IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS

UNITED STATES OF AMERICA, Plaintiff, v. FLINT HILLS RESOURCES PORT ARTHUR, LLC, Defendant.	)	No. 1:14CV169

TABLE OF CONTENTS

TABLE OF SERIES ONE APPENDICES

OTHER APPENDICES

CONSENT DECREE

WHEREAS Plaintiff the United States of America ("United States"), on behalf of the United States Environmental Protection Agency ("EPA"), has filed a complaint against Defendant Flint Hills Resources, LP ("FHR"), concurrently with the lodging of this Consent Decree, for alleged environmental violations at FHR's chemical manufacturing facility ("Facility") located in Port Arthur, Texas;

WHEREAS the United States alleges on information and belief in its Complaint that, at its flares, FHR has violated and/or continues to violate one or more of the following statutory and regulatory provisions of the Clean Air Act ("CAA"):

a. The Prevention of Significant Deterioration ("PSD") requirements found in 42 U.S.C. § 7475 and 40 C.F.R. §§ 52.21(a)(2)(iii) and 52.21(j)–52.21(r)(5);

b. The Non-Attainment New Source Review ("NNSR") requirements found in 42 U.S.C. §§ 7502(c)(5), 7503(a)–(c) and 40 C.F.R. Part 51, Appendix S, Part IV, Conditions 1–4;

c. The federally enforceable Minor New Source Review ("Minor NSR") requirements adopted and implemented in the Texas State Implementation Plan ("SIP") pursuant to 42 U.S.C. § 7410(a)(2)(C) and 40 C.F.R. §§ 51.160–51.164;

d. The New Source Performance Standards ("NSPS") promulgated at 40 C.F.R. Part 60, Subparts A, VV, and VVa, pursuant to Section 111 of the CAA, 42 U.S.C. § 7411;

e. The National Emission Standards for Hazardous Air Pollutants ("NESHAPs") promulgated at 40 C.F.R. Part 61, Subparts A and FF and 40 C.F.R. Part 63, Subparts A, G, SS, and YY, pursuant to Section 112 of the CAA, 42 U.S.C. § 7412;

f. The requirements of Title V of the CAA found at 42 U.S.C. §§ 7661a(a), 7661b(c), 7661c(a); and 40 C.F.R. §§ 70.1(b), 70.5(a) and (b), 70.6(a) and (c), and 70.7(b);

g. The portions of the Title V permit for the Facility that adopt, incorporate, or implement the provisions cited in a–e and h; and

h. The federally enforceable Texas SIP provisions that incorporate, adopt, and/or implement the federal requirements listed in a–b and d–f.

WHEREAS the United States alleges in its Complaint that FHR has violated and/or continues to violate the Leak Detection and Repair ("LDAR") requirements promulgated pursuant to Sections 111 and 112 of the Act and found at 40 C.F.R. Part 60, Subpart VV; 40 Part 61, Subpart V; and 40 C.F.R. Part 63, Subparts H and UU;

WHEREAS FHR denies that it has violated and/or continues to violate any of statutory and regulatory requirements set forth in the two preceding "whereas" clauses and denies any liability to the United States arising out of the transactions or occurrences alleged in the Complaint, and nothing in the Complaint, nor in this Consent Decree, nor in the execution and implementation of this Consent Decree shall be treated as an admission of any violation of federal or state statutes or regulations in any litigation or forum whatsoever, except that the terms of this Consent Decree, and FHR's failure to comply with the terms and conditions thereof may be used by the United States in any action or dispute resolution proceeding to enforce the terms of this Consent Decree or as otherwise permitted by law;

WHEREAS FHR operates three Flares at the Facility: the Light Olefins Unit/Propylene Drying Unit ("LOU") Flare; the permanent, back-up flare to the LOU Flare which is known as the LOU Flare-2; and the Aromatics Unit ("AU") Flare; these three Flares (the "Covered Flares") are the subject of Section IV of this Consent Decree;

WHEREAS the monitoring method on the LOU Flare is used on the LOU Flare-2 when the LOU Flare is not in operation;

WHEREAS, as set forth below, FHR has provided a significant level of cooperation with EPA by implementing flaring emission reductions prior to entry of this Consent Decree, by installing and proving that a Flare Gas Recovery System can operate effectively at a stand-alone

olefins plant, and by implementing programs under both LDAR and the Benzene Waste Operations National Emissions Standards for Hazardous Air Pollutants prior to entry of this Consent Decree;

WHEREAS prior to entry of this Consent Decree, without any admission of liability or of violation of law with respect to the Covered Flares, FHR already has undertaken the following:

- Equipped each Covered Flare with a Vent Gas Flow Monitoring System (including a Vent Gas Average Molecular Weight Analyzer), a Total Steam Flow Monitoring System, and upgraded steam control equipment;
- Automated the control of the Steam-to-Vent-Gas ("S/VG") ratio at the Covered Flares;
- Installed a Gas Chromatograph ("GC") to speciate and measure the Vent Gas constituents set forth in Appendix 1.9 directed to the LOU Flare and LOU Flare-2 and utilized this GC to calculate the Net Heating Value of the Vent Gas directed to LOU Flare; this already-installed GC had a sample cycle time of approximately 20 minutes;
- Operated a Meteorologic Station;
- Met or exceeded the technical specifications set forth in Appendix 1.10 for the Vent Gas Flow Monitoring Systems (including the Vent Gas Average Molecular Weight Analyzer), the Total Steam Flow Monitoring System existing at the Facility as of the Date of Lodging, the Gas Chromatograph, and the Meteorologic Station; and
- Commenced, in August of 2011, the Startup of a Flare Gas Recovery System ("FGRS") consisting of three, equal-sized, staged liquid ring compressors, each with a nominal design capacity of 1000 acfm (or approximately 60 kscfh), designed to capture Waste Gas vented to the Covered Flares.

WHEREAS prior to the entry of this Consent Decree, without any admission of liability or of violation of law, FHR undertook numerous measures to minimize Waste Gas flow to the Covered Flares including but not limited to:

- Identified the volumetric and mass flow rates of Waste Gas to the Covered Flares;
- Identified the baseload Waste Gas flow to the Covered Flares;
- Identified the constituents within the Waste Gas using engineering evaluations, monitoring, and sample analyses;
- Undertook Waste Gas mapping (*i.e.*, identifying Waste Gas ties-ins between the main flare headers and the process unit headers (sometimes known as "subheaders")) using instrumentation, isotopic tracing, and engineering calculations;
- Designed, constructed, and began operating an FGRS;

- Optimized the utilization of the FGRS to route Waste Gas from the AU Flare to the FGRS;
- Implemented practices to minimize the frequency and duration of outages of the FGRS and to minimize the volume of gas flared during such outages; and
- Implemented procedures and/or practices to minimize flaring during planned and unplanned Startups, Shutdowns, and maintenance activities, including Turnarounds.

WHEREAS in October of 2010, FHR undertook Passive Fourier Transform Infrared ("Passive FTIR") testing at the LOU and AU Flares and based on these flare-specific results, EPA determined that, in order to achieve 98% Combustion Efficiency at these Flares, net heating value limits based on flow rate as opposed to Vent Gas composition was appropriate;

WHEREAS prior to the Lodging of this Consent Decree, FHR demonstrated to EPA's satisfaction that, due to FHR's Vent Gas composition (which includes a significant amount of propylene), an S/VG ratio of approximately 3.5 at times resulted in smoking, rendering it necessary to establish a higher ratio than 3.5 as the limit;

WHEREAS, for purposes of the Enhanced LDAR Program set forth in Section V of this Consent Decree, all operating units at the Facility are "Covered Process Units;"

WHEREAS four of the Covered Process Units are in volatile hazardous air pollutant ("VHAP") service (Gasoline Hydrogenation, Pyrolysis Hydrogenation, UDEX, and Cyclohexane) and one is in non-VHAP service (LOU);

WHEREAS, prior to entry of this Consent Decree, without any admission of liability or of violation of law of the LDAR Regulations or the Benzene Waste Operations NESHAP, FHR undertook the following:

- Developed and implemented written facility-wide LDAR program procedures pursuant to Paragraph 48;
- Revised the leak definitions to enable early identification of leaks pursuant to Paragraph 49;
- Implemented enhanced monitoring frequencies for various equipment pursuant to Paragraph 51;

- During the 2012 LOU Turnaround Project, replaced and/or repacked approximately 1,200 valves with Low-Emission technology pursuant to Paragraph 64;
- Developed an LDAR Training module and LDAR New Employee Orientation pursuant to Paragraph 72;
- Created and implemented a certification procedure for LDAR monitoring technicians and LDAR Database Coordinator pursuant to Paragraph 73;
- Commenced quarterly quality assurance/quality control reviews of LDAR performance pursuant to Paragraph 74;
- Completed two third-party audits of laboratories that perform benzene analyses pursuant to Paragraph 91;
- Developed and implemented a benzene accounting procedure for spills pursuant to Paragraph 92;
- Installed equipment and collected samples at a proposed End of Line ("EOL") location at Sump 65 (API Separator Inlet) pursuant to Paragraph 94; and
- Identified and marked all process flow drains to ensure stormwater drains are segregated pursuant to Paragraph 97.a.iv.

WHEREAS, in 2012, FHR completed a Turnaround of the LOU, the Gasoline Hydrogenation Unit, the Pyrolysis Hydrogenation Unit and equipment located outside the battery limits of the Facility;

WHEREAS, during that Turnaround, FHR implemented all of the actions required in Paragraph 64 of this Decree, thus completing one of the two rounds of actions that otherwise would have been required;

WHEREAS, since at least the time of FHR's ownership of the Facility (November 2007), all open-ended lines at their closure devices ("OELCDs") in both VHAP and non-VHAP units have been connectors, have been included in the Facility's LDAR program as connectors, and have been monitored and otherwise treated as connectors;

WHEREAS FHR estimates that the injunctive relief measures it already has undertaken and will undertake pursuant to this Consent Decree will cost approximately $44.5 million;

WHEREAS FHR estimates that the environmental mitigation projects required to be implemented pursuant to Section IX of this Decree will cost $2,350,000;

WHEREAS, for several years, FHR has undertaken a program to proactively investigate and respond to events at the two fence line monitoring stations within the Facility and FHR has agreed to continue the proactive monitoring of its fence line through implementation of the program in Section X (Fence Line Monitoring Program);

WHEREAS, between the beginning of 2011 and the full implementation of this Decree, EPA estimates that emissions from Covered Flares will be reduced by approximately the following amounts (in "tons per year" or "TPY"):

Pollutant	2011 through implementation
Volatile Organic Compounds ("VOCs")	1,605 TPY
Carbon Dioxide Equivalents ("CO_2e")	69,550 TPY
Hazardous Air Pollutants ("HAPs")	255 TPY
Nitrogen Oxides ("NO_x")	20 TPY

WHEREAS, between the beginning of 2011 and the full implementation of this Consent Decree, emissions of carbon monoxide ("CO") from the Covered Flares also will be reduced;

WHEREAS, by entering into this Consent Decree, FHR has indicated that it is committed to continuing to proactively reduce emissions from its Flares, its LDAR equipment, and its benzene waste operations streams;

WHEREAS this Consent Decree is intended to represent a comprehensive resolution of the claims alleged in the Complaint and the claims resolved through Section XVI (Effect of Settlement) and to ensure that when the compliance measures required by this Decree have been fully implemented, each Covered Flare will be operated and maintained to prevent a recurrence of the violations alleged in the Complaint and the violations resolved through Section XVI (Effect of Settlement);

WHEREAS the United States anticipates that the specific and comprehensive compliance measures set forth in this Consent Decree, which are subject to a reasonable timetable for

implementation, will result in the cessation of the violations alleged in the Complaint and the violations resolved through Section XVI (Effect of Settlement);

WHEREAS, the United States and FHR (the "Parties") recognize, and this Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith and will avoid litigation between the Parties, and that this Consent Decree is fair, reasonable, and in the public interest;

NOW, THEREFORE, before the taking of any testimony, without the adjudication or admission of any issue of fact or law except as provided in Section I, and with the consent of the Parties, IT IS HEREBY ADJUDGED, ORDERED, AND DECREED as follows:

I. JURISDICTION AND VENUE

1. This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331, 1345, and 1355; Sections 113(b) and 167 of the CAA, 42 U.S.C. §§ 7413(b) and 7477; and over the Parties. Venue lies in this District pursuant to Section 113(b) of the CAA, 42 U.S.C. § 7413(b); and 28 U.S.C. §§ 1391(b) and (c) and 1395(a), because FHR resides and is located in this judicial district and the violations alleged in the Complaint are alleged to have occurred in this judicial district. For purposes of this Decree, or any action to enforce this Decree, FHR consents to this Court's jurisdiction over this Decree, over any action to enforce this Decree, and over FHR. FHR also consents to venue in this judicial district.

2. For purposes of this Consent Decree, FHR does not contest that the Complaint states claims upon which relief may be granted.

3. Notice of the commencement of this action has been given to Texas, under Sections 113(a)(1) and 113(b) of the CAA, 42 U.S.C. §§ 7413(a)(1) and (b).

II. APPLICABILITY

4. The obligations of this Consent Decree apply to and are binding upon the United States and upon FHR and any successors, assigns, and other entities or persons otherwise bound by law.

5. FHR shall give written notice of, and shall provide a copy of, the Consent Decree to any successors in interest at least sixty (60) days prior to the transfer of ownership or operation of any portion of the Facility. FHR shall notify the United States in accordance with the notice provisions in Section XVIII (Notice) of any successor in interest at least thirty days prior to any such transfer.

6. If FHR intends to request that the United States agree to a transferee's assumption of any obligations of the Consent Decree, FHR shall condition any transfer, in whole or in part, of ownership of, operation of, or other interest in the Facility upon the transferee's written agreement to execute a modification to the Consent Decree that shall make the terms and conditions of the Consent Decree applicable to the transferee.

7. As soon as possible prior to the transfer: (i) FHR shall notify the United States of the proposed transfer and of the specific Consent Decree provisions that FHR proposes the transferee assume; (ii) FHR shall certify that the transferee is contractually bound to assume the obligations and liabilities of this Consent Decree; and (iii) the transferee shall submit to the United States a certification that the transferee has the financial and technical ability to assume the obligations and liabilities of this Consent Decree and a certification that the transferee is contractually bound to assume the obligations and liabilities of this Consent Decree.

8. After the submission to the United States of the notice and certification required by the previous Paragraph, either: (i) the United States, shall notify FHR that the United States

does not agree to modify the Consent Decree to make the transferee responsible for complying with the terms and conditions of the Consent Decree; or (ii) the United States, FHR, and the transferee shall file with the Court a joint motion requesting the Court to approve a modification substituting the transferee for FHR as the Defendant responsible for complying with the terms and conditions of the Consent Decree.

9. If FHR does not secure the agreement of the United States to a joint motion within a reasonable period of time, then FHR and the transferee may file, without the agreement of the United States, a motion requesting the Court to approve a modification substituting the transferee for FHR as the Defendant responsible for complying with some or all of the terms and conditions of the Consent Decree. The United States may file an opposition to the motion. In reviewing the motion to modify, the Court shall consider whether the transferee has demonstrated that it has the financial and technical ability to assume the obligations and liabilities of the Consent Decree; whether the modification language effectively transfers the obligations and liabilities to the transferee; and any other relevant matters.

10. Except as provided in Paragraphs 5–9 and Section XIII (Force Majeure), FHR shall be responsible for ensuring that performance of the work contemplated under this Consent Decree is undertaken in accordance with the deadlines and requirements contained in this Consent Decree and any attachments hereto. FHR shall provide a copy of all applicable portions of this Consent Decree to all officers and employees whose duties might reasonably include compliance with any provision of this Decree. No later than the execution of any contract with a consulting or contracting firm that is retained to perform work required by this Consent Decree, FHR shall provide a copy of the applicable provisions of this Consent Decree to each such consulting or contracting firm. FHR shall condition any such contract upon performance of the

work in conformity with the applicable terms of this Consent Decree. No later than thirty (30) days after the Date of Lodging of the Consent Decree, FHR also shall provide a copy of the applicable provisions of this Consent Decree to each consulting or contracting firm that FHR already has retained to perform the work required by this Consent Decree. Copies of the applicable provisions of the Consent Decree do not need to be supplied to firms who are retained to supply materials or equipment to satisfy requirements of this Consent Decree.

11. In any action to enforce this Consent Decree, FHR shall not raise as a defense the failure by any of its officers, directors, employees, agents, or contractors to take any actions necessary to comply with the provisions of this Consent Decree. Nothing in this Paragraph is intended to prevent FHR from asserting a Force Majeure defense under this Decree.

III. DEFINITIONS APPLICABLE TO ALL SECTIONS OF THE CONSENT DECREE

12. Terms common to all Sections of this Consent Decree are defined in this Section III. Terms specific to Section IV (Emissions Reductions from Flares) and Section V (Leak Detection and Repair) are defined therein. Terms used in this Consent Decree that are defined in the CAA or in federal and state regulations promulgated pursuant to the CAA shall have the meaning assigned to them in the CAA or such regulations, unless otherwise provided in this Decree. Whenever the terms listed below are used in this Consent Decree, the following definitions shall apply:

a. "Calendar Quarter" shall mean a three-month period ending on March 31, June 30, September 30, or December 31.

b. "Clean Air Act" or "CAA" means the federal Clean Air Act, 42 U.S.C. §§7401-7671q, and its implementing regulations

c. "Consent Decree" or "Decree" shall mean this Consent Decree and all Appendices attached hereto, but in the event of any conflict between the text of this Consent Decree and any Appendix, the text of this Consent Decree shall control."

d. "Date of Lodging of this Consent Decree" or "Date of Lodging" or "DOL" shall mean the date that this Consent Decree is filed for lodging with the Clerk of the Court for the United States District Court for the Eastern District of Texas.

e. "Date of Entry of this Consent Decree" or "Date of Entry" or "DOE" shall mean the Effective Date of this Consent Decree as set forth in Section XIX.

f. "EPA" shall mean the United States Environmental Protection Agency, and any successor departments or agencies of the United States.

g. "Facility" shall mean the chemical manufacturing plant owned and operated by FHR and located at 4241 Savannah Avenue, Port Arthur, Texas, 77640.

h. "FHR" shall mean Flint Hills Resources Port Arthur, LLC, the owner and operator of the Facility.

i. "Paragraph" shall mean a portion of this Consent Decree identified by an Arabic numeral.

j. "Parties" shall mean the United States and FHR.

k. "Projects" shall mean the Environmental Mitigation Projects identified in Section IX and Appendix 4.1 of this Consent Decree.

l. "Project Dollars" shall mean FHR's expenditures and payments incurred or made in carrying out the Environmental Mitigation Projects identified in Section IX and Appendix 4.1 of this Consent Decree to the extent that such expenditures or payments both: (i) comply with the requirements set forth in Section IX and Appendix 4.1 of this Consent

Decree; and (ii) constitute FHR's direct payments for such projects or FHR's external costs for contractors, vendors, and equipment.

m. "Section" shall mean a portion of this Consent Decree that has a heading identified by an upper case Roman numeral.

n. "Shutdown" shall mean the cessation of operation for any purpose.

o. "Startup" shall mean the setting in operation for any purpose.

p. "Subparagraph" shall mean a portion of a Paragraph of this Consent Decree that is identified by a lower case letter, a lower case Roman numeral ("romanette"), or an italicized Arabic numeral in parenthesis.

q. "Subsection" shall mean a portion of a Section of this Consent Decree that has a heading identified by a capital letter.

r. "Title V Permit" shall mean the permit required of major sources under Subchapter V of the Clean Air Act, 42 U.S.C. §§ 7661-7661e, and the applicable State Implementation Plans.

s. "United States" shall mean the United States of America, on behalf of EPA.

t. "VOC" or "Volatile Organic Compounds" shall have the definition set forth in 40 C.F.R. § 51.100(s).

IV. AFFIRMATIVE RELIEF: EMISSIONS REDUCTIONS FROM FLARES

A. Definitions

13. Terms used in this Section IV that are defined in the CAA or in federal and state regulations promulgated pursuant to the CAA, shall have the meaning assigned to them in the

CAA, or such regulations, unless otherwise provided in this Decree. Whenever the terms set forth below are used in this Section IV, the following definitions shall apply:

a. "Ambient Air" or "air" shall mean that portion of the atmosphere, external to buildings, to which persons have access.

b. "AU Flare" shall mean the Flare affiliated with the "Aromatics Unit" at the Facility and designated by FHR as the AU Flare.

c. "Automatic Control System" or "ACS" shall mean a system that utilizes programming logic to automate the operation of the instrumentation and systems identified in Paragraph 17 of this Decree so as to produce the operational results required in Paragraphs 32, 34–37.

d. "Available for Operation" shall mean, with respect to a Compressor within a Flare Gas Recovery System, that the Compressor is capable of commencing the recovery of Potentially Recoverable Gas as soon as practicable but not more than one hour after the Need for the Compressor to Operate arises. The period of time, not to exceed one hour, allowed by this definition for the startup of a Compressor shall be included in the amount of the time that a compressor is Available for Operation.

e. "BTU/scf" shall mean British Thermal Unit per standard cubic foot.

f. "Capable of Receiving Sweep, Supplemental, and/or Waste Gas" shall mean, for a Flare, that the flow of Sweep, Supplemental, and/or Waste Gas is/are not prevented by means of closed valves and/or blinds.

g. "Center Steam" or "S_{cen}" shall mean steam piped into the center of a Flare stack or center of the lower part of the Flare tip where it mixes directly with Vent Gas without

entraining air. Diagrams illustrating the meaning and location of Center, Lower, and Upper Steam are set forth in Appendix 1.1 to this Consent Decree.

h. "Center Steam Volumetric Flow Rate" or "$Q_{s\text{-}cen}$" shall mean the volumetric flow rate of Center Steam supplied to a Flare, in scfm, as either measured (if applicable) or estimated using best engineering judgment, on a 5-minute block average.

i. "Center Steam Mass Flow Rate" or "$\dot{m}_{s\text{-}cen}$" shall mean the mass flow rate of Center Steam supplied to a Flare, in pounds per hour, as either measured (if applicable) or estimated using best engineering judgment, on a 5-minute block average using Equation 2 in Appendix 1.2.

j. "Combustion Efficiency" or "*CE*" shall mean a Flare's efficiency in converting the organic carbon compounds found in Vent Gas to carbon dioxide. Combustion Efficiency shall be determined as set forth in Equation 1 in Appendix 1.2.

k. "Combustion Zone" shall mean the area of the Flare flame where the combustion of Combustion Zone Gas occurs.

l. "Compressor" shall mean, with respect to a Flare Gas Recovery System, a mechanical device designed and installed to recover gas from a flare header. Types of Flare Gas Recovery System compressors include, but may not be limited to, reciprocating compressors, centrifugal compressors, liquid ring compressors, and liquid jet ejectors.

m. "Combustion Zone Gas" shall mean the mixture of all gases and steam found after the Flare tip. This gas includes all Vent Gas, all Pilot Gas, and all Total Steam.

n. "Covered Flare" shall mean the LOU Flare, the LOU Flare-2, and the AU Flare, all of which are Elevated, Steam-Assisted Flares. The LOU Flare-2 is a permanent back-up to the LOU Flare.

o. "Discontinuous Wake Dominated Flow" shall mean gas flow exiting a Flare tip that is identified visually by:

(i) The presence of a flame that is: (1) immediately adjacent to the exterior of the Flare tip body; and (2) below the exit plane of the Flare tip; and

(ii) A discontinuous flame, such that pockets of flame are detached from the portion of the flame that is immediately adjacent to the exterior of the Flare tip body.

Representations of Discontinuous Wake Dominated Flow are set forth in Appendix 1.12.

p. "Duplicate Spare Compressor" shall mean, with respect to a Flare Gas Recovery System, an installed compressor, designed to be identical or functionally equivalent to the other compressor(s) of the FGRS. In order to qualify as a "Duplicate Spare Compressor," the compressor must be functionally interchangeable with the other FGRS compressor(s) such that the operating design capacity of the FGRS is Available for Operation while any one compressor of the FGRS is out of service. The capacity of a Duplicate Spare Compressor depends upon the number of compressors installed to meet the operating design capacity of the FGRS. For example, if one compressor is installed to provide an operating design capacity of 270 kscfh, the Duplicate Spare Compressor shall have a capacity of 270 kscfh; if, instead, three, 90 kscfh compressors are installed, the Duplicate Spare Compressor shall have a capacity of 90 kscfh.

q. "Elevated Flare" shall mean a Flare that supports combustion at a tip that is situated at the upper end of a vertical conveyance (*e.g.*, pipe, duct); the combustion zone is elevated in order to separate the heat generated by combustion from people, equipment, or structures at grade level.

r. "Exit Velocity" shall mean the velocity ("*v*"), in feet per second, of the Vent Gas and Center Steam as they exit the flare tip. Exit Velocity shall be calculated by adding

together the Vent Gas Volumetric Flow Rate and the Center Steam Volumetric Flow Rate, based on standard conditions, and dividing by the Unobstructed Cross Sectional Area of the Flare Tip.

s. "External Utility Loss" shall mean a loss in the supply of electrical power, steam, or other third-party utility to the Facility that is caused by events occurring outside the boundaries of the Facility, excluding utility losses due to an interruptible utility service agreement.

t. "Flare" shall mean a combustion device that uses an uncontrolled volume of Ambient Air to burn gases.

u. "Flare Gas Recovery System" or "FGRS" shall mean a system of one or more compressors, piping, and associated water seal, rupture disk, or similar device used to divert gas from a Flare and direct the gas to a fuel gas system, to a combustion device other than the Flare, or to a product, co-product, by product, or raw material recovery system.

v. "Initial Waste Gas Minimization Plan" or "Initial WGMP" shall mean the document submitted pursuant to Paragraph 21.

w. "In Operation" or "Being In Operation" or "Operating," with respect to a Flare shall mean any and all times that any gas (*e.g.*, Waste, Vent, Purge, Pilot, *etc.*) is or may be vented to a Flare. A Flare that is In Operation is Capable of Receiving Sweep, Supplemental, and/or Waste Gas unless all Sweep, Supplemental, and Waste Gas flow is prevented by means of closed valves and/or blinds.

x. "KSCFH" or "kscfh" shall mean thousand standard cubic feet per hour.

y. "LOU Flare" shall mean the Flare affiliated with the "Light Olefins Unit/Propylene Drying Unit" at the Facility and designated by FHR as the LOU Flare.

z. "LOU Flare-2" shall mean the back-up Flare to the LOU Flare that is designated by FHR as the LOU Flare-2.

aa. "Lower Heating Value" or "*LHV*" shall mean the theoretical total quantity of heat liberated by the complete combustion of a unit volume or weight of a fuel initially at 25 degrees Centigrade and 760 mmHg, assuming that the produced water is vaporized and all combustion products remain at, or are returned to, 25 degrees Centigrade; however, the standard for determining the volume corresponding to one mole is 20 degrees Centigrade.

bb. "Lower Steam" shall mean steam piped to an exterior annular ring near the lower part of a Flare tip, which entrains Ambient Air which flows through tubes to the Flare tip, and ultimately exits the tubes at the top of the Flare tip. Diagrams illustrating the meaning and location of Center, Lower, and Upper Steam are set forth in Appendix 1.1 to this Consent Decree.

cc. "Malfunction" shall mean any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not Malfunctions. In any action under this Consent Decree involving this definition, FHR shall have the burden of proving a Malfunction and, in interpreting this definition, the ten requirements for a "malfunction" set forth in Section II ("*Affirmative Defenses for Malfunctions"*) of EPA's Policy on Excess Emissions during Malfunctions, Startup, and Shutdown shall apply. This Policy is attached as Appendix 1.4.

dd. "Need for a Compressor to Operate" shall mean:

i. For a situation in which no Compressor within the FGRS is recovering gas: When a Potentially Recoverable Gas flow rate (determined on a five-minute block average) to the Covered Flare(s) serviced by the Flare Gas Recovery System exists; or

ii. For a situation in which one or more Compressors within the FGRS already is recovering gas: When the Potentially Recoverable Gas flow rate (determined on a five minute block average) exceeds the capacity of the operating Compressor(s).

ee. "Net Heating Value" shall mean Lower Heating Value.

ff. "Net Heating Value of Combustion Zone Gas" or "NHV_{cz}" shall mean the Lower Heating Value, in BTU/scf, of the Combustion Zone Gas in a Flare. NHV_{cz} is represented by Equations 2a or 2.b in Appendix 2.1 to this Consent Decree and shall be calculated in accordance with Equations 2–5 of Appendix 2.1.

gg. "Net Heating Value of Combustion Zone Gas Limit" or "$NHV_{cz\text{-}limit}$" shall mean the minimum Net Heating Value that the Combustion Zone Gas must have to ensure an acceptable Combustion Efficiency. $NHV_{cz\text{-}limit}$ shall be calculated in accordance with Equations 6–11 of Appendix 2.1.

hh. "Net Heating Value of Vent Gas" or "NHV_{vg}" shall mean the Lower Heating Value, in BTU/scf, of the Vent Gas directed to a Flare. NHV_{vg} is calculated as set forth in Equation 1 of Appendix 2.1.

ii. "Passive FTIR" shall mean a Fourier Transform Infrared System that collects thermal (infrared) radiation emitted by a hot gas plume, and through the analysis of the resulting emission spectrum, identifies and quantifies the compounds producing values proportional to the path integrated gas concentrations.

jj. "Pilot Gas" shall mean all gas introduced through the pilot tip of a Flare to maintain a flame.

kk. "Portable Flare" shall mean a Flare that is not permanently installed that receives Waste Gas that has been redirected to it from the Covered Flare for periods that are anticipated to be 504 hours or less on a rolling 1095-day period.

ll. "Potentially Recoverable Gas" shall mean the Sweep Gas, Supplemental Gas, and/or Waste Gas (including hydrogen, nitrogen, oxygen, carbon dioxide, carbon monoxide, and/or water) directed to a Covered Flare's or group of Covered Flares' FGRS, except that Regeneration Waste Gas Streams are not included in the definition of "Potentially Recoverable Gas."

mm. "Prevention Measure" shall mean an instrument, device, piece of equipment, system, process change, physical change to process equipment, or change to or addition of a procedure or program to minimize or eliminate flaring.

nn. "Purge Gas" shall mean the minimum amount of gas introduced between a Flare header's water seal and the Flare tip to prevent oxygen infiltration (backflow) into the Flare tip. For a Flare with no water seal, the function of Purge Gas is performed by Sweep Gas, and therefore, by definition, such a Flare has no Purge Gas.

oo. "Regeneration Waste Gas Streams" shall mean waste gas streams produced during the regeneration of the dryers and reactors at the LOU. Regeneration Waste Gas Streams are high in nitrogen and have very low heating value, thus not being useful as a fuel.

pp. "Reportable Flaring Incident" shall mean when Waste Gas equal to or greater than 500,000 scf is flared within a 24-hour period at the Facility. For purposes of calculating whether the triggering level of Waste Gas flow has been met, if FHR has instrumentation capable of calculating the volumetric flow rate of hydrogen, nitrogen, oxygen,

carbon monoxide, carbon dioxide, and/or water (steam) in the Waste Gas, the contribution of all measured flows of any of these elements/compounds may be excluded. A flaring event or events that have the same root cause(s) that last(s) more than 24 hours shall be considered a single incident. When flaring occurs at more than one Covered Flare, the volume of non-excluded Waste Gas flow at each Covered Flare shall be added together unless the root cause(s) of the flaring at each Covered Flare is(are) not related to each other.

qq. "SCFD" or "scfd" shall mean standard cubic feet per day.

rr. "SCFH" or "scfh" shall mean standard cubic feet per hour.

ss. "SCFM" or "scfm" shall mean standard cubic feet per minute.

tt. "Smoke Emissions" shall have the definition set forth in Section 3.5 of Method 22 of 40 C.F.R. Part 60, Appendix A. Smoke Emissions may be documented either by a person trained pursuant to Method 22 or by a video camera.

uu. "Standard Conditions" shall mean a temperature of 68 degrees Fahrenheit and a pressure of 1 atmosphere. Unless otherwise expressly set forth in this Consent Decree or an Appendix, Standard Conditions shall apply.

vv. "Steam-Assisted Flare" shall mean a Flare that utilizes steam piped to a Flare tip to assist in combustion.

ww. "Supplemental Gas" shall mean all gas introduced to a Flare to comply with the net heating value requirements of 40 C.F.R. § 60.18(b), 40 C.F.R. § 63.11(b), and/or Paragraph 34 of this Consent Decree, and/or the minimum amount of gas introduced to a Flare to comply with the requirements of Paragraphs 35 and/or 36.

xx. "S/VG_{mass}" or "Total-Steam-Mass-Flow-Rate-to-Vent-Gas-Mass-Flow-Rate Ratio" shall mean the ratio of the Total Steam Mass Flow Rate to the Vent Gas Mass Flow Rate.

yy. "Sweep Gas" shall mean:

i. For a Flare with a Water Seal: The minimum amount of gas introduced into a Flare header in order to: *(a)* prevent oxygen buildup, corrosion, and/or freezing in the Flare header; and *(b)* maintain a safe flow of gas through the Flare header, including a higher flow during hot taps. Sweep Gas in these Flares is introduced prior to and is intended to be recovered by the Flare Gas Recovery System; and

ii. For a Flare without a Water Seal: The minimum amount of gas introduced into a Flare header in order to: *(a)* prevent oxygen buildup, corrosion, and/or freezing in the Flare header; *(b)* maintain a safe flow of gas through the Flare header, including a higher flow during hot taps; and *(c)* prevent oxygen infiltration (backflow) into the Flare tip.

zz. "Total Steam" or "*S*" shall mean the total of all steam that intentionally is introduced into a Steam-Assisted Flare to assist in combustion. Total Steam includes, but is not limited to, Lower Steam, Center Steam, and Upper Steam.

aaa. "Total Steam Mass Flow Rate" or "$\dot{m}_s$" shall mean the mass flow rate of Total Steam supplied to a Flare, in pounds per hour as calculated on a 5-minute block average. Total Steam Mass Flow Rate shall be calculated as set forth in Equation 3 of Appendix 1.2.

bbb. "Total-Steam-Mass-Flow-Rate-to-Vent-Gas-Mass-Flow-Rate Ratio" or "S/VG_{mass}" shall mean the ratio of the Total Steam Mass Flow Rate to the Vent Gas Mass Flow Rate.

ccc. "Total Steam Volumetric Flow Rate" or "Q_s" shall mean the volumetric flow rate of Total Steam supplied to a Flare, in scfm, as measured on a 5-minute block average.

ddd. "Unobstructed Cross Sectional Area of the Flare Tip" or "$A_{tip\text{-}unob}$" shall mean the open, unobstructed area of a Flare tip through which Vent Gas and Center Steam pass. Diagrams of four common flare types are set forth in Appendix 1.6 together with the equations for calculating the $A_{tip\text{-}unob}$ of these four types.

eee. "Upper Steam," sometimes called Ring Steam, shall mean steam piped to nozzles located on the exterior perimeter of the upper end of a Flare tip. Diagrams illustrating the meaning and location of Center, Lower, and Upper Steam are set forth in Appendix 1.1 to this Consent Decree.

fff. "Velocity of the Wind" or "wind speed" or "v_{wind}" shall mean the velocity of the Ambient Air, in miles per hour on a five-minute block average, measured at the Meteorological Station at the Facility.

ggg. "Vent Gas" shall mean the mixture of all gases found just prior to the Flare tip. This gas includes all Waste Gas, Sweep Gas, Purge Gas, and Supplemental Gas, but does not include Pilot Gas, Total Steam, or Assist Air.

hhh. "Vent Gas Volumetric Flow Rate" or "Q_{vg}" shall mean the volumetric flow rate of Vent Gas directed to a Covered Flare, in wet scfm, on a 5-minute block average basis.

iii. "Vent Gas Mass Flow Rate" or "$\dot{m}_{vg}$" shall mean the mass flow rate of Vent Gas directed to a Covered Flare, in pounds per hour on a 5-minute block average. Vent Gas Mass Flow Rate shall be calculated as set forth in Equation 4 of Appendix 1.2.

jjj. "Vent Gas Molecular Weight" or "MW_{vg}" shall mean the Molecular Weight, in pounds per pound-mole, of the Vent Gas, on a 5-minute block average.

kkk. "Visible Emissions" shall mean five minutes or more of Smoke Emissions during any two consecutive hours. For purposes of this Consent Decree, Visible Emissions may be determined by a person trained pursuant to Method 22 or documented by a video camera.

lll. "Waste Gas" shall mean the mixture of all gases from facility operations that is directed to a flare for the purpose of disposing of the gas. "Waste Gas" does not include gas introduced to a flare exclusively to make it operate safely and as intended; therefore, "Waste Gas" does not include Pilot Gas, Total Steam, assist air, or the minimum amount of Sweep Gas and Purge Gas that is necessary to perform the functions of Sweep Gas and Purge Gas. "Waste Gas" also does not include the minimum amount of gas introduced to a flare to comply with regulatory and/or enforceable permit requirements and/or the requirements of Paragraphs 34–36; therefore, "Waste Gas" does not include Supplemental Gas. Depending upon the instrumentation that monitors Waste Gas, certain compounds (hydrogen, nitrogen, oxygen, carbon dioxide, carbon monoxide, and/or water (steam)) that are directed to a Flare for the purpose of disposing of these compounds may be excluded from calculations relating to Waste Gas flow. In the relevant provisions of Subsections IV.B–G, the circumstances in which such exclusions are permitted are specifically identified. Appendix 1.7 to this Consent Decree depicts the meaning of "Waste Gas," together with its relation to other gases associated with Flares.

B. Instruments and Monitoring Systems

14. Flare Data and Monitoring Systems and Protocol Report ("Flare Data and Monitoring Systems and Protocol Report"). For each Covered Flare, by no later than the Date of Entry, FHR shall submit a report, consistent with the requirements in Appendix 1.8, to EPA that includes the following:

a. The information, diagrams, and drawings specified in Paragraphs 1–8 of Appendix 1.8;

b. A detailed description of each instrument and piece of monitoring equipment, including the specific model and manufacturer, that has been or will be installed on each Covered Flare (Paragraphs 8.1 and 9 of Appendix 1.8);

c. A narrative description of the monitoring methods and calculations that FHR shall use to comply with the requirements of Paragraphs 34–36 (Paragraph 10 of Appendix 1.8) for each Covered Flare; and

d. The identification of the calibration gases to be used to comply with Subparagraphs V.B. and VI.B of Appendix 1.10 (Paragraph 11 of Appendix 1.8).

15. Video Camera. By no later than June 30, 2014, FHR shall install a video camera that views the Flare tip and flame of each Covered Flare. This instrument shall record, in digital format, the flame of (including any resulting from Discontinuous Wake Dominated Flow), and any Smoke Emissions from, each Covered Flare.

15A. Vent Gas Net Heating Value Analyzer. By no later than December 31, 2014, FHR shall install a Vent Gas Net Heating Value Analyzer that shall continuously analyze or calculate the Net Heating Value, in BTU per standard cubic foot ("BTU/scf"), of the Vent Gas directed to the AU Flare. This instrument may be located upstream of the introduction of Supplemental and/or Purge Gas if the Net Heating Value and flow rate of any such Supplemental and/or Purge Gas is(are) (a) known constant(s) and if this/these constant(s) is(are) then used in the calculation of the Net Heating Value of the Vent Gas directed to the AU Flare. When installed, the Vent Gas Net Heating Value Analyzer shall meet or exceed the applicable specifications and Quality Assurance/Quality Control ("QA/QC") requirements set forth in Appendix 1.10.

15B. Total Steam Flow Monitoring System. Commencing on the Date of Lodging, FHR shall continue to operate the total steam flow monitoring systems that currently exist for the

Covered Flares ("Current Total Steam Flow Monitoring Systems"). By the earlier of (i) the next outage of the Covered Flares; or (ii) December 31, 2020, FHR shall replace or upgrade the Current Total Steam Flow Monitoring Systems with total steam flow monitoring systems that, when installed, shall meet or exceed the applicable specifications and QA/QC requirements set forth in Appendix 1.10 ("New Total Steam Flow Monitoring Systems").

