IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF LOUISIANA

UNITED STATES OF AMERICA, THE COMMONWEALTH OF KENTUCKY DEPARTMENT FOR ENVIRONMENTAL PROTECTION, AND THE LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY,	
Plaintiffs,	**Civil Action No. 2:22-cv-01577**
v.	**Judge**
WESTLAKE CHEMICAL OPCO LP, WESTLAKE PETROCHEMICALS LLC, WESTLAKE POLYMERS LLC, WESTLAKE STYRENE LLC, and WESTLAKE VINYLS, INC.,	**Magistrate**
Defendants.	

NOTICE OF LODGING OF CONSENT DECREE PENDING SOLICITATION OF PUBLIC COMMENT

Plaintiffs, the United States of America, by and through the authority of the Attorney General of the United States and through the undersigned attorneys and acting at the request of the Administrator of the United States Environmental Protection Agency ("EPA"), the Commonwealth of Kentucky Department for Environmental Protection (the "KDEP"), and the Louisiana Department of Environment Quality (the "LDEQ"), provide notice that the attached proposed Consent Decree submitted herewith is hereby lodged with the Court pending solicitation of public comment by Plaintiffs. The proposed Consent Decree would, if entered by the Court, resolve the Plaintiffs' claims in this case. **As explained below, at this time Plaintiffs respectfully request that the Court not sign the proposed Consent Decree unless and until Plaintiffs file a Motion for Entry.**

Before the proposed Consent Decree can be finalized, the United States must satisfy requirements regarding public comment. Paragraph 121 of the proposed Consent Decree provides that 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. The U.S. Department of Justice will publish in the Federal Register a notice that the proposed Consent Decree has been lodged with the Court and soliciting public comment for a period of thirty (30) days. After the close of the comment period, the United States will evaluate any comments received, determine whether any comments disclose facts or considerations which indicate that the proposed Consent Decree is inappropriate, inadequate, or improper, and in concurrence with the LDEQ and KDEP, advise the Court whether the proposed Consent Decree should be entered.

Paragraph 122 of the proposed Consent Decree provides that the LDEQ and KDEP reserve the right to withdraw or withhold their consent if the comments regarding the Consent Decree disclose facts or considerations indicating that this Consent Decree is inappropriate, improper, or inadequate. The LDEQ will publish a notice of this Consent Decree in the newspaper of general circulation and the official journal of the parish in which the Lake Charles Plants are located, in order to provide for public comment for a period of not less than forty-five (45) days. Similarly, the KDEP will publish notice of this Consent Decree in the newspaper of general circulation and the official journal of the county in which the Calvert City plant is located, in order to provide for public comment for a period of not less than thirty (30) days. After the close of the comment periods, the LDEQ and KDEP will evaluate any comments received, determine whether any comments disclose facts or considerations which indicate that

the proposed Consent Decree is inappropriate, inadequate, or improper, and in concurrence with the United States, advise the Court whether the proposed Consent Decree should be entered.

Until such time that the three public comment periods have lapsed, and any comments received addressed, the Plaintiffs respectfully requests that the Court not sign the proposed Consent Decree.

Respectfully submitted,

TODD KIM
Assistant Attorney General
Environment and Natural Resources Division

s/ Thomas P. Carroll

Trial Attorney:
THOMAS P. CARROLL
District of Columbia Bar No. 388593
Assistant Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, DC 20044-7611
202-514-1134 (Phone)
202-616-6584 (Fax)
thomas.carroll@usdoj.gov

BRANDON B. BROWN
United States Attorney
Western District of Louisiana

Local of Counsel:
DESIREE C. WILLIAMS (#30978)
Assistant United States Attorney
800 Lafayette Street, Suite 2200
Lafayette, Louisiana 70501
Telephone: (337) 262-6618
Facsimile: (337) 262-6682
Email: desiree.williams@usdoj.gov

OF COUNSEL:
Robert Parrish, Attorney-Advisor
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., N.W. (2242A)
Washington, D.C. 20460

ATTORNEYS FOR THE UNITED STATES

FOR THE KENTUCKY DEPARTMENT FOR ENVIRONMENTAL PROTECTION

s/ Christopher Fitzpatrick
CHRISTOPHER FITZPATRICK, General Counsel
(Ky. Bar # 82179)
Department for Environmental Protection
Office of Legal Services
Commonwealth of Kentucky
Energy and Environment Cabinet
300 Sower Boulevard
Frankfort, Kentucky 40601

FOR THE LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

s/ Dwana King
BRANDON WILLIAMS, Trial Attorney (La. Bar #27139)
DWANA KING, Deputy General Counsel
(La. Bar # 20590)
Office of the Secretary, Legal Affairs Division
Louisiana Department of Environmental Quality
P.O. Box 4302
Baton Rouge, Louisiana 70821-4302
Dwana.King@La.Gov
Brandon.Williams@La.Gov

CERTIFICATE OF SERVICE

I hereby certify that on June 9, 2022, a copy of the foregoing "Notice of Lodging of Consent Decree Pending Solicitation of Public Comment" was filed electronically with the Clerk of Court using the CM/ECF system. I also certify that I have served this filing to counsel for Defendant, by U.S. mail, postage prepaid:

Madeleine Boyer, Esq.
Beveridge & Diamond
400 W. 15th Street, Suite 1410
Austin, Texas 78701-1648

Robert Brager, Esq.
Beveridge & Diamond
201 North Charles Street, Suite 2210
Baltimore, Maryland 21201-4150

s/ Thomas P. Carroll

THOMAS P. CARROLL
District of Columbia Bar No. 388593
Assistant Section Chief
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, DC 20044-7611
Tel: 202-514-4051
thomas.carroll@usdoj.gov

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT LOUISIANA

UNITED STATES OF AMERICA, THE COMMONWEALTH OF KENTUCKY DEPARTMENT FOR ENVIRONMENTAL PROTECTION, AND THE LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY, Plaintiffs, v. WESTLAKE CHEMICAL OPCO LP, WESTLAKE PETROCHEMICALS LLC, WESTLAKE POLYMERS LLC, WESTLAKE STYRENE LLC, and WESTLAKE VINYLS, INC., Defendants.	Civil Action No. Judge Magistrate

CONSENT DECREE

TABLE OF CONTENTS

TABLES OF APPENDICES

Table 1:

Table 2

WHEREAS, concurrently with the lodging of this Consent Decree, Plaintiffs, the United States of America ("United States"), on behalf of the United States Environmental Protection Agency ("EPA"), the Commonwealth of Kentucky Department for Environmental Protection ("KDEP"), and the Louisiana Department of Environmental Quality ("LDEQ"), have filed a Complaint (the "Complaint") in this action seeking injunctive relief and civil penalties from the Defendants, Westlake Chemical OpCo LP, Westlake Petrochemicals LLC, Westlake Polymers LLC, Westlake Styrene LLC, and Westlake Vinyls, Inc., for alleged violations of the Clean Air Act (the "CAA"), 42 U.S.C. §§ 7401 *et seq.*, with respect to emissions of volatile organic compounds ("VOCs"), hazardous air pollutants ("HAPs"), and other pollutants at the Defendants' chemical manufacturing plants located in or near Calvert City, Kentucky (the "Calvert City Plant") and Lake Charles, Louisiana (the "Lake Charles Plants");

WHEREAS, Co-Plaintiff the LDEQ also seeks injunctive relief and civil penalties from Defendants at the Lake Charles Plants for alleged violations of the Louisiana Environmental Quality Act ("LEQA"), La. R.S. 30:2001 *et seq*.;

WHEREAS, Co-Plaintiff the KDEP also seeks injunctive relief and civil penalties from Defendants at the Calvert City Plant for alleged violations of the Kentucky Revised Statutes ("KRS") Chapter 224 and the regulations promulgated pursuant thereto;

WHEREAS, Defendants own and/or operate the Calvert City Plant and the Lake Charles Plants (collectively, the "Covered Plants"), including the Air-Assisted, Steam-Assisted, and Unassisted industrial Flares used at those plants to control emissions of air pollutants generated by the manufacturing processes;

WHEREAS, the Complaint alleges that these failures violated one or more of the following federal CAA requirements, as well as of one or more of the following Kentucky and/or Louisiana state air pollution requirements:

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(i) – 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 New Source Performance Standards ("NSPS") promulgated at 40 C.F.R. Part 60, Subpart A, pursuant to Section 111 of the CAA, 42 U.S.C. § 7411;

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

e. The Title V requirements 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);

f. The federally enforceable Kentucky and Louisiana state implementation plan ("SIP") provisions that incorporate, adopt, and/or implement the federal requirements listed in a–e;

g. Additional federally enforceable Kentucky and Louisiana SIP regulations; and

h. The portions of the Title V Permits for the Calvert City and Lake Charles Plants that adopt, incorporate, or implement the provisions cited in a–g.

WHEREAS, Defendants have commenced implementation of corrective measures at the Covered Plants to resolve the violations described above, and will continue these actions;

WHEREAS, by entering into this Consent Decree, Defendants are committing to undertake further projects at the Covered Plants intended to: (i) assure compliance with the requirements of the CAA and the requirements of Kentucky's and Louisiana's air pollution

control laws that were allegedly violated at the Covered Plants, (ii) reduce emissions of air pollutants from the Covered Plants, and (iii) protect public health, welfare, and the environment;

WHEREAS, as more specifically described in Paragraph 39.b and Appendix 1.9, Defendants have implemented a project that routes hydrogen-rich gas streams from the Petro 1 Flare and Petro 2 Flare at the Lake Charles Petro Plant to an on-site hydrogen recovery plant, and have agreed to implement a project to route hydrogen-rich gas streams around the flare gas recovery system ("FGRS");

WHEREAS, as more specifically described in Section V (Compliance Requirements), Defendants have agreed to install and operate monitoring equipment and control technology at the eight Flares covered by this Consent Decree ("Covered Flares") that will ensure proper Combustion Efficiency at the Covered Flares;

WHEREAS, as more specifically described in Section V (Compliance Requirements), Defendants have agreed to install and operate a FGRS at the Calvert City Plant and at the Lake Charles Petro Plant for the purposes of reducing and recovering Waste Gas;

WHEREAS, as more specifically described in Section V (Compliance Requirements) and Appendix 2.1., Defendants have agreed to fenceline monitoring projects at the Lake Charles Petro Plant and the Calvert City Plant;

WHEREAS, Defendants estimate that implementing the Consent Decree's compliance requirements will cost approximately $110 million;

WHEREAS, Defendants estimate that the fenceline monitoring projects required pursuant to Section V.F of this Decree will cost up to $500,000;

WHEREAS, between January 18, 2018, and full implementation of the Consent Decree's compliance requirements, the EPA estimates that emissions from the Covered Flares will be reduced by approximately the following amounts (in tons per year or "TPY"):

Pollutant	Amount in TPY (2018 – through implementation)
VOCs	2,258
HAPs	65
Green House Gas ("CO_2e")	50,733
Nitrogen Oxides ("NOx")	14

WHEREAS, implementing the Consent Decree's compliance requirements will also reduce emissions of carbon monoxide ("CO") from the Covered Flares;

WHEREAS, the United States, the KDEP, and the LDEQ anticipate 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 those resolved through Section XIII (Effect of Settlement);

WHEREAS, the Defendants deny they have violated or continue to violate any of the statutory and regulatory requirements set forth in the preceding "whereas" clauses and deny any liability to the United States, to the KDEP for the Calvert City Plant, and to the LDEQ for the Lake Charles Plants arising out of the occurrences alleged in the Complaint; and

WHEREAS, the Parties recognize, and the 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, and Section 113(b) of the CAA, 42 U.S.C. § 7413(b). This Court has personal jurisdiction over Westlake Chemical OpCo LP, Westlake Petrochemicals LLC, Westlake Polymers LLC, and Westlake Styrene LLC because they are located and do business within the jurisdictional boundaries for the United States District Court for the Western District of Louisiana, as established under 28 U.S.C. § 98. This Court has supplemental jurisdiction over the state law claims asserted by the KDEP and the LDEQ pursuant to 28 U.S.C. § 1367. 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 it is the judicial district in which Westlake Chemical OpCo LP, Westlake Petrochemicals LLC, Westlake Polymers LLC, and Westlake Styrene LLC are located, are doing business, and in which a substantial part of the alleged violations occurred. For purposes of this Consent Decree, Defendants consent to: a) this Court's subject matter jurisdiction over this Consent Decree and any action to enforce this Consent Decree; b) this Court's personal jurisdiction over them; and c) venue in this judicial district.

2. For purposes of this Consent Decree, the Defendants agree that the claims alleged in the Complaint are all claims upon which relief may be granted pursuant to the CAA and/or pursuant to Kentucky or Louisiana state law.

3. Notice of the commencement of this action has been given to the KDEP and the LDEQ in accordance with Section 113(b) of the CAA, 42 U.S.C. § 7413(b).

II. APPLICABILITY

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

5. At least 60 Days before a transfer of the ownership or operation of any of the Covered Plants or Covered Flares, the Applicable Defendant(s) must provide a copy of this Consent Decree to the proposed transferee(s). At least 30 Days before any such transfer, the Applicable Defendant(s) must provide written notice of the prospective transfer to the EPA and the United States, in accordance with Section XVI (Notices). For transfers of the Lake Charles Plant(s) or of the Covered Flares located at those plants, at least 30 Days before such transfer, the Applicable Defendant(s) must also provide written notice of the prospective transfer to the LDEQ in accordance with Section XVI (Notices). For transfers of the Calvert City Plant or of the Covered Flares located at that plant, at least 30 Days before such transfer, the Applicable Defendant must also provide written notice of the prospective transfer to the KDEP in accordance with Section XVI (Notices). Any attempt to transfer ownership or operation of any of the Covered Plants or Covered Flares without complying with this Paragraph constitutes a violation of this Decree.

6. If an Applicable Defendant intends to request that the United States agree to a transferee's assumption of any obligations of the Consent Decree, the Applicable Defendant(s) must condition the transfer of the Covered Plant(s) or Covered Flare(s) upon the transferee's written agreement to execute a modification to the Consent Decree that makes the terms and

conditions of the Consent Decree applicable to, binding upon, and enforceable against the transferee.

7. As soon as possible before the transfer, the Applicable Defendant(s) must: (i) notify the United States, the KDEP for the Calvert City Plant, and the LDEQ for the Lake Charles Plants of the proposed transfer and of the specific Consent Decree provisions that the Applicable Defendant(s) propose the transferee assume; (ii) certify that the transferee is contractually bound to assume the ongoing compliance requirements and obligations of this Consent Decree; and (iii) require the transferee to submit to the United States both a certification that the transferee has the financial and technical ability to assume the ongoing compliance requirements and obligations of this Consent Decree and a certification that the transferee is contractually bound to assume the ongoing compliance requirements and obligations of this Consent Decree.

8. After submitting to the United States, the KDEP (for the Calvert City Plant), and the LDEQ (for the Lake Charles Plants), the notice and certification required by the previous Paragraph, either: (i) the United States will notify the Applicable Defendant 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, the Applicable Defendant, and the transferee must file with the Court a joint motion requesting the Court approve a modification substituting the transferee for the Applicable Defendant as the defendant responsible for complying with the terms and conditions of the Consent Decree that the Applicable Defendant intends the transferee to assume.

9. If an Applicable Defendant does not secure the agreement of the United States to a joint motion to modify the Consent Decree within a reasonable period of time, then the

Applicable Defendant(s) 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 the Applicable Defendant(s) as the defendant responsible for complying with the terms and conditions of the Consent Decree that the transferee intends to assume. The United States may file an opposition to the motion. The motion to modify must be granted unless the Applicable Defendant(s) and the transferee: (i) fail to show that the transferee has the financial and technical ability to assume the ongoing compliance requirements and obligations of the Consent Decree; (ii) fail to show that the modification language effectively transfers the ongoing compliance requirements and obligations to the transferee; or (iii) the Court finds other good cause for denying the motion.

10. The Applicable Defendant(s) must provide a copy of this Consent Decree to all officers whose duties might reasonably include compliance with any provision of this Decree. For all employees whose duties might reasonably include compliance with any provision of this Decree, as well as for any contractor or agent retained to perform work required under this Consent Decree, the Applicable Defendant(s) must provide a copy of the portions of this Consent Decree that are applicable to the employee's duties or to the contractor or agent's work. The Applicable Defendant(s) must condition any such contract upon performance of the work in conformity with the terms of this Consent Decree.

11. In any action to enforce this Consent Decree, the Applicable Defendant(s) must 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.

III. DEFINITIONS

12. Terms used in this Consent Decree that are defined in the CAA or in federal or state regulations promulgated pursuant to the CAA will have the meanings 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 Consent Decree, the following definitions apply:

a. "Applicable Defendant" means
   (1) with respect to the Co-Products Flare, Westlake Chemical OpCo LP and Westlake Styrene LLC;
   (2) with respect to the Petro 1 Flare and Petro 2 Flare, Westlake Chemical OpCo LP;
   (3) with respect to the Poly 1 Flare and Poly 2 Flare, Westlake Polymers LLC;
   (4) with respect to the Styrene Flare, Westlake Styrene LLC;
   (5) with respect to the Poly 3 LP Flare, Westlake Petrochemicals LLC;
   (6) with respect to the Ethylene Flare, Westlake Chemical OpCo LP; and
   (7) with respect to the Vinyls Flare, Westlake Vinyls, Inc.

b. "Ambient Air" means that portion of the atmosphere, external to buildings, to which persons have access.

c. "Assist Air" means all air that is intentionally introduced before or at a Flare tip through nozzles or other hardware conveyance for the purposes of, including, but not limited to, protecting the design of the Flare tip, promoting turbulence for mixing, or inducing air into the flame. Assist Air includes Premix Assist Air and Perimeter Assist Air. Assist Air does not include Ambient Air. Flares that use Assist Air are referred to in this Consent Decree as "Air-Assisted Flares."

d. "Assist Steam" means all steam that is intentionally introduced before or at a Flare tip through nozzles or other hardware conveyance for the purposes of, including, but not limited to, protecting the design of the Flare tip, promoting turbulence for mixing, or inducing air into the flame. Assist Steam includes, but is not necessarily limited to, center steam, lower steam, and upper steam.

e. "Available for Operation" means, with respect to a Compressor within a FGRS, 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 a Compressor to Operate arises. The period of time, not to exceed one hour, allowed by this definition for the startup of a Compressor will be included in the amount of time that a Compressor is Available for Operation. The periods provided for in sub-

Paragraphs 39.d (Maintenance of FGRS) and 39.e (Shut Down) may be included in the amount of time that the Compressors are Available for Operation.

f. "Baseload Waste Gas Flow Rate" means, for a particular Covered Flare, the daily average flow rate, in scfd, to the Flare, excluding all flows during periods of startup, shutdown, and Malfunction. The flow rate data period that must be used to determine Baseload Waste Gas Flow Rate is set forth in sub-Paragraph 30.a(2).

g. "BTU/scf" means British Thermal Unit per standard cubic foot.

h. "Calvert City Plant" means the petrochemical manufacturing plant owned and operated by Westlake Vinyls, Inc. and Westlake Chemical OpCo LP, located at 2468 Industrial Parkway, Calvert City, Kentucky 42029.

i. "Calvert City Flares" means the Steam-Assisted Ethylene Flare and the Unassisted Vinyls Flare at the Calvert City Plant.

j. "Capable of Receiving Sweep, Supplemental, and/or Waste Gas" means, for a Flare, that the flow of Sweep, Supplemental, and/or Waste Gas is/are not prevented from being directed to the Flare by means of an isolation device such as closed valves, blinds, or stopples.

k. "Combustion Efficiency" or "CE" means a Flare's efficiency in converting the organic carbon compounds found in Vent Gas to carbon dioxide. Combustion Efficiency must be determined in accordance with the NHV_{cz} calculations in Appendix 1.2.

l. "Combustion Zone" means the area of the Flare flame where the Combustion Zone Gas combines for combustion.

m. "Combustion Zone Gas" means all gases and vapors found after the Flare tip. This gas includes all Vent Gas, Pilot Gas, Total Steam, and Assist Air.

n. "Complaint" means the complaint filed by the United States, the KDEP, and the LDEQ in this action.

o. "Compressor" means, with respect to a FGRS, a mechanical device designed and installed to recover gas from a flare header. Types of FGRS compressors include reciprocating compressors, centrifugal compressors, liquid ring compressors and liquid jet ejectors.

p. "Consent Decree" or "Decree" means this Consent Decree, including any and all appendices attached hereto.

q. "Covered Air-Assisted Flares" means each of the following Flares, as well as any Air-Assisted Portable Flare in use at a Covered Plant:

- the Poly 3 LP Flare located at the Lake Charles Petro Plant at the Poly 3 Unit; and
- the Co-Products Flare located at the Lake Charles Petro Plant at the Co-Products Unit.

r. "Covered Plant" or "Covered Plants" means each of the following plants:

- the Calvert City Plant, and
- the Lake Charles Plants.

s. "Covered Flare" or "Covered Flares" means each of the following Flares, as well as any Newly Installed Covered Flare or Portable Flare in use at a Covered Plant, provided however that once a Covered Flare is permanently taken out of service after the Effective Date and that change is reported in the subsequent Semi-Annual Report, that Flare is no longer a Covered Flare:

- the Calvert City Flares, and
- the Lake Charles Flares.

t. "Covered Steam-Assisted Flares" means Flares:

- At the Lake Charles Plants, the Petro 1, Petro 2, Poly 1 and 2, and Styrene Flares;
- At the Calvert City Plant, the Ethylene Flare; and
- Any Steam-Assisted Portable Flare in use at a Covered Plant.

u. "Date of Lodging" means the date this Consent Decree is filed for lodging with the Clerk of the Court for the United States District Court for the Western District of Louisiana.

v. "Day" means a calendar day unless expressly stated to be a business day. In computing any period of time for a compliance deadline under this Consent Decree (*e.g.*, a deadline for installing a FGRS or submitting a Waste Gas Minimization Plan ("WGMP"), where the last day would fall on a Saturday, Sunday, or federal holiday, the period will run until the close of business of the next business day.

w. "Defendants" means Westlake Chemical OpCo LP, Westlake Petrochemicals LLC, Westlake Polymers LLC, Westlake Styrene LLC, and Westlake Vinyls, Inc.

x. "Design Capacity" means, with respect to a FGRS, the capacity, in mscf per Day, of the installed flare gas recovery Compressor, excluding the capacity of any installed Duplicate Spare Compressor or warehouse spare Compressor.

y. "Duplicate Spare Compressor" means, with respect to a Flare Gas Recovery System, an installed Compressor, designed to be identical or functionally equivalent

to the other Compressor of the FGRS. In order to qualify as a "Duplicate Spare Compressor," the Compressor must be functionally interchangeable with the other FGRS Compressor such that the Design Capacity of the FGRS is Available for Operation while the other Compressor of the FGRS is out of service.

z. "Effective Date" shall have the definition provided in Section XVII.

aa. "EPA" means the United States Environmental Protection Agency and any of its successor departments or agencies.

