EXHIBIT A

PART 5 OF 6

APPENDIX 1.2

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

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 must 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.

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

For the first 15-minute block period of an event, Q_{NG1} must use the volumetric flow value for the current 15-minute block period (i.e. $Q_{NG1} = Q_{NG2}$). NHV_{NG} must 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 must 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.

$$NHV_{dil} = \frac{Q_{vg} * Diam * NHV_{vg}}{\left(Q_{vg} + Q_s + Q_{a,premix} + Q_{a,perimeter}\right)}$$ *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.

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

APPENDIX 1.2

Step 6: Ensure that during flare operation, $NHV_{dil} \geq 22$ BTU/ft²

A flare actively receiving Perimeter Assist Air must be operated to ensure that NHV_{dil} is equal to or above 22 BTU/ft², 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 V_{tip} Operating Limits.

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

(a) Defendants must 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 must 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 must be calculated using Equation 10.

$$Vtip = \frac{Q_{cum}}{Areax900} \qquad \textit{Equation 10}$$

(d) If Settling Defendants choose to comply with Paragraph 40.b, Defendants must 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-mol)*
850 = Constant
900 = Conversion factor, (seconds / 15-minute block average)
1,212 = Constant
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-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 must 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.
Dow Chemical Company, et al

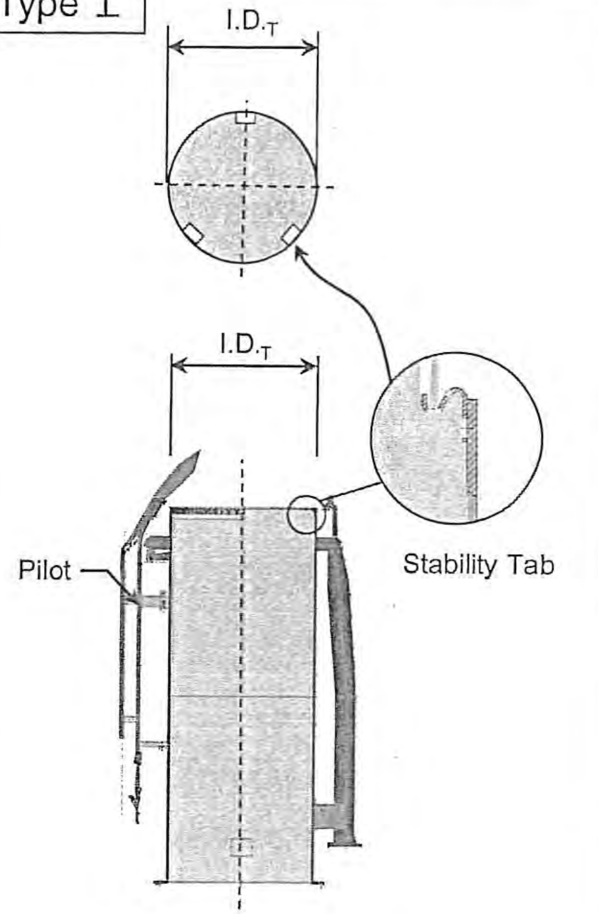
APPENDICES TO CONSENT DECREE

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

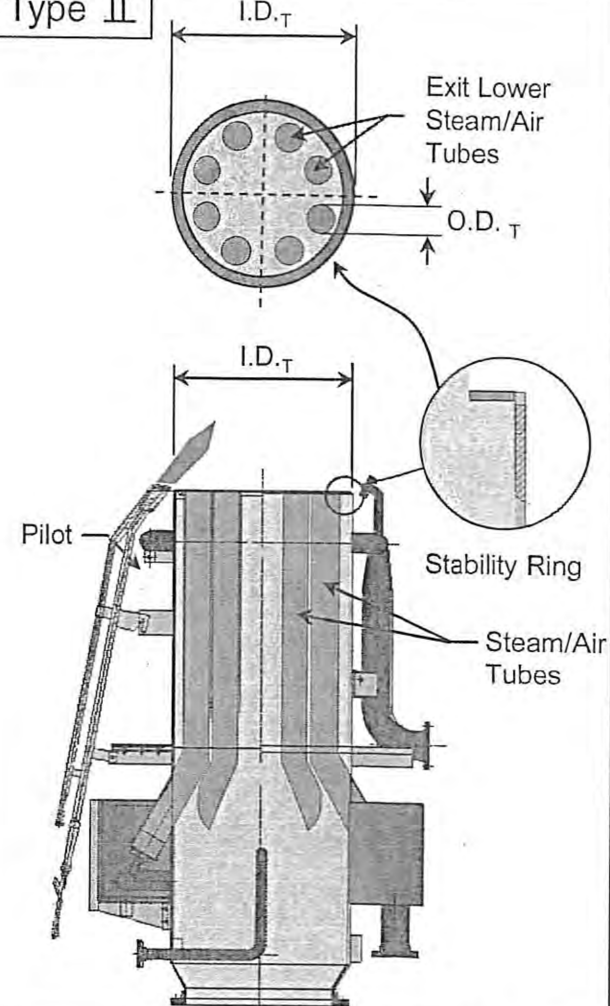
X_T = 3

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

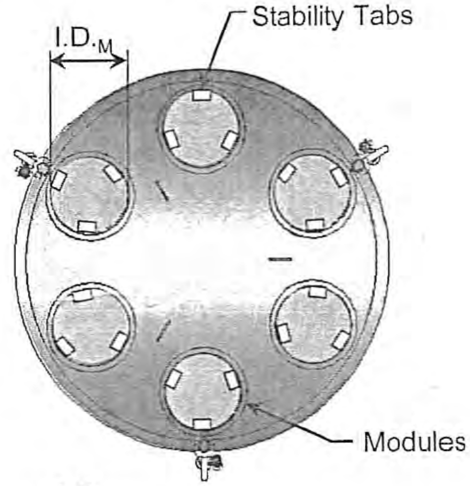
N_T = 8

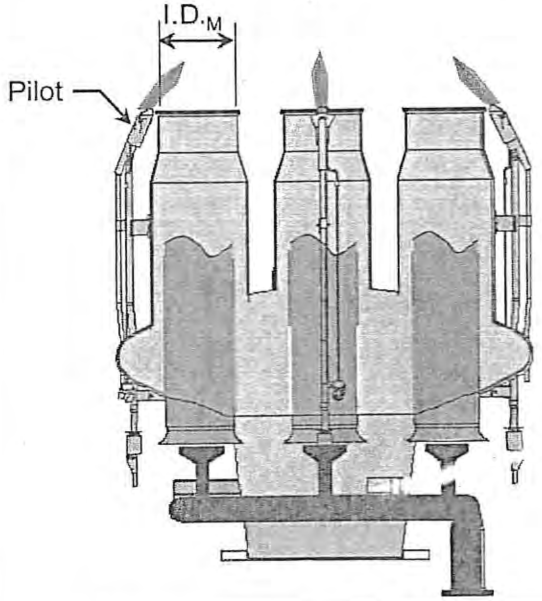
$A_{tip\text{-}unob} = \pi\ (47.5)^2/4 - 100 - 8 * \pi * (6.5)^2/4$