16. Instruments and Monitoring Systems: Compliance with Specifications and QA/QC Requirements in Appendix 1.10. Except for the Video Camera required in Paragraph 15, the Vent Gas Net Heating Value Analyzer/Calculator required in Paragraph 15A, and the New Total Steam Flow Monitoring Systems required in Paragraph 15B, the instruments and monitoring systems identified in Paragraph 17 shall, by no later than the Date of Entry, meet or exceed the applicable specifications and comply with the applicable Quality Assurance/Quality Control requirements set forth in Appendix 1.10.

17. Instruments and Monitoring Systems: Recording and Averaging Times. By no later than the dates set forth below, FHR shall operate each of the following instruments and monitoring systems associated with the Covered Flares at the Facility so as to produce and record data measurements and calculations for each parameter at the following time intervals.

Instrument and/or Monitoring System	Recording and Averaging Times	Date
Vent Gas Flow Monitor; Vent Gas Average Molecular Weight Analyzer; Current Total Steam Flow Monitor; Pilot Gas Flow (if installed)	Measure continuously and record 5 minute block averages	Date of Entry
New Total Steam Flow Monitor	Measure continuously and record 5 minute block averages	The earlier of (i) the next outage of the Covered Flares; or (ii) December 31, 2020
Gas Chromatograph (at the LOU Flare and LOU Flare-2)	Measure no less than once every 20 minutes and record that value	Date of Entry
Net Heating Value Analyzer (at the AU Flare)	Measure continuously and record 5 minute block averages	12.31.2014
Instrument measuring Wind Speed	Measure continuously and record 5 minute block averages	Date of Entry
Video Camera	Record at a rate of no less than 4 frames per minute	6.30.2014

Nothing in this Paragraph is intended to prohibit FHR from setting up process control logic that uses different averaging times from those in this table provided that the recording and averaging times in this table are available and used for determining compliance with this Consent Decree.

18. Instruments and Monitoring Systems: Operation and Maintenance. Commencing on December 31, 2014 for the Video Camera, June 30, 2015 for the Net Heating Value Analyzer, six months after the installation of the New Total Steam Flow Monitors, and in the first full calendar quarter after the Date of Entry for all other instruments and monitoring systems, FHR shall operate each of the instruments and monitoring systems identified in the table in Paragraph 17 on a continuous basis when the Covered Flare that the instrument and/or

monitoring system is associated with is In Operation and Capable of Receiving Sweep, Supplemental, and/or Waste Gas, except for the following periods:

a. Malfunction of an instrument and/or monitoring system;

b. Maintenance following instrument and/or monitoring system Malfunction;

c. Scheduled maintenance of an instrument and/or monitoring system in accordance with the manufacturer's recommended schedule; and/or

d. Quality Assurance/Quality Control activities.

Except as explicitly provided in Paragraphs VII.A.1 and VII.B.1 of Appendix 1.10, in no event shall the excepted activities in Subparagraphs18.a–18.d for any instrument monitoring one of the Covered Flares exceed 110 hours in any calendar quarter. For all instruments except the Gas Chromatograph, the calculation of instrument downtime shall be made in accordance with 40 C.F.R. § 60.13(h)(2) and Paragraph VII of Appendix 1.10. For the Gas Chromatograph, the calculation of instrument downtime shall be made in accordance with Paragraph VII.A of Appendix 1.10. Except as explicitly provided in Paragraphs VII.A.1 and VII.B.1 of Appendix 1.10, if the excepted activities in Subparagraphs 18.a–18.d for any instrument exceed 110 hours in any calendar quarter, EPA shall be entitled to seek stipulated penalties as set forth in Subparagraph 120.d of this Consent Decree and FHR shall be entitled to assert that the period of instrument and/or monitoring system downtime was justified under the circumstances. Nothing in this Paragraph is intended to prevent FHR from claiming a *force majeure* defense to any period of instrument and/or monitoring system downtime.

C. <u>Determining Whether the Covered Flares (which have a Water Seal because they have an FGRS) are Not Receiving Potentially Recoverable Gas Flow</u>

19. If all of the following conditions are met for the Covered Flares, then there is no flow of Potentially Recoverable Gas to the Covered Flare:

a. For the water seal drum associated with the respective Covered Flare, the pressure difference between the inlet pressure and the outlet pressure is less than the water seal pressure as set by the static head of water between the opening of the dip tube in the drum and the level setting weir or liquid level in the drum;

b. For the water seal drum associated with the respective Covered Flare, if a level setting weir is used, the water level in the drum is at the level of the weir; and

c. Downstream of the water seal drum, other than periods when Regeneration Waste Gas Streams are directed to the LOU Flare or LOU Flare-2, there is no flow of Supplemental Gas that is directed to the Covered Flare.

D. Waste Gas Minimization

20. Waste Gas Minimization Practices and Procedures. Commencing on the Date of Entry, FHR shall continue to implement the following practices and procedures to minimize Waste Gas flow to the Covered Flares:

a. Optimize the utilization and operation of the FGRS, including but not limited to: (i) evaluating outages of the FGRS to implement practices to minimize the frequency and duration of these outages; (ii) evaluating small maintenance activities to determine if Waste Gas from these activities can be routed to the FGRS; and (iii) during periods when the LOU is non-operational but the Aromatics Unit is operational, direct as much Waste Gas from the AU Flare to the FGRS as feasible given the number of LOU cracking furnaces available to accept the recovered gas;

b. Revise operational procedures and/or practices as needed for Startup, Shutdown, and maintenance (including Turnaround) by undertaking a program of evaluating flaring that occurs during Startup, Shutdown, and maintenance (including Turnaround) with the goal of performing these activities with as little flaring as possible (or no flaring);

c. Revise operational procedures and/or practices as needed by undertaking a program of evaluating recurrent failures of air pollution control equipment, process equipment, or a process to operate in a normal and usual manner, including considering the adequacy of existing maintenance schedules and protocols for such equipment. A failure is "recurrent" if it occurs more than twice during any five year period as a result of the same cause.

21. Initial Waste Gas Minimization Plan. In the first semi-annual report required under Section VIII of this Decree that is due after one year has passed since the Date of Entry, FHR shall include an Initial Waste Gas Minimization Plan, which shall include the following:

a. Updates, if and as necessary, to the information, diagrams, and drawings provided in the Flare Data and Monitoring Systems and Protocol Report required under Paragraph 14.

b. Volumetric (in scfm) and mass (in pounds) of Waste Gas flow. FHR shall identify the volumetric flow of Waste Gas, in scfm on a 30-day rolling average, and the mass flow rate, in pounds per hour on a 30-day rolling average, vented to each Covered Flare for the period of time between the Date of Entry and 31 days prior to the submission of the semi-annual report;

c. Reductions previously realized. FHR shall describe the equipment, processes and/or procedures installed or implemented to reduce flaring for the period of time between the Date of Entry and 31 days prior to the submission of the semi-annual report. The description shall specify the date of installation or implementation and the amount of reductions realized.

d. Reductions Based on Root Cause Analysis. FHR shall review all of the Root Cause Analysis reports submitted under Paragraph 25 for the period of time between the Date of Entry and 31 days prior to the submission of the semi-annual report to determine if reductions in addition to the reductions achieved through any required corrective action under Paragraph 26 can be realized;

e. Planned reductions. FHR shall describe the equipment, processes, or procedures that FHR plans to install or implement to eliminate or reduce flaring in the future. The description shall specify a schedule for expeditious installation and commencement of operation or implementation and a projection of the amount of reductions to be realized. Subsequent to the submission of the Initial WGMP, FHR may revise the installation and operation dates provided that FHR does so in writing to EPA within a reasonable time of determining that such a revision(s) is(are) necessary and provides a reasonable explanation for the revised date(s);

f. Prevention Measures. FHR shall describe and evaluate Prevention Measures, including a schedule for the expeditious implementation and commencement of operation of Prevention Measures, to address the following:

i. Flaring that has occurred or may reasonably be expected to occur during planned maintenance activities, including Startup and Shutdown; and

ii. Flaring caused by the recurrent failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. The evaluation shall consider the adequacy of existing maintenance schedules and protocols for such equipment. A failure is "recurrent" if it occurs more than twice during any five year period as a result of the same cause.

22. Subsequent Updates to Waste Gas Minimization Plan. In the semi-annual report that is due one year after the Initial WGMP is submitted, FHR shall submit an updated WGMP. On an annual basis thereafter until termination of the Decree, FHR shall submit an updated WGMP as part of the applicable semi-annual report. Each update shall update, if and as necessary, the information required in Paragraph 21. To the extent that FHR proposes to extend any schedule set forth in a previous WGMP, FHR shall do so only with good cause.

23. Waste Gas Minimization Plan: Implementation. By no later than the dates specified in a WGMP, FHR shall implement the actions described therein. If (i) no implementation date and/or (ii) no completion date for actions that do not require ongoing implementation (such as the installation of a piece of a equipment) is (are) set forth in the WGMP, the implementation and/or completion date shall be deemed the date of the submission of the WGMP.

24. Enforceability of WGMPs. The terms of each WGMP submitted under this Consent Decree are specifically enforceable.

25. Root Cause Analysis for Reportable Flaring Incident.

a. Internal Reporting and Recordkeeping. Except as provided in Paragraph 27, commencing no later than six months after the Date of Entry, FHR shall conduct

an investigation into the root cause(s) of a Reportable Flaring Incident and shall prepare and keep as a record, by no later than forty-five days following the end of a Reportable Flaring Incident, an internal report that shall include, at a minimum, the following:

i. The date and time that the Reportable Flaring Incident started and ended;

ii. The volume of Waste Gas flared and an estimate of the quantity of VOCs and HAPs that was emitted and the calculations that were used to determine that quantity;

iii. The steps, if any, that FHR took to limit the duration of the Reportable Flaring Incident and the estimated quantity of VOC and HAP emissions associated therewith;

iv. A detailed analysis that sets forth the root cause and all contributing causes of the Reportable Flaring Incident, to the extent determinable;

v. An analysis of the measures, if any, that are available to reduce the likelihood of a recurrence of a Reportable Flaring Incident resulting from the same root cause or contributing causes in the future. The analysis shall discuss the alternatives, if any, that are available, the probable effectiveness and the cost of the alternatives, if an alternative is eliminated based on cost. Possible design and operation and maintenance changes shall be evaluated. If FHR concludes that corrective action(s) is (are) required under Paragraph 26, the report shall include a description of the action(s) and, if not already completed, a schedule for its (their) implementation, including proposed commencement and completion dates. If FHR concludes that corrective action is not required under Paragraph 26, the report shall explain the basis for that conclusion; and

vi. To the extent that investigations of the causes and/or possible corrective actions still are underway at the time the internal report must be completed (i.e., forty five days after the end of a Reportable Flaring Incident), a statement of the anticipated date by which a follow-up report fully conforming to the requirements of this Subparagraph will be submitted.

b. Submitting Summary of Internal Flaring Incident Reports. In each semi-annual report due under Section VIII of this Decree (Reporting Requirements), FHR shall

include a summary of the following items for each Reportable Flaring Incident that occurred during the six-month period that the semi-annual report covers:

i. Date;

ii. Duration;

iii. Amount of VOCs and HAPs released;

iv. Root Cause(s);

v. Corrective Action(s) completed;

vi. Corrective Action(s) still outstanding; and

vii. An analysis of any trends identified by FHR in terms of the number of Incidents, the root causes, or the types of Corrective Action.

26. Corrective Action Implementation. In response to any Reportable Flaring Incident that occurs on and after six months after the Date of Entry, FHR shall take, as expeditiously as practicable, such interim and/or long-term corrective actions, if any, as are consistent with good engineering practice to minimize the likelihood of a recurrence of the root cause and all contributing causes of that Reportable Flaring Incident.

27. In lieu of preparing a new report under Paragraph 25 and analyzing and implementing corrective action under Paragraph 26 for a Reportable Flaring Incident that has as its root cause the same root cause as a previously reported Reportable Flaring Incident, FHR may cross-reference and utilize the prior report and analysis when preparing the report required by Paragraph 25.

E. Flare Gas Recovery System at the Facility

28. FGRS: Capacity and Start-Up Date. Prior to the Date of Lodging, FHR completed installation and commenced operation of a Flare Gas Recovery System to recover

Potentially Recoverable Gas directed to the Covered Flares. The FGRS consists of three, staged liquid ring compressors, each of which has a nominal design capacity to recover a total flow of Potentially Recoverable Gas of 1000 actual cubic feet per minute ("acfm") (or approximately 60 kscfh). One compressor is a Duplicate Spare Compressor. Nothing in this Subsection IV.E shall require FHR to recover Regeneration Waste Gas Streams in the FGRS.

29. FGRS: Operation.

a. Commencing on the Date of Entry, FHR shall operate the FGRS in a manner to minimize Waste Gas to the Covered Flares while ensuring safe operations. FHR also shall operate the FGRS consistent with good engineering and maintenance practices and in accordance with its design and the manufacturer's specifications.

b. Requirements Related to Compressors Being Available for Operation. By no later than the Date of Entry, FHR shall comply with the following requirements for the FGRS when Potentially Recoverable Gas is being generated and there are at least three furnaces operating within the LOU:

i. FHR shall have two Compressors Available for Operation and/or in operation 95% of the time and one Compressor Available for Operation and/or in operation at all times. The following periods may be included in the amount of time that a Compressor is Available for Operation when determining compliance with the requirement to have one Compressor Available for Operation and/or in operation "at all times":

(1) Periods of maintenance on and subsequent restart of the equipment within the FGRS that is shared by all Compressors (for example, the water seal, the knock out drum, valves), such that the entire FGRS must be shut down in order to undertake the maintenance; provided however, that these periods of maintenance shall not exceed 336 hours in a five-year rolling sum period, rolled daily. FHR shall use best efforts to schedule these maintenance activities during periods when FHR anticipates that a minimum of three furnaces within the

LOU will not be available to sustain operation of the FGRS (*e.g.*, an LOU Turnaround). To the extent it is not practicable to undertake these maintenance activities during a period when a minimum of three furnaces are not in operation, FHR shall use best efforts to minimize the generation of Waste Gas during such periods.

(2) Periods in which the Compressor is shut down (including the subsequent restart) due to by operating conditions (such as high temperatures or large quantities of entrained liquid in the Vent Gas) outside the design operating range of the FGRS, including the associated knock out drum(s), such that the outage is necessary for safety and/or to preserve the mechanical integrity of the FGRS. By no later than 60 days after any such period of outage, FHR shall investigate the root cause and all contributing causes of the outage and shall implement, as expeditiously as practicable, corrective action, if any, to prevent a recurrence of the cause(s). In the reports due under Section VIII of this Decree, FHR shall describe each outage that occurred under the conditions identified in this Subparagraph, including the date, duration, cause(s), corrective action, and the status of the implementation of corrective action.

ii. Period to be Used for Computing Percentage of Time. The period for computing the percentage of time that a Compressor or group of Compressors is Available for Operation and/or in operation shall be an 8760-hour rolling sum period, rolled hourly using only hours when Potentially Recoverable Gas was generated during all or part of the hour but excluding hours for flows that could not have been prevented through reasonable planning and were in anticipation of or caused by a natural disaster, act of war or terrorism, or External Utility Loss. When no Potentially Recoverable Gas is generated during an entire hour, then that hour shall not be used in computing the 8760-hour rolling sum. The rolling sum shall include only the prior 8760 1-hour periods when Potentially Recoverable Gas was generated during all or part of the hour, provided that the Potentially Recoverable Gas was not generated by flows that could not have been prevented through reasonable planning and were in anticipation of or caused by a natural disaster, act of war or terrorism, or External Utility Loss.

F. Flare Combustion Efficiency

30. General Emission Standards Applicable to Covered Flares. Beginning no later than the Date of Entry, FHR shall comply with the following requirements at each Covered Flare at all times when the Covered Flare is In Operation.

a. Operation during Emissions Venting. FHR shall operate each Covered Flare at all times when emissions may be vented to it.

b. No Visible Emissions. Except for periods of Startup, Shutdown, and/or Malfunction, FHR shall operate each Covered Flare with no Visible Emissions. Method 22 in 40 C.F.R. Part 60, Appendix A, shall be used to determine compliance with this standard. However, for purposes of this Consent Decree, Visible Emissions may be determined by a person trained pursuant to Method 22 or documented by a video camera.

c. Flame Presence. FHR shall operate each Covered Flare with a flame present at all times. FHR shall monitor the presence of the pilot flame using a thermocouple or any other equivalent device to detect the presence of the pilot flame.

d. Monitoring According to Applicable Provisions. FHR shall comply with all applicable Subparts of 40 C.F.R. Parts 60, 61, or 63 that state how a particular Covered Flare must be monitored.

e. Good Air Pollution Control Practices. At all times, including during periods of Startup, Shutdown, and/or Malfunction, FHR shall implement good air pollution control practices to minimize emissions from each Covered Flare; provided however, that FHR shall not be in violation of this requirement for any practice that this Consent Decree requires FHR to implement after the Date of Lodging for the period between the Date of Lodging and the implementation date or compliance date (whichever is applicable) for the particular practice.

Nothing in this Subparagraph 30.e requires FHR to install or maintain flare monitoring equipment in addition to or different from the equipment required by this Consent Decree.

f. Exit Velocity. Except for periods of Startup, Shutdown, and/or Malfunction, FHR shall operate each Covered Flare with an Exit Velocity less than 18.3 m/sec (60 ft/sec) on a one-hour block average; provided however, that:

i. If the Covered Flare combusts Vent Gas with a Net Heating Value of greater than 1000 BTU/scf, FHR may operate the Covered Flare with an Exit Velocity equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec) on a one-hour block average; and

ii. If the Covered Flare has a maximum permitted velocity (Vmax), FHR may operate the Covered Flare with an Exit Velocity less than Vmax provided that it also operates the applicable Flare with an Exit Velocity of less than 122 m/sec (400 ft/sec) on a one-hour block average. V_{max} shall be calculated in accordance with 40 C.F.R. § 60.18(f)(5). The Unobstructed Cross Sectional Area of the Flare Tip shall be calculated consistent with Appendix 1.6.

g. Operation According to Design. FHR shall operate and maintain each Covered Flare in accordance with its design, except if, and only to the extent that, operation and maintenance of the Covered Flare in conformance with its design conflicts with compliance with one or more of the requirements of this Consent Decree.

31. Revisions to 40 C.F.R. §§ 60.18(b)–(f) and/or 63.11(b). To the extent that, from the Date of Entry of this Consent Decree until its termination, revisions to 40 C.F.R. §§ 60.18(b)–(f) and/or 63.11(b) are final and effective that are inconsistent with any of the requirements in Paragraph 30, then FHR shall comply with the final, effective regulations and any requirements in Paragraph 30 that are not inconsistent with these final, effective regulations. As used in this Paragraph, "inconsistent" mean that compliance with both provisions is not possible.

32. Work Practice Standards for each Covered Flare. By no later than the dates set forth below, FHR shall operate on each Covered Flare an Automatic Control System that automates the control of the Supplemental Gas flow rate and the S/VG_{mass} to the respective Covered Flare:

Automation Requirement	LOU Flare	AU Flare
Supplemental Gas flow rate	Date of Entry	12.31.2014
Control of S/VG_{mass}	6.30.2014	6.30.2014

33. Exception to Work Practice Standards in Paragraph 32. FHR manually may override the operation of the Automatic Control System required in Paragraph 32 if the exception in Paragraph 38 applies, and/or during Startup, Shutdown, or Malfunction of a process unit that feeds a Covered Flare, and/or to achieve the following:

a. Stop Smoke Emissions that are occurring;

b. Meet the Net Heating Value requirements of Paragraph 34;

c. Prevent extinguishing the Flare;

d. Protect personnel and process safety; and/or

e. Stop Discontinuous Wake Dominated Flow.

34. Net Heating Value Standards for each Covered Flare.

a. Net Heating Value of Vent Gas (NHV_{vg}). Beginning on the Date of Entry and continuing until the earlier of: (i) termination of this Consent Decree; or (ii) the requirements in 40 C.F.R. §§ 60.18(c)(3)(ii) and/or 63.11(b)(6)(ii) (whichever is applicable) related to NHV_{vg} are modified, FHR shall operate each Covered Flare with an NHV_{vg} of greater than or equal to 300 BTU/scf, except as provided in Paragraph 38.

b. Net Heating Value of Combustion Zone Gas (NHV_{cz}).

i. LOU Flare and LOU Flare-2. By no later than six months after the Date of Entry, for the LOU Flare, FHR shall calculate an $NHV_{cz\text{-}limit}$ no less frequently than every twenty minutes. Except as provided in Paragraph 38, FHR shall operate the LOU Flare so as to ensure that the NHV_{cz}, on a three-hour rolling average, rolled every twenty minutes, is greater than or equal to its $NHV_{cz\text{-}limit}$ on a three-hour rolling average, rolled every twenty minutes. FHR shall utilize the equations and directives set forth in Appendix 2.1 to meet the requirements of this Subparagraph. FHR shall not use an adjusted value for the Net Heating Value of hydrogen. When the LOU Flare-2 is in operation instead of the LOU Flare, FHR shall comply with the requirements of this Subparagraph at the LOU Flare-2.

ii. LOU Flare and LOU Flare-2: Optional Utilization of Net Heating Value Analyzer. At any time at least one year prior to the termination of this Decree, FHR may notify EPA of its intent to utilize a Net Heating Value Analyzer on the LOU Flare to calculate the Net Heating Value of the LOU Flare's Vent Gas instead of using the LOU Flare's Gas Chromatograph for that purpose. The notice shall identify the date (no sooner than 30 days after the notice) that FHR shall make the change. On that date, FHR shall commence calculating an $NHV_{cz\text{-}limit}$ no less frequently than every five minutes. Except as provided in Paragraph 38, FHR shall operate the LOU Flare so as to ensure that the NHV_{cz}, on a one-hour rolling average, rolled every five minutes, is greater than or equal to its $NHV_{cz\text{-}limit}$ on a one-hour rolling average, rolled every five minutes. FHR shall utilize the equations and directives set forth in Appendix 2.1 to meet the requirements of this Subparagraph except that, instead of using Equation 1 to calculate the NHV_{vg}, FHR shall use the value measured by the NHV Analyzer. FHR shall not use an

adjusted value for the Net Heating Value of hydrogen. FHR shall not cease operation of the Gas Chromatograph for purposes other than calculating NHV_{vg}.

iii. AU Flare. By no later than June 30, 2015, for the AU Flare, FHR shall calculate an $NHV_{cz\text{-}limit}$ no less frequently than every five minutes. Except as provided in Paragraph 38, FHR shall operate the AU Flare so as to ensure that the NHV_{cz}, on a one-hour rolling average, rolled every five minutes, is greater than or equal to its $NHV_{cz\text{-}limit}$ on a one-hour rolling average, rolled every five minutes. FHR shall utilize the equations and directives set forth in Appendix 2.1 to meet the requirements of this Subparagraph. FHR shall not use an adjusted value for the Net Heating Value of hydrogen.

35. *S/VG* Standards (Total-Steam-to-Vent-Gas Ratio Standards).

a. Standard. By no later than the six months after the Date of Entry, and except as provided in Subparagraph 35.b and Paragraph 38, FHR shall operate each Covered Flare at less than or equal to an S/VG_{mass} of 4.0 on a one-hour rolling average, rolled every five minutes. For each Covered Flare, FHR shall record the S/VG_{mass}.

b. Exceptions. Notwithstanding the requirements of Subparagraph 35.a, FHR is not subject to the emissions standards in that Subparagraph if the exception in Paragraph 38 applies and/or in order to achieve the following:

i. Stop Smoke Emissions that are occurring;

ii. Meet the Net Heating Value requirements of Paragraph 34;

iii. Prevent extinguishing the Flare; and/or

iv. Protect personnel and process safety.

36. Prohibition on Discontinuous Wake Dominated Flow

a. By no later than six months after the Date of Entry, FHR shall not operate the Covered Flares with Discontinuous Wake Dominated Flow except for periods not to exceed a total of five minutes during any two consecutive hours. FHR shall add Supplemental Gas as necessary to prevent such instances of Discontinuous Wake Dominated Flow at the Covered Flares. Notwithstanding the previous sentence, FHR shall not be required to add Supplemental Gas at any time that Paragraph 38 applies and/or the wind speed at the Facility is greater than or equal to 35 mph on a 60-minute rolling average basis, rolled every 5 minutes

b. Prior to the effective date of the prohibition in Subparagraph 36.a, for all operators and supervisors with responsibility and/or oversight for the operation of the Covered Flares, FHR shall complete training on the meaning and prevention of Discontinuous Wake Dominated Flow. After this effective date, operators shall monitor the operation of each Covered Flare at intervals appropriate for the weather conditions and service of the Covered Flare in order to comply with the prohibition in Subparagraph 36.a.

37. 98% Combustion Efficiency. By no later than six months after the Date of Entry for the LOU Flare (and, when operating in its place, the LOU Flare-2) and by no later than June 30, 2015 for the AU Flare, FHR shall operate each Covered Flare with a minimum of a 98% Combustion Efficiency at all times when Waste Gases are vented to it. To demonstrate continuous compliance with the 98% Combustion Efficiency, FHR shall operate each Covered Flare in compliance with the applicable requirements in Paragraphs 34–36.

38. Exception for Instrument Downtime. A failure to comply with the work practices and standards in Paragraphs 32, 34.a, 34.b, 35.a, and 36.a, after the compliance dates in those

Paragraphs, shall not constitute a violation of such work practice or standard if the noncompliance results from downtime of instruments or equipment due to the following:

a. Malfunction of an instrument, for an instrument needed to meet the requirement(s);

b. Maintenance following instrument Malfunction, for an instrument needed to meet the requirement(s);

c. Scheduled maintenance of an instrument in accordance with the manufacturer's recommended schedule, for an instrument needed to meet the requirement(s); and/or

d. Quality Assurance/Quality Control activities on an instrument needed to meet the requirement(s).

Except as explicitly provided in Paragraphs VII.A.1 and VII.B.1 of Appendix 1.10, this exception shall no longer be applicable if the activities in Subparagraphs 38.a–38.d exceed 110 hours in any calendar quarter for any instrument. For all instruments except the Gas Chromatograph, the calculation of instrument downtime shall be made in accordance with 40 C.F.R. § 60.13(h)(2) and Paragraph VII of Appendix 1.10. For the Gas Chromatograph, the calculation of instrument downtime shall be made in accordance with Paragraph VII.A of Appendix 1.10.

39. Inapplicability of Paragraphs 34–37. The requirements of Paragraphs 34–37 are not applicable to a Covered Flare when the only gas or gases being vented to the Covered Flare is/are Pilot Gas and/or Purge Gas.

40. Recordkeeping: Timing and Substance. FHR shall comply with the following recordkeeping requirements:

a. By no later than three months after the Date of Entry, FHR shall calculate and record each of the following parameters:

i. Total Steam Volumetric and Mass Flow Rates (in scfm and lb/hr) (in accordance with the recording and averaging times required in Paragraph 17)

ii. Vent Gas Volumetric and Mass Flow Rates (in scfm and lb/hr) (in accordance with the recording and averaging times required in Paragraph 17)

iii. S/VG_{mass} (in lb steam/lb Vent Gas) (in accordance with the averaging times in Subparagraph 35.a)

iv. NHV_{vg} (in BTU/scf) (on a one-hour block average for purposes of Subparagraph 34.a)

v. NHV_{cz} (in BTU/scf) (in accordance with the averaging times in Subparagraph 34.b)

vi. $NHV_{cz\text{-}limit}$ (in BTU/scf) (in accordance with the averaging times in Subparagraph 34.b)

b. By no later than the dates required for compliance with the work practice standards in Paragraph 32: (i) FHR shall record, within seven days after the end of an override, each time it manually overrides an Automatic Control System, including the date, time, duration, reason for the override, and corrective actions that FHR took; and (ii) where the reason for the override was to stop Smoke Emissions that were occurring and/or to stop Discontinuous Wake Dominated Flow, then, by no later than June 30, 2014, FHR shall include a copy of the digital video record (with a time stamp) of the flare during the period of the manual override.

c. By no later than the end of the first full calendar quarter after the Date of Entry, commencing if and when the excepted activities in Subparagraphs 18.a–18.d for any instrument subject to Paragraph 18 exceed 110 hours in any calendar quarter, FHR shall record the duration of the deviation, an explanation of the cause(s) of the deviation, and a description of the corrective action(s) that FHR took.

d. By no later than the three months after the Date of Entry, at any time that FHR deviates from any of the standards in Paragraphs 30 and 34–37, FHR shall record the duration of the deviation, an explanation of the cause(s) of the deviation, and a description of the corrective action(s) that FHR took.

G. Miscellaneous

41. Portable Flares.

a. Applicability. The provisions of this Paragraph shall apply to Portable Flares.

b. Distinction between Planned and Unplanned Outages of Covered Flares. For purposes of this Paragraph, a "planned" outage shall mean an outage of a Covered Flare that is scheduled 30 days or more in advance of the outage. An "unplanned" outage is an outage that either is scheduled less than 30 days in advance or is unscheduled.

c. 504 hours or less. For any planned or unplanned outage of a Covered Flare that FHR knows or reasonably anticipates will result in 504 hours or less of downtime on a 1095-day rolling period, rolled daily, FHR shall make good faith efforts to ensure that the Portable Flare that replaces the Covered Flare complies with all of the requirements of this Consent Decree that are applicable to the Covered Flare that the Portable Flare replaces.

d. More than 504 hours.

i. Planned. For any planned outage of a Covered Flare that FHR knows or reasonably can anticipate will last 504 hours or more on a 1095 day rolling period, rolled daily, FHR shall ensure that the Portable Flare complies with all of the requirements of this Consent Decree related to the Covered Flare that it replaces as of the date that the Portable Flare is In Operation and is Capable of Receiving Sweep, Supplemental, and/or Waste Gas.

ii. Unplanned. For any unplanned outage of a Covered Flare that, in advance of the outage, FHR cannot reasonably anticipate will last longer than 504 hours, FHR shall ensure that the Portable Flare complies with all of the requirements of this Consent Decree related to the Covered Flare that it replaces by no later than 30 days after the date that FHR knows or reasonably should have known that the outage would last 504 hours or more.

e. Recordkeeping. FHR shall keep records sufficient to document compliance with the requirements of this Paragraph any time it uses a Portable Flare.

H. Incorporation of Section IV Requirements into Federally Enforceable Permits

42. Permits Needed to Meet Compliance Obligations. If any compliance obligation under this Section IV requires FHR to obtain a federal, state, or local permit or approval, FHR shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals. FHR may seek relief under the provisions of Section XIII of this Decree (Force Majeure) for any delay in the performance of any such obligation resulting from a failure to obtain, or a delay in obtaining, any permit or approval required to fulfill such obligation, if FHR has submitted timely and complete applications and has taken all other actions necessary to obtain all such permits or approvals.

43. Permits to Ensure Survival of Consent Decree Limits and Standards after Termination of Consent Decree.

a. Prior to termination of this Consent Decree, FHR shall submit complete applications to the appropriate permitting authorities in the State of Texas to incorporate the limits and standards listed in Subparagraph 43.b into non-Title V, federally enforceable permits that will survive termination of this Consent Decree. Prior to termination of this Consent Decree, FHR shall submit to the appropriate permitting authorities in the State of Texas,

appropriate applications, amendments and/or supplements to incorporate as "applicable requirements" the limits and standards listed in Subparagraph 43.b to ensure that these limits and standards survive termination of this Consent Decree.

b. The limits and standards imposed by the following Paragraphs of this Consent Decree shall survive termination: 15–19, 29–30, 32–33, 34.b, 35.a–b, 36.a and 37–40. At the time of submission of the documents necessary to ensure survival of the limits and standards identified in this Subparagraph, FHR may elect, at any Covered Flare, to cease recording both S/VG_{mass} and S/VG_{vol} and instead may identify the S/VG basis (*i.e.*, volume or mass) that it elects to comply with going forward and record S/VG only on that basis.

44. Modifications to Title V Operating Permits. Prior to termination of this Consent Decree, FHR shall submit complete applications to the appropriate permitting authorities in the State of Texas to modify, amend, or revise the Title V permit of the Facility to incorporate the limits and standards identified in the preceding Paragraph into the Title V permits. The Parties agree that the incorporation of these emission limits and standards into Title V Permits shall be done in accordance with applicable state or local Title V rules. The Parties agree that the incorporation may be by "amendment" under 40 C.F.R. § 70.7(d) and analogous state Title V rules, where allowed by state law.

V. AFFIRMATIVE RELIEF: LEAK DETECTION AND REPAIR

A. Definitions

45. Terms used in this Section V that are defined in the CAA or in federal and state regulations promulgated pursuant to the CAA shall have the meaning assigned to them in the CAA or such regulations, unless otherwise provided in this Section V. Whenever the terms listed below are used in this Section V, the following definitions shall apply:

a. "Annual" or "Annually" shall mean a calendar year, except as otherwise provided in applicable LDAR regulations.

b. "Covered Equipment" shall mean all Covered Types of Equipment in all Covered Process Units.

c. "Covered Process Unit" shall include each of the following process units at the Facility:

i. Gasoline Hydrogenation Unit ("GHU")
ii. Pyrolysis Hydrogenation Unit ("PHU")
iii. UDEX Unit
iv. Light Olefins Unit/Propylene Drying Unit ("LOU")
v. Cyclohexane Unit
vi. Outside Battery Limits ("OSBL") Equipment associated with the Covered Process Units

d. "Covered Types of Equipment" shall mean all valves (except pressure relief valves), connectors, pumps, agitators, and open-ended lines in light liquid or gas/vapor service at each Covered Process Unit that are regulated under any "equipment" leak provisions of 40 C.F.R. Part 60, 61, or 63 or state or local LDAR regulations.

e. "Day," for purposes of requirements uniquely imposed by this Enhanced LDAR Program and not by any applicable LDAR regulations, shall mean a calendar day. In computing any period of time under this Consent Decree for submittal of reports, where the last day would fall on a Saturday, Sunday, or a federal holiday, the period shall run until the close of business of the next business day. For all other purposes, "day" shall have the meaning provided in applicable LDAR regulations.

f. "Directed Maintenance" shall mean the utilization of monitoring (or other method that indicates the relative size of the leak) concurrent with the repair of a leaking piece of equipment to achieve the best repair/lowest emission rate reasonably possible.

g. "DOR" shall mean Delay of Repair.

h. "ELP" shall mean the Enhanced Leak Detection and Repair Program set forth in this Section V of this Decree.

i. "Existing Valve" shall have the meaning set forth in Paragraph 60.

j. "Extension," for purposes of Subparagraph 45.o.i.*(2)* and 45.o.ii.*(2)*, shall mean that: (i) the tested and untested valve were produced by the same manufacturer to the same or essentially equivalent quality requirements; (ii) the characteristics of the valve that affect sealing performance (e.g., type of valve, stem motion, tolerances, surface finishes, loading arrangement, and stem and body seal material, design, and construction) are the same or essentially equivalent as between the tested and the untested valve; and (iii) the temperature and pressure ratings of the tested valve are at least as high as the temperature and pressure ratings of the untested valve.

k. "LDAR" or "Leak Detection and Repair" shall mean the leak detection and repair activities required by any applicable "equipment leak" provision of 40 C.F.R. Parts 60, 61, or 63. LDAR shall also mean any state or local equipment leak provisions that require the use of Method 21 to monitor for equipment leaks and also require the repair of leaks discovered through such monitoring.

l. "LDAR Audit Commencement Date" or "Commencement of an LDAR Audit" shall mean the first day of the on-site inspection that accompanies an LDAR audit.

m. "LDAR Audit Completion Date" or "Completion of an LDAR Audit" shall mean the date that is no more than 120 days after the LDAR Audit Commencement Date.

n. "Low-Emissions Packing" or Low-E Packing" shall mean either of the following:

i. A valve packing product, independent of any specific valve, for which the manufacturer has issued a written warranty that the packing will not emit fugitives at greater than 100 ppm, and that, if it does so emit at any time in the first five years, the manufacturer will replace the product; provided however, that no packing product shall qualify as "Low-E" by reason of written warranty unless the packing first was tested by the manufacturer or a qualified testing firm pursuant to generally-accepted good engineering practices for testing fugitive emissions and the results of the testing reasonably support the warranty; or

ii. A valve packing product, independent of any specific valve, that has been tested by the manufacturer or a qualified testing firm pursuant to generally-accepted good engineering practices for testing fugitive emissions, and that, during the test, at no time leaked at greater than 500 ppm, and on average, leaked at less than 100 ppm.

o. "Low-Emissions Valve" or "Low-E Valve" shall mean either of the following:

i. A valve (including its specific packing assembly) for which the manufacturer has issued a written warranty that it will not emit fugitives at greater than 100 ppm, and that, if it does so emit at any time in the first five years, the manufacturer will replace the valve; provided however, that no valve shall qualify as "Low-E" by reason of written warranty unless the valve (including its specific packing assembly) either:

(1) First was tested by the manufacturer or a qualified testing firm pursuant to generally-accepted good engineering practices for testing fugitive emissions and the results of the testing reasonably support the warranty; or

(2) Is an Extension of another valve that qualified as "Low-E" under Subparagraph 45.o.i.*(1)*;

or:

ii. A valve (including its specific packing assembly) that:

(1) Has been tested by the manufacturer or a qualified testing firm pursuant to generally-accepted good engineering practices for testing fugitive emissions and that, during the test, at no time leaked at greater than 500 ppm, and on average, leaked at less than 100 ppm; or

(2) Is an Extension of another valve that qualified as "Low-E" under Subparagraph 45.o.ii.*(1)*.

p. "Malfunction" shall mean, as that term is defined under 40 C.F.R. § 60.2, "any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operations are not malfunctions."

q. "Method 21" shall mean the test method found at 40 C.F.R. Part 60, Appendix A, Method 21. To the extent that the Covered Equipment is subject to regulations that modify Method 21, those modifications shall be applicable.

r. "Month" or "monthly" shall mean a calendar month, except as otherwise provided in applicable LDAR regulations.

s. "New Valve" shall mean a valve that is not replacing an Existing Valve.

t. "NSPS" shall mean the New Source Performance Standards within the meaning of Part A of Subchapter I of the Clean Air Act. 42 U.S.C. § 7411. The NSPS are codified at 40 C.F.R. Part 60.

u. "OEL" or "Open-Ended Line" shall mean any valve, except pressure relief valves, having one side of the valve seat in contact with process fluid and one side open to the atmosphere, either directly or through open piping.

v. "OELCD" shall mean an open-ended line at the closure device (i.e., secondary valve, cap, blind flange, or plug).

w. "PPM" or "ppm" shall mean parts per million.

x. "Process Unit Shutdown" shall have the meaning set forth in 40 C.F.R. § 63.161.

y. "Quarter" or "quarterly" shall mean a calendar quarter (January through March, April through June, July through September, October through December), except as otherwise provided in applicable LDAR regulations.

z. "Repair Verification Monitoring" shall mean the utilization of monitoring (or other method that indicates the relative size of the leak) within 24 hours of each attempt at repair of a leaking piece of equipment in order to ensure that the leak has been eliminated or is below the applicable leak definition in the ELP.

aa. "Screening Value" shall mean the highest emission level that is recorded at each piece of equipment as it is monitored in compliance with Method 21.

bb. "Turnaround" shall mean the planned shutdown of a Covered Process Unit that is done for the purpose of conducting mechanical integrity inspections and/or large scale repairs and/or scheduled, long term preventative and required maintenance in order to try to ensure the reliable operation of the Covered Process Unit. Due to the extensive and comprehensive nature of a Turnaround of a Covered Process Unit at the Facility, it typically is scheduled to occur approximately every four to seven years.

cc. "VHAP Process Units" shall mean the GHU, PHU, UDEX and Cyclohexane units.