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

cc. "First Updated Waste Gas Minimization Plan" or "First Updated WGMP" means the document submitted pursuant to Paragraph 31 as the first update to the Initial WGMP.

dd. "Flare" means a combustion device lacking an enclosed combustion chamber that uses an uncontrolled volume of Ambient Air to burn gases.

ee. "Flare Gas Recovery System" or "FGRS" means 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.

ff. "Flare Tip Velocity" or "V_{tip}" means the velocity of gases exiting the Flare tip as defined in Paragraph 41.

gg. "Initial Waste Gas Minimization Plan" or "Initial WGMP" means the document submitted pursuant to Paragraph 30.

hh. "In Operation" or "Being In Operation" or "Operating," with respect to a Flare, means any and all times that Sweep, Supplemental, and/or Waste Gas 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 an isolation device, such as closed valves, blinds and/or stopples.

ii. "KDEP" means the Kentucky Department for Environmental Protection and any of its successor departments or agencies.

jj. "KSCFH" or "kscfh" means thousand standard cubic feet per hour.

kk. "Lake Charles Petro Plant" means the petrochemical manufacturing plant (including the Co-Products Unit, Petro 1 Unit, Petro 2 Unit, Poly 3 Unit, and Styrene Unit) owned and operated by Westlake Chemical OpCo LP, Westlake Petrochemicals LLC, and Westlake Styrene LLC and located at 900 Highway 108, Sulfur, Louisiana 70665.

ll. "Lake Charles Plants" means, collectively, the Lake Charles Poly Plant and the Lake Charles Petro Plant.

mm. "Lake Charles Poly Plant" means the petrochemical manufacturing plant (including the Poly 1 Unit and Poly 2 Unit) owned and operated by Westlake Polymers LLC and located at 3525 Cities Service Hwy, Sulphur, Louisiana, 70665.

nn. "Lake Charles Flares" mean, collectively:

(1) the following four Steam-Assisted Flares:

- Petro 1 Flare, located at the Lake Charles Petro Plant at the Petro 1 Unit;
- Petro 2 Flare located at the Lake Charles Petro Plant at the Petro 2 Unit;
- Poly 1 & 2 Flare, located at the Lake Charles Poly Plant at the Poly 1 and Poly 2 Units; and
- Styrene Flare, located at the Lake Charles Petro Plant at the Styrene Unit; and

(2) the following two Air-Assisted Flares:

- Poly 3 LP Flare, located at the Lake Charles Petro Plant at the Poly 3 Unit; and
- Co-Products Flare, located at the Lake Charles Petro Plant at the Co-Products Unit.

oo. "LDEQ" means the Louisiana Department of Environmental Quality and any of its successor departments or agencies.

pp. "Malfunction" means, as specified in 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 operation are not Malfunctions." In any dispute under this Consent Decree involving this definition, the Applicable Defendant has the burden of proving all of the following:

(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 used, 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) 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;

(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.

qq. "Need for a Compressor to Operate" means that Potentially Recoverable Gas (determined on a fifteen-minute block average) is flowing to a Covered Flare serviced by the FGRS.

rr. "Net Heating Value" means 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.

ss. "Net Heating Value Analyzers" or "NHV Analyzers" means an instrument capable of measuring the Net Heating Value of Vent Gas in BTU/scf. The sample extraction point of a Net Heating Value Analyzer may be located upstream of the introduction of Supplemental and/or Sweep and/or Purge Gas if the composition and flow rate of any such Supplemental and/or Sweep and/or Purge Gas are known constants or measured and if the constant or measurements are then used in the calculation of the Net Heating Value of the Vent Gas.

tt. "Net Heating Value of Combustion Zone Gas" or "NHV_{cz}" means the Net Heating Value, in BTU/scf, of the Combustion Zone Gas in a Flare. NHV_{cz} must be calculated in accordance with Step 3 of Appendix 1.2.

uu. "Net Heating Value Dilution Parameter" or "NHV_{dil}" means the Net Heating Value, in BTU/ft^2, of the dilution zone gas in a Flare. NHV_{dil} must be calculated in accordance with Step 4 of Appendix 1.2.

vv. "Net Heating Value of Vent Gas" or "NHV_{vg}" means the Net Heating Value, in BTU/scf, of the Vent Gas directed to a Flare. NHV_{vg} must be calculated in accordance with Step 1 of Appendix 1.2.

ww. "Newly Installed Covered Flare(s)" means any Air-Assisted Flare or Steam-Assisted Flare that is permanently installed, receives Waste Gas that has been redirected to it from an existing Covered Flare (existing as of the Effective Date), and commences operation at a Covered Plant after the Effective Date.

xx. "New Source Review" or "NSR" means the PSD and NNSR provisions in Part C and D of Subchapter I of the Clean Air Act, 42 U.S.C. §§ 7470-7492, 7501-7515, the Minor NSR provisions in 42 U.S.C. § 7410(a), applicable federal regulations implementing such provisions of the CAA, and the corresponding provisions of the federally enforceable SIPs for the State of Kentucky and the State of Louisiana.

yy. "Paragraph" means a portion of this Decree identified by an arabic numeral.

zz. "Parties" means the United States, the KDEP, the LDEQ, and the Defendants.

aaa. "Perimeter Assist Air" means the portion of Assist Air introduced at the perimeter of the Flare tip or above the Flare tip. Perimeter Assist Air includes air intentionally entrained in lower and upper steam. Perimeter Assist Air includes all Assist Air except Premix Assist Air.

bbb. "Pilot Gas" means gas introduced into a Flare tip that provides a flame to ignite the Vent Gas.

ccc. "Portable Flare" means a Flare that is not permanently installed and that receives Waste Gas that has been redirected to it from a Covered Flare.

ddd. "Potentially Recoverable Gas" means the Sweep Gas, Supplemental Gas, and/or Waste Gas (including hydrogen, nitrogen, oxygen, carbon dioxide, carbon monoxide, and/or water/steam) directed to a Covered Flare's FGRS. Waste Gas streams generated from the maintenance of the units listed in this definition due to buildup of polymer or oily material and that contain cleaning or neutralizing chemicals that would damage the fuel gas consumers if recovered are not Potentially Recoverable Gas:

(1) At the Lake Charles Petro 2 Flare: Feed Saturator, Wastewater Stripper, Process Water Stripper, Dilution Steam Generator, DOX Media, and Wastewater Steam Stripper Feed/Effluent Exchanger, Depropanizer Column, Debutanizer Column, Caustic Column, Cracked Gas Compressor, Quench System; and

(2) At the Calvert City Ethylene Flare: Quench System, Depropanizer Column, Debutanizer Column, Gas Column, Caustic Column, Cracked Gas Compressors (i.e., Booster Compressor and Feed Gas Compressor).

Regeneration Waste Gas Streams are also not included in the definition of Potentially Recoverable Gas.

eee. "Premix Assist Air" means the portion of Assist Air that is introduced to the Vent Gas, whether injected or induced, before the Flare tip. Premix Assist Air also includes any air intentionally entrained in center steam.

fff. "Prevention Measure" means an instrument, device, piece of equipment, system, process change, physical change to process equipment, procedure, or program to minimize or eliminate flaring.

ggg. "Purge Gas" means the 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.

hhh. "Regeneration Waste Gas Streams" means Waste Gas streams produced during the regeneration of the dryers, reactors, and other vessels at the Covered Plants. Regeneration Waste Gas Streams are high in nitrogen and/or steam and have very low heating value, thus they are not a useful fuel.

iii. "Reportable Flaring Incident" means when Waste Gas equal to or greater than 500,000 scf is flared within a 24-hour period at any Covered Plant. For purposes of

calculating whether the triggering level of Waste Gas flow has been met the following flows may be excluded: i) the pro-rated Baseload Waste Gas Flow Rate (pro-rated on the basis of the duration of the Reportable Flaring Incident); (ii) if a Covered Plant 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 will be considered a single Reportable Flaring Incident. When flaring occurs at more than one Covered Flare, the volume of non-excluded Waste Gas flow at each Covered Flare must be added together unless the root cause(s) of the flaring at each Covered Flare is (are) not related to each other.

jjj. "SCFD" or "scfd" means standard cubic feet per Day.

kkk. "SCFH" or "scfh" means standard cubic feet per hour.

lll. "SCFM" or "scfm" means standard cubic feet per minute.

mmm. "Section" means a portion of this Decree identified by a roman numeral.

nnn. "Smoke Emissions" shall have the definition set forth in Section 3.5 of Method 22 of 40 C.F.R. Part 60, Appendix A ("Method 22"). For purposes of this Consent Decree, Smoke Emissions may be either documented by a video camera or determined by an observer knowledgeable with respect to the general procedures for determining the presence of Smoke Emissions per Method 22.

ooo. "Standard Conditions" means 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 apply.

ppp. "Steam-Assisted Flare" means a Flare that uses steam piped to a Flare tip to assist in combustion.

qqq. "Supplemental Gas" means all gas introduced to a Flare in order to improve the combustible characteristics of the Combustion Zone Gas.

rrr. "Sweep Gas" means:

(1) <u>For a Flare with an FGRS:</u> Gas intentionally introduced into a Flare header system to prevent oxygen buildup in the Flare header. Sweep Gas in these Flares is introduced prior to and recovered by the FGRS; and

(2) <u>For a Flare without an FGRS:</u> Gas intentionally introduced into a Flare header system to maintain a constant flow of gas through the

Flare header and out the Flare tip in order to prevent oxygen building in the Flare header and to prevent infiltration (backflow) into the Flare tip.

sss. "Total Steam" means the total of all steam that is supplied to a Flare and includes, but is not limited to, lower steam, center steam, and upper steam.

ttt. "Turnaround" means a complete shutdown of any emission unit to: (1) perform necessary cleaning, repairs and other maintenance; (2) perform required tests and internal inspections; and/or (3) install any modifications or additions, or make preparations necessary for a future modification or addition.

uuu. "Unassisted Flare" means a Flare that does not use Assist Steam or Assist Air.

vvv. "United States" means the United States of America, acting on behalf of the EPA.

www. "Unobstructed Cross Sectional Area of the Flare Tip" or "$A_{tip\text{-}unob}$" means 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 1.3 together with the equations for calculating the $A_{tip\text{-}unob}$ of these four types.

xxx. "Variable Speed Drive" means a piece of equipment that regulates the speed and rotational force, or torque output, of an electric motor and that outputs a variable frequency to a motor to allow it to operate at variable speeds between the motor's minimum and maximum speed.

yyy. "Variable Speed Motor" means a motor that operates at continuously variable speeds between a minimum and maximum as regulated by a Variable Speed Drive.

zzz. "Vent Gas" means all gas found just before the Flare tip. This gas includes all Waste Gas, that portion of Sweep Gas that is not recovered, Purge Gas, and Supplemental Gas, but does not include Pilot Gas, Total Steam, or Assist Air.

aaaa. "Visible Emissions" means five minutes or more of Smoke Emissions during any two consecutive hours.

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

cccc. "Waste Gas" means the mixture of all gases from plant 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 regarding the combustible characteristics of Combustion Zone Gas; 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. The circumstances in which such exclusions are permitted are specifically identified in Section V (Compliance Requirements). Appendix 1.4 to this Consent Decree depicts the meaning of "Waste Gas," together with its relation to other gases associated with Flares.

IV. CIVIL PENALTY

13. By no later than 30 Days after the Effective Date, the Defendants, jointly and severally, must pay the following amounts as a civil penalty:

a. $562,500 to the United States,

b. $62,500 to the KDEP, and

c. $375,000 to the LDEQ.

14. The Defendants must pay the civil penalty due to the United States by FedWire Electronic Funds Transfer (EFT) to the U.S. Department of Justice account, in accordance with instructions provided to the Defendants by the Financial Litigation Unit ("FLU") of the United States Attorney's Office for the Western District of Louisiana after the Effective Date. The payment instructions provided by the FLU will include a Consolidated Debt Collection System ("CDCS") number, which the Defendants must use to identify all payments required to be made in accordance with this Consent Decree. The FLU will provide the payment instructions to:

William Anamosa
2801 Post Oak Boulevard, Suite 1600
Houston, Texas 77056
713-963-1561
wanamosa@westlake.com

on behalf of the Defendants. The Defendants may change the individual to receive payment instructions on its behalf by providing written notice of such change to the United States and the EPA in accordance with Section XVI (Notices).

15. At the time of payment, the Defendants must send notice that payment has been made: (i) to the United States via email and regular mail in accordance with Section XVI and (ii) to the EPA via email at cinwd_acctsreceivable@epa.gov and regular mail at: EPA Cincinnati Finance Office, 26 W. Martin Luther King Drive, Cincinnati, Ohio 45268. This notice must state that the payment is for the civil penalty owed pursuant to the Consent Decree in *United States, et al. v. Westlake Chemicals OpCo LP, et al.* and must reference the civil action number, CDCS Number, and DOJ case number 90-5-2-1-11287.

16. The Defendants must not deduct any penalties paid under this Decree pursuant to this Section or Section IX (Stipulated Penalties) in calculating their federal, state, or local income tax.

17. Payments to the KDEP and the LDEQ

a. The Defendants must pay the civil penalty due to the KDEP by a cashier's check, certified check, or money order (with the notation "Westlake Flare Combustion Consent Decree" on the instrument of payment) made payable to "Kentucky State Treasurer" and mailed to Director, Division of Enforcement, 300 Sower Boulevard, Frankfort, Kentucky 40601.

b. The Defendants must pay the civil penalty due to the LDEQ by EFT in accordance with instructions to be provided to Defendants by the LDEQ or check made payable to the Louisiana Department of Environmental Quality, referencing this Civil Action, and mailed to: Accountant Administrator, Financial Services Division, LDEQ, P.O. Box 4303, Baton Rouge,

Louisiana 70821-4303. At the time of payment, Westlake shall send notice that payment has been made to LDEQ in accordance with Section XVI (Notices).

V. COMPLIANCE REQUIREMENTS

A. Instrumentation and Monitoring Systems

18. Flare Data and Initial Monitoring Systems Report. For each Covered Flare, by the applicable compliance dates set forth in Appendix 1.1, the Applicable Defendant must submit a report, consistent with the requirements in Appendix 1.5, to the EPA that includes the following:

a. The information, diagrams, and drawings specified in Paragraphs 1–7 of Appendix 1.5;

b. A detailed description of each instrument and piece of monitoring equipment, including the specific model and manufacturer, that the Applicable Defendant has installed or will install in compliance with Paragraphs 20–25 of this Consent Decree (Paragraphs 8–9 of Appendix 1.5); and

c. A narrative description of the monitoring methods and calculations that the Applicable Defendant will use to comply with the requirements of Paragraph 44 (Paragraph 10 of Appendix 1.5).

19. Installation and Operation of Monitoring and Control Systems.

a. By no later than the applicable compliance dates set forth in Appendix 1.1, the Applicable Defendant must install and commence operation of the instrumentation, controls, and monitoring systems set forth in Paragraphs 20–24 at each Covered Flare, except for the Vinyls Flare (which must instead install and commence operation of a Vent Gas flow meter pursuant to Paragraph 20.a and a calorimeter pursuant to Paragraph 24.b), Newly Installed Covered Flares, and Portable Flares.

b. By no later than the date that any Newly Installed Covered Flare or Portable Flare is In Operation and Capable of Receiving Waste, Supplemental, and/or Sweep Gas at a Covered Plant, the Applicable Defendant must complete installation (or have in place) and commence operation of the instrumentation, controls, and monitoring systems set forth in Paragraphs 20–24. The Applicable Defendant must operate the instrumentation, controls, and monitoring systems for each Newly Installed Covered Flare and Portable Flare in accordance with Paragraphs 20–24.

20. Vent Gas, Assist Steam, and Assist Air Monitoring Systems.

a. For each Covered Flare, the Applicable Defendant must install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the volumetric flow rate of Vent Gas in the header or headers feeding that Covered Flare. This system must also be able to continuously analyze pressure and temperature at each point of Vent Gas flow measurement. Different flow monitoring methods may be used to measure different gaseous streams that make up the Vent Gas provided that the flow rates of all gas streams that contribute to the Vent Gas are determined. Flow must be calculated in scfm.

b. For each Covered Steam-Assisted Flare, the Applicable Defendant must install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the volumetric flow rate of Assist Steam used with each Covered Steam-Assisted Flare. This system must also be able to continuously analyze the pressure and temperature of Assist Steam at a representative point of steam flow measurement. Flow must be calculated in scfm.

c. For each Covered Air-Assisted Flare, the Applicable Defendant must install, operate, calibrate, and maintain a monitoring system capable of continuously measuring,

calculating, and recording the volumetric flow rate of Assist Air used with each Covered Air-Assisted Flare. If Premix Assist Air and Perimeter Assist Air are both used, the Applicable Defendant must install, operate, calibrate, and maintain a monitoring system capable of separately continuously measuring, calculating, and recording the volumetric flow rate of Premix Assist Air and Perimeter Assist Air used with that Flare. Continuously monitoring fan speed or power and using fan curves is an acceptable method for continuously monitoring Assist Air flow rates.

d. Each flow rate monitoring system must be able to correct for the temperature and pressure of the system and output parameters in Standard Conditions.

e. In lieu of a monitoring system that directly measures volumetric flow rate, the Applicable Defendant may choose from the following additional options for monitoring any gas stream:

(1) Mass flow monitors may be used for determining the volumetric flow rate of Assist Steam provided that the Applicable Defendant converts the mass flow rates to volumetric flow rates pursuant to the methodology in Step 2 of Appendix 1.2;

(2) Mass flow monitors may be used for determining the volumetric flow rate of Vent Gas, provided the Applicable Defendant determines the molecular weight of such Vent Gas using compositional analysis data collected pursuant to the monitoring method specified in Paragraph 24.a and provided that the Applicable Defendant converts the mass flow rates to volumetric flow rates pursuant to the methodology in Step 2 of Appendix 1.2; and

(3) Continuous pressure/temperature monitoring system(s) and appropriate engineering calculations may be used in lieu of a continuous volumetric flow monitoring system provided the molecular weight of the gas is known and provided the Applicable Defendant comply with the methodology in Step 2 of Appendix 1.2 for calculating volumetric flow rates. For Vent Gas, the Applicable Defendant must determine molecular weight using

compositional analysis data collected pursuant to the monitoring method specified in Paragraph 24.a.

21. Assist Steam Control Equipment. The Applicable Defendant must install and commence operation of equipment, including, as necessary, main and trim control valves and piping that enables the Applicable Defendant to control Assist Steam flow to each Covered Steam-Assisted Flare in a manner sufficient to ensure compliance with this Decree.

22. Assist Air Control Equipment. The Applicable Defendant must install and commence operation of equipment, including a Variable Speed Motor on each Covered Air-Assisted Flare, that enables the Applicable Defendant to control Assist Air flow to each Covered Air-Assisted Flare in a manner sufficient to ensure compliance with this Decree.

23. Video Camera. The Applicable Defendant must install and commence operation of a video camera that is capable of recording, in digital format, the flame of and any Smoke Emissions from each Covered Flare except the Vinyls Flare.

24. Vent Gas Compositional Monitoring or Direct Monitoring of Net Heating Value of Vent Gas. For each Covered Flare, the Applicable Defendant must either determine the concentration of individual components in the Vent Gas or directly monitor the Net Heating Value of the Vent Gas (NHV_{vg}) in compliance with one of the methods specified in this Paragraph. The Applicable Defendant may elect to use different monitoring methods (of the methods provided in this Paragraph) for different gaseous streams that make up the Vent Gas provided the composition or Net Heating Value of all gas streams that contribute to the Vent Gas are determined. The Applicable Defendant must:

a. Install, operate, calibrate, and maintain a monitoring system capable of continuously measuring (*i.e.*, at least once every 15 minutes), calculating, and recording the individual component concentrations present in the Vent Gas; or

b. Install, operate, calibrate, and maintain a calorimeter capable of continuously measuring (*i.e.*, at least once every 15 minutes), calculating, and recording the NHV_{vg} at Standard Conditions. If an Applicable Defendant elects this method, the Applicable Defendant may install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the hydrogen concentration in the Vent Gas. The sample extraction point of the calorimeter may be located upstream of the introduction of Supplemental Gas and/or Sweep Gas and/or Purge Gas if the composition and flow rate of any such Supplemental Gas and/or Sweep Gas and/or Purge Gas is a known constant and if this constant then is used in the calculation of the Net Heating Value of the Vent Gas.

c. If the Applicable Defendant elects the method in Paragraph 24.b, and the Net Heating Value of the Vent Gas exceeds the upper calibrated span of the calorimeter on the Covered Flare, then the Applicable Defendant must use the value of the upper calibrated span of that calorimeter for calculating the NHV_{vg} at Standard Conditions until the Net Heating Value of the Vent Gas returns to within the measured calibrated span. Use of this method will not constitute instrument system downtime for the period of time that the Net Heating Value of the Vent Gas exceeds the upper calibrated span of the calorimeter.

d. Direct compositional or Net Heating Value monitoring is not required for purchased ("pipeline quality") natural gas streams. The Net Heating Value of purchased natural gas streams may be determined using annual or more frequent grab sampling at any one representative location. Alternatively, the Net Heating Value of any purchased natural gas stream can be assumed to be 920 BTU/scf.

25. Instrumentation and Monitoring Systems: Optional Equipment for any Covered Flare. To continuously measure and calculate flow of all Pilot Gas to a Covered Flare in scfm

and pounds per hour, the Applicable Defendant, at its option, may either: a) install (if not already installed) an instrument; or b) use a restriction orifice and pressure measurements. The Applicable Defendant may use the data generated by this instrument or restriction orifice as part of the calculation of the Net Heating Value of the Combustion Zone Gas.

26. Instrumentation and Monitoring Systems: Specifications, Calibration, Quality Control, and Maintenance.

a. The instrumentation and monitoring systems identified in Paragraphs 20 and 24 must:

(1) Meet or exceed all applicable minimum accuracy, calibration and quality control requirements specified in Table 13 of 40 C.F.R. Part 63, Subpart CC;

(2) Have an associated readout (*i.e.*, a visual display or record) or other indication of the monitored operating parameter that is readily accessible onsite for operational control or inspection by the Applicable Defendant;

(3) Be capable of measuring the appropriate parameter over the range of values expected for that measurement location; and

(4) Have an associated data recording system with a resolution that is equal to or better than the required instrumentation/system accuracy.

b. The Applicable Defendant must operate, maintain, and calibrate each instrument and monitoring system identified in Paragraphs 20 and 24 according to a monitoring plan that contains the information listed in 40 C.F.R. § 63.671(b)(1)-(5). However, if an Applicable Defendant is determining NHV_{vg} using a process mass spectrometer, the Applicable Defendant may use the methods established for determining NHV_{vg} as outlined in the February 5, 2018 letter to representatives of Extrel CMS, LLC and AMETEK, Energy & Process Division from Steffan M. Johnson, Group Leader, Measurement Technology Group, Office of Air Quality

Planning and Standards (attached as Appendix 1.7) in lieu of complying with 40 C.F.R. § 63.671(b)(1)-(5)'s requirements for determining NHV_{vg} using gas chromatographs.

c. All gas chromatograph systems permitted by Paragraph 24.a must also meet the requirements of 40 C.F.R. § 63.671(e)(1)-(3) (Additional Requirements for Gas Chromatographs) regardless of whether the gas chromatographs are complying with 40 C.F.R. § 63.671(e)(1)-(3) or the methods outlined in Appendix 1.7.

d. For each instrumentation and monitoring system required by Paragraphs 20 and 24 (or installed pursuant to Paragraph 25), the Applicable Defendant must comply with the out-of-control procedures described in 40 C.F.R. § 63.671(c)(1) and (2), and with the data reduction requirements specified in 40 C.F.R. § 63.671(d)(1) through (3).

e. The language in 40 C.F.R. § 63.671 or Table 13 of 40 C.F.R. Part 63, Subpart CC, or in any regulatory provision cross-referenced in 40 C.F.R. § 63.671 or Table 13 of 40 C.F.R. Part 63, Subpart CC, that limits the applicability of these regulatory requirements to periods when "regulated material" (as defined in 40 C.F.R. § 63.641) is routed to a Flare is not applicable for purposes of this Consent Decree. In addition, for purposes of this Decree, the language in 40 C.F.R. § 63.671 or Table 13 of 40 C.F.R. Part 63, Subpart CC, or in any regulatory provision cross-referenced in 40 C.F.R. § 63.671 or Table 13 of 40 C.F.R. Part 63, Subpart CC, that refers to a continuous parametric monitoring system will instead be read to refer to the instrumentation and monitoring systems required by Paragraphs 20 and 24.

f. The Applicable Defendant may elect to utilize exceptions set forth in 40 C.F.R. § 63.1103(e)(4)(i)-(ix) when complying with this Paragraph.

27. Instrumentation and Monitoring Systems: Recording and Averaging Times. The instrumentation and monitoring systems identified in Paragraphs 20 and 23-25 must be able to

produce and record data measurements and calculations for each parameter at the following time intervals:

Instrumentation and Monitoring System	**Recording and Averaging Times**
Vent Gas, Assist Steam Flow Monitoring Systems, Assist Air Flow Monitoring Systems and (if installed) Pilot Gas Flow	Measure continuously and record 15-minute block averages
Vent Gas Compositional Monitoring (if using the methodology in Paragraph 24.a)	Measure no less than once every 15-minutes and record that value
Vent Gas Net Heating Value Analyzer (if using the methodology in Paragraph 24.b)	Measure continuously and record 15-minute block averages
Video Camera	Record at a rate of no less than 4 frames per minute

The term "continuously" means to make a measurement as often as the manufacturer's stated design capabilities of the flow monitors (for Vent Gas, Assist Steam, Assist Air, and if installed Pilot Gas) and the Vent Gas Net Heating Value Analyzers during each fifteen (15) minute block period, but in no case shall the flow monitors or the Vent Gas Net Heating Value Analyzers make less than one measurement in each fifteen (15) minute block period. The measurement results are then averaged and recorded to represent each fifteen (15) minute block period. Nothing in this Paragraph is intended to prohibit the Applicable Defendant 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.

28. Instrumentation and Monitoring Systems: Operation. The Applicable Defendant must operate each of the instruments and monitoring systems required by Paragraphs 20 and 23-24 and collect data on a continuous basis at all times 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 periods of instrument downtime specified in sub-Paragraphs 45.a–d.

B. Determining Whether a Covered Flare that has a Water Seal is Not Receiving Potentially Recoverable Gas Flow

29. For each Covered Flare that has a water seal, if all of the following conditions are met, then the Covered Flare is not receiving Potentially Recoverable Gas flow:

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 water level in the drum;

b. For the water seal drum associated with the respective Covered Flare, the water level in the drum is: (i) at the level of the weir or (ii) if the water level in the drum is measured, the measurement indicates that the water seal is present; and

c. Downstream of the seal drum, there is no flow of Supplemental Gas directed to the Covered Flare.

