

Region 6 - Enforcement & Compliance Assurance Division
INSPECTION REPORT

Inspection Date(s):	09/22/2025 to 9/25/2025	
Media Program:	Air	
Regulatory Program(s)	Consent Decree Civil No. 1:03-cv-01028-HFB	
Company Name:	Lion Oil Company dba Delek US Holdings, Inc	
Facility Name:	El Dorado Refinery	
Facility Physical Location:	1005 Robert E Lee St	
(city, state, zip code)	El Dorado, Arkansas 71730	
Mailing address:	1005 Robert E Lee St	
(city, state, zip code)	El Dorado, Arkansas 71730	
County/Parish:	Union County	
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FRS Number:	110017419667	
Identification/Permit Number:	AR0000000513900016/0868-AOP-R24	
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Personnel participating in inspection:		
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Section I – INTRODUCTION

PURPOSE OF THE INSPECTION

EPA Region 6 inspectors Prince Nfodzo, Nicolas Studebaker, and I (Kim Nguyen) arrived at Lion Oil Company, owned and operated by Delek US (“Lion Oil/Delek”), El Dorado Refinery at 12:30 pm on September 22, 2025, for an announced inspection. We were accompanied by Jayden Keels and Jay Northern (“ADEQ inspectors”) from the Arkansas Division of Environmental Quality (“ADEQ”). Prior to making entry, EPA conducted a fence line survey to note the layout of the facility, off site receptors in the area, and other features that might help identify potential regulatory concerns in plain view. EPA also used an optical gas imaging (OGI) camera to conduct a survey to identify visible hydrocarbon emissions and did not observe any issues of concern. EPA met with Lion Oil/Delek El Dorado Refinery representatives at 1:20 pm for an opening conference. We, the EPA inspectors, presented our credentials to Mr. Mitch Colvin, Sr. Environmental Manager, and informed the El Dorado refinery representatives that this was an Environmental Protection Agency (EPA) inspection to evaluate compliance with the federally issued EPA Clean Air Act (CAA) Consent Decree (*United States, et al. v. Lion Oil Company, Civil No. 03-1028, entered June 12, 2003*), and associated Stipulated Order (Case 1:03-cv-01028-HFB entered September 14, 2009). The opening conference attendee sign-in sheet is included as **Appendix 3**.

The scope of the inspection was a partial compliance evaluation (PCE) focused on the four marquee issues addressed by the Consent Decree (CD): (i) emissions control at the Fluidized Catalytic Cracking Unit (FCCU), Heaters, and Boilers; (ii) emissions control at the Sulfur Recovery Plants (SRPs) and associated hydrocarbon, tail gas and acid gas flaring; (iii) Benzene Waste Operations NESHAP (BWON) program enhancements; and (iv) Leak Detection and Repair (LDAR) program enhancements. The CD consists of 19 Sections designated by Roman numerals I through XIX. Of these, Section V, included as **Appendix 11**, is the focus of this inspection which includes affirmative relief that addresses the requirements of nitrogen oxides (NO_x), sulfur dioxide (SO₂), carbon monoxide (CO), particulate matter (PM), volatile organic carbon (VOC), hydrogen sulfide (H₂S), and benzene emission reductions through various construction projects, process additives, and other required process and program enhancements. The inspection is part of a comprehensive consent decree compliance review for calendar years 2021 to 2025.

FACILITY DESCRIPTION

After multiple upgrades, the El Dorado Refinery now has the capacity to refine 80,000 barrels per day and operates as a fully integrated refinery with crude distillation, an FCCU, alkylation (sulfuric acid), catalytic reforming, hydrodesulphurization, sulfur recovery, and fuel blending. The main refinery products are transportation fuels. Crude oil primarily arrives via pipeline, with some quantities delivered by railcar and tank truck. Products also leave the facility by pipeline, railcar, and tank truck. A plant wide process flow diagram, and written facility description are included as **Appendix 4**.

Section II – OBSERVATIONS

Section V. Affirmative Relief/Environmental Projects

Control of NO_x Emissions from FCCUs

Program Summary, CD Paragraph 11: Lion Oil/Delek shall limit NO_x emissions from any FCCU to 20 parts per million by volume per day (ppmvd) NO_x or less on a 365-day rolling average and 40 ppmvd NO_x or less on a 24-hour rolling average. Lion Oil/Delek shall use a NO_x CEMS to monitor the performance of any FCCU and to report compliance with the terms and conditions of the consent decree.

Lion Oil/Delek fully incorporated the consent decree NO_x emission limits in the facility's federally enforceable operating permit, 0868-AOP-R24, issued March 11, 2025. The FCCU NO_x emission trends from September 1, 2024, to August 31, 2025, for both rolling averages are included in **Appendix 5**. There were no exceedances of the 365-day rolling average limit. However, there were approximately nine (9) consecutive days where Lion Oil/Delek exceeded the 24-hour rolling average limit during this same period [see **Area of Concern (AOC) #1**].

Upon reviewing the quarterly Continuous Emission Monitoring Systems (CEMS) audits from January 2021 to August 2025, EPA observed that Relative Accuracy Test Audits (RATA) and Cylinder Gas Audits (CGA) were conducted on time in accordance with 40 CFR, Part 60, Appendix F. The relative accuracies for the CEMS were found to be within the allowable requirements. Lion Oil/Delek conducted CGAs by challenging the CEMS with low-level and mid-level audit gases of known concentrations. For each audit, an individual audit gas was injected three times, resulting in three CEMS responses. However, EPA noticed that, in the majority of CGA reports, the run times for each injection were consistently recorded as being identical (see **AOC #2**).

Lion Oil/Delek operates one FCCU at the El Dorado refinery. EPA observed that Lion Oil/Delek has installed and operates NO_x and oxygen (O₂) CEMS in accordance with the applicable CD and rule based requirements, including certification. Concentrations of calibration gases used were accurate and within their certification periods. A photograph of the observed CEMS analyzers is included as **Photo No. 1**, in **Appendix 1**. EPA observed that the NO_x exit concentration at the CEMS was within the emission limits required by the CD; however, the CEMS displayed negative readings for NO_x at the time of inspection (see **AOC #3**). A photograph of the NO_x CEMS display readings is included as **Photo No. 2**, in **Appendix 1**.

Control of SO₂ Emission from FCCUs

Program Summary, CD Paragraph 12: Lion Oil/Delek shall limit SO₂ emissions from any FCCU to 25 ppmvd on a 365-day rolling average and 50 ppm on a 7-day rolling average. Lion Oil/Delek shall use a SO₂ CEMS to monitor the performance of any FCCU and to report compliance with the terms and conditions of the consent decree.

Lion Oil/Delek installed and operates a wet gas scrubber (WGS) to comply with the SO₂ emission limits. Lion Oil/Delek fully incorporated the consent decree SO₂ emission limits in operating permit 0868-AOP-R24 issued March 11, 2025. EPA observed that Lion Oil/Delek installed and operates SO₂ and O₂ CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and within their certification periods. A photograph of the CEMS analyzers is included as **Photo No. 1**, in **Appendix 1**.

The FCCU SO₂ emission trends from September 1, 2024, to August 31, 2025, for both rolling averages are included in Appendix 5. There were no exceedances of the limits during this period. Upon reviewing the

quarterly CEMS audits from January 2021 to August 2025, EPA observed that RATAs and CGAs were conducted on time in accordance with 40 CFR Part 60, Appendix F. The relative accuracies for the CEMS were found to be within the allowable requirements. However, EPA noticed that, in the majority of CGA reports, the run times for each audit gas injection were consistently recorded as being identical (see **AOC #2**).

Control of Particulate Emissions from FCCUs

Program Summary, CD Paragraph 13: Lion Oil/Delek shall limit PM emissions from the FCCU to 0.5 pounds or less per 1000 pounds of coke burned in a 3-hour average basis.

Lion Oil/Delek has fully incorporated the consent decree PM emission limits in operating permit 0868-AOP-R24 issued March 11, 2025. The El Dorado refinery FCCU operates in full burn mode and PM emissions are controlled by a wet gas scrubber. Continuous parameter monitoring of pressure drop (ΔP) and liquid to gas (L/G) ratios for the wet gas scrubber are monitored and a minimum pressure drop value has been established by stack testing. The filterable and total PM emission limits were not exceeded during performance tests conducted from 2021 to 2025. **Appendix 5** contains parameter monitoring trends for the wet gas scrubber from September 1, 2024, to August 31, 2025, and the summary of the test results from the latest performance test conducted on May 28, 2025.

CO Emissions Reductions from FCCU

Program Summary, CD Paragraph 14: Lion Oil/Delek shall implement a program to reduce CO emissions from the El Dorado FCCU by the use of full combustion and limit CO emissions from any FCCU to 500 ppmvd or less on a 1-hour average basis and 100 ppmvd or less on a 365-day average basis. A CO CEMS shall be used to monitor the performance of any FCCU and to report compliance with the terms and conditions of the consent decree.

Lion Oil/Delek has fully incorporated the consent decree CO emission limits in operating permit 0868-AOP-R24 issued March 11, 2025. EPA observed that Lion Oil/Delek installed and is operating CO and O₂ CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and within their certification periods. Photograph of the CEMS analyzers is included as **Photo Nos. 1**, in **Appendix 1**.

The FCCU CO emission trends from September 1, 2024, to August 31, 2025, for both rolling averages are included as **Appendix 5**. There were no exceedances of the 365-day rolling average limit. However, Lion Oil/Delek exceeded the 1-hour rolling average limit multiple times during this period (see **AOC #1**). Upon reviewing the quarterly CEMS audits from January 2021 to August 2025, EPA observed that RATAs and CGAs were conducted on time in accordance with 40 CFR, Part 60, Appendix F. The relative accuracies for the CEMS were found to be within the allowable requirements. However, EPA noticed that in the majority of CGA reports, the run times for each audit gas injection were consistently recorded as being identical (see **AOC #2**).

New Source Performance Standards (NSPS) Applicability of FCCU Regenerators.