B. Applicability and Written Facility-Wide LDAR Program Procedures

46. General. In order to minimize or eliminate fugitive emissions of volatile organic compounds ("VOCs"), benzene, volatile hazardous air pollutants ("VHAPs"), and organic hazardous air pollutants ("Organic HAPs") from equipment in light liquid and/or in gas/vapor service, FHR shall undertake the enhancements identified in this Section to its LDAR program for the Facility under 40 C.F.R. Part 61, Subpart FF, Part 63, Subparts H and UU; and applicable

state and local LDAR regulations. The terms "equipment," "in light liquid service" and "in gas/vapor service" shall have the respective definitions set forth in the applicable provisions of 40 C.F.R. Part 63, Subparts H and UU; and applicable state and local LDAR regulations.

47. Applicability. The requirements of this Section shall apply to all Covered Equipment and are in addition to, and not in lieu of, the requirements of any other LDAR regulation that may be applicable to a piece of Covered Equipment. If there is a conflict between a federal, state, or local LDAR regulation and this Section, FHR shall follow the more stringent of the requirements. If, prior to the termination of this Consent Decree, a Covered Process Unit ceases to have any equipment subject to LDAR, the requirements of this ELP (Section V) no longer shall apply to that Covered Process Unit.

48. Written, Facility-Wide LDAR Program. Prior to the Date of Lodging, FHR developed a written, facility-wide LDAR Program to ensure compliance with all LDAR regulations applicable to each Covered Process Unit. The LDAR Program for each Covered Process Unit includes no less than all of the following:

a. an identification system for all equipment in light liquid and/or in gas/vapor service that is subject to periodic monitoring requirements via Method 21, or other methods, under any applicable LDAR regulation;

b. procedures for identifying leaking equipment within each Covered Process Unit;

c. procedures for repairing and keeping track of leaking equipment;

d. a tracking program (e.g., Management of Change) that ensures that new pieces of equipment added to the Facility for any reason are integrated into the LDAR program and that Covered Equipment that is permanently taken out of service is removed from the LDAR program;

e. procedures for quality assurance/quality control ("QA/QC") reviews of all data generated by LDAR monitoring technicians;

f. a description of the Port Arthur Facility's LDAR monitoring organization and a designation of the person or position responsible for LDAR management who has the authority, consistent with FHR's management authorities, to implement LDAR improvements at the Facility, as needed, including the roles and responsibilities of all employee and contractor personnel assigned to LDAR functions at the Facility, and how the number of personnel dedicated to the LDAR functions is sufficient to satisfy the requirements of the LDAR program.

Commencing in the first full calendar year after the Date of Entry, FHR shall review the written LDAR Program on an annual basis and shall update it as needed by no later than December 31 of each year.

C. Leak Definitions

49. Commencing no later than the Date of Entry, for all Covered Equipment, FHR shall continue to use the following internal leak definitions, unless otherwise indicated herein, or unless more stringent definition is required by permit, or federal, state, or local laws or regulations.

a. Valves, including, if and when applicable, any valves that serve as OELCDs – 250 ppm;

b. Connectors, including connectors that serve as OELCDs – 250 ppm;

c. Pumps – 500 ppm except that reciprocating pumps shall retain their applicable regulatory leak definition; and

d. Agitators – 500 ppm.

50. Reporting of Valves, Connectors, Pumps and Agitators Based on the Internal Leak Definitions. For regulatory reporting purposes (i.e., reports to federal, state, or local agencies not required by this Decree), FHR may continue to report leak rates against the applicable regulatory leak definition or use the lower, internal leak definitions specified in this Subsection V.C. FHR shall identify in the applicable report which definition is being used.

D. Monitoring Frequency and Equipment

51. Commencing no later than the Date of Entry, and except as provided in Subparagraph 51.d, for all Covered Equipment, FHR shall continue to comply with the following periodic monitoring frequencies, unless more frequent monitoring is required by federal, state, or local laws or regulations:

a. Valves, including valves, if any, that serve as OELCDs – Quarterly

b. Connectors, including connectors that serve as OELCDs – Semi-annually for the GHU, PHU, UDEX, and Cyclohexane Covered Process Units and for the OSBL; Annually for the LOU.

c. Pumps/Agitators – Monthly, except that monitoring shall not be required for pumps and agitators that are seal-less or that are equipped with a dual mechanical seal system that complies with the requirements of 40 C.F.R. §§ 63.163(e) or 63.173(d), as applicable.

d. Any pieces of Covered Equipment that are designated as "inaccessible," "unsafe-to-monitor" or "difficult-to-monitor" in accordance with the applicable provisions of 40 C.F.R. Part 63, Subparts H and UU, shall be exempt from the requirements of Subparagraphs 51.a. through 51.c. and Paragraph 61, so long as FHR satisfies the applicable conditions and requirements of 40 C.F.R. Part 63, Subparts H and UU. In the case of components that do not have applicable "unsafe-to-monitor" or "inaccessible" provisions, FHR shall follow the "unsafe-to-monitor" and "inaccessible" provisions of 40 C.F.R. Part 63, Subpart UU. In the case of connectors serving as OELCDs, FHR shall follow the "unsafe-to-monitor" and "inaccessible" provisions for connectors found in 40 C.F.R. Part 63, Subpart UU. In no event shall any "difficult-to-monitor" provisions apply to any connectors, including connectors serving as OELCDs.

E. Repairs

52. Except as explicitly provided in Subparagraph 64.b.i, by no later than 5 days after detecting a leak, FHR shall perform a first attempt at repair. By no later than 15 days after detection, FHR shall perform a final attempt at repair or may place the piece of equipment on the Delay of Repair list provided that FHR has complied with all applicable regulations and with the requirements of Paragraphs 53–56 and 58.

53. Commencing no later than 90 days after the Date of Entry, FHR shall perform "Directed Maintenance" during all in field repair attempts except as follows: (i) for control valves, pumps, drill and tap repairs performed under Paragraph 55, and other repair efforts where Directed Maintenance is unsafe or not feasible, FHR shall perform Repair Verification Monitoring instead of Directed Maintenance; or (ii) whenever Subparagraph 64.b.i is applicable. Nothing in this Paragraph shall relieve FHR of its obligation under applicable state LDAR rules and/or permit requirements to perform directed maintenance as required by those rules and/or permit requirements.

54. Repair Attempt for Valves (Other than Control Valves) with Screening Values Greater than or Equal to 100 ppm and less than 250 ppm. Commencing no later than 90 days after the Date of Entry, for any valve, excluding control valves, that has a Screening Value greater than or equal to 100 but less than 250 ppm, FHR shall make an initial attempt to repair the valve and eliminate the leak by no later than 5 days after detecting the leak. Except as provided in Paragraph 53, directed Maintenance shall be performed to determine if the repair has been successful. If, upon Directed Maintenance (or Repair Verification Monitoring, if applicable), the Screening Value is less than 250 ppm, no further actions shall be required. If, upon Directed Maintenance (or Repair Verification Monitoring, if applicable), the Screening Value is greater than or equal to 250 ppm, FHR shall undertake the repair actions required by Paragraphs 52–58 of this Consent Decree (and all deadlines for such requirements shall be based on the date of the failed Directed Maintenance or Repair Verification Monitoring, as applicable), but FHR shall not be required to replace the valve pursuant to Subsection V.G. Nothing in this Paragraph, however, shall prevent FHR from electing to replace any valve covered by this

Paragraph, and if FHR chooses to replace any such valve, FHR shall not be required to undertake any repairs.

55. Drill and tap. Except as explicitly provided in Subparagraph 64.b.i, and except for control valves, commencing no later than 90 days after the Date of Entry, when other repair attempts have proven ineffective and/or FHR is not able to remove the leaking valve from service, FHR shall use the "drill-and-tap" or equivalent method for fixing valves leaking over 500 ppm, unless FHR can demonstrate that there is a safety, mechanical, product quality, or adverse environmental concern posed by attempting to repair the leak in this manner. FHR shall attempt at least one drill and tap repair (with a second injection of an appropriate sealing material if the first injection is unsuccessful) before placing the valve (other than provisionally) on the DOR list; however, FHR provisionally may place the valve on the DOR list pending drill and tap if repair efforts have not been successful within 15 days from the initial monitoring event. In no event may FHR take more than 30 days from initial monitoring to finalize its drill and tap repair efforts (with two injections, if necessary). After an unsuccessful drill and tap repair effort (including two injection attempts), FHR may place the leaking valve on its DOR list. If FHR plans to use a new valve repair method not currently in use by the refining and/or chemical industry, FHR will secure EPA's approval prior to implementing such a method. This Paragraph applies only to the valve packing and/or stem and not to areas on or associated with the valve that cannot be drilled and tapped, such as the bonnet

56. Except as explicitly provided in Subparagraph 64.b.i, for each leak, commencing no later than 90 days after the Date of Entry, FHR shall record the following information: the date of each repair attempt; the repair method(s) used during each attempt; the date, time, and Screening Values for all re-monitoring events; and, if applicable, the information required under

Paragraph 55 and 58 for Covered Equipment placed on the DOR list. If multiple leak measurements are taken during any single repair or remonitoring event, the Screening Value of the final measurement shall be the one used.

57. Nothing in Paragraphs 52–56 is intended to prevent FHR from taking a leaking piece of Covered Equipment out of service; provided however, commencing no later than 90 days after the Date of Entry, prior to placing the leaking piece of Covered Equipment back in service, FHR must repair the leak or must comply with the requirements of Paragraph 58 (Delay of Repair) to place the piece of Covered Equipment on the DOR list.

F. Delay of Repair

58. Beginning no later than 30 days after the Date of Entry, for all Covered Equipment placed on the DOR list, FHR shall:

a. Require sign-off from the relevant Covered Process Unit supervisor or person of similar authority that the piece of Covered Equipment is technically infeasible to repair without a Process Unit Shutdown;

b. Undertake periodic monitoring, at the frequency required for other pieces of Covered Equipment of that type in the process unit, of the Covered Equipment placed on the DOR list; and

c. Repair the piece of Covered Equipment within the time frame required by the applicable LDAR regulation.

G. Valve and Connector Replacement and Improvement Program

59. Commencing no later than 180 days after the Date of Entry and continuing until termination of this Decree, FHR shall implement the program set forth in Paragraphs 60 to 71 to improve the emissions performance of valves and connectors that are Covered Equipment in each Covered Process Unit.

60. List of all Valves in the Covered Process Units. In the first compliance status report due at least 180 days after the Date of Entry, FHR shall include, to the best of its

knowledge, information and belief, an initial list of the tag numbers of all valves subject to this ELP, broken down by Covered Process Unit, that are in existence as of the Date of Entry ("Initial List"). By no later than 180 days after submission of the first third party audit report required by Paragraph 80, FHR shall update the Initial List ("Updated List"). For actions required by Paragraph 61–64 prior to completion of the Updated List, the valves on the Initial List shall be the "Existing Valves" for purposes of Paragraphs 61–64. For actions required by Paragraphs 61–64 after completion of the Updated List, the valves on Updated List shall be the "Existing Valves" for purposes of Paragraphs 61–64.

61. Pro-Active Valve Tightening Work Practices Relating to each New Valve that is Installed and each Existing Valve that is Repacked. FHR shall undertake the following work practices with respect to each new valve that is installed (whether the new valve replaces an Existing Valve or is newly added to a Covered Process Unit), or each Existing Valve that is repacked:

a. Upon installation (or re-installation in the case of repacking), FHR shall ensure that the valve's packing gland nuts or their equivalent (e.g., pushers) are tightened to: (i) the manufacturer's recommended gland nut or packing torque; or (ii) any appropriate tightness that will minimize the potential for fugitive emission leaks of any magnitude. This practice shall be implemented prior to the valve's exposure (or re-exposure, in the case of repacking) to process fluids.

b. Except for control valves, not less than 3 days nor more than 17 days after a new valve that has been installed or an Existing Valve that has been repacked first is exposed to process fluids at operating conditions, FHR shall ensure that the packing gland nuts or their equivalent (e.g., pushers) are or were tightened to: (i) the manufacturer's recommended gland nut or packing torque; or (ii) any appropriate tightness that will minimize the potential for fugitive emission leaks of any magnitude.

62. Optional Pro Active Monitoring and Repair Practices relating to all Valves.

a. FHR may undertake Method 21 or FLIR monitoring: (i) during or immediately following any recheck done pursuant to Paragraph 61.b; and

(ii) after a valve is placed back into service following a maintenance or equipment shutdown event that involves thermal cycling. This monitoring shall be in addition to, and not in lieu of, periodic monitoring. Any Screening Values recorded during Method 21 monitoring that exceed the applicable regulatory leak definitions shall be included in calculating the leak rate of the Covered Process Unit where the leak was found. Any leaks detected by FLIR monitoring either shall be followed up with Method 21 monitoring as soon as practicable but not more than 1 day after the FLIR monitoring or shall be recorded as a leak within FHR's electronic LDAR data management system and repaired consistent with Paragraph 52. Any Screening Values recorded during the follow up Method 21 monitoring that exceed the applicable regulatory leak definitions shall be included in calculating the leak rate of the Covered Process Unit where the leak was found.

b. Detection of the following Screening Values during monitoring under Paragraph 62.a (regardless of whether it is initial Method 21 monitoring or follow up Method 21 monitoring after FLIR monitoring) shall be treated as follows: (i) for each Screening Value at or above 250 ppm, FHR shall comply with Paragraphs 52–56 and 58; (ii) for each Screening Value that also is at or above 500 ppm, FHR shall comply with all regulatory requirements related to that Screening Value; and (iii) FHR shall not be required to comply with Paragraph 64 for any Screening Value detected during monitoring conducted pursuant to this Paragraph.

63. Installing New Valves. Except as provided in Subparagraphs 63.a, 63.b, or Paragraph 65, FHR shall ensure that each new valve (other than a valve that serves as an OELCD) that it installs in each Covered Process Unit, and that, when installed, will be regulated under LDAR, is either a Low-E Valve or is fitted with Low-E Packing. This requirement applies to entirely new valves that are added to a Covered Process Unit and to Existing Valves that are replaced for whatever reason in a Covered Process Unit.

a. Paragraph 63 shall not apply in emergencies or exigent circumstances requiring immediate installation or replacement of a valve where a Low-E Valve or Low-E Packing is not available on a timely basis. Any such instance shall be reported in the next ELP compliance status report.

b. Paragraph 63 shall not apply to valves that are installed temporarily for a short-term purpose and then removed (e.g., valves connecting a portion of the Covered Process Unit to a testing device).

64. Replacing or Repacking Valves that have Screening Values at or above 250 ppm with Low-E Valves or Low-E Packing

a. Delay of Repair Requirements Remain in Effect. The requirements of Paragraph 64.b–64.d are in addition to, and not in lieu of, Delay of Repair requirements in applicable LDAR regulations and in this ELP. Nothing in Subparagraphs 64.b–64.d is intended to modify or revise Delay of Repair requirements.

b. Existing Valves Required to Be Replaced or Repacked

i. All Covered Process Units Except LOU and OSBL Equipment. Except as provided in Paragraph 65, for each Existing Valve in all Covered Process Units except the LOU and OSBL Equipment that has a Screening Value at or above 250 ppm during any monitoring event, FHR shall replace or repack the Existing Valve with a Low E Valve or with Low-E Packing by no later than: (1) 30 days after the monitoring event that triggers the replacement or repacking requirement; (2) if the valve is removed from service within 30 days after the monitoring event that triggers the replacement or repacking, the date the valve is returned to service; or (3) if replacement or repacking cannot be undertaken pursuant to (1) or is not undertaken pursuant to (2), by no later than the first Turnaround after the triggering monitoring event. Valves identified with a Screening Value equal to or greater than 250 ppm during the time period that is ninety (90) days prior to the Turnaround shall be excluded from the requirement in (3). However, these valves shall be replaced or repacked during the subsequent Covered Process Unit Turnaround, if such a Turnaround occurs during the pendency of this Consent Decree.

ii. LOU

(1) Valves that can be replaced or repacked during LOU operation. Except as provided in Paragraph 65, for each Existing Valve in the LOU that has a Screening Value at or above 250 ppm during any monitoring event and that can be replaced or repacked during the operation of the LOU, FHR shall replace or repack the Existing Valve with a Low E Valve or with Low E Packing by no later than (1) 30 days after the monitoring event that triggers the replacement or repacking requirement; or (2) if the valve is removed from service within 30 days after the monitoring event that triggers the replacement or repacking, the date the valve is returned to service.

(2) Valves that cannot be replaced or repacked during LOU operation.

(a) Priority List. For valves that cannot be replaced or repacked during LOU operation, by no later than ninety days prior to the first LOU Turnaround that occurs after the Date of Entry, FHR shall generate a list of all Existing Valves within the LOU that had Screening Values equal to or greater than 250 ppm during any monitoring event that took place between the completion of the Fall 2012 LOU Turnaround and ninety days prior to the first LOU Turnaround that occurs after the Date of Entry ("Applicable Review Period"). The list shall include, at a minimum, the Screening Value recorded; the number of times the valve had a Screening Value equal to or greater than 250 ppm over the course of all monitoring events that took place during the Applicable Review Period; the size of the valve; and the service of the valve. For purposes of replacing and/or repacking valves on this list, FHR shall prioritize the list to the extent practical evaluating the following factors: (1) the number of times the valve leaked at or above 250 ppm (the higher the number, the higher the priority); (2) the level of the Screening Value (the higher the Screening Value, the higher the priority); (3) the size of the valve (the bigger the valve, the higher the priority); (4) the toxicity of the pollutant(s) emitted (the more toxic, the higher the priority); and (5) the potential availability of Low E technology for the valve in question (the greater the likelihood of availability, the higher the priority). Once prioritized, this list shall be called the "Priority List."

(b) Replacements or Repackings during the First Turnaround after the Date of Entry. During the first LOU Turnaround after the Date of Entry, FHR shall first replace or repack valves on the Facility's DOR list and valves that were drilled and tapped. After completing these replacements or repackings, FHR shall replace or repack, in the order of priority, the valves on the Priority List. Except as provided in Paragraph 65, FHR shall utilize Low E Valves or Low E Packing for all valves replaced or repacked during this Turnaround. FHR shall replace or repack no less than 800 valves during this Turnaround. FHR shall further pre-plan for the replacement of an additional 100 valves. If the duration of the Turnaround so allows, FHR shall use best efforts to continue to replace or

repack some or all of the pre-planned valves until the completion of the Turnaround activities.

iii. OSBL. Except as provided in Paragraph 65, for each Existing Valve in OSBL Equipment that has a Screening Value at or above 250 ppm during any monitoring event, FHR shall replace or repack the Existing Valve with a Low E Valve or with Low-E Packing by no later than: (1) 30 days after the monitoring event that triggers the replacement or repacking requirement; (2) if the valve is removed from service within 30 days after the monitoring event that triggers the replacement or repacking, the date the valve is returned to service; or (3) if replacement or repacking cannot be undertaken pursuant to (1) or is not undertaken pursuant to (2), by no later than the first Turnaround after the triggering monitoring event. Valves identified with a Screening Value equal to or greater than 250 ppm during the time period that is ninety (90) days prior to the Turnaround shall be excluded from the requirement in (3). However, these valves shall be replaced or repacked during the subsequent Covered Process Unit Turnaround, if such a Turnaround occurs during the pendency of this Consent Decree.

c. Repair Requirements Pending Replacements or Repackings pursuant to Subparagraph 64.b.

i. Subsection V.E (Repairs) Requirements. For each Existing Valve that has a Screening Value at or above 250 ppm, FHR shall not be required to comply with Subsection V.E (Repair) pending replacement or repacking pursuant to Subparagraph 64.b if FHR completes the replacement or repacking within 30 days of detecting the leak, or if the Existing Valve is on the Delay of Repair list. If FHR does not complete the replacement or repacking within 30 days, FHR shall comply with all applicable requirements of Subsection V.E (Repair).

ii. Requirements of Applicable Regulations. For each Existing Valve that has a Screening Value at or above 500 ppm, FHR shall comply with all repair and "delay of repair" requirements of any applicable regulation pending replacement or repacking pursuant to Subparagraph 64.b.

d. Number of Turnarounds Required. FHR shall comply with the requirements of this Paragraph 64 for the following number of Turnarounds for the following Covered Process Units:

Covered Process Unit	No. of Turnarounds
LOU and associated OSBL Equipment	1
GHU and associated OSBL Equipment	1
PHU and associated OSBL Equipment	1
UDEX and associated OSBL Equipment	2
Cyclohexane and associated OSBL Equipment	2

65. Commercial Unavailability of a Low-E Valve or Low-E Packing. FHR shall not be required to utilize a Low-E Valve or Low-E Packing to replace or repack a valve if a Low-E Valve or Low-E Packing is commercially unavailable for the service and operating conditions of the valve. Factors and procedures for asserting commercial unavailability are set forth in Appendix 3.1. If FHR exercises the Commercial Unavailability exemption under this Paragraph for any valve, FHR shall:

a. Include the following in the applicable compliance status report required under Section VIII: (1) all documentation required by Section II.3 of Appendix 3.1; and (2) identify the commercially available valve or packing technology that comes closest to meeting the requirements for a Low-E Valve or Low-E Packing.

b. Install the best performing (i.e., least likely to leak) commercially available valve for the service and operating conditions of the valve.

66. Provisions Related to Low-E Valves and Low-E Packing.

a. "Low-E" Status Not Affected By Subsequent Leaks. If, during any monitoring after installation, a Low-E Valve or valve using Low-E Packing has a Screening Value at or above 250 ppm, the leak is not a violation of this Decree, does not invalidate the "Low-E" status or use of that type of valve or packing technology, and does not require replacing other, non-leaking valves or packing technology of the same type.

b. Replacing or Repacking. The first time a Low-E Valve or a valve using Low-E Packing has a Screening Value at or above 250 ppm, FHR shall not be required to replace or repack it if FHR timely repairs the valve and reduces the Screening Value to below 250 ppm. If the Low-E Valve or a valve using Low-E Packing either cannot be repaired to below 250 ppm or if the valve subsequently has a Screening Value at or above 250 ppm, FHR shall replace or repack it pursuant to the requirements of Paragraph 64.

67. Records of Low-E Valves and Low-E Packing. Prior to installing any Low-E Valves or Low-E Packing, or if not possible before installation, then as soon as possible thereafter, FHR shall secure from each manufacturer documentation that demonstrates that the proposed valve or packing technology meets the definition of "Low-E Valve" and/or "Low-E Packing." FHR shall retain that documentation for the duration of this Consent Decree and make it available upon request.

68. Connector Replacement and Improvement Descriptions.

a. For each of the following types of connectors, the following type of replacement or improvement shall apply:

Connector Type	Replacement or Improvement Description
Flanged	Replacement or Improvement of the gasket or installation of tension washers
Threaded	Replacement of the connector with a like kind connector or other
Compression	Replacement of the connector with a like kind connector or other
CamLock	Replacement or improvement of the gasket or replacement or improvement of the CamLock
Quick Connect	Replacement or improvement of the gasket, if applicable, or replacement of the connector (with either a like kind connector or other), if there is no gasket
Any type (including any of the above)	Elimination (e.g., through welding, pipe replacement, etc.)

b. In cases where replacement in kind is utilized as the method for replacing or improving a connector (e.g., a Quick Connect replaces another Quick Connect), the provisions of Subparagraphs 68.b.i and 68.b.ii shall apply.

i. If there are types, models or styles of a like-kind connector that are less likely to leak than the existing connector, and one or more of those types, models or styles are technically feasible to use (considering the service, operating conditions, and type of piping or tubing that the connector is in) and would not create a major safety, mechanical, product quality, regulatory or other issue, FHR shall select a like-kind connector from among such types, models or styles.

ii. If Subparagraph 68.b.i does not apply, FHR may install a like-kind connector that is the same type, model or style as the existing connector.

69. Installing New or Like-Kind Connectors. When installing any new or replacement connector in a Covered Process Unit, FHR shall use best efforts to select a connector that is least likely to leak, using good engineering judgment, for the service, operating conditions, and type of piping or tubing that the connector is in.

70. Replacing or Improving Connectors.

a. Replacing or Improving Requirements. For each existing connector that, in any (2) times out of three (3) consecutive monitoring periods after the Date of Entry, has a Screening Value at or above 250 ppm, FHR shall replace or improve the connector in accordance with the applicable replacement or improvement described in Paragraph 68. FHR shall use best efforts to install a replacement or improvement that will be the least likely to leak, using good engineering judgment, for the service, operating conditions, and type of piping or tubing that the connector is in. FHR shall undertake the replacement or improvement within: (i) 30 days after the monitoring event that triggers the replacement or improvement requirement; or (ii) if the replacement or improvement cannot be done within 30 days, FHR shall undertake the replacement or improvement during the first Turnaround that follows the triggering monitoring event. The requirements of this Subparagraph are in addition to, and not

in lieu of, Delay of Repair requirements in applicable LDAR regulations and in this ELP. Nothing in this Subparagraph is intended to modify or revise Delay of Repair requirements.

b. Repair Requirements Pending Replacements or Improvements Pursuant to Subparagraph 70.a.

i. Subsection V.E (Repairs) Requirements. For each connector that has a Screening Valve at or above 250 ppm, FHR shall not be required to comply with Subsection V.E (Repairs) pending replacement or improvement pursuant to Subparagraph 70.a if FHR completes the replacement or improvement within 30 days of detecting the leak. If FHR does not complete the replacement or improvement within 30 days, or if, at the time of the leak detection, FHR reasonably can anticipate that it might not be able to complete the replacement or improvement within 30 days, FHR shall comply with all applicable requirements of Subsection V.E (Repairs).

ii. Requirements of Applicable Regulations. For each connector that has a Screening Value at or above 500 ppm, FHR shall comply with all repair and DOR requirements of any applicable regulation pending replacement or improvement pursuant to Subparagraph 70.a.

71. Valve and Connector Replacement/Improvement Report. In each compliance status report due under Section VIII (Reporting) of this Decree, FHR shall include a separate section in the Report that: (i) describes the actions it took to comply with this Subsection V.G, including identifying the number and types of pieces of equipment that triggered a requirement in Subsection V.G, the ranges of Screening Values for identified equipment, the types of actions taken (i.e., replacement, repacking, or improvement), and the dates when the action was taken; (ii) identifies any required actions that were not taken and explains why; and (iii) identifies the schedule for any known, future replacements, repackings, improvements, or eliminations.

H. Training

72. Prior to the Date of Lodging, FHR developed a training protocol and implemented a training program at the Facility which includes the following features:

a. For FHR's personnel newly-assigned to LDAR responsibilities, FHR requires LDAR training prior to each employee beginning such work;

b. For all FHR personnel assigned LDAR responsibilities, FHR requires completion of annual (i.e., once each calendar year) LDAR training;

c. For all other Facility operations and maintenance personnel (including contract personnel) who have routine duties relevant to LDAR, FHR provides and/or requires completion of an initial training program that includes instruction on aspects of LDAR that are relevant to the person's duties. For the individuals covered by this Paragraph, "refresher" training in LDAR must be performed at least annually during the term of this Consent Decree.

After the Date of Entry, FHR shall continue to implement an LDAR training program in accordance with the requirements of Subparagraphs 72.a–72.c.

I. Quality Assurance/Quality Control ("QA/QC")

73. Daily Certifications by Monitoring Technicians and LDAR Database Coordinator. Commencing no later than the Date of Entry, on each day that monitoring occurs, at the end of such monitoring, FHR shall continue to ensure that each monitoring technician and LDAR Database Coordinator signs a form that includes the following certification:

> For Monitoring Technicians:
>
> On [insert date], to the best of my knowledge and belief, I performed monitoring according to Method 21 and I captured in my datalogger or paper logs the data associated with all of the components I monitored today.
>
> For LDAR Database Coordinator:
>
> On [insert date], I transferred to the Facility's LDAR database the data gathered today by the monitoring technicians in their dataloggers or paper logs and I did not manipulate or otherwise alter the data I transferred.

In lieu of using a form for each day of monitoring, a log sheet may be created that includes the certifications that the monitoring technician and LDAR Database Coordinator must date and sign each day of data collection and transferring.

74. Commencing by no later than the first full calendar quarter after the Date of Entry, at unannounced times, an LDAR-trained employee or contractor of FHR, who does not serve on a routine basis as an LDAR monitoring technician, shall continue to undertake the following no less than once per calendar quarter:

a. For the prior calendar quarter:

i. Review whether any pieces of equipment that are required to be in the LDAR program are not included;

ii. Verify that equipment was monitored at the appropriate frequency;

iii. Verify that proper documentation and sign offs have been recorded for all equipment placed on the DOR list;

iv. Ensure that repairs have been performed in the required periods;

v. Review monitoring data and equipment counts (e.g., number of pieces of equipment monitored per day) for feasibility and unusual trends;

vi. Verify that proper calibration records and monitoring instrument maintenance information are maintained; and

vii. Verify that other LDAR program records are maintained as required.

b. Conduct random observations of each LDAR monitoring technician in the field to ensure monitoring is being conducted as required.

75. FHR shall correct any deficiencies detected or observed pursuant to Paragraph 74 as soon as practicable. FHR shall maintain a record of: (i) the date that the reviews,

verifications, and observations required by Paragraph 74 were undertaken; and (ii) a description of the nature and timing of any corrective actions taken.

76. Electronic Monitoring, Storing, and Reporting of LDAR Data.

a. Electronic Storing and Reporting of LDAR Data. After the Date of Entry, FHR shall continue to maintain an electronic database for storing and reporting LDAR data at the Facility.

b. Electronic Data Collection During LDAR Monitoring and Transfer Thereafter. After the Date of Entry, FHR shall continue to use data loggers and/or electronic data collection devices during all LDAR monitoring at the Facility. FHR, or its designated contractor, shall use its best efforts to transfer, by the end of the next business day, the electronic data from electronic data logging devices to the electronic database maintained pursuant to Subparagraph 76.a. For all monitoring events in which an electronic data collection device is used, the collected monitoring data shall include a time and date stamp and an identification of the instrument and operator. FHR may use paper logs only where necessary or more feasible (e.g., small rounds, re-monitoring, or when data loggers are unavailable or broken, etc.), and shall record, at a minimum, the identity of the technician, the date, the monitoring starting and ending times, all monitoring readings, and an identification of the monitoring equipment. FHR shall use its best efforts to transfer any manually recorded monitoring data to the electronic database maintained pursuant to Subparagraph 76.a within seven (7) days of the monitoring event.

J. LDAR Audits and Corrective Action

77. FHR shall conduct LDAR audits pursuant to the schedule in Paragraph 78 and the requirements of Paragraph 79. FHR shall not use the same third party that undertakes its routine LDAR monitoring to undertake its LDAR audit.

78. Until termination of this Decree, FHR shall ensure that an LDAR audit at each Covered Process Unit is conducted every other year (i.e., three audits within five years). The Initial LDAR Audit Commencement Date for each Covered Process Unit shall be no later than 90 days after the Date of Entry of this Consent Decree. The LDAR Audit Commencement Date for each subsequent LDAR audit shall occur no later than 21–27 months after the month of the

prior LDAR Audit Commencement Date. All LDAR audits shall be conducted by a third party. FHR personnel may accompany the third party audit team for educational purposes, but may not undertake any responsibility for audit activities, except for providing requested information to the third-party audit team or facilitating audit activities.

79. Each LDAR audit shall include but not be limited to reviewing compliance with all applicable LDAR regulations, observing LDAR monitoring technicians in the field to ensure monitoring is being conducted as required, reviewing and/or verifying the same items that are required to be reviewed and/or verified in Subparagraphs 74.a.i–74.a.vii (*i.e.*, reviewing whether any pieces of equipment required to be in the LDAR program are not included, verifying that equipment was monitored at the appropriate frequency, etc.), and performing the following activities:

a. Calculating Comparative Monitoring Audit Leak Percentages. Covered Equipment shall be monitored in order to calculate a leak percentage for each Covered Process Unit, broken down by equipment type (i.e., valves (including valves serving as OELCDs), pumps, agitators, connectors (including connectors serving as OELCDs)). The monitoring that takes place during the audit shall be called "comparative monitoring" and the leak percentages derived from the comparative monitoring shall be called the "Comparative Monitoring Audit Leak Percentages."

b. Calculating the Historic, Average Leak Percentage from Prior Periodic Monitoring Events. For each Covered Process Unit that is audited, the historic, average leak percentage from prior periodic monitoring events, broken down by equipment type (i.e., valves, pumps, agitators, and connectors, including connectors serving as OELCDs) shall be calculated. The following number of complete monitoring periods immediately preceding the comparative monitoring audit shall be used for this purpose: valves - 4 periods; pumps and agitators - 12 periods; connectors, including OELCDs serving as connectors - 2 periods (this means that for connectors, including OELCDs, in the VHAP Process Units there will be one year of data and for connectors, including OELCDs, in LOU there will be two years of data).

c. Calculating the Comparative Monitoring Leak Ratio. For each Covered Process Unit and each type of equipment (valves, pumps, agitators, and

> connectors, including connectors serving as OELCDs), the ratio of the comparative monitoring audit leak percentage from Subparagraph 79.a to the historic periodic monitoring leak percentage from Subparagraph 79.b shall be calculated. This ratio shall be called the "Comparative Monitoring Leak Ratio." If the denominator in this calculation is zero, it shall be assumed for purposes of this calculation only that one leaking piece of equipment was found in the process unit through routine monitoring during the 12-month period before the audit and the ratio shall be recalculated.

In addition to the foregoing items, LDAR audits after the Initial LDAR audit shall include reviewing the Facility's compliance with this ELP.

80. LDAR Audit Reports. FHR shall have an LDAR audit report prepared by no later than one hundred and twenty (120) days after the LDAR Audit Commencement Date. In the first semi-annual compliance status report required pursuant to Section VIII that is due no less than ninety (90) days after the LDAR Audit Completion Date, FHR shall include the third-party auditor's description of the procedures and methodology used to conduct the audit, including those used in undertaking the comparative monitoring required by Subparagraphs 79.a–79.c, and how the third party otherwise complied with the audit requirements of this Decree.

81. When More Frequent Periodic Monitoring is Required. If a comparative monitoring audit leak percentage calculated pursuant to Paragraph 79.c triggers a more frequent monitoring schedule under any applicable federal, state, or local law or regulation than the frequencies listed in Paragraph 51 for the equipment type in that Covered Process Unit, FHR shall monitor the affected type of equipment at the greater frequency unless and until less frequent monitoring is again allowed under the specific federal, state, or local law or regulation. At no time may FHR monitor at intervals less frequently than those in Paragraph 51.

82. Corrective Action Plan (CAP)

a. Requirements of a CAP. By no later than 30 days after each LDAR Audit Completion Date, FHR shall develop a preliminary Corrective Action Plan

if: (i) the results of an LDAR audit identify any deficiencies; and/or (ii) if the Comparative Monitoring Leak Ratio calculated pursuant to Subparagraph 79.c is 3.0 or higher and the Comparative Monitoring Audit Leak Percentage calculated pursuant to Subparagraph 79.a is greater than or equal to 0.5 percent. The preliminary CAP shall describe the actions that FHR has taken or shall take to address: (i) the deficiencies; and/or (ii) the systemic causes of a Comparative Monitoring Leak Ratio that is 3.0 or higher (but only if the Comparative Monitoring Audit Leak Percentage is at or above 0.5 percent). FHR shall include a schedule by which actions that have not yet been completed shall be completed. FHR shall complete each corrective action item as expeditiously as possible with the goal of completing each action within 90 days after the LDAR Audit Completion Date. If any action is not completed or not expected to be completed within 90 days after the LDAR Audit Completion Date, FHR shall explain the reasons and propose a schedule for completion as expeditiously as practicable in the final CAP to be submitted under Subparagraph 82.b.

b. Submission of the Final CAP to EPA. In the first semi-annual compliance status report required pursuant to Section VIII that is due no less than 90 days after the LDAR Audit Completion Date, FHR shall submit the final CAP to EPA, together with a certification of the completion of each item of corrective action. If any action is not completed by the time of the submission of the Final CAP, FHR shall explain the reasons, together with a proposed schedule for completion as expeditiously as practicable. FHR shall submit a supplemental certification of completion by no later than the next compliance status report that is required pursuant to Section VIII.

c. EPA Review/Comment on CAP. EPA may submit comments on the CAP. Except for good cause, EPA may not request FHR to modify any action within the CAP that already has been completed at the time of EPA's comments. Within 30 days of receipt of any comments from EPA, FHR shall submit a reply. Disputes arising with respect to any aspect of a CAP shall be resolved in accordance with the dispute resolution provisions of this Decree.

K. Recordkeeping

83. FHR shall keep all original records required by this ELP, including each LDAR audit report, to document compliance with the requirements of this ELP for at least one year after termination of this Decree, and shall maintain a written record of all Corrective Action that FHR takes in response to any deficiencies identified in the LDAR Audits. Upon request by EPA, FHR

shall make all such documents available to EPA and shall provide, in their original electronic format, all LDAR monitoring data generated during the life of this Consent Decree.

L. Certification of Compliance

84. In the first compliance status report required pursuant to Section VIII that is due no less than 90 days after the LDAR Audit Completion Date, FHR shall certify to EPA that, to the signer's best knowledge and belief formed after reasonable inquiry: (i) except as otherwise noted, the Facility is in compliance with all applicable LDAR regulations and this ELP; (ii) FHR has completed all corrective actions, if applicable, or is in the process of completing all corrective actions pursuant to a CAP; and (iii) all equipment at the Facility that is regulated under LDAR has been identified and included in the Facility's LDAR program. To the extent that FHR cannot make the certification in all respects, it shall specifically identify any deviations from Items (i)–(iii).

VI. AFFIRMATIVE RELIEF: BENZENE WASTE OPERATIONS NESHAP

85. Summary: As of the Date of Entry, the Facility has a total annual benzene ("TAB") amount above 10 Mg. Upon the Date of Entry, the Facility plans to continue to comply with 40 C.F.R. § 61.342(c), utilizing the exemptions set forth in 40 C.F.R. §§ 61.342(c)(2) and (c)(3)(ii) (hereinafter referred to as the "2 Mg Compliance Option").

86. FHR shall undertake the measures set forth in this Section VI to ensure continuing compliance with 40 C.F.R. Part 61, Subpart FF ("Benzene Waste Operations NESHAP," "BWON," or "Subpart FF") and to minimize or eliminate fugitive benzene waste operations emissions at the Facility.

87. One-Time Review and Verification of Facility's TAB and Compliance Status

a. One-Time Review and Verification Process. FHR shall use a third party contractor to complete a one-time review and verification of the Facility's TAB and compliance status. The one–time review and verification for the Facility shall be completed by no later than 90 days after the Date of Entry of this Decree. The review and verification process for the Facility shall include, but not be limited to:

i. an identification of each waste stream that is required to be included in the Facility's TAB (*e.g.*, slop oil, tank water draws, spent caustic, other sample wastes, maintenance wastes, and turnaround wastes);

ii. a review and identification of the calculations and/or measurements used to determine the flows of each waste stream for the purpose of ensuring the accuracy of the annual waste quantity for each waste stream;

iii. an identification of the benzene concentration in each waste stream, including sampling for benzene concentration, consistent with the requirements of 40 C.F.R. § 61.355(c)(1) and (3); provided, however, that previous analytical data or documented knowledge of waste streams may be used, pursuant to 40 C.F.R. § 61.355(c)(2), for streams not sampled;

iv. an identification of whether or not the waste stream is controlled consistent with the applicable requirements of Subpart FF; and

v. an identification of any existing noncompliance with the requirements of Subpart FF.

b. No later than 120 days after the Date of Entry of this Decree, FHR shall submit to EPA a BWON compliance review and verification report ("Compliance Review and Verification Report") for the Facility that sets forth the results of this review, including but not limited to, the items identified in Subparagraphs 87.a.i–87.a.v.