C. Waste Gas Minimization

30. Initial Waste Gas Minimization Plan ("Initial WGMP"). By no later than the applicable compliance dates set forth in Appendix 1.1, for each Covered Flare except for the Vinyls Flare, the Applicable Defendant must submit to the EPA an Initial Waste Gas Minimization Plan that discusses and evaluates flaring Prevention Measures on both a plant-wide and Flare-specific basis. The Initial WGMP must include but not be limited to:

a. Waste Gas Characterization and Mapping. The Applicable Defendant must characterize the Waste Gas being disposed of at each Covered Flare except for the Vinyls Flare, and determine its source as follows:

(1) Volumetric (in scfm) and mass (in pounds) flow rate. The Applicable Defendant must 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 except for the Vinyls Flare, for the one-year period of time ending 180 Days before the submission of the Initial WGMP. To the extent that, for any particular Covered Flare, the Applicable Defendant has instrumentation capable of measuring and/or calculating the volumetric and mass flow rate of hydrogen, nitrogen, oxygen, carbon monoxide, carbon dioxide, and/or water (steam) in the Waste Gas, the Applicable Defendant may calculate the volumetric and mass flow of: (i) all Waste Gas flows excluding hydrogen, nitrogen, oxygen, carbon monoxide, carbon dioxide, and/or water (steam); and (ii) hydrogen, nitrogen, oxygen, carbon monoxide, carbon dioxide, and/or water (steam) flows in the Waste Gas. The Applicable Defendant may use either an engineering evaluation or measurements from monitoring or a combination to determine flow rate. In determining flow rate, except as provided in the next sentence, flows during all periods must be included (including but not limited to normal operations and periods of startup, shutdown, Malfunction, process upsets, relief valve leakages, utility losses due to an interruptible utility service agreement, and emergencies arising from events within the boundaries of the Covered Plants). Flows that could not be prevented through reasonable planning and are in anticipation of or caused by a natural disaster, act of war or terrorism, or External Utility Loss are the only flows that may be excluded from the calculation of flow rate. The Applicable Defendant must provide the date, time, and nature of the event that results in the exclusion of any flows from the calculation.

(2) Baseload Waste Gas Flow Rates. The Applicable Defendant must use flow rate data for the one-year period of time starting 180 Days before the submission of the Initial WGMP to determine the Baseload Waste Gas Flow Rate, in scfd, to each Covered Flare except for the Vinyls Flare.

(3) Identification of Constituent Gases. The Applicable Defendant must use best efforts to identify the constituent gases within each Covered Flare's (except for the Vinyls Flare) Waste Gas and the

percentage contribution of each such constituent during baseload conditions. The Applicable Defendant may use either an engineering evaluation or measurements from monitoring or a combination to determine Waste Gas constituents.

(4) Waste Gas Mapping. Using instrumentation, isotopic tracing, and/or engineering calculations, the Applicable Defendant must identify and estimate the flow from each process unit header (sometimes referred to as a "subheader") to the main header(s) servicing each Covered Flare except for the Vinyls Flare. Using that information and all other available information, the Applicable Defendant must complete an identification of each Waste Gas tie-in to the main header(s) and process unit header(s), as applicable, consistent with Appendix 1.6. Temporary connections to the main header(s) of a Covered Flare and/or process unit header(s) are not required to be included in the mapping.

b. Reductions Previously Realized. The Applicable Defendant must describe the equipment, processes and procedures installed or implemented to reduce flaring between the Effective Date and 60 Days prior to the submission of the Initial WGMP. The description must specify the date of installation or implementation and the amount of reductions (in both flow and mass of pollutants) realized.

c. Planned Reductions. The Applicable Defendant must describe any equipment, processes, or procedures that the Applicable Defendant plans to install or implement to eliminate or reduce flaring from the Covered Flares except for the Vinyls Flare. The description must specify a schedule for expeditiously installing and commencing operation of any equipment, process, or procedures the Applicable Defendant plans to install, add, or implement to minimize flaring. The description must also include a projection of the amount of reductions to be realized. After submitting the Initial WGMP, the Applicable Defendant may revise the installation and operation dates provided the Applicable Defendant: i) does so in writing to the EPA before the First Updated Waste Gas Minimization Plan is due, and ii) provides a reasonable explanation for the revised date. In formulating this plan, the Applicable

Defendant must review and evaluate the results of the Waste Gas mapping required by sub-Paragraph 30.a(4). Any schedule revision accompanied by a reasonable explanation and made before the First Updated Waste Gas Minimization Plan is due shall be considered part of the Initial Waste Gas Minimization Plan.

d. Taking a Covered Flare Permanently Out of Service and Converting a Flare to an Unassisted Flare. The Applicable Defendant must identify any Covered Flare it intends to permanently take out of service or to convert to an Unassisted Flare, including the date for completing the decommissioning or the conversion to an Unassisted Flare. Taking a Covered Flare "permanently out of service" means physically removing piping in the Flare header or physically isolating the piping with a welded blind so as to eliminate direct piping to the Covered Flare and surrendering any permit to operate such Covered Flare. Converting a Covered Flare to an Unassisted Flare means physically removing piping used to provide Assist Steam or Assist Air or physically isolating such piping with a welded blind so as to eliminate direct piping of Assist Steam or Assist Air to the Covered Flare.

e. Prevention Measures. The Applicable Defendant must describe and evaluate all Prevention Measures, including a schedule for expeditiously implementing and commencing operation of all Prevention Measures, that will address the following:

(1) Flaring that has occurred or may reasonably be expected to occur during planned maintenance activities, including startup and shutdown. The evaluation must include a review of flaring that has occurred during these activities in the three years prior to the applicable compliance date set forth in Appendix 1.1 and must consider the feasibility of performing these activities without flaring; and

(2) 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 must 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.

31. First Updated Waste Gas Minimization Plan. By no later than the applicable compliance dates set forth in Appendix 1.1, except for the Vinyls Flare, the Applicable Defendant must submit to the EPA a First Updated WGMP that updates, if and as necessary based on any changes, the information, diagrams, and drawings required in the Flare Data and Monitoring Systems and Protocol Report required by Paragraph 18 and the information required in sub-Paragraphs 30.a–e for the 12-month period after the period covered by the Initial Waste Gas Minimization Plans. The First Updated WGMP must also include:

a. Updated Waste Gas Mapping. The Applicable Defendant must update the Waste Gas mapping from each process unit header (sometimes referred to as a "subheader") to the main header(s) servicing each Covered Flare, except for the Vinyls Flare, if more information relevant to Waste Gas Mapping becomes available. The Applicable Defendant must use this updated mapping to plan any reductions in Waste Gas flow;

b. Reductions Based on Root Cause Analysis. The Applicable Defendant must review all of the root cause analysis reports submitted under Paragraph 35 to determine if reductions in addition to the reductions achieved through any required corrective action under Paragraph 36 can be realized; and

c. Revised Schedule. To the extent the Applicable Defendant proposes to extend any schedule set forth in the Initial WGMP or subsequent WGMP, the Applicable Defendant may do so only with good cause, the determination of which is subject to Section XI (Dispute Resolution).

32. Subsequent Updates to Waste Gas Minimization Plan. On an annual basis after submitting the First Updated WGMP and continuing until the Applicable Defendant has achieved compliance with all provisions of this Section V (Compliance Requirements) applicable to its Covered Plant other than the requirements of this Paragraph, the Applicable Defendant must submit an updated WGMP for a Covered Plant as part of the Semi-Annual Report required by Section VIII (Reporting Requirements) if, at that Covered Plant, the Applicable Defendant: a) commences operation of a Newly Installed Covered Flare or permanently removes a Covered Flare from service, b) connects a new Waste Gas stream to a Covered Flare, c) intentionally modifies the Baseload Waste Gas Flow Rate to a Covered Flare, d) installs additional FGRS, or e) changes the design of a Covered Flare (including, but not limited to, converting a Covered Flare to an Unassisted Flare). Each update must update, if and as necessary, the information required in sub-Paragraphs 30.a.(1) - 30.a.(3) and sub-Paragraphs 31.a and 31.b, as applicable. To the extent the Applicable Defendant proposes to extend any schedule set forth in a previous WGMP (excepting schedule changes made to the Initial Waste Gas Minimization Plan prior to the First Updated Waste Gas Minimization Plan as described in Paragraph 30.c) for any of the Covered Plants, the Applicable Defendant may do so only with good cause, the determination of which is subject to Section XI (Dispute Resolution).

33. Waste Gas Minimization Plan: Implementation. By no later than the dates specified in a WGMP, the Applicable Defendant must implement the actions described therein.

34. Enforceability of WGMPs. The terms of each WGMP (including Initial, First Updated, and Subsequently Updated WGMPs) submitted under this Consent Decree are specifically enforceable.

35. Root Cause Analysis for Reportable Flaring Incidents.

a. Internal Reporting and Recordkeeping. Commencing no later than the applicable compliance dates set forth in Appendix 1.1, except as provided in Paragraph 37, the Applicable Defendant must conduct an investigation into the root cause(s) of each Reportable Flaring Incident at any of the Covered Plants and prepare and keep as a record an internal report that contains the information listed below. The Applicable Defendant must conduct the investigation into the root cause(s) of each Reportable Flaring Incident and prepare the internal report by no later than 45 Days following the end of a Reportable Flaring Incident. The internal report must include, at a minimum, the following information:

(1) The date and time that the Reportable Flaring Incident started and ended;

(2) The measured volume of Waste Gas flared and an estimate of the individual quantities of VOCs and HAPs that were emitted during the Reportable Flaring Incident and the calculations that were used to determine the quantities;

(3) The steps, if any, the Applicable Defendant took to limit the duration of the Reportable Flaring Incident, and to limit the quantity of VOC and HAP emissions associated with the Reportable Flaring Incident;

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

(5) 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. The analysis must 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, operation, and maintenance changes must be evaluated. If the Applicable Defendant concludes that corrective action(s) is (are) required under Paragraph 36, the report must 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 the Applicable Defendant concludes that corrective action is not required under Paragraph 36, the report must explain the basis for that conclusion; and

(6) To the extent that investigations of the causes or possible corrective actions are still underway 45 Days after the Reportable Flaring Incident ended, a statement of the anticipated date by which a follow-up report fully conforming to the requirements of this Paragraph will be completed.

b. Submitting Summary of Internal Flaring Incident Reports. In each Semi-Annual Report due under Section VIII (Reporting Requirements), the Applicable Defendant must 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:

(1) Date;

(2) Duration;

(3) Amount of VOCs and HAPs emitted;

(4) Root cause(s);

(5) Corrective action(s) completed;

(6) Corrective action(s) still outstanding; and

(7) An analysis of any trends identified by the Applicable Defendant in the number of Reportable Flaring Incidents, the root causes, or the types of corrective action(s).

36. Corrective Action Implementation. In response to any Reportable Flaring Incident, the Applicable Defendant must take, as expeditiously as practicable, such interim and 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.

37. In lieu of preparing a new report under Paragraph 35 and analyzing and implementing corrective action under Paragraph 36 for a Reportable Flaring Incident that has as

its root cause the same root cause as a previously reported Reportable Flaring Incident, the Applicable Defendant may cross-reference and use the prior report and analysis when preparing the report required by Paragraph 35.

D. Flare Gas Recovery Systems for Covered Plants

38. FGRS Capacity and Start Up. The Applicable Defendant must complete installation and commence operation of the respective FGRS(s) for the Covered Flares as described in Appendix 1.8 and by the deadlines set forth in Appendix 1.1.

39. FGRS: Operation and Availability Requirements.

a. General. No later than the applicable compliance dates set forth in Appendix 1.1, the Applicable Defendant must operate each FGRS in a manner to minimize Waste Gas to the applicable Covered Flare(s) while ensuring safe chemical plant operations. The Applicable Defendant also must operate each FGRS consistent with good engineering and maintenance practices and in accordance with its design and the manufacturer's specifications. Nothing in this Paragraph 39 will require the Applicable Defendant to recover any Waste Gas stream that is not a Potentially Recoverable Gas stream.

b. Requirements Related to Hydrogen Rich Gas Mixture Flows to the Lake Charles Petro 2 Unit. The Lake Charles Petro 2 Unit generates a hydrogen rich gas mixture which is used internally, sent to an offsite third party, and/or will be sent to the Petro 2 Flare via piping that bypasses the FGRS as described in Appendix 1.9. In limited circumstances involving the shutdown, startup or Malfunction and isolation of the methanator, the hydrogen rich gas mixture can also be sent to the Petro 2 Flare header prior to recovery by the FGRS. By no later than the Lake Charles Petro 2 Unit's FGRS operational date as set forth in Appendix 1.1, the Applicable Defendant must not route any of the hydrogen rich gas mixture to the Petro 2 flare

header prior to recovery by the FGRS, except for periods when the methanator is isolated due to startup, shutdown or Malfunction and the hydrogen rich gas mixture must be routed through the Petro 2 Flare header prior to recovery by the FGRS. The hours in which the hydrogen rich gas mixture is routed through the Petro 2 Flare header prior to recovery by the FGRS due to methanator startup, shutdown or Malfunction and isolation shall be no more than 60 hours in any calendar year.

c. FGRS Compressor Availability. By no later than the applicable compliance dates set forth in Appendix 1.1, each FGRS must be Available for Operation or in operation for 98% of the time, as calculated according to Paragraph 39.g (Averaging Periods). The periods provided for in Paragraphs 39.d (Maintenance of FGRS) and 39.e (Shut Down) below may be included in the amount of time that the FGRS is Available for Operation or in operation when determining compliance with the requirement of this Paragraph.

d. Maintenance of FGRS. Periods of maintenance on and subsequent restart of a Compressor may be included in the amount of time that a Compressor is Available for Operation or in operation when determining compliance with the requirement to have a Compressor Available for Operation or in operation; provided however, these periods of maintenance and subsequent restart must not exceed 1,344 hours per Compressor in a five-year rolling sum period, rolled daily. The Applicable Defendant must use best efforts to schedule maintenance activities during a Turnaround of the process units venting to the Covered Flare(s) served by the applicable FGRS. To the extent it is not practicable to undertake these maintenance activities during a Turnaround of these units, the Applicable Defendant must use best efforts to minimize the generation of Waste Gas during such periods.

e. Shut Down. Periods in which the FGRS is shut down (including the subsequent restart) due to 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 or to preserve the mechanical integrity of the FGRS may be included in the amount of time that a Compressor is Available for Operation or in operation when determining compliance with the requirement to have the Compressor Available for Operation or in operation. By no later than 45 Days after any such outage, the Applicable Defendant must investigate the root cause and all contributing causes of the outage and must implement, as expeditiously as practicable, corrective action, if any, to prevent a recurrence of the cause(s). In the reports due under Section VIII (Reporting Requirements) of this Decree, the Applicable Defendant must describe each outage that occurred under the conditions in this sub-Paragraph, including the date, duration, cause(s), corrective action, and the status of the implementation of corrective action.

f. Alternative FGRS. The Applicable Defendant may submit a request to the EPA for approval of an alternative FGRS that is not explicitly referenced in Appendix 1.8 or in this Section in order to ensure compliance with availability requirements, provided that the proposed alternative FGRS provides equivalent or better Waste Gas recovery capacity than the FGRS required by Appendix 1.8.

g. Averaging Periods. For purposes of calculating compliance with the period of time that a Compressor must be Available for Operation and/or in operation, as required by Paragraph 39.c, the period to be used must be an 8,760-hour rolling sum, 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 was generated during an entire hour, then that hour must not be used in computing the 8,760-hour rolling sum. The rolling sum must include only the previous 8,760 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.

E. Flare Combustion Efficiency

40. General Emission Standards Applicable to Covered Flares. By no later than the applicable compliance dates set forth in Appendix 1.1, the Applicable Defendant must comply with the requirements set forth in this Paragraph at each Covered Flare at all times when that Covered Flare, including a Portable Flare, is In Operation.

a. Operation during Emissions Venting. The Applicable Defendant must operate each Covered Flare at all times when emissions may be vented to it.

b. No Visible Emissions. The Applicable Defendant must specify the smokeless design capacity of each Covered Flare and operate with no Visible Emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours, when the Covered Flare is In Operation and the Vent Gas flow is less than the smokeless design capacity of the Covered Flare. 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. The Applicable Defendant must monitor for Visible Emissions from each Covered Flare while it is In Operation as specified below in sub-Paragraphs 40.b(1) or (2). An initial Visible Emissions demonstration must be conducted using an observation period of 2 hours using Method 22 at 40 C.F.R. Part 60,

Appendix A–7. A previously conducted Method 22 Visible Emissions observation is sufficient to meet the initial Visible Emissions demonstration requirement if the most recent Method 22 Visible Emissions observation was conducted within three years prior to the Effective Date. Subsequent Visible Emissions observations must be conducted using either method listed in sub-Paragraphs 40.b(1) or (2). The Applicable Defendant must record and report any instances where Visible Emissions are observed for more than 5 minutes during any 2 consecutive hours as specified in 40 C.F.R. § 63.655(g)(11)(ii).

(1) At least once per day, the Applicable Defendant must conduct Visible Emissions observations using an observation period of 5 minutes using Method 22 at 40 C.F.R. Part 60, Appendix A–7. If at any time a Defendant sees Visible Emissions, even if the minimum required daily Visible Emissions monitoring has already been performed, the Applicable Defendant must immediately begin an observation period of 5 minutes using Method 22 at 40 C.F.R. Part 60, Appendix A–7. If Visible Emissions are observed for more than one continuous minute during any 5-minute observation period, the observation period using Method 22 at 40 C.F.R. Part 60, Appendix A–7 must be extended to 2 hours or until 5 minutes of Visible Emissions are observed.

(2) Alternatively, the Applicable Defendant may use a video camera to continuously record (at least one frame every 15 seconds with time and date stamps) images of the Flare flame and a reasonable distance above the Flare flame at an angle suitable for Visible Emissions observations. The Applicable Defendant must provide real-time video camera output to the control room or other continuously staffed location where the camera images may be viewed at any time.

c. Pilot Flame Presence. The Applicable Defendant must operate each Covered Flare with a pilot flame present at all times. The Applicable Defendant must continuously monitor the presence of the pilot flame(s) using a device (including, but not limited to, a thermocouple, ultraviolet beam sensor, or infrared sensor) capable of detecting that the pilot flame is present.

d. Monitoring According to Applicable Provisions. The Applicable Defendant must 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, the Applicable Defendant must implement good air pollution control practices to minimize emissions from each Covered Flare; provided however that the Applicable Defendant is not in violation of this requirement for any practice that this Decree requires the Applicable Defendant to implement after the Effective Date for the period between the Effective Date and the compliance requirements. Nothing in this sub-Paragraph requires the Applicable Defendant to install or maintain Flare monitoring equipment in addition to or different from the equipment required by this Consent Decree

41. Flare Tip Velocity or V_{tip}. By no later than the applicable compliance dates set forth in Appendix 1.1, the Applicable Defendant must operate each Covered Flare in compliance with either sub-Paragraph 41.a. or 41.b. below, provided that the appropriate monitoring systems are in place, whenever the Vent Gas flow rate is less than the smokeless design capacity of the Covered Flare.

a. The actual Flare Tip Velocity (V_{tip}) must be less than 60 feet per second. The Applicable Defendant must monitor V_{tip} using the procedures specified in Appendix 1.2; or

b. V_{tip} must be less than 400 feet per second and also less than the maximum allowed Flare Tip Velocity (V_{max}) as calculated according to Equation 11 in Appendix 1.2. The Applicable Defendant must monitor V_{tip} and gas composition and must determine NHV_{vg} using the procedures specified in Appendix 1.2. The Unobstructed Cross Sectional Area of the Flare Tip must be calculated consistent with Appendix 1.3.

42. Revisions to 40 C.F.R. §§ 60.18(b)–(f) and/or 63.11(b). From the Effective Date until termination of this Consent Decree, if revisions are made to 40 C.F.R. §§ 60.18(b)–(f) and/or 63.11(b) that become final and effective, but inconsistent with any of the requirements in Paragraphs 40.a–d, 41, or 44.a, the Applicable Defendants must comply with the final, effective regulations and any requirements in Paragraphs 40.a–d, 41, or 44.a, that are not inconsistent with these final, effective regulations. As used in this Paragraph, "inconsistent" means that compliance with both provisions is not possible, or the EPA determines by regulation or applicable Alternative Means of Emissions Limitation (AMEL) that compliance with the 270 NHV_{cz} requirement can be used in lieu of the 300 NHV_{vg} requirement.

43. Operation According to Design. By no later than the applicable dates set forth in Appendix 1.1, the Applicable Defendant must operate and maintain each Covered Flare in accordance with its design and the requirements of this Consent Decree.

44. Net Heating Value Standards. The Applicable Defendant must comply with the following Net Heating Value standards, except as provided in Paragraph 45 (Standard During Instrument Downtime).

a. Net Heating Value of Vent Gas (NHV_{vg}). By no later than the applicable compliance dates set forth in Appendix 1.1 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 63.11(b)(6)(ii) related to the NHV_{vg} are modified (whether in those regulations, in any NESHAP/NSPS regulation, or by applicable AMEL), with the exception of the Vinyls Flare, the Applicable Defendant must operate each Covered Flare with an NHV_{vg} of greater than or equal to 300 BTU/scf determined on a 15-minute block period basis when Waste Gas is routed to the Covered

Flare for at least 15 minutes. The Applicable Defendant must monitor and calculate NHV_{vg} at each Covered Flare in accordance with Appendix 1.2.

b. Net Heating Value of Combustion Zone Gas (NHV_{cz}). By no later than the applicable compliance dates set forth in Appendix 1.1, with the exception of the Vinyls Flare, at any time that a Covered Flare is In Operation, the Applicable Defendant must operate that Flare so as to maintain the NHV_{cz} at or above 270 BTU/scf determined on a 15-minute block period basis when Waste Gas is routed to the Covered Flare for at least 15 minutes. The Applicable Defendant must monitor and calculate NHV_{cz} at each Covered Flare in accordance with Appendix 1.2.

c. Dilution Operating Limits for Covered Flares with Perimeter Assist Air (NHV_{dil}). By no later than the applicable compliance dates set forth in Appendix 1.1, while each Covered Flare that is actively receiving Perimeter Assist Air is In Operation, the Applicable Defendant must maintain the Net Heating Value Dilution Parameter (NHV_{dil}) at or above 22 BTU/square foot determined on a 15-minute block period basis when Waste Gas is routed to the Covered Flare for at least 15 minutes. The Applicable Defendant must monitor and calculate NHV_{dil} at each Covered Flare that is actively receiving Perimeter Assist Air in accordance with Appendix 1.2.

d. Net Heating Value of Vent Gas (NHV_{vg}) for the Vinyls Flare. By no later than the applicable compliance date set forth in Appendix 1.1, the Applicable Defendant must operate the Vinyls Flare with an NHV_{vg} of greater than or equal to 200 BTU/scf determined on a 15-minute block period basis when Waste Gas is routed to the Vinyls Flare for at least 15 minutes. The Applicable Defendant must monitor and calculate NHV_{vg} at the Vinyls Flare in accordance with Appendix 1.2.

45. 98% Combustion Efficiency. By no later than the applicable compliance dates set forth in Appendix 1.1, the Applicable Defendant must operate each Covered Flare with a minimum of a 98% Combustion Efficiency at all times when Waste Gas is routed to the Covered Flare for at least 15 minutes. To demonstrate continuous compliance with the 98% Combustion Efficiency, the Applicable Defendant must operate each Covered Flare in compliance with the applicable requirements in Paragraph 44 (*i.e.*, 44.b for Steam-Assisted Flares, 44.b and c for Air-Assisted Flares, and 44.d for the Vinyls Flare).

46. Standard During Instrument Downtime. If one or more of the following conditions (collectively referred to as "Instrument Downtime") is present and renders the Applicable Defendant incapable of operating a Covered Flare in accordance with the applicable NHV standards in Paragraph 44, the Applicable Defendant must operate that Covered Flare in accordance with good air pollution control practices so as to minimize emissions and ensure good Combustion Efficiency at that Covered Flare:

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

b. Repairs following the Malfunction of an instrument needed to meet the requirement(s);

c. Recommended 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). Instrument Downtime must be calculated in accordance with 40 C.F.R. § 60.13(h)(2).

In no event shall Instrument Downtime exceed 5% of the time in each Semi-Annual Period that the Covered Flare affected by the Instrument Downtime is In Operation. For purposes of calculating the 5%, the time used for NHV Analyzer, mass spectrometer, or gas chromatograph calibration and validation activities may be excluded. Nothing in this Paragraph is intended to prevent an Applicable Defendant from asserting Force Majeure as provided in Section X as the cause of any period of Instrument Downtime.