Program Summary, CD Paragraph 15: The FCCU Regenerator at the El Dorado Refinery shall be an affected facility, as that term is used in the Standards of Performance for New Stationary Sources

(“NSPS”), 40 C.F.R. Part 60, and shall be subject to and comply with the requirements of NSPS Subparts A and J for each of the relevant pollutants.

Lion Oil/Delek fully incorporated the Part 60 NSPS A and J requirements for SO₂, CO, PM and Opacity emission limits at the FCCU in operating permit 0868-AOP-R24 issued March 11, 2025. Lion Oil/Delek uses a continuous parameter monitoring system (CPMS) to monitor the pressure drop (ΔP) across the wet gas scrubber and the liquid to gas (L/G) ratio. Parametric trends from September 1, 2024, to August 31, 2025, are included in **Appendix 5**. Lion Oil/Delek did not meet the minimum limit for ΔP multiple times during this period (see **AOC #1**).

NO_x Emissions Reductions from Heaters and Boilers, and NO_x and CO Emission Reductions from Air Compressor (SN-841)

Program Summary, CD Paragraph 16: Lion Oil/Delek will implement an eight-year program to reduce NO_x emissions from the heaters and boilers listed in Appendix C (“Controlled Heaters and Boilers”) by installing Next Generation Ultra Low- NO_x Burners (“Next Generation ULNBs”) or Alternative NO_x Control Technology, and demonstrating continuous compliance with lower emission limits through the use of source testing, CEMS, and/or parametric monitoring.

Lion Oil/Delek has incorporated the proposed required NO_x emission limits for all covered heaters and boilers in operating permit 0868-AOP-R24 issued March 11, 2025. An updated list of affected sources and NO_x emission trends for heaters and boilers covered under the CD with NO_x CEMS, which are required if the heat input exceeds 100 pounds per million British thermal units (lbs/mmBtu/hour), inclusive of the period from September 1, 2024, to August 31, 2025, are found in **Appendix 6**. All the heaters and boilers exceeded the NO_x emission limits on a 3-hour average basis multiple times during this period (see **AOC #1**). During the inspection, EPA observed that a CEMS for one of the boilers displayed negative readings (see **AOC #3** and **Photo Nos. 6**). Upon reviewing the quarterly CEMS audits from January 2021 to August 2025, EPA noted that Lion Oil/Delek conducted some CEMS audits too close together (i.e. less than 2 months apart). Some CEMS CGA reports referenced the date or year incorrectly. For example, one CGA was conducted in the 1st quarter of 2024, but the report says 2023. Also, in the majority of CGA reports, the run times for each audit gas injection were consistently recorded as being identical. (see **AOC #2**).

Control of SO₂ Emissions from, and NSPS Applicability to, Heaters and Boilers

Program Summary, CD Paragraph 17: Lion Oil/Delek shall undertake measures to reduce SO₂ emissions from refinery heaters and boilers by restricting H₂S in refinery fuel gas and by agreeing not to continue and/or commence the burning of fuel oil except under the provisions set forth herein.

Lion Oil/Delek El Dorado refinery operates a single refinery fuel gas system. The facility monitors SO₂ from three (3) heaters (#9 Platformer Heater, #4 Atmospheric Heater, and #4 Vacuum Heater), in lieu of using an H₂S analyzer on the fuel gas system. The #9 Platformer Heater is designated as the primary emission source for monitoring and demonstrating compliance with H₂S and SO₂ emission limits allowed in condition 12, Section VI (Plantwide Conditions) of the Title V operating permit, a copy of which is contained in **Appendix 7**, and as allowed under NSPS J, 40 CFR 60.105(a)(3)(iv).

With an optical gas imaging (OGI) camera, EPA observed hydrocarbon emissions from the stacks of four (4) heaters, two (2) boilers, and the nearby Fin Fan and Diesel Hydrotreater units (see **Videos FLIR0109, FLIR0112, FLIR0113, FLIR0114, FLIR0116, FLIR0117, FLIR0118, and FLIR0119 in Appendix 2, and also AOC #4**).

EPA observed that the SO₂ concentrations at the SO₂ CEMS were within the emission limits, and certification and concentrations of calibration gases were accurate and within their certification periods. Photographs of representative CEMS analyzers are included as **Photo Nos. 3 and 4 in Appendix 1**. Also included in **Appendix 7** are #9 Platformer Heater, #4 Atmospheric Heater, and #4 Vacuum Heater SO₂ emission trends for September 1, 2024, to August 31, 2025. There were no exceedances of the SO₂ limit during this period. Upon reviewing the quarterly CEMS audits from January 2021 to August 2025, EPA noted that Lion Oil/Delek did not conduct quarterly CGAs for one heater five (5) times. Some CEMS audits were conducted too close together (i.e. less than 2 months apart), other CGA reports referenced the date and year incorrectly, and in the majority of CGA reports, the run times for each audit gas injection were consistently recorded as being identical (see **AOC #2**).

NSPS Applicability of and Compliance for Sulfur Recovery Plant (SRP)

Program Summary, CD Paragraph 18: Lion Oil/Delek El Dorado Refinery's SRP is required to comply with, the applicable provisions of 40 C.F.R. Part 60, Subparts A and J.

Lion Oil/Delek's El Dorado refinery operates one sulfur recovery plant (SRP). Lion Oil/Delek incorporated the consent decree requirements to comply with SO₂ emission limits in operating permit 0868-AOP-R24 issued March 11, 2025. EPA observed that Lion Oil/Delek installed and operated the SO₂ CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and within their certification periods. The SO₂ emission trend from September 1, 2024, to August 31, 2025, is included in **Appendix 8**, and shows that Lion Oil/Delek exceeded the 12-hour rolling average SO₂ emission limit of 250 parts per million (ppm) multiple times during this period (see **AOC #1**).

During the inspection, EPA observed a noticeable accumulation of sulfur on the ground in the SRP area (see **Photo Nos. 7 in Appendix 1, AOC #5**). EPA used an OGI camera to survey the SRP for hydrocarbon emissions. While no significantly noticeable trailing of hydrocarbon emissions was observed at the sulfur pit, EPA did observe hydrocarbon emissions from the sulfur recovery unit (SRU) stack (see **Video FLIR0115 in Appendix 2, AOC #4**).

Upon reviewing the quarterly CEMS audits from January 2021 to August 2025, EPA observed that RATAs and CGAs were conducted on time in accordance with 40 CFR Part 60, Appendix F. The relative accuracies for the CEMS were found to be within the allowable requirements. However, EPA noticed that, in the majority of CGA reports, the run times for each audit gas injection were consistently recorded as being identical (see **AOC #2**).

Flaring Devices: NSPS Applicability and Control of Hydrocarbon, Acid Gas, and Tail Gas Flaring Incidents

Program Summary, CD Paragraph 19-21: *Each Flaring Device shall be an “affected facility,” as that term is used in 40 C.F.R. Part 60, Subparts A and J, and therefore subject to, and required to comply with, the requirements of 40 C.F.R. Part 60, Subparts A and J, for fuel gas combustion devices.*

Lion Oil/Delek’s El Dorado refinery operates two flaring devices - the Low Pressure (LP) flare and the High Pressure (HP) flare. Both flares are subject to NSPS subpart J requirements, and the vent gas streams are combined and sent to a flare gas recovery system (FGRS). The flare gas recovery system consists of three liquid ring-sealed compressors. During a vent gas release to either flare, the concentration of H₂S in the excess sour gas routed to the flares is monitored. When the water seal is broken at the compressors, an automated sampling system collects a sample for analysis. If the flaring of sour gas continues for more than one (1) hour, additional samples are taken every hour to monitor the H₂S concentration. This is because the CD requires that Lion Oil/Delek comply with the emission limit set by 40 C.F.R. § 60.104(a)(1) for fuel gas containing H₂S combusted in the LP Flare and the HP Flare. A photograph of the automated system sampling point is included as **Photo Nos. 8 in Appendix 1**.

During the inspection, EPA observed no visible emissions from the two flares. However, EPA did observe hydrocarbon emission trails from the flare stacks with the OGI camera (see **Video FLIR0120 and FLIR0121 in Appendix 2** and see **AOC #4**). EPA reviewed the volumetric flow data for both flares at the time the OGI videos were recorded and found that no excess sour gas was being combusted at the flares during the observation period. EPA reviewed the Flare Management Plans (FMP) for both the LP Flare and the HP Flare. In the LP Flare FMP, EPA noticed that Section 2, which is supposed to describe the Low Pressure Flare System, was titled "High Pressure Flare System." This inaccuracy was also reflected in the table of contents of the FMP (see **AOC #6**).

Benzene Waste Operations – Part 61 National Emission Standards for Hazardous Air Pollutants (BWON NESHAP) Program Enhancements

Program Summary, CD Paragraph 22: *In addition to continuing to comply with all applicable requirements of 40 C.F.R. Part 61, Subpart FF (“Benzene Waste NESHAP” or “Subpart FF”), Lion Oil agrees to undertake, at the El Dorado Refinery, the measures set forth in Paragraphs 22.B through 22.N to ensure continuing compliance with Subpart FF and to minimize or eliminate fugitive benzene waste emissions.*

Based on the results of the 2010 Total Annual Benzene (TAB) estimate, Lion Oil/Delek exceeded the 10 megagram (Mg) threshold of Subpart FF. Lion Oil/Delek is complying with the “6 BQ” compliance option of the rule and operates dual carbon canisters in series as a control device. The current written BWON sampling plan and simplified process diagram are included as **Appendix 9**.