88. Implementation of Actions Necessary to Correct Non-Compliance or to Come Into Compliance

a. Amended TAB Reports. If the results of the BWON Compliance Review and Verification Report indicate that the Facility's most recently filed TAB report required by 40 C.F.R. § 61.357(d) is inaccurate and/or does not satisfy the requirements of Subpart FF, FHR shall submit, by no later than 60 days after submission to EPA of the BWON Compliance Review and Verification Report, an amended TAB report to EPA.

b. BWON Corrective Action Measures. If the results of the BWON Compliance Review and Verification Report indicate that the Facility is not in compliance with the 2 Mg Compliance Option, FHR shall submit to EPA for review and comment, by no later than 90 days after submission of the BWON Compliance Review and Verification Report, a BWON Corrective Action Plan that identifies with specificity either: (i) the compliance strategy and schedule that FHR shall implement to ensure that the Facility complies with the 2 Mg Compliance Option as soon as practicable; or (ii) a compliance strategy and schedule that the Facility will implement to ensure that it complies with the 6 BQ Compliance Option set forth in 40 C.F.R. § 61.342(e). FHR shall implement the plan according to the schedule provided in such plan unless and until EPA disapproves the plan.

c. Certification of Compliance. By no later than thirty (30) days after completion of the implementation of all corrective actions, if any, required pursuant to Corrective Action Measures set forth in Subparagraphs 88.a and 88.b, FHR shall submit a report to EPA certifying that the Facility complies with the Benzene Waste Operations NESHAP.

89. Carbon Canisters. FHR shall implement the requirements of this Paragraph at all locations at the Facility where a carbon canister(s) is utilized as a regulated control device under the Benzene Waste Operations NESHAP. To the extent that any applicable state or local rule,

regulation, or permit contains more stringent requirements than those set forth in this Paragraph 89, those more stringent requirements shall apply instead.

a. By no later than Date of Entry of this Decree, FHR shall continue to operate primary and secondary carbon canisters at all locations that use carbon canisters as a control device under the Benzene Waste Operations NESHAP. In the first semi-annual compliance status report required pursuant to Section VIII, FHR shall include a list of all locations in the Facility where, as of the Date of Entry, carbon canister systems are used as control devices under Subpart FF. If FHR installs any new dual canister systems after the Date of Entry, FHR shall notify EPA of this installation in the next semi-annual compliance status report following completion of the installation.

b. For dual carbon canister systems, "breakthrough" between the primary and secondary canister is defined as any reading equal to or greater than 50 ppm VOC or 5 ppm benzene (depending upon the constituent that FHR decides to monitor). At its option, FHR may utilize a concentration for "breakthrough" that is lower than 50 ppm VOC or 5 ppm benzene.

c. FHR shall monitor for breakthrough between the primary and secondary carbon canisters weekly at times when there is actual flow to the carbon canister or in accordance with the frequency specified in 40 C.F.R. § 61.354(d), whichever is more frequent. This requirement shall commence: (i) by no later than thirty (30) days after the Date of Entry, where dual carbon canisters are installed and put into service prior to the Date of Entry; and (ii) within thirty (30) days after installation of any new dual carbon canister system subsequent to the Date of Entry. In the event there is no flow to the canister, FHR shall document the lack of flow and remonitor at the next monitoring period.

d. When breakthrough is detected as described in Subparagraph 89.b, FHR shall comply with either Subparagraph 89.d.i or 89.d.ii:

i. Replace the original primary carbon canister (or route the flow to an appropriate alternative control device) immediately. The original secondary carbon canister (or a fresh canister) will become the new primary carbon canister and a fresh carbon canister will become the secondary canister. For purposes of this Subparagraph, "immediately" shall mean within eight (8) hours of detection of breakthrough for canisters 55 gallons or less and within twenty-four (24) hours of the detection of breakthrough for canisters greater than 55 gallons. If FHR chooses to define breakthrough for primary carbon canister replacement at 5 ppm or lower VOC, FHR may replace primary canisters of 55 gallons or less within twenty-four (24) hours of detecting breakthrough.

ii. In lieu of replacing the primary canister immediately, FHR may elect to monitor the outlet of the secondary canister beginning on the day the breakthrough between the primary and secondary canister is identified and each calendar day thereafter. This daily monitoring shall continue until the primary canister is replaced. If the constituent being monitored (either benzene or VOC) is detected above background at the outlet of the secondary canister during this period of daily monitoring, both canisters must be replaced within eight (8) hours of the detection of breakthrough.

e. Temporary Applications. For a period not longer than forty-five (45) days, FHR may utilize properly-sized single canisters for short-term operations such as with temporary storage tanks or as temporary control devices. For canisters 55 gallons or less operated as part of a single canister system, "breakthrough" is defined for purposes of this Consent Decree as any reading of VOC above background or benzene above 1 ppm (whichever is monitored). For canisters greater than 55 gallons, "breakthrough" is defined for purposes of this Consent Decree as any reading of benzene above 10 ppm. Beginning no later than the Date of Entry, FHR shall monitor for breakthrough from a single carbon canister system once every calendar day that there is actual flow to the carbon canister. FHR shall replace the single carbon canister with a fresh carbon canister, discontinue flow, or route the stream to an alternate,

appropriate device immediately when breakthrough is detected. For purposes of this Subparagraph, "immediately" shall mean within eight (8) hours. If a single canister has been found to exceed the applicable breakthrough concentration, flow must be discontinued to that canister immediately. Such a spent canister may not be placed back into Benzene Waste Operations NESHAP vapor control service until it has been appropriately regenerated. As an alternative, FHR may utilize dual carbon canisters for temporary applications, in which case Subparagraphs 89.b, 89.c, 89.d, and 89.f shall apply.

f. FHR shall continue to maintain a readily-available supply of fresh carbon or fresh carbon canisters at all times for the Facility where carbon canisters are used as a control device or shall otherwise ensure that such canisters are readily available to implement the requirements of this Paragraph 89.

g. In the first compliance status report required under Section VIII, FHR will notify EPA which breakthrough definition (i.e., either 50 ppm VOC or 5 ppm benzene) will be used.

90. Annual Review. By no later than 90 days after the Date of Entry, FHR shall modify, to the extent necessary, its existing written management of change procedures to provide for an annual review of process information for the Facility, including but not limited to construction projects, to ensure that all new benzene waste streams are included in the waste stream inventory during the term of this Consent Decree. FHR shall conduct such reviews on an annual basis.

91. Laboratory Audits. FHR shall conduct audits of all laboratories that perform BWON analyses of the Facility's Benzene Waste Operations NESHAP samples used to comply

with 40 C.F.R. § 61.355(c)(3) to ensure that proper analytical and quality assurance/quality control procedures are followed for such samples.

a. In 2012, FHR completed an audit of the laboratory used by the Facility, and in 2013, FHR completed an audit of another laboratory. If, after the Date of Entry, FHR uses a different laboratory for analyses of benzene samples from the Facility than the ones it audited in 2012 or 2013, FHR shall audit that laboratory prior to using it.

b. During the term of this Consent Decree, FHR shall conduct subsequent laboratory audits such that each laboratory that FHR uses is audited once every two (2) calendar years.

c. FHR may conduct audits itself, retain third parties to conduct these audits, or use audits conducted by others as its own, but the responsibility and obligation to ensure compliance with this Consent Decree, this Paragraph, and Subpart FF are solely FHR's.

92. Benzene Spills. For any spill at the Facility after the Date of Entry, FHR shall continue to review the spill to determine if any benzene waste, as defined by Subpart FF, was generated as a result of the spill. In its annual calculation of uncontrolled benzene under the 2 Mg compliance option, FHR shall continue to account for all benzene wastes generated through spills that are not managed in controlled equipment, in an enhanced biotreatment unit, or shipped offsite in accordance with 40 C.F.R. §§ 61.342–61.348

93. Training

a. By no later than 90 days after the Date of Entry, FHR shall develop and implement a program for annual (i.e. once each calendar year) training for all employees who draw benzene samples for Benzene Waste Operations NESHAP compliance purposes.

b. By no later than 180 days after the Date of Entry, FHR shall implement standard operating procedures for all control devices and treatment processes used to comply with the Benzene Waste Operations NESHAP at the Facility.

c. By no later than 270 days after the Date of Entry, FHR shall complete an initial training program regarding the procedures required by Subparagraph 93.b for all operators assigned to the relevant equipment, if such training has not already been provided. Comparable training shall also be provided to any persons who subsequently become operators, prior to their assumption of this duty. "Refresher" training in these procedures shall be performed on a three-year cycle (i.e., once every three calendar years) during the term of the Consent Decree.

d. FHR shall require any contractors hired to perform any of the requirements of this Section VI to provide evidence that its employees are properly trained to implement any requirements that they are hired to perform.

94. "End of Line" ("EOL") Sampling under the 2 Mg Compliance Option. FHR shall conduct quarterly sampling as described by this Paragraph at the Facility for the purpose of calculating quarterly, uncontrolled benzene quantities.

a. Prior to the Date of Lodging, FHR submitted to EPA for approval a draft sampling plan for the Facility designed to identify the quarterly benzene quantity in uncontrolled benzene waste streams. After review and comment, EPA approved the final EOL sampling plan ("Sampling Plan") for the Facility.

b. If changes in processes, operations, or other factors lead FHR to conclude that its approved Sampling Plan may no longer provide an accurate measure of the Facility's quarterly benzene quantity in uncontrolled benzene waste streams, FHR shall submit a revised sampling plan to EPA for approval within 30 days after discovery of an issue under this

Paragraph occurs, and shall commence implementation of the revised plan after submission thereof unless and until EPA disapproves the revised plan.

c. FHR shall commence sampling under its Sampling Plan during the first full calendar quarter following the Date of Entry. FHR shall take, and have analyzed, at least three (3) representative samples from each identified sampling location. FHR shall use the average of all samples taken and the identified flow calculations to determine its quarterly benzene quantity in uncontrolled waste streams and to estimate a calendar year value for the Facility.

d. After at least eight quarters of sampling under an approved Sampling Plan under this Paragraph 94, FHR may submit a report to EPA that requests a change in the monitoring frequency for the Facility. If EPA determines, after an opportunity for consultation with FHR, that the information presented in the report supports a change in the monitoring frequency at the Facility, then the monitoring frequency requirement under this Paragraph will be modified by written agreement of the Parties. Such a change is not a material modification to this Consent Decree.

95. Quarterly and Annual Estimations of Uncontrolled Benzene Quantity. At the end of each calendar quarter following commencement of quarterly sampling, FHR shall calculate a quarterly uncontrolled benzene quantity and shall estimate a projected calendar year uncontrolled benzene quantity based on the quarterly sampling results and the approved flow calculations. FHR shall submit the quarterly uncontrolled benzene quantity and projected calendar year uncontrolled benzene quantity in the Compliance Status Reports required pursuant to Section VIII for the two quarters covered by the report. If the projected calendar year

uncontrolled benzene quantity is greater than 2.0 Mg/yr, FHR shall provide this information to EPA within 30 days of the end of the calendar quarter.

96. Corrective Measures.

a. BWON Corrective Measures Plan. If the calculations in Paragraph 95 indicate that the quarterly uncontrolled benzene quantity exceeds 0.5 Megagrams or the projected calendar year uncontrolled benzene quantity exceeds 2.0 Megagrams, then, by no later than 30 days after the end of that calendar quarter, FHR shall prepare a BWON Corrective Measures Plan that shall identify: (i) the cause of the potentially elevated benzene quantities; (ii) all corrective actions that FHR has taken or plans to take to ensure that the cause will not recur; and (iii) an appropriate strategy and schedule that FHR shall implement to ensure that FHR complies with the 2 Mg Compliance Option. FHR will implement the BWON Corrective Measures Plan in accordance with the schedule provided therein, unless and until EPA disapproves thereof. If FHR can identify the reason(s) in any particular calendar quarter that the quarterly and projected annual calculations result in benzene quantities in excess of those identified in this Paragraph and states that it does not expect such reason to recur, then FHR may exclude the benzene quantity attributable to the identified reason from the projected calendar year quantity. If that exclusion results in no potential violation of the Benzene Waste Operation NESHAP, FHR will not be required to implement corrective measures.

b. In each compliance status report required pursuant to Section VIII of this Decree, FHR shall include each BWON Corrective Measures Plan that it developed under Subparagraph 96.a, and shall describe with specificity the status of the implementation of the Plan.

c. Third-Party TAB Study and Compliance Review. By no later than 60 days after the end of a second consecutive quarter in which at least one of the conditions in Subparagraph 96.a continues to exist and FHR is not then able to identify the cause(s) and/or appropriate corrective measures to ensure compliance with the 2 Mg Compliance Option, FHR shall retain a third-party contractor to undertake a comprehensive TAB study and compliance review ("Third-Party TAB Study and Compliance Review") at the Facility. By no later than 90 days after FHR receives the results of the third-party TAB study, FHR will submit such results, along with a plan and schedule for remedying any deficiencies identified, to EPA. FHR will implement the plan unless and until EPA disapproves.

97. Miscellaneous Measures.

a. By no later than sixty (60) days after the Date of Entry, FHR shall:

i. Conduct monthly visual inspections of, and if appropriate, refill, all Subpart FF water traps within the Facility's individual drain systems;

ii. If FHR utilizes conservation vents, visually inspect all Subpart FF conservation vents or indicators on Subpart FF affected individual drain systems (i.e., process sewers) for detectable leaks on a weekly basis, reset any vents where leaks are detected, and record the results of the inspections. After six (6) months of weekly inspections, and based upon an evaluation of the recorded results, FHR may submit a request to EPA Region 6 to modify the frequency of the inspections. EPA shall not unreasonably withhold its consent to such modification. Alternatively, for conservation vents with indicators that identify whether flow has occurred, FHR may elect to visually inspect such indicators on a monthly basis and, if flow is then detected, FHR shall then visually inspect that indicator on a weekly basis for four weeks. If flow is detected during normal operation any two of those four weeks, FHR shall install a carbon canister on that vent until appropriate corrective action(s) can be implemented to prevent such flow. Nothing in this Subparagraph shall require FHR to monitor conservation vents on fixed roof tanks;

iii. Conduct quarterly monitoring and repair of the oil-water separators subject to the requirements of 40 C.F.R. § 61.347 consistent with the "no detectable emissions" provision in 40 C.F.R. § 61.347 or quarterly measurements of the oil-water separator secondary seal gap if using the alternative control requirements allowed under 40 C.F.R. § 61.352, if the separator is a control device under Subpart FF; and

iv. Identify and mark at the drain all process area drains that are allowed to receive process flow and ensure that they are segregated from stormwater drains.

b. FHR shall retain records containing the following information during the time period that the Consent Decree remains in effect:

i. Monthly visual individual drain inspection results;

ii. Conservation vent monitoring results and installation of alternative control equipment; and

iii. Oil/water separator monitoring results.

98. Reporting Requirements for this Section VI: Outside of the Reports Required under 40 C.F.R. § 61.357 and the Compliance Status Reports Required by Section VIII. At the times specified in the applicable provisions of this Section VI, FHR will submit, as and to the extent required, the following reports to EPA:

a. BWON Compliance Review and Verification Report (under Subparagraph 87.b);

b. Amended TAB Report, if required (under Subparagraph 88.a);

c. BWON Corrective Action Plan, if required (under Subparagraph 88.b);

d. Certification of compliance (under Subparagraph 88.c);

e. A revised BWON Sampling Plan, if required (under Subparagraph 94.b); and

f. The results of the Third-Party TAB Study and Compliance Review, if required (under Subparagraph 96.c).

VII. EMISSION CREDIT GENERATION

99. Prohibitions.

a. Definition. "CD Emissions Reductions" shall mean any NO_x, VOC, or CO emissions reductions that result from any projects conducted or controls used to comply with this Consent Decree.

b. Prohibitions.

i. FHR shall neither generate nor use any CD Emissions Reductions: as netting reductions; as emissions offsets; to apply for, obtain, trade, or sell any emission reduction credits; or in determining whether a project would result in a significant emissions increase or significant net emissions increase in any PSD, major non-attainment, and/or minor New Source Review permit or permit proceeding. Baseline actual emissions during any 24-month period selected by FHR shall be adjusted downward to exclude any portion of the baseline emissions that would have been eliminated as CD Emissions Reductions had FHR been complying with this Consent Decree during that 24-month period;

ii. Any CD Emissions Reductions that result from the Waste Gas minimization requirements of Paragraphs 20–27 may not be used as netting reductions, as emissions offsets, or in determining whether a project is "major" in any PSD, major non-attainment and/or minor New Source Review permit or permit proceeding. Baseline actual emissions during any 24-month period selected by FHR shall be adjusted downward to exclude any portion of the baseline emissions that would have been eliminated as Waste Gas minimization related CD Emissions Reductions as if FHR previously achieved the reductions during that 24-month period;

iii. Except as provided in Subparagraph 100.b, FHR shall not apply for, obtain, trade, or sell any emission reduction credits that result from CD Emissions Reductions.

100. Outside the Scope of the Prohibition. Nothing in this Section is intended to prohibit FHR from seeking to nor prohibit the State of Texas from denying FHR's ability to:

a. Use or generate netting reductions or emission reduction credits for units that are not subject to an emission limitation pursuant to this Consent Decree;

b. Use CD Emissions Reductions for the Facility's compliance with any rules or regulations designed to address regional haze or the non-attainment status of any area (excluding PSD and Non-Attainment New Source Review rules, but including, for example, Reasonably Available Control Technology rules) that apply to the Facility; provided, however, that FHR shall not be allowed to trade or sell any CD Emissions Reductions;

c. Use CD Emission Reductions for purposes of the State of Texas' air toxics modeling program.

VIII. REPORTING REQUIREMENTS

101. Semi-Annual Compliance Status Reports. On the dates and for the time periods set forth in Paragraph 106, FHR shall submit to EPA in the manner set forth in Section XVIII (Notices) the following information:

a. A progress report on the implementation of the requirements in Sections IV, V, and VI of this Decree (Affirmative Relief) at the Facility;

b. A description of any problems anticipated with respect to meeting the requirements of Sections IV, V, VI at the Facility;

c. Monitoring equipment/instrument downtime, override of Automatic Control System ("ACS"), and exceedances of emission standards, as described in Paragraph 102;

d. For the semi-annual report due on July 31 of each year, annual emissions data, as described in Paragraph 103;

e. The semi-annual reporting requirements under Section V (LDAR), as described in Paragraph 104;

f. The semi-annual reporting requirements under Section VI (BWON), as described in Paragraph 105;

g. A description of the status of the Mitigation Projects in Section IX of this Decree;

h. The information required to be reported in Appendix 5.1 of this Decree;

i. Any additional matters required by any other Paragraph of this Consent Decree to be submitted in the semi-annual report; and

j. Any additional matters that FHR believes should be brought to the attention of EPA.

102. Monitoring Instrument/Equipment Downtime; Override of ACS; and Emissions Exceedances. In each semi-annual compliance status report, on and after the date of applicability of any work practice or standard, FHR shall provide a summary of the following, per Covered Flare per calendar quarter (hours shall be rounded to the nearest tenth):

a. Monitoring Instrument/Equipment Downtime. The total number of hours of downtime of each monitoring instrument/equipment required pursuant to Paragraph 17 expressed as both an absolute number and a percentage of time the Covered Flare that the instrument/equipment monitors is In Operation;

b. Monitoring Instrument/Equipment Downtime. If the total number of hours of downtime of any monitoring instrument/equipment required pursuant to Paragraph 17 exceeds 110 hours in any calendar quarter an identification of the periods of downtime by date, time, cause (including Malfunction or maintenance), and, if the cause is asserted to be a Malfunction, the corrective action taken;

c. Override of Automatic Control System. The total number of hours in which FHR manually overrode the ACS required in Paragraph 32, expressed both as an absolute number of hours and a percentage of time the Covered Flare was In Operation;

d. Override of Automatic Control System. If the reason for the override was not one of the exceptions set forth in Paragraph 33 or if the total number of hours in which the ACS was overridden exceeds 110 hours in any calendar quarter, an identification of the periods of override (that exceed 110 hours) by the date, time, duration, reason for the override, and corrective actions taken;

e. Inapplicability of Standards in Paragraphs 34–37. The total number of hours, expressed as both an absolute number of hours and a percentage of time that the Covered Flare was In Operation, in which the requirements of Paragraphs 34–37 were not applicable because the only gas or gases being vented was/were Pilot Gas and/or Purge Gas; for purposes of Subparagraphs 102.f. and 102.g, all remaining hours shall be termed "Hours of Applicability";

f. Exceedances of Standards in Subparagraphs 34.b, 35.a, and 37. During the Hours of Applicability, the total number of hours, expressed as both an

absolute number of hours and a percentage of time the Covered Flare was In Operation, of exceedances of the emissions standards in Subparagraphs 34.b, 35.a, and 37; provided however, that if the exceedance of these standards was less than 110 hours in the calendar quarter and was due to one or more of the exceptions set forth in Paragraph 38, the report shall so note; and

g. Exceedances of Standards in Subparagraphs 34.b, 35.a, and 37. During the Hours of Applicability, if the exceedance of the emissions standards in Subparagraphs 34.b, 35.a, and 37 was not due to one of the exceptions in Paragraph 38, or if the exceedance was due to one or more of the exceptions in Paragraph 38 but the total number of hours caused by the exceptions in Paragraph 38 was greater than 110 an identification of each Block Period that exceeded the standard, by time and date; the cause of the exceedance (including Startup, Shutdown, maintenance, or Malfunction), and if the cause is asserted to be a Malfunction, an explanation and any corrective actions taken.

103. Emissions Data. In the semi-annual report that is submitted on July 31 of each year, FHR shall provide, for each Covered Flare, for the prior calendar year, the amount of emissions of the following compounds (in tons per year): VOCs, NOx, CO_2, methane, and ethane.

104. Enhanced LDAR Program Compliance Status. On and after the date of applicability of the respective requirement in Section V, FHR shall provide the following in the semi-annual compliance status reports:

a. The information required in Subsection V.G, Paragraph 71;

b. A certification that LDAR trainings in accordance with Paragraph 72 of this Consent Decree have been done;

c. Any deviations identified in the QA/QC procedures performed under Subsection V.I, Paragraph 74, as well as any corrective actions taken under that Subsection;

d. For the applicable semi-annual compliance status report as identified in Paragraph 80, the LDAR Audit Report; and

e. For the applicable semi-annual compliance status report as identified in Subparagraph 82.b, the final CAP (if any), together with any other items required by Subparagraph 82.b.

105. Benzene Waste Operation NESHAP.

In the semi-annual compliance status report that is required on January 31 of each year, FHR shall submit the following information:

a. All locations in the Facility, where, as of the Date of Entry, carbon canister systems are used as control devices under Subpart FF (Paragraph 89.a) (this information is required to be reported only in the first compliance status report that is submitted under this Decree);

b. An identification of all laboratory audits, if any, completed during the prior year, including a description of the methods used in the audit and the results of the audit (Paragraph 91);

c. A description of the measures taken, if any, during the prior year to comply with the training provisions of Paragraph 93; and .

d. A summary of the prior year's sampling results required under Subparagraph 94.c, and the prior year's calculations of the quarterly and projected annual uncontrolled benzene quantities under Paragraph 95.

106. Due Dates. The first compliance status report shall be due thirty-one days after the first full half-year after the Effective Date of this Consent Decree (*i.e.,* either: (i) January 31 of the year after the Effective Date, if the Effective Date is between January 1 and June 30 of the preceding year; or (ii) July 31 of the year after the Effective Date, if the Effective Date is between July 1 and December 31). The initial report shall cover the period between the Effective Date and the first full half year after the Effective Date (a "half year" runs between January 1 and June 30 and between July 1 and December 31). Until termination of this Decree, each subsequent report will be due on January 31 and July 31 and shall cover the prior half year (*i.e.*, January 1 to June 30 or July 1 to December 31).

107. Each report submitted under this Consent Decree shall be signed by the plant manager (or his/her designee), the person responsible for environmental management and compliance, or a corporate official responsible for plant engineering management, and shall include the following certification:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

108. The reporting requirements of this Consent Decree do not relieve FHR of any reporting obligations required by the CAA or implementing regulations, or by any other federal, state, or local law, regulation, permit, or other requirement. Any information provided pursuant to this Consent Decree may be used by the United States in any proceeding to enforce the provisions of this Consent Decree and as otherwise permitted by law.

IX. ENVIRONMENTAL MITIGATION PROJECTS

109. FHR shall implement the "City of Port Arthur Diesel Emissions Reduction Project" set forth in Section 4.1.1 of Appendix 4.1 of this Decree in accordance with the requirements in Appendix 4.1. In implementing this Project, FHR shall spend no less than $2.0 million in Project Dollars. FHR shall not include, as Project Dollars, its own personnel costs in overseeing the implementation of the Project. The City of Port Arthur's own personnel costs also shall not be included as Project Dollars.

110. FHR shall implement the "Energy Efficiency Project" set forth in Section 4.1.2 of Appendix 4.1 in accordance with the requirements in Appendix 4.1. In implementing this

Project, FHR shall spend no less than $350,000 in Project Dollars. FHR shall not include, as Project Dollars, its own personnel costs in overseeing the implementation of the Project.

111. By signing this Consent Decree, FHR certifies that it is not required to perform or develop these Mitigation Projects by any federal, state, or local law or regulation and is not required to perform or develop these Projects by agreement, grant, or as injunctive relief awarded in any other action in any forum; that these Projects are not ones that FHR was planning or intending to construct, perform, or implement other than in settlement of the claims resolved by this Decree; and that FHR will not receive any reimbursement for any portion of the costs of these Projects from any other person.

112. Any public statement, oral or written, in print, film, or other media, made by FHR and referring to the Mitigation Projects under this Decree shall include the following language: "This project was undertaken in connection with the settlement of an enforcement action, United States v. Flint Hills Resources, taken on behalf of the EPA under the Clean Air Act."

113. Environmental Mitigation Project Progress and Completion Reports. FHR shall include in each report required under Section VIII ("Reporting") a status update on each Mitigation Project required by this Section. In addition, the report required by Section VIII for the period in which the Project is completed shall contain the following information:

a. A detailed description of the Project as implemented;

b. A description of any problems encountered in completing the Project and the solutions thereto;

c. A description of the environmental and public health benefits resulting from implementation of the Project (with a quantification of the benefits and an estimate of the pollutant reductions); and

d. A certification that the Project has been fully implemented pursuant to the provisions of this Decree.

X. FENCE LINE MONITORING PROGRAM

114. FHR shall implement the "Fence Line Monitoring Program" set forth in Appendix 5.1 consistent with the requirements of Appendix 5.1.

XI. CIVIL PENALTY

115. By no later than 30 days after the Effective Date of this Consent Decree, FHR shall pay the sum of $350,000 as a civil penalty. FHR shall pay the civil penalty by FedWire Electronic Funds Transfer ("EFT") to the U.S. Department of Justice in accordance with written instructions to be provided to FHR, following lodging of the Consent Decree, by the Financial Litigation Unit of the U.S. Attorney's Office for the Eastern District of Texas, 110 N. College, Suite 700, Tyler, Texas 75702. At the time of payment, FHR shall send a copy of the EFT authorization form, the EFT transaction record, and a transmittal letter: (i) to the United States in the manner set forth in Section XVIII of this Decree (Notices); (ii) by email to acctsreceivable.CINWD@epa.gov; and (iii) by mail to:

EPA Cincinnati Finance Office
26 Martin Luther King Drive
Cincinnati, Ohio 45268

The transmittal letter shall state that the payment is for the civil penalty owed pursuant to the Consent Decree in United States v. Flint Hills Resources Port Arthur, LLC, and shall reference the civil action number, USAO File Number 2013V00893, and DOJ case number 90-5-2-1-10070.

116. If any portion of the civil penalty due to the United States is not paid when due, FHR shall pay interest on the amount past due, accruing from the Effective Date through the date of payment, at the rate specified in 28 U.S.C. § 1961. Interest payment under this Paragraph shall be in addition to any stipulated penalty due.

117. FHR shall not deduct any penalties paid under this Decree pursuant to this Section or Section XII (Stipulated Penalties) in calculating its federal income tax.

XII. STIPULATED PENALTIES

118. Failure to Pay Civil Penalty. If FHR fails to pay any portion of the civil penalty required to be paid under Section XI of this Decree (Civil Penalty) when due, FHR shall pay a stipulated penalty of $2500 per day for each day that the payment is late. Late payment of the civil penalty and any accrued stipulated penalties shall be made in accordance with Paragraph 115.

119. Failure to Meet all Other Consent Decree Obligations. FHR shall be liable for stipulated penalties to the United States for violations of this Consent Decree as specified in Paragraphs 120 through 124 below unless excused under Section XIII of this Decree (Force Majeure). For those provisions where a stipulated penalty of either a fixed amount or 1.2 times the economic benefit of delayed compliance is available, the decision of which alternative to seek rests exclusively within the discretion of the United States.

120. Failure to Meet the Obligations in Section IV of this Consent Decree.

Violation	**Stipulated Penalty**	
120.a. Violation of Paragraph 14. Failure to timely submit a report (¶ 14) that conforms to the requirements of that Paragraph	Period of delay or noncompliance	Penalty per day
	Days 1–30	$ 300
	Days 31–60	$ 400
	Days 61 and later	$ 500

120.b. Violation of Paragraph 15, 15A, 15B, 16, or 17. Failure to install, by June 30, 2014, December 31, 2014, or the earlier of (i) the next outage of the Covered Flares or (ii) December 31, 2020, respectively, the equipment required by Paragraph 15, 15A, or 15B; or failure to comply with Paragraph 17; or failure to meet the applicable technical specifications in Paragraph 16 or Appendix 1.10 (except for the requirements of Appendix 1.10 found in Subparagraphs I.g, III.A.c, III.B.e, IV, V.B, VI.B, and VIII of Appendix 1.10: those are QA/QC requirements covered in Subparagraph 120.c below)	Period of delay or noncompliance, per monitoring system Days 1–30 Days 31–60 Days 61 and later	Penalty per day per monitoring system $ 750 $ 1250 $ 2000 or an amount equal to 1.2 times the economic benefit of delayed compliance, whichever is greater
120.c. Violation of the QA/QC requirements in Appendix 1.10. Failure to comply with the QA/QC requirements in Appendix 1.10 at Subparagraphs I.g, III.A.c, III.B.e, IV, V.B, VI.B, and VIII	Violation of a: Daily requirement Quarterly requirement Annual requirement	Penalty $ 100 $ 200 per day late $ 500 per day late
120.d. Violation of Paragraph 18. Except for 110 hours per calendar quarter, failure to operate the monitoring systems identified in Paragraph 17 pursuant to the requirements of Paragraph 18; provided however, that FHR shall not be liable for a stipulated penalty for violation of Paragraph 18 if, during the period of instrument downtime, the only gas(es) being sent to the Covered Flare in question is/are Purge Gas and/or Pilot Gas. For any monitoring system that serves a dual purpose, this stipulated penalty applies per instrument only.	Per monitoring system, number of hours per calendar quarter of downtime over 110 0.25–50.0 50.25–100.0 Over 100.0	Penalty per hour per monitoring system $ 250 $ 500 $ 1000

120.e. Violation of Paragraph 21 or 22. Failure to timely submit a plan (¶¶ 21 or 22) that conforms to the requirements of Paragraph 21 or 22	Period of delay or noncompliance Days 1–30 Days 31–60 Days 61 and later	Penalty per day $ 500 $ 750 $ 1000
120.f. Violation of Paragraph 25. Failure to timely develop a report that conforms to the requirements in Subparagraph 25.a; or failure to keep it as an internal record; or failure to timely submit a summary of the flaring incident reports that conforms to the requirements in Subparagraph 25.b	Period of delay or noncompliance Days 1 – 30 Days 31 – 60 Days 61 and later	Penalty per day $ 800 $ 1,600 $ 3,000
120.g. Violation of Paragraph 26. Failure to complete any corrective action under Paragraph 26 in accordance with the schedule for corrective action agreed to by FHR or imposed on FHR pursuant to the dispute resolution provisions of this Decree (with any such extensions thereto as to which EPA and FHR may agree in writing)	Period of delay or noncompliance Days 1 – 30 Days 31 – 60 Days 61 and later	Penalty per day $ 1,000 $ 2,000 $ 5,000
120.h. Violation of a Certain Subparagraph 29.b.i requirement. For each failure to comply with the Subparagraph 29.b.i requirement to have one Compressor Available for Operation and/or in operation "at all times"	Per hour or fraction thereof: $750; provided however, that stipulated penalties shall not apply for any hour in which a Compressor's unavailability did not result in flaring	
120.i. Violation of a Certain Subparagraph 29.b.i (excluding the one identified in Subparagraph 129.h). For each failure to comply with the following requirement in Subparagraph 29.b.i to have two Compressors Available for Operation and/or in operation 95% of the time	The number of hours or fraction thereof–over the allowed percentage—in a rolling 8760-hour period that a Compressor required to be Available for Operation is not: $750; provided however, that stipulated penalties shall not apply for any hour or fraction thereof in which a Compressor's unavailability did not result in flaring.	
120.j. Violation of Paragraph 32. Failure to timely install and operate the Automatic Control System requirements of Paragraph 32	Penalty per Covered Flare per day: $500	

120.k. Violation of Subparagraph 34.b.i or 34.b.ii. For each Covered Flare, failure to comply with the Net Heating Value in the Combustion Zone Gas ("NHV_{cz}") standard in Subparagraph 34.b.i or 34.b.ii.	On a per Covered Flare basis, hours per calendar quarter in noncompliance / Penalty per hour, or fraction there of per flare Hours 0.25–50.0 — $ 25 Hours 50.25–100.0 — $ 75 Hours over 100.0 — $ 150 For purposes of calculating the number of hours of noncompliance with the NHV_{cz} standard for the LOU Flare and the LOU Flare-2, all 20 minute periods of violation shall be added together to determine the total. For purposes of calculating the number of hours of noncompliance with the NHV_{cz} standard for the AU flare all 5 minute periods of violation shall be added together to determine the total.
120.l. Violation of Subparagraph 36.a. Failure to comply with the prohibition on Discontinuous Wake Dominated Flow	Flare Tip Size (inches) / Penalty per hour or fraction thereof 1.0–24.0 — $ 150 24.1–48.0 — $ 225 Over 48.0 — $ 525
120.m. Violation of Paragraph 40. Failure to record any information required to be recorded pursuant to Subparagraphs 40.a, b, or c	$100 per day
120.n. Violation of Subparagraph 41.d.i or 41.d.ii. Failure to ensure that a Portable Flare that falls under the conditions of Subparagraph 41.d.i or 41.d.ii complies with the requirements of those Subparagraphs	Number of days Portable Flare did not comply / Penalty per day Days 1–7 — $ 1000 Days 8–15 — $ 2000 Days 16 and later — $ 5000

121. Failure to Meet the Obligations in Section V of this Decree.

Violation	**Stipulated Penalty**
121.a. Failure to timely update the Facility-Wide LDAR Document required in Paragraph 48 on an annual basis if needed pursuant to Paragraph 48	Period of noncompliance — Penalty per day late 1 - 15 days — $ 300 16 - 30 days — $ 400 31 days or more — $ 500
121.b. Each failure to perform monitoring at the frequencies set forth in Paragraph 51	$100 per component per missed monitoring event, not to exceed $25,000 per month per Covered Process Unit
121.c. Each failure to timely perform a first attempt at repair as required by Paragraph 52 or 54, unless not required to do so under Subparagraph 64.c.i or 70.b.i. For purposes of these stipulated penalties, the term "repair" includes the required remonitoring in Paragraph 53 after the repair attempt; the stipulated penalties in Subparagraph 121.e do not apply.	$ 150 per day for each late day, not to exceed $1500 per leak
121.d. Each failure to timely perform a final attempt at repair as required by Paragraph 52, unless not required to do so under Subparagraph 64.c.i or 70.b.i. For purposes of these stipulated penalties, the term "repair" includes the required remonitoring in Paragraph 53 after the repair attempt; the stipulated penalties in Subparagraph 121.e do not apply.	Equipment type — Penalty per Component per day late — Not to Exceed Valves, connectors — $ 300 — $ 37,500 Pumps, agitators — $1,200 — $ 150,000
121.e. Each failure to timely perform Repair Verification Monitoring as required by Paragraph 53 in circumstances where the first attempt to adjust, or otherwise alter, the piece of equipment to eliminate the leak was made within 5 days and the final attempt to adjust, or otherwise alter, the piece of equipment to eliminate the leak was made within 15 days	Equipment type — Penalty per Component per day late — Not to Exceed Valves, connectors — $ 150 — $ 18,750 Pumps, agitators — $ 600 — $ 75,000

<table>
<tr><td>121.f. Each failure to undertake the drill-and-tap method as required by Paragraph 55</td><td><table><tr><th>Period of noncompliance</th><th>Penalty per component per day late</th></tr><tr><td>Between 1 and 15 days</td><td>$ 200</td></tr><tr><td>Between 16 and 30 days</td><td>$ 350</td></tr><tr><td>Over 30 days</td><td>$ 500 per day for each day over 30, not to exceed $37,500</td></tr></table></td></tr>
<tr><td>121.g. Each failure to record the information required by Paragraph 56</td><td>$ 100 per component per item of missed information</td></tr>
<tr><td>121.h. Each improper placement of a piece of Covered Equipment on the DOR list (i.e., placing a piece of Covered Equipment on the DOR list even though it is feasible to repair it without a process unit shutdown)</td><td><table><tr><th>Equipment Type</th><th>Penalty per component per day on list</th><th>Not to exceed</th></tr><tr><td>Valve, connectors</td><td>$ 300</td><td>$ 75,000</td></tr><tr><td>Pumps, Agitators</td><td>$ 1200</td><td>$ 300,000</td></tr></table></td></tr>
<tr><td>121.i. Each failure to comply with the requirement in Subparagraph 58.a that a relevant unit supervisor or person of similar authority sign off on placing a piece of Covered Equipment on the DOR list</td><td>$250 per piece of Covered Equipment</td></tr>
<tr><td>121.j. Each failure to comply with the requirement of Subparagraph 58.c</td><td>Refer to the applicable stipulated penalties in Subparagraphs 121.c and 121.d</td></tr>
<tr><td>121.k. Each failure to comply with the work practice standards in Paragraph 61</td><td>$50 per violation per valve per day, not to exceed $30,000 for all valves in a Covered Process Unit per quarter</td></tr>
<tr><td>121.l. Each failure to install a Low-E Valve or a valve fitted with Low-E Packing when required to do so pursuant to Paragraph 63</td><td>$ 20,000 per failure, except as provided in Paragraph 122 below</td></tr>
<tr><td>121.m. Each failure, in violation of Subparagraph 32.b, to timely comply with the requirements relating to installing a Low-E Valve or Low-E Packing if a process unit shutdown is not required</td><td>$500 per day per failure, not to exceed $20,000, except as provided in Paragraph 122 below</td></tr>
<tr><td>121.n. Each failure, in violation of Subparagraph 32.b, to install a Low-E Valve or Low-E Packing when required to do so during a Turnaround</td><td>$20,000 per failure, except as provided in Paragraph 122 below</td></tr>
</table>

121.o. Each failure, in violation of Paragraph 69, to timely comply with the requirements relating to replacing or improving a connector for any new connector installation	$10,000 per failure
121.p. Each failure, in violation of Subparagraph 70.a, to timely comply with the requirements relating to replacing or improving a connector if the replacement or improvement does not require a process unit shutdown	$250 per day per failure, not to exceed $10,000 per failure
121.q. Each failure, in violation of Subparagraph 70.a, to comply with the requirements relating to replacing or improving a connector if the replacement or improvement requires a process unit shutdown	$10,000 per failure
121.r. Each failure to perform initial, refresher, or new personnel training as required by the training program identified in Paragraph 72	$ 1000 per person per month late
121.s. Each failure of a monitoring technician or LDAR database coordinator to complete the certification required in Paragraph 73	$100 per failure per technician or database coordinator
121.t. Each failure to perform any of the requirements relating to QA/QC in Paragraph 74	$1000 per missed requirement per quarter
121.u. During each monitoring event, for each failure to electronically record the date, time, identification number of the monitoring instrument, and the identification of technician, in violation of the requirements of Paragraph 76.b	$100 per failure per piece of equipment monitored
121.v. Each failure to conduct an LDAR audit in accordance with the schedule set forth in Paragraph 78.	<u>Period of noncompliance</u> <u>Penalty per day</u> 1 – 15 days $300 16 – 30 days $400 31 days or more $500, not to exceed $100,000 per audit
121.w. For each use of FHR's regular LDAR contractor to conduct the third party audit in violation of Paragraph 77	$25,000 per audit

121.x. Except for the requirement to undertake Comparative Monitoring, each failure to substantially comply with the LDAR audit requirements in Paragraph 79	$100,000 per audit
121.y. Each failure to substantially comply with the Comparative Monitoring requirements of Paragraph 79	$50,000 per audit
121.z. Each failure to timely submit a Final Corrective Action Plan that substantially conforms to the requirements of Paragraph 82	Period of noncompliance — Penalty per day per violation 1 - 15 days — $ 100 16 - 30 days — $ 250 31 days or more — $ 500 Not to exceed $100,000 per audit
121.aa. Each failure to implement a corrective action within 90 days after the LDAR Audit Completion Date or pursuant to the schedule that FHR must propose pursuant to Subparagraph 82.a if the corrective action cannot be completed in 90 days	Period of noncompliance — Penalty per day per violation 1 - 15 days — $ 500 16 - 30 days — $ 750 31 days or more — $ 1000 Not to exceed $200,000 per audit
121.bb. Each failure to timely submit a Certification of Compliance that substantially conforms to the requirements of Paragraph 84	Period of noncompliance — Penalty per day per violation 1 - 15 days — $ 100 16 - 30 days — $ 250 31 days or more — $ 500 Not to exceed $75,000
121.cc. Each failure to include a piece of equipment in the Facility's LDAR program that should have been included, except for each failure identified in the first LDAR Audit Report submitted pursuant to this Consent Decree	If the failure is determined through a federal, state, or local investigation, $500 per piece of equipment not included; if the failure is determined by FHR (either on its own or through a third-party audit), $175 per piece of equipment not included
121.dd. Each failure to substantially comply with any recordkeeping, submission, or reporting requirement in Section V not specifically identified above in this Table	Period of noncompliance — Penalty per day per violation 1 - 15 days — $ 100 16 - 30 days — $ 250 31 days or more — $ 500

122. Stipulated Penalties in Lieu of those in Subparagraphs 121.l, 121.m, and 121.n.

a. For purposes of this Paragraph, the term "Non-Compliant Valve" means a valve that is either: (i) not a Low-E Valve; or (ii) not fitted with Low-E Packing. The term "Compliant Valve" means a valve that is either: (i) a Low-E Valve; or (ii) fitted with Low-E Packing.

b. The stipulated penalties in Subparagraph 122.c are to be used instead of those in Subparagraphs 121.l, 121.m, and 121.n when all of the following requirements are met:

i. FHR, and not a government agency, discovers the failure involved;

ii. FHR promptly reports the failure to EPA;

iii. In the report, FHR sets forth a schedule for promptly replacing the Non-Compliant Valve with a Compliant Valve; provided however, that FHR shall not be required to undertake an unscheduled shutdown of the affected Covered Process Unit in proposing the schedule unless FHR so chooses;

iv. FHR monitors the Non-Compliant Valve once a month from the time of its discovery until the valve is replaced with a Compliant Valve and no Screening Values above 100 ppm are recorded;

v. FHR replaces the Non-Compliant Valve with a Compliant Valve in accordance with the schedule set forth in 131.b.iii; and

vi. FHR demonstrates that in good faith it intended to install a Compliant Valve but inadvertently installed a Non-Compliant Valve.

c. The following stipulated penalties shall apply under the circumstances in this Paragraph 122:

i. In lieu of the penalty in Subparagraph 121.l, $2000 per failure.

ii. In lieu of the penalty in Subparagraph 121.m, $50 per day per failure, not to exceed $2000.

iii. In lieu of the penalty in Subparagraph 121.n, $2000 per failure.