47. Recordkeeping: Timing and Substance. The Applicable Defendant must comply with the following recordkeeping requirements:

a. By no later than the applicable compliance dates set forth in Appendix 1.1, for each Covered Flare except the Vinyls Flare, the Applicable Defendant must calculate and record each of the following parameters:

(1) Volumetric flow rates of all gas streams that contribute to the Vent Gas volumetric flow rate (in scfm) (in 15-minute block averages and in accordance with any calculation requirements of Paragraphs 20, 26 and Step 2 of Appendix 1.2);

(2) Assist Steam volumetric flow rate (in scfm) (in 15-minute block averages and in accordance with any calculation requirements of Paragraphs 20, 26 and Step 2 of Appendix 1.2);

(3) Assist Air volumetric flow rate (in scfm) (in 15-minute block averages and in accordance with any calculation requirements of Paragraphs 20, 26 and Step 2 of Appendix 1.2);

(4) NHV_{vg} (in BTU/scf) (in 15-minute block averages in accordance with Step 1 of Appendix 1.2);

(5) NHV_{cz} (in BTU/scf) (in 15-minute block averages in accordance with Step 3 of Appendix 1.2);

(6) NHV_{dil} (in BTU/scf) (in 15-minute block averages in accordance with Step 4 of Appendix 1.2); and

(7) For the Vinyls Flare, the Applicable Defendant shall only calculate and record the NHV_{vg} (in BTU/scf) (in 15-minute block averages in accordance with Step 1 of Appendix 1.2).

b. Instrument Downtime. By no later than the applicable compliance dates set forth in Appendix 1.1, for each Covered Flare, the Applicable Defendant must record the duration of all periods of Instrument Downtime for each Covered Flare that exceed 5% of the time in a Semi-Annual Period that the Covered Flare is In Operation. The Applicable Defendant must record which instrument(s) experienced the downtime, which Covered Flare was affected by the downtime, an explanation of the cause(s) of the deviation, and a description of the corrective action(s) that the Applicable Defendant took.

c. By no later than the applicable compliance dates set forth in Appendix 1.1, the Applicable Defendant must record the dates and times of any periods that the Applicable Defendant deviates from the standards in Paragraph 39.c (FGRS Compressor Availability). For all of the events described in this sub-Paragraph, the Applicable Defendant must also record the duration of the deviation, an explanation of the cause(s) of the deviation, and a description of the corrective action(s) that the Applicable Defendant took.

d. By no later than the applicable compliance dates set forth in Appendix 1.1, at any time that the Applicable Defendant deviates from the emissions standards in Paragraphs 44 - 45 at any Covered Flare, the Applicable Defendant must record the duration of the deviation, an explanation of the cause(s) of the deviation, and a description of the corrective action(s) that the Applicable Defendant took.

F. Fenceline Monitoring Project Requirements

48. The Applicable Defendants must maintain and operate at the Calvert City Plant and the Lake Charles Petro Plant a Fenceline Monitoring Mitigation Project in accordance with Appendix 2.1.

VI. PERMITS

49. Permits Needed for Compliance Obligations. The Applicable Defendants must obtain all required federal, state, and local permits necessary for performing any compliance obligation under this Consent Decree including, without limitation, permits for the construction of pollution control technology and the installation of equipment at each Covered Plant. The Applicable Defendant may seek relief under the provisions of Section X (Force Majeure) for any delay in performing any such obligation resulting from a failure to obtain, or a delay in obtaining, any permit or approval required to fulfill such obligation, provided that the Applicable Defendant has submitted timely and complete applications and has taken all other actions necessary to obtain all such permits or approvals.

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

a. For the Calvert City Plant. By no later than one year after the Effective Date or one year after the applicable compliance dates set forth in Appendix 1.1, whichever is later, the Applicable Defendant must complete and submit to the KDEP's consolidated preconstruction and Title V CAA permitting program appropriate applications to incorporate the requirements listed in sub-Paragraph 50.c, as applicable, into a federally enforceable Major/Title V permit for the Calvert City Plant, such that the requirements listed in sub-Paragraph 50.c: (i) become and remain "applicable requirements" as that term is defined in 40 C.F.R. § 70.2; and (ii) survive the termination of this Consent Decree.

b. For the Lake Charles Plants. By no later than one year after the Effective Date or one year after the applicable compliance dates set forth in Appendix 1.1 for the compliance requirements listed in Paragraph 50.c, whichever is later, the Applicable Defendant must complete and submit to the LDEQ's consolidated preconstruction and Title V CAA permitting program appropriate applications to incorporate the requirements listed in sub-Paragraph 50.c, as applicable, into a federally enforceable Title V permit for the Lake Charles Plants, such that the requirements listed in sub-Paragraph 50.c: (i) become and remain "applicable requirements" as that term is defined in 40 C.F.R. § 70.2; and (ii) survive the termination of this Consent Decree.

c. The following requirements of the Consent Decree shall survive termination: Paragraphs 20–24 (Instrumentation and Monitoring Systems), Paragraphs 26–28 (Specifications, Calibration, Quality Control, and Maintenance / Recording and Averaging Times / Operation), Paragraph 29 (Determining whether Flare has Potentially Recoverable Gas), Paragraph 39 (FGRS: Operation and Availability Requirements), Paragraphs 40–41 (Flaring Efficiency Standards), Paragraph 43 (Operation According to Design), Paragraph 44.b-c (NHV_{cz} and NHV_{dil} standards), Paragraph 44.d (NHV_{vg} standard for the Vinyls Flare), Paragraph 45 (98% CE), Paragraph 45 (Standard During Instrument Downtime), Paragraph 47 (Recordkeeping), and Paragraph 48/Appendix 2.1 (Fenceline Monitoring Project). Nothing in this Paragraph shall prohibit an Applicable Defendant from seeking to incorporate Paragraph 25 (Optional Equipment) in a permit that survives termination of this Decree.

51. The permit applications and process of incorporating the requirements of this Consent Decree into Title V permits shall be in accordance with applicable state or local Title V rules, including applicable administrative amendment provisions of such 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.

52. Following submission of the complete permit applications, the Applicable Defendants must cooperate with the KDEP and the LDEQ by promptly submitting all available information that either the KDEP or the LDEQ seeks following its receipt of the permit materials.

VII. EMISSION CREDIT GENERATION

53. Prohibitions.

a. Definition. "CD Emissions Reductions" means any NOx, VOC, PM, PM_{TOTAL}, PM_{10}, $PM_{2.5}$, HAP, or CO emissions reductions that result from any projects conducted or controls used to comply with this Consent Decree.

b. An Applicable Defendant must not use, apply for, obtain, trade, sell, generate or use CD Emissions Reductions:

(1) As netting reductions,

(2) As emissions offsets, or

(3) For the purpose of determining whether a project would result in a significant emissions increase or significant net emissions increase in any major or minor NSR permit or permit proceeding, or for the purpose of obtaining offsets in any non-attainment NSR permit or permit proceeding. Baseline actual emissions during any 24-month period selected by the Applicable Defendant must be adjusted downward to exclude any portion of the baseline emissions that would have been eliminated as CD Emissions Reductions (including the Waste Gas Minimization requirements of Section V.C) had the Applicable Defendants been complying with this Consent Decree during that 24-month period.

54. Outside the Scope of the Prohibition. Nothing in this Section is intended to prohibit the Applicable Defendant from using or generating:

a. Emission reductions, netting credits, or emission offsets from process units at a Covered Plant that are not subject to an emission limitation pursuant to this Consent Decree;

b. CD Emissions Reductions for a Covered Plant's compliance with any rules or regulations designed to address regional haze or the non-attainment status of any area (excluding NSR rules, but including, for example, Reasonably Available Control Technology rules) that apply to a Covered Plant; provided, however, that the Applicable Defendant must not trade or sell any CD Emissions Reductions; and

c. CD Emission Reductions for purposes of the KDEP or the LDEQ's toxics modeling programs.

VIII. REPORTING REQUIREMENTS

55. Semi-Annual Reports. By no later than February 28th and August 31st of each year after the Effective Date, until termination of this Decree pursuant to Section XX, the Applicable Defendant must submit a "Semi-Annual Report" to the EPA, to the KDEP for the Calvert City Plant, and to the LDEQ for the Lake Charles Plants, except that the first Semi-Annual Report shall be due 60 Days after the first full half year after the Effective Date of this Consent Decree (a "half year" runs between January 1 and June 30 and between July 1 and December 31). Each Semi-Annual Report must contain the following information for the preceding six months (*i.e.*, January through June will be addressed in the report to be submitted by August 31, and July through December will be addressed in the report submitted by February 28, except that the first Semi-Annual Report will cover the period between the Effective Date through the end of the first full half year):

a. A description of the status of work performed and progress made toward implementing all requirements of Section V (Compliance Requirements) at the Covered Plants. This topic should describe any major milestones completed and remaining to be completed;

b. A description of any problems encountered or anticipated in meeting the requirements in Section V (Compliance Requirements) at the Covered Plants, together with implemented or proposed solutions;

c. A description of the status of any permit applications, including a summary of all permitting activity, pertaining to compliance with this Consent Decree;

d. A copy of any reports that were submitted only to the KDEP or the LDEQ and that pertain to compliance with this Consent Decree;

e. Any WGMPs or updated WGMPs for the Covered Plants as required by Paragraphs 30-32;

f. Any summary of internal flaring incident reports as required by Paragraphs 35-36;

g. A summary of the following, per Covered Flare per Semi-Annual Period (hours shall be rounded to the nearest tenth):

(1) The total number of hours of Instrument Downtime claimed pursuant to Paragraph 45, expressed as both an absolute number and a percentage of time the Covered Flare that the instrument/equipment monitors is In Operation and Capable of Receiving Sweep, Supplemental, and/or Waste Gas;

(2) If the total number of hours of Instrument Downtime claimed pursuant to Paragraph 45 exceeds 5% of the time in a Semi-Annual Period, the Covered Flare affected by the downtime is In Operation, 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;

(3) 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 43-44 were not applicable because the only gas or gases being vented were Pilot Gas or Purge Gas;

(4) Exceedances of Emissions Standards.

(a) 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 Paragraphs 44-45; provided however, that if the exceedance of these standards was less than 5% of the time in a Semi-Annual Period and was due to one or more of the exceptions set forth in Paragraph 45, the report shall so note;

(b) If the exceedance of the emissions standards in Paragraphs 44-45 was not due to one of the exceptions in Paragraph 45 (Standard During Instrument Downtime), or if the exceedance was due to one or more of the exceptions in Paragraph 45 and the total number of hours caused by the exceptions exceeds 5% of the time in a Semi-Annual Period that the Covered Flare affected by the Instrument Downtime was In Operation, 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;

(5) Compliance with Compressor Availability Requirements. Sufficient information to document compliance with the FGRS Compressor availability requirements of sub-Paragraph 39.c. For any period of non-compliance, the Applicable Defendant must identify the date, cause, and corrective action taken; and

(6) Compliance with the Limitation on Hours During Which the Hydrogen Rich Gas Mixture is Routed Through the Petro 2 Flare Header Prior To Recovery by the FGRS. Sufficient information to document compliance with the limitation on the hydrogen rich gas mixture being routed through the Petro 2 Flare header prior to recovery by the FGRS, as set forth in Paragraph 39.b. The Applicable Defendant must state the number of minutes per calendar year that the hydrogen rich gas mixture was routed through the Petro 2 Flare header prior to recovery by the FGRS,

the date(s), start and stop times of gas flow, the volume of gas involved, and the cause for routing the hydrogen rich gas mixture through the Petro 2 Flare header prior to recovery by the FGRS. For any period of non-compliance (exceedance of the number of hours allowed), the Applicable Defendant must identify the date, cause, and corrective action taken.

h. Any additional matters that the Applicable Defendant believes should be brought to the attention of the EPA, the KDEP, or the LDEQ.

56. Fenceline Monitoring Project Reports. The Applicable Defendant must submit Fenceline Monitoring Project Reports for the Calvert City Plant and the Lake Charles Petro Plant as part of each Semi-Annual Report. The Fenceline Monitoring Project Reports must contain the following information:

a. In spreadsheet format, the individual sample results for each monitor comprising the Fenceline Monitoring System, each bi-weekly annual average benzene concentration difference value (*i.e.*, the annual average Δc based on the average of the 26 most recent 14-Day sampling periods) once the data from 26 sampling periods are available (determined in accordance with Appendix 2.1, Section 3.g), and the corresponding meteorological data for the relevant monitoring periods. The first two columns of each spreadsheet will list respectively the date and time for each sample taken; and

b. A detailed description of the findings of any root cause analysis and corrective action(s) undertaken pursuant to Paragraph 3.g of Appendix 2.1, including the known results of the corrective action(s) and the anticipated emissions reductions (in TPY per pollutant).

For the purpose of determining the cause of an Action Level exceedance, the Applicable Defendant may submit and discuss additional data collected by it or by third parties in the reports required pursuant to Paragraph 3.h of Appendix 2.1 and/or this Paragraph. If the Applicable Defendant concludes that an exceedance of the Action Level described in Paragraph 3.f of Appendix 2.1 of this Consent Decree was caused by an offsite source(s), that conclusion

does not relieve the Applicable Defendant of its obligation to perform the Root Cause investigation described in Paragraph 3.g of Appendix 2.1.

57. Annual Emissions Data. In the Semi-Annual report that is submitted by February 28 of each year, the Applicable Defendant must provide, for each Covered Flare, for the prior calendar year, the amount of emissions of the following compounds (in tons per year): VOCs, HAPs, CO_2, methane, and ethane.

58. Each Semi-Annual report must also include a description of any non-compliance with the requirements of this Consent Decree not otherwise identified in Paragraph 55 and an explanation of the violation's likely cause and of the remedial steps taken, or to be taken, to prevent or minimize such violation. If the cause of a violation cannot be fully explained at the time the report is due, the Applicable Defendant must so state in the report. The Applicable Defendant must investigate the cause of the violation and must then submit an amendment to the report, including a full explanation of the cause of the violation, within 30 Days of the Day the Applicable Defendant becomes aware of the cause of the violation. Nothing in this Paragraph or the following Paragraph relieves the Applicable Defendant of its obligation to provide the notice required by Section X (Force Majeure).

59. All reports required under this Section must be submitted to the persons and in the manner designated in Section XVI (Notices).

60. Each report submitted by an Applicable Defendant under this Section must be signed by an official of the Covered Plant and 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 have no personal knowledge that the information submitted is other than 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.

61. The reporting requirements of this Consent Decree do not relieve the Applicable Defendant of any reporting obligations required by the CAA, state or local laws, or their implementing regulations, or by any other federal, state, or local law, regulation, permit, or other requirement.

62. Any information provided pursuant to this Consent Decree may be used by the United States, the KDEP, and the LDEQ in any proceeding to enforce the provisions of this Consent Decree and as otherwise permitted by law.

IX. STIPULATED PENALTIES

63. Except where the stipulated penalties reference "Defendants," in which case all Defendants are jointly and severally liable for stipulated penalties, an Applicable Defendant is liable to the United States, to the KDEP for the Calvert City Plant, and to the LDEQ for the Lake Charles Plants, for violations of this Consent Decree as specified below, unless excused under Section X (Force Majeure). A violation includes failing to perform any obligation required by the terms of this Decree, including any work plan or schedule approved under this Decree, according to all applicable requirements of this Decree and within the specified time schedules established by or approved under this Decree.

64. Late Payment of Civil Penalty. If the Defendants fail to pay the civil penalty required to be paid under Section IV (Civil Penalty) when due, the Defendants must pay a stipulated penalty of $2,500 per Day for each Day that the payment is late.

65. Failure to Meet Compliance Requirements. For the following violations of Section V (Compliance Requirements):

Violation	**Stipulated Penalty**	
65.a. Violations of Paragraph 18. Failure to timely submit a Flare Data and Monitoring Systems and Protocol Report in accordance with the requirements of Paragraph 18.	Period of Delay or Noncompliance Days 1–30 Days 31–60 Days 61 and later	Penalty per Day per Violation $300 $400 $500
65.b. Violations of Paragraph 19-24. Failure to install the equipment and monitoring systems in accordance with Paragraphs 19–24 by the compliance date and to maintain them in accordance with the respective, applicable technical specifications in those Paragraphs and Paragraphs 26–28 (except for the QA/QC requirements referenced in sub-Paragraph 26.a, which are covered in sub-Paragraph 65.c below).	Period of Delay or Noncompliance, per monitoring system/ instrument control instrument Days 1–30 Days 31–60 Days 61 and later	Penalty per Day per monitoring system/control $750 $1,250 $2,000 or an amount equal to 1.2 times the economic benefit of delayed compliance, whichever is greater
65.c. Violations of the QA/QC requirements in Paragraphs 26.a. Failure to perform the QA/QC requirements in accordance with Paragraph 26.a.	Violation of a: Daily requirement Quarterly requirement Annual requirement	Penalty per Violation $100 $200 per Day late $500 per Day late
65.d. Violations of Paragraph 28. Except for 5% of the time per Semi-Annual Period, failure to operate each monitoring system required by Paragraphs 20-22 and 24 in accordance with Paragraph 28; provided however, that the Applicable Defendants will not be liable for a stipulated penalty for violation of Paragraph 28 if, during the period of 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/ control instrument, number of hours per Semi-Annual Period 0.25–100.0 100.25–200.0 Over 200.0	Penalty per hour per monitoring system/ control instrument $250 $500 $1,000

65.e. Violations of Paragraph 30, 31, or 32. Failure to timely submit a WGMP in accordance with the requirements of the applicable Paragraph.	Period of Delay or Noncompliance Days 1–30 Days 31–60 Days 61 and later	Penalty per Day per Violation $500 $750 $1,000
65.f. Violations of Paragraph 35. Failure to timely develop a root cause flaring investigation report in accordance with the requirements in sub-Paragraph 35.a; or failure to keep it as an internal record; or failure to timely submit a summary of the flaring incident reports in accordance with the requirements in sub-Paragraph 35.b.	Period of Delay or Noncompliance Days 1 – 30 Days 31 – 60 Days 61 and later	Penalty per Day per Violation $800 $1,600 $3,000
65.g. Violations of Paragraph 36. Failure to complete any corrective action in accordance with the requirements of Paragraph 36.	Period of Delay or Noncompliance Days 1 – 30 Days 31 – 60 Days 61 and later	Penalty per Day per Violation $ 1,000 $ 2,000 $ 5,000

65.h. Violations of Paragraph 38 and Appendix 1.1. For failing to timely install any FGRS listed in Appendix 1.8 in accordance with the requirements of Paragraph 38 and Appendix 1.1.	Period of Delay or Noncompliance, per FGRS Days 1–30 Days 31–60 Days 61 and later	Penalty per Day per FGRS $ 1,250 $ 3,000 $ 5,000 or an amount equal to 1.2 times the economic benefit of delayed compliance, whichever is greater
65.i. Violations of Paragraph 39.b. For failing to comply with the 60 hour per calendar year limit that the hydrogen rich gas mixture is routed to the Petro 2 Flare header prior to recovery by the FGRS in accordance with Paragraph 39.b.	Hours over 60 Hours 1–100 Hours 101–200 Hours over 200 For purposes of calculating the number of hours of noncompliance, all minutes of violation shall be added together to determine the total.	Penalty per hour $100 $200 $300
65.j. Violations of Paragraph 39.c. For each failure to have the FGRS Compressor Available for Operation in accordance with Paragraph 39.c.	Per FGRS, $750 per hour or fraction thereof over the allowed percentage in a rolling 8,760-hour period that a Compressor required to be Available for Operation is not Available for Operation; provided however, that stipulated penalties will not apply for any hour in which a Compressor's unavailability did not result in flaring.	

65.k. Violations of Paragraphs 44.b, 44.d, and 45. For each Covered Flare, each failure to operate a Covered Flare in accordance with the Net Heating Value of Vent Gas (for the Vinyls Flare only) in Paragraph 44.d, the Net Heating Value of Combustion Zone Gas in Paragraph 44.b, or the Standard During Instrument Downtime in Paragraph 45.	On a per Covered Flare Basis, Hours per Semi-Annual Period in Noncompliance — Penalty per Hour, per Covered Flare Hours 0.25–100.0 — $50 Hours 100.25–200.0 — $100 Hours over 200.0 — $300 For purposes of calculating the number of hours of noncompliance with the NHV_{vg} or NHV_{cz} standard, all 15-minute periods of violation shall be added together to determine the total.
65.l. Violations of Paragraph 47. Failure to record any information required to be recorded pursuant to Paragraph 47.	$100 per Day
65.m. Violations of Paragraph 48 (Fenceline Monitoring Project Requirements). For each failure to operate the Fenceline Monitoring System in accordance with any requirement of Paragraph 48 or Appendix 2.1.	Period of Delay or Noncompliance — Penalty per Day Days 1–30 — $500 Days 31–60 — $1,500 Days 61 and later — $3,000

66. Failure to Meet Reporting Requirements. For each failure to submit a Semi-Annual Report in accordance with the requirements of Section VIII:

Period of Delay or Noncompliance per Semi-Annual Report		Penalty per Day per Semi-Annual Report
Days	1–30	$300
Days	31–60	$1,000
Days	61 and later	$2,000

67. Incorporation of Consent Decree Requirements into Federally Enforceable Permits. For each failure to timely submit an application or site-specific SIP revision request to incorporate Consent Decree requirements required by Paragraph 50 to the KDEP or the LDEQ:

Period of Delay or Non-Compliance		Penalty per Violation per Day
Days	1–30	$500

Days	31–60	$1,500
Day	61 and later	$3,000

68. Stipulated penalties under this Section begin to accrue on the Day after performance is due or on the Day a violation occurs, whichever is applicable, and, except as provided in Paragraph 71, will continue to accrue until performance is satisfactorily completed or until the violation ceases. Stipulated penalties will accrue simultaneously for separate violations of this Consent Decree.

69. The United States, the KDEP (for violations arising from the Calvert City Plant), or the LDEQ (for violations arising from the Lake Charles Plants), or both the United States and the KDEP or the LDEQ, may seek stipulated penalties under this Section by sending a joint written demand to the Applicable Defendant, or by either sovereign sending a written demand to the Applicable Defendant, with a copy simultaneously sent to the other Plaintiff. Either sovereign may waive stipulated penalties or reduce the amount of stipulated penalties it seeks, in the unreviewable exercise of its discretion and in accordance with this Paragraph.

70. The Applicable Defendant must pay stipulated penalties to the United States, to the KDEP for violations arising from the Calvert City Plant, and to the LDEQ for violations arising from the Lake Charles Plants, within 60 Days of receiving a written demand unless the demand is disputed through compliance with the requirements of the Dispute Resolution provisions in Section XI of this Consent Decree. The KDEP may only demand stipulated penalties arising from violations at the Calvert City Plant. The LDEQ may only demand stipulated penalties arising from violations at the Lake Charles Plants. For stipulated penalties arising from violations at the Calvert City Plant, the Applicable Defendant must pay 50 percent of the total stipulated penalty amount due to the United States and 50 percent to the KDEP. For stipulated penalties arising from violations at the Lake Charles Plants, the Applicable Defendant

must pay 50 percent of the total stipulated penalty amount due to the United States and 50 percent to the LDEQ. Where only one sovereign demands stipulated penalties for violations arising at any of the Covered Plants subject to this Consent Decree, and the other sovereign does not join in the demand within 30 Days of receiving the demand, or timely joins in the demand but subsequently elects to waive or reduce some or all stipulated penalties for that violation, the Applicable Defendant must pay the full stipulated penalty due for the violation to the sovereign making the demand less any amount paid to the other sovereign.

71. By no later than 60 Days after receiving a demand for stipulated penalties, the Applicable Defendant may dispute liability for any or all stipulated penalties demanded by invoking the dispute resolution procedures of Section XI 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 XI, the Plaintiff and the Applicable Defendant agree upon; or (ii) the date that the Applicable Defendant files a motion with the Court under Paragraph 85; provided however, that in order for stipulated penalties to cease accruing pursuant to either (i) or (ii), the Applicable Defendant must place the disputed amount in an interest-bearing commercial escrow account, the administrative costs of which are to be borne by the Applicable Defendant, and are not subject to deduction from any amount(s) owed to the United States, the KDEP, or the LDEQ. The interest rate must be determined in accordance with 28 U.S.C. § 1961. If the dispute is resolved in the Applicable Defendant's favor, the escrowed amount plus accrued interest will be returned to the Applicable Defendant; otherwise, the United States, the KDEP for the Calvert City Plant, and the LDEQ for the Lake Charles Plants 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.

72. The Applicable Defendant must pay stipulated penalties owing to the United States in the manner set forth and with the confirmation notices required by Paragraph 14, except that the transmittal letter must state that the payment is for stipulated penalties and must state for which violation(s) the penalties are being paid. The Applicable Defendant must pay stipulated penalties owing to the KDEP and the LDEQ in the manner set forth and with the confirmation notices required by Paragraph 17, except that the transmittal letter must state that the payment is for stipulated penalties and must state for which violation(s) the penalties are being paid.

73. If the Applicable Defendant fails to pay stipulated penalties according to the terms of this Consent Decree, the Applicable Defendant is liable for interest on such penalties, as provided for in 28 U.S.C. § 1961, accruing as of the date payment became due. Nothing in this Paragraph must be construed to limit the United States, the KDEP, or the LDEQ from seeking any remedy otherwise provided by law for the Applicable Defendant's failure to pay any stipulated penalties.

74. The payment of penalties and interest, if any, do not alter in any way the Applicable Defendant's obligation to complete the performance of the requirements of this Consent Decree.