$A_{tip\text{-}unob}$ = 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

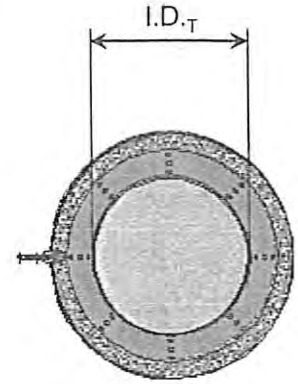
$N_M = 6$ $X_T = 3$

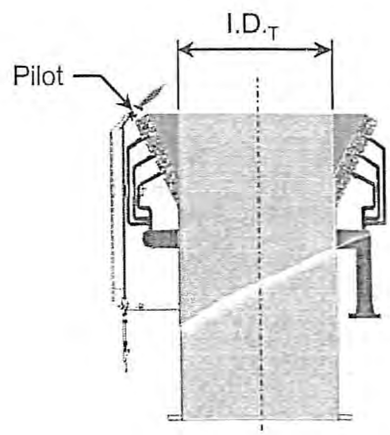
A_{ST} = 3 Sq. inches

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

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

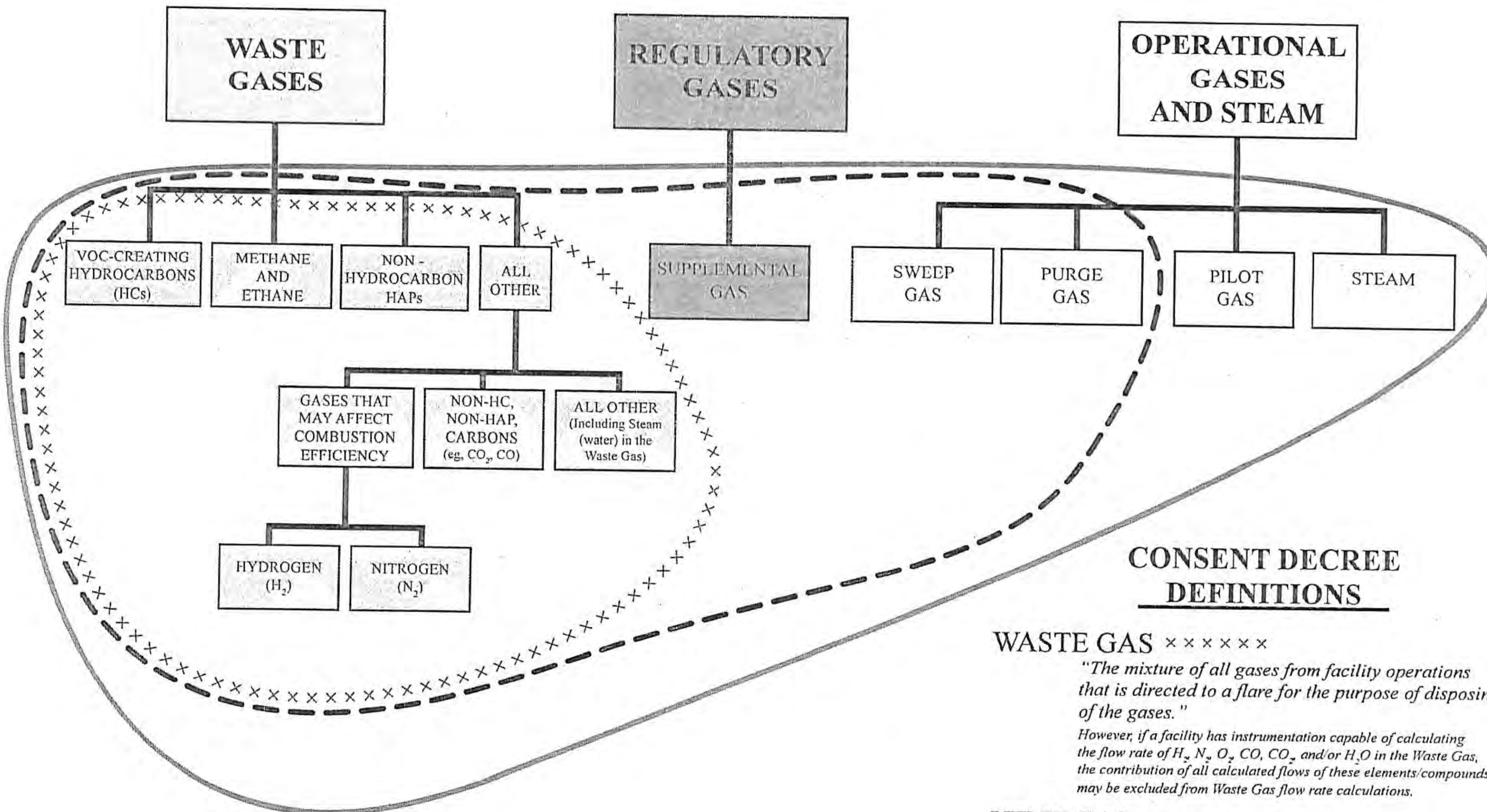
United States, et al.
v.
Dow Chemical Company, et al

APPENDICES TO CONSENT DECREE

APPENDIX 1.4

Depiction of Gases Associated with Steam-Assisted Flares

DEPICTION OF GASES ASSOCIATED WITH STEAM-ASSISTED FLARES



CONSENT DECREE DEFINITIONS

WASTE GAS × × × × × ×

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

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

VENT GAS — — —

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

COMBUSTION ZONE GAS ———

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

APPENDIX 1.4

United States, et al.
v.
Dow Chemical Company, 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* Part 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
   3.3 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. FGRS

5.1 Complete description of each major component, including but not limited to:
  5.1.1 Compressor(s), including design capacities
  5.1.2 Water seal(s), rupture disk, or similar device to divert the flow
5.2 Maximum actual past flow on an scfm basis and the annual average flow in scfm for the five years preceding Date of Lodging
5.3 Simplified schematic showing the FGRS
5.4 Process Flow Diagram that adds the FGRS to the diagrams referenced in Part 4

6. Flare Design Parameters

6.1 Maximum Vent Gas Flow Rate and/or Mass Rate
6.2 Maximum Sweep Gas Flow Rate and/or Mass Rate
6.3 Maximum Purge Gas Flow and/or Mass Rate, if applicable
6.4 Maximum Pilot Gas Flow and/or Mass Rate
6.5 Maximum Supplemental Gas Flow Rate and/or Mass Rate
6.6 If steam-assisted, Minimum Total Steam Rate, including all available information on how that Rate was derived

7. Gases Venting to Flare

7.1. Sweep Gas
  7.1.1 Type of gas used
  7.1.2 Actual set operating flow rate (in scfm)
  7.1.3 Average lower heating value expected for each type of gas used
7.2 Purge Gas, if applicable
  7.2.1 Type of gas used
  7.2.2 Actual set operating flow rate (in scfm)
  7.2.3 Average lower heating value expected for each type of gas used
7.3 Pilot Gas
  7.3.1 Type of gas used
  7.3.2 Actual set operating flow rate (in scfm)
  7.3.3 Average lower heating value expected for each type of gas used
7.4 Supplemental Gas
  7.4.1 Type of gas used
  7.4.2 Average lower heating value expected for each type of gas used
7.5 Steam (if applicable)
  7.5.1 Drawing showing points of introduction of Lower, Center, Upper, and any other steam
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.