During the inspection, EPA observed refinery personnel monitoring the secondary canisters at the outlets of the primary canister, as required. EPA reviewed carbon canister monitoring records for September 1, 2024, to August 31, 2025, and noted that Lion Oil/Delek monitored for breakthrough and replaced carbon canisters as required. EPA used the OGI camera to check for leaks and did not observe hydrocarbon emission trails from tanks at all of the Tank Farm areas; however, EPA did observe hydrocarbon emission trails at the Trap Slop oil recovery sump at the Wastewater Treatment Plant (WWTP) area (see **Video FLIR0123, and see AOC #4**). EPA observed Lion Oil/Delek employees conducting an End of Line (EOL) sampling demonstration at one of the sampling points. A photograph of

the Lion Oil/Delek employee's sampling setup is included as **Photo Nos. 10** in **Appendix 1**. EPA observed that the employee collected only two (2) volatile organics analysis (VOA) vials at the sampling point. Lion Oil/Delek uses EPA Method 8260D (SW-846) to analyze benzene samples, which requires that at least two (2) replicate VOA vials be collected and labeled immediately for each field sample. The CD requires that three representative monthly samples must be collected and analyzed from each approved sampling location, meaning a minimum of six (6) VOA vials should have been collected for three (3) field samples. EPA reviewed the BWON chain of custody records from January 1, 2025, to October 8, 2025, along with the most recent laboratory report dated October 8, 2025. EPA found that Lion Oil/Delek collected only one sample monthly at each sampling location, and also noted that no blank samples were collected during this period, which does not conform to BWON analytical method quality assurance requirements. (see **AOC #7**).

EPA reviewed records of audits conducted at laboratories that perform BWON sample analyses and noted that Lion Oil/Delek conducted audits of the Eurofins Arkansas laboratory biennially, as required by the CD, in 2020, 2022, and 2024. EPA reviewed annual training records from 2020 to 2024 of employees that draw benzene samples, and noted lapses in the employee training (see **AOC #8**). EPA reviewed the most recent inspection reports from 2024 to 2025 for seven (7) above-ground floating roof storage tanks and found that the gap measurements for both the primary and secondary seals of all tanks were within the permissible limits set by NESHAP Subpart FF.

Leak Detection and Repair ("LDAR") Program

Program Summary, CD Paragraph 23: Lion Oil/Delek shall implement measures to enhance the refinery's LDAR program under 40 CFR Subpart GGG, Part 61 Subparts J and V and Part 63 Subparts F, H and CC. Lion Oil/Delek shall develop a written description of a Refinery-wide program designed to achieve and maintain compliance with all applicable federal and state LDAR regulations, as well as all requirements imposed by this Part. Lion Oil/Delek shall implement a training program at the Refinery for LDAR personnel. Lion Oil/Delek shall conduct periodic refinery-wide audits of Lion Oil/Delek's compliance with all applicable LDAR requirements at the Refinery.

Lion Oil/Delek uses a third-party contractor to implement the enhanced LDAR program required by the consent decree. EPA verified that Lion Oil/Delek conducts mid-day and end-of-shift drift checks at the Spanbox5 Calibration System, as required by the CD. EPA observed that Lion Oil/Delek calibrated monitoring instruments (e.g. phx42 FID) accurately. EPA verified that certification and concentrations of calibration gases were accurate and within their certification periods and that Lion Oil/Delek uses an electronic data collection system for LDAR monitoring, including data loggers, and leak tracking and reporting software. During EPA's walking tour and survey of the process unit areas, EPA noticed that some leaking components were not properly tagged as required by the CD (see **AOC #9**). Photographs of selected equipment with tagging issues are shown as **Photo Nos. 5 and 9** in **Appendix 1**. Additionally, EPA detected a leaking piping segment with the OGI camera (see **Photo Nos. 11** in **Appendix 1** and **Video FLIR0124** in **Appendix 2**, and also see **AOC #4**).

Lion Oil/Delek consistently maintains required equipment calibration records, and conducted LDAR program audits in 2019, 2021, and 2023 as required by the CD. The 2023 audit report indicated that the auditor recommended that the LDAR contractor's technicians should undergo re-training in the use of EPA Method 21, with a particular focus on conducting Audio, Visual, or Olfactory (AVO) observations

(see **AOC #10**). Additionally, EPA noted that the 2023 audit report comparative monitoring section did not include the comparative leak ratios and statistical data that was included in the 2019 and 2021 audits. This section of the 2023 report simply stating that there were no findings (see **AOC #10**).

Section III – AREAS OF CONCERN

AOC 1 - Emission Limit Exceedances

FCCU NO_x Emission Limits - CD Paragraph 11.E requires Lion Oil to immediately, or within 30 days if EPA's NO_x concentration limits are different from Lion Oil's proposed limit, comply with the established emissions limits.

The established FCCU NO_x 24-hour rolling average limit of 40 ppmvd was exceeded from December 20, 2024, to December 28, 2024. See FCCU emission trends in **Appendix 5**.

FCCU CO Emission Limits - CD Paragraph 14.B requires the El Dorado FCCU, by no later than December 31, 2004, shall meet an emission limit of 500 ppmvd CO corrected to 0% O₂ on a 1-hour average basis and 100 ppmvd CO corrected to 0% O₂ on a 365-day rolling average basis, except during periods of startup, shutdown, and Malfunction of the FCCU, provided that good air pollution control practices are instituted during such events.

During the period of September 1, 2024, to August 31, 2025, the FCCU CO 1-hour rolling average limit of 500 ppmvd was exceeded multiple times. See FCCU emission trends in **Appendix 5**.

NSPS Applicability of FCCU Regenerators - CD Paragraph 15 requires the FCCU Regenerator shall be subject to and comply with the requirements of NSPS Subparts A and J for SO₂, PM, CO, and Opacity by December 31, 2024. Under 40 CFR 60.105a(b)(1)(ii), for units controlled using a wet scrubber, the owner or operator shall use CPMS to measure and record the hourly average pressure drop, liquid feed rate, and exhaust gas flow rate.

During the period of September 1, 2024, to August 31, 2025, the wet gas scrubber pressure drop minimum value limit was not met multiple times. See FCCU Pressure Drop Trend in **Appendix 5**.

NO_x Permit Limits for Heaters and Boilers - CD Paragraph 16.D requires, within 120 days after the start-up of the operation of any NO_x Control Technology required by Paragraph 16, Lion Oil shall submit a permit application to ADEQ in which Lion Oil proposes NO_x emission limits in lb/mmBtu on a 3-hour average basis.

During the period of September 1, 2024, to August 31, 2025, three (3) CEMS-equipped heaters (#9 Platform Heater, #4 Atmospheric Heater, and #4 Vacuum Heater) exceeded the NO_x emission limit of 0.045 lb/mmBtu multiple times during the period. (see heaters emission trends in **Appendix 6**). Three (3) CEMS-equipped boilers (Boiler 18, Boiler 19, and Boiler 20) exceeded the NO_x emission limit of 0.035 lb/mmBtu multiple times during this period. See boilers emission trends in **Appendix 6**.

NSPS Applicability of SRP – Sulfur Pit Emissions - CD Paragraph 18.B requires, as of the Date of Lodging, through and after termination of the Consent Decree, Lion Oil shall continue to route all El Dorado SRP

sulfur pit emissions from the El Dorado SRP so that sulfur pit emissions to the atmosphere either are eliminated or are included and monitored as part of the applicable Sulfur Recovery Plants tail gas emissions that meet the NSPS Subpart J limit for SO₂: a 12-hour rolling average of 250 ppmvd SO₂ corrected to 0% oxygen, as required by 40 C.F.R. § 60.104(a)(2).

During the period of September 1, 2024, to August 31, 2025, the SRP SO₂ 12-hour rolling average emission limit of 250 ppmvd was exceeded multiple times. See SRP SO₂ emission trend in **Appendix 8**.

AOC 2 - CEMS Audit Issues and Reporting Errors

CD Paragraph 11, 12, 14, 16, and 17 require that Lion Oil shall install, certify, calibrate, maintain, and operate all CEMS required by this Consent Decree in accordance with the requirements of 40 C.F.R. §§ 60.11, 60.13 and Part 60 Appendix A, and the applicable performance specification test of 40 C.F.R. Part 60 Appendices B and F.

40 C.F.R. Part 60, Appendix F, Section 5.1.2 requires that the CEMS should be challenged at each audit point for a sufficient period of time to assure adsorption-desorption of the CEMS sample transport surfaces has stabilized.

- At Boiler #18, Lion Oil/Delek conducted successive CGA audits closer than two months apart between the 3rd and 4th quarters of 2022.
- For all affected units with CEMS, in most CGA reports, run times for each audit gas injection were recorded as 00:00:00, 01:00:00, or 23:00:00. Additionally, there were instances where no gas injection run times were recorded. Lion Oil/Delek also did not ensure accurate recording of run times to verify that the CEM system's response had stabilized.
- For heaters and boilers, EPA identified eight (8) instances of typographical errors related to testing dates and unit names. For example, the report cover letter for the #9 Platform Heater indicated that CGAs were conducted on February 22, 2024, whereas the CGA reports listed the test date as February 22, 2023. Furthermore, in the fourth quarter of 2021, the RATA report for the #4 Atmospheric Heater labeled the unit as the Vacuum Heater in both Attachment A and Attachment B of the report.

AOC 3 - Negative CEMS Readings Observed During inspection

CD Paragraph 11, 12, 14, 16, and 17 require that Lion Oil shall install, certify, calibrate, maintain, and operate all CEMS required by this Consent Decree in accordance with the requirements of 40 C.F.R. §§ 60.11, 60.13 and Part 60 Appendix A, and the applicable performance specification test of 40 C.F.R. Part 60 Appendices B and F.

- During the inspection, the FCCU NO_x CEMS displayed -0.365 ppm for the concentration reading.
- During the inspection, the Boiler #18 CEMS displayed -0.5 ppm concentration reading for CO.

AOC 4 – Hydrocarbon Emissions Observed with OGI Camera

CD Paragraph 17, 18, and 19 require that the heaters and boilers, the SRP and Flaring Devices at the El Dorado Refinery shall be affected facilities, as that term is used in 40 C.F.R. Part 60, Subparts A and J, and shall be subject to and comply with the requirements of NSPS Subparts A and J.

Hydrocarbon emission trails were observed at the flares, the SRU stack, six (6) heaters and boilers, a stabilizer unit, the Fin Fan, the Diesel Hydrotreater, Trap Slop oil recovery sump, and from a leaking piping segment using the forward-looking infrared OGI camera. This indicates that some emissions are not captured and routed to a control device, and that the flares are not operating properly, as required by NSPS A and J.