75. Non-Exclusivity of Remedy. Stipulated penalties are not the United States', the KDEP's (for the Calvert City Plant), or the LDEQ's (for the Lake Charles Plants) exclusive remedy for violations of this Consent Decree. Subject to the provisions of Section XIII (Effect of Settlement/Reservation of Rights), the United States, the KDEP (for the Calvert City Plant) and the LDEQ (for the Lake Charles Plants) expressly reserve the right to seek any other relief they deem appropriate for the Applicable Defendant's violation of this Decree or applicable law, including but not limited to an action against any Applicable Defendant for statutory penalties,

additional injunctive relief, mitigation or offset measures, and/or contempt. However, the amount of any statutory penalty assessed for a violation of this Consent Decree must be reduced by an amount equal to the amount of any stipulated penalty assessed and paid pursuant to this Consent Decree.

X. FORCE MAJEURE

76. "Force Majeure," for purposes of this Consent Decree, is defined as any event beyond the control of an Applicable Defendant, of any entity controlled by an Applicable Defendant, or of an Applicable Defendant's contractors, which delays or prevents the performance of any obligation under this Consent Decree despite an Applicable Defendant's best efforts to fulfill the obligation. The requirement that an Applicable Defendant exercises "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 potential Force Majeure event: (a) as it is occurring, and (b) following the potential Force Majeure, such that the delay and any adverse effects of the delay are minimized. "Force Majeure" does not include an Applicable Defendant's financial inability to perform any obligation under this Consent Decree.

77. 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, an Applicable Defendant must provide notice to the EPA, the KDEP (for the Calvert City Plant), and the LDEQ (for the Lake Charles Plants) in accordance with Section XVI no later than fifteen (15) Days after the date the Applicable Defendant first knew, or by the exercise of due diligence should have known, that the event might cause a delay. This notice must specifically reference this Paragraph of the Consent Decree and must 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 implementing any measures to be taken to prevent or mitigate the delay or the effect of the delay; the Applicable Defendant'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 the Applicable Defendant, such event may cause or contribute to an endangerment to public health, welfare or the environment. The Applicable Defendant must include with any notice all available documentation supporting the claim that the delay was attributable to a Force Majeure. Failure to comply with the above requirements will preclude the Applicable Defendant from asserting any claim of Force Majeure for that event for the period of time of such failure to comply, and for any additional delay caused by such failure. The Applicable Defendant will be deemed to know of any circumstance of which the Applicable Defendant, any entity controlled by the Applicable Defendant, or the Applicable Defendant's contractors knew or should have known.

78. If the EPA, after a reasonable opportunity for review and comment by the KDEP (for the Calvert City Plant) or the LDEQ (for the Lake Charles Plants), 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 the EPA, after a reasonable opportunity for review and comment by the KDEP (for the Calvert City Plant) or the LDEQ (for the Lake Charles Plants), 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 will not, by itself, extend the time for performance of any other obligation. The EPA will notify the Applicable Defendant in writing of the length of the extension, if any, for performing the obligations affected by the Force Majeure event.

79. If the EPA, after a reasonable opportunity for review and comment by the KDEP (for the Calvert City Plant) or the LDEQ (for the Lake Charles Plants), does not agree that the delay or anticipated delay has been or will be caused by a Force Majeure event, the EPA will notify the Applicable Defendant in writing of its decision.

80. If an Applicable Defendant elects to invoke the dispute resolution procedures set forth in Section XI (Dispute Resolution), it must do so no later than 45 Days after receiving the EPA's notice of decision. In any such dispute resolution proceeding, the Applicable Defendant has 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 the Applicable Defendant complied with the requirements of Paragraphs 76 and 77. If the Applicable Defendant carries this burden, the delay at issue will be deemed to not be a violation by the Applicable Defendant of the affected obligation of this Consent Decree identified to the EPA and the Court.

XI. DISPUTE RESOLUTION

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

82. Informal Dispute Resolution. Any dispute subject to Dispute Resolution under this Consent Decree will first be the subject of informal negotiations. The dispute will be considered to have arisen when an Applicable Defendant sends the United States, the KDEP for the Calvert City Plant, and the LDEQ for the Lake Charles Plants, a written Notice of Dispute. Such Notice of Dispute must clearly state the matter in dispute. The period of informal

negotiations must not exceed 60 Days from the date the dispute arises, unless that period is modified by written agreement. If the Parties cannot resolve a dispute by informal negotiations, then the position advanced by the United States and the KDEP (for the Calvert City Plant), and the United States and the LDEQ (for the Lake Charles Plants), will be considered binding unless, within 45 Days after the conclusion of the informal negotiation period, the Applicable Defendant invokes formal dispute resolution procedures as set forth below.

83. Formal Dispute Resolution. An Applicable Defendant must invoke formal dispute resolution procedures, within the time period provided in the preceding Paragraph, by serving on the United States, the KDEP for the Calvert City Plant, and the LDEQ for the Lake Charles Plants a written Statement of Position regarding the matter in dispute. The Statement of Position must include, but need not be limited to, any factual data, analysis, or opinion supporting the Applicable Defendant's position and any supporting documentation relied upon by the Applicable Defendant.

84. The United States, after consultation with the KDEP for the Calvert City Plant, and the LDEQ for the Lake Charles Plants, must serve its Statement of Position within 45 Days of receiving an Applicable Defendant'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 will be binding on the Applicable Defendant, unless the Applicable Defendant files a motion for judicial review of the dispute in accordance with the following Paragraph.

85. An Applicable Defendant may seek judicial review of the dispute by filing with the Court and serving on the United States, the KDEP for disputes about the Calvert City Plant,

and on the LDEQ for disputes about the Lake Charles Plants, in accordance with Section XVI (Notices), a motion requesting judicial resolution of the dispute. The motion must be filed within 45 Days of receiving the United States' Statement of Position pursuant to the preceding Paragraph. The motion must contain a written statement of the Applicable Defendant's position on the matter in dispute, including any supporting factual data, analysis, opinion, or documentation, and must set forth the relief requested and any schedule within which the dispute must be resolved for orderly implementation of the Consent Decree.

86. The United States shall respond to the Applicable Defendant's motion within the time period allowed by the Local Rules of this Court. The Applicable Defendant may file a reply memorandum, to the extent permitted by the Local Rules.

87. Standard of Review. In a formal dispute resolution proceeding under this Section, the Applicable Defendant bears the burden of demonstrating that its position complies with this Consent Decree and the Clean Air Act, 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 the Applicable Defendant reserves the right to argue to the contrary.

88. The invocation of dispute resolution procedures under this Section will not, by itself, extend, postpone, or affect in any way any obligation of the Applicable Defendant under this Consent Decree, unless and until final resolution of the dispute so provides. Stipulated penalties with respect to the disputed matter will continue to accrue from the first Day of noncompliance, but payment will be stayed pending resolution of the dispute as provided in Paragraph 71. If the Applicable Defendant does not prevail on the disputed issue, stipulated penalties will be assessed and paid as provided in Section IX (Stipulated Penalties).

XII. INFORMATION COLLECTION AND RETENTION

89. The United States, the KDEP (for the Calvert City Plant), and the LDEQ (for the Lake Charles Plants) and their representatives, including attorneys, contractors, and consultants, have the right of entry into any plant covered by this Consent Decree, at all reasonable times, upon presentation of credentials, to:

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

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

c. Obtain samples and, upon request, splits of any samples taken by the Applicable Defendant or their representatives, contractors, or consultants;

d. Obtain documentary evidence, including photographs and similar data; and

e. Assess the Applicable Defendant's compliance with this Consent Decree.

90. Upon request, the Applicable Defendant must provide the EPA, the KDEP, the LDEQ or their authorized representatives, splits of any samples taken by the Applicable Defendant. Upon request, the EPA, the KDEP, or the LDEQ must provide the Applicable Defendant splits of any samples taken by the EPA, the KDEP, or the LDEQ.

91. Notwithstanding Section XX (Termination), and except for data recorded by any video camera required pursuant to Paragraph 23, until three years after the termination of this Consent Decree, the Applicable Defendant must retain, and must instruct its contractors and agents to preserve, all non-identical copies of all documents, records, or other information (including documents, records, or other information in electronic form) in their contractors' or agents' possession or control, or that come into their or their contractors' or agents' possession or control, and that relates to Applicable Defendant's performance of its obligations under this

Consent Decree. This information-retention requirement applies regardless of any contrary corporate or institutional policies or procedures. At any time during this information-retention period, upon request by the United States the Applicable Defendant must provide copies of any documents, records, or other information required to be maintained under this Paragraph. The Applicable Defendant must retain the data recorded by the video cameras required pursuant to Paragraph 23 for one year from the date of recording.

92. The Applicable Defendant must notify the United States at least 90 Days before the destruction of any documents, records, or other information subject to the requirements of the preceding Paragraph ("Discard Notice"). Within 90 days after the date of the Discard Notice, the United States may provide the Applicable Defendant with a written request for production that: (a) identifies specific documents, records, or other information and/or (b) provides a general description of categories of documents, records, or other information, and the Applicable Defendant shall produce the requested documents, records, or information to the United States. The Applicable Defendant may destroy any documents, records, or other information not requested for production by the United States at any time after 90 Days from the date of the Discard Notice.

93. The Applicable Defendant may assert that certain documents, records, or other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Applicable Defendant asserts such a privilege, it must provide the following: (a) the title of the document, record, or information; (b) the date of the document, record, or information; (c) the name and title of each author of the document, record, or information; (d) the name and title of each addressee and recipient; (e) a description of the subject of the document, record, or information; and (f) the privilege asserted by the Applicable

Defendant. However, no documents, records, or other information created or generated pursuant to the requirements of this Consent Decree may be withheld on grounds of privilege.

94. Except for emissions data, the Applicable Defendant may also 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 the Applicable Defendant seek to protect as CBI, the Applicable Defendant must follow the procedures set forth in 40 C.F.R. Part 2. To assert that records, data or other information required to be submitted to the LDEQ is entitled to be protected as confidential, the Lake Charles Plants shall follow the law and procedures as set forth in the applicable provisions of La. R.S. 30:2030; La. R.S. 2074.D; and LAC 33:I.Chapter 5. To assert that records, data, or other information required to be submitted to the KDEP is entitled to be protected as confidential, the Applicable Defendant shall follow the law and procedures as set forth in the applicable provisions of K.R.S. 224.10-210.

95. 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, the KDEP, or the LDEQ pursuant to applicable federal or state laws, regulations, or permits, nor does it limit or affect any duty or obligation of the Applicable Defendant to maintain documents, records, or other information imposed by applicable federal or state laws, regulations, or permits.

XIII. EFFECT OF SETTLEMENT/RESERVATION OF RIGHTS

96. Definitions. For purposes of this Section XIII, the following definitions apply:

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

(1) 40 C.F.R. § 60.18(c)(3)(ii);

(2) 40 C.F.R. § 63.11(b)(6)(ii); and

(3) The provisions of 40 C.F.R. Part 60, 61, and 63 that require compliance with 40 C.F.R. § 60.18(c)(3)(ii) (for example 40 C.F.R. § 61.349(a)(2)(iii)) or 40 C.F.R. § 63.11(b)(6)(ii) (for example 40 C.F.R. § 63.113(a)(1)(i)) and are applicable requirements in a federally enforceable permit for a Covered Plant as of the Effective Date.

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

(1) 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);

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

(3) 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);

(4) 40 C.F.R. § 60.18(c)(5) and 40 C.F.R. § 63.11(b)(8) (both relate to exit velocity requirements for Air-Assisted Flares); and

(5) 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:

(1) 40 C.F.R. § 60.11(d);

(2) 40 C.F.R. § 61.12(c); and

(3) 40 C.F.R. § 63.6(e)(1)(i).

d. "Post-Lodging Compliance Dates" shall mean any dates in Section V (Compliance Requirements) after the Date of Lodging.

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

(1) 42 U.S.C. § 7475;

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

(3) 42 U.S.C. §§ 7502(c)(5) and 7503(a)–(c);

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

(5) Any applicable, federally enforceable state or local regulation that implements, adopts, or incorporates the federal provisions cited in sub-Paragraphs 96.e(1)–(4); and

(6) Any applicable Title V permit requirement that implements, adopts, or incorporates the federal provisions or federally enforceable state provisions cited in sub-Paragraphs 96.e(1)–(4).

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

(1) 40 C.F.R. § 60.18(d);

(2) 40 C.F.R. § 63.11(b)(1); and

(3) The provisions of 40 C.F.R. Part 60, 61, and 63 that require compliance with 40 C.F.R. § 60.18(d) (for example 40 C.F.R. § 61.349(a)(2)(iii)) or 40 C.F.R. § 63.11(b)(1) (for example 40 C.F.R. § 63.113(a)(1)(i)) and are applicable requirements in a federally enforceable permit for a Covered Plant as of the Effective Date.

97. Entry of this Consent Decree resolves the civil claims of the United States, the KDEP, and the LDEQ for the violations alleged in the Complaint filed in this action and occurring through the Date of Lodging, and as noted below.

98. 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 (except for the Vinyls Flare), entry of this Consent Decree resolves the civil claims of the United States, the KDEP, and the LDEQ against the Defendants for violations of the PSD/NNSR Requirements resulting from construction or modification from the date of the pre-Lodging construction or modification through the compliance dates with Paragraph 38 or 44.b, whichever is later as set

forth in Appendix 1.1, for each Covered Flare. This Paragraph does not apply to and does not resolve any violations for the Vinyls Flare or for Newly Installed Covered Flares.

99. Resolution of Pre-Lodging Claims at the Covered Flares for Failing to Comply with (a) BTU/scf Flared Gas Requirements and (b) General Flare Requirements. With respect to emissions of VOCs and HAPs from the Covered Flares, entry of this Consent Decree resolves the civil claims of the United States, the KDEP, and the LDEQ against the Defendants for violations of the following requirements from the date those claims accrued until the Date of Lodging: a) BTU/scf Flared Gas Requirements; and b) General Flare Requirements.

100. Resolution of Claims for Failing to Comply with (a) Requirements Related to Good Air Pollution Control Practices, and (b) Requirements Related to Monitoring, Operation, and Maintenance According to Flare Design for all Covered Flares. With respect to emissions of VOCs and HAPs from the Covered Flares, entry of this Consent Decree resolves the civil claims of the United States, the KDEP, and the LDEQ against the Defendants for violations of Requirements Related to Good Air Pollution Control Practices, and Monitoring, Operation, and Maintenance According to Flare Design, but only to the extent that the claims are based on the Defendants' use of too much steam or air in relation to Vent Gas flow. The resolution in this Paragraph extends through the compliance dates with Paragraph 44.b (or Paragraph 44.d for the Vinyls Flare) as set forth in Appendix 1.1 for each Covered Flare. This Paragraph does not apply to and does not resolve any violations for Newly Installed Covered Flares.

101. Resolution of Title V Violations. Entry of this Consent Decree resolves the civil claims of the United States, the KDEP, and the LDEQ against the Defendants 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 98–100 for the time frames set forth in those Paragraphs.

102. Reservation of Rights — Resolution of Liability in Paragraphs 98 and 100-101 can be Rendered Void. Notwithstanding the resolution of liability in Paragraphs 98 and 100-101, for the period of time between the Date of Lodging and the post-lodging dates specified in Paragraphs 98 and 100-101, those resolutions of liability will be rendered void if an Applicable Defendant materially fails to comply with any of the obligations and requirements of Section V (Compliance Requirements) and Section VII (Emission Credit Generation). To the extent that a material failure involves a particular Covered Plant, the resolution of liability will be rendered void only with respect to claims involving that particular Covered Plant. The resolutions of liability in Paragraphs 98 and 100-101 will not be rendered void if the Applicable Defendant, as expeditiously as practicable, remedies such material failure and pays all stipulated penalties due as a result of such material failure.

103. The United States, the KDEP (for the Calvert City Plant), and the LDEQ (for the Lake Charles Plants) reserve all legal and equitable remedies available to enforce the provisions of this Consent Decree. This Consent Decree will not be construed to limit the rights of the United States, the KDEP (for the Calvert City Plant), or the LDEQ (for the Lake Charles Plants) 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 specified in Paragraphs 98-101. The United States, the KDEP (for the Calvert City Plant) and the LDEQ (for the Lake Charles Plants) further reserve 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 Covered Plants, whether related to the violations addressed in this Consent Decree or otherwise.

104. In any subsequent administrative or judicial proceeding initiated by the United States, the KDEP (for the Calvert City Plants), or the LDEQ (for the Lake Charles Plants) for injunctive relief, civil penalties, other appropriate relief relating to a Covered Plant or an Applicable Defendant's violations, the Applicable Defendant must 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, the KDEP, or the LDEQ 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 98-101.

105. This Consent Decree is not a permit, or a modification of any permit, under any federal, state, or local laws or regulations. The Defendants are responsible for maintaining compliance with all applicable federal, state, and local laws, regulations, and permits; and the Defendants' compliance with this Consent Decree is no defense to any action commenced pursuant to any such laws, regulations, or permits, except as set forth herein. The United States, the KDEP, and the LDEQ do not, by their consent to the entry of this Consent Decree, warrant or aver in any manner that the Defendants' compliance with any aspect of this Consent Decree will result in compliance with provisions of the CAA, 42 U.S.C. § 7401 *et seq.* or with any other provisions of federal, state, or local laws, regulations, or permits.

106. This Consent Decree does not limit or affect the rights of the Defendants or of the United States, the KDEP, or the LDEQ against any third parties, not party to this Consent

Decree, nor does it limit the rights of third parties, not party to this Consent Decree, against the Defendants, except as otherwise provided by law.

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

XIV. COSTS

108. The Parties must bear their own costs of this action, including attorneys' fees, except that the United States, the KDEP, and the LDEQ are entitled to collect the costs (including attorneys' fees) incurred in any action necessary to collect any portion of the civil penalty or any stipulated penalties due but not paid by an Applicable Defendant.

XV. 26 U.S.C. § 162(f)(2)(A)(ii) IDENTIFICATION

109. For purposes of the identification requirement of Section 162(f)(2)(A)(ii) of the Internal Revenue Code, 26 U.S.C. § 162(f)(2)(A)(ii), performance of Section II (Applicability), Paragraph 10, Section V (Compliance Requirements), Paragraphs 18-33 and 35-48; Section VI (Permits), Paragraphs 49-50; Section VIII (Reporting Requirements), Paragraphs 55-60; Section XII (Information Collection and Retention), Paragraphs 89-90; and related Appendices 1.1-1.9 and 2.1 is restitution or required to come into compliance with law.

XVI. NOTICES

110. Unless otherwise specified in this Decree, whenever notifications, submissions, or communications are required by this Consent Decree, they must be made electronically as described below, unless such notifications, submissions, or communications are unable to be uploaded to the CDX electronic system (in the case of the EPA) or transmitted by email (in the case of any other party). For all notifications, submissions, or communications to the EPA, Defendants must register for the CDX electronic system and upload such notifications,

submissions, or communications at https://cdx.epa.gov_home.asp. Any notifications, submissions, or communications that cannot be uploaded or electronically transmitted via email shall be provided in writing to the addresses below:

As to the United States by email: eescdcopy.enrd@usdoj.gov
Re: DJ No. 90-5-2-1-11287

As to the United States by mail:
EES Case Management Unit
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611
Re: DJ No. 90-5-2-1-11287

As to the United States Attorney for the Western District of Louisiana by mail:
United States Attorney
Western District of Louisiana
Assistant United States Attorney
300 Fannin Street Suite 3201
Shreveport, LA 71101-3068

and as to the EPA as set forth below:

As to the EPA by email:
parrish.robert@epa.gov
foley.patrick@epa.gov
reed.wendell@epa.gov
thompson.steve@epa.gov

As to the EPA by mail:
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

As to the KDEP by email: melissa.duff@ky.gov

As to the KDEP by mail:
Director, Division for Air Quality
Energy and Environment Cabinet
300 Sower Boulevard
Frankfort, Kentucky 40601

As to the LDEQ by email:
angela.marse@la.gov
dwana.king@la.gov
brandon.williams@la.gov

As to the LDEQ by mail:
Angela Marse
Administrator, Enforcement Division
Office of Environmental Compliance
Louisiana Department of Environmental Quality
P.O. Box 4312
Baton Rouge, Louisiana 70821-4312

and

Brandon Williams
Dwana King
P.O. Box 4302
Attorney, Legal Affairs
Louisiana Department of Environmental Quality
Baton Rouge, Louisiana 70821-4302

As to the Defendants by email:
lstone@westlake.com
rmoring@westlake.com

As to the Defendants by mail:
Lloyd Stone, Director Corporate HSE
Rebecca H. Moring, Senior Counsel
2801 Post Oak Boulevard, Suite 600
Houston, Texas 77056

111. Any Party may, by written notice to the other Parties, change its designated notice recipient or notice address provided above.

112. Notices submitted pursuant to this Section will be deemed submitted upon mailing, unless otherwise provided in this Consent Decree or by mutual agreement of the Parties in writing.

XVII. EFFECTIVE DATE

113. The Effective Date of this Consent Decree is 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.

XVIII. RETENTION OF JURISDICTION

114. The Court retains jurisdiction over this case until termination of this Consent Decree, for the purpose of: a) resolving disputes arising under this Decree pursuant to Section XI, b) entering orders modifying this Decree pursuant to Section XIX, and c) effectuating or enforcing compliance with the terms of this Decree.

XIX. MODIFICATION

115. Except as otherwise allowed in Paragraphs 14 and 110 (notice recipients and addresses), the terms of this Consent Decree, including any attached appendices, may be modified only by a subsequent written agreement signed by all the Parties. Where the modification constitutes a material change to this Decree, it will be effective only upon approval by the Court.

116. Any disputes concerning modification of this Decree must be resolved pursuant to Section XI (Dispute Resolution), provided, however, that, instead of the burden of proof provided by Paragraph 87, 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).

XX. TERMINATION

117. Before seeking termination of the entire Consent Decree or the set of requirements applicable to one of the Covered Plants, an Applicable Defendant must:

a. Pay the civil penalty and any accrued stipulated penalties as required by this Consent Decree;

b. Satisfactorily comply with all provisions of Section V (Compliance Requirements) applicable to the Covered Plant that is subject to the termination request;

c. Operate for at least one year in satisfactory compliance with the limitations and standards set forth in Paragraphs 39.c (availability of FGRS compressors), 44 (NHV and NHV_{dil} standards), and 45 (98% Combustion Efficiency) for all of the Covered Flares at the Covered Plant that is subject to the termination request;

d. Apply for and receive a federally enforceable permit for the Calvert City Plant issued pursuant to the KDEP's consolidated preconstruction and Title V CAA permitting program, which incorporates the requirements set forth set forth in Paragraph 50.c. The cited basis for the incorporated requirements in the KDEP's consolidated permit cannot be this Consent Decree and will be the minor NSR authority to issue new limits; and

e. Apply for and receive a federally enforceable permit for the Lake Charles Plants issued pursuant to the LDEQ's consolidated preconstruction and Title V CAA permitting program, which incorporates the requirements set forth in Paragraph 50.c. The cited basis for the incorporated requirements in the LDEQ's consolidated permit cannot be this Consent Decree and will be the minor NSR authority to issue new limits.

118. After the Applicable Defendant(s) believes that it has satisfied the conditions for termination set forth in the preceding Paragraph for either the entire Consent Decree or for one of the Covered Plants, the Applicable Defendant(s) may submit a request for termination to the United States, the KDEP (for the Calvert City Plant), and the LDEQ (for the Lake Charles Plants) by certifying such compliance in accordance with the certification language in Paragraph 60 ("Request for Termination"). In the Request for Termination, the Applicable

Defendant(s) must demonstrate that it has satisfied the conditions for termination set forth in the preceding Paragraph, as well as submit all necessary supporting documentation.

119. Following receipt by the United States, the KDEP for the Calvert City Plant, and by the LDEQ for the Lake Charles Plants, of the Applicable Defendants' Request for Termination, the Parties will confer informally concerning the request. If the United States, after consultation with the KDEP for the Calvert City Plant, and after consultation with the LDEQ for the Lake Charles Plants, agrees that the Decree may be terminated, the Parties will submit, for the Court's approval, a joint stipulation terminating the Decree.

120. If the United States, after consultation with the KDEP for the Calvert City Plant, and after consultation with the LDEQ for the Lake Charles Plants, does not agree that the Decree may be terminated, or if the Applicable Defendant(s) does not receive a written response from the United States with 90 Days of the Applicable Defendant's submission of the Request for Termination, the Applicable Defendant(s) may invoke Dispute Resolution under Section XI.

XXI. PUBLIC PARTICIPATION

121. 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. The Defendants consent to entry of this Consent Decree without further notice and agree 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 the Defendants, the KDEP, and the LDEQ in writing that it no longer supports entry of the Decree.