The Dow Chemical Company, et al.

APPENDICES TO CONSENT DECREE

APPENDIX 1.6

Interim Compliance Provisions and Schedule for Instrumentation Upgrades at the Freeport FS-1, Freeport GF-500, Hahnville EO Site Logistics, Orange CDG, Plaquemine LHC-2, Plaquemine Poly A, and Plaquemine Poly C

1. Freeport FS-1 and GF-500 Flares: Combustion Efficiency Requirements. By no later than the Effective Date through May 31, 2021 or the date 14-days after the issuance of CAA Title V Permit Number O2213, whichever is sooner, at the Freeport FS-1 and GF-500 Flares, the Applicable Defendant must:

a. Comply with the requirements set forth in Paragraph 43.b; or

b. Make best efforts to operate the flares as close to the requirements set forth in Paragraph 43.b as possible. Notwithstanding the preceding sentence, any 15-minute block period with an NHVcz value at either flare of less than 240 BTU/scf will be a violation of this Consent Decree and will be subject to stipulated penalties pursuant to Paragraph 72.j.

After May 31, 2021 or the date 14-days after the issuance of CAA Title V Permit Number O2213, whichever is sooner, the Applicable Defendant must comply with Paragraph 43.b of this Consent Decree at the Freeport FS-1 and GF-500 Flares.

2. <u>Hahnville EO Site Logistics Flare: Vent Gas Monitoring Requirements</u>. By no later than the Effective Date through September 30, 2021, at the Hahnville EO Site Logistics Flare, the Applicable Defendants must:

   a. Measure volumetric Vent Gas flow as required by Paragraph 20 and Appendix 1.2 of this Consent Decree; or

   b. Calculate volumetric Vent Gas flow using a fixed molecular weight of 19.50 to convert measured Vent Gas mass flow to volumetric flow.

Failure comply with either Paragraph 2.a or b above is a violation of this Consent Decree and therefore subject to stipulated penalties pursuant to Paragraph 72.b of this Consent Decree. After September 30, 2021, the Applicable Defendant must comply with Paragraph 20 of this Consent Decree at the Hahnville EO Site Logistics Flare.

3. <u>Orange CDG Flare: Vent Gas Monitoring Requirements</u>. By no later than the Effective Date through June 30, 2022 at the Orange CDG Flare, the Applicable Defendants must:

   a. Measure volumetric Vent Gas Flow as required by Paragraph 20 and Appendix 1.2 of this Consent Decree; or

   b. Calculate volumetric Vent Gas flow using a fixed molecular weight of 28 to convert measured Vent Gas mass flow to volumetric flow.

Failure to comply with either Paragraph 3.a. or b above is a violation of this Consent Decree and therefore subject to stipulated penalties pursuant to Paragraph 72.b. of this Consent Decree. After June 30, 2022, the Applicable Defendant must comply with Paragraph 20 of this Consent Decree at the Orange CDG flare.

4. Plaquemine LHC-2 Flare: Requirements for Monitoring NHV_{vg} and Calculating NHV_{cz}. By no later than the Effective Date through June 30, 2021, at the Plaquemine LHC-2 Flare, the Applicable Defendant must:

   a. Use the currently installed Gas Chromatograph (GC) to determine the concentration of individual components in the Vent Gas for the purpose of monitoring the NHV_{vg} value at the Flare at least every 45-minutes, and use that NHV_{vg} value to calculate NHV_{cz} every 15-minutes as required by Paragraph 43.b. and Appendix 1.2 of this Consent Decree; or

   b. Measure NHV_{vg} and calculate NHV_{cz} as required by Paragraphs 23, 26, and 43 and Appendix 1.2 of this Consent Decree.

   Failure comply with either Paragraph 4.a or b above is a violation of this Consent Decree and therefore subject to stipulated penalties pursuant to Paragraph 72.b and 72.j of this Consent Decree. After June 30, 2021, the Applicable Defendants must comply with Paragraphs 23, 26, and 43 and Appendix 1.2 of the Consent Decree at the Plaquemine LHC-2 Flare.

5. Plaquemine LHC-2 Flare: GC Calibration. By no later than the Effective Date through June 30, 2021, at the Plaquemine LHC-2 Flare, the Applicable Defendant must:

   a. Use single point calibration at the existing GC at least once per week using the following percent calibration error calculation standard for each compound listed below:

      Hydrogen – 42.5%
      Ethylene – 5%
      Ethane – 3%
      Oxygen – 0.5%
      Nitrogen – 25%
      Methane – 20%
      Propylene – 2%
      Propane – 2%

      The percent calibration error must be calculated for each compound using the same equation found in pursuant to the equation set forth in Section 12.3 of EPA's Performance Specification 9 – Specifications and Test Procedures for Gas Chromatographic Continuous Emission Monitoring Systems in Stationary Sources, August 7, 2017:

12.3 Calibration Error Determination. Determine the percent calibration error (CE) at each concentration for each pollutant using the following equation.

$$CE = \frac{C_m - C_a}{C_a} \times 100 \qquad \text{Eq. 9-2}$$

C_m = average instrument response, ppm.

C_a = cylinder gas value, ppm.

The calibration is complete provided each compound demonstrates a calibration error of less than 10%; or

b. Comply with the calibration standards and procedures in Paragraph 25 of this Consent Decree.

Failure comply with either Paragraph 5.a or b above is a violation of this Consent Decree and therefore subject to stipulated penalties pursuant to Paragraph 72.c of this Consent Decree. After June 30, 2021, the Applicable Defendants must comply with Paragraph 25 of this Consent Decree at the Plaquemine LHC-2 Flare.

6. Plaquemine Poly A Flare: Vent Gas Monitoring Requirements. By not later than the Effective Date through October 31, 2020, at the Plaquemine Poly A Flare, the Applicable Defendant must:

   a. Measure volumetric Vent Gas flow as required by Paragraph 20 of the Consent Decree; or

   b. Measure volumetric Vent Gas flow by using a fixed molecular weight of 30.76 to convert measured Vent Gas mass flow to volumetric flow.

Failure comply with either Paragraph 6.a or b above is a violation of this Consent Decree and therefore subject to stipulated penalties pursuant to Paragraph 72.b of this Consent Decree. After October 31, 2020, the Applicable Defendant must comply with Paragraph 20 of this Consent Decree at the Plaquemine Poly A Flare.

7. Plaquemine Poly C Flare: Vent Gas Flow Measurement. By no later than the Effective Date and until December 31, 2021, at the Plaquemine Poly C Flare, the Applicable Defendant must:

a. Use the currently installed Vent Gas flow meter to measure Vent Gas flow, and monitor the flare flame every 15-minutes to minimize the indicia of over-steaming (*i.e.*, visible steam), and maintain the Flare's steam-to-vent gas ratio at the lowest practicable value possible; or

b. Meet the minimum Vent Gas flow meter accuracy requirement contained in Table 13 of the 40 CFR Part 63, Subpart CC as required by Paragraph 25.a of the Consent Decree.

Failure comply with either Paragraph 7.a or b above is a violation of this Consent Decree and therefore subject to stipulated penalties pursuant to Paragraph 72.c of this Consent Decree. After December 31, 2021, the Applicable Defendant must comply with Paragraph 25 of this Consent Decree at the Plaquemine Poly C Flare.