AOC 5 – Sulfur Accumulation in SRP

CD Paragraph 18.C requires, at all times, including periods of startup, shutdown, and Malfunction, Lion Oil shall, to the extent practicable, operate and maintain the El Dorado SRP and TGU and any supplemental control devices, in accordance with Lion Oil's obligation to minimize Sulfur Recovery Plant emissions through implementation of good air pollution control practices as required in 40 C.F.R. § 60.11(d).

The accumulation of sulfur on the ground in the SRP area poses a housekeeping concern and indicates a need to improve air pollution control practices.

AOC 6 – Flare Management Plans

CD Paragraph 19 states that the Flaring Devices, High Pressure Flare and Low Pressure Flare, already are affected facilities, as that term is used in NSPS, 40 C.F.R. Part 60, and are subject to and are required to comply with the requirements of 40 C.F.R. Part 60, Subparts A and J for fuel gas combustion devices. Under 40 C.F.R. §60.103a, the owners and operators that operates a flare that is subject to this subpart shall develop and implement a written flare management plan.

In the Flare Management Plan for the Low Pressure Flare, Section 2 is titled "High Pressure Flare System" in both the body of the plan and the table of contents.

AOC 7 – Required BWON Samples

CD Paragraph 22.I shall apply after the El Dorado Refinery's TAB reaches or exceeds 10 Mg/yr and shall continue to apply until termination. El Dorado Refinery's TAB exceeded 10 Mg/yr in 2010. ***CD Paragraph 22.I.iii*** requires Lion Oil/Delek to conduct EOL sampling on a monthly basis by collecting and analyzing three representative samples from each approved sampling location.

The chain of custody (COC) records from January 1, 2025, to October 8, 2025, indicate that Lion Oil/Delek collected only one (1) sample at each sampling location per month during this period. Additionally, sample blanks, such as trip blanks, were not included for analytical test method quality control in any COC records for the period.

AOC 8 – BWON Training

CD Paragraph 22.G requires, if and when the El Dorado's TAB reaches 1 Mg/yr or more, Lion Oil shall develop and begin implementation of annual (i.e., once each calendar year) training for all employees asked to draw benzene waste samples.

EPA identified gaps in employee training records for 2 employees. For example, there is no record of a particular employee's training in 2021 to 2023, but there are records of training in 2020, 2024, and 2025.

AOC 9 - LDAR Program - Equipment Tagging Issues

CD Paragraph 23.A requires Lion Oil to undertake, at the El Dorado Refinery, the enhancements at Paragraph 23.A through Paragraph 23.P to the El Dorado Refinery's LDAR program under Title 40 of the Code of Federal Regulations, Part 60, Subpart GGG; Part 61, Subparts J and V; Part 63, Subparts F, H, and CC; and applicable state LDAR requirements.

Areas of concern EPA identified with the LDAR program include:

- Equipment tags found on the ground
- Maintenance tags remaining in place after work is completed
- Difficult to read equipment tags, torn temporary tags, and temporary tags that have not been replaced with permanent tags after several months.

AOC 10 – LDAR Program – LDAR Audit Issues

CD Paragraph 23.C requires that the LDAR audits shall include but not be limited to, comparative monitoring, records review, tagging, data management, and observation of the LDAR technicians' calibration and monitoring techniques.

- The 2023 LDAR audit report indicated that the third-party auditor observed multiple unreported AVO-discovered leaks, even though the LDAR contractor technicians responsible for conducting monitoring had recently been present in the area. The auditor recommended that the technicians who missed the leaks should undergo retraining in EPA Method 21, with a particular focus on properly conducting AVO monitoring.
- Unlike the 2019 and 2021 audits, the 2023 LDAR audit did not include evaluation results and graphical representations of comparative monitoring but merely stated that there were no findings from the comparative monitoring. The audit report did not include any comparative leak ratios, statistical results, or a Findings table. Comparative monitoring functions as a quality assurance tool - monitoring results and leak percentage calculations allow comparison of the leak percentages found in LDAR audits to internal monitoring leak percentages.

Closing Conference

EPA Region 6 inspectors Prince Nfodzo, Nicolas Studebaker, and Kim Nguyen conducted a closing conference at Lion Oil/Delek El Dorado Refinery along with ADEQ inspectors Jayden Keels and Jay Northern at 3:30 pm on September 25, 2025. During the closing conference, EPA reviewed the Areas of Concern noted during the inspection for AOCs 2 (partial), 3-7, 9 and 10, fielded questions from facility personnel, and provided information about the next steps in the inspection process. AOCs 1, 2 (partial),

and 8 were determined after conducting the field activity for the inspection and were not discussed in the closing conference. The attendee sign-in sheet for the closing conference is included as **Appendix 3**.

Section IV – POST INSPECTION FOLLOW UP

EPA received the following additional records after exiting the Facility on September 25, 2025:

- On September 26, 2025, EPA received emission trends, additional BWON training records, and flare vent gas flow records.
- On September 28, 2025, EPA received flare emissions calculation summaries.
- On October 3, 2025, EPA received additional LDAR monitoring calibration records for September 25, 2025, and calibration gas certificates for Boiler #18, Boiler #19, and Boiler #20.
- On October 21, 2025, EPA received additional calibration gas certificates for LDAR monitoring, BWON end-of-line (EOL) sample chains of custody, the most recent benzene waste laboratory test report for benzene samples, record of repair for the above-ground storage tank 4491278, and the fuel gas SO₂ emission trend data for the #9 Platformer Heater, the #4 Atmospheric Heater, and the #4 Vacuum Heater .

Section V – LIST OF APPENDICES

Appendix 1 – Photo Log

Appendix 2 – Video Log

Appendix 3 - Opening and Closing Conference Sign-in Sheets

Appendix 4 – Plant-wide Process Flow Diagram and Process Description

Appendix 5 - FCCU Emission and WGS Parameter Monitoring Trends

Appendix 6 - Heaters and Boilers: NO_x Emission Trends and Updated List of Units with CEMS and NO_x Controls

Appendix 7 - Refinery Fuel Gas System Permit Requirements and SO₂ Emission Trends

Appendix 8 - Sulfur Recovery Plants SO₂ Emission Trend

Appendix 9 - BWON End-Of-Line Sampling Plan and Associated Process Flow Diagrams

Appendix 10 - Operating Permit Excerpts Related to Consent Decree Requirements.

Appendix 11 – Consent Decree Section V and CD Appendices

Appendix 1

Photograph Log



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 1

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County/Parish: Union	State: Arkansas



Photo File Name: DSCN1641.JPG

Date of Photo: 09/23/25

Time of Photo: 09:02 AM

Photographer: Kim Nguyen

Site Name: El Dorado Refinery

Description: FCCU CEMS



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 2

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County/Parish: Union	State: Arkansas



Photo File Name: DSCN1642.JPG

Date of Photo: 09/23/25

Time of Photo: 09:03 AM

Photographer: Kim Nguyen

Site Name: El Dorado Refinery

Description: FCCU NOx CEMS readings

NO: -0.365 ppm

NO2: 5.339 ppm

NOx: 4.974 ppm



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 3

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County/Parish: Union	State: Arkansas



Photo File Name: DSCN1643.JPG

Date of Photo: 09/23/25

Time of Photo: 09:28 AM

Photographer: Kim Nguyen

Site Name: El Dorado Refinery

Description: #9 Plat Heater (SN-811) CEMS

NOx: 33.45 ppm

SO2: 1.996 ppm

O2: 2.523%



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 4

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County/Parish: Union	State: Arkansas



Photo File Name: DSCN1644.JPG

Date of Photo: 09/23/25

Time of Photo: 10:08 AM

Photographer: Kim Nguyen

Site Name: El Dorado Refinery

Description: #4 Vacuum Heater (SN-805N) CEMS



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Photograph Log

Photo No. 5

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County/Parish: Union	State: Arkansas



Photo File Name: DSCN1645.JPG

Date of Photo: 09/23/25

Time of Photo: 10:42 AM

Photographer: Kim Nguyen

Site Name: El Dorado Refinery

Description: Completed Work/Maintenance Tags at #4 Atmospheric Heater's area



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 6

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County/Parish: Union	State: Arkansas