122. KDEP and LDEQ Public Notice.

a. The Parties agree and acknowledge that final approval by the LDEQ and entry of this Consent Decree are subject to the requirements of La. R.S. 30:2050.7, which provides for: (a) public notice of this Consent Decree in the newspaper of general circulation and the official journal of the parish in which the Lake Charles Plants are located, (b) an opportunity for public comment for a period of not less than forty-five Days and consideration of any comments received, and (c) concurrence by the State Attorney General. The LDEQ reserves the right to withdraw or withhold consent if the comments regarding this Decree disclose facts or considerations that indicate that this Decree is inappropriate, improper, or inadequate.

b. The Parties agree and acknowledge that final approval by the KDEP and entry of this Consent Decree are subject to the requirements of KRS 224.10-120, KRS 224.10-100(1), and KRS 224.10-100(25), which provide for: public notice of this Consent Decree in the newspaper of general circulation and the official journal of the county in which the Calvert City Plant is located, and an opportunity for public comment for a period of not less than 30 Days and consideration of any comments received. The KDEP reserves the right to withdraw or withhold consent if the comments regarding this Decree disclose facts or considerations that indicate that this Decree is inappropriate, improper, or inadequate.

XXII. SIGNATORIES/SERVICE

123. Each undersigned representative of the Defendants, the KDEP, the LDEQ, and the Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice certifies 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 or Parties he or she represents to this document.

124. This Consent Decree may be signed in counterparts, and its validity cannot be challenged on that basis. The Defendants agree 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.

XXIII. INTEGRATION

125. This Consent Decree constitutes the final, complete, and exclusive agreement and understanding among the Parties with respect to the settlement embodied in the Decree and supersedes all prior agreements and understandings, whether oral or written, concerning the settlement embodied herein. Other than deliverables that are subsequently submitted and approved pursuant to this Decree, the Parties acknowledge that there are no representations, agreements, or understandings relating to the settlement other than those expressly contained in this Consent Decree.

XXIV. FINAL JUDGMENT

126. Upon approval and entry of this Consent Decree by the Court, this Consent Decree constitutes a final judgment of the Court as to the United States, the KDEP, the LDEQ, and the Defendants.

APPENDICES

127. The Appendices listed in the Tables of Appendices are attached to and part of this Consent Decree.

Dated and entered this _____ Day of _____, 202___

_____
UNITED STATES DISTRICT JUDGE
WESTERN DISTRICT OF LOUISIANA

Subject to the notice and comment provisions of 28 C.F.R. § 50.7, THE UNDERSIGNED PARTIES enter into this Consent Decree entered in the matter of the *United States et al. v. Westlake Chemical OpCo LP et al.* (W.D. La.).

FOR THE UNITED STATES OF AMERICA:

TODD KIM
Assistant Attorney General
Environment and Natural Resources Division
U.S. Department of Justice

Attorney-In-Charge:

Thomas P. Carroll

THOMAS P. CARROLL
District of Columbia Bar No. 388593
Assistant Section Chief
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, DC 20044-7611
202-514-4051 (Phone)
202-616-6584 (Fax)
Thomas.Carroll@usdoj.gov

BRANDON B. BROWN
United States Attorney
Western District of Louisiana

Local Co-counsel:

DESIREE C. WILLIAMS
(#30978) Assistant United States Attorney 800 Lafayette Street,
Suite 2200 Lafayette, Louisiana
70501 Telephone: (337) 262-6618
Facsimile: (337) 262-6682
Email: desiree.williams@usdoj.gov

Subject to the notice and comment provisions of 28 C.F.R. § 50.7, THE UNDERSIGNED PARTIES enter into this Consent Decree entered in the matter of the *United States et al. v. Westlake Chemical OpCo LP et al.* (W.D. La.).

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LAWRENCE STARFIELD

Digitally signed by LAWRENCE STARFIELD
Date: 2022.05.06 18:04:26 -04'00'

LAWRENCE E. STARFIELD
Acting Assistant Administrator
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue
Washington, D.C. 20460

ROSEMARIE A. KELLEY
Director, Office of Civil Enforcement
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

MARY E. GREENE
Director, Air Enforcement Division
Office of Civil Enforcement
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

ROBERT PARRISH
Attorney Advisor, Air Enforcement Division
Office of Civil Enforcement
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

Subject to the notice and comment provisions of 28 C.F.R. § 50.7, THE UNDERSIGNED PARTIES enter into this Consent Decree entered in the matter of the *United States et al. v. Westlake Chemical OpCo LP et al.* (W.D. La.).

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION 6

Cheryl D. Seager Digitally signed by CHERYL SEAGER
Date: 2022.05.17 10:53:58 -05'00'

CHERYL SEAGER
Director - Compliance Assurance
Enforcement Division
U.S. Environmental Protection Agency,
Region 6
1445 Ross Ave.
Dallas, TX 75202-2733

Subject to the notice and comment provisions of La. R.S. 30 § 2050.7 and 28 C.F.R. § 50.7, THE UNDERSIGNED PARTIES enter into this Consent Decree entered in the matter of the *United States et al. v. Westlake Chemical OpCo LP et al.* (W.D. La.).

FOR THE LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

CELENA CAGE
Assistant Secretary
Office of Environmental Compliance
Louisiana Department of Environmental Quality
P.O. Box 4312
Baton Rouge, Louisiana 70821-4312

DWANA KING, Deputy General Counsel
(La. Bar # 20590)
Office of the Secretary, Legal Affairs Division
Louisiana Department of Environmental Quality
P.O. Box 4302
Baton Rouge, Louisiana 70821-4302

Subject to the notice and comment provisions of KRS 224.10-120, KRS 224.10-100(1), and KRS 224.10-100(25) and 28 C.F.R. § 50.7, THE UNDERSIGNED PARTIES enter into this Consent Decree entered in the matter of the *United States et al. v. Westlake Chemical OpCo LP et al.* (W.D. La.).

FOR THE KENTUCKY DEPARTMENT FOR ENVIRONMENTAL PROTECTION

CHRISTOPHER FITZPATRICK, General Counsel
(Ky. Bar # 82179)
Department for Environmental Protection
Office of Legal Services
Commonwealth of Kentucky
Energy and Environment Cabinet
300 Sower Boulevard
Frankfort, Kentucky 40601

THE UNDERSIGNED PARTIES enter into this Consent Decree entered in the matter of the *United States et al. v. Westlake Chemical OpCo LP et al.* (W.D. La.).

FOR WESTLAKE CHEMICAL OPCO LP, WESTLAKE PETROCHEMICALS LLC, WESTLAKE POLYMERS LLC, WESTLAKE STYRENE LLC, AND WESTLAKE VINYLS, INC.

DocuSigned by:
Andrew Kenner
C5FAB59AB5F8438...

ANDREW KENNER
Sr. Vice President Operations
Westlake Chemical Corporation
2801 Post Oak Blvd., Suite 600
Houston, Texas 77056

DS

United States, et al
v.
Westlake Chemical OpCo LP, et al

APPENDICES TO CONSENT DECREE

Appendix 1.1 Compliance Schedule									
Flare*	Flare Data and Monitoring Systems Protocol Report	Installation & Operation of Monitoring & Control Systems	Initial Waste Gas Minimization Plan	First Updated Waste Gas Minimization Plan	Root Cause Analysis	Flare Gas Recovery (FGR) Installation & Commence Operation	General Provisions	Net Heating Value of Combustion Zone/ Net Heating Value of Vent Gas/Net Heating Value Dil	Record-keeping
A	B	C	D	E	F	G	H	I	J
Referenced Paragraphs of the Consent Decree									
	18	19	30	31	35	38	40-41, 43	44.a-b (for all Covered Flares, except the Vinyls Flare); 44.a-c (for the Poly 3 HP and Co-Products); 44.d (for the Vinyls Flare)	47
Calvert City, Ethylene Flare	ED + 365 Days	ED	ED + 365 Days	ED + 730 Days	ED + 365 Days	3/31/24	ED	ED	ED
Calvert City, Vinyls Flare	ED + 365 Days	ED for calorimeter; 12/31/23 for Vent Gas Flow Meter	NA	NA	NA	NA	ED	ED (44.d only)	ED
Lake Charles, Co-Products	ED + 365 Days	12/31/21	ED + 365 Days	ED + 730 Days	ED + 365 Days	NA	ED	3/31/22	ED
Lake Charles, Petro 1	ED + 365 Days	ED	ED + 365 Days	ED + 730 Days	ED + 365 Days	NA	ED	ED	ED
Lake Charles, Petro 2	ED + 365 Days	12/31/21	ED + 365 Days	ED + 730 Days	ED + 365 Days	12/31/23	ED	3/31/22	ED

Appendix 1.1 Compliance Schedule									
Flare*	Flare Data and Monitoring Systems Protocol Report	Installation & Operation of Monitoring & Control Systems	Initial Waste Gas Minimization Plan	First Updated Waste Gas Minimization Plan	Root Cause Analysis	Flare Gas Recovery (FGR) Installation & Commence Operation	General Provisions	Net Heating Value of Combustion Zone/ Net Heating Value of Vent Gas/Net Heating Value Dil	Record-keeping
A	B	C	D	E	F	G	H	I	J
Lake Charles, Poly 1 & 2	ED + 365 Days	ED	ED + 365 Days	ED + 730 Days	ED + 365 Days	NA	ED	ED	ED
Lake Charles, Poly 3 LP	ED + 365 Days	ED	ED + 365 Days	ED + 730 Days	ED + 365 Days	NA	ED	ED	ED
Lake Charles, Styrene Flare	ED + 365 Days	ED	ED + 365 Days	ED + 730 Days	ED + 365 Days	NA	ED	ED	ED

***Abbreviations**:

ED: Effective Date
NA: Not Applicable

United States, et al
v.
Westlake Chemical OpCo LP, et al

APPENDICES TO CONSENT DECREE

APPENDIX 1.2

Calculating Combustion Efficiency, Net Heating Value of the Combustion Zone Gas (Nhv_{cz}), the Net Heating Value Dilution Parameter (Nhv_{dil}), and Flare Tip Velocity

APPENDIX 1.2

All abbreviations, constants, and variables are defined in the Key on Page 8 of this Appendix.

Combustion Efficiency Equation:

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

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.

Step 1: Determine the Net Heating Value of the Vent Gas (NHV_{vg})

The Company shall determine the Net Heating Value of the Vent Gas (NHV_{vg}) based on composition monitoring data on a 15-minute block average basis according to the following requirements. If the Company monitors separate gas streams that combine to comprise the total vent gas flow to a Covered Flare, the 15-minute block average Net Heating Value shall be determined separately for each measurement location according to the following requirements and a flow-weighted average of the gas stream Net Heating Values shall be used to determine the 15-minute block average Net Heating Value of the cumulative Vent Gas. The NHV_{vg} 15-minute block averages shall be calculated for set 15-minute time periods starting at 12 midnight to 12:15 AM, 12:15 AM to 12:30 AM and so on, concluding at 11:45 PM to midnight.

Step 1a: Equation or Output to be Used to Determine NHV_{vg} at a Measurement Location

For any gas stream for which the Company complies with Paragraph 24 by collecting compositional analysis data in accordance with the method set forth in 24.a: Equation 1 shall be used to determine the NHV_{vg} of a specific sample by summing the Net Heating Value for each

APPENDIX 1.2

individual component by individual component volume fractions. Individual component Net Heating Values are listed in Table 1 of this Appendix.

$$NHV_{vg} = \sum_{i=1}^{n} (x_i \cdot NHV_i) \qquad \textit{Equation 1}$$

For any gas stream for which the Company complies with Paragraph 24 by collecting direct Net Heating Value monitoring data in accordance with the method set forth in 21.b but for which a Hydrogen Concentration Monitor is not used: Use the direct output (measured value) of the monitoring system(s) (in BTU/scf) to determine the NHV_{vg} for the sample.

For any gas stream for which the Company complies with Paragraph 24 by collecting direct Net Heating Value monitoring data in accordance with the method set forth in 21.b and for which a Hydrogen Concentration Monitor is also used: Equation 2 shall be used to determine the NHV_{vg} for each sample measured via the Net Heating Value monitoring system. Where hydrogen concentration data is collected, Equation 2 performs a net correction for the measured heating value of hydrogen since the theoretical Net Heating Value for hydrogen is 274 Btu/scf, but for the purposes of this Consent Decree, a Net Heating Value of 1,212 Btu/scf may be used (1,212 – 274 = 938 BTU/scf).

$$NHV_{vg} = NHV_{measured} + 938x_{H2} \qquad \textit{Equation 2}$$

Step 1b: Calculation Method to be Used in Applying Equation/Output to Determine NHV_{vg}

For any Covered Flare for which the Company complies with Paragraph 24 by using a continuous monitoring system in accordance with the method set forth in 24.a or 24.b: The Company may elect to determine the 15-minute block average NHV_{vg} using either the Feed-Forward Calculation Method or the Direct Calculation Method (both described below). The Company need not elect to use the same methodology at all Covered Flares with a continuous monitoring system; however, for each such Covered Flare, the Company must elect one calculation method that will apply at all times, and use that method for all continuously monitored flare vent streams associated with that Covered Flare. If the Company intends to change the calculation method that applies to a Covered Flare, the Company must notify the EPA 30 days in advance of such a change.

Feed-Forward Calculation Method. When calculating NHV_{vg} for a specific 15-minute block:

1. Use the results from the first sample collected during an event (for periodic Vent Gas flow events) for the first 15-minute block associated with that event.
2. If the results from the first sample collected during an event (for periodic Vent Gas flow events) are not available until after the second 15-minute block starts, use the results from the first sample collected during an event for the second 15-minute block associated with that event.

3. For all other cases, use the results that are available from the most recent sample prior to the 15-minute block period for that 15-minute block period for all Vent Gas streams. For the purpose of this requirement, use the time that the results become available rather than the time the sample was collected. For example, if a sample is collected at 12:25 AM and the analysis is completed at 12:38 AM, the results are available at 12:38 AM and these results would be used to determine compliance during the 15-minute block period from 12:45 AM to 1:00 AM.

Direct Calculation Method. When calculating NHV_{vg} for a specific 15-minute block:

1. If the results from the first sample collected during an event (for periodic Vent Gas flow events) are not available until after the second 15-minute block starts, use the results from the first sample collected during an event for the first 15-minute block associated with that event.
2. For all other cases, use the arithmetic average of all NHV_{vg} measurement data results that become available during a 15-minute block to calculate the 15-minute block average for that period. For the purpose of this requirement, use the time that the results become available rather than the time the sample was collected. For example, if a sample is collected at 12:25 AM and the analysis is completed at 12:38 AM, the results are available at 12:38 AM and these results would be used to determine compliance during the 15-minute block period from 12:30 AM to 12:45 AM.

Step 2: Determine Volumetric Flow Rates of Gas Streams

The Company shall determine the volumetric flow rate in standard cubic feet (scf) of vent gas, along with the volumetric flow rates (in scf) of any Supplemental Gas, Assist Steam, and Premix Assist Air, over a 15-minute block average basis. The 15-minute block average volumetric flow rates shall be calculated for set 15-minute time periods starting at 12 midnight to 12:15 AM, 12:15 AM to 12:30 AM and so on, concluding at 11:45 PM to midnight.

For any gas streams for which the Company complies with Paragraph 20 by using a monitoring system that directly records volumetric flow rate: Use the direct output (measured value) of the monitoring system(s) (in scf), as corrected for the temperature and pressure of the system to standard conditions (i.e., a temperature of 20 °C (68 °F) and a pressure of 1 atmosphere) to then calculate the average volumetric flow rate of that gas stream for the 15-minute block period.

For Vent Gas, Assist Steam, or Premix Assist Air gas streams for which the Company complies with Paragraph 20 by using a mass flow monitor to determine volumetric flow rate: Equation 3 shall be used to determine the volumetric flow rate of Vent Gas, Assist Air, or Assist Steam by converting mass flow rate to volumetric flow at standard conditions (i.e., a temperature of 20 °C (68 °F) and a pressure of 1 atmosphere). Equation 3 uses the molecular weight of the gas stream as an input to the equation; therefore, if the Company elects to use a mass flow monitor to determine volumetric flow rate of Vent Gas, the Company must collect compositional analysis data for such Vent Gas in accordance with the method set forth in

APPENDIX 1.2

Paragraph 24.a. For assist steam, use a molecular weight of 18 pounds per pound-mole. For assist air, use a molecular weight of 29 pounds per pound-mole. The converted volumetric flow rates at standard conditions from Equation 3 shall then be used to calculate the average volumetric flow rate of that gas stream for the 15-minute block period.

$$Q_{vol} = \frac{Q_{mass} * 385.3}{MWt} \qquad \textit{Equation 3}$$

For gas streams for which the molecular weight of the gas is known and for which the Company complies with Paragraph 20 by using continuous pressure/temperature monitoring system(s): Use appropriate engineering calculations to determine the average volumetric flow rate of that gas stream for the 15-minute block period. For assist steam, use a molecular weight of 18 pounds per pound-mole. For assist air, use a molecular weight of 29 pounds per pound-mole. For Vent Gas, molecular weight must be determined by collecting compositional analysis data for such Vent Gas in accordance with the method set forth in Paragraph 24.a.

Step 3: Calculate the Net Heating Value of the Combustion Zone Gas (NHV_{cz})

For any Covered Flare at which: 1) the Feed-Forward Calculation Method is used; 2) gas composition or Net Heating Value monitoring is performed in a location representative of the cumulative vent gas stream; and 3) Supplemental Gas flow additions to the flare are directly monitored: Equation 4 shall be used to determine the 15-minute block average NHV_{cz} based on the 15-minute block average vent gas, supplemental gas, and assist gas flow rates.

$$NHV_{cz} = \frac{(Q_{vg} - Q_{NG2} + Q_{NG1}) * NHV_{vg} + (Q_{NG2} - Q_{NG1}) * NHV_{NG}}{Q_{vg} + Q_s + Q_{a,premix}} \qquad \textit{Equation 4}$$

For the first 15-minute block period of an event, Q_{NG1} shall use the volumetric flow value for the current 15-minute block period (i.e. $Q_{NG1} = Q_{NG2}$). NHV_{NG} shall be determined using one of the following methods: 1) direct compositional or Net Heating Value monitoring of the natural gas stream in accordance with Step 1; or 2) for purchased ("pipeline quality") natural gas streams, the Company may elect to either: a) use annual or more frequent grab sampling at any one representative location; or b) assume a Net Heating Value of 920 BTU/scf.

For all other Covered Flares: Equation 5 shall be used to determine the 15-minute block average NHV_{cz} based on the 15-minute block average vent gas and assist gas flow rates. For periods when there is no Assist Steam flow or Premix Assist Air flow, $NHV_{cz} = NHV_{vg}$.

$$NHV_{cz} = \frac{Q_{vg} * NHV_{vg}}{Q_{vg} + Q_s + Q_{a,premix}} \qquad \textit{Equation 5}$$

APPENDIX 1.2

Step 4: Calculate the Net Heating Value Dilution Parameter (NHV_{dil})

For any Covered Flare at which: 1) the Feed-Forward Calculation Method is used; 2) gas composition or Net Heating Value monitoring is performed in a location representative of the cumulative vent gas stream; and 3) Supplemental Gas flow additions to the flare are directly monitored: Equation 6 shall be used to determine the 15-minute block average NHV_{dil} only during periods when Perimeter Assist Air is used. For 15-minute block periods when there is no cumulative volumetric flow of Perimeter Assist Air, the 15- minute block average NHV_{dil} parameter does not need to be calculated.

$$NHV_{dil} = \frac{\left[(Q_{vg} - Q_{NG2} + Q_{NG1}) * NHV_{vg} + (Q_{NG2} - Q_{NG1}) * NHV_{NG}\right] * Diam}{(Q_{vg} + Q_s + Q_{a,premix} + Q_{a,perimeter})} \qquad \textit{Equation 6}$$

For the first 15-minute block period of an event, Q_{NG1} shall use the volumetric flow value for the current 15-minute block period (i.e. $Q_{NG1} = Q_{NG2}$). NHV_{NG} shall be determined using one of the following methods: 1) direct compositional or Net Heating Value monitoring of the natural gas stream in accordance with Step 1; or 2) for purchased ("pipeline quality") natural gas streams, the Company may elect to either: a) use annual or more frequent grab sampling at any one representative location; or b) assume a Net Heating Value of 920 BTU/scf.

For all other Covered Flares: Equation 7 shall be used to determine the 15-minute block average NHV_{dil} based on the 15-minute block average vent gas and Perimeter Assist Air flow rates, only during periods when Perimeter Assist Air is used. For 15-minute block periods when there is no cumulative volumetric flow of Perimeter Assist Air, the 15- minute block average NHV_{dil} parameter does not need to be calculated.

$$NHV_{dil} = \frac{Q_{vg} * Diam * NHV_{vg}}{(Q_{vg} + Q_s + Q_{a,premix} + Q_{a,perimeter})} \qquad \textit{Equation 7}$$

Step 5: Ensure that during flare operation, $NHV_{cz} \geq 270$ BTU/scf

The flare must be operated to ensure that NHV_{cz} is equal to or above 270 BTU/scf, as determined for each 15-minute block period when Supplemental, Sweep, and/or Waste Gas is routed to a Covered Flare for at least 15-minutes. Equation 8 shows this relationship.

$$NHV_{cz} \geq 270\ BTU/scf \qquad \textit{Equation 8}$$

APPENDIX 1.2

Step 6: Ensure that during flare operation, $NHV_{dil} \geq 22$ BTU/ft^2

A flare actively receiving Perimeter Assist Air must be operated to ensure that NHV_{dil} is equal to or above 22 BTU/ft^2, as determined for each 15-minute block period when Supplemental, Sweep, and/or Waste Gas is routed to a Covered Flare for at least 15-minutes. Equation 9 shows this relationship.

$$NHV_{dil} \geq 22\ BTU/ft^2 \qquad \textit{Equation 9}$$

Calculation Method for Determining Compliance with Vtip Operating Limits.

The Company shall determine Vtip on a 15-minute Block Average basis according to the following requirements:

(a) Defendants shall use design and engineering principles and the guidance in Appendix 1.3 to determine the Unobstructed Cross Sectional Area of the Flare Tip. The Unobstructed Cross Sectional Area of the Flare Tip is the total tip area that Vent Gas can pass through. This area does not include any stability tabs, stability rings, and Upper Steam or air tubes because Vent Gas does not exit through them.

(b) Defendants shall determine the cumulative volumetric flow of Vent Gas for each 15-minute Block Average Period using the data from the continuous flow monitoring system required in Paragraph 20 according to the requirements in Step 2 above.

(c) The 15-minute Block Average Vtip shall be calculated using Equation 10.

$$Vtip = \frac{Q_{cum}}{Area * 900} \qquad \textit{Equation 10}$$

(d) If Defendants choose to comply with Paragraph 41.a. Defendants shall also determine the NHVvg using Step 1 above and calculate Vmax using Equation 11 in order to compare Vtip to Vmax on a 15-minute Block Average basis.

$$log_{10}(V_{max}) = \frac{NHV_{vg} + 1{,}212}{850} \qquad \textit{Equation 11}$$

APPENDIX 1.2

Key to the Abbreviations:

$385.3 = conversion\ factor\ (scf/lb\text{-}mol)$
850 = Constant
900 = Conversion factor, (seconds / 15-minute block average)
1,212 = Constant for heating value of hydrogen (H2)
Area = The unobstructed cross sectional area of the flare tip is the total tip area that vent gas can pass through, ft². This area does not include any stability tabs, stability rings, and upper steam or air tubes because flare vent gas does not exit through them. Use design and engineering principles to determine the unobstructed cross sectional area of the flare tip.
Diam = Effective diameter of the unobstructed area of the flare tip for flare vent gas flow, ft. Determine the diameter as $Diam = 2 * \sqrt{Area \div \pi}$
$i = individual\ component\ in\ Vent\ Gas\ (unitless)$
$MWt = molecular\ weight\ of\ the\ gas\ at\ the\ flow\ monitoring\ location\ (lb/lb\text{–}mol)$
$n = number\ of\ components\ in\ Vent\ Gas\ (unitless)$
$NHV_{cz} = Net\ Heating\ Value\ of\ Combustion\ Zone\ Gas\ (BTU/scf)$
$NHV_i = Net\ Heating\ Value\ of\ component\ i\ according\ to\ Table\ 1\ of\ this\ Appendix\ (BTU/scf)$
$NHV_{measured} = Net\ Heating\ Value\ of\ Vent\ Gas\ stream\ as\ measured\ by\ monitoring\ system\ (BTU/scf)$
$NHV_{NG} = Net\ Heating\ Value\ of\ Supplemental\ Gas\ to\ flare\ during\ the\ 15-minute\ block\ period\ (BTU/scf)$
$NHV_{vg} = Net\ Heating\ Value\ of\ Vent\ Gas\ (BTU/scf)$
$Q_{a,perimeter} = cumulative\ vol\ flow\ of\ perimeter\ assist\ air\ during\ the\ 15-minute\ block\ period\ (scf)$
$Q_{a,premix} = cumulative\ vol\ flow\ of\ premix\ assist\ air\ during\ the\ 15-minute\ block\ period\ (scf)$
Qcum = cumulative volumetric flow over 15-minute block average period (scf)
$Q_{mass} = massflow\ rate\ (pounds\ per\ second)$
$Q_{NG1} = cumulative\ vol\ flow\ of\ Supplemental\ Gas\ to\ flare\ during\ previous\ 15-minute\ block\ period\ (scf)$
$Q_{NG2} = cumulative\ vol\ flow\ of\ Supplemental\ Gas\ to\ flare\ during\ the\ 15-minute\ block\ period\ (scf)$
$Q_s = cumulative\ vol\ flow\ of\ Total\ Steam\ during\ the\ 15-minute\ block\ period\ (scf)$
$Q_{vg} = cumulative\ vol\ flow\ of\ Vent\ Gas\ during\ the\ 15-minute\ block\ period\ (scf)$
$Q_{vol} = volumetric\ flow\ rate\ (scf\ per\ second)$
Vmax = Maximum allowed flare tip velocity (feet per second)
Vtip = Flare tip velocity (feet per second)
$x_i = concentration\ of\ component\ i\ in\ Vent\ Gas\ (vol\ fraction)$
$x_{H2} = concentration\ of\ H2\ in\ Vent\ Gas\ at\ time\ sample\ was\ input\ into\ NHV\ monitoring\ system\ (vol\ fraction)$

APPENDIX 1.2

Table 1
Individual Component Properties

Component	Molecular Formula	MW_i (pounds per pound-mole)	CMN_i (mole per mole)	NHV_i (British thermal units per standard cubic foot)	LFL_i (volume %)
Acetylene	C_2H_2	26.04	2	1,404	2.5
Benzene	C_6H_6	78.11	6	3,591	1.3
1,2-Butadiene	C_4H_6	54.09	4	2,794	2.0
1,3-Butadiene	C_4H_6	54.09	4	2,690	2.0
iso-Butane	C_4H_{10}	58.12	4	2,957	1.8
n-Butane	C_4H_{10}	58.12	4	2,968	1.8
cis-Butene	C_4H_8	56.11	4	2,830	1.6
iso-Butene	C_4H_8	56.11	4	2,928	1.8
trans-Butene	C_4H_8	56.11	4	2,826	1.7
Carbon Dioxide	CO_2	44.01	1	0	∞
Carbon Monoxide	CO	28.01	1	316	12.5
Cyclopropane	C_3H_6	42.08	3	2,185	2.4
Ethane	C_2H_6	30.07	2	1,595	3.0
Ethylene	C_2H_4	28.05	2	1,477	2.7
Hydrogen	H_2	2.02	0	1,212[A]	4.0
Hydrogen Sulfide	H_2S	34.08	0	587	4.0
Methane	CH_4	16.04	1	896	5.0
Methyl-Acetylene	C_3H_4	40.06	3	2,088	1.7
Nitrogen	N_2	28.01	0	0	∞
Oxygen	O_2	32.00	0	0	∞
Pentane+ (C5+)	C_5H_{12}	72.15	5	3,655	1.4
Propadiene	C_3H_4	40.06	3	2,066	2.16
Propane	C_3H_8	44.10	3	2,281	2.1
Propylene	C_3H_6	42.08	3	2,150	2.4
Water	H_2O	18.02	0	0	∞

[A] The theoretical Net Heating Value for hydrogen is 274 Btu/scf, but for the purposes of this Consent Decree, a Net Heating Value of 1,212 Btu/scf shall be used.