United States, et al.
v.
Dow Chemical Company, et al

APPENDICES TO CONSENT DECREE

APPENDIX 1.7

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

APPENDIX 1.7

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:

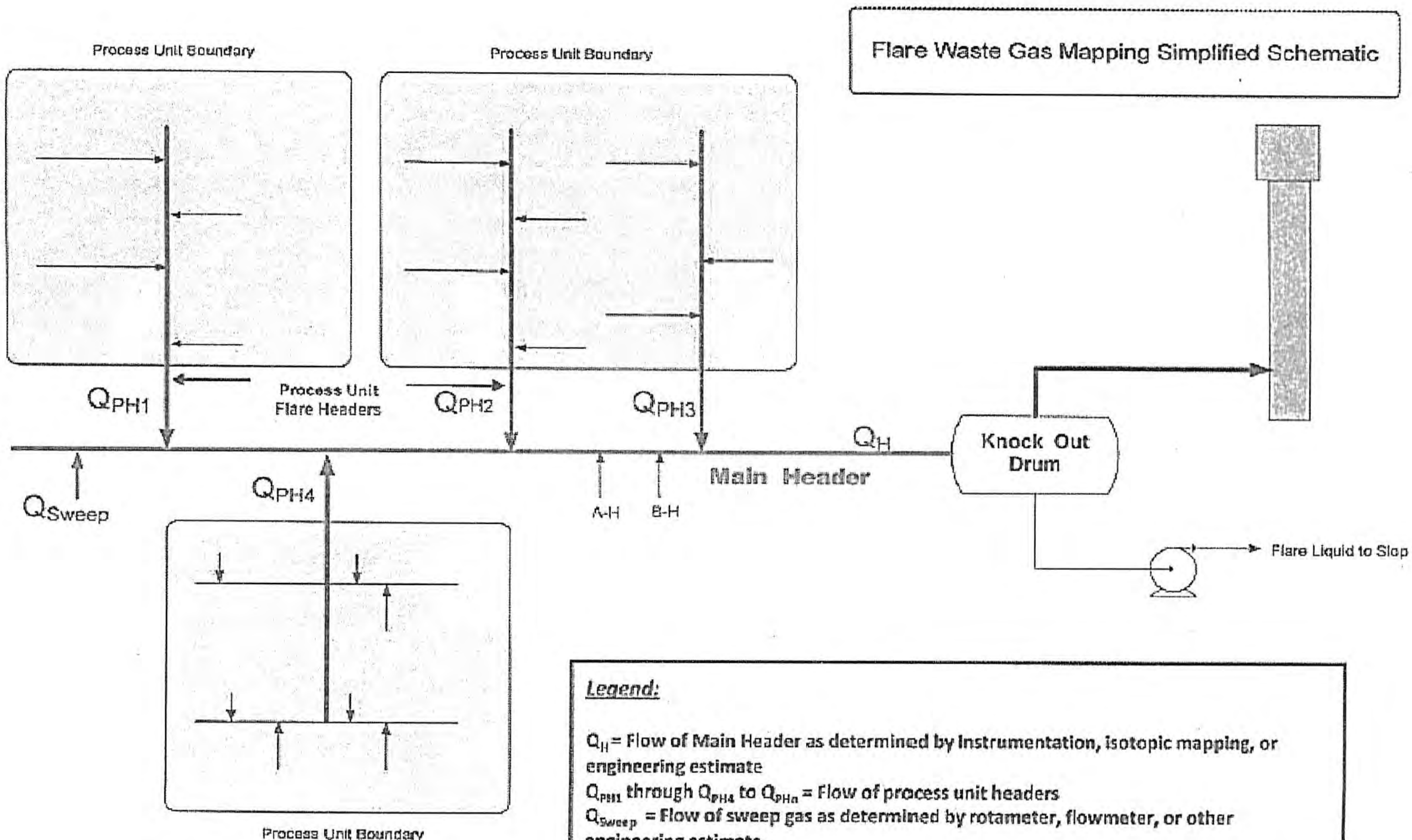
For purposes of waste gas mapping, a main header is defined as the last pipe segment prior to the flare knock out drum. Process unit headers are defined as pipes from inside the battery limits of each process unit that connect to the main header. For process unit headers that are greater than or equal 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.



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.
Dow Chemical Company, et al