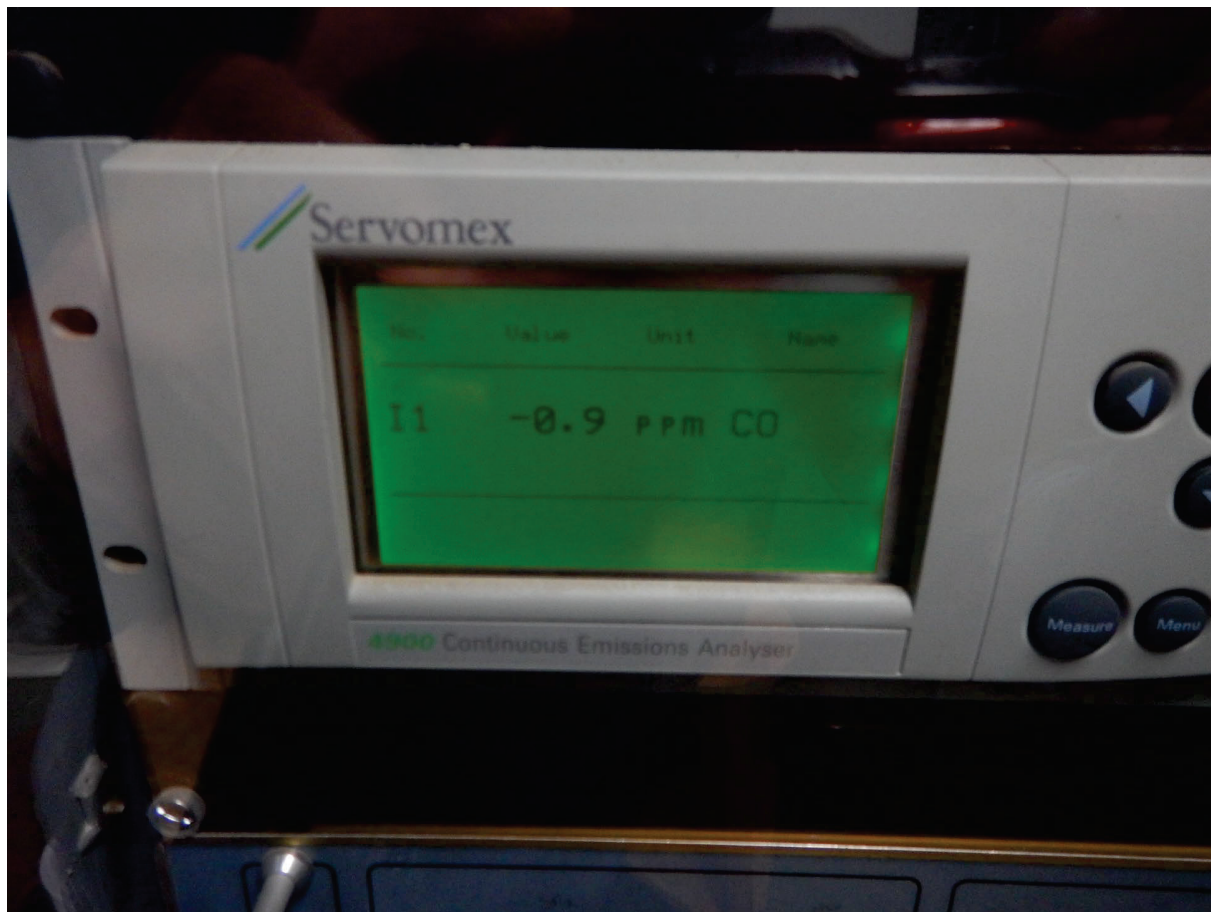


Photo File Name: DSCN1646.JPG

Date of Photo: 09/23/25

Time of Photo: 10:55 AM

Photographer: Kim Nguyen

Site Name: El Dorado Refinery

Description: #18 Boiler (SN-821a) CO CEMS reading

CO: -0.9 ppm



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 7

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County/Parish: Union	State: Arkansas



Photo File Name: DSCN1647.JPG

Date of Photo: 09/23/25

Time of Photo: 11:13 AM

Photographer: Kim Nguyen

Site Name: El Dorado Refinery

Description: Sulfur on the ground at SRP area



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Photograph Log

Photo No. 8

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County/Parish: Union	State: Arkansas



Photo File Name: DSCN1648.JPG

Date of Photo: 09/23/25

Time of Photo: 11:34 AM

Photographer: Kim Nguyen

Site Name: El Dorado Refinery

Description: Fuel gas sample location



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Photograph Log

Photo No. 9

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County/Parish: Union	State: Arkansas

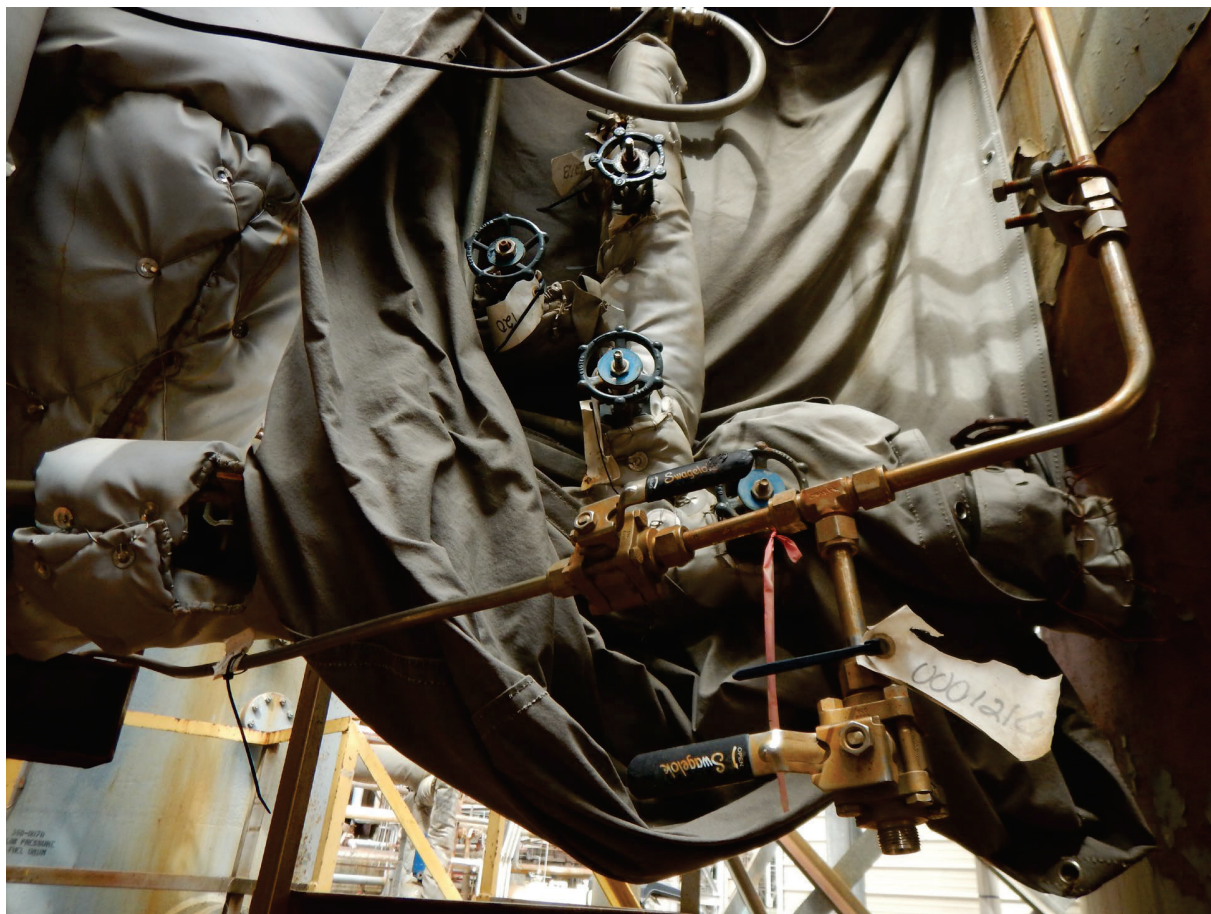


Photo File Name: DSCN1649.JPG

Date of Photo: 09/23/25

Time of Photo: 11:38 AM

Photographer: Kim Nguyen

Site Name: El Dorado Refinery

Description: Temporary LDAR tags



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 10

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County/Parish: Union	State: Arkansas



Photo File Name: FLIR0122.JPG

Date of Photo: 09/25/25

Time of Photo: 09:25 AM

Photographer: Nicolas Studebaker

Site Name: El Dorado Refinery

Description: BWON EOL sampling set up



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Photograph Log

Photo No. 11

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County/Parish: Union	State: Arkansas



Photo File Name: FLIR0125.JPG

Date of Photo: 09/25/25

Time of Photo: 10:46 AM

Photographer: Nicolas Studebaker

Site Name: El Dorado Refinery

Description: Leaking line at Unit-4A

Appendix 2

Video Log



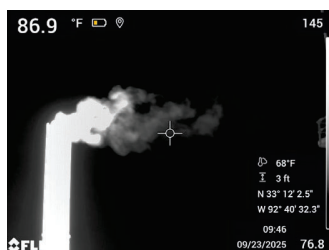
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Video Log

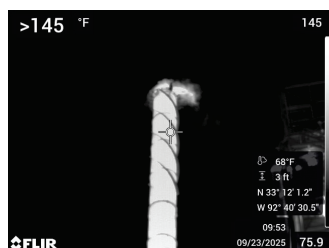
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City: El Dorado	County: Union	State: Arkansas



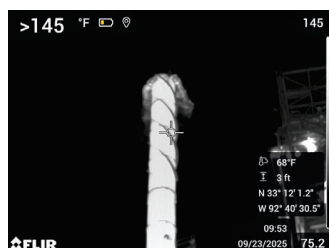
Video File Name: [FLIR0109](#)
Date of Video: 09/23/2025
Time of Video: 09:45 AM
Videographer: Nicolas Studebaker
Description: View of emissions from #6 Heater stack.



Video File Name: FLIR0110
Date of Video: 09/23/2025
Time of Video: 09:47 AM
Videographer: Nicolas Studebaker
Description: Repeat of FLIR0109. Not referred to in the associated inspection report.



File Name: FLIR0111
Date of Video: 09/23/2025
Time of Video: 09:53 AM
Videographer: Nicolas Studebaker
Description: Accidental picture. Not referred to in the associated inspection report.



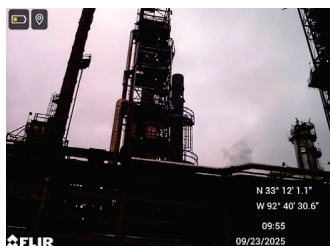
Video File Name: [FLIR0112](#)
Date of Video: 09/23/2025
Time of Video: 09:54 AM
Videographer: Nicolas Studebaker
Description: View of emissions from #9 Plat Heater stack.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Video Log

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County: Union	State: Arkansas



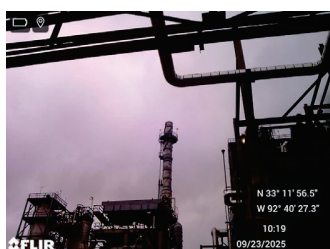
Video File Name: [FLIR0113](#)
Date of Video: 09/23/2025
Time of Video: 09:55 AM
Videographer: Nicolas Studebaker
Description: View of emissions from #9 Stabilizer.



Video File Name: [FLIR0114](#)
Date of Video: 09/23/2025
Time of Video: 10:02 AM
Videographer: Nicolas Studebaker
Description: View of emissions from #4 Atmospheric Heater stack.