Note: If a component is not specified in this Table 1, the heats of combustion may be determined using any published values where the net enthalpy per mole of offgas is based on combustion at 25 °C and 1 atmosphere (or constant pressure) with offgas water in the gaseous state, but the standard temperature for determining the volume corresponding to one mole of vent gas is 20 °C.

United States, et al
v.
Westlake Chemical OpCo LP, et al

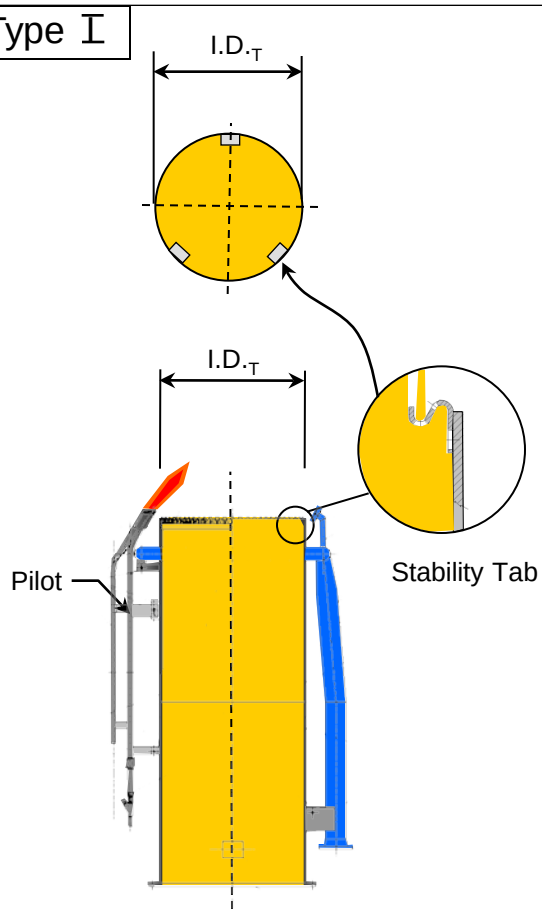
APPENDICES TO CONSENT DECREE

APPENDIX 1.3

Calculating the Unobstructed Cross Sectional Area of Various Types of Flare Tips

APPENDIX 1.3

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

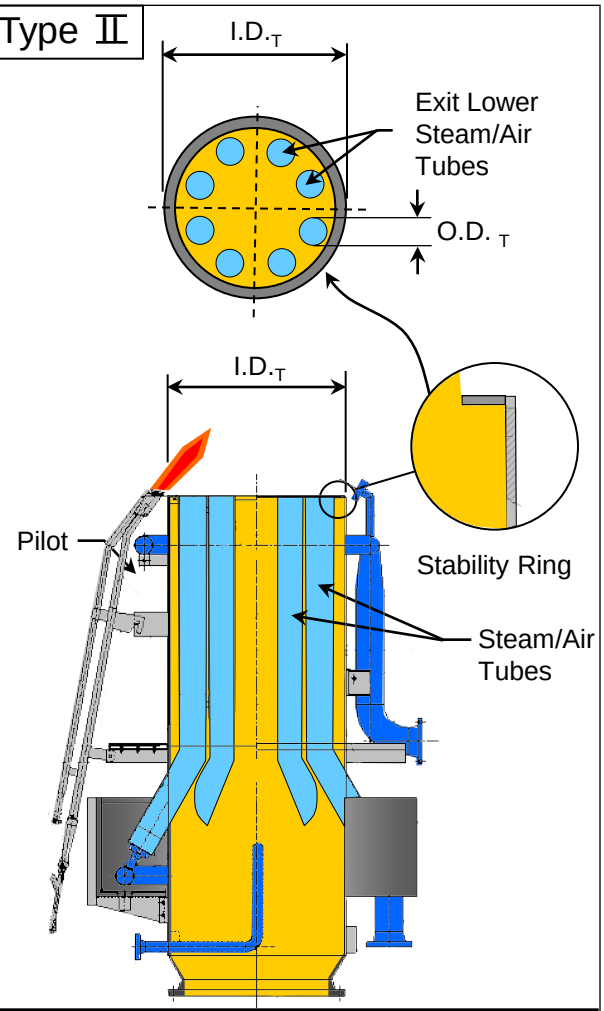
Example:

- $I.D._T$ = 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:

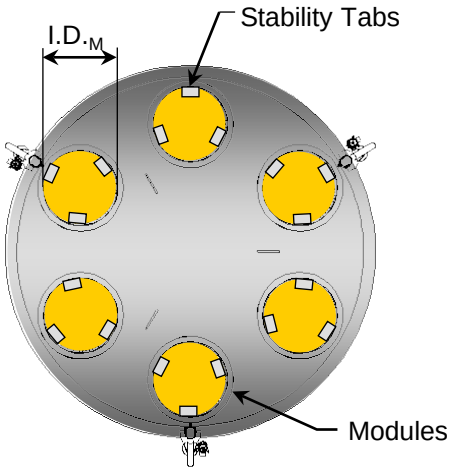
- $I.D._T$ = 47.5 inches
- A_{ST} = 100 Sq. inches
- $O.D._T$ = 6.5 inches
- N_T = 8

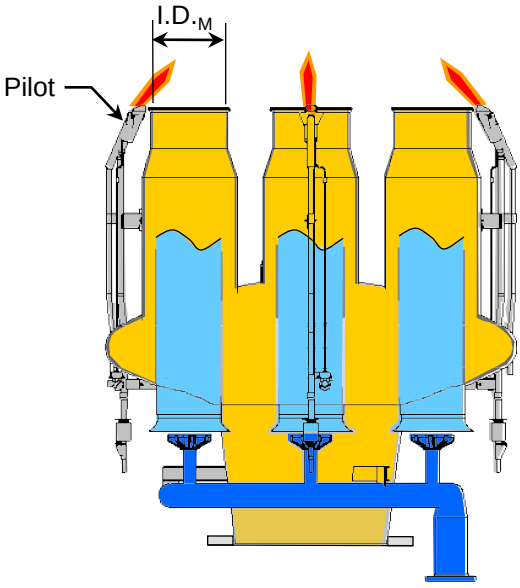
$A_{tip\text{-}unob} = \pi\ (47.5)^2/4 - 100 - 8 * \pi * (6.5)^2/4$

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

APPENDIX 1.3

Type III





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

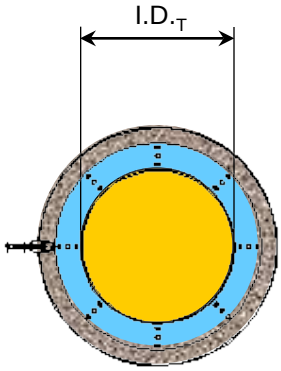
Where:
- $A_{tip\text{-}unob}$ = Unobstructed Cross Sectional Area of Flare Tip
- $I.D._M$ = Inside Diameter of One Tip Module
- N_M = Number of Modules
- X_T = Number of Stability Tabs per Module
- A_{ST} = Area of a Stability Tab

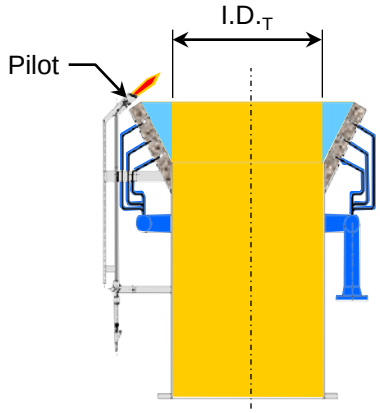
Example:
- $I.D._M$ = 17 inches
- N_M = 6
- X_T = 3
- A_{ST} = 3 Sq. inches

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

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

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

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

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

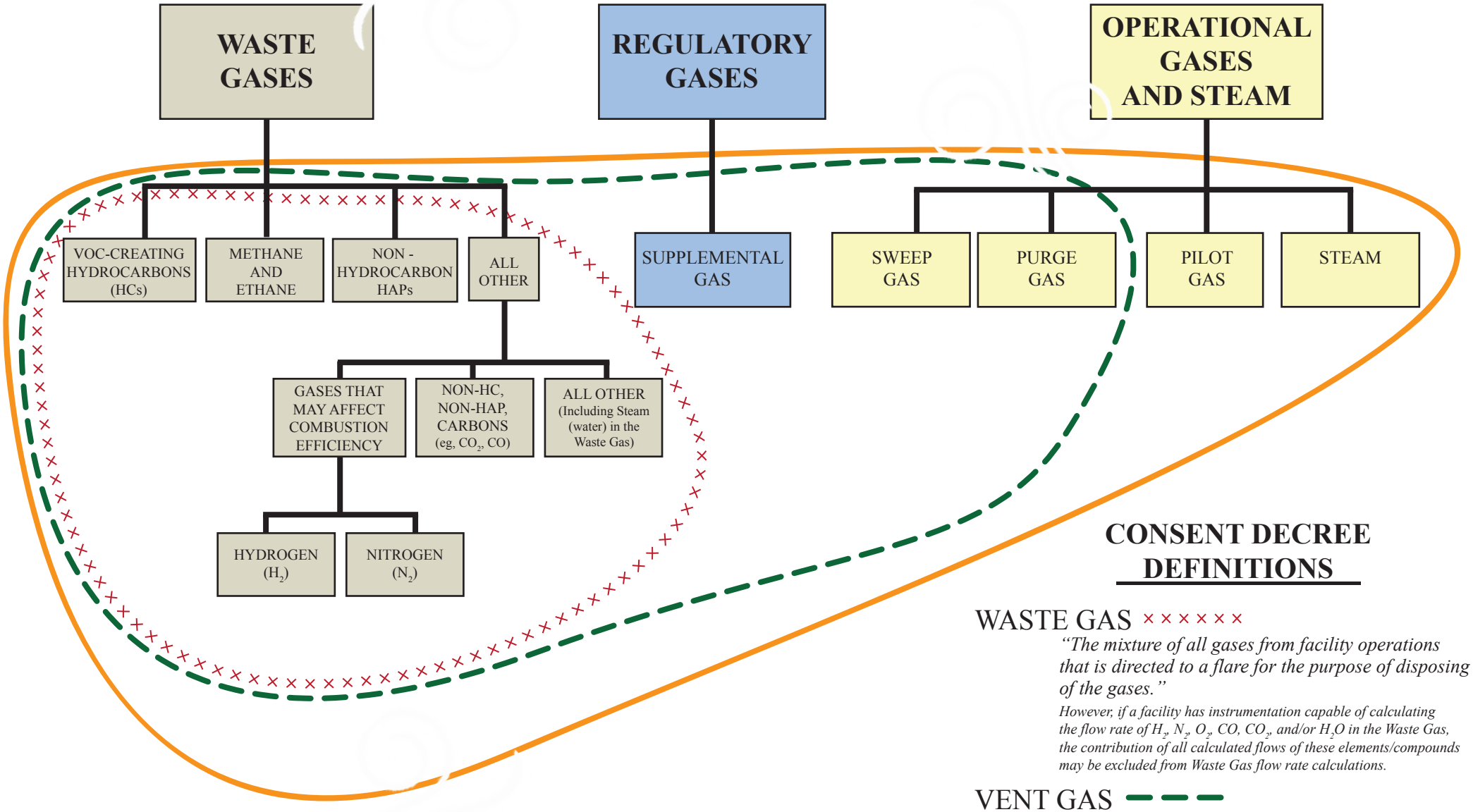
United States, et al.
v.
Westlake OpCo LP, et al

APPENDICES TO CONSENT DECREE

APPENDIX 1.4

Depiction of Gases Associated with Steam-Assisted Flares

DETECTION 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 1.4

United States, et al
v.
Westlake Chemical OpCo LP, et al

APPENDICES TO CONSENT DECREE

APPENDIX 1.5

Outline of Requirements for the Flare Data and Initial Monitoring Systems Report

APPENDIX 1.5

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* Paragraph 5), including but not limited to:

    3.1 Flare stack (for elevated flares)
    3.2 Flare tip
        3.2.1 Date installed
        3.2.2 Manufacturer
        3.2.3 Tip Size
        3.2.4 Tip Drawing
        3.2.5 Smokeless Design Capacity
    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 1.5

5. Calvert City and Lake Charles Flare Gas Recovery Systems ("FGRSs")

    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 five years preceding Date of Lodging
    5.3 Simplified schematic showing the FGRSs
    5.4 Process Flow Diagram that adds the FGRSs to the PDF(s) in Paragraph 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
    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)

APPENDIX 1.5

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
8.1.3 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)
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 and Calculations that will be used to comply with the NHV_{CZ} Requirements in the Consent Decree

United States, et al
v.
Westlake Chemical OpCo LP, et al

APPENDICES TO CONSENT DECREE

APPENDIX 1.6

Waste Gas Mapping: Level of Detail Needed to Show Main Headers and Process Unit Headers

APPENDIX 1.6

WASTE GAS MAPPING:
LEVEL OF DETAIL NEEDED TO SHOW MAIN HEADERS AND PROCESS UNIT HEADERS

Purpose:

Waste Gas Mapping is required in order to identify the source(s) of waste gas entering each Covered Flare. Waste Gas Mapping can be done using instrumentation, isotopic tracing, acoustic monitoring, and/or engineering estimates for all sources entering a flare header (e.g. pump seal purges, sample station purges, compressor seal nitrogen purges, relief valve leakage, and other sources under normal operations). This Appendix outlines what needs to be included as the Waste Gas Mapping section within the Initial Waste Gas Minimization Plan ("Initial WGMP") and, as needed, later updated.

Waste Gas Mapping Criteria:

For purposes of waste gas mapping, a main header is defined as the last pipe segment prior to the flare knock out drum. Process unit headers are defined as pipes from inside the battery limits of each process unit that connect to the main header. For process unit headers that are greater than or equal to six (6) inches in diameter, flow ("Q") must be identified and quantified if it is technically feasible to do so. In addition, all sources feeding each process unit header must be identified and listed in a table, but not necessarily individually quantified. For process unit headers that are less than six (6) inches in diameter, sources must be identified, but they do not need to be quantified.

Waste Gas Mapping Submission Requirements:

For each Covered Flare, the following shall be included within the Waste Gas Mapping section of the Initial WGMP:

1. A simplified schematic consistent with the example schematic included on the second page of this Appendix.

2. A table of all sources connected to each flare main header and process unit header consistent with the Table included on the third page of this Appendix.

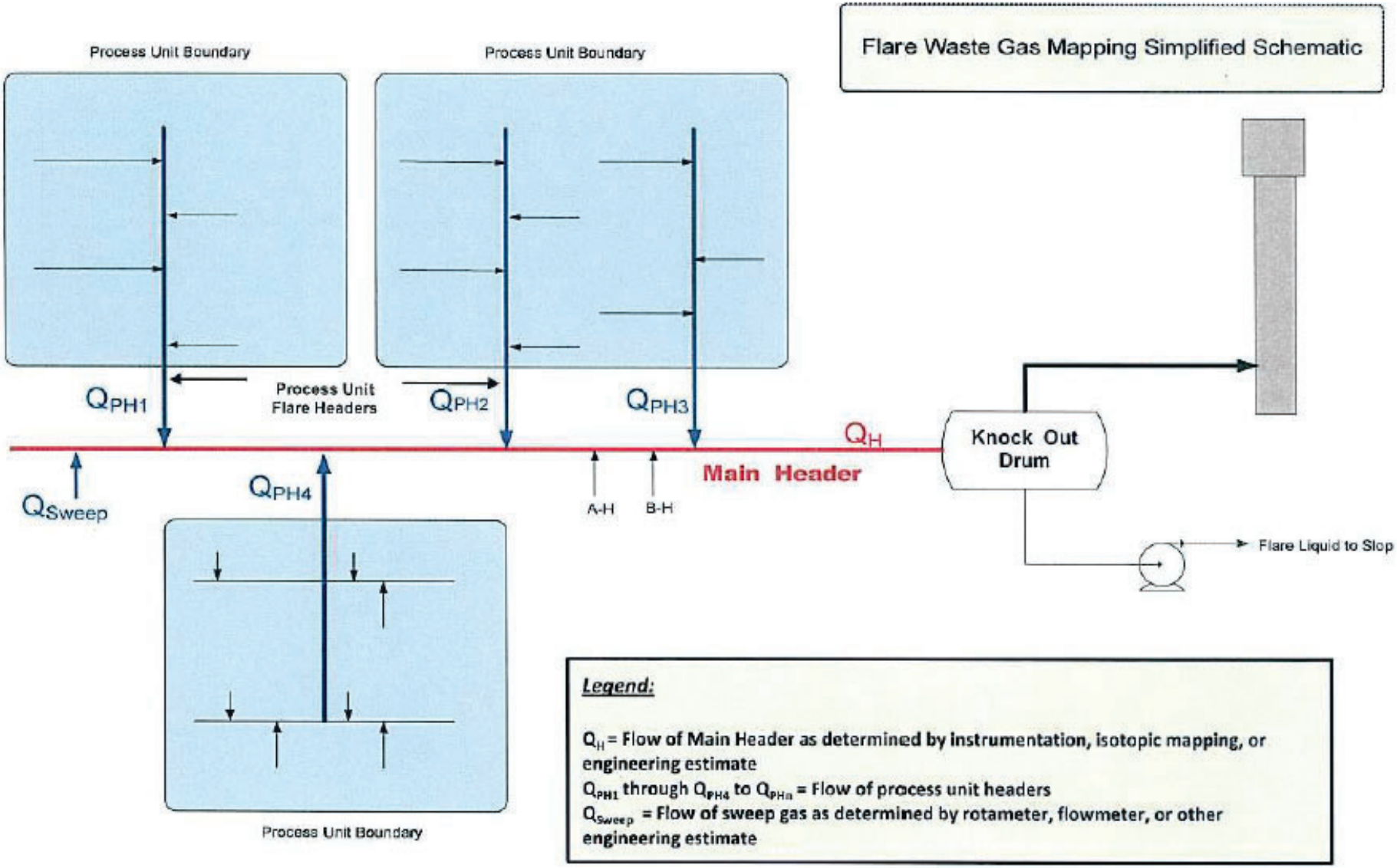

Flare Waste Gas Mapping Simplified Schematic
Process Unit Boundary
Process Unit Boundary
Q_{PH1}
Process Unit Flare Headers
Q_{PH2}
Q_{PH3}
Q_H
Main Header
Knock Out Drum
Q_{Sweep}
Q_{PH4}
A-H
B-H
Flare Liquid to Slop
Process Unit Boundary
Legend:
Q_H = Flow of Main Header as determined by instrumentation, isotopic mapping, or engineering estimate
Q_{PH1} through Q_{PH4} to Q_{PHn} = Flow of process unit headers
Q_{Sweep} = Flow of sweep gas as determined by rotameter, flowmeter, or other engineering estimate

Table 1: Example of Flare Source Description Table

Process Unit Header	Sources	Detailed Source Description
Q_{PH1} (Ex: FCCU Gas Con Unit)	3 PSVs	PSV-14 on 110-D-5 Gas Con Absorber PSV-12 on 110-D-1 Amine Scrubber PSV-7 on 110-F-1 Batch Caustic Vessel
	2 Pump Seal Purges	110-G-1 LPG Pump 110-G-2 Rich Amine Pump
	1 Sample Station	110-S-1 LPG
	1 PSV	PSV 17 on 112-D-1 Main Column
	1 Pressure Control Valve	PCV 21 – Emergency Wet Gas Compressor
	1 PSV	PSV-21 on Flush Oil Drum
	1 Pump Seal Purge	110-G-23 Slurry Oil Pump
Q_{PH2} (Ex: Gas Oil Treater)	Continue same as PH1	Continue same as PH1
Q_{PH3}	Continue same as PH1	Continue same as PH1
Q_{PH4}	Continue same as PH1	Continue same as PH1
A-H	1 PSVs	PSV-17 on 109-E-42 Slurry Heat Exchanger
B-H	2 Pump Seal Purges	110-G-3 Gas Oil Feed 110-G-4 Main Column Reflux

United States, et al
v.
Westlake Chemical OpCo LP, et al

APPENDICES TO CONSENT DECREE

APPENDIX 1.7

February 5, 2018 Letter to Representatives of Extrel CMS, LLC and AMETEK, Energy and Process Division from Steffan M. Johnson, Group Leader, Measurement Technology Group, Office of Air Quality Planning and Standards

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

Mr. Chuck DeCarlo
Marketing Manager
Extrel CMS, LLC
575 Epsilon Drive, Suite 2
Pittsburg, PA 15238-2838

FEB 05 2018

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Tony Slapikas
Product Manager for Mass Spectrometry
AMETEK, Energy & Process Division
150 Freeport Road
Pittsburgh, PA 15238

Dear Mr. DeCarlo and Mr. Slapikas,

I am writing in response to your letter dated August 18, 2017, requesting approval for use of process mass spectrometers as part of an alternative to testing procedures utilizing calorimeters or gas chromatographs to measure Net Heating Value (NHV_{VG}) in flare vent gas as required under 40 CFR Part 63, Subpart CC – National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries. The owner or operator of facilities subject to Subpart CC must measure flare vent gas composition to determine NHV_{VG} in units of British Thermal Units per standard cubic foot (BTU/SCF). This BTU/SCF determination may be performed using a calorimeter capable of continuously measuring, calculating, and recording NHV_{VG} at standard conditions (40 CFR 63.670 (j)(3)) or equipment that determines the concentration of individual components in the flare vent gas (40 CFR 63.670 (j)(1)), such as a gas chromatograph, and, if desired, may directly measure the hydrogen concentration in the flare vent gas following the methods provided in 40 CFR 63.670 (j)(4). All monitoring equipment must meet the applicable minimum accuracy, calibration and quality control requirements specified in Table 13 and §63.671 of Subpart CC.

In your letter, you propose to use a process mass spectrometer analyzer and the following measurement approach as an alternative to measure NHV_{VG}:

1) The owner or operator of the affected facility will perform a pre-survey to determine the list and concentration of components that are present in flare vent gas feed. This pre-survey will be used in part to:
   a) Determine an appropriate analysis method for the site-specific refinery flare vent gas;
   b) Create a list of vent gas components to be included in calibration gas cylinders to be used to evaluate the quality of the measurement procedure used to determine NHV_{VG};
   c) Define calibration standards to be prepared by a vendor at a certified accuracy of 2 percent and traceable to NIST; and
   d) Perform an initial calibration to identify mass fragment overlap and response factors for the target compounds.