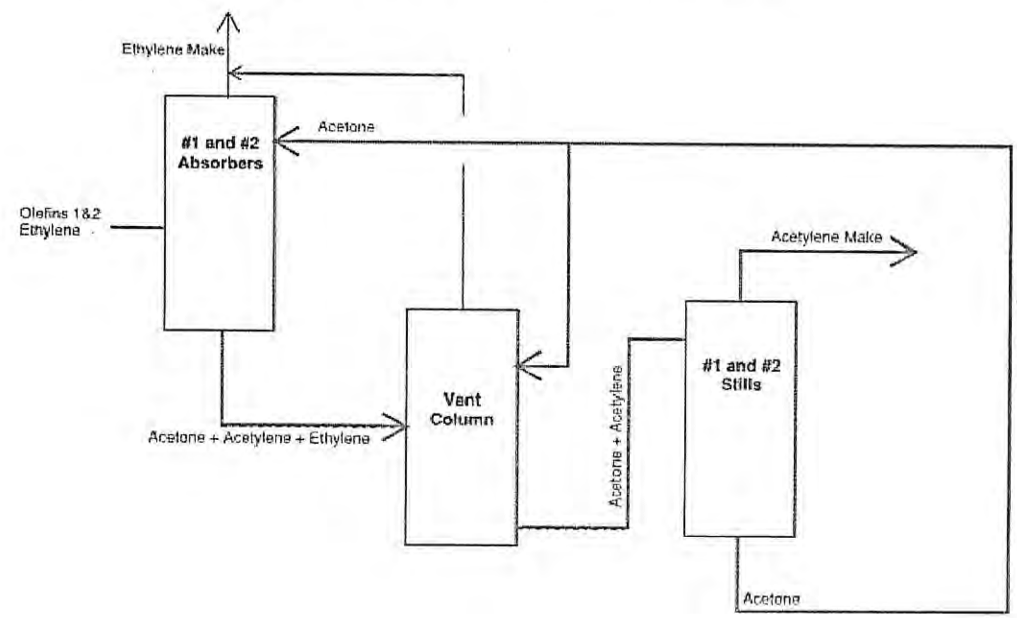
APPENDICES TO CONSENT DECREE

APPENDIX 1.8

Acetylene Streams at the Hahnville Olefins 1 and 2 FGRS

Existing Acetylene System

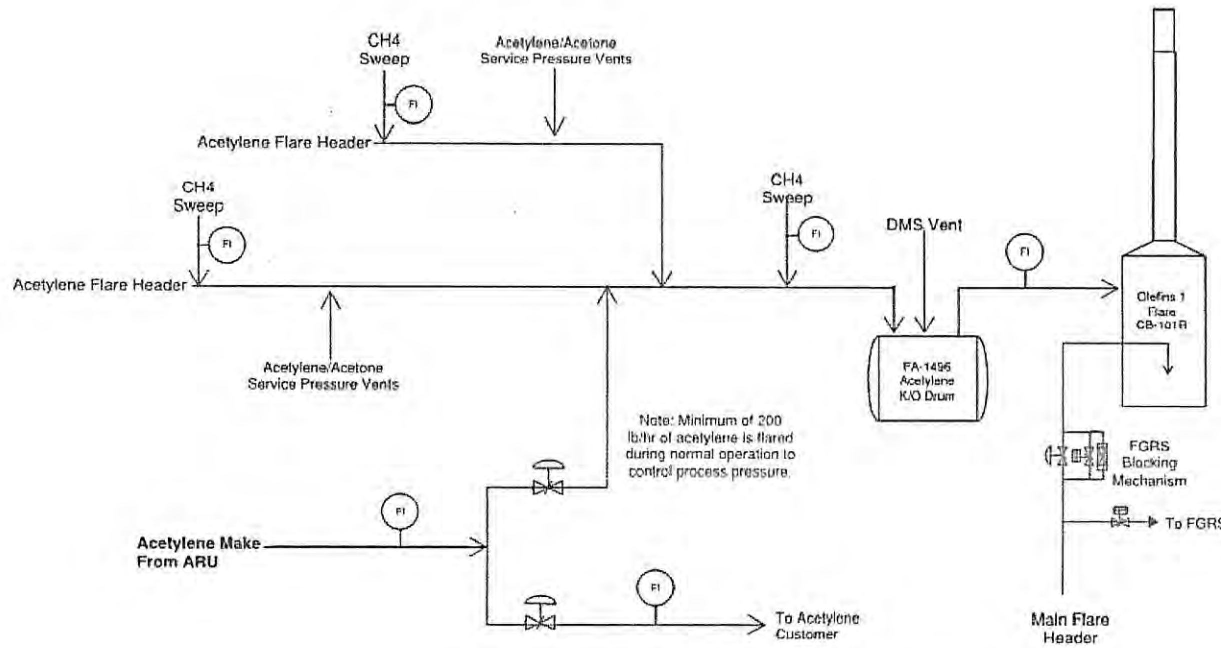
The Hahnville, Louisiana Olefins complex includes an Acetylene Removal Unit (ARU) that processes Olefins 1 and 2 off-specification ethylene to produce on-specification ethylene. The ARU process uses an acetone absorption system. The acetylene is stripped in the #1 and #2 Stills and the process produces approximately 2,700 lbs/hr of acetylene gas. A high-level flow diagram of this process is included below:



A portion of the acetylene make is sold to a third-party customer, and the remainder of this gas is sent to the Olefins 1 Acetylene Flare header. A minimum flow of acetylene gas is always sent to the Olefins 1 Flare to control pressure on the system, but the flow increases when the customer cannot consume all the available acetylene. When the customer is down or when ARU is experiencing certain reliability issues, the maximum flow of 2,700 lb/hr of acetylene is flared. In addition, the following streams are included with the acetylene stream:

1. A methane sweep is added to the Acetylene Flare header due to the potential instability of pure acetylene; and
2. A small vent source (DMS Vent) containing methane and dimethysulfide vents into this line for approximately 2 hours every 2 weeks.

The acetylene header is routed to the Olefins 1 Flare separately from the main flare Olefins 1 Flare header. A flow diagram of the acetylene flare header is shown below:

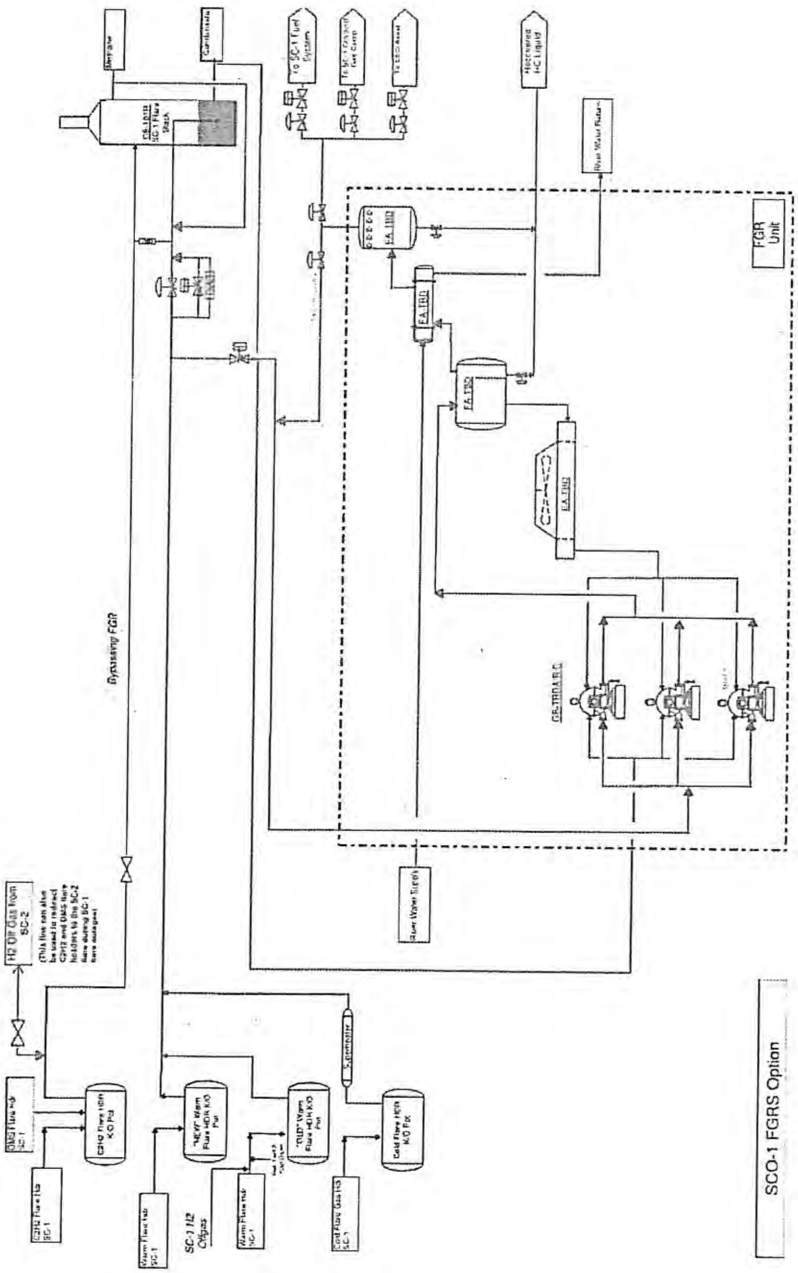


Acetylene Route-Around of Olefins 1 and 2 FGRS

The acetylene header flow may be routed around the Olefins 1 FGRS to the Olefins 1 Flare, eliminating process safety concerns around compressing acetylene above the current safe operating limit of 20 psig.

During times when the Olefins 1 Flare system is out of service, the acetylene header flow may be routed around the Olefins 2 FGRS to the Olefins 2 Flare by installing a cross-tie connection between the existing Olefins 1 Acetylene Flare header and the Olefins 2 Hydrogen/Methane Vent Gas bypass.