Video File Name: [FLIR0115](#)
Date of Video: 09/23/2025
Time of Video: 10:17 AM
Videographer: Nicolas Studebaker
Description: View of emissions from SRU stack.



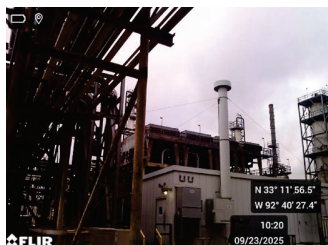
Video File Name: [FLIR0116](#)
Date of Video: 09/23/2025
Time of Video: 10:20 AM
Videographer: Nicolas Studebaker
Description: View of emissions from #4 Vacuum Heater stack.



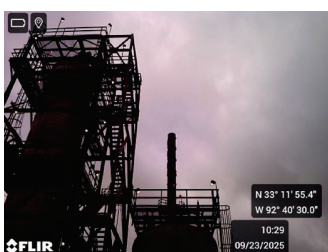
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Video Log

Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County: Union	State: Arkansas



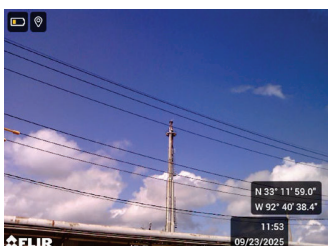
Video File Name: [FLIR0117](#)
Date of Video: 09/23/2025
Time of Video: 10:21 AM
Videographer: Nicolas Studebaker
Description: View of emissions from Fin Fan.



Video File Name: [FLIR0118](#)
Date of Video: 09/23/2025
Time of Video: 10:30 AM
Videographer: Nicolas Studebaker
Description: View of emissions from the Diesel Hydrotreater.



Video File Name: [FLIR0119](#)
Date of Video: 09/23/2025
Time of Video: 11:04 AM
Videographer: Nicolas Studebaker
Description: View of emissions from #18 Boiler and #19 Boiler stacks.



Video File Name: [FLIR0120](#)
Date of Video: 09/23/2025
Time of Video: 11:53 AM
Videographer: Nicolas Studebaker
Description: View of emissions from HP Flare.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Video Log

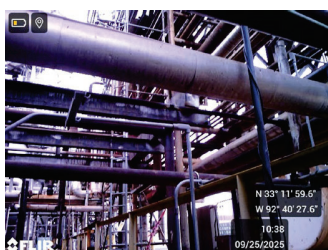
Location: Lion Oil Company dba Delek US Holdings, Inc, El Dorado Refinery		
City: El Dorado	County: Union	State: Arkansas



Video File Name: [FLIR0121](#)
Date of Video: 09/23/2025
Time of Video: 11:55 AM
Videographer: Nicolas Studebaker
Description: View of emissions from LP Flare.



Video File Name: [FLIR0123](#)
Date of Video: 09/25/2025
Time of Video: 09:39 AM
Videographer: Nicolas Studebaker
Description: View of emissions from API Trap Slop oil recovery sump.



Video File Name: [FLIR0124](#)
Date of Video: 09/25/2025
Time of Video: 10:39 AM
Videographer: Nicolas Studebaker
Description: View of emissions from leaking line at Unit-4A.

Appendix 3

Opening and Closing Conference Sign-in Sheets

Opening Conference

Commence opening/pre-inspection meeting 9/22/2025 Time: ~ 1315

Name	Title	Representing	e-Mail	Phone
Prince Nfodzo	Environmental Engineer	US EPA	Nfodzo.prince@epa.gov	(214) 665-7491
Kim Nguyen	Environmental Scientist	US EPA	nguyen.kim.j@epa.gov	(214) 665-7133
Nicolas Studebaker	Physical Scientist	US EPA	Studebaker.Nicolas@epa.gov	(214) 665-3133
Kayce Carter	Environmental Specialist	DELEK	kayce.carter@delekus.com	870-864-1153
Mitch Colvin	Env. Manager	DELEK	mitch.colvin@delekus.com	870-864-1464
Alex Hulsey	Environmental Specialist	DELEK	alex.hulsey@delekus.com	870-864-1483
Jayden Keels	Air Inspector	ADEQ	jayden.keels@adeq.arkansas.gov	501-680-8760
Jay Northern	Air Inspector	ADEQ	jay.northern@adeq.arkansas.gov	501-251-4507
Zach Poindexter	Environmental Specialist	Delek	Zachary.Poindexter@delekus.com	870-864-1283
Teay Sanders	SR Director PSN/Environ HSE	Delek	teay.sanders@delekus.com	903-716-3852
John Thompson	GENERAL MANAGER	DELEK	John.Thompson@delekus.com	225-716-2026
Nicolas Studebaker	NS			
Adam Buchanan	Environmental Specialist	Delek	adam.buchanan@delekus.com	N/A

Conclude opening/pre-inspection meeting 9/22/2025 Time: 1430

Closing Conference

Commenced meeting..... Time: 1530

Name	Title	Representing	e-Mail	Phone
Prince Nfodzo	Environmental Engineer	US EPA	Nfodzo.prince@epa.gov	(214) 665-7491
Kim Nguyen	Environmental Scientist	US EPA	nguyen.kim.j@epa.gov	(214) 665-7133
Nicolas Studebaker	Physical Scientist	US EPA	Studebaker.Nicolas@epa.gov	(214) 665-3133
Kayce Carter	Environmental Specialist	DELEK	Kayce.carter@delekus.com	870-864-1153
Zach Poindexter	Environmental Specialist	Delek	Zachary.Poindexter@delekus.com	870-864-1263
Mitch Colvin	Env. Manager	Delek	mitche.colvin@delekus.com	870-864-1464
Alex Hulsey	Env Specialist	Delek	alex.hulsey@delekus.com	870-864-1486
Jayden Keels	A/E Inspector II	ADEC	Jayden.Keels@arhousess.gov	501-680-8760
Jay Northman	ADEC Inspector II	DEK	Jay.northman@arkansass.gov	501-251-4507
Terry Sanders	Tahom HSSE / Corp PSM	Delek	terry.sanders@delekus.com	903-316-5852
Justin Thompson	VP GM REFINERY	DELEK	JUSTIN.THOMPSON@delekus.com	225-716-2026
BRANDON DAVISLEY	ATTORNEY (HS+E)	DELEK	BRANDON.DAVISLEY@delekus.com	
MATT BUELL	EXECUTIVE ENVIRONMENTAL	DELEK	MATT.BUELL@DELEKUS.COM	

Conclude meeting..... Time: ~1615

HEATHER HARRIS

VP EH+S

DELEK

HEATHER.HARRIS@DELEKUS.COM

Appendix 4

Plant-wide Process Flow Diagram and Process Description

Delek US – El Dorado Refinery Facility Description

#4 Crude Unit

Crude enters the refinery at the #4 Crude Unit. This unit is designed to separate approximately 80,000 BPD of light straight run gasoline and crude oil into various components of naphtha, gasoline, kerosene, diesel, gas oils and asphalt. The crude entering the refinery is preheated using heat exchangers and hot rundown streams from the unit and flashed in the Pre-flash Column to produce gasoline and naphtha. The bottoms from the Pre-flash Column is further separated in the Atmospheric Column into naphtha, kerosene, diesel, and gas oil. The Atmospheric Column bottoms are separated in the Vacuum Column into gas oil and asphalt products.

#7 Fluid Catalytic Cracking Unit

The #7 Fluid Catalytic Cracking Unit converts gas oil from the crude unit and other sources into more useful products. The gas oil is heated in a furnace then contacted with a hot fluidized catalyst which causes the gas oil to crack into lighter products. The catalyst is then separated from the products in the Reactor and returned to the Regenerator. In the Regenerator, coke which has deposited on the catalyst is burned off and the catalyst is recycled. The hot flue gas leaving the Regenerator passes through two sets of cyclones to remove any catalyst fines and is then used to produce steam in the waste heat boiler. The light products produced in the reactor are separated in the Fractionator Tower.

#8 ULSD Hydrotreater:

The #8 ULSD Hydrotreater unit is designed to process diesel, kerosene, and light cycle oil. This unit makes ultralow sulfur diesel quality fuel from diesel feedstock by reducing the sulfur content to 15 ppm. The feed to the unit is heated then reacted with hydrogen in the reactor. Bottoms from the reactor flow through a high and low pressure product separator where the unreacted hydrogen is separated from the product and recycled to the reactor. The high pressure hydrogen gas stream is passed through an amine absorber to remove hydrogen sulfide gases from the system. The stream rich in hydrogen sulfide is then sent to the sulfur recovery plant and/or NaHS unit for sulfur removal. The liquid from the low pressure separator is passed through a stripper to remove any residual hydrogen sulfide before the desulfurized product is sent to storage.

#9 Unit:

This #9 unit is designed to process naphtha from the crude unit and upgrade it into higher octane products. The process is divided into the Unifiner and Platformer sections.

In the Unifiner section, naphtha is heated then reacted with hydrogen over a cobalt/molybdenum catalyst to convert the sulfur in the naphtha stream to hydrogen sulfide. The Reactor effluent is passed through the Separator and Stripper to remove the hydrogen and hydrogen sulfide. The Stripper bottoms are sent to the Platformer section for further processing.

In the Platformer section, the Stripper bottoms are heated then passed over a platinum/iridium catalyst in the reactor where the naphtha molecules are restructured to form high octane compounds. The reactor effluent is sent to two Separators where hydrogen is separated from the platformate and recycled. The platformate is then sent to the Stabilizer where the low molecular weight gases are removed and sent to the fuel gas system. The bottoms from the Stabilizer are sent to gasoline storage.

The Continuous Catalyst Regeneration (CCR) section of the Platformer continuously burns off the coke that is deposited on the catalyst and restores catalyst activity, selectivity, and stability to essentially fresh catalyst levels.