123. Failure to Meet the Obligations in Section VI of this Decree.

Violation	**Stipulated Penalty**
123.a. For failure to timely conduct the One-Time Review and Verification of the Facility's TAB and Compliance Status in accordance with the requirements of Paragraph 87	$ 7500 per month (or fraction thereof)
123.b. For each failure to take any action necessary to correct non-compliance or to come into compliance as required by Paragraph 88	Period of delay or noncompliance — Penalty per day Days 1 – 30 — $ 750 Days 31 – 60 — $ 1,500 Days 61 and later — $ 3,500 or an amount equal to 1.2 times the economic benefit of delayed compliance, whichever is greater
123.c. For each failure to comply with any requirement of Paragraph 89 related to the use, monitoring, and replacement of carbon canisters	$ 500 per incidence of non-compliance, per day
123.d. For failure to establish an annual review program to identify new benzene waste streams as required by Paragraph 90	$ 2,500 per month (or fraction thereof)
123.e. For failure to perform laboratory audits as required by Paragraph 91	$ 5,000 per month (or fraction thereof), per audit
123.f. For failure to implement the training requirements of Paragraph 93	$ 10,000 per quarter (or fraction thereof)
123.g. For each failure to conduct EOL sampling in accordance Paragraph 94.c and the approved sampling plan	$ 2000 per sampling location not sampled; $ 1000 per incidence of any other type of non-compliance
123.h. For failure to timely submit a BWON Corrective Measure Plan if and when required pursuant to Subparagraph 96.a or failure to timely retain a third-party consultant if any when required pursuant to Subparagraph 96.c	$10,000 per month (or fraction thereof)
123.i. For each failure to conduct monthly visual inspections as required by Subparagraph 97.a.i	$500 per drain not inspected
123.j. If FHR uses Subpart FF conservation vents, for each failure to monitor these vents as required by Subparagraph 97.a.ii	$500 per vent not monitored

123.k. For each failure to conduct monitoring and/or repair of oil-water separators as required by Subparagraph 97.a.iii	$1,000 per month per separator
123.l. For each failure to identify and mark all process area drains to ensure they are segregated from stormwater drains	$1,000 per week per drain not identified and/or marked
123.m. Each failure to substantially comply with any recordkeeping, submission, or reporting requirement in Section V not specifically identified above in this Table	Period of noncompliance — Penalty per day per violation 1 - 15 days — $ 100 16 - 30 days — $ 250 31 days or more — $ 500

124. Failure to Meet Obligations in Sections VIII and IX of this Decree.

124.a. Violation of Section VIII (Reports). For each failure to submit reports as required by Section IX	Period of delay or noncompliance per report Days 1–30 Days 31–60 Days 61 and later	Penalty per day per report $ 300 $ 1000 $ 2000
124.b. Violation of Paragraphs 109 or 110. For failure to expend the Project Dollars required to be spent in implementing the Diesel Emissions Reduction Project and the Energy Efficiency Project or for failure to complete the Diesel Emissions Reduction Project and the Energy Efficiency Project in accordance with the requirements of Paragraphs 109 and 110 and Appendix 4.1; nothing in this Paragraph, however, shall preclude FHR from asserting that any failure to complete either of the Projects was caused by events outside its control as described in Paragraph 4.1.3.D of Appendix 4.1 or by a Force Majeure Event	Period of delay or noncompliance Days 1–30 Days 31–60 Days 61 and later	Penalty per day $ 1,000 $ 2,000 $ 3,000

125. Waiver of Payment. The United States may, in its unreviewable discretion, reduce or waive payment of stipulated penalties otherwise due to it under this Consent Decree.

126. Demand for Stipulated Penalties. A written demand by the United States for the payment of stipulated penalties will identify the particular violation(s) to which the stipulated penalty relates; the stipulated penalty amount (as can be best estimated) that the United States is demanding for each violation; the calculation method underlying the demand; and the grounds upon which the demand is based. Prior to issuing a written demand for stipulated penalties, the United States may, in its unreviewable discretion, contact FHR for informal discussion of matters that the United States believes may merit stipulated penalties.

127. Stipulated Penalties Accrual. Stipulated penalties will begin to accrue on the day after performance is due or the day a violation occurs, whichever is applicable, and, except as provided in Paragraph 125, shall continue to accrue until performance is satisfactorily completed or the violation ceases. Stipulated penalties shall accrue simultaneously for separate violations of this Consent Decree.

128. Stipulated Penalties Payment Due Date. Stipulated penalties shall be paid no later than sixty (60) days after receipt of a written demand by the United States unless the demand is disputed through compliance with the requirements of the dispute resolution provisions of this Decree.

129. Manner of Payment of Stipulated Penalties. Stipulated penalties owing to the United States shall be paid by FedWire EFT in the manner set forth in Section XI of this Decree (Civil Penalty) except that FHR shall contact the Financial Litigation Unit ("FLU") of the U.S. Attorney's Office in the Eastern District of Texas, 110 N. College, Suite 700, Tyler, Texas 75702, and ask the FLU to prepare written instructions for the payment due. All transmittal correspondence shall state that the payment is for stipulated penalties, shall identify the

violations to which the payment relates, and shall include the same identifying information required by Paragraph 115.

130. Disputes over Stipulated Penalties. By no later than 60 days after receiving a demand for stipulated penalties, FHR may dispute liability for any or all stipulated penalties demanded by invoking the dispute resolution procedures of Section XIV of this Decree (Dispute Resolution). In the event of a dispute over stipulated penalties, stipulated penalties shall not accrue commencing on the later of either: (i) the date that, during dispute resolution under Section XIV, the United States and FHR agree upon; or (ii) the date that FHR files a motion with the Court under Paragraph 144; provided however, that in order for stipulated penalties to cease accruing pursuant to either (i) or (ii), FHR must place the disputed amount in an interest-bearing commercial escrow account. If the dispute thereafter is resolved in FHR's favor, the escrowed amount plus accrued interest will be returned to FHR; otherwise, the United States will be entitled to the amount determined by the Court to be due, plus interest that has accrued on such amount in the escrow account.

131. No amount of the stipulated penalties paid by FHR shall be used to reduce its federal tax obligations.

132. Subject to the provisions of Section XVI of this Decree (Effect of Settlement/Reservation of Rights), the stipulated penalties provided for in this Decree shall be in addition to any other rights, remedies, or sanctions available to the United States for a violation of this Consent Decree or applicable law. In addition to injunctive relief or stipulated penalties, the United States may seek mitigating emissions reductions equal to or greater than the excess amounts emitted if the violations result in excess emissions. FHR reserves the right to oppose

the United States' request for mitigating emission reductions. FHR shall be allowed a credit, for any stipulated penalties paid, against any statutory penalties imposed for such violation.

XIII. FORCE MAJEURE

133. "Force Majeure," for purposes of this Consent Decree, is defined as any event beyond the control of FHR, its contractors, or any entity controlled by FHR that delays the performance of any obligation under this Consent Decree despite FHR's best efforts to fulfill the obligation. The requirement that FHR exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential Force Majeure event and best efforts to address the effects of any such event: (a) as it is occurring; and (b) after it has occurred, to prevent or minimize any resulting delay.

134. "Force Majeure" does not include FHR's financial inability to perform any obligation under this Consent Decree. Unanticipated or increased costs or expenses associated with the performance of FHR's obligations under this Consent Decree shall not constitute circumstances beyond FHR's control nor serve as the basis for an extension of time under this Section XIII.

135. If any event occurs or has occurred that may delay the performance of any obligation under this Consent Decree, whether or not caused by a Force Majeure event, FHR shall notify EPA in writing not later than fifteen calendar days after the time FHR first knew or should have known by the exercise of due diligence that the event might cause a delay. In the written notice, FHR shall specifically reference this Paragraph 135 of the Consent Decree and shall provide an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the

delay; FHR's rationale for attributing such delay to a Force Majeure event if it intends to assert such a claim; and a statement as to whether, in the opinion of FHR, such event may cause or contribute to an endangerment to public health, welfare, or the environment. FHR shall be deemed to know of any circumstance of which FHR, any entity controlled by FHR, or FHR's contractors knew or should have known. FHR shall include with any notice all available documentation supporting the claim that the delay was attributable to a Force Majeure. The written notice required by this Paragraph shall be effective upon the mailing of the same by overnight mail or by certified mail, return receipt requested, to EPA in the manner set forth in Section XVIII of this Decree (Notices).

136. Failure by FHR to comply with the requirements in Paragraph 135 shall preclude FHR from asserting any claim of Force Majeure for the event for the period of time of such failure to comply, and for any additional delay caused by such failure.

137. If EPA agrees that the delay or anticipated delay is attributable to a Force Majeure event, the time for performance of the obligations under this Consent Decree that are affected by the Force Majeure event will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the Force Majeure event shall not, of itself, extend the time for performance of any other obligation. EPA will notify FHR in writing of the length of the extension, if any, for performance of the obligations affected by the Force Majeure event.

138. If EPA does not agree that the delay or anticipated delay has been or will be caused by a Force Majeure event, or if the EPA and FHR fail to agree on the length of the delay attributable to the Force Majeure event, EPA will notify FHR of its decision.

139. If FHR elects to invoke the dispute resolution procedures set forth in Section XIV of this Decree (Dispute Resolution), it shall do so no later than 45 days after receipt of EPA's notice. In any such proceeding, FHR shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a Force Majeure event, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that FHR complied with the requirements of Paragraphs 133 and 135. If FHR carries this burden, the delay at issue shall be deemed not to be a violation by FHR of the affected obligation of this Consent Decree identified to EPA and the Court.

XIV. DISPUTE RESOLUTION

140. Unless otherwise expressly provided for in this Consent Decree, the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Decree.

141. Informal Dispute Resolution. The first stage of dispute resolution shall consist of informal negotiations. The dispute shall be considered to have arisen when one Party sends the other Party a written Notice of Dispute. Such Notice of Dispute shall state clearly the matter in dispute. The period of informal negotiations shall not exceed 60 days after the Notice of Dispute, unless that period is modified by written agreement. If the Parties cannot resolve the dispute by informal negotiations, then the position advanced by the United States shall be considered binding unless within 45 days after the conclusion of the informal negotiation period, FHR invokes formal dispute resolution procedures set forth below.

142. Formal Dispute Resolution. FHR shall invoke formal dispute resolution procedures, within the time period provided in the preceding Paragraph, by serving on the United

States a written Statement of Position regarding the matter in dispute. The Statement of Position shall include, but need not be limited to, any factual data, analysis, or opinion supporting FHR's position and any supporting documentation relied upon by FHR.

143. The United States shall serve its Statement of Position within 45 days of receipt of FHR's Statement of Position. The United States' Statement of Position shall include, but need not be limited to, any factual data, analysis, or opinion supporting that position and any supporting documentation relied upon by the United States. The United States' Statement of Position shall be binding on FHR unless FHR files a motion for judicial review of the dispute in accordance with the following Paragraph.

144. FHR may seek judicial review of the dispute by filing with the Court and serving, in accordance with Section XVIII of this Decree (Notices), on the United States a motion requesting judicial resolution of the dispute. The motion must be filed within 45 days of receipt of the United States' Statement of Position pursuant to the preceding Paragraph. The motion shall contain a written statement of FHR's position on the matter in dispute, including any supporting factual data, analysis, opinion, or documentation, and shall set forth the relief requested and any schedule within which the dispute must be resolved for orderly implementation of the Consent Decree.

145. The United States shall respond to FHR's motion within the time period allowed by the Local Rules of this Court for responses to dispositive motions. FHR may file a reply memorandum, to the extent permitted by the Local Rules.

146. In a formal dispute resolution proceeding under this Section, FHR shall bear the burden of demonstrating that its position complies with this Consent Decree and the CAA and that it is entitled to relief under applicable principles of law. The United States reserves the right

to argue that its position is reviewable only on the administrative record and must be upheld unless arbitrary and capricious or otherwise not in accordance with law, and FHR reserves the right to argue to the contrary.

147. The invocation of dispute resolution procedures under this Section shall not, by itself, extend, postpone, or affect in any way any obligation of FHR under this Consent Decree, unless and until final resolution of the dispute so provides. Stipulated penalties with respect to the disputed matter shall accrue in accordance with Paragraph 127, but payment shall be stayed pending resolution of the dispute.

XV. INFORMATION COLLECTION AND RETENTION

148. The United States and its representatives, employees, contractors, and consultants shall have the right of entry into the Facility, at all reasonable times, upon presentation of credentials and any other documentation required by law, to:

a. monitor the progress of activities required under this Consent Decree;

b. verify any data or information submitted to the United States in accordance with the terms of this Consent Decree;

c. obtain documentary evidence, including photographs and similar data, relevant to compliance with the terms of this Consent Decree; and

d. assess FHR's compliance with this Consent Decree.

149. Except for data recorded by any video camera required pursuant to Paragraph 15, until one year after termination of this Consent Decree, FHR shall retain all documents, records, or other information, regardless of storage medium (*e.g.*, paper or electronic) in its possession or control that directly relate to FHR's performance of its obligations under this Consent Decree. Except for data recorded by any video camera required pursuant to Paragraph 15, until one year after termination of this Consent Decree, FHR shall instruct its contractors and agents to preserve

all documents, records, or other information, regardless of storage medium (*e.g.*, paper or electronic) in its contractors' or agents' possession or control, or that come into its or its contractors' or agents' possession or control, that demonstrate or document FHR's compliance or non-compliance with the obligations of this Consent Decree. This information-retention requirement shall apply regardless of any contrary corporate or institutional policies or procedures. At any time during this information-retention period, the United States may request copies of any documents, records, or other information required to be maintained under this Paragraph. FHR shall retain the data recorded by the video camera required pursuant to Paragraph 15 for three years from the date of recording.

150. Except for emissions data, FHR may assert that information required to be provided under this Section is protected as Confidential Business Information ("CBI") under 40 C.F.R. Part 2. As to any information that FHR seeks to protect as CBI, FHR shall follow the procedures set forth in 40 C.F.R. Part 2, where applicable.

151. This Consent Decree in no way limits or affects any right of entry and inspection, or any right to obtain information, held by the United States pursuant to applicable federal laws, regulations, or permits, nor does it limit or affect any duty or obligation of FHR to maintain documents, records, or other information imposed by applicable federal or state laws, regulations, or permits.

XVI. EFFECT OF SETTLEMENT/RESERVATION OF RIGHTS

152. Definitions. For purposes of this Section XVI, the following definitions apply:

a. "BTU/scf Flared Gas Requirements" shall mean the requirements found in the following regulations:

i. 40 C.F.R. § 60.18(c)(3)(ii);

ii. 40 C.F.R. § 63.11(b)(6)(ii);

iii. 40 C.F.R. §§ 60.482-10(d), 60.482-10a(d) (Part 60, Subpart VV and VVa provisions), but only to the extent that these provisions require compliance with 40 C.F.R. § 60.18(c)(3)(ii);

iv. 40 C.F.R. § 61.349(a)(2)(iii) (Part 61, Subpart FF provision), but only to the extent that this provision requires compliance with 40 C.F.R. § 60.18(c)(3)(ii);

v. 40 C.F.R. § 63.113(a)(1)(i) (Part 63, HON process vent provision), but only to the extent that this provision requires compliance with 40 C.F.R. § 63.11(b)(6)(ii);

vi. 40 C.F.R. § 63.1103(e)(3) and Table 7 at (d) (Part 63, Subpart YY process vent provision), but only to the extent that these provisions: (1) relate to flares; and (2) require compliance with 40 C.F.R. § 63.982(b) (Part 63, Subpart SS provision) (but only to the extent that this provision requires compliance with 40 C.F.R. § 63.987(a) (Part 63, Subpart SS provision));

vii. 40 C.F.R. § 63.987(a) (Part 63, Subpart SS provision), but only to the extent that this provision requires compliance with 40 C.F.R. § 63.11(b)(6)(ii); and

viii. 40 C.F.R. § 63.1103(e)(3) and Table 7 at (f) (Part 63, Subpart YY LDAR provision), but only to the extent that these provisions: (1) relate to flares; and (2) require compliance with 40 C.F.R. § 63.1034(b)(iii) (Part 63, Subpart UU provision) (but only to the extent that this provision requires compliance with the flare provisions of Subpart SS)

b. "General Flare Requirements" shall mean the requirements found in the following regulations:

i. 40 C.F.R. § 60.18(c)(1) and
40 C.F.R. § 63.11(b)(4)
(both relate to a prohibition on visible emissions);

ii. 40 C.F.R. § 60.18(c)(2) and
40 C.F.R. § 63.11(b)(5)
(both relate to flame presence);

iii. 40 C.F.R. § 60.18(c)(4) and
40 C.F.R. § 63.11(b)(7)
(both relate to exit velocity requirements for steam-assisted flares); and

iv. 40 C.F.R. § 60.18(e) and
40 C.F.R. § 63.11(b)(3)
(both relate to operation during emissions venting).

c. "Good Air Pollution Control Practice Requirements" shall mean the requirements found in the following regulations:

i. 40 C.F.R. § 60.11(d);

ii. 40 C.F.R. § 61.12(c);

d. "PSD/NNSR Requirements" shall mean the Prevention of Significant Deterioration and Non-Attainment New Source Review requirements found in the following:

i. 42 U.S.C. § 7475;

ii. 40 C.F.R. §§ 52.21(a)(2)(iii) and 52.21(j)–52.21(r)(5);

iii. 42 U.S.C. §§ 7502(c)(5), 7503(a)–(c);

iv. 40 C.F.R. Part 51, Appendix S, Part IV, Conditions 1–4;

v. any applicable, federally enforceable state or local regulation that implements, adopts, or incorporates the federal provisions cited in Subparagraphs 152.d.i–iv; and

vi. Title V permit requirements that implements, adopts, or incorporates the federal, or federally enforceable state, provisions cited in Subparagraphs 152.d.i–v;

e. "Requirements Related to Monitoring, Operation, and Maintenance According to Flare Design" shall mean the requirements found in the following regulations:

i. 40 C.F.R. § 60.18(d);

ii. 40 C.F.R. § 63.11(b)(1);

iii. 40 C.F.R. §§ 60.482-10(d), 60.482-10a(d) (Part 60, Subpart VV and VVa provisions), but only to the extent that these provisions require compliance with 40 C.F.R. § 60.18(d);

iv. 40 C.F.R. §§ 60.482-10(e), 60.482-10a(e) (Part 60, Subpart VV and VVa provisions), but only to the extent that these provisions relate to flares;

v. 40 C.F.R. § 61.349(a)(2)(iii) (Part 61, Subpart FF provision), but only to the extent that this provision requires compliance with 40 C.F.R. § 60.18(d);

vi. 40 C.F.R. § 63.113(a)(1)(i) (Part 63 HON process vent provision), but only to the extent that this provision requires compliance with 40 C.F.R. § 63.11(b)(1);

vii. 40 C.F.R. § 63.1103(e)(3) and Table 7 at (d) (Part 63, Subpart YY process vent provision), but only to the extent that these provisions: (1) relate to flares; and (2) require compliance with 40 C.F.R. § 63.982(b) (Part 63, Subpart SS provision) (which in turn requires compliance with 40 C.F.R. § 63.987(a) (Part 63, Subpart SS provision));

viii. 40 C.F.R. § 63.987(a) (Part 63, Subpart SS provision), but only to the extent that this provision requires compliance with 40 C.F.R. § 63.11(b)(1); and

ix. 40 C.F.R. § 63.1103(e)(3) and Table 7 at (f) (Part 63, Subpart YY LDAR provision), but only to the extent that these provisions: (1) relate to flares; and (2) require compliance with 40 C.F.R. § 63.1034(b)(2) and (b)(2)(iii) (Part 63, Subpart UU provision) (which in turn requires compliance with the flare provisions of Subpart SS)

153. Entry of this Consent Decree shall resolve the civil claims of the United States for the violations alleged in the Complaint filed in this action through the Date of Lodging and for the violations of the federally-enforceable regulations (which include regulations under Texas' approved state implementation plan) alleged on Pages 1–3 of the March 2009 Compliance Agreement between the Texas Commission on Environmental Quality and FHR, attached hereto as Appendix 6.1, through the Date of Lodging.

154. Resolution of Claims for Violating PSD/NNSR Requirements at the Covered Flares. With respect to emissions of VOCs, NOx, and CO from the Covered Flares, entry of this

Consent Decree shall resolve the civil claims of the United States against FHR for violations of the PSD/NNSR Requirements at the Covered Flares resulting from construction or modification from the date of the pre-Lodging construction or modification through the Date of Entry.

155. Resolution of Claims at the Covered Flares for Failing to Comply with: (a) BTU/scf Flared Gas Requirements; (b) General Flare Requirements; (c) Good Air Pollution Control Practice Requirements; and (d) Requirements Related to Monitoring, Operation, and Maintenance According to Flare Design. With respect to emissions of the following pollutants from the Covered Flares, entry of this Consent Decree shall resolve the civil claims of the United States against FHR for violations of the following requirements from the date those claims accrued through the Date of Entry:

Pollutant(s)	**Requirement/Regulation**
VOCs and HAPs	BTU/scf Flared Gas Requirements
VOCs and HAPs	General Flare Requirements
VOCs and HAPs	Good Air Pollution Control Practice Requirements
VOCs and HAPs	Requirements Related to Monitoring, Operation, and Maintenance According to Flare Design

156. Resolution of Title V Violations. Entry of this Consent Decree shall resolve the civil claims of the United States against FHR for the violations of Sections 502(a), 503(c), and 504(a) of the CAA, 42 U.S.C. §§ 7661a(a), 7661b(c), 7661c(a), and of 40 C.F.R. §§ 70.1(b), 70.5(a) and (b), 70.6(a) and (c), and 70.7(b), that are based upon the violations resolved by Paragraphs 154–155 for the time frames set forth in those Paragraphs.

157. The United States reserves all legal and equitable remedies available to enforce the provisions of this Consent Decree, except as expressly stated in Paragraphs 153–156. This

Consent Decree shall not be construed to limit the rights of the United States to obtain penalties or injunctive relief under the CAA or implementing regulations, or under other federal or state laws, regulations, or permit conditions, except as expressly specified in Paragraphs 153–156. The United States further reserves all legal and equitable remedies to address any imminent and substantial endangerment to the public health or welfare or the environment arising at, or posed by the Facility, whether related to the violations addressed in this Consent Decree or otherwise.

158. In any subsequent administrative or judicial proceeding initiated by the United States for injunctive relief, civil penalties, other appropriate relief relating to the Facility or FHR's CAA violations, FHR shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States in the subsequent proceeding were or should have been brought in the instant case, except with respect to claims that have been specifically resolved pursuant to Paragraphs 153–156.

159. This Consent Decree is not a permit, or a modification of any permit, under any federal, state, or local laws or regulations. FHR is responsible for achieving and maintaining complete compliance with all applicable federal, state, and local laws, regulations, and permits; and FHR's compliance with this Consent Decree shall be no defense to any action commenced pursuant to any such laws, regulations, or permits, except as set forth herein. The United States does not, by its consent to the entry of this Consent Decree, warrant or aver in any manner that FHR's compliance with any aspect of this Consent Decree will result in compliance with provisions of the Act, 42 U.S.C. § 7401 *et seq.*, or with any other provisions of federal, state, or local laws, regulations, or permits.

160. This Consent Decree does not limit or affect the rights of FHR or the United States against any third parties that are not party to this Consent Decree, nor does it limit the rights of third parties that are not party to this Consent Decree against FHR, except as otherwise provided by law.

161. This Consent Decree shall not be construed to create rights in, or grant any cause of action to, any third party not party to this Consent Decree.

XVII. COSTS

162. The Parties shall bear their own costs of this action, including attorneys' fees, except that the United States shall be entitled to collect the costs (including attorneys' fees) incurred in any action necessary to enforce this Consent Decree or to collect any portion of the civil penalty or any stipulated penalties due but not paid by FHR.

XVIII. NOTICES

163. Unless otherwise specified herein, whenever notifications, submissions, or communications are required by this Consent Decree, they shall be made in writing and addressed to the persons set forth below. Submission by U.S. mail or courier is required and shall be sufficient to comply with the notice requirements of this Consent Decree; however, for the submission of technical information or data, FHR shall submit the data in electronic form (*e.g.*, a disk or hard drive). The email addresses listed below are to permit the submission of courtesy copies.

Notice or submission to the United States:

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
Box 7611 Ben Franklin Station
Washington, DC 20044-7611
Re: DOJ No. 90-5-2-1-10070

And to the EPA addresses listed below.

Notice or submission to EPA:

Director, Air Enforcement Division
Office of Civil Enforcement
U.S. Environmental Protection Agency
Mail Code 2242-A
Regular Mail: 1200 Pennsylvania Ave, N.W.
Ariel Rios Building South
Room 1119
Washington, DC 20460-0001
Express Mail: Use same address but use 20004 as the zip code

and

Associate Director
Air, Toxics, and Inspections Coordination Branch (6 EN-A)
U.S. EPA, Region 6
1445 Ross Avenue
Dallas, Texas 75202

For courtesy purposes, electronic copies to:

parrish.robert@epa.gov
foley.patrick@epa.gov
huser.jennifer@epa.gov

Notice or submission to FHR:

General Counsel
Flint Hills Resources, LP
4111 East 37th Street North
Wichita, KS 67220

and

Associate General Counsel–Environmental
Flint Hills Resources, LP
4111 East 37th Street North
Wichita, KS 67220

For courtesy purposes, electronic copies to:

alan.hallock@fhr.com
jane.schilmoeller@fhr.com

Any Party may, by written notice to the other Party, change its designated notice recipient(s) or notice address(es) provided above. Notices submitted pursuant to this Section shall be deemed submitted upon mailing, unless otherwise provided in this Consent Decree or by mutual agreement of the Parties in writing.

XIX. EFFECTIVE DATE

164. The Effective Date of this Consent Decree shall be the date upon which this Consent Decree is entered by the Court or a motion to enter the Consent Decree is granted, whichever occurs first, as recorded on the Court's docket; provided however, that FHR hereby agrees that it shall be bound to perform duties scheduled to occur prior to the Effective Date. In the event the United States withdraws or withholds consent to this Consent Decree before entry, or the Court declines to enter this Consent Decree, then the preceding requirement to perform duties scheduled to occur before the Effective Date shall terminate.

XX. RETENTION OF JURISDICTION

165. The Court shall retain jurisdiction over this case until termination of this Consent Decree for the purposes of resolving disputes arising under this Decree, entering orders modifying this Decree, or effectuating or enforcing compliance with the terms of this Decree.

XXI. MODIFICATION

166. Except as provided in Paragraph 9, the terms of this Consent Decree may be modified only by a subsequent written agreement signed by the United States and FHR. Where the modification constitutes a material change to any term of this Consent Decree, it shall be effective only upon approval by the Court.

167. Except as provided in Paragraphs 5–9, any disputes concerning modification of this Decree shall be resolved pursuant to Section XIV of this Decree (Dispute Resolution); provided, however, that instead of the burden of proof as provided by Paragraph 146, the Party seeking the modification bears the burden of demonstrating that it is entitled to the requested modification in accordance with Federal Rule of Civil Procedure 60(b).

XXII. TERMINATION

168. Termination: Conditions Precedent. Prior to termination, FHR must have completed all of the following requirements of this Consent Decree:

a. Payment of all civil penalties, stipulated penalties and other monetary obligations;

b. Satisfactory compliance with all provisions of Sections IV, V, and VI of this Decree (Affirmative Relief);

c. Operation for at least one year in satisfactory compliance with the limitations and standards set forth in Subparagraphs 34.b, 35.a, 36.a, and 37 for the Covered Flares;

d. Completion of the Mitigation Projects in Section IX;

e. Application for and receipt of all non-Title V permits necessary to ensure survival of the Consent Decree limits and standards after termination of this Consent Decree (the Paragraph 43 requirement) for the Covered Flares; and

f. Application for a modification or amendment to the Title V permit to incorporate the limits and standards in Paragraph 43 into the Title V permit of the Facility.

169. Termination: Procedure.

a. At such time as FHR believes that it has satisfied the conditions for termination set forth in Paragraph 168, FHR may submit a request for termination to the United States by certifying such compliance in accordance with the certification language in Paragraph 107. In the Request for Termination, FHR must demonstrate that it has satisfied the

conditions for termination set forth in Paragraph 168. The Request for Termination shall include all necessary supporting documentation.

b. Following receipt by the United States of FHR's Request for Termination, the Parties shall confer informally concerning the Request. If the United States agrees that the Decree may be terminated, the Parties shall submit, for the Court's approval, a joint stipulation terminating the Decree.

c. If the United States does not agree that the Consent Decree may be terminated, or if FHR does not receive a written response from the United States within 60 days of FHR's submission of the Request for Termination, FHR may invoke dispute resolution under Section XIV of this Decree (Dispute Resolution).

XXIII. PUBLIC PARTICIPATION

170. This Consent Decree shall be lodged with the Court for a period of not less than 30 days for public notice and comment in accordance with 28 C.F.R. § 50.7. The United States reserves the right to withdraw or withhold its consent if the comments regarding the Consent Decree disclose facts or considerations indicating that the Consent Decree is inappropriate, improper, or inadequate. FHR consents to entry of this Consent Decree without further notice and agrees not to withdraw from or oppose entry of this Consent Decree by the Court or to challenge any provision of the Decree unless the United States has notified FHR in writing that it no longer supports entry of the Decree.

XXIV. SIGNATORIES/SERVICE

171. Each undersigned representative of FHR and the Acting Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice (or his or her designee), certify that he or she is fully authorized to enter into the terms and conditions of

this Consent Decree and to execute and legally bind the Party he or she represents to this document.

172. This Consent Decree may be signed in counterparts, and its validity shall not be challenged on that basis. FHR agrees to accept service of process by mail with respect to all matters arising under or relating to this Consent Decree and to waive the formal service requirements set forth in Rules 4 and 5 of the Federal Rules of Civil Procedure and any applicable Local Rules of this Court including, but not limited to, service of a summons.

XXV. INTEGRATION

173. This Consent Decree and its Appendices constitute the final, complete, and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Consent Decree and its Appendixes and supersede all prior agreements and understandings, whether oral or written, concerning the settlement embodied herein. No other document, except for any plans or other deliverables that are submitted pursuant to this Decree, nor any representation, inducement, agreement, understanding, or promise, constitutes any part of this Decree or the settlement it represents, and no such extrinsic document or statement of any kind shall be used in construing the terms of this Decree.

XXVI. FINAL JUDGMENT

174. Upon approval and entry of this Consent Decree by the Court, this Consent Decree shall constitute a final judgment of the Court in this action as to the United States and FHR.

175. The Court finds that there is no just reason for delay and therefore enters this judgment as a final judgment under Fed. R. Civ. P. 54 and 58.

DATED this _____ day of _____2014.

_____

UNITED STATES DISTRICT JUDGE
EASTERN DISTRICT OF TEXAS

We hereby consent to the entry of the Consent Decree in the matter of United States v. Flint Hills Resources Port Arthur, LLC (E.D. Texas), subject to public notice and comment.

FOR THE UNITED STATES OF AMERICA

/s/ Robert G. Dreher
ROBERT G. DREHER
Acting Assistant Attorney General
Environment and Natural Resources Division
United States Department of Justice

/s/Annette M. Lang
ANNETTE M. LANG
Senior Counsel
Environmental Enforcement Section
Environment and Natural Resources Division
Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611
Telephone: (202) 514-4213
Fax: (202) 616-6584
annette.lang@usdoj.gov

JOHN M. BALES
United States Attorney
Eastern District of Texas

/s/ Michael W. Lockhart
By: MICHAEL W. LOCKHART
Assistant United States Attorney
U.S. Attorney's Office
Eastern District of Texas
Texas Bar No. 12472200
350 Magnolia, Suite 150
Beaumont, Texas 77701-2237
Telephone: 409 839-2538
Fax: 409 839-2643
USATXE.CivECFBmt@usdoj.gov

We hereby consent to the entry of the Consent Decree in the matter of United States v. Flint Hills Resources Port Arthur, LLC (E.D. Texas), subject to public notice and comment.

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

/s/ Cynthia Giles
CYNTHIA GILES
Assistant Administrator
Office of Enforcement and Compliance Assurance
United States Environmental Protection Agency
Washington, DC

/s/ Susan Shinkman
SUSAN SHINKMAN
Director, Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
United States Environmental Protection Agency
Washington, DC

/s/ Phillip A. Brooks
PHILLIP A BROOKS
Director, Air Enforcement Division
Office of Enforcement and Compliance Assurance
United States Environmental Protection Agency
Washington, DC

We hereby consent to the entry of the Consent Decree in the matter of United States, v. Flint Hills Resources Port Arthur, LLC (E.D. Texas), subject to public notice and comment.

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

/s/ John Blevins
JOHN BLEVINS
Director
Compliance Assurance and Enforcement Division
EPA Region 6
Dallas, TX

We hereby consent to the entry of the Consent Decree in the matter United States, v. Flint Hills Resources Port Arthur, LLC (E.D. Texas).