A drawing for the future Olefins 1 FGRS (including the cross-tie to the Olefins 1 Acetylene Flare header) is provided below:


Bypassing FGR
FGR Unit
H2 Off Gas from SC-2
SCO-1 FGRS Option

United States, et al.

v.

Dow Chemical Company, et al

APPENDICES TO CONSENT DECREE

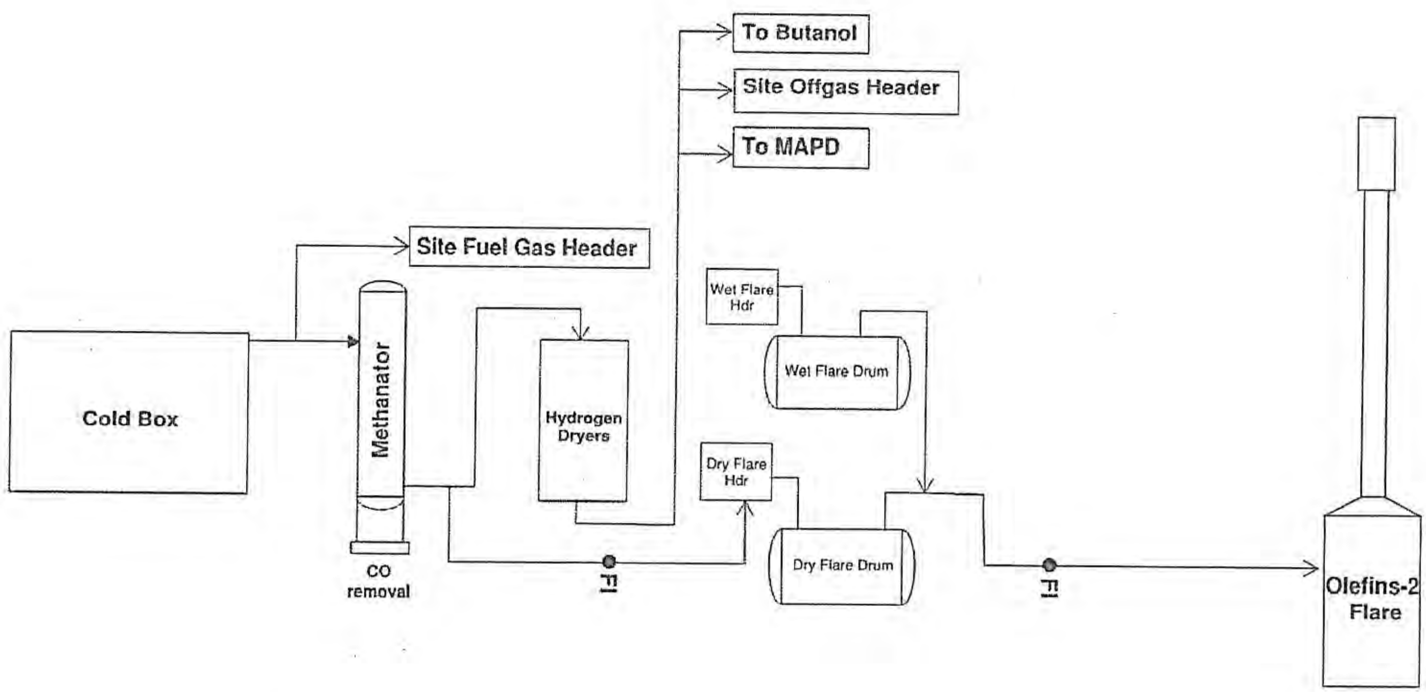
APPENDIX 1.9

Hahnville Olefins 2 Hydrogen/Methane Vent Gas Stream Route-Around of FGRS Olefins 2 FGRS

Existing Hydrogen Delivery System and Olefins 2 Flare

The Hahnville Olefins 2 plant produces hydrogen/methane gas. A portion of this gas mixture is used by the Butanol 1 and Butanol 2 plants at the site, a portion of this gas mixture is used as fuel in the Energy Systems facilities at the site, and the remainder of this gas mixture is routed from an existing unit operation called the methanator, which is part of the hydrogen delivery system, to the Olefins 2 flare (hereafter "Hydrogen/Methane Vent Gas"). The Hydrogen/Methane Vent Gas flows from the methanator through the Dry Flare Drum to the Olefins 2 flare.

A process flow diagram of the existing hydrogen delivery system and methanator is provided below.



Future Design of the Olefins 2 FGRS

By no later than the operational date of the Olefins 2 FGRS as set forth in Paragraph 37 of this Consent Decree, the Hydrogen/Methane Vent Gas must be routed around the Olefins 2 FGRS directly to the Olefins 1 or Olefins 2 Flares. This must be accomplished by installing a pipeline during the FGRS project from the methanator portion of the hydrogen delivery system to the Olefins 1 and Olefins 2 Flares.

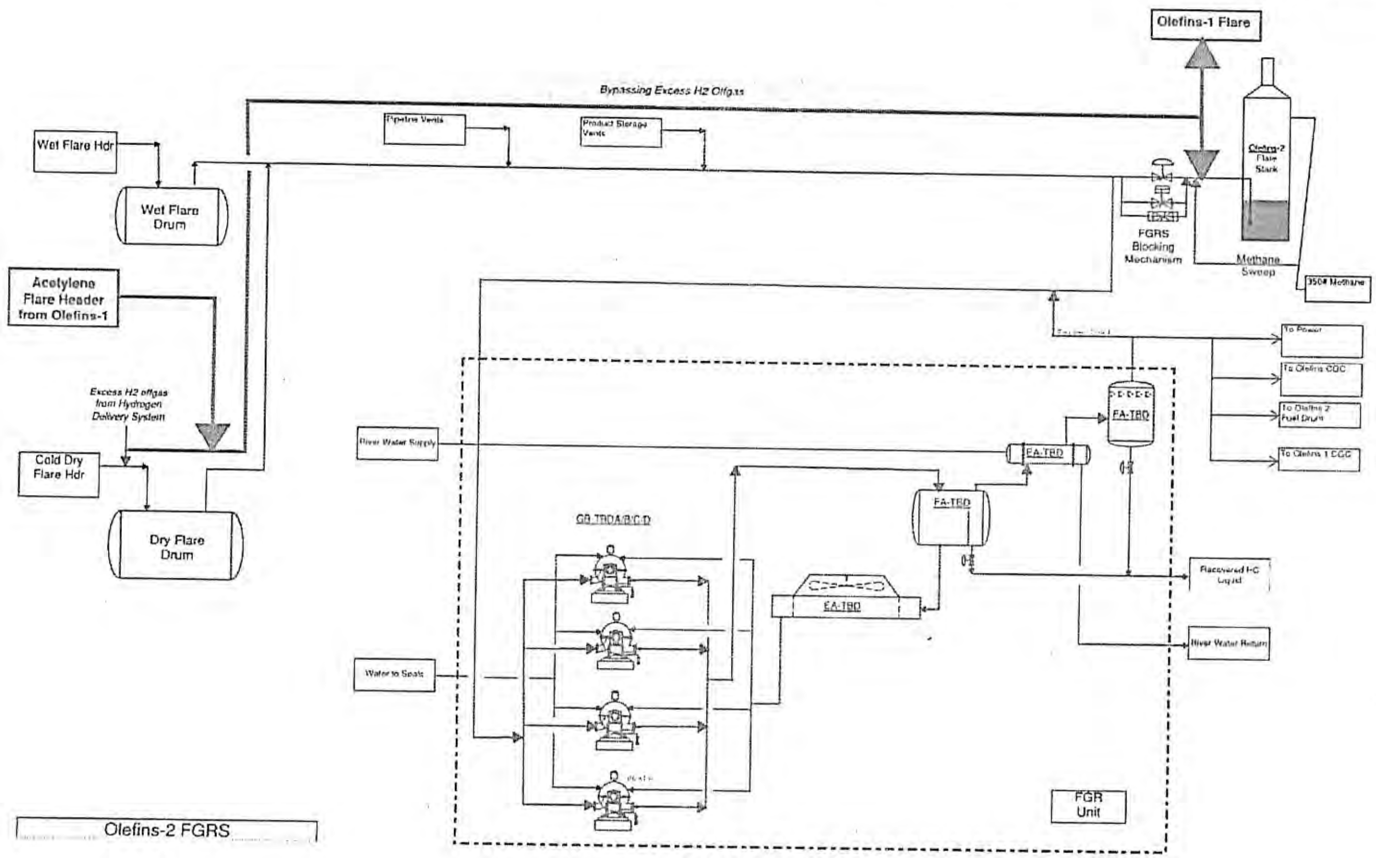
Once the FGRS is installed, Hydrogen/Methane Vent Gas must be flared at:

1. The Olefins 2 flare; or
2. Routed to the Olefins 1 flare so that the gas can be used as supplemental fuel in that flare, as needed (shown as the arrow to the Olefins 1 flare on the following flow diagram).

In addition, during times when the Olefins 1 plant or flare is not in service, the acetylene by-pass stream from the Olefins 1 area can be routed to the Olefins 2 flare through the same bypass line. More details regarding the acetylene bypass stream in included in Appendix 1.8.

A process flow diagram showing the future FGRS and the bypass pipeline for hydrogen/methane is shown on the next page.

Hahnville, LA Olefins 2 Flare Gas Recovery System Process Flow Diagram



United States, et al.
v.
Dow Chemical Company, et al

APPENDICES TO CONSENT DECREE

APPENDIX 1.10

Orange Ethylene Plant Hydrogen Rich Gas Mixture Route-Around of the Ethylene FGRS

Existing Operations: Ethylene Plant Flare

I. Hydrogen Rich Gas Mixture

The Orange, Texas Ethylene plant produces approximately 15,000 pounds per hour of a hydrogen rich gas mixture. A portion of this gas mixture is used in the Ethylene plant and the remainder is sent to internal Dow customers (Energy facilities and a Dow user plant) or to an on-site third-party customer. When the customer(s) shut down, the excess gas mixture is routed from the hydrogen delivery system to the Ethylene plant flare. During these operations, the average flow of the hydrogen rich gas mixture to the Ethylene plant flare is about 7,600 pounds per hour, and the maximum hourly flow ranges from 11,500 pounds per hour to 15,000 pounds per hour, depending on the operating conditions of the site fuel system.

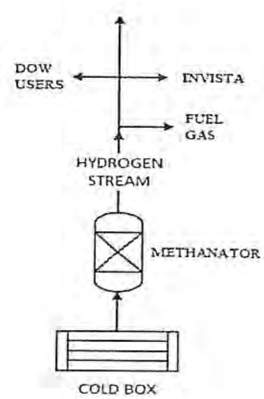
The composition of the hydrogen rich gas mixture is approximately:

Hydrogen = 97.54 mol%
Methane = 2.36 mol%
Water = 0.1 mol%

Molecular Weight = 2.35 lb/lb-mole

II. Origin of Hydrogen Rich Gas Mixture

Cracked gas from the compressors 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, and hydrogen gas is sent to a methanator for further removal of some carbon monoxide that is present with the hydrogen gas. The hydrogen header ties into the flare after the methanator. A flow diagram is shown below:

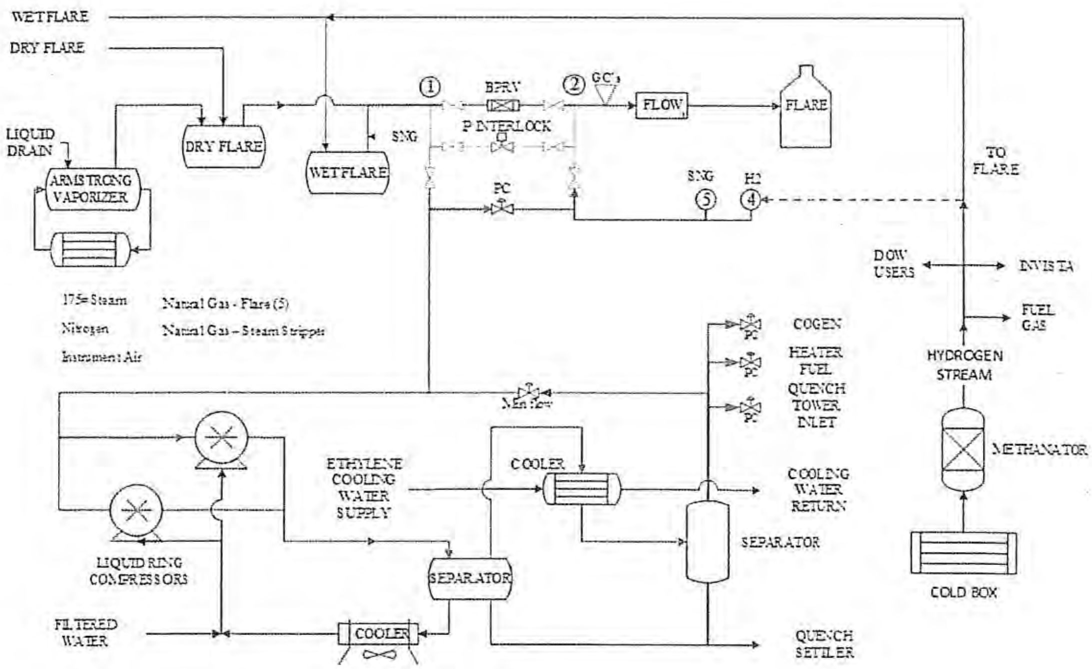


Proposed Future Design and Ethylene Plant FGRS

The hydrogen rich gas mixture, by no later than the operational deadline for the Ethylene Plant FGRS as set forth in Paragraph 37 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 by internal or third-party consumers, the excess hydrogen gas mixture will bypass or be routed around the future FGRS. Piping will be installed and will run from the hydrogen processing system directly to the Ethylene Plant flare. This is shown as Stream #4 on the FGRS flow diagram.

A drawing of the future Ethylene Plant FGRS is shown below:



United States, et al.

v.

Dow Chemical Company, et al

APPENDICES TO CONSENT DECREE

APPENDIX 2.1

Louisiana Beneficial Environmental Projects Protocol

EXHIBIT A

PART 6 OF 6

The Defendants must spend at least $424,786 to implement State Beneficial Environmental Projects (BEPs) described below (collectively referred to as "Project(s)"). These Projects must comply with the requirements of this Appendix and with Section VI (Louisiana Beneficial Environmental Projects) of this Consent Decree. All reporting on the Projects must be done consistent with Section IX (Reporting Requirements) of the Consent Decree and this Appendix.