2) The process mass spectrometer will be calibrated using calibration gas standards consisting of a mix of the compounds identified in the site specific flare gas pre-survey.
3) During flare gas analysis, compounds that are not identified during the pre-survey and that have mass fragments identical to the compounds found during the pre-survey will be included in the calculation of NHV_{VG}.
4) Calibration error (CE) for each component in the calibration blend will be calculated using the following equation:

$$CE = \frac{C_m - C_a}{C_a} x\ 100$$

Where :

C_m = Average instrument response, (ppm)
C_a = Cylinder gas value or tag value, (ppm)

5) The average instrument CE for each calibration compound at any calibration concentration must not differ by more than 10 percent from the cylinder gas value or tag value.
6) For each set of triplicate injections at each calibration concentration for each calibration compound, any one introduction shall not deviate more than 5 percent from the average concentration measured at that level.

Your supporting information included Method 301 calculations that showed acceptable bias and precision when you measured a mixture of gases from a vendor certified gas cylinder. Your request also includes reference to facilities needing to monitor flare gas composition continuously to effectively maintain flare efficiency while compensating for changes in the flare gas composition.

With this letter, we are approving your request to substitute continuous process mass spectrometry for continuous gas chromatography as allowed in 40 CFR 63.670 and 63.671 predicated on both your proposed use of these process mass spectrometers as described above and the additional provisos listed below:

1) You must meet the requirements in 40 CFR 63.671 (e)(1) and (2) including Table 13 requirements for Net Heating Value by Gas Chromatograph.
2) You may use the alternative sampling line temperature allowed in 40 CFR 63, Subpart CC, Table 13, under Net Heating Value by Gas Chromatograph.
3) You must meet applicable Performance Specification 9 (40 CFR part 60, appendix B) requirements for initial continuous monitoring system acceptance including, but not limited to:
    - Performing a multi-point calibration check at three concentrations following the procedure in Section 10.1; and
    - Performing periodic process mass spectrometer calibrations as directed for gas chromatographs in 40 CFR 63, Subpart CC, Table 13.
4) You may augment the minimum list of calibration gas components found in 40 CFR 63.671(e) with compounds found during the pre-survey as needed to develop a site-specific analysis method.

5) For unknown gas components that have similar analytical mass fragments to calibration compounds, you may report the unknowns as an increase in the overlapped calibration gas compound.
6) For unknown compounds that do not produce mass fragments that overlap calibration compounds, you may use the response factor for the nearest molecular weight hydrocarbon in the calibration mix to quantify the unknown component's NHV_{VG}. This requirement parallels the requirements in 40 CFR Part 63.671 (e)(3) for gas chromatographs.
7) You may use the response factor for n-pentane to quantify any unknown components detected with a higher molecular weight than n-pentane.
8) You must meet all other applicable generic requirements of §§63.670 and 63.671 for measurement of NHV_{VG} (i.e., measurement requirements not specifically targeted to gas chromatographs).
9) A copy of this approval letter must be included in the report for each testing program where these alternative testing procedures are applied.

Since this alternative test method approval under 40 CFR 63.7 (f) is appropriate for use at all facilities subject to 40 CFR 63, Subpart CC, we will announce on EPA's Web site (*https://www.epa.gov/emc/broadly-applicable-approved-alternative-test-methods*) that the alternative method is broadly applicable to determination of NHV_{VG} under this subpart.

If you have any questions regarding this approval or need further assistance, please contact Ray Merrill at (919) 541-5225 or *merrill.raymond@epa.gov*, or Robin Segall at (919) 541-0893 or *segall.robin@epa.gov*.

Sincerely,

Robin R. Segall for SMJ

Steffan M. Johnson, Group Leader
Measurement Technology Group

cc.

Gerri Garwood, EPA/OAQPS/SPPD
Maria Malave, EPA/OECA/OC
Brenda Shine, EPA/OAQPS/SPPD
EPA Regional Testing Contacts

United States, et al.
v.
Westlake Chemical OpCo LP, et al

APPENDICES TO CONSENT DECREE

APPENDIX 1.8

FGRS for Lake Charles and Calvert City

FGRS Requirements

Covered Plant	**FGRS Type**	**Covered Flare(s)**	**FGRS Operating Design Capacity (thousand scf/hour)**	**Total No. of Installed Compressors**	**Capacity of Each Compressor (thousand scf/hour)**
Calvert City	Liquid Ring	Ethylene Flare	≥ 62.5	1 Compressor system with 1 installed Duplicate Spare Compressor	≥ 62.5
Lake Charles	Liquid Ring	Petro 2	≥ 62.5	1 Compressor system with 1 installed Duplicate Spare Compressor	≥ 62.5

United States, et al
v.

Westlake Chemical OpCo LP, et al

APPENDICES TO CONSENT DECREE

APPENDIX 1.9

Lake Charles Petro 2 Unit Hydrogen Rich Gas Mixture Route-Around of the Petro 2 Unit Flare FGRS

Existing Operations: Petro 2 Unit Flare

I. Hydrogen Rich Gas Mixture

The Lake Charles, Louisiana Petro 2 Unit produces approximately 19,535 pounds per hour of a hydrogen rich gas mixture. A portion of this gas mixture is used for internal consumption by the Petro 2 Unit, and a portion is sent to an on-site third-party customer. When the customer shuts down, the excess gas mixture is routed from the hydrogen delivery system to the Petro 2 Unit Flare. During these events, the average flow of the hydrogen rich gas mixture to the Petro 2 Unit Flare is approximately 5,200 pounds per hour with a maximum hourly flow of up to approximately 16,000 pounds per hour, depending on the operating conditions of the site fuel system.

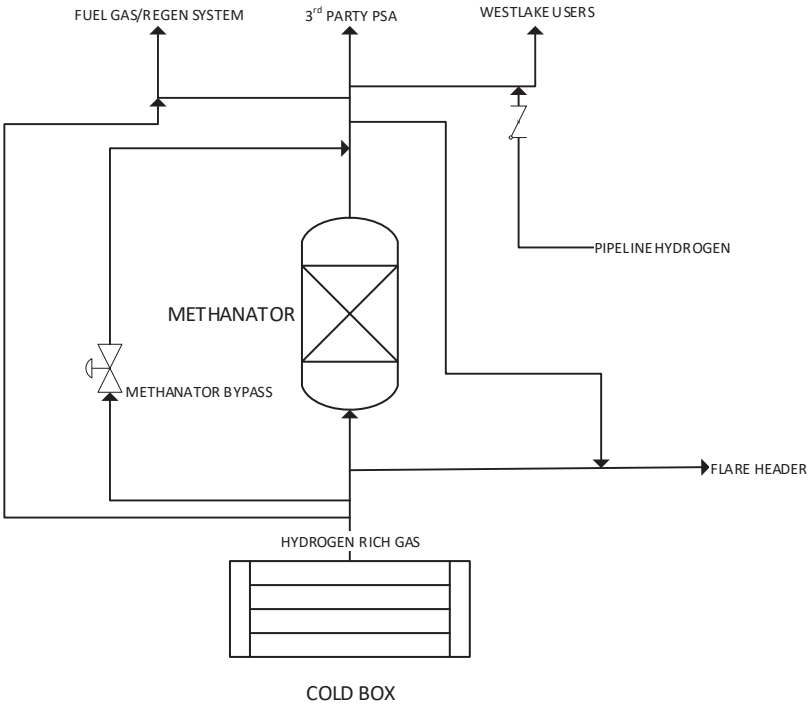
The composition of the hydrogen rich gas mixture is approximately:

Hydrogen = 92.7 mol%
Methane = 7.1 mol%
Carbon Monoxide = 0.2 mol%

Molecular Weight = 3.08 lb/lb-mole

II. Origin of Hydrogen Rich Gas Mixture

During normal operation, cracked gas from the compressor is routed through a number of heat exchangers to cool and condense the gas/liquids to very low temperatures. Hydrogen is separated from the cracked gas mixture in the last cooling step called the cold box. Hydrocarbon liquids from the Cold Box are routed to the distillation train. A portion of the hydrogen gas is sent to fuel, and the remainder is sent to a third-party customer. In an alternative mode of operation, a portion of the hydrogen gas is sent to fuel, a portion is consumed internally after it has been sent to a methanator for removal of carbon monoxide, and the remainder is sent to a third-party customer. In the present configuration, if venting of excess hydrogen gas is required, the flare tie-in upstream of the methanator is primarily used. A flow diagram is shown below:

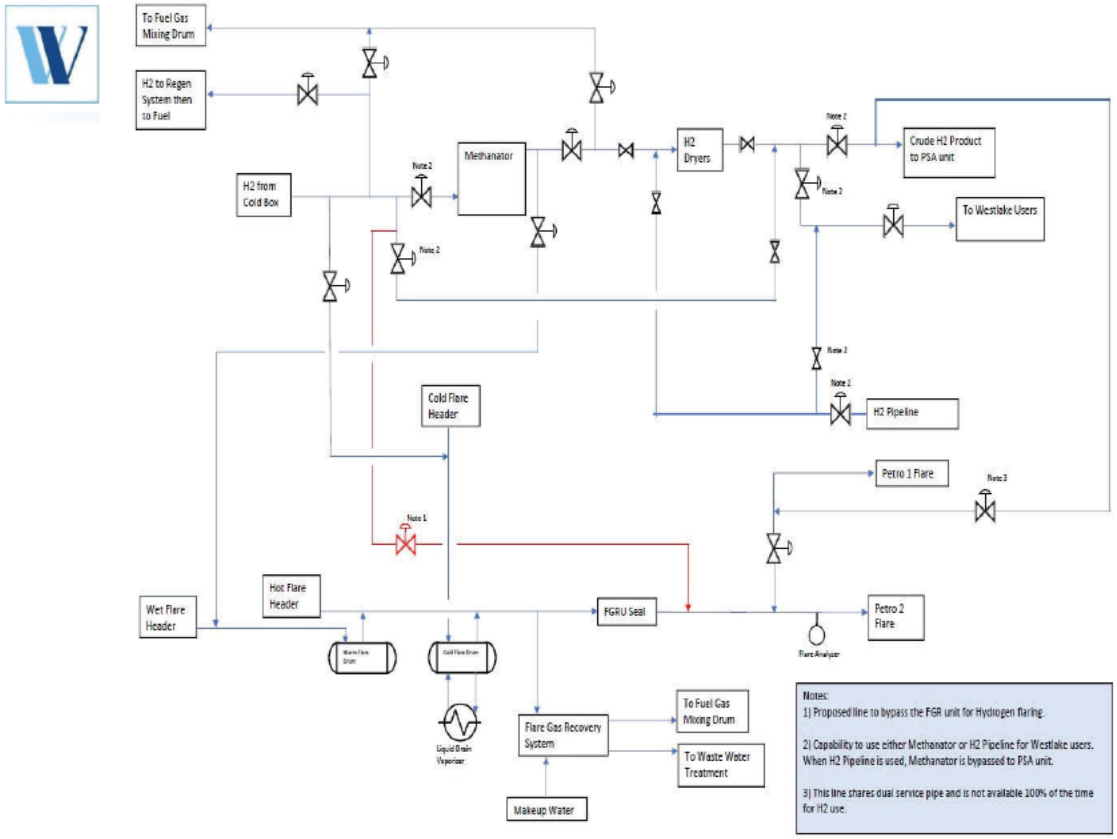


Proposed Future Design and Petro 2 Unit FGRS

The hydrogen rich gas mixture, by no later than the operational deadline for the Petro 2 Unit FGRS as set forth in Paragraph 38 of this Consent Decree, must be routed around the FGRS as described and shown in the drawing below.

Hydrogen Rich Gas Mixture - During times when the hydrogen rich gas mixture is not consumed for internal use or by the third-party customer, the excess hydrogen rich gas mixture will be routed around the future FGRS. During these times, the excess hydrogen rich gas mixture is not Potentially Recoverable Gas. Piping will be installed and will run from the hydrogen processing system directly to the Petro 2 Unit Flare. This is shown in red on the FGRS flow diagram.

A drawing of the future Petro 2 Unit FGRS is shown below:


To Fuel Gas Mixing Drum
H2 to Regen System then to Fuel
H2 from Cold Box
Methanator
H2 Dryers
Crude H2 Product to PSA unit
To Westlake Users
Note 2
Cold Flare Header
H2 Pipeline
Petro 1 Flare
Note 3
Note 1
Wet Flare Header
Hot Flare Header
PGRU Seal
Petro 2 Flare
Flare Analyzer
Liquid Drain Vaporizer
Flare Gas Recovery System
To Fuel Gas Mixing Drum
To Waste Water Treatment
Makeup Water
Notes:
1) Proposed line to bypass the PGR unit for Hydrogen flaring.
2) Capability to use either Methanator or H2 Pipeline for Westlake users. When H2 Pipeline is used, Methanator is bypassed to PSA unit.
3) This line shares dual service pipe and is not available 100% of the time for H2 use.

United States, et al
v.

Westlake Chemical OpCo LP, et al

APPENDICES TO CONSENT DECREE

APPENDIX 2.1

Scope of Work for the
Fenceline Monitoring Project

APPENDIX 2.1

SCOPE OF WORK FOR THE FENCELINE MONITORING PROJECT

1. **Applicability.** The requirements of this Fenceline Monitoring Mitigation Project apply to the Covered Plants listed in Paragraph 12.s of this Consent Decree (including the Marine Loading Area at the Lake Charles Plant, but excluding the Polymers Plant at the Lake Charles Plant).

2. **Timing and Public Transparency**. No later than 270 Days after the Effective Date, the Applicable Defendant(s) must submit in writing to EPA a report: a) showing the location of all monitors at each Covered Plant that will be utilized to comply with the Monitoring Requirements of Paragraph 3 below; b) providing an active/live/not-password-protected URL to a mockup of the publicly available website to be used to report monitoring data pursuant to this Fenceline Monitoring Mitigation Project; and c) a statement indicating that the website is properly indexed (including, but not limited to the following search terms: "benzene," "fenceline monitoring," and the Plant name and location) with the major search engines (*e.g.,* Google, Bing, Yahoo) to allow the public to easily find the website.

   The Fenceline Monitoring System described in Paragraph 3 below must commence collecting data 365 Days after the Effective Date (Effective Date is defined at Section XVII of the Consent Decree).

   The Applicable Defendant(s) must post to a publicly available website each individual sample result for each monitor, each biweekly annual average concentration difference value (once annual averages are available), and any corrective action plan submitted to EPA pursuant to Paragraph 3.g below (corrective action plans posted to the website may be redacted to protect confidential business information). The Applicable Defendant(s) must post each individual sample result for each monitor within 30 Days of the end of the biweekly sampling period or within 30 Days of sampling collected pursuant to the "alternative sampling frequency for burden reduction" requirements set forth in Paragraph 3.e.(3) below. The Applicable Defendant(s) must post each annual average difference value within 45 Days of the sampling period that allows the creation of a new annual average difference value. The data must be presented in a tabular format.

3. **Monitoring Requirements**.

a. The Applicable Defendant(s) must commence sampling along the property boundary of each of the Covered Plants. The Applicable Defendant(s) must collect and analyze the samples in accordance with Methods 325A and 325B of Appendix A to 40 C.F.R. Part 63 (Test Methods –

Pollutant Measurement Methods From Various Waste Media) (hereafter "Rule Appendix A"), and Paragraphs 3.b through 3.g below.

b. The target analyte for the Fenceline Monitoring System is benzene.

c. Siting of monitors. The Applicable Defendant(s) must determine the passive monitor locations comprising each Fenceline Monitoring System in accordance with Section 8.2 of Method 325A of Rule Appendix A, with the exception of the number of duplicates and blanks, which will be determined pursuant to 40 C.F.R. § 63.658(c)(3).

(1) As it pertains to this Fenceline Monitoring Mitigation Project, "known sources of VOCs," as used in Section 8.2.1.3 in Method 325A of Rule Appendix A for siting passive monitors, means a wastewater treatment unit, process unit, or any emission source requiring HAP control according to the requirements of any state or federal air permit applicable to the Covered Plants, including marine vessel loading operations. For marine loading operations that are located offshore, one passive monitor should be sited on the shoreline adjacent to the dock. For purposes of this Appendix, an additional monitor is not required if the only emission sources within 50 meters of the monitoring boundary are equipment leak sources satisfying all of the requirements in 40 C.F.R. § 63.658(c)(1)(i) through (iv).

(2) If there are 19 or fewer monitoring locations, the Applicable Defendant(s) shall collect at least one co-located duplicate sample per sampling period and at least one field blank per sampling period. If there are 20 or more monitoring locations, the Applicable Defendant(s) shall collect at least two co-located duplicate samples per sampling period and at least one field blank per sampling period, as described in 40 C.F.R. § 63.658(c)(3). The co-located duplicates may be collected at any one of the perimeter sampling locations.

(3) The Applicable Defendant(s) must follow the procedure in Section 9.6 of Method 325B of Rule Appendix A to determine the detection limit of benzene for each sampler used to collect samples and co-located samples and blanks. Each monitor used to conduct sampling in accordance with this Appendix must have a detection limit that is at least an order of magnitude lower than the benzene action level.

d. Collection of meteorological data. The Applicable Defendant(s) must collect and record meteorological data according to the applicable requirements in Paragraphs 3.d.(1) and 3.e(2) of this Appendix 2.1.

(1) The Applicable Defendant(s) must collect and record the average temperature during each sampling period using either an on-site meteorological station in accordance with Section 8.3 of Method 325A of Rule Appendix A or, alternatively, using data from a United States Weather Service (USWS) meteorological station provided the USWS meteorological station is within 40 kilometers (25 miles) of the applicable Covered Plants.

(2) If an on-site meteorological station is used, the Applicable Defendant(s) must follow the calibration and standardization procedures for meteorological measurements in EPA-454/B-

08-002.
http://www3.epa.gov/ttnamti1/files/ambient/met/Volume_IV_Meteorological_Measurements.pdf.

e. Sampling Frequency. The Applicable Defendant(s) must use a sampling period and sampling frequency as specified in this Paragraph 3.e.

(1) *Sampling period*. A 14-Day sampling period must be used, unless a shorter sampling period is determined to be necessary under Paragraph 3.g. A sampling period is defined as the period during which a sampling tube is deployed at a specific sampling location with the diffusive sampling end cap in-place. The sampling period does not include the time required to analyze the sample. For the purpose of this sub-Paragraph, a 14-Day sampling period may be no shorter than 13 calendar days and no longer than 15 calendar days, but the routine sampling period must be 14 calendar days.

(2) *Base sampling frequency*. Except as provided in Paragraph 3.e.(3) , the frequency of sample collection must be once each contiguous 14-Day sampling period, such that the next 14-Day sampling period begins immediately upon the completion of the previous 14-Day sampling period.

(3) *Alternative sampling frequency for burden reduction*. When an individual monitor consistently, as defined in Paragraph 3.e.(3)(i) through (v), yields results at or below 0.9 $\mu g/m^3$, the Applicable Defendant(s) may elect to use the applicable minimum sampling frequency specified in Paragraph 3.e.(3)(i) through (v) for that individual monitoring site. When calculating Δc (as defined in Paragraph 3.f) for the monitoring period when using this alternative for burden reduction, zero must be substituted for the sample result for the monitoring site for any period where a sample is not taken.

(i) If every sample at an individual monitoring site is at or below 0.9 $\mu g/m^3$ for 2 years (52 consecutive samples), every other sampling period can be skipped for that individual monitoring site, *i.e.*, sampling can occur approximately once per month.

(ii) If every sample at an individual monitoring site that is monitored at the frequency specified in Paragraph 3.e.(3)(i) is at or below 0.9 $\mu g/m^3$ for 2 years (*i.e.*, 26 consecutive "monthly" samples), five 14-Day sampling periods can be skipped for that individual monitoring site following each period of sampling, *i.e.*, sampling will occur approximately once per quarter.

(iii) If every sample at an individual monitoring site that is monitored at the frequency specified in Paragraph 3.e.(3)(ii) is at or below 0.9 $\mu g/m^3$ for 2 years (i.e., 8 consecutive quarterly samples), twelve 14-Day sampling periods can be skipped for that individual monitoring site following each period of sampling, *i.e.*, sampling will occur twice a year.

(iv) If every sample at an individual monitoring site that is monitored at the frequency specified in Paragraph 3.e.(3)(iii) is at or below 0.9 $\mu g/m^3$ for an 2 years (*i.e.*, 4

consecutive semi-annual samples), only one sample per year is required for that individual monitoring site. For yearly sampling, samples must occur at least 10 months but no more than 14 months apart.

(v) If at any time a sample for an individual monitoring site that is monitored at the frequency specified in Paragraphs 3.e.(3)(i) through (iv) returns a result that is above 0.9 $\mu g/m^3$, that sampling site must return to the original sampling requirements of contiguous 14-Day sampling periods with no skip periods for one quarter (six 14-Day sampling periods). If every sample collected during this quarter is at or below 0.9 $\mu g/m^3$, the Applicable Defendant(s) may revert back to the reduced monitoring frequency applicable for that individual monitoring site immediately prior to the sample reading exceeding 0.9 $\mu g/m^3$. If any sample collected this quarter is above 0.9 $\mu g/m^3$, that individual monitoring site must return to the original sampling requirements of contiguous 14-Day sampling periods with no skip periods for a minimum of two years. The burden reduction requirements can be used again for that monitoring site once the requirements of Paragraph 3.e.(3)(i) are met again, *i.e.*, after 52 contiguous 14-Day samples with no results above 0.9 $\mu g/m^3$.

f. Action Level. Within 45 Days of completion of each sampling period, the Applicable Defendant(s) must determine whether the results are above or below the action level as follows:

(1) Calculation of the Δc. The Applicable Defendant(s) must determine the benzene difference concentration (Δc) for each 14-Day sampling period by determining the highest and lowest sample results for benzene concentrations from the sample pool and calculating the Δc as the difference in these concentrations. The Applicable Defendant(s) must adhere to the following procedures when one or more samples for the sampling period are below the method detection limit for benzene:

(i) If the lowest detected value of benzene is below detection, the Applicable Defendant(s) must use zero as the lowest sample result when calculating Δc.

(ii) If all sample results are below the method detection limit, the Applicable Defendant(s) must use the method detection limit as the highest sample result.

(2) The Applicable Defendant(s) must calculate the annual average Δc based on the average of the 26 most recent 14-Day sampling periods. The Applicable Defendant(s) must update this annual average value after receiving the results of each subsequent 14-Day sampling period (*i.e.*, on a "rolling" basis).

(3) The action level for benzene is 9 micrograms per cubic meter ($\mu g/m^3$) on an annual average basis. If the annual average Δc value for benzene is less than or equal to 9 $\mu g/m^3$, the concentration is below the action level. If the annual average Δc value for benzene is greater

than 9 µg/m^3, the concentration is above the action level, and the Applicable Defendant(s) must conduct a root cause analysis and corrective action in accordance with Paragraph 3.g.

g. Root Cause Analysis and Corrective Action. Within 5 Days of determining that the action level has been exceeded for any annual average Δc and no longer than 50 Days after completion of the sampling period, the Applicable Defendant(s) must initiate a root cause analysis to determine the cause of such exceedance and to determine appropriate corrective action, such as those described in Paragraphs 3.g.(1) through (4). The root cause analysis and initial corrective action analysis must be completed and initial corrective actions taken no later than 45 Days after determining there is an exceedance. Root cause analysis and corrective action may include, but are not limited to:

(1) Leak inspection using Method 21 of 40 C.F.R. Part 60, Appendix A-7 and repairing any leaks found.

(2) Leak inspection using optical gas imaging and repairing any leaks found.

(3) Visual inspection to determine the cause of the high benzene emissions and implementing repairs to reduce the level of emissions.

(4) Employing progressively more frequent sampling, analysis and meteorology (*e.g.*, using shorter sampling periods for Methods 325A and 325B of Appendix A of 40 C.F.R. Part 63, or using active sampling techniques).

If, after completing the corrective action analysis and corrective actions such as those described in Paragraph 3.g , the Δc value for the next 14-Day sampling period for which the sampling start time begins after the completion of the corrective actions is greater than 9 µg/m^3 or if all corrective action measures identified require more than 45 Days to implement, the Applicable Defendant(s) must develop a corrective action plan that describes the corrective action(s) completed to date, additional measures that the Applicable Defendant(s) proposes to employ to reduce benzene concentrations in question below the action level, and a schedule for completion of these measures. The Applicable Defendant(s) must submit the corrective action plan to EPA within 60 Days after receiving the analytical results indicating that the Δc value for the 14-Day sampling period following the completion of the initial corrective action is greater than 9 µg/m^3 or, if no initial corrective actions were identified, no later than 60 Days following the completion of the corrective action analysis required in Paragraph 3.g.

h. Alternative Test Method. The Applicable Defendant may submit for review and approval pursuant to this Consent Decree a request to use an alternative test method as provided in 40 C.F.R. § 63.658(k).