FOR FLINT HILLS RESOURCES PORT ARTHUR, LLC

/s/ Phil Gaarder***
PHIL GAARDER
Vice President
Flint Hills Resources Port Arthur, LLC
4241 Savannah Avenue
Port Arthur, TX 77640
Telephone: (316) 828-5860
Fax: (316) 828-3747
phil.gaarder@fhr.com

*** Signed with permission.

UNITED STATES
v.
FLINT HILLS RESOURCES PORT ARTHUR, LLC

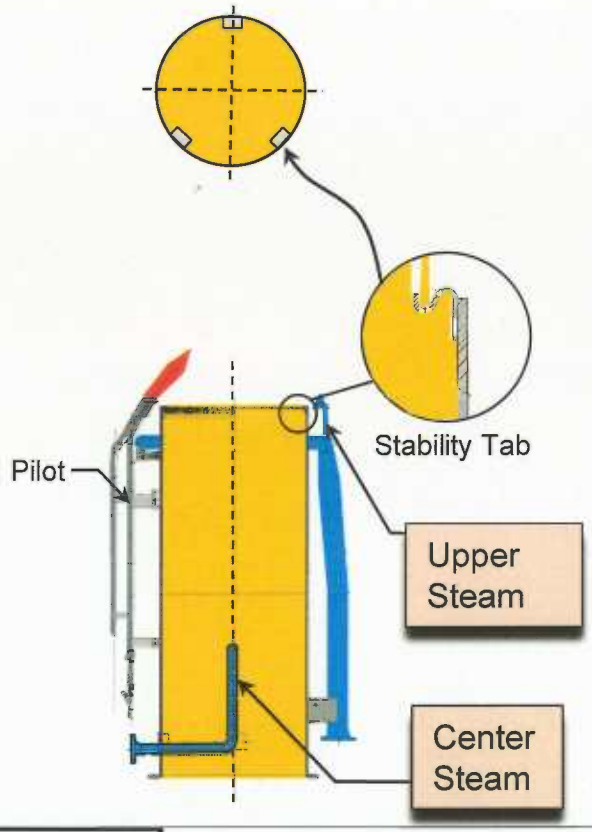
APPENDICES TO CONSENT DECREE

APPENDIX 1.1

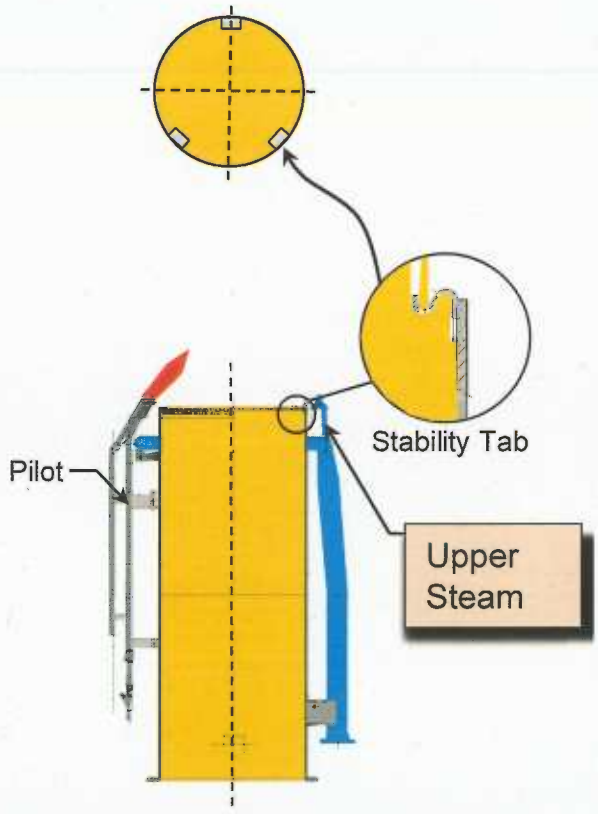
DRAWINGS ILLUSTRATING LOWER, CENTER, AND UPPER STEAM INJECTION IN VARIOUS TYPES OF FLARE TIPS

Appendix 1.1

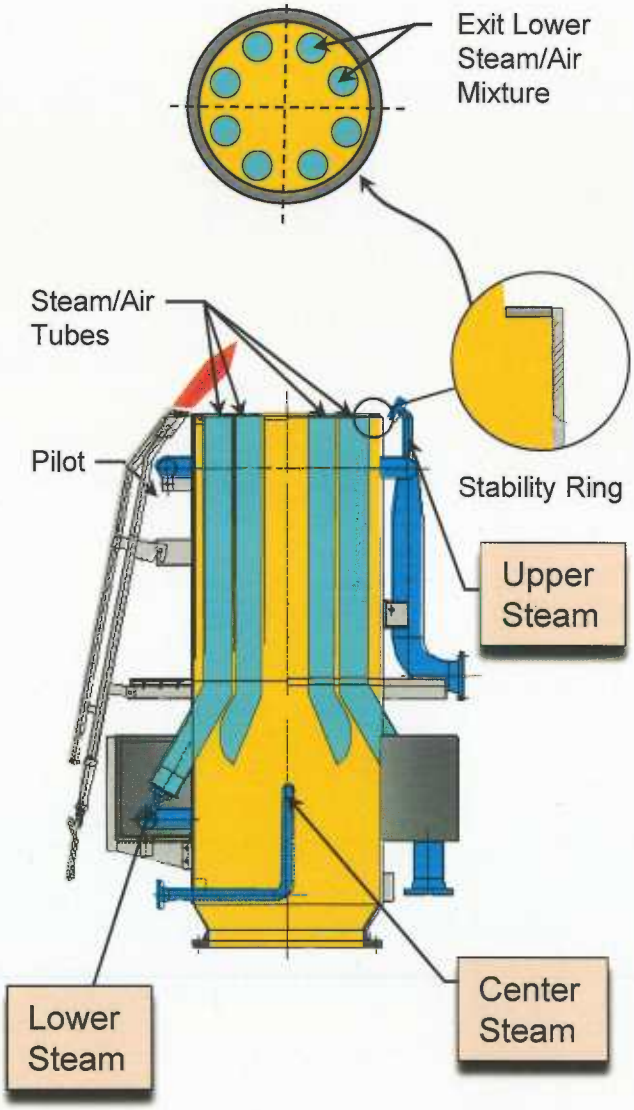
Type IA



Type IB



Type II

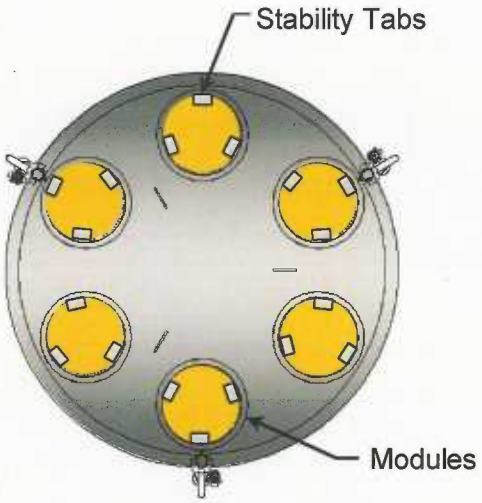


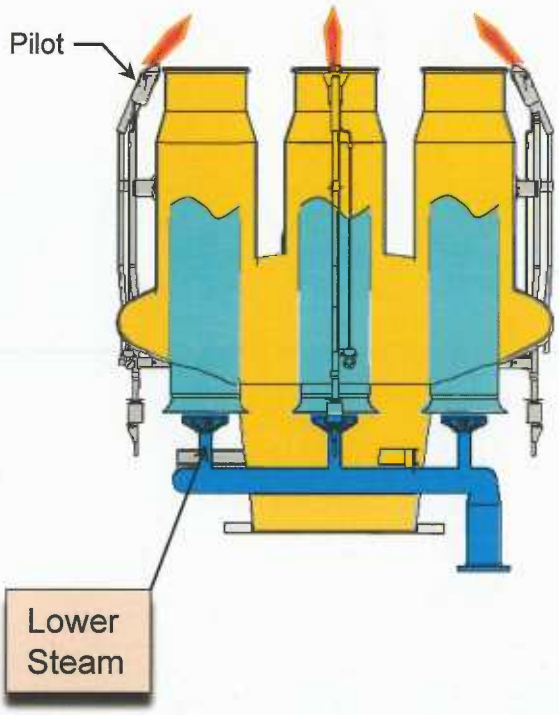
Key:

Yellow	=	Vent Gas
Red	=	Fire
Light Blue	=	Steam / Air
Dark Blue	=	Steam

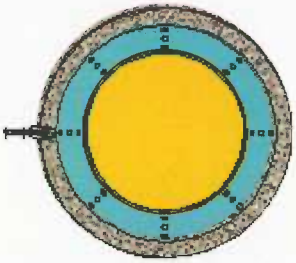
Appendix 1.1

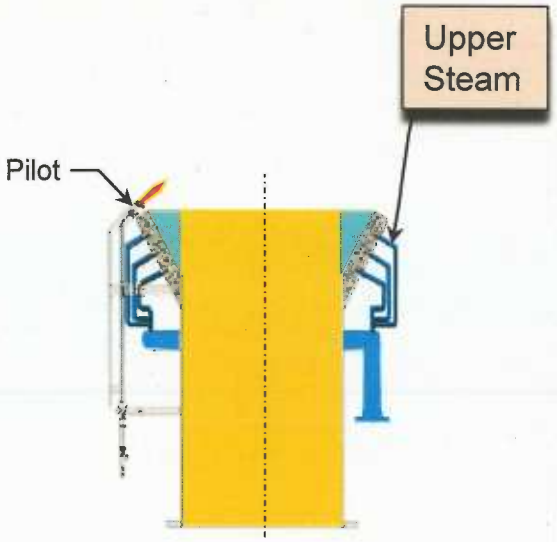
Type III





Type IV





Key:

Yellow	=	Vent Gas
Red	=	Fire
Light Blue	=	Steam / Air
Dark Blue	=	Steam

UNITED STATES
v.

FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.2

GENERAL EQUATIONS

APPENDIX 1.2

GENERAL EQUATIONS

Equation 1: **"*Combustion Efficiency*" or "*CE*":**

$$CE = [CO_2]/([CO_2] + [CO] + [OC])$$

where:

$[CO_2]$ = Concentration in volume percent or ppm-meters of carbon dioxide in the combusted gas immediately above the Combustion Zone

$[CO]$ = Concentration in volume percent or ppm-meters of carbon monoxide in the combusted gas immediately above the Combustion Zone

$[OC]$ = Concentration in volume percent or ppm-meters of the sum of all organic carbon compounds in the combusted gas immediately above the Combustion Zone, counting each carbon molecule separately where the concentration of each individual compound is multiplied by the number of carbon atoms it contains before summing (*e.g.*, 0.1 volume percent ethane shall count as 0.2 percent OC because ethane has two carbon atoms)

For purposes of using the *CE* equation, the unit of measurement for CO_2, CO, and OC must be the same; that is, if "volume percent" is used for one compound, it must be used for all compounds. "Volume percent" cannot be used for one or more compounds and "ppm-meters" for the remainder.

Equation 2: ***"Center Steam Mass Flow Rate" or "$\dot{m}_{s\text{-}cen}$":***

$$\dot{m}_{s\text{-}cen} = Q_{s\text{-}cen} \times (18/385.5)$$

where:

$Q_{s\text{-}cen}$ = Center Steam Volumetric Flow Rate

Equation 3: ***"Total Steam Mass Flow Rate" or "$\dot{m}_s$":***

$$\dot{m}_s = Q_s \times (18/385.5)$$

where:

Q_s = Total Steam Volumetric Flow Rate

APPENDIX 1.2

Equation 4: ***"Vent Gas Mass Flow Rate"* or "$\dot{m}_{vg}$":**

$\dot{m}_{vg} = Q_{vg} \times (MW_{vg}/385.5)$

where:

Q_{vg} = Vent Gas Volumetric Flow Rate

MW_{vg} = Molecular Weight, in pounds per pound-mole, of the Vent Gas, as measured by the Vent Gas Average Molecular Weight Analyzer described in Paragraph 17 of this Consent Decree

[End of Appendix 1.2]

UNITED STATES
v.
FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.3

INTENTIONALLY LEFT BLANK

UNITED STATES
v.
FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.4

EPA'S POLICY ON EXCESS EMISSIONS DURING MALFUNCTIONS, STARTUP, AND SHUTDOWN

APPENDIX 1.4

POLICY ON EXCESS EMISSIONS DURING MALFUNCTIONS, STARTUP, AND SHUTDOWN

Introduction

This policy specifies when and in what manner state implementation plans (SIPs) may provide for defenses to violations caused by periods of excess emissions due to malfunctions,[1] startup, or shutdown. Generally, since SIPs must provide for attainment and maintenance of the national ambient air quality standards and the achievement of PSD increments, all periods of excess emissions must be considered violations. Accordingly, any provision that allows for an automatic exemption[2] for excess emissions is prohibited.

However, the imposition of a penalty for excess emissions during malfunctions caused by circumstances entirely beyond the control of the owner or operator may not be appropriate. States may, therefore, as an exercise of their inherent enforcement discretion, choose not to penalize a source that has produced excess emissions under such circumstances.

This policy provides an alternative approach to enforcement discretion for areas and pollutants where the respective contributions of individual sources to pollutant concentrations in ambient air are such that no single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments. Where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments, as is often the case for sulfur dioxide and lead,[3] EPA believes approaches other than enforcement discretion are not appropriate. In such cases, any excess emissions may have a significant chance of causing an exceedance or violation of the applicable standard or PSD increment.

---

[1]The term excess emission means an air emission level which exceeds any applicable emission limitation. Malfunction means a sudden and unavoidable breakdown of process or control equipment.

[2]The term automatic exemption means a generally applicable provision in a SIP that would provide that if certain conditions existed during a period of excess emissions, then those exceedances would not be considered violations.

[3]This policy also does not apply for purposes of PM2.5 NAAQS. In American Trucking Association v. EPA, 175 F. 3d 1027 (D.C. Circ., 1999), the court remanded the PM2.5 NAAQS to the EPA. The Agency has not determined whether this policy is appropriate for PM2.5 NAAQS.

APPENDIX 1.4

Except where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments, states may include in their SIPs affirmative defenses[4] for excess emissions, as long as the SIP establishes limitations consistent with those set out below. If approved into a SIP, an affirmative defense would be available to sources in an enforcement action seeking penalties brought by the state, EPA, or citizens. However, a determination by the state not to take an enforcement action would not bar EPA or citizen action.[5]

In addition, in certain limited circumstances, it may be appropriate for the State to build into a source-specific or source-category-specific emission standard a provision stating that the otherwise applicable emission limitations do not apply during narrowly defined startup and shutdown periods.

I. AUTOMATIC EXEMPTIONS AND ENFORCEMENT DISCRETION

If a SIP contains a provision addressing excess emissions, it cannot be the type that provides for automatic exemptions. Automatic exemptions might aggravate ambient air quality by excusing excess emissions that cause or contribute to a violation of an ambient air quality standard. Additional grounds for disapproving a SIP that includes the automatic exemption approach are discussed in more detail at 42 Fed. Reg. 58171 (November 8, 1977) and 42 Fed. Reg. 21372 (April 27, 1977). As a result, EPA will not approve any SIP revisions that provide automatic exemptions for periods of excess emissions.

The best assurance that excess emissions will not interfere with NAAQS attainment, maintenance, or increments is to address excess emissions through enforcement discretion. This policy provides alternative means for addressing excess emissions of criteria pollutants. However, this policy does not apply where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments. Moreover,

---

[4]The term affirmative defense means, in the context of an enforcement proceeding, a response or defense put forward by a defendant, regarding which the defendant has the burden of proof, and the merits of which are independently and objectively evaluated in a judicial or administrative proceeding.

[5]Because all periods of excess emissions are violations and because affirmative defense provisions may not apply in actions for injunctive relief, under no circumstances would EPA consider periods of excess emissions, even if covered by an affirmative defense, to be "federally permitted releases" under EPCRA or CERCLA.

APPENDIX 1.4

nothing in this guidance should be construed as requiring States to include affirmative defense provisions in their SIPs.

II. AFFIRMATIVE DEFENSES FOR MALFUNCTIONS

The EPA can approve a SIP revision that creates an affirmative defense to claims for penalties in enforcement actions regarding excess emissions caused by malfunctions as long as the defense does not apply to SIP provisions that derive from federally promulgated performance standards or emission limits, such as new source performance standards (NSPS) and national emissions standards for hazardous air pollutants (NESHAPS).[6] In addition, affirmative defenses are not appropriate for areas and pollutants where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments. Furthermore, affirmative defenses to claims for injunctive relief are not allowed. To be approved, an affirmative defense provision must provide that the defendant has the burden of proof of demonstrating that:

1. The excess emissions were caused by a sudden, unavoidable breakdown of technology, beyond the control of the owner or operator;

2. The excess emissions (a) did not stem from any activity or event that could have been foreseen and avoided, or planned for, and (b) could not have been avoided by better operation and maintenance practices;

3. To the maximum extent practicable the air pollution control equipment or processes were maintained and operated in a manner consistent with good practice for minimizing emissions;

4. Repairs were made in an expeditious fashion when the operator knew or should have known that applicable emission limitations were being exceeded. Off-shift labor and overtime must have been utilized, to the extent practicable, to ensure that such repairs were made as expeditiously as practicable;

5. The amount and duration of the excess emissions (including any bypass) were minimized to the maximum extent practicable during periods of such emissions;

---

[6]To the extent a State includes NSPS or NESHAPS in its SIP, the standards should not deviate from those that were federally promulgated. Because EPA set these standards taking into account technological limitations, additional exemptions would be inappropriate.

APPENDIX 1.4

6. All possible steps were taken to minimize the impact of the excess emissions on ambient air quality;

7. All emission monitoring systems were kept in operation if at all possible;

8. The owner or operator's actions in response to the excess emissions were documented by properly signed, contemporaneous operating logs, or other relevant evidence;

9. The excess emissions were not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and

10. The owner or operator properly and promptly notified the appropriate regulatory authority.

The EPA interprets these criteria narrowly. Only those malfunctions that are sudden, unavoidable, and unpredictable in nature qualify for the defense. For example, a single instance of a burst pipe that meets the above criteria may qualify under an affirmative defense. The defense would not be available, however, if the facility had a history of similar failures because of improper design, improper maintenance, or poor operating practices. Furthermore, a source must have taken all available measures to compensate for and resolve the malfunction. If a facility has a baghouse fire that leads to excess emissions, the affirmative defense would be appropriate only for the period of time necessary to modify or curtail operations to come into compliance. The fire should not be used to excuse excess emissions generated during an extended period of time while the operator orders and installs new bags, and relevant SIP language must limit applicability of the affirmative defense accordingly.

III. EXCESS EMISSIONS DURING STARTUP AND SHUTDOWN

In general, startup and shutdown of process equipment are part of the normal operation of a source and should be accounted for in the planning, design, and implementation of operating procedures for the process and control equipment. Accordingly, it is reasonable to expect that careful and prudent planning and design will eliminate violations of emission limitations during such periods.

A. SOURCE CATEGORY SPECIFIC RULES FOR STARTUP AND SHUTDOWN

For some source categories, given the types of control technologies available, there may exist short periods of emissions during startup and shutdown when, despite best efforts regarding planning, design, and operating procedures, the

APPENDIX 1.4

otherwise applicable emission limitation cannot be met. Accordingly, except in the case where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments, it may be appropriate, in consultation with EPA, to create narrowly-tailored SIP revisions that take these technological limitations into account and state that the otherwise applicable emissions limitations do not apply during narrowly defined startup and shutdown periods. To be approved, these revisions should meet the following requirements:

1. The revision must be limited to specific, narrowly-defined source categories using specific control strategies (e.g., cogeneration facilities burning natural gas and using selective catalytic reduction);

2. Use of the control strategy for this source category must be technically infeasible during startup or shutdown periods;

3. The frequency and duration of operation in startup or shutdown mode must be minimized to the maximum extent practicable;

4. As part of its justification of the SIP revision, the state should analyze the potential worst-case emissions that could occur during startup and shutdown;

5. All possible steps must be taken to minimize the impact of emissions during startup and shutdown on ambient air quality;

6. At all times, the facility must be operated in a manner consistent with good practice for minimizing emissions, and the source must have used best efforts regarding planning, design, and operating procedures to meet the otherwise applicable emission limitation; and

7. The owner or operator's actions during startup and shutdown periods must be documented by properly signed, contemporaneous operating logs, or other relevant evidence.

B. GENERAL AFFIRMATIVE DEFENSE PROVISIONS RELATING TO STARTUP AND SHUTDOWN

In addition to the approach outlined in Section II(A) above, States may address the problem of excess emissions occurring during startup and shutdown periods through an enforcement discretion approach. Further, except in the case where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments, States may also adopt for their SIPs an affirmative defense approach. Using this

APPENDIX 1.4

approach, all periods of excess emissions arising during startup and shutdown must be treated as violations, and the affirmative defense provision must not be available for claims for injunctive relief. Furthermore, to be approved, such a provision must provide that the defendant has the burden of proof of demonstrating that:

1. The periods of excess emissions that occurred during startup and shutdown were short and infrequent and could not have been prevented through careful planning and design;

2. The excess emissions were not part of a recurring pattern indicative of inadequate design, operation, or maintenance;

3. If the excess emissions were caused by a bypass (an intentional diversion of control equipment), then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

4. At all times, the facility was operated in a manner consistent with good practice for minimizing emissions;

5. The frequency and duration of operation in startup or shutdown mode was minimized to the maximum extent practicable;

6. All possible steps were taken to minimize the impact of the excess emissions on ambient air quality;

7. All emission monitoring systems were kept in operation if at all possible;

8. The owner or operator's actions during the period of excess emissions were documented by properly signed, contemporaneous operating logs, or other relevant evidence; and

9. The owner or operator properly and promptly notified the appropriate regulatory authority.

If excess emissions occur during routine startup or shutdown periods due to a malfunction, then those instances should be treated as other malfunctions that are subject to the malfunction provisions of this policy. (Reference Part I above).

UNITED STATES
v.
FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.5

INTENTIONALLY LEFT BLANK

UNITED STATES
v.

FLINT HILLS RESOURCES PORT ARTHUR, LLC

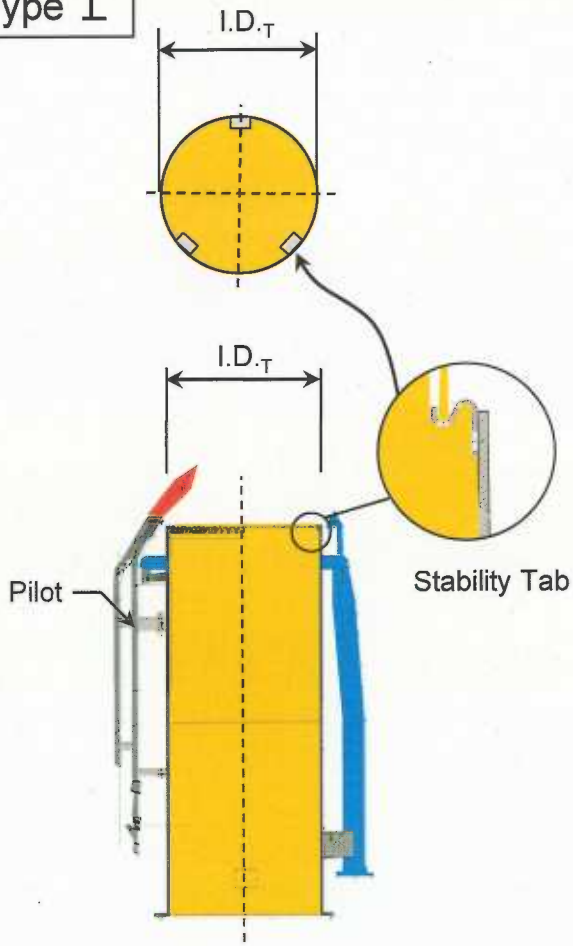
APPENDICES TO CONSENT DECREE

APPENDIX 1.6

CALCULATING THE UNOBSTRUCTED CROSS SECTIONAL AREA OF VARIOUS TYPES OF FLARE TIPS

APPENDIX 1.6

Type I



$A_{tip\text{-}unob} = \pi(I.D._T)^2/4 - (X_T * A_{ST})$

Where:

- $A_{tip\text{-}unob}$ = Unobstructed Cross Sectional Area of Flare Tip
- $I.D._T$ = Inside Diameter Flare Tip
- X_T = Number of Stability Tabs
- A_{ST} = Area of a Stability Tab

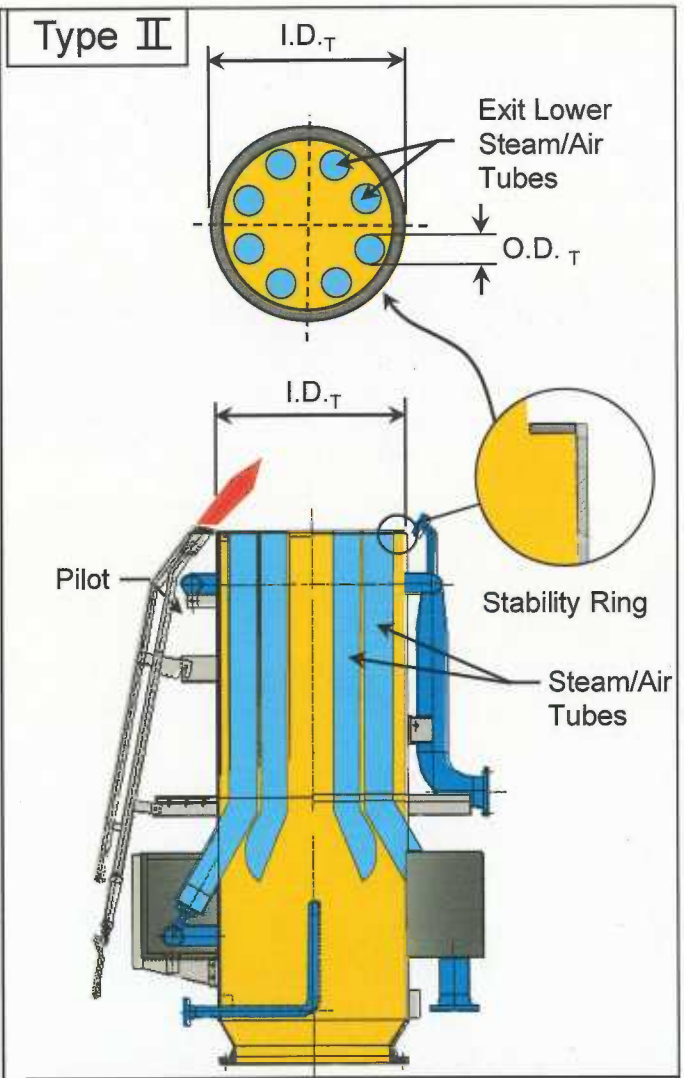
Example:

- $I.D._T$ = 41.5 inches
- X_T = 3
- A_{ST} = 3 Sq. inches

$A_{tip\text{-}unob} = \pi(41.5)^2/4 - (3 * 3)$

$A_{tip\text{-}unob}$ = 1344 Sq. inches

Type II



$A_{tip\text{-}unob} = \pi(I.D._T)^2/4 - A_{ST} - N_T * \pi * (O.D._T)^2/4$

Where:

- $A_{tip\text{-}unob}$ = Unobstructed Cross Sectional Area of Flare Tip
- $I.D._T$ = Inside Diameter Flare Tip
- A_{ST} = Area of Stability Ring
- $O.D._T$ = Outside Diameter of Steam/Air Tubes
- N_T = Number of Steam/Air Tubes

Example:

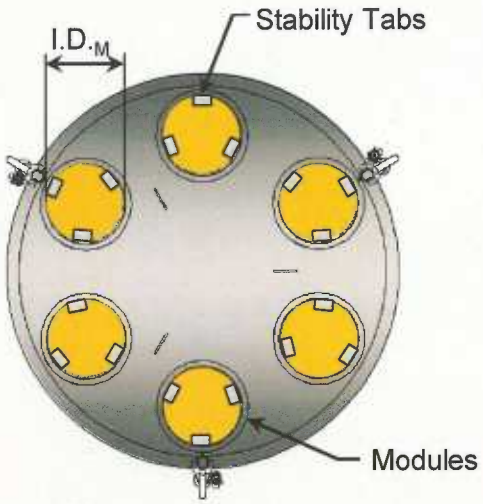
- $I.D._T$ = 47.5 inches
- A_{ST} = 100 Sq. inches
- $O.D._T$ = 6.5 inches
- N_T = 8

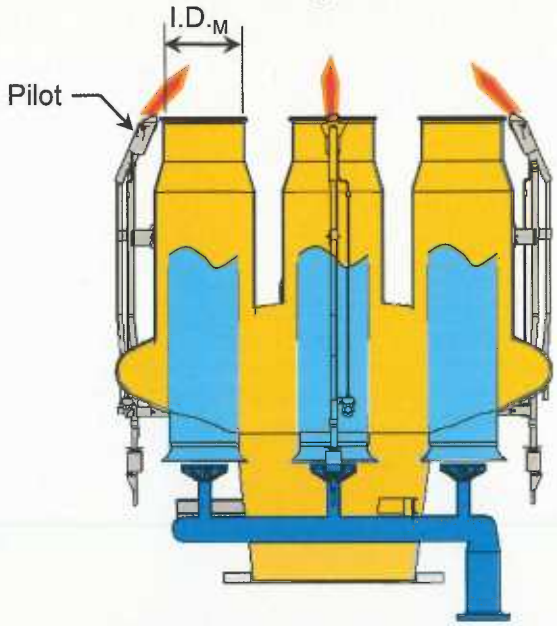
$A_{tip\text{-}unob} = \pi (47.5)^2/4 - 100 - 8 * \pi * (6.5)^2/4$

$A_{tip\text{-}unob}$ = 1322 Sq. inches

APPENDIX 1.6

Type III





$$A_{tip\text{-}unob} = N_M * (\pi * (I.D._M)^2/4 - X_T * A_{ST})$$

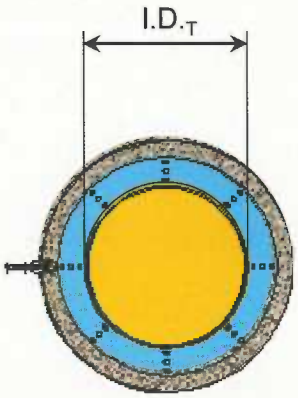
Where:
- $A_{tip\text{-}unob}$ = Unobstructed Cross Sectional Area of Flare Tip
- $I.D._M$ = Inside Diameter of One Tip Module
- N_M = Number of Modules
- X_T = Number of Stability Tabs per Module
- A_{ST} = Area of a Stability Tab

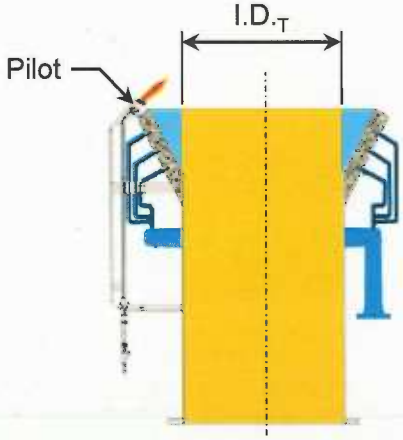
Example:
- $I.D._M$ = 17 inches
- N_M = 6 X_T = 3
- A_{ST} = 3 Sq. inches

$$A_{tip\text{-}unob} = 6 * (\pi * (17)^2/4 - 3 * 3)$$

$$A_{tip\text{-}unob} = 1308 \text{ Sq. inches}$$

Type IV





$$A_{tip\text{-}unob} = \pi (I.D._T)^2/4$$

Where:
- $A_{tip\text{-}unob}$ = Unobstructed Cross Sectional Area of Flare Tip
- $I.D._T$ = Inside Diameter of Flare Tip

Example:
- $I.D._T$ = 41.5 inches

$$A_{tip\text{-}unob} = \pi (41.5)^2/4$$

$$A_{tip\text{-}unob} = 1353 \text{ Sq. inches}$$

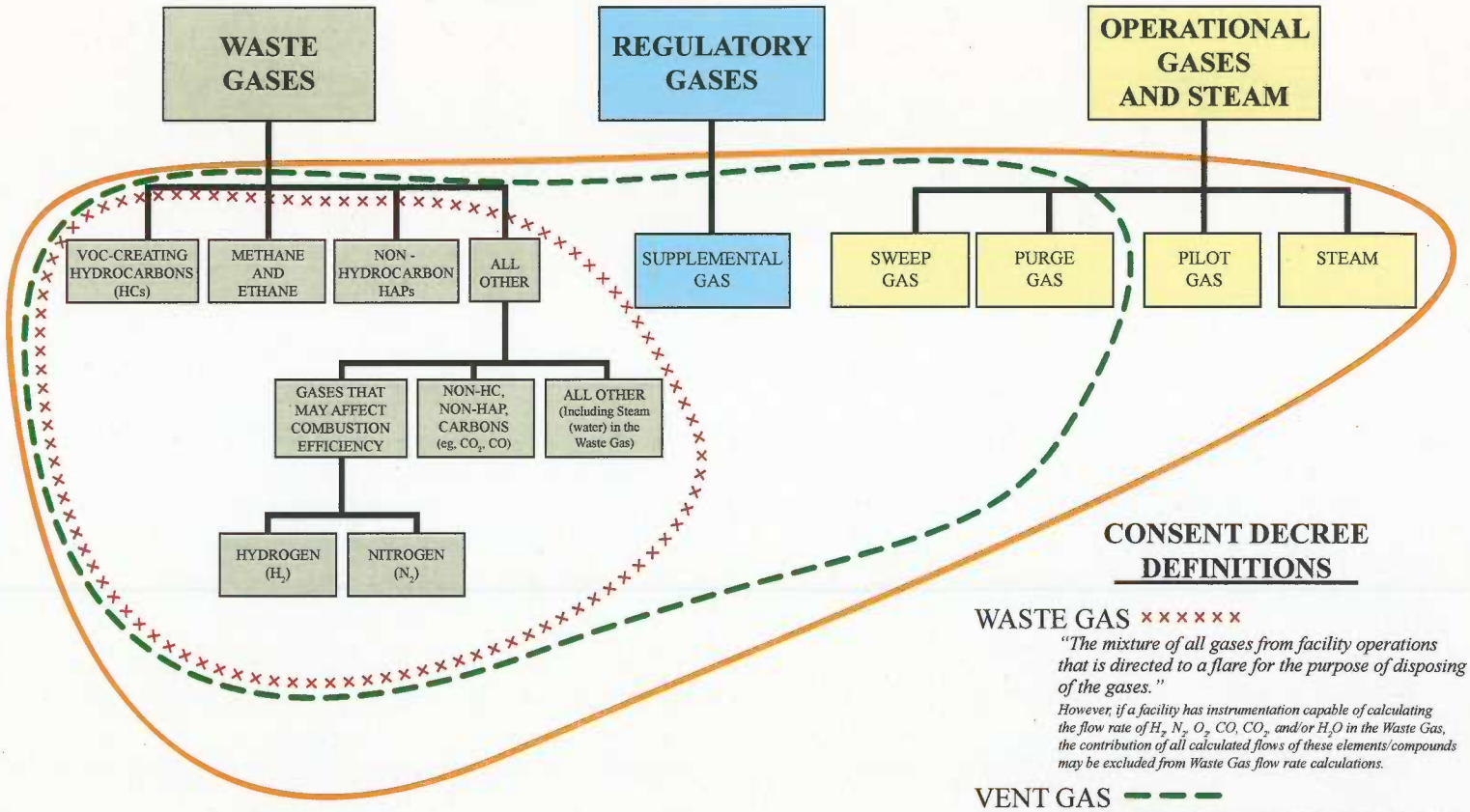
UNITED STATES
v.
FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.7

DEPICTION OF GASES ASSOCIATED WITH STEAM-ASSISTED FLARES

DEPICTION OF GASES ASSOCIATED WITH STEAM-ASSISTED FLARES



CONSENT DECREE DEFINITIONS

WASTE GAS ××××××

"The mixture of all gases from facility operations that is directed to a flare for the purpose of disposing of the gases."

However, if a facility has instrumentation capable of calculating the flow rate of H_2, N_2, O_2, CO, CO_2, and/or H_2O in the Waste Gas, the contribution of all calculated flows of these elements/compounds may be excluded from Waste Gas flow rate calculations.

VENT GAS – – –

"The mixture of all gases found prior to the flare tip. This includes all Waste Gas, Supplemental Gas, Sweep Gas, and Purge Gas."

COMBUSTION ZONE GAS ——

"The mixture of all gases and steam found just after the flare tip. This includes all Vent Gas, Pilot Gas, and Total Steam."

APPENDIX 1.7

UNITED STATES
v.
FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.8

OUTLINE OF REQUIREMENTS FOR THE FLARE DATA AND INITIAL MONITORING SYSTEMS REPORT

APPENDIX 1.8

OUTLINE OF REQUIREMENTS FOR THE FLARE DATA AND INITIAL MONITORING SYSTEMS REPORT

1. Facility-Wide

   1.1 Facility plot plan showing the location of each flare in relation to the general plant layout

2. General Description of Flare

   2.1 Ground or elevated
   2.2 Type of assist system
   2.3 Simple or integrated (*e.g.*, sequential, staged)
   2.4 Date first installed
   2.5 History of any physical changes to the Flare
   2.6 Whether the Flare is a Temporary-Use Flare, and if so, the duration and time periods of use
   2.7 Flare Gas Recovery System ("FGRS"), if any, and date first installed

3. Flare Components: Complete description of each major component of the Flare, except the Flare Gas Recovery System (*see* Part 5), including but not limited to:

   3.1 Flare stack (for elevated flares)
   3.2 Flare tip
      3.1.2.1 Date installed
      3.1.2.2 Manufacturer
      3.1.2.3 Tip Size
      3.1.2.4 Tip Drawing
   3.3 Knockout or surge drum(s) or pot(s), including dimensions and design capacities
   3.4 Water seal(s), including dimensions and design parameters
   3.5 Flare header(s)
   3.6 Sweep Gas system
   3.7 Purge gas system
   3.8 Pilot gas system
   3.9 Supplemental gas system
   3.10 Assist system
   3.11 Ignition system

4. Simplified process diagram(s) showing the configuration of the components listed in Paragraph 3

APPENDIX 1.8

5. Existing Flare Gas Recovery System ("FGRS")

   5.1 Complete description of each major component, including but not limited to:
      5.1.1 Compressor(s), including design capacities
      5.1.2 Water seal(s), rupture disk, or similar device to divert the flow
   5.2 Maximum actual past flow on an scfm basis and the annual average flow in scfm for the lesser of the five years preceding Date of Lodging or since the FGRS has been in operation
   5.3 Simplified schematic showing the FGRS
   5.4 Process Flow Diagram that adds the FGRS to the PDF(s) in Part 4

6. Flare Design Parameters

   6.1 Maximum Vent Gas Flow Rate and/or Mass Rate
   6.2 Maximum Sweep Gas Flow Rate and/or Mass Rate
   6.3 Maximum Purge Gas Flow and/or Mass Rate, if applicable
   6.4 Maximum Pilot Gas Flow and/or Mass Rate
   6.5 Maximum Supplemental Gas Flow Rate and/or Mass Rate
   6.6 If steam-assisted, Minimum Total Steam Rate, including all available information on how that Rate was derived

7. Gases Venting to Flare

   7.1. Sweep Gas
      7.1.1 Type of gas used
      7.1.2 Actual set operating flow rate (in scfm)
      7.1.3 Average lower heating value expected for each type of gas used
   7.2 Purge Gas, if applicable
      7.2.1 Type of gas used
      7.2.2 Actual set operating flow rate (in scfm)
      7.2.3 Average lower heating value expected for each type of gas used
   7.3 Pilot Gas
      7.3.1 Type of gas used
      7.3.2 Actual set operating flow rate (in scfm)
      7.3.3 Average lower heating value expected for each type of gas used
   7.4 Supplemental Gas
      7.4.1 Type of gas used
      7.4.2 Average lower heating value expected for each type of gas used
   7.5 Steam (if applicable)
      7.5.1 Drawing showing points of introduction of Lower, Center, Upper, and any other steam

APPENDIX 1.8

7.6 Simplified flow diagram that depicts the points of introduction of all gases, including Waste Gases, at the Flare (in this diagram, the detailed drawings of 7.5.1 may be simplified; in addition, detailed Waste Gas mapping is not required; a simple identification of the header(s) that carries(y) the Waste Gas to the Flare and show(s) its(their) location in relation to the location of the introduction of the other gases is all that is required)

8. Existing Monitoring Systems

8.1 A brief narrative description, including manufacturer and date of installation, of all existing monitoring systems, including but not limited to:

8.1.1 Waste Gas and/or Vent Gas flow monitoring
8.1.2 Waste Gas and/or Vent Gas heat content analyzer
81.3 Sweep Gas flow monitoring
8.1.4 Purge Gas flow monitoring
8.1.5 Supplemental Gas flow monitoring
8.1.6 Steam flow monitoring
8.1.7 Waste Gas or Vent Gas molecular weight analyzer
8.1.8 Gas Chromatograph
8.1.9 Sulfur analyzer(s) (not applicable for stand-alone olefins plants)
8.1.10 Video camera
8.1.11 Thermocouple

8.2 Drawing(s) showing locations of all existing monitoring systems

9. Monitoring Equipment to be installed to comply with Consent Decree

10. Narrative Description of the monitoring methods, calculations, and control logic that will be used to comply with the NHV_{CZ} and S/VG requirements in the Consent Decree

11. Identification of Calibration Gases to be used to comply with Appendix 1.10

UNITED STATES
v.
FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.9

LIST OF COMPOUNDS A GAS CHROMATOGRAPH MUST BE CAPABLE OF SPECIATING

APPENDIX 1.9

LIST OF COMPOUNDS A GAS CHROMATOGRAPH MUST BE CAPABLE OF SPECIATING

The LOU Gas Chromatograph must be capable of speciating the Vent Gas into the following:

1. Hydrogen
2. Oxygen
3. Nitrogen
4. Carbon Dioxide
5. Carbon Monoxide
6. Methane
7. Ethane
8. Ethene (aka: Ethylene)
9. Propane
10. Propene (aka: Propylene)
11. 2-Methylpropane (aka: iso-Butane)
12. Butane (aka: n-Butane)
13. Isomers of butene: But-1-ene (aka: butene, alpha-butylene); 2-methylpropene (aka: iso-butylene, iso-butene); E-but-2-ene (aka: beta-butylene, trans-butene); Z-but-2-ene (aka: beta-butylene, cis-butene)
14. 1,3 butadiene
15. Pentane plus (aka: C_5 plus) (*i.e.*, all HCs with five Cs or more)
16. Benzene
17. Toluene
18. Ethylbenzene
19. Xylenes

Outputs from the LOU Gas Chromatograph shall be on a mole percent basis.

UNITED STATES

v.

FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.10

EQUIPMENT AND INSTRUMENTATION TECHNICAL SPECIFICATIONS AND QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

APPENDIX 1.10

EQUIPMENT AND INSTRUMENTATION TECHNICAL SPECIFICATIONS AND QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

These technical specifications are the minimally acceptable standards. Standards better than or beyond these are acceptable.