The compliance deadlines for the BEPs may be extended by a written, mutual agreement among the Parties.

Keep Louisiana Beautiful (KLB) Environmental Education Program

Implementation. As a term and condition of the settlement between the Defendants and LDEQ that is reflected in this Consent Decree, the Defendants will pay $300,000 to Keep Louisiana Beautiful (KLB) within thirty (30) days of the Effective Date in order to fund the KLB Environmental Education Program under La. Admin. Code Tit. 33, I Chapter 25. In the first Semi-Annual Report that is required by Section IX, the Defendants must confirm whether that payment was made as required by this Consent Decree. LDEQ has agreed that KLB will perform the Environmental Education Program that is to be funded with that payment, as described herein.

Purpose. The purpose of the KLB Environmental Education program is to provide Louisiana educators with resources, knowledge, and professional development opportunities that will increase their knowledge of environmental issues, particularly those that are specific to Louisiana; and to provide the infrastructure and resources necessary for these teachers to bring comprehensive environmental education and hands-on field experiences to their classrooms so that it reaches the students of Louisiana. Mastery of these environmental issues will motivate teachers to teach their students and empower them to preserve and protect the unique natural beauty of Louisiana. Students will be taught skills to identify and solve environmental problems that they face on a regular basis in their lives now, so that they may be better prepared to do so in the future. An increase in knowledge and awareness of local issues will result in a change in knowledge, attitudes, and behaviors as it relates to environmental care and stewardship. This program is designed to reach all teachers and students from Kindergarten through the Fifth Grade throughout Louisiana.

One Year Budget Description

$50,000 – Outreach Environmental Educator - KLB will hire or contract with an Outreach Environmental Educator (OEE) to develop and implement an engagement plan for the education program and manage all the tasks outlined in this proposal. The OEE will organize and implement all aspects of the teacher workshops, webinars, and professional development classes; research and provide content for the on-line network; and develop and manage the grants program including establishing grant guidelines, grant eligibility, monitoring, review and outcomes tracking.

Approximately $35 per hour x 30 hours per week x 47.5 weeks = $50,000

$3,600 – Statewide Mileage and Travel – For the OEE to reach out to all school districts and conduct trainings and professional development.

$8,495 – Green Teacher Coalition will be developed to create a platform for sharing knowledge, information and engagement opportunities for teachers and their students. Teachers and students will participate and compete in the annual Love the Boot cleanup week. A webpage, e-news-letter, print materials, resources and webinars for teachers are other examples of how the coalition might further develop environmental educators throughout the state. The coalition will educate, engage and cultivate teachers and students on environmental issues such as litter, recycling, plastic pollution, and waste reduction.

$17,250 – Teacher trainings and professional development workshops to develop their base knowledge on the subjects to increase the likelihood that they will teach the content in the classroom. Materials, teacher stipends, lesson plan manuals, and supplies for workshops. Full-day Saturday workshops will be conducted throughout the state.

Workshop Expenses: ($100 teacher stipend to attend + $15 materials) $115 per teacher x 150 teachers = $17,250

$11,250 – Environmental Education grants to implement litter lesson plans and to cover the cost of hands-on field study and field trips for students. Pre and Post tests required and reporting. Fifteen $750 grants reaching approximately 500-700 students.

$9,405 – Keep Louisiana Beautiful management and administrative fee. The Executive Director of KLB is responsible for supervising the successful implementation of the BEP. This fee is to cover time associated to supervise the OEE, to oversee all aspects of the BEP including the coalition, workshops and grant programs; to track and monitor progress; to ensure BEP grant monies are spent in accordance with the contract and expenditures are well documented; to achieve agreed upon outcomes; and to submit required progress and monitoring reports. $44 per hour x 4.5 hours per week x 47.5 weeks = $9,405

$100,000 Total Per Year

$300,000 Total three-year term

Environmental & Natural Resource Education Through the Louisiana Envirothon Program

Implementation. As a term and condition of the settlement between the Defendants and LDEQ that is reflected in this Consent Decree, Defendants will pay $75,000 to LDEQ within thirty (30) days of the Effective Date to fund the Louisiana Envirothon Program under La. Admin. Code Tit. 33, I Chapter 25. In the first Semi-Annual Report that is required by Section IX, the Defendants must confirm whether that payment was made as required by this Consent Decree. LDEQ has agreed that in conjunction with the other Envirothon partners, that it will perform the Environmental Education Program that is to be funded with that payment, as described herein.

Purpose. Envirothon is a statewide environmental problem-solving competition for students. Through Envirothon, students demonstrate knowledge of environmental science and natural resource management. Students participate in hands-on experiences, enabling them to become environmentally aware, action-oriented citizens. Envirothon has proven to be an exciting and useful tool for incorporating environmental education and conservation into studies and promoting STEM careers and subjects. Envirothon assists in meeting the new science standards on phenomenon-based learning in Louisiana. Envirothon is a partnership of between state government, universities, and private entities, with LDEQ as the main/lead partner.

Cost

Total per year	**$15,000**
Total for 5 years	**$75,000**

Air Monitoring Equipment and Related Accessories: Jerome Hydrogen Sulfide Handheld Monitor and Drone

Implementation. As a term and condition of the settlement between the Defendants and LDEQ that is reflected in this Consent Decree, Defendants will pay $49,786 to LDEQ within thirty (30) days of the Effective Date in order to fund the purchase of the monitoring equipment (i.e., a Jerome Hydrogen Sulfide Handheld Monitor and drone compatible with the monitor) under La. Admin. Code Tit. 33, I Chapter 25. In the first Semi-Annual Report that is required by Section IX, the Defendants must confirm whether that payment was made as required by this Consent Decree. LDEQ has agreed that it will purchase and operate the equipment as described herein.

Purpose. The LDEQ personnel will use the air monitoring equipment and drone described above for ambient air analysis, odor nuisance monitoring, leak detection, and as an accuracy check for other monitors.

Total air monitoring equipment/drone cost is $49,786

Total Amount for BEPs = $424,786

United States, et al.
v.
Dow Chemical Company, et al

APPENDICES TO CONSENT DECREE

APPENDIX 2.2

Scope of Work for the
Fenceline Monitoring Project

APPENDIX 2.2

SCOPE OF WORK FOR THE FENCELINE MONITORING PROJECT

1. **Applicability.** The requirements of this Fenceline Monitoring Project apply to the Covered Facilities listed in Paragraph 12.p of this Consent Decree.

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 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 XVIII 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)(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 Facilities. 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 subparagraphs 3(b) through 3(g).

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 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 Facilities, 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 the 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) must 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) must 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. <u>Collection of meteorological data.</u> The Applicable Defendant(s) must collect and record meteorological data according to the applicable requirements in sub-Paragraphs 3(d)(1) and 3(e(2) .

(1) The Applicable Defendant(s) must collect and record the average temperature and barometric pressure 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 Facilities.

(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 sub-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 sub-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 $\mu g/m^3$, 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 $\mu g/m^3$ 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 $\mu g/m^3$ 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).