I. VENT GAS FLOW METER

a. Velocity Range: 0.1–250 ft/sec

b. Repeatability: ± 1% of reading over the velocity range

c. Design Accuracy: ± 5% initially to 30%, 60%, and 90% of monitor full scale as certified by the manufacturer

d. Operational Accuracy: ± 20% of reading over the velocity range of 0.1–1 ft/s and ± 5% of reading over the velocity range of 1–250 ft/s

e. Installation: Applicable AGA, ANSI, API, or equivalent standard

f. Flow Rate Determination: Must be corrected to one atmosphere pressure and 68 °F

g. QA/QC: Annual calibration shall be conducted.

h. Pressure and Temperature Sensors: *See* Part IV below.

II. VENT GAS AVERAGE MOLECULAR WEIGHT ANALYZER (may be part of the Vent Gas Flow Meter)

a. Molecular Weight Range and Accuracy: 2 to 120 gr/grmol, ± 2%

III. STEAM FLOW METER

A. For the steam flow meters at the LOU and AU Flare that exist as of the Date of Lodging ("Current Steam Flow Meters"):

a. Pressure and Temperature: Currently-existing steam flow meters do not have pressure or temperature sensors. FHR assumes the following values:

APPENDIX 1.10

METER	PRESSURE	TEMPERATURE
150# steam (FR 902)	159 psig	510° F
600# steam (FR 903)	590 psig	700° F

b. Flow Rate Determination: Must be corrected to one atmosphere pressure and 68 °F

c. QA/QC: Annual calibration shall be conducted.

B. For the steam flow meters that must be installed by the earlier of the next LOU and AU flare outage or December 31, 2020 ("New Steam Flow Meters"):

a. Repeatability: ± 5% of reading over the range of the instrument

b. Accuracy: +/- 1% of full scale for ranges between 15% and 100% of full scale

+/- 2% of full scale for ranges between 6% and 15% of full scale

+/- 3% of full scale for ranges between 4% and 6% of full scale

c. Installation: Applicable AGA, ANSI, API, or equivalent standard

d. Flow Rate Determination: Must be corrected to one atmosphere pressure and 68 °F

e. QA/QC: Annual calibration shall be conducted.

IV. VENT GAS FLOW METERS: PRESSURE AND TEMPERATURE SENSORS

a. Temperature monitor must be calibrated annually to ± 5%.

b. Pressure monitor must be calibrated annually to within ± 5%.

V. GAS CHROMATOGRAPH ("GC")

A. General

a. Accuracy: ± 5% over full scale.

b. 8-Hour Repeatability:

± 0.5% of full scale for ranges between 2-100% of full scale;

± 1% of full scale for ranges between 0.05-2% of full scale;
± 2% of full scale for ranges between 50-500 ppm;
± 3% of full scale for ranges between 5-50 ppm;
± 5% of full scale for ranges between 0.5-5 ppm.

c. The minimum sampling frequency shall be one sample every 20 minutes.

d. The GC shall be capable of speciating all gas constituents listed in Appendix 1.9.

e. The sampling system sample line shall be heat traced and maintained at no lower than 150 degrees Fahrenheit with no cold spots. The sampling cabinet shall be maintained at no lower than 110 degrees Fahrenheit. All system components shall be heated, including the probe external to the flare piping, calibration valve, sample lines, sampling loop (or sample introduction system), and GC oven.

f. Where technically feasible, the sampling location should be at least two equivalent duct diameters downstream from the nearest control device, point of pollutant generation, or other point at which a change in the pollutant concentration or emission rate occurs. The location should not be close to air in-leakages. Where technically feasible, the location should also be at least 0.5 diameters upstream from the exhaust or control device.

B. **Calibration Standards: Net Heating Value and Analyte Measurements**. For the Net Heating Value and Analyte measurements, the GC shall be operated and maintained in accordance with Performance Specification 9 ("PS9") of Appendix B of 40 C.F.R. Part 60 except:

1. The daily mid-level validation procedure in Section 10.2 of PS9 shall be conducted on the calculated Net Heating Value of the certified calibration gas based upon the concentration of each analyte. The average instrument response shall not vary by more than 10 percent from the Net Heating Value of the certified calibration gas.

2. The multi-point calibration error check procedure in Section 10.1 of PS9 shall be conducted quarterly for the limited set of analytes listed in Subparagraph V.B.3 below. No calibrations will be required after routine maintenance or repair where such activities do not have the potential to alter the sampling or analysis of the gas. The GC must meet the calibration performance criteria in Sections 13.1 and 13.2 of PS9 for the listed analytes only.

3. The analytes to be used are:

   i. Hydrogen
   ii. Nitrogen

iii. Methane
iv. Ethane
v. Propane
vi. Propylene
vii. Ethylene

4. The calibration gas mixtures may be set by the procedures identified in Section 7.1 of PS9 or may be within 10 percent of the concentration values listed in Table 1. The gases must be certified to ± 2 percent.

Table 1: Calibration Gas Mixtures for Net Heating Value Calibrations/Validations[(1)]

Component	Daily Mid-Level	Quarterly Low-Level	Quarterly Mid-Level	Quarterly High-Level
Hydrogen	30	8	30	12
Nitrogen	8	65	8	5
Methane	48	22	48	30
Ethane	3	2	3	30
Propane	2	1	2	15
Propylene	8	1	8	5
Ethylene	1	1	1	3
NHV (Btu/scf) Unadjusted for H2	793	310	793	1273

(1) The individual analytes are in volume percent.

VI. NET HEATING VALUE ANALYZER ("NHV Analyzer")

A. General

1. Accuracy: ± 5% of full scale.

2. Repeatability: ± 1% of reading over full scale.

3. The minimum sampling frequency shall be one sample every 5 minutes.

4. Where technically feasible, the sampling location should be at least two equivalent duct diameters downstream from the nearest control device, point of pollutant generation, or other point at which a change in the pollutant concentration or emission rate occurs. The location should not be close to air in-leakages. Where technically feasible, the location should also be at least 0.5 diameters upstream from the exhaust or control device.

APPENDIX 1.10

B. **Calibration Standards: Net Heating Value and Analyte Measurements**. The Net Heating Value Analyzer shall be operated and maintained in accordance with the following:

1. Daily Validation Procedure. A daily low-level and mid-level validation procedure shall be conducted on the calculated Net Heating Value of a certified calibration gas mixture that is developed pursuant to Subparagraph VI.B.3. below. The average instrument response shall not vary by more than 10 percent from the Net Heating Value of the certified calibration gas.

2. Quarterly Validation Procedure. A multi-point (*i.e.*, low-level, mid-level, high-level) calibration error check procedure as set forth in Section 10.1 of PS9 shall be conducted quarterly using the calibration gas mixture developed pursuant to Subparagraph VI.B.3. below. No calibrations will be required after routine maintenance or repair where such activities do not have the potential to alter the sampling or analysis of the gas. The Net Heating Value Analyzer must meet the calibration performance criteria in Sections 13.1 and 13.2 of PS9 such that the precision check of the NHV measured by the NHV Analyzer does not deviate by more than 5 percent from the NHV of the calibration gas.

3. The calibration gas mixtures may be set by the procedures identified in Section 7.1 of PS9 or may be within 10 percent of the concentration values listed in Table 2. The gases must be certified to ± 2 percent.

Table 2: Calibration Gas Mixtures for Net Heating Value Calibrations/Validations[(1)]

Component	Daily Low-Level	Daily Mid-Level	Quarterly Low-Level	Quarterly Mid-Level	Quarterly High-Level
Hydrogen	**8**	**30**	**8**	**30**	**12**
Nitrogen	**65**	**8**	**65**	**8**	**5**
Methane	**22**	**48**	**22**	**48**	**30**
Ethane	**2**	**3**	**2**	**3**	**30**
Propane	**1**	**2**	**1**	**2**	**15**
Propylene	**1**	**8**	**1**	**8**	**5**
Ethylene	**1**	**1**	**1**	**1**	**3**
NHV (Btu/scf) Unadjusted for H2	**310**	**793**	**310**	**793**	**1273**

(1) The individual analytes are in volume percent.

APPENDIX 1.10

VII. Calculation of Instrument Downtime

A. Gas Chromatograph

1. For purposes of calculating the 110 hours per calendar quarter of instrument downtime allowed pursuant to Paragraphs 18 and 38 of the Consent Decree, the time used for GC calibration and validation activities required by Subparagraph V.B. of this Appendix may be excluded.

2. Any hour that meets the requirements as set forth below shall not be counted toward instrument downtime. Specifically:

   (i) For a full operating hour (any clock hour where the flare is available for operation for 60 minutes), if there are at least three valid data points to calculate the hourly average (that is, one data point in each of the 20-minute sector of the hour), then there is no period of instrument downtime;

   (ii) For a partial operating hour (any clock hour where the flare is available for operation for less than 60 minutes), if there is at least one valid data point in each 20-minute sector of the hour in which the flare is available for operation to calculate the hourly average, then there is no period of instrument downtime; and

   (iii) For any operating hour in which required maintenance or quality-assurance activities on the instruments or monitoring systems associated with the flare are performed:

      (A) If the flare is available for operation in two or more 15-minute quadrants of the hour and if there are at least two valid data points separated by at least 15 minutes to calculate the hourly average, then there is no period of instrument downtime; or

      (B) If the flare is available for operation in only one 15-minute quadrant of the hour and if there is at least one valid data point to calculate the hourly average, then there is no period of instrument downtime.

B. Net Heating Value Analyzer

1. For purposes of calculating the 110 hours per calendar quarter of instrument downtime allowed pursuant to Paragraphs 18 and 38 of the Consent Decree, the time used for NHV analyzer calibration and validation activities required by Subparagraph V.B.1 of this Appendix may be excluded.

APPENDIX 1.10

2. Any hour that meets the requirements of 40 C.F.R. § 60.13(h)(2) shall not be counted toward instrument downtime. Specifically:

   (i) For a full operating hour (any clock hour where the flare is available for operation for 60 minutes), if there are at least four valid data points to calculate the hourly average (that is, one data point in each of the 15-minute quadrants of the hour), then there is no period of instrument downtime;

   (ii) For a partial operating hour (any clock hour where the flare is available for operation for less than 60 minutes), if there is at least one valid data point in each 15-minute quadrant of the hour in which the flare is available for operation to calculate the hourly average, then there is no period of instrument downtime; and

   (iii) For any operating hour in which required maintenance or quality-assurance activities on the instruments or monitoring systems associated with the flare are performed:

      (A) If the flare is available for operation in two or more quadrants of the hour and if there are at least two valid data points separated by at least 15 minutes to calculate the hourly average, then there is no period of instrument downtime; or

      (B) If the flare is available for operation in only one quadrant of the hour and if there is at least one valid data point to calculate the hourly average, then there is no period of instrument downtime.

VIII. METEOROLOGIC STATION

a. Wind speed sensors must be calibrated annually to +/- 10%.

UNITED STATES
v.
FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.11

INTENTIONALLY LEFT BLANK

UNITED STATES
v.
FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.12

REPRESENTATIONS OF DISCONTINUOUS WAKE DOMINATED FLOW

APPENDIX 1.12

REPRESENTATIONS OF DISCONTINUOUS WAKE DOMINATED FLOW

Definition

"Discontinuous Wake Dominated Flow" shall mean gas flow exiting a Flare tip that is identified visually by:

i. The presence of a flame that is: (1) immediately adjacent to the exterior of the Flare tip body; and (2) below the exit plane of the Flare tip; and

ii. A discontinuous flame, such that pockets of flame are detached from the portion of the flame that is immediately adjacent to the exterior of the Flare tip body.

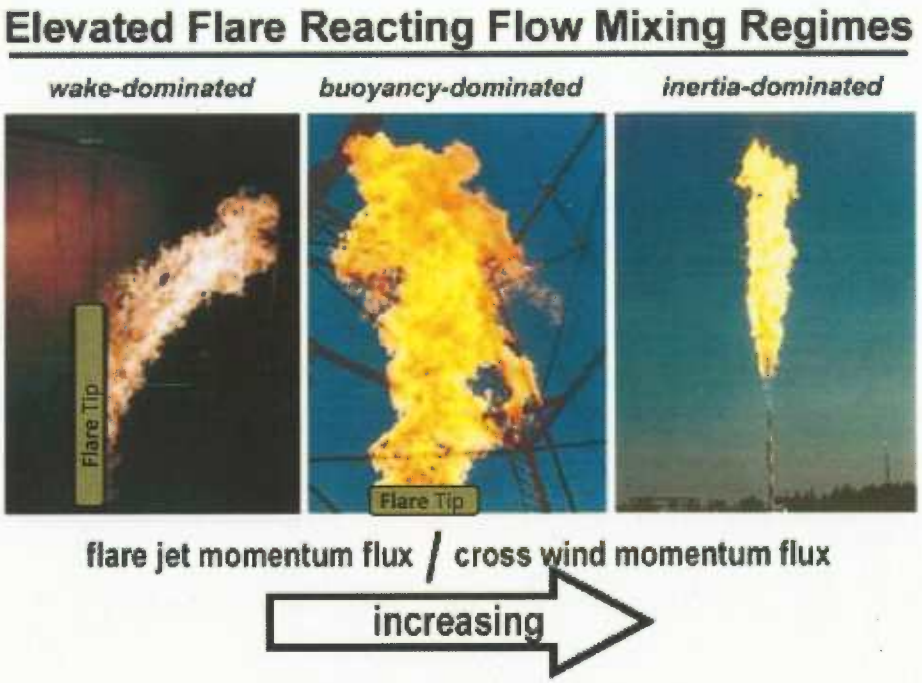
Background

The gases present just outside of the flare tip are influenced by several factors. All of these factors are present all of the time, but as process and environmental conditions change, the relative "strength" of each factor will change. The most dominant factors will dictate the flow of the Vent Gases, *i.e.*, will determine the size, shape, and direction of the flame. Some of the influences on the Vent Gases are:

- The low pressure region, or wake, that is downwind and next to the flare.
- The temperature gradient that causes the warm combustion gases to be buoyant, or rise.
- The inertia, or resistance to changes in speed and direction, of the Vent Gases as they exit the tip.

The regimes below show how a flame will appear when the most dominant influences are, respectively, the wake, the buoyancy due to temperature, and the inertia due to the gas's momentum.

APPENDIX 1.12



Images take from: Practical Implications of Prior Research on Today's Outstanding Flare Emissions Questions and a Research Program to Answer Them
James Seebold, ChevronTexaco (Retired)
Peter Gogolek, Natural Resources Canada
John Pohl, Virginia Polytechnic Institute and State University
Robert Schwartz, John Zink Company LLC

As a wake dominated flame becomes less stable, it becomes segmented, or discontinuous. The following is a representation of "Discontinuous Wake Dominated Flow." The red area is an artist's rendition of a flame.

APPENDIX 1.12

The following image represents a flame below the plane of the exit of the flare tip. However, since the flame is not discontinuous and not immediately adjacent to the tip, this image would not represent Discontinuous Wake Dominated Flow.

The following image represents a flame below the plane of the exit of the flare tip and attached to the tip. However, since the flame is not discontinuous, this image would not represent Discontinuous Wake Dominated Flow.

APPENDIX 1.12

In order for the flame to be deemed discontinuous, it should be segmented, and not merely possess small pockets of flame at the outer boundary of a single large cohesive flame. Furthermore, a discontinuous flame will normally appear thin relative to its length, and lack a single bulbous core. The following image represents a flame with a small pocket of flame only at the outer edges of the broad main flame. This would not represent a discontinuous flame, and therefore would not be Discontinuous Wake Dominated Flow.

UNITED STATES
v.
FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.13

INTENTIONALLY LEFT BLANK

UNITED STATES
v.

FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.14

INTENTIONALLY LEFT BLANK

UNITED STATES
v.

FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 1.15

CALCULATING ROLLING SUMS AND ROLLING AVERAGES

APPENDIX 1.15

ROLLING SUMS AND ROLLING AVERAGES

This Appendix describes how to calculate the standards, exceptions, and triggering events that are on a "rolling sum" or "rolling average" basis in the Consent Decree. Because the calculation of all rolling sums and rolling averages requires the calculation of block sums and block averages, respectively, those concepts are described as well. For rolling sums, the calculation—as the term "sum" implies—requires the use of addition. For rolling averages, the calculation—as the term "average" implies—requires the calculation of the arithmetic mean.

I. ROLLING SUMS

A. Definitions

2.2.1. "Block Sum" means the sum total of the measured or calculated standard, exception, or triggering event during a Block Sum Period. Most often, the term "block sum" is not explicitly used; rather, the concept is implicit in the description.

> *Example 1.a. For an exception to instrument operation that applies during 110 hours of a calendar quarter, the exception is stated in terms of a "Block Sum"—110 hours—but it is not explicitly defined as such. The defendant would add together the total number of hours in a calendar quarter that an instrument was not operating and then compare that sum to the allowed Block Sum value of 110 hours.*

2.2.2. "Block Sum Period" means the uninterrupted period of time during which the Block Sum must be calculated. Most often, the term "block sum period" (and indeed the term "sum period") is not explicitly used; rather, the concept is implicit in the description.

> *Example 1.b. Using Example 1.a, the "Block Sum Period" is a calendar quarter.*

2.2.3. "Rolling Sum" or "*y* rolling sum, rolled *n*" requires: (i) the calculation of a Block Sum during each Block Sum Period of *n* length of time; and (ii) the adding together of the Block Sum values for the total number of Block Sums that equals *y* length of time.

> *Example 2.a. A "365-day rolling sum, rolled daily," requires calculating daily Block Sums and then adding together the values for 365 Block Sums.*

2.2.4. "Rolling Sum Period" means the total length of time for which the Block Sums must be added together.

> *Example 2.b. Using Example 2.a, the "Rolling Sum Period" is 365 days.*

B. Relationship between Block Sums and Rolling Sums

2.2.5. The calculation of a Block Sum is implicit or explicit in the calculation of all Rolling Sums.

APPENDIX 1.15

Example 3. A "8760-hour rolling sum" without any further description requires the calculation of an hourly Block Sum and then the adding together of 8760 Block Sums.

C. Time of Commencement of and Ability to Calculate Block Sums and Rolling Sums

2.2.6. Block Sums. A Block Sum commences with the first value that is recorded at the start of each Block Sum Period. A Block Sum cannot be calculated until after the last value in the Block Sum Period is recorded.

Example 4. For a Block Sum Period that is "daily," the calculation of the Block Sum commences with the value that is recorded starting at midnight each calendar day and ends with value that is recorded immediately prior to midnight of the next day. For a Block Sum Period that is "hourly," the calculation of the Block Sum commences with the value that is recorded at the top of each hour and ends with value that is recorded immediately prior to the start of the next hour.

2.2.7. Rolling Sums. A Rolling Sum commences with the first Block Sum that is calculated. A Rolling Sum cannot be calculated until the last Block Sum of the Rolling Sum Period is calculated.

Example 5. For a 365-day Rolling Sum, rolled daily, the Rolling Sum commences with the Block Sum that is calculated on the first day of the Rolling Sum Period; however, the first Rolling Sum cannot be calculated until the first 365 days are over (i.e., the 365-day Rolling Sum Period is completed).

D. Standards, Exceptions and/or Triggering Events in this Consent Decree that are on a "Rolling Sum" Basis

2.2.8. The following standards, exceptions, and/or triggering events are on a "rolling sum" basis in the Consent Decree. These standards, exceptions, and/or triggering events therefore require the calculation of Block Sums during Block Sum Periods in order to calculate Rolling Sums:

APPENDIX 1.15

TABLE 1

Generic Description of Standards, Exceptions, and/or Triggering Events	Actual Standard, Exception, and/or Triggering Event in the CD	**Block Sum Period** (the "rolled by" period)	**Rolling Sum Period**
Percentage of Time a Compressor is Available for Operation and/or in operation	**95% of the time** (2 Compressors); **100% of the time** (w/ exceptions) (1 Compressors) (¶ 29.b.i)	Hourly	8760 hours
Exempted Hours of Maintenance on FGRS (exempted from percentage of time Available for Operation and/or in operation)	**336 hours** (¶ 29.b.i*(1)*)	Daily	5 years
Hours a Portable Flare is In Operation during outage(s) of a Covered Flare	**504 hours** (¶ 41.c and d)	Daily	1095 days

E. Calculating Rolling Sums for the Percentage of Time a Compressor is Available for Operation and/or in operation

2.2.9. Calculate each Hourly Block Sum. Calculate the amount of time that a compressor is Available for Operation and/or in operation ("A") during each hour (*i.e.,* during each Block Sum Period). Calculate the amount of time during each hour (*i.e.*, each Block Sum Period) that the standard is applicable and for which an exemption does not apply ("R"). Calculate each hourly Block Sum as A/R (which will be a percentage of time). If an exclusion applies during the entire hour, then that hour is not included in the Rolling Sum calculation.

2.2.10. Calculate the Rolling Sum for the first Rolling Sum Period. Add together the first 8760 hourly Block Sums. Use only the prior 8760 1-hour periods when at least some part of the hour was not covered by an exclusion.

2.2.11. Continue calculating the Rolling Sum. Drop out the first Block Sum (*i.e.*, the first hour) in the first Rolling Sum Period and add in the 8761st Block Sum.

F. Calculating Rolling Sums for Exempted Hours of Maintenance on FGRS

2.2.12. Calculate each Daily Block Sum. Calculate the amount of time that a particular Compressor is shut down for exempted maintenance during each day (*i.e.* during each Block Sum Period).

2.2.13. Calculate the Rolling Sum for the first Rolling Sum Period. Add together the first 1826 daily Block Sums ((5 years x 365 days) + 1 leap year day).

2.2.14. Continue calculating the Rolling Sum. Drop out the first Block Sum (*i.e.*, the first day) in the first Rolling Sum Period and add in the 1827th Block Sum.

G. Calculating Rolling Sums for the Number of Hours a Portable Flare is in operation during the outage of a Covered Flare

2.2.15. Calculate each Daily Block Sum. Calculate the number of hours that the Portable Flare is in operation during each day (*i.e.* during each Block Sum Period).

2.2.16. Calculate the Rolling Sum for the first Rolling Sum Period. Add together the first 1095 daily Block Sums.

2.2.17. Continue calculating the Rolling Sum. Drop out the first Block Sum (*i.e.*, the first day) in the first Rolling Sum Period and add in the 1095th Block Sum.

II. ROLLING AVERAGES

A. Definitions

2.2.18. "Block Average" means the arithmetic mean of a measured or calculated parameter during a Block Average Period.

> *Example 6.a. For an exit velocity standard that is applicable on a one-hour block average, the arithmetic mean of all of the measurements during a one-hour period is calculated and compared to the standard.*

2.2.19. "Block Average Period" means the uninterrupted period of time during which the Block Average must be calculated.

> *Example 6.b. Using Example 6.a, the "Block Average Period" is one-hour.*

2.2.20. "Rolling Average" or "*y* rolling average, rolled *n*" requires: (i) the calculation of a Block Average during each Block Average Period of *n* length of time; and (ii) the calculation of the arithmetic mean of the Block Average values for the total number of Block Averages that equals *y* length of time.

> *Example 7.a. A "3-hour rolling average, rolling every 15 minutes" requires the calculation of 15-minute block averages and then the calculation of the arithmetic mean of 12 (i.e., 3 x 4) 15-minute block averages.*

APPENDIX 1.15

2.2.21. "Rolling Average Period" means the total length of time for which the arithmetic mean of the Block Averages must be calculated.

Example 7.b. Using Example 7.a, the "Rolling Average Period" is 3 hours.

B. Relationship between Block Averages and Rolling Averages

2.2.22. The calculation of a Block Average is implicit or explicit in the calculation of all Rolling Averages.

Example 8. A "365-day rolling average" without any further description requires the calculation of daily Block Averages. A "1-hour rolling average, rolled every 5 minutes," requires the calculation of 5-minute Block Averages.

C. Time of Commencement of and Ability to Calculate Block Averages and Rolling Averages

2.2.23. Block Averages and Rolling Averages. The description set forth in Paragraphs 2.2.6 and 2.2.7 for time of commencement of and ability to calculate Block Sums and Rolling Sums applies equally to Block Averages and Rolling Averages.

Example 9. For "a 3-hour rolling average, rolled every 15 minutes," the calculation of the Block Average commences with the first value that is recorded starting at the top of each 15 minute period and ends with the last value that is recorded immediately prior to the start of the next 15 minute period. The Rolling Average commences with the first 15-minute Block Average that is calculated but the first Rolling Average cannot be calculated until all the first twelve Block Averages are calculated. ("Twelve" is the appropriate number of prior 15-minute Block Averages because there are four 15-minute Block Averages in one hour; therefore, there are twelve 15-minute Block Averages in three hours (4 x 3). The "3-hour rolling average, rolled every 15 minutes" would equal the arithmetic mean of twelve 15-minute Block Averages.)

D. Parameters in this Consent Decree that are on a "Rolling Average" Basis

2.2.24. The following parameters are on a "rolling average" basis in this Consent Decree. These parameters therefore require the calculation of Block Averages during Block Average Periods in order to calculate Rolling Averages:

APPENDIX 1.15

TABLE 2

Generic Description of the Parameter	Standard in the CD	Block Average Period (the "rolled by" period)	Rolling Average Period
Volumetric and Waste Gas Mass Flow Rate	(not a standard; just a calculation of the actual) (¶ 21.b.)	Daily	30 days
NHV_{cz} (calculated by GC)	¶ 34.b and App. 2.1	20 minutes	3 hours
NHV_{cz} (calculated by NHV analyzer)	¶ 34.b and App. 2.1	5 minutes	1 hour
S/VG_{mass}	4.0 (¶ 35.a)	5 minutes	1 hour

E. When measured values are "Zero" in a Block Average Period

2.2.25. If, during a Block Average Period, a parameter is measured to be zero, the number "0" is used for that measurement when determining the arithmetic mean of the values (*i.e.*, the Block Average) during the Block Average Period. If all of the measured values during a Block Average Period are zeros, the Block Average is the number "0." "0" *is* a value and "0" should be used in calculating the arithmetic mean. This is distinct from the circumstances identified in Paragraphs 2.2.26 and 2.2.27 below.

F. When one or more measured values either may be excluded for some part of a Block Average Period and/or do(es) not exist for some part of a Block Average Period.

2.2.26. If, for any reason, one or more value(s) of a parameter either: (i) may be excluded for some part of a Block Average Period (*e.g.*, Paragraph 38 applies), and/or (ii) do(es) not exist for some part of a Block Average Period (*e.g.*, an instrument is down), only the remaining value(s) in the Block Average Period are to be used in measuring or calculating the Block Average. For clarity, values that are excluded or do not exist are ***not*** given the number "0." They should not have any value assigned to them. The Block Average is the arithmetic mean of the non-excluded, existing values.

G. When all values in a Block Average Period may be excluded and/or do(es) not exist.

2.2.27. If, for any reason, the value(s) of a parameter either: (i) may be excluded during the entirety of a Block Average Period (*e.g.*, Paragraph 38 applies); and/or (ii) do(es) not exist for the entirety of a Block Average Period (*e.g.*, an instrument is down), then there is ***no*** Block Average for that Block Average Period. (For clarity, the number "0" is *not* the Block Average value in this circumstance.) Under this circumstance, there will be a gap in the Block Average Periods that have values (sometimes referred to as a "gap in the data").

APPENDIX 1.15

H. NHV_{cz} and S/VG_{mass} limitations in Paragraphs 34 and 35: Calculating Rolling Averages when contiguous Block Average Periods in a Rolling Average Period do not each have a value

2.2.28. If, pursuant to Paragraph 2.2.27, a Block Average Period does not have a value, then that Block Average Period shall be excluded when computing the Rolling Average. The Rolling Average Period—15 minutes or 5 minutes, as applicable—shall include only the prior twelve Block Average Periods that have non-excluded, existing values. "Twelve" is the correct number because there are 12 Block Average Periods in a standard based on a "3-hour rolling average, rolled every 15 minutes" and in a standard that is based on a "1-hour rolling average, rolled every 5 minutes."

> *Example 10. Assume that a standard must be complied with on a 3-hour rolling average, rolled every 15 minutes. Then, assume that in Hours 1, 2, and 3, the standard is applicable during all twelve 15-minute Block Average Periods; then, in Hour 4, the standard does not apply because of excepted instrument downtime; and finally, in Hour 5, the standard is once again applicable during all four 15 minute Block Average Periods. For Hour 4, the records and reports would state that the standard was not applicable. For Hour 5, the Rolling Average in the first 15 minute block would be the average of the last eleven 15 minute Block Averages in Hours 1, 2, and 3 and the first 15 minute Block Average in Hour 5.*

III. WHEN COMPLIANCE FIRST CAN BE DEMONSTRATED

2.2.29. For both Rolling Sums and Rolling Averages, compliance cannot be demonstrated until the first Rolling Sum Period or Rolling Average Period is completed.

> *Example 11. For a standard that is applicable on a 365-day rolling average, rolled daily, where the initial compliance date is January 1, 2014, values must start to be recorded at midnight on January 1, 2014. The first daily Block Average that can be calculated is at midnight on January 2, 2014. Then, assuming there are no gaps in the data, the first Rolling Average that can be calculated is at midnight on January 1, 2015. The first Rolling Average would be the arithmetic mean of the 365 Block Averages calculated for January 1, 2014, through December 31, 2014.*

UNITED STATES
v.

FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 2.1

CALCULATING NHV_{cz} AND $NHV_{cz\text{-}limit}$ FOR FHR'S COVERED FLARES

APPENDIX 2.1

CALCULATING $NHV_{cz\text{-}limit}$ AND NHV_{cz} FOR LOU AND AU FLARES

The LOU and AU Flares at the FHR Facility were subject to Passive FTIR testing in October of 2010. Based on the results of that test, EPA determined that the limits for the Net Heating Value of the Combustion Zone Gas of the LOU and AU Flares are more appropriately based on Vent Gas flow rate than the Vent Gas composition. This Appendix provides the methodology and equations for calculating NHV_{cz} and $NHV_{cz\text{-}limits}$ for the LOU and AU Flares.

All abbreviations, constants, and variables are defined in the Key on Page 4 of this Appendix.

Steps in the Calculations

Step 1: Determine the Net Heating Value of the Vent Gas (NHV_{vg})

For the LOU Flare (where a Gas Chromatograph will be used): The net heating value of the vent gas is calculated and reported from the GC at the conclusion of each analytical cycle. Equation 1 is used by the GC to calculate the vent gas net heating value from each individual compound net heating value. Individual compound volume fractions, except for water, are measured directly by the GC. A company is not required to measure water in Vent Gas. If a company chooses to measure water, then: (i) if the water measurement is taken upstream of a knock-out drum, then water does not have to be included in the calculation of NHV_{vg}; (ii) if no knock-out drum exists or if the water measurement is taken after the knock-out drum, then the company must include water in the calculation of NHV_{vg} and adjust the concentration of the compounds measured by the GC to a wet basis. Individual compound net heating values, including water, are listed in Table 1 of this Appendix.

$$NHV_{vg} = \sum_{i=1}^{n} (x_i \cdot NHV_i) \qquad \textit{Equation 1}$$

For the AU Flare (where a Net Heating Value Analyzer/Calculator will be used): Use the measured value.

NOTE: Table 1 includes two alternative values for the Net Heating Value of hydrogen: the actual NHV of hydrogen (274 BTU/scf) and an "adjusted" NHV of hydrogen (1212 BTU/scf). Companies have the option of using either in calculating NHV_{vg}; however, whichever option is selected also must be used in calculating NHV_{cz}. In this case, FHR has elected to use the actual, not adjusted, NHV of hydrogen.

APPENDIX 2.1

Step 2: Calculate the Net Heating Value of the Combustion Zone Gas (NHV_{cz})

The NHV in the combustion zone (NHV_{cz}) combines the NHVs of the Vent Gas, pilot gas, and steam and is calculated by Equation 2a (based on mass flow measurement) or 2b (based on volumetric flow measurement). These two equations are equivalent for combustion zone conditions, as shown in Addendum A to this Appendix. The NHV of steam is assumed to be zero. Vent Gas flow rate ($\dot{m}_{vg}$ *or* Q_{vg}) and steam flow rate ($\dot{m}_s$ *or* Q_s) are measured by on-line flow meters. The pilot gas flow rate ($\dot{m}_{pg}$ *or* Q_{pg}) is constant for each flare and set by a regulator.

$$NV_{cz} = \frac{\left(\frac{\dot{m}_{vg} \cdot NHV_{vg}}{MW_{vg}}\right) + \left(\frac{\dot{m}_{pg} \cdot NHV_{pg}}{MW_{pg}}\right)}{\left(\frac{\dot{m}_{vg}}{MW_{vg}}\right) + \left(\frac{\dot{m}_{pg}}{MW_{pg}}\right) + \left(\frac{\dot{m}_s}{MW_{H_2O}}\right) + \left(\frac{\dot{m}_{air}}{MW_{air}}\right)} \qquad \textit{Equation 2a}$$

OR

$$NHV_{cz} = \frac{(Q_{vg} * NHV_{vg}) + (Q_{pg} * NHV_{pg})}{Q_{vg} + Q_{pg} + Q_s + Q_{air}} \qquad \textit{Equation 2b}$$

The values for $\dot{m}_s$, $\dot{m}_{air}$, Q_s and Q_{air} are determined as follows for the LOU and AU Flares, which do not have a Minimum Steam Reduction System:

Steam-Assisted Flare without a Minimum Steam Reduction System

$\dot{m}_s$ *or* $Q_s = measured\ value$

$\dot{m}_{air}$ *or* $Q_{air} = 0$

The molecular weight of the vent gas (MW_{vg}) is to be calculated by the GC on the LOU Flare using Equation 3. Individual compound molecular weights are listed in Table 1 of this Appendix.

$$MW_{vg} = \sum_{i=1}^{n} (x_i \cdot MW_i) \qquad \textit{Equation 3}$$

The on-line ultrasonic flow meter on the AU Flare automatically and directly calculates the molecular weight of the Vent Gas of the AU Flare using a proprietary algorithm which involves the speed of sound, temperature, and pressure.

The NHV of the pilot gas (NHV_{pg}) and MW of the pilot gas (MW_{pg}) are calculated using Equations 4 and 5, respectively. These calculations are similar to the vent gas calculations, except the individual compound volume fractions are that of the pilot gas and not the vent gas.

APPENDIX 2.1

Individual compound volume fractions are measured by laboratory analysis of a pilot gas sample, or may be taken from the natural gas supplier's laboratory certificate of analysis.

$$NHV_{pg} = \sum_{i=1}^{n} (pg_i \cdot NHV_i) \qquad \textit{Equation 4}$$

$$MW_{pg} = \sum_{i=1}^{n} (pg_i \cdot MW_i) \qquad \textit{Equation 5}$$

Step 3: Calculate the Net Heating Value of Combustion Zone Gas Limit ($NHV_{cz\text{-}limit}$)

For the LOU Flare:

If $\dot{m}_{vg} < 3000$ lb/hr: $NHV_{cz\text{-}limit} = 187$ BTU/scf *Equation 6*

If $\dot{m}_{vg} \geq 3000$ lb/hr and $< 20{,}049$ lb/hr:

$NHV_{cz\text{-}limit} = 187 + (VG - 3000)*0.0098$ *Equation 7*

If $\dot{m}_{vg} \geq 20{,}049$ lb/hr: $NHV_{cz\text{-}limit} = 357$ BTU/scf *Equation 8*

Provided however, that if the following three conditions are met, the $NHV_{cz\text{-}limit}$ shall equal the value achieved by supplying supplemental natural gas at a rate of 3700 lb/hr:

(1) Vent Gas mass flow rate ($\dot{m}_{vg}$) is greater than 13,000 lb/hr;

(2) The S/VG_{mass} is less than or equal to 4.0 on a one-hour rolling average, rolled every five minutes (or it had been increased only to stop Smoke Emissions from occurring); and

(3) Supplemental natural gas is being added at a rate of 3700 lb/hr or more

APPENDIX 2.1

For the AU Flare:

If $\dot{m}_{vg}$ < 868 lb/hr: $NHV_{cz\text{-}limit} = 211$ BTU/scf ***Equation 9***

If $\dot{m}_{vg} \geq$ 868 lb/hr and < 1567 lb/hr:

$NHV_{cz\text{-}limit} = 211 + (VG - 868)*0.12$ ***Equation 10***

If $\dot{m}_{vg} \geq$ 1567 lb/hr: $NHV_{cz\text{-}limit} = 295$ BTU/scf ***Equation 11***

Step 4: Ensure that during flare operation, $NHV_{cz} \geq NHV_{cz\text{-}limit}$

The flare must be operated to ensure that NHV_{cz} is equal to or above $NHV_{cz\text{-}limit}$ to ensure acceptable combustion efficiency. Equation 12 shows this relationship.

$$NHV_{cz} \geq NHV_{cz-limit}$$ ***Equation 12***

APPENDIX 2.1

Key to the Abbreviations:

$0.21 = mole\ fraction\ of\ oxygen\ in\ air (0.21\ lb\text{-}mol\ O_2/lb\text{-}mol\ air)$
$385.5 = conversion\ from\ pound\ moles\ to\ standard\ cubic\ feet\ (385.5\ scf/lb\text{-}mol)$
$i = individual\ numbered\ compound\ from\ column\ i\ in\ Table\ 1\ (unitless)$
$j = individual\ numbered\ compound\ from\ column\ j\ in\ Table\ 1\ (unitless)$
$k = individual\ gaseous\ component\ of\ the\ combustion\ zone\ (unitless)$
$\dot{m}_{air} = mass\ flow\ rate\ of\ air\ (lb/hr)$
$\dot{m}_k = mass\ flow\ rate\ of\ individual\ combustion\ zone\ gas\ component\ (lb/hr)$
$\dot{m}_{O2-stoich-vg} = stoichiometric\ oxygen\ mass\ flow\ for\ the\ vent\ gas\ (lb/hr)$
$\dot{m}_{pg} = mass\ flow\ rate\ of\ pilot\ gas\ (lb/hr)$
$\dot{m}_s = mass\ flow\ rate\ of\ total\ steam\ (lb/hr)$
$\dot{m}_{vg} = mass\ flow\ rate\ of\ vent\ gas\ (lb/hr)$
$\dot{n}_{O2-stoich} = stoichiometric\ oxygen\ molar\ flow\ for\ an\ individual\ compound\ (mol/hr)$
$MW_{H_2O} = molecular\ weight\ of\ water\ (18.02\ lb/lb\text{-}mol)$
$MW_i = molecular\ weight\ of\ individual\ compound\ (lb/lb\text{-}mol)$
$MW_k = molecular\ weight\ of\ individual\ combustion\ zone\ gas\ component (lb/lb\text{-}mol)$
$MW_{O_2} = molecular\ weight\ of\ oxygen\ (32.0\ lb/lb\text{-}mol)$
$MW_{air} = molecular\ weight\ of\ air\ (28.9\ lb/lb\text{-}mol)$
$MW_{pg} = molecular\ weight\ of\ pilot\ gas\ (lb/lb\text{-}mol)$
$MW_{vg} = molecular\ weight\ of\ vent\ gas\ (lb/lb\text{-}mol)$
$n = list\ of\ individual\ compounds\ from\ Table\ 1\ (unitless)$
$NHV_{cz} = net\ heating\ value\ of\ the\ combustion\ zone\ (BTU/scf)$
$NHV_i = net\ heating\ value\ of\ individual\ compound\ (BTU/scf)$
$NHV_{vg-LFL} = net\ heating\ value\ vent\ gas\ at\ lower\ flammability\ limit\ (BTU/scf)$
$NHV_{cz-limit} = limit\ net\ heating\ value\ of\ the\ combustion\ zone\ (BTU/scf)$
$NHV_{pg} = net\ heating\ value\ of\ pilot\ gas\ (BTU/scf)$
$NHV_{vg} = net\ heating\ value\ of\ vent\ gas\ (BTU/scf)$
$P_{cz} = pressure\ of\ combustion\ zone\ gas\ (psia)$
$P_{std} = ambent\ pressure\ at\ standard\ condtions\ (14.696\ psi)$
$pg_i = individual\ compound\ volume\ fraction\ in\ pilot\ gas\ (vol\ fraction)$
$Q_k = individal\ vent\ gas\ component\ volumetric\ flow\ rate\ (scfh)$
$Q_{k,acf} = individal\ vent\ gas\ component\ volumetric\ flow\ rate\ (ft^3/hr)$
$Q_{vg} = vent\ gas\ volumetric\ flow\ rate\ (scfh)$
$Q_{pg} = pilot\ gas\ volumetric\ flow\ rate\ (scfh)$
$Q_s = steam\ volumetric\ flow\ rate\ (scfh)$
$Q_{air} = air\ volumetric\ flow\ rate\ (scfh)$
$R = gas\ constant\ (10.73\ ft^3 \cdot psi/lb - mol \cdot R)$
S/VG_{mass} = the ratio of the Total Steam Mass Flow Rate to the Vent Gas Mass Flow Rate
$T_{cz} = absolute\ temperature\ of\ combustion\ zone\ gas\ (°R)$
$T_{std} = absolute\ temperature\ at\ standard\ conditions (528°R)$
$x = moles\ of\ carbon\ per\ mole\ of\ C_xH_y\ (mol/mol)$
$x_i = individual\ compound\ volume\ fraction\ in\ the\ vent\ gas\ (vol\ fraction)$
$x_j = individual\ combustible\ compound\ volume\ fraction\ in\ the\ vent\ gas\ (vol\ fraction)$
$y = moles\ of\ hydrogen\ per\ mole\ of\ C_xH_y\ (mol/mol)$

APPENDIX 2.1

Table 1
Individual Compound Properties

i[1]	j	Compound[2]	NHV_i (Btu/scf)	MW_i (lb/lbmol)	C_x	H_y
1	1	Hydrogen	273	2.02	0	2
2	-	Oxygen	0	32.00	n/a	n/a
3	-	Nitrogen	0	28.01	n/a	n/a
4	-	CO_2	0	44.01	n/a	n/a
5	-	CO	316	28.01	n/a	n/a
6	2	Methane	909	16.04	1	4
7	3	Ethane	1619	30.07	2	6
8	4	Ethylene	1501	28.05	2	4
9	5	Propane	2302	44.10	3	8
10	6	Propylene	2182	42.08	3	6
11	7	Butanes	3017	58.12	4	10
12	8	Butenes	2885	56.11	4	8
13	9	1,3-Butadiene	2773	54.09	4	6
14	10	Pentane+ (C_5+)	3715	72.15	5	12
15	11	Benzene	3591	78.11	6	6
16	12	Toluene	4252	92.14	7	8
17	13	Ethylbenzene	4942	106.16	8	10
18	14	O,P,M Xylenes	4958	106.16	8	10

[1] i=all compounds, j=organic compounds and hydrogen

[2] NHV data for all compounds, except O, P, M Xylenes, was obtained from the final report of the PFTIR Test prepared by Clean Air Engineering (report dated June 17, 2011). O, P, M, Xylenes' NHV data is based on the original manufacturer settings for FHR's GC.

APPENDIX 2.1

Addendum A
Verification of Equation 2a and Equation 2b Equivalency

In this Appendix, all gaseous flows (i.e, vent gas, steam, pilot gas, and air) may be measured on either a mass basis (lb/hr) or a volumetric basis (scfh). Depending on which measurement methodology is used, different versions of some equations must be used. These versions are designated with an "a" or "b" (e.g. Equation 2a or 2b). In all cases, these equations are equivalent. This Addendum demonstrates the equivalence of the two methods for calculating NHVcz.

Equation 2b uses volumetric flow rates for the calculation of NHV_{cz}:

$$NHV_{cz} = \frac{(Q_{vg} * NHV_{vg}) + (Q_{pg} * NHV_{pg})}{Q_{vg} + Q_{pg} + Q_s + Q_{air}} \qquad \textit{Equation 2b}$$

The ideal gas law provides a method for determining volumetric flow rate of a specific gas, *k,* in the combustion zone at standard conditions:

$$Q_k = Q_{k,acf} * \frac{P_{cz}}{P_{std}} * \frac{T_{std}}{T_{cz}} \qquad \textit{Equation A1}$$

$$Q_{k,acf} = \frac{\dot{m}_k R T_{cz}}{MW_k P_{cz}} \qquad \textit{Equation A2}$$

$$Q_k = \frac{\dot{m}_k R T_{cz}}{MW_k P_{cz}} * \frac{P_{cz}}{P_{std}} * \frac{T_{std}}{T_{cz}} = \frac{\dot{m}_k R T_{std}}{MW_k P_{std}} \qquad \textit{Equation A3}$$

$$Q_k = \frac{\dot{m}_k * 10.73 * 528}{MW_k * 14.696} = 385.5 \frac{\dot{m}_k}{MW_k} \qquad \textit{Equation A4}$$

Substitution of this expression into Equation 2b gives NHV_{cz} in terms of mass flow:

$$NHV_{cz} = \frac{\left(385.5 \frac{\dot{m}_{vg}}{MW_{vg}} * NHV_{vg}\right) + \left(385.5 \frac{\dot{m}_{pg}}{MW_{pg}} * NHV_{pg}\right)}{385.5 \frac{\dot{m}_{vg}}{MW_{vg}} + 385.5 \frac{\dot{m}_{pg}}{MW_{pg}} + 385.5 \frac{\dot{m}_s}{MW_{H_2O}} + 385.5 \frac{\dot{m}_{air}}{MW_{air}}} \qquad \textit{Equation A5}$$

Because the combustion zone is well-mixed, each gaseous component of the combustion zone is at the same temperature and pressure. Thus, the last expression reduces to Equation 2a:

APPENDIX 2.1

$$NHV_{cz} = \frac{\left(\frac{\dot{m}_{vg} \cdot NHV_{vg}}{MW_{vg}}\right) + \left(\frac{\dot{m}_{pg} \cdot NHV_{pg}}{MW_{pg}}\right)}{\left(\frac{\dot{m}_{vg}}{MW_{vg}}\right) + \left(\frac{\dot{m}_{pg}}{MW_{pg}}\right) + \left(\frac{\dot{m}_{s}}{MW_{H_2O}}\right) + \left(\frac{\dot{m}_{air}}{MW_{air}}\right)} \qquad \textit{Equation 2a}$$

This demonstrates the equivalence of Equations 2a and 2b.

UNITED STATES
v.

FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 3.1

FACTORS TO BE CONSIDERED AND PROCEDURES TO BE FOLLOWED TO CLAIM COMMERCIAL UNAVAILABILITY

APPENDIX 3.1

Factors to be Considered and Procedures to be Followed
To Claim Commercial Unavailability

This Appendix outlines the factors to be taken into consideration and the procedures to be followed for FHR to assert that a Low-E Valve or Low-E Packing is "commercially unavailable" pursuant to Paragraph 65 of the Consent Decree.

I. FACTORS

A. Nothing in the Consent Decree or this Appendix requires FHR to utilize any valve or packing that is not suitable for its intended use in a Covered Process Unit.

B. The following factors are relevant in determining whether a Low-E Valve or Low-E Packing is commercially available to replace or repack an existing valve:

1. Valve type (*e.g.,* ball, gate, butterfly, needle) (this ELP does not require consideration of a different type of valve than the type that is being replaced)
2. Nominal valve size (*e.g.,* 2 inches, 4 inches)
3. Compatibility of materials of construction with process chemistry
4. Valve operating conditions (*e.g.,* temperature, pressure)
5. Service life
6. Packing friction (*e.g.,* impact on operability of valve)
7. Whether the valve is part of a packaged system or not
8. Retrofit requirements (*e.g.,* re-piping or space limitations)
9. Other relevant considerations

C. The following factors may also be relevant, depending upon the process unit or equipment where the valve is located:

10. In cases where the valve is a component of equipment that FHR is licensing or leasing from a third party, valve or valve packing specifications identified by the lessor or licensor of the equipment of which the valve is a component

11. Valve or valve packing vendor or manufacturer recommendations for the relevant process unit components.

II. PROCEDURES THAT FHR SHALL FOLLOW TO ASSERT COMMERCIAL UNAVAILABILITY

FHR shall comply with the following procedures if it seeks to assert commercial unavailability under Paragraph 65 of the Consent Decree:

APPENDIX 3.1

1. FHR must contact a reasonable number of vendors of valves or valve packing that FHR, in good faith, believes may have valves or valve packing suitable for the intended use taking into account the relevant factors listed in Subsections I.A. and I.B above.

a. For purposes of this Consent Decree, a reasonable number of vendors presumptively shall mean no less than three.

b. If fewer than three vendors are contacted, the determination of whether such fewer number is reasonable shall be based on Factors (10) and (11) or on a demonstration that fewer than three vendors offer valves or valve packing considering Factors (1) – (9).

2. FHR shall obtain a written representation from each vendor, or equivalent documentation, that a particular valve or valve packing is not available as "Low-Emissions" from that vendor for the intended conditions or use.

a. "Equivalent documentation" may include e-mail or other correspondence or data showing that a valve or valve packing suitable for the intended use does not meet the definition of "Low-E Valve" or "Low-E Packing" in the Consent Decree.

b. If the vendor does not respond or refuses to provide documentation, "equivalent documentation" may consist of records of FHR's attempts to obtain a response from the vendor.

3. Each Compliance Status Report required by Section VIII of the Consent Decree shall identify each valve that FHR otherwise was required to replace or repack, but for which, during the time period covered by the Report, FHR determined that a Low-E Valve and/or Low-E Packing was not commercially-available. FHR shall provide a complete explanation of the basis for its claim of commercial unavailability, including, as an attachment to the Compliance Status Report, all relevant documentation. This report shall be valid for a period of twelve months from the date of the report for the specific valve involved and all other similar valves, taking into account the factors listed in Part I.

III. OPTIONAL EPA REVIEW OF FHR'S ASSERTION OF COMMERCIAL UNAVAILABILITY

A. At its option, EPA may review an assertion by FHR of commercial unavailability. If EPA disagrees with FHR's assertion, EPA shall notify FHR in writing, specifying the Low-E Valve or Low-E Packing that EPA believes to be commercially available and the basis for its view that such valve or packing is appropriate taking into consideration the Factors described in Part I. After FHR receives EPA's notice, the following shall apply:

1. FHR shall not be required to retrofit the valve or valve packing for which it asserted commercial unavailability (unless FHR is otherwise required to do so pursuant to another provision of the Consent Decree).

APPENDIX 3.1

2. FHR shall be on notice that EPA will not accept a future assertion of commercial unavailability for: (i) the valve or packing that was the subject of the unavailability assertion; and/or (ii) a valve or packing that is similar to the subject assertion, taking into account the Factors described in Part I.

3. If FHR disagrees with EPA's notification, FHR and EPA shall informally discuss the basis for the claim of commercial unavailability. EPA may thereafter revise its determination, if necessary.

4. If FHR makes a subsequent commercial unavailability claim for the same or similar valve or packing that EPA previously rejected, and the subsequent claim also is rejected by EPA, FHR shall retrofit the valve or packing with the commercially available valve or packing unless FHR is successful under Subsection III.B below.

B. Any disputes under this Appendix first shall be subject to informal discussions between FHR and EPA before FHR shall be required to invoke the Dispute Resolution provisions of Section XIV of the Consent Decree. Thereafter, if the dispute remains, FHR shall invoke the Dispute Resolution provisions.

UNITED STATES
v.

FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 4.1

ENVIRONMENTAL MITIGATION PROJECTS

APPENDIX 4.1

ENVIRONMENTAL MITIGATION PROJECTS

FHR shall spend $2,350,000 and shall comply with the requirements of this Appendix and with Section IX of this Consent Decree ("Environmental Mitigation Projects") to implement and secure the environmental benefits of the Projects described below.

4.1.1. City of Port Arthur Diesel Emissions Reduction Project ("Diesel Emissions Reduction Project")

A. By no later than 120 days of the Date of Entry, FHR, in consultation with the City of Port Arthur ("City"), shall submit a plan ("Diesel Project Plan") to spend $2,000,000 in Project Dollars to implement and complete the retrofitting, repowering, replacement, and/or retiring of as many of the following diesel-engine vehicles (which are owned and operated by the City) as can be retrofitted, repowered, replaced, and/or retired with the $2,000,000 in Project Dollars:

Item	Vehicle No.	Model Year	Make	Model
1	1404	2001	Chevrolet	8 yd Dump Truck
2	1158	1996	Ford	Water Truck
3	1189	1996	Ford	Water Truck
4	1155	1996	Ford	8 yd Dump Truck
5	1214	1996	Ford	8 yd Dump Truck
6	1206	1996	Ford	8 yd Dump Truck
7	1208	1996	Ford	8 yd Dump Truck
8	1218	1996	Ford	8 yd Dump Truck
9	1219	1996	Ford	8 yd Dump Truck
10	1225	1996	Ford	8 yd Dump Truck
11	1220	1996	Ford	8 yd Dump Truck
12	980	1993	Champ	Motor Grader
13	1332	1998	Gradall	XL4100
14	915	1992	GMC	1 ton Flat Bed Truck
15	1413	2000	Gradall	XL4100
16	1389	2000	Caterpillar	Front End Loader
17	1329	1999	GMC	8 yd Dump Truck
18	1330	1999	GMC	8 yd Dump Truck
19	1331	1999	Ford	8 yd Dump Truck
20	1140	1995	Caterpillar	Front End Loader
21	1443	2001	John Deere	Mini-Excavator
22	884	1992	John Deere	Trackhoe
23	1489	2003	Elgin	Street Sweeper
24	1566	2006	Mack/Heil	Commercial Garbage Truck
25	1640	2006	GMC	Tow Truck/Grapple/Trailer

APPENDIX 4.1

26	1552	2004	GMC	Tow Truck/Grapple/Trailer
27	1788	2007	Autocar/Heil	Commercial Garbage Truck
28	1629	2007	Mack/Heil	Residential Garbage Truck
29	1630	2007	Mack/Heil	Residential Garbage Truck
30	1626	2007	Autocar	Residential Garbage Truck
31	1591	2006	Caterpillar	Mini-Excavator
32	1547	2004	Case	Mini-Excavator

This list hereafter shall be called the "Vehicle List." Nothing in this Paragraph shall prohibit FHR, in consultation with the City, from submitting the Diesel Project Plan sooner than 120 days after the Date of Entry.

B. Prior to the submission of the Diesel Project Plan or in the Diesel Project Plan itself or as the Diesel Project Plan is being implemented, FHR, in consultation with the City, may elect to include vehicles not on the Vehicle List by providing to EPA in writing a justification for the addition. Such vehicles shall be considered a part of the "Vehicle List" for purposes of this Appendix unless EPA disagrees. Changes to the Vehicle List are not material changes and do not require a modification of this Consent Decree.

C. The Diesel Project Plan shall:

1. List the specific proposed vehicles, including model, make, year, and usage of the vehicles to be retrofitted, repowered, replaced, and/or retired; the option selected for the emissions reductions (retrofitting, repowering, replacing, or retiring); if retrofitted or repowered, the EPA- or CARB-certified technology to be used; and the estimated costs;

2. Provide expected implementation timelines and expected completion dates;

3. Describe the schedule and budgetary increments in which FHR shall provide the necessary funding to the City to implement the Project; and

4. Estimate the environmental benefits of the Diesel Emissions Reduction Project including an estimate of emission reductions (*e.g.*, CO, NOx, $PM_{2.5}$) expected to be realized.

D. FHR, working in conjunction with the City, shall implement the Diesel Emissions Reduction Project in accordance with the Diesel Project Plan unless EPA seeks changes to the Plan.

APPENDIX 4.1

E. The Parties agree that FHR must spend at least $2.0 million in Project Dollars by no later than two years after the Date of Entry. FHR is not precluded from spending $2.0 million sooner than two years after the Date of Entry. A demonstration of adequate justification based on unexpected conditions shall enable FHR to extend the deadline beyond two years after the Date of Entry with the agreement of the City and EPA.

F. FHR, working in conjunction with the City, shall use good faith efforts to secure as much environmental benefit as possible for the Project Dollars expended, but the determination about which option to use to reduce diesel emissions (*i.e.*, retrofitting, repowering, replacing and/or retiring) shall rest exclusively with the City.

G. In determining which vehicles to retrofit, repower, replace, and/or retire, priority should be given to older, higher-polluting vehicles that have high annual usage rates and/or vehicle miles travelled so that the pollution reductions obtained from the Project will be maximized. The order of priority for expending the Project Dollars shall rest exclusively with the City. Notwithstanding the preceding, vehicles numbered 1404, 1158, 1189, and 1332 on the Vehicle List shall be retrofitted, repowered, replaced, and/or permanently retired unless the Diesel Project Plan describes in detail the justification for not retrofitting, repowering, replacing, and/or permanently retiring those vehicles and EPA does not disagree.

H. All vehicles that are replaced or retired shall be disposed of appropriately and shall not remain in or be placed back into service in any way.

I. All diesel engine retrofits conducted under this Diesel Emissions Reduction Project shall use exhaust control technologies verified by EPA or by the California Air Resources Board ("CARB"). A list of EPA-verified technologies can be found at http://epa.gov/cleandiesel/verification/verif-list.htm. A list of CARB-verified technologies can be found at www.arb.ca.gov.diesel.verdev/vt/cvt.htm. If the Diesel Emissions Reductions Project includes diesel particulate filter ("DPF") retrofits, the Diesel Emissions Reduction Project may also include the purchase of DPF service equipment required for proper DPF maintenance.

J. All diesel engine repowering conducted under this Diesel Emission Reduction Project shall use technologies certified by EPA, or by CARB if available, and shall consist of new engine configurations certified to emission standards. Information on engine certification can be found at www.epa.gov/otaq/certdata.htm.

4.1.2 Energy Efficiency Project

A. By no later than 120 days of the Date of Entry, FHR, in consultation with the Southeast Texas Regional Planning Commission, shall submit a plan ("Energy Efficiency Plan") to spend $350,000 in Project Dollars to implement and complete a project for the purchase and installation of environmentally beneficial energy efficiency technologies, including but not limited to windows, doors, lighting, and appliances, to reduce the energy demand in low income residences. The Energy Efficiency Plan may follow the methods and protocols already

APPENDIX 4.1

established by the Southeast Texas Regional Planning Commission in its implementation of what is known as the Lighthouse Project. Nothing in this Paragraph shall prohibit FHR, in consultation with the Southeast Texas Regional Planning Commission, from submitting the Energy Efficiency Plan sooner than 120 days after the Date of Entry.

B. The Energy Efficiency Plan shall:

1. Describe, in general, the proposed actions and how those actions are consistent with the requirements of this Consent Decree and Section 4.1.2 of Appendix 4.1;

2. Provide expected implementation timelines and expected completion dates;

3. Describe the schedule and budgetary increments in which FHR shall provide the necessary funding to the Southeast Texas Regional Planning Commission to implement the Project; in the alternative, the Energy Efficiency Plan may require one upfront, lump sum payment; and

4. Estimate the environmental benefits of the Energy Efficiency Project.

C. FHR, working in conjunction with the Southeast Texas Regional Planning Commission, shall implement the Energy Efficiency Project in accordance with the Energy Efficiency Plan unless EPA seeks changes to the Plan.

D. To be eligible for consideration for this Project, applicants must:

1. Own homes or reside in homes within the city limits of the City of Port Arthur for a period of at least the previous twelve months; and

2. Have a household income that does not exceed 80% of the average median household income for the Beaumont-Port Arthur Standard Metropolitan Statistical Area.

E. Priority shall be given to applicants who live in the Westside neighborhood of the City of Port Arthur, although the Southeast Texas Regional Planning Commission retains the discretion to undertake energy efficiency improvements in other areas of the City based upon the economic circumstances of the applicants requesting assistance.

F. The Energy Efficiency Project shall be completed within three years from the Date of Entry except that FHR, in consultation and with the approval of Southeast Texas Regional Planning Commission, may request an extension of time to complete the Project if it appears likely that all Project Dollars will not be spent within such three year period despite FHR's best efforts to implement the Energy Efficiency Project within such period.

APPENDIX 4.1

4.1.3 General Provisions

A. Commencing with the first Semi-Annual Compliance Status Report due under the Decree and continuing thereafter until completion of each of the Projects, FHR shall include in each Compliance Status Report information describing the progress of the Projects and the Project Dollars expended on each Project to date.

B. Upon completion of the Diesel Emissions Reduction Project and upon completion of the Energy Efficiency Project, FHR shall submit to EPA a project completion report in accordance with the requirements of Paragraph 113 of the Consent Decree.

C. Nothing in this Consent Decree or Appendix shall be construed to require FHR to spend more than the amounts set forth in Paragraphs 109 and 110 of the Consent Decree and in Sections 4.1.1 and 4.1.2 of this Appendix on Environmental Mitigation Projects, provided that the amounts expended by FHR and any third party are spent in compliance with all requirements of the Consent Decree and this Appendix.

D. The Parties recognize that implementation of the Projects in this Appendix will require action by third parties (*i.e.*, the City of Port Arthur and Southeast Texas Regional Planning Commission). If FHR is unable to complete a Project in accordance with this Appendix and the Project Plan due to such third-party's failure to fulfill its obligations, and that failure is not caused by FHR and is beyond the control of FHR despite FHR's best efforts to fulfill its obligations, then EPA and FHR may agree to: (1) allow FHR and the third party(ies) to amend the Project Plan as appropriate to successfully complete the Project; or (2) cancel the Project and redirect any unspent funds for the Project that cannot be completed to the other Project identified in this Appendix.

E. Any funds designated for a specific Project that are left unspent at the Project's completion may be redirected by FHR, after consultation and approval by EPA, to the other Project identified in the Appendix.

UNITED STATES
v.

FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 5.1

FENCE LINE MONITORING PROGRAM

APPENDIX 5.1

FENCE LINE MONITORING PROGRAM

Minimum Equipment and Program Requirements:

FHR shall maintain in good working order at the Facility the equipment identified within and adhere to the elements of this Appendix. FHR shall obtain prior approval from EPA before changing any fence line monitoring equipment types (other than like-kind), action levels, or compounds monitored.

1-Hour Analyzers - The monitoring stations at Miller Farm Road and Levee Road are each equipped with 1-Hour Gas Chromatograph (GC) analyzers that monitor at an hourly interval. FHR shall use these monitors for the detection in parts per billion by volume (ppb-v) concentrations of at least Benzene and 1,3-Butadiene. Nothing in this Appendix prohibits FHR from voluntarily choosing to use these monitors for the detection of additional compounds.

15-Minute Analyzers – In addition to the 1-Hour GC Analyzers, the monitoring stations at Miller Farm Road and Levee Road are also equipped with 15-minute GC analyzers that monitor for the detection of Benzene at 15-minute sampling intervals at ppb-v concentrations.

Equipment:

FHR shall maintain and operate the two existing fence line monitoring stations, which are located at Levee Road and Miller Farm Road within the Facility. Each of these stations shall be equipped with a one-hour GC analyzer and a fifteen-minute GC analyzer (benzene only).

FHR shall maintain and use the portable monitoring equipment referenced in this Appendix to aid in investigation activities, as appropriate. This equipment includes, at a minimum, Toxic Vapor Analyzers (TVAs), a parts per billion (PPB) detection handheld analyzer, and infrared cameras.

Action Level Definitions and Limits:

Action Level means a concentration at which internal investigative action is triggered. FHR has set these Action Levels at concentrations that will enhance leak identification and repair. Action Levels do not directly correspond to Federal or State reportable quantities (RQ), Threshold Limit Values (TLV®), or Biological Exposure Indices (BEI®).

1-Hour Action Level means a 1-hour concentration equal to or greater than the concentration for the specific compound as listed below:

APPENDIX 5.1

MILLER FARM ROAD 1-HOUR ANALYZER		LEVEE ROAD 1-HOUR ANALYZER	
Compound	**Action Level**	**Compound**	**Action Level**
Benzene	25.0 ppb-v	Benzene	25.0 ppb-v
1,3-Butadiene	25.0 ppb-v	1,3-Butadiene	25.0 ppb-v

15-Minute Action Level means a 15-minute concentration equal to or greater than the 25 ppb-v alarm limit for benzene as identified below:

MILLER FARM ROAD 15-MINUTE ANALYZER		LEVEE ROAD 15-MINUTE ANALYZER	
Compound	**Alarm Limit**	**Compound**	**Alarm Limit**
Benzene	25.0 ppb-v	Benzene	25.0 ppb-v

Investigation Activities:

An exceedance of an Action Level at either fence line monitoring station shall result in an immediate notification at FHR's Process Control Console. Within 24 hours of receipt of this notification, Facility shift personnel, or other appropriate Facility personnel or contractor, shall initiate an investigation in an attempt to identify the source of the Action Level exceedance using concentration and meteorological data provided by the fence line monitoring station(s).

The Facility shift personnel on duty, other appropriate FHR personnel, or contractor should conduct the activities and/or review information below during the field investigation, as appropriate:

- Question FHR personnel on shift and/or contractors as to whether any unusual activities, significant operating changes, and/or maintenance activities are being conducted.

- Use the fence line monitoring compass response plot plan map and/or one of five specific chemical component source maps already available at the Facility to determine the suspected zones based upon site (Miller Farm Road/Levee Road), chemical component(s), and meteorological information.

- If the prevailing wind direction indicates an off-site source from a neighboring industrial facility, the Shift Manager on duty or appropriate FHR personnel or contractor will contact the neighboring facility and provide the data from the fence line monitor.

- Review the gas detection alarm summary to determine if gas sensors throughout the plant detected emissions.

APPENDIX 5.1

  - If the gas detection alarm summary indicates that emissions may be occurring in a particular area, review any maintenance work or equipment clearings in progress.

- If the Flare Gas Recovery System (FGRS) is down, review the flare report to verify the potential of emissions from the flares.
- Perform a check of possible areas within the Facility for emission sources utilizing the portable PPB RAE®, which is capable of parts per billion (PPB) level detection.
- Contact the on-site Emergency Response (ER) group to monitor using its portable equipment, including a FLIR® IR Gas Detection Camera.
- Contact the LDAR Group for leak detection assistance. LDAR technicians can assist using their TVA or a FLIR® IR Gas Detection Camera.
- Coordinate with other departments and assign Operators or other FHR personnel or contractors to assist in locating a potential source.

Notification:

If the investigation results in the identification of a leak source, Facility shift personnel on duty, other appropriate FHR personnel, or contractor, shall conduct the notification activities below, as appropriate:

- Promptly report the findings to the appropriate Environmental Department personnel.
- Contact necessary FHR personnel and/or contractors for assistance in addressing the source and mitigating the emissions.

If a malfunction to the fence line monitoring system is suspected, the Facility shift personnel on duty, FHR personnel, or contractor shall contact the appropriate resources for technical assistance.

Response Actions:

If the investigation results in the identification of a leak source, the necessary FHR personnel and/or contractor shall undertake, to the extent feasible and as soon as practicable, all appropriate response actions to mitigate or eliminate the source.

APPENDIX 5.1

Documentation:

As soon as practicable but no later than 24 hours after the Action Level was exceeded, the Facility shift personnel on duty, appropriate FHR personnel, or contractor must complete and distribute an incident report to facility personnel. Note that multiple Action Level exceedances that occurred during the same operational shift can be documented in a single incident report. The report shall include the following, as appropriate:

- Monitoring Site where Action Level Exceedance(s) occurred
- Date and Time of Action Level Exceedance(s)
- Compound and Analyzer (1 Hour or 15 Minute) that alarmed; number of alarms if multiple
- Wind Direction at time of Action Level Exceedance(s)
- Description of investigation activities
- Description of any emissions source(s) identified during investigation
- Identify who was notified regarding Action Level Exceedance(s)

Reports and Schedule:

FHR shall submit Air Monitoring Semi-Annual Reports to EPA that contain, in spreadsheet format, the data collected by the fence line monitoring stations. This data shall include time-synchronized concentration data and meteorological data which shall be presented in contiguous columns on the spreadsheet. The first two columns of each sheet shall be the date and time. In addition, the Air Monitoring Semi-Annual Reports shall include a summary of the internal incident reports described in the previous section of this Appendix and a summary of the response actions, if any, that FHR took as a result of its investigation into an Action Level exceedance.

The Air Monitoring Semi-Annual Reports shall be submitted with the Semi-Annual Reports due under Paragraph 101 of the Decree. The Air Monitoring Semi-Annual Report shall be certified in accordance with Paragraph 107 of the Consent Decree.

FHR shall post the Air Monitoring Semi-Annual Reports on the Internet, with confidential information redacted, at the same time as submission to the EPA.

On a calendar week basis, FHR shall post to a publicly available internet site the data collected by the fence line monitoring stations for the prior week. FHR shall post this data for each calendar week no later than the last day of the following calendar week. The data shall be presented in a form that allows benzene and 1,3 butadiene concentrations, wind speed, and wind direction to be viewed concurrently (*i.e.* in a tabular format). This data shall be

APPENDIX 5.1

preliminary and subject to change upon completion of a Quality Assurance/Quality Control (QA/QC) check.

On a monthly basis, based upon a QA/QC check, FHR shall revise, if and as necessary, the preliminary fence line monitoring data described above. The revised data shall be posted no later than the last day of the month following the month that the data covers.

FHR shall comply with all terms of this Appendix for a period of two years starting with the Date of Entry.

UNITED STATES
v.
FLINT HILLS RESOURCES PORT ARTHUR, LLC

APPENDICES TO CONSENT DECREE

APPENDIX 6.1

MARCH 2009 COMPLIANCE AGREEMENT BETWEEN THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY AND FLINT HILLS RESOURCES

Texas Commission on Environmental Quality

COMPLIANCE AGREEMENT

Flint Hills Resources, LP, Port Arthur Chemicals Facility
RN100217389
Jefferson County, Texas

The Texas Commission on Environmental Quality (the "Commission" or "TCEQ") is the state agency charged with enforcing the TEX. HEALTH & SAFETY CODE and TEX. WATER CODE.

Flint Hills Resources, LP, Port Arthur Chemicals Facility ("FHR") is an ethylene and propylene manufacturing facility located at 4241 Savannah Avenue, Port Arthur, Jefferson County, Texas.

FHR has voluntarily disclosed violations of the Commission's regulations pertaining to air emissions. The disclosure was made as a result of a voluntary compliance audit performed by FHR pursuant to the Texas Environmental, Health, and Safety Audit Privilege Act ("Audit Act"). Tex. Rev. Civ. Stat. Ann. art. 4447cc (Vernon's). Notification of FHR's intent to perform the compliance audit was made via facsimile and certified mail on November 2, 2007 of the intent to commence an audit on November 5, 2007. FHR purchased the Port Arthur Chemicals Facility from the Huntsman Petrochemical Corporation in an asset purchase on November 5, 2007. A disclosure was made via certified mail dated April 30, 2008, and a response to comments received from TCEQ was provided on June 30, 2008.

According to FHR's voluntary disclosure statement, the following violations were discovered:

No.	Audit Finding	Associated Rule or Permit Provision
1	4 open-ended lines were found without control by cap, plug or blind, or double block valves.	40 Code of Federal Regulations (CFR) § 63.1033(b) 40 CFR § 63.167(a) 40 CFR § 60.482-6(a) 30 Tex. Admin Code (TAC) § 115.352 (4)
2	5 valves were found without tags that appear to have been overlooked from the leak detection and repair (LDAR) inventory.	40 CFR § 63.1019 40 CFR § 63.1025(b) 40 CFR § 63.160(a) 40 CFR § 63.168(b) 30 TAC § 115.352
3	21P-104 was documented as a sensory leaker on December 9, 2007 by operations. The leak was not documented in the LDAR database and delay of repair (DOR) paperwork was not completed (with reason of isolated from service) before the 15-day deadline.	30 TAC § 115.356(E)(i), (ii) 30 TAC § 115.352(2)(A) and (3) 40 CFR § 63.1026 40 CFR § 63.1038(b)(7)

No.	Audit Finding	Associated Rule or Permit Provision
4	Points of generation for commingled waste streams have been grouped for total annual benzene (TAB) reporting purposes. However, flow and determination of benzene quantity should be reported for each point of generation. Also, drain system and closed vent system monitoring needs to be implemented at the initial point of generation, not downstream.	40 CFR § 61.355(c)(1)(i)
5	Material sent off-site for recycling has not been included in TAB (candidates include spent carbon and used oil).	40 CFR § 61.355(a)
6	Prior sampling for determination of benzene content has not included each phase in multi-phase waste streams. (Only water has been analyzed). Similarly, oil streams are not all accounted for as part of TAB.	40 CFR § 61.355(c)(1)(v)
7	The Title V permit has not been updated to reflect the wastewater applicability determinations that the site is currently operating under. For example, Light Olefins Unit (LOU) stripper as in process, Hazardous Organics NESHAP (HON) and Ethylene Maximum Achievable Control Technology (MACT) overlap with NESHAP FF, storage tank changes of service/applicability.	30 TAC § 122.210(a)
8	Certification statement in quarterly NESHAP FF report does not include affirmation of less than 10 parts per million by weight (ppmw) treatment standard, although the samples reflect less than 10 ppmw.	40 CFR § 61.357(d)(7)(i)
9	NESHAP FF off-site waste notification is not provided with each waste shipment. It is included in the waste profile which is provided one time in advance of shipment.	40 CFR § 61.342(f)(2)
10	Ethylene MACT off-site waste notifications have not been completed.	40 CFR § 63.1096
11	Maintenance wash pad is not included in the TAB and may need to be considered as uncontrolled for purposes of 2 megagram (Mg) exemption.	40 CFR § 61.355(a)

No.	Audit Finding	Associated Rule or Permit Provision
12	No detectible emissions (NDE) monitoring is not conducted for spent carbon supersacks, Frac tanks and vacuum trucks, which are considered containers under Subpart FF.	40 CFR § 61.345(a)(1)(i)
13	The team is comfortable with site's use of HON control requirements to supersede NESHAP FF controls on equipment receiving HON streams; however, this does not allow grouping of all waste streams (including streams not flowing from HON units) for Point of Generation/Determination and reporting purposes.	40 CFR § 63.110(e) 40 CFR § 63.1100(g) 40 CFR § 61.355(a) & (b) 40 CFR § 61.357(d)(2)
14	The team observed bypass lines that were not locked or car sealed closed in the closed vent system for the wastewater stripper unit flare knockout drum.	40 CFR § 61.349(a)(1)(ii) 40 CFR § 63.148(f)
15	The team observed inconsistency in the field tagging and absence of tags in wastewater drain systems and closed vent systems that made it difficult to verify which regulations govern a stream and that fugitive monitoring has been conducted for each stream as required. For example, spot checks of untagged components near the LOU flare knockout pot drain systems could not be identified in the LDAR Database as having been monitored.	40 CFR § 61.346(a)(1)(i)(A) 40 CFR § 61.349(a)(1)(i) 40 CFR § 63.148(f)
16	The roof on the American Petroleum Institute (API) separator has a history of recurring leaks. The roof is vented to a vapor recovery system; however, the leaks that are measured indicate that there are gases from the roof that are not being controlled such that the true partial pressure of the Volatile Organic Compound in those gasses is less than 0.5 psia.	30 TAC § 115.132(a)(3)
17	There are compliance gaps in regulatory applicability because of overlap in regulatory applicability and site practices. Examples include: -Unsafe to monitor and difficult to monitor provisions do not exist for audio/visual/olfactory (AVO) inspection of closed vent systems. -Use of instrument monitoring in lieu of visuals for drains is not sufficient to meet all requirements.	40 CFR § 61.356(g) 40 CFR § 63.110

The Executive Director recognizes that FHR has submitted prompt disclosures and updates and that violation numbers 1, 2, 3, 5, 8, 9, 10, 11, and 12 have been addressed through satisfactory corrective actions.

In response to the voluntary self-disclosure and in an effort to ensure that appropriate efforts to achieve compliance are initiated, pursued with due diligence, and completed within a reasonable time for violation numbers 4, 6, 7, 13, 14, 15, 16, and 17, FHR and the Commission have entered into a Compliance Agreement ("CA"). The provisions of this Agreement are as follows:

1. Respond completely and adequately, as determined by the TCEQ, to all requests for information concerning the "Disclosure of Violation" within 30 days after the date of such requests, or by any other deadline specified in writing.

2. Submit, to the TCEQ Enforcement Division's audit program, quarterly updates of the progress made toward closure of violation numbers 4, 6, 13, 14, 15, 16, and 17. Updates shall be provided within 30 days following the end of each calendar quarter, beginning with the first calendar quarter during which this CA is entered.

3. Submit, to the TCEQ Enforcement Division's audit program, quarterly status updates for permit number O-1317, violation number 7, and send a confirmation letter to the audit program once FHR has received permit issuance confirmation from the Air Permits Division.

4. On or before March 31, 2009, FHR shall submit a proposed regulatory applicability determination to the TCEQ central office for the API separator-related to violation number 16.

5. On or before May 31, 2009, for HON and BWON overlap-related violation numbers 14, 15, and 17, FHR shall:

    a. Conduct a survey of potential bypass lines for closed vent systems associated with HON or BWON process areas.
    b. Conduct a survey of field tagging of wastewater drain systems and closed vent systems to verify which regulations govern each stream so that fugitive monitoring may be conducted as required.
    c. Develop a plan for addressing identified areas of regulatory overlap.

6. On or before August 31, 2009, for Benzene Waste NESHAP (BWON)-related violation numbers 4, 6, 13 and 16, FHR shall:

    a. Complete its identification and begin monitoring existing drain and closed vent BWON streams.
    b. Complete its identification of points of generation for each BWON stream and develop a site sampling strategy sufficient to complete the 2008 Total Annual Benzene ("TAB") report due August 31, 2009.
    c. Complete representative sampling of BWON streams.
    d. Include each phase in multi-phase waste streams in determination of benzene content.
    e. Implement stream tracking systems whereby FHR can certify the TAB report and 2 Mg exemption totals starting in 2008 (TAB report due August 31, 2009).
    f. Submit the 2008 TAB report. This report will be certified, provided that FHR has restarted from its current shutdown by April 1, 2009, without upsets that would impede FHR's ability to capture samples representative of BWON streams. In the event that FHR has not restarted by April 1, 2009, without upsets that would impede FHR's ability to capture samples representative of BWON streams, FHR shall:
        i. Notify TCEQ of these events on or before April 1, 2009;
        ii. Submit its 2008 TAB report to the best of its knowledge;

iii. Submit its 2009 TAB report with a certification on or before August 31, 2010.

g. Complete identification and tagging of components to be included in the FHR Facility's LDAR program within Benzene Waste Management Units.

h. Submit written confirmation to the TCEQ Enforcement Division, Audit Program indicating that the regulatory applicability determination related to violation number 16 has been implemented, or notify the Audit Program in writing that FHR received a contrary determination and include in your response a proposed compliance schedule.

7. By October 1, 2009, FHR shall submit, in writing, verification of compliance with Provision Numbers 1– 6 to:

Mr. Kent Heath, Audit Coordinator
Enforcement Division, MC 219
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

With a copy to:

Ms. Georgie Volz, Regional Director
Texas Commission on Environmental Quality
Region 10
3870 Eastex Freeway, Suite 110
Beaumont, Texas 77703

Should unforeseen future circumstances indicate a need to alter the above mentioned schedule, FHR shall immediately notify the Commission so that an amendment can be discussed.

The effective date of this agreement is the signature date of FHR's authorized representative. Acceptance of the terms of this agreement is indicated by the signatures below.

Signature — Date: 3/19/09

KEVIN RADKE
Name (Printed or typed)
Authorized Representative of
Flint Hills Resources, LP

Bryan Sinclair, Director — Date: 3/2/09
Enforcement Division
Texas Commission on Environmental Quality

Instructions: Send this signed, original Compliance Agreement to Mr. Kent Heath, Coordinator, Enforcement Division, MC 219, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087. Please keep a copy for your records.