#10 Diesel Desulfurization Unit:

The #10 Diesel Desulfurization Unit removes sulfur from a heavy cut of FCC gasoline so that the overall concentrations of sulfur in Lion Oil's gasoline pool to 30 ppm to meet the Tier II Gasoline sulfur

Delek US – El Dorado Refinery Facility Description

regulations. Unit feed is heated then reacted with hydrogen in the reactor. Bottoms from the reactor flow to the product separator where the unreacted hydrogen is separated from the product and recycled to the reactor. The product then flows to a flash drum where most of the hydrogen sulfide that was formed in the reactor is flashed off and sent to the #17 and #18 units for treatment. The liquid from the flash drum is passed through a stripper to remove any residual hydrogen sulfide before the desulfurized product is sent to storage.

#11 Deasphaltizing Unit:

The #11 Deasphaltizing Unit processes asphalt from the #4 Crude Unit. It separates light hydrocarbons from the asphalt to yield a product suitable for catalytic cracking while also producing an asphalt with desirable properties. Flux from the Crude Unit is pumped into the top of the Extraction Tower and flows countercurrent to a propane/butane solvent. The solvent and deasphalted oil are then sent through a series of evaporators and a stripper where the solvent is distilled and condensed for recycle to the Extraction Tower. The deasphalted oil is used as feed to the FCC. Asphalt from the bottom of the Extraction Tower is heated and passed through the Flash Tower and Asphalt Stripper to remove any residual solvent. The asphalt product is then sent to the Asphalt Plant where it is blended with other products.

#12 Distillate Hydrotreater:

The #12 Distillate Hydrotreater is a diesel and gas oil desulfurization unit whose purpose is to produce on-road diesel quality fuel. It reduces the sulfur content of light cycle oil from the #7 FCCU and kerosene and diesel from the #4 Crude Unit to less than 0.05 weight percent. The mixed feed is heated then reacted with hydrogen in the reactor. The reactor effluent is cooled before flowing into the High Pressure Separator where the unreacted hydrogen is separated from the product and recycled to the reactor. A small portion of the unreacted hydrogen stream is vented to the sour fuel gas system. The liquid product flows to the Low Pressure Separator where some of the hydrogen sulfide that is formed in the reactor is flashed off and sent to the #17 Sulfur Recovery Unit and the #18 Sodium Hydrosulfide Unit for treatment. The liquid from the Low Pressure Separator then flows through heat exchangers to the stripper to remove any residual hydrogen sulfide. The bottoms of the stripper are then cooled and sent to storage.

Boilers:

The three boilers in operation burn fuel gas and natural gas, but may burn fuel oil if neither of those are available.

Sour Water Stripper:

The refinery generates numerous water streams from storage tanks and accumulators that contain high concentrations of hydrogen sulfide and ammonia. The Sour Water Stripper (SWS) is a trayed column that steam strips the hydrogen sulfide and ammonia from the sour water streams before the water is discharged into the refinery waste water treatment system. The sour gases that are stripped from the water are directed to a Claus combustor/thermal reactor to recover sulfur in the form of hydrogen sulfide.

#18 Sodium Hydrosulfide Unit:

In order to use the light sour gas produced by various refinery units as fuel gas, the hydrogen sulfide must be removed to prevent excess SO₂ emissions as it is burned. The #18 Sodium Hydrosulfide Unit removes the hydrogen sulfide by contacting the fuel gas with caustic soda. The fuel gas leaving the unit then flows to the #17 Unit where it is contacted with amine.

Fuel Gas System:

Various streams enter the refinery fuel gas system directly as unit off gas streams, while others are first treated in units #18 and #17 to remove hydrogen sulfide content. All of these streams combine and enter into the two fuel gas drums before being distributed to the various heaters and boilers throughout the refinery. Additionally, purchased natural gas is used in burner pilots and to maintain fuel gas supply.

Delek US – El Dorado Refinery Facility Description

If there is a fuel gas upset it is possible to divert the excess fuel gas (NSPS) to the flare.

#17 Sulfur Recovery Plant:

The purpose of the #17 Sulfur Recovery Plant is to recover sulfur as hydrogen sulfide from fuel gas and natural gases from Great Lakes Chemical. In addition, Sour Water Stripper (SWS) off gas can be treated in the Sulfur Recovery Plant. The hydrogen sulfide is converted to a salable elemental sulfur product. The Sulfur Recovery Plant can be divided into three process units:

- a. Amine Unit consisting of two (2) amine contactors
- b. Sulfur Recovery Unit (SRU) (Claus)
- c. Tail Gas Treating Unit (TGTU)

Sour gas enters the primary amine unit where it is contacted with amine. The amine removes hydrogen sulfide and some carbon dioxide from the sour fuel gas stream. The sweetened gas exits the primary amine unit for distribution throughout the refinery. The acid gas (hydrogen sulfide rich) stream is then sent to the SRU. Acid gas from the primary amine unit and recirculated gas from the TGTU, along with SWS off gas, enter the SRU and go directly to the Claus Combustor/Thermal reactor. This is where approximately one-third of the hydrogen sulfide is converted to sulfur dioxide. Also, ammonia in the SWS off gas is converted to diatomic nitrogen and water at the Claus reactor. The hot vapor products leaving the thermal reactor make several passes through the sulfur condenser and the catalytic reactors. The sulfur condenser separates the condensed sulfur from the vapor and removes it to storage. The remaining vapors exit the SRU to the TGTU. The purpose of the TGTU is to recover sulfur from the SRU tail gas. The sulfur compounds are hydrogenated to hydrogen sulfide in the TGTU reactor. The vapor products from the reactor are then cooled and directed to the TGTU amine unit which operates much like the primary amine unit. The amine stripper off gas is recirculated to the SRU feed and the amine absorber off gas is directed to the Sulfur Recovery Plant catalytic incinerator. The remaining low concentrations of hydrogen sulfide, carbon monoxide, and hydrogen are combusted in the incinerator.

Flares:

The refinery operates a High and a Low Pressure Flare to dispose of excess combustible gases. These gases result from undetected leaks in operating equipment, upset conditions in the normal operation of a refinery where gases must be vented to avoid dangerously high pressure in operating equipment, plant start-ups, and emergency shutdowns. The flares are identical John Zink "smokeless" flares which use steam aspiration to control visible emissions. In addition to excess refinery gases, each flare burns approximately 1,406 scf/hr of natural gas for the pilot burners.

Flare Gas Recover Unit (FGRU):

The FGRU draws excess flare gases from the flare gas header upstream of a liquid seal vessel and recovers gas that would otherwise be burned in the flares. The capacity of the FGRU is automatically varied to maintain a positive pressure on the flare header upstream from the liquid seal vessel. Maintaining a positive pressure ensures that the air is not drawn into either the flare system or the flare gas recovery system. If the volume of the gas in the flare header exceeds the capacity of the FGRU, the excess gas will vent through the water seal on the FGRS to the flares.

Truck Loading Racks:

The refinery operates several truck and rail loading racks. Products loaded range from asphalt to propane. Vapors generated at the gasoline/diesel loading rack during the loading operations are routed through a knock-out pot where any free liquids are recovered and the vapors are vented to a vapor recovery unit.

#5 Alkylation Unit:

The purpose of the Alky Unit is to convert olefin feed to a high octane, low RVP gasoline blend stock. Olefin and isobutane are contacted with a sulfuric acid catalyst to make alkylate product. The reactor

Delek US – El Dorado Refinery Facility Description

product flows into an emulsion settler that separates the acid, refrigeration vapors, and effluent. The spent acid is recirculated back to the reactor. A portion of the refrigeration vapors are sent to the Depropanizer, the overheads of which is propane product and the bottoms is isobutane that is recycled back to the reactor. The other portion of the refrigeration vapors, along with reactor vapors, are compressed and sent back to the reactor for cooling. The reactor effluent is treated to remove entrained acid then fractionated in a Deisobutanizer and Debutanizer to produce alkylate for gasoline blending. Recycle isobutane and butane product are the overhead products of the DIB and DEB, respectively.

#6 Hydrotreater/Isomerization Unit:

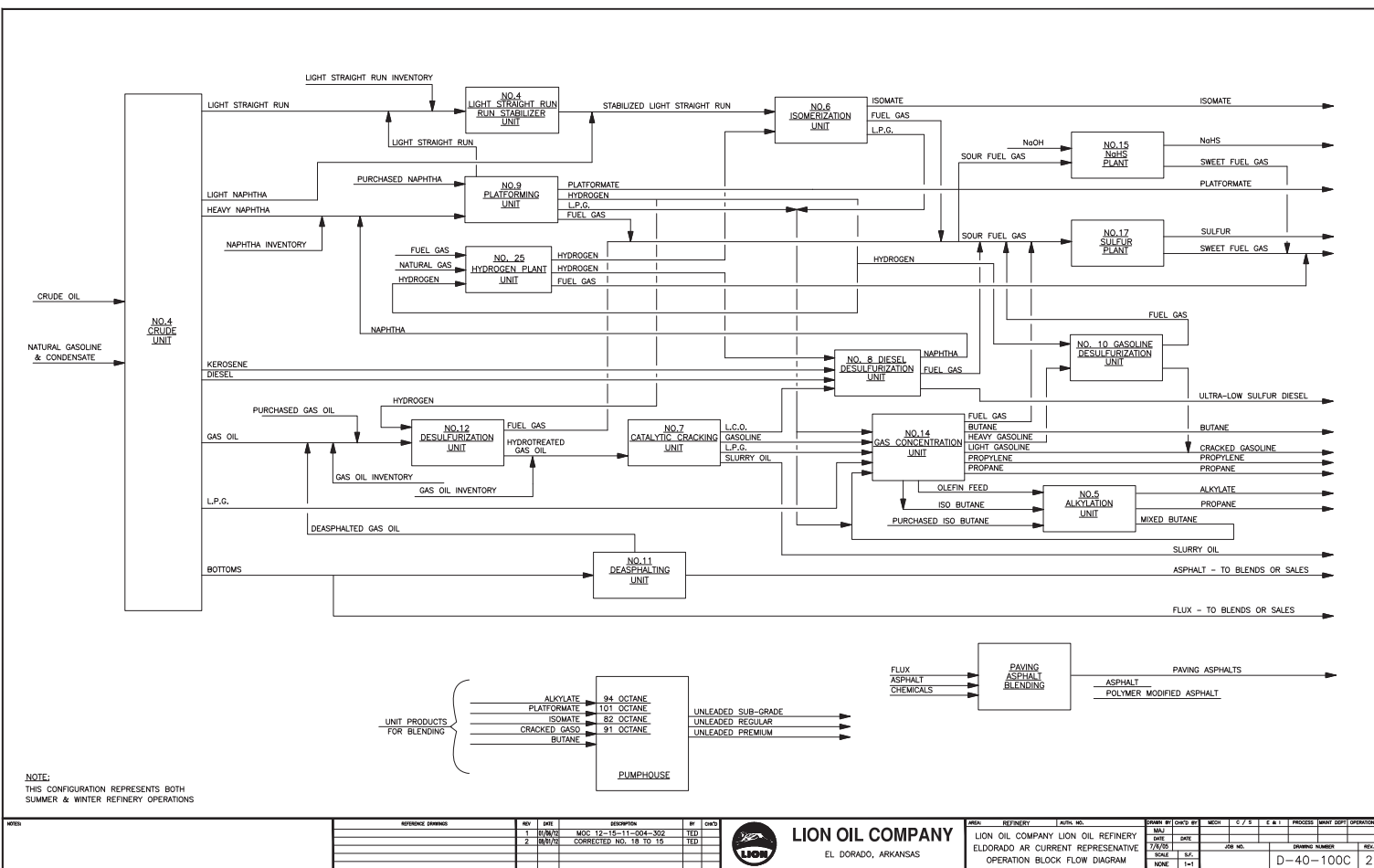
This unit upgrades light straight run naphtha from the crude unit into a higher octane gasoline. It consists of a hydrotreater section and a penex isomerization section. In the hydrotreater, the light straight run naphtha is heated and reacted with hydrogen over a nickel/molybdenum catalyst to convert the sulfur in the feed stream to hydrogen sulfide. The reactor effluent is passed through the separator and stripper to remove hydrogen and hydrogen sulfide. The stripper bottoms are sent to the penex isomerization section for further processing. Here, the stripper bottoms are heated then passed over a platinum catalyst in the reactor where the light straight run naphtha molecules are restructured to form higher octane compounds. The reactor effluent is sent to a separator where hydrogen is separated from the isomerate and recycled. The isomerate is then sent to the stabilizer where the low molecular weight gases are removed through a caustic scrubber and sent to the refinery fuel gas system. The bottoms from the stabilizer are sent to gasoline storage.

Wastewater Treatment Plant:

This unit uses a combination of chemical, biochemical, and physical processes to remove pollutants from refinery wastewater before discharging into DeLoutre Creek. The main components of the unit are dual API separators, two equalization tanks and pond, a dissolved air flotation (DAF) unit, a cooling tower, two activated sludge bio-reactors, two clarification tanks, sludge recycle equipment, an aerobic digester, and a sludge thickener. Final effluent filters assure a minimum level of suspended matter in the effluent discharged to DeLoutre Creek. The final effluent cooling towers cool the effluent and sludge generated at the Waste Water Treatment Plant are dewatered at the Sludge Management Facilities (SMF) prior to effluent disposal.

*The Title V Permit was referenced in writing this document

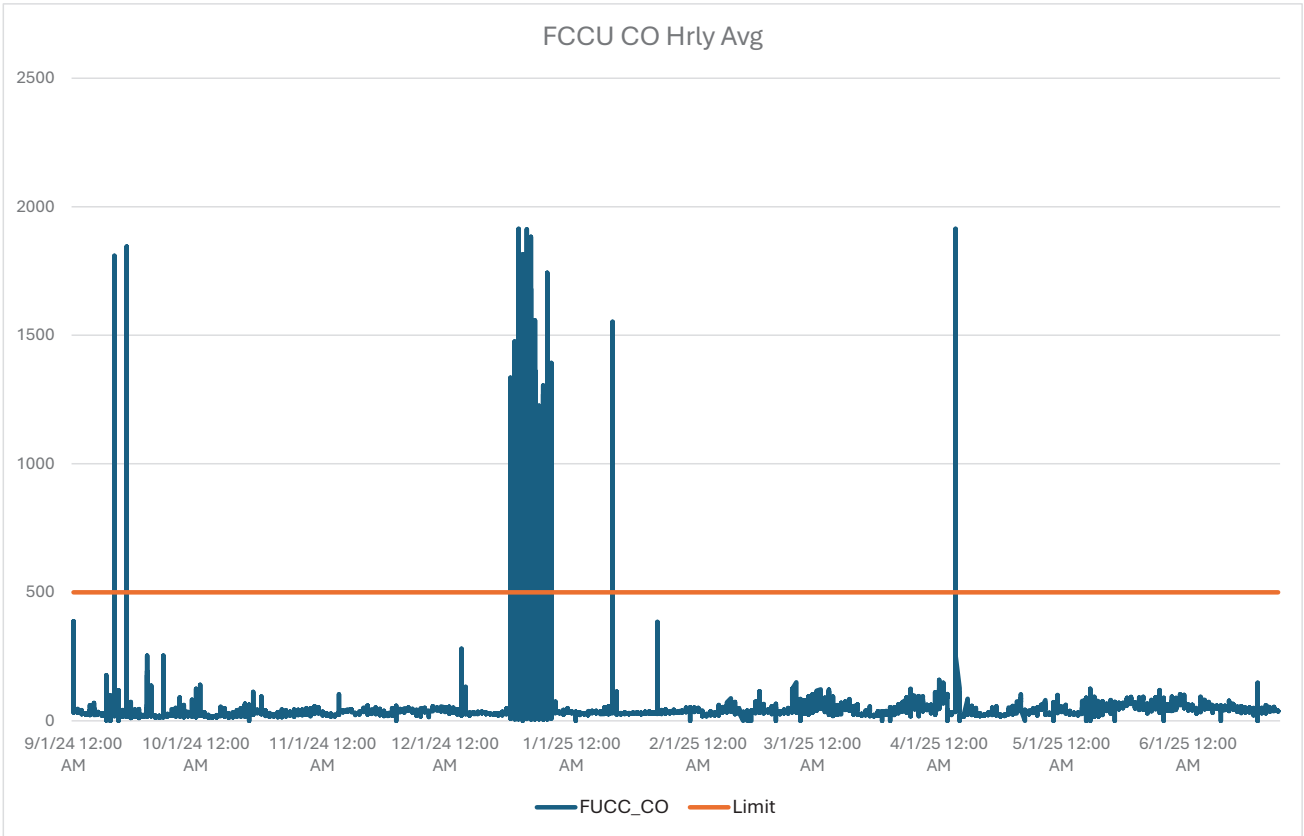
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Appendix 5

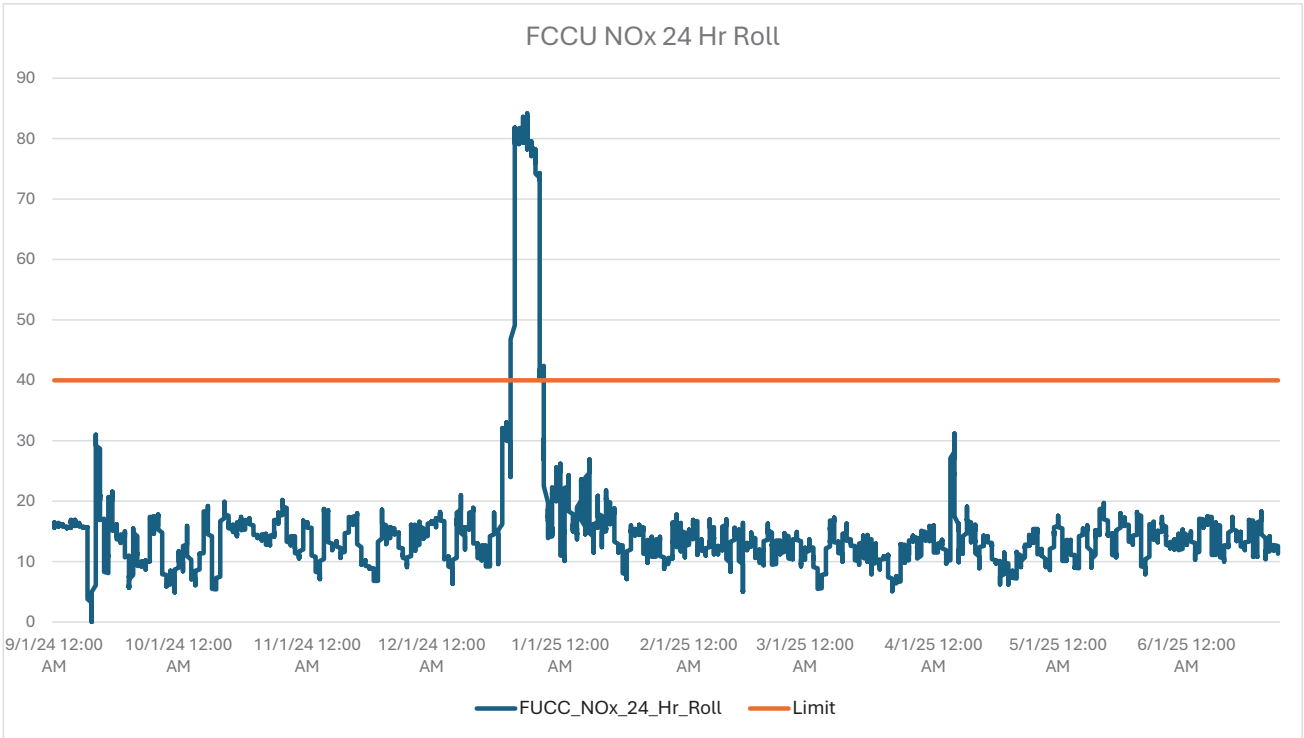
FCCU Emission and WGS Parameter Monitoring Trends

R1-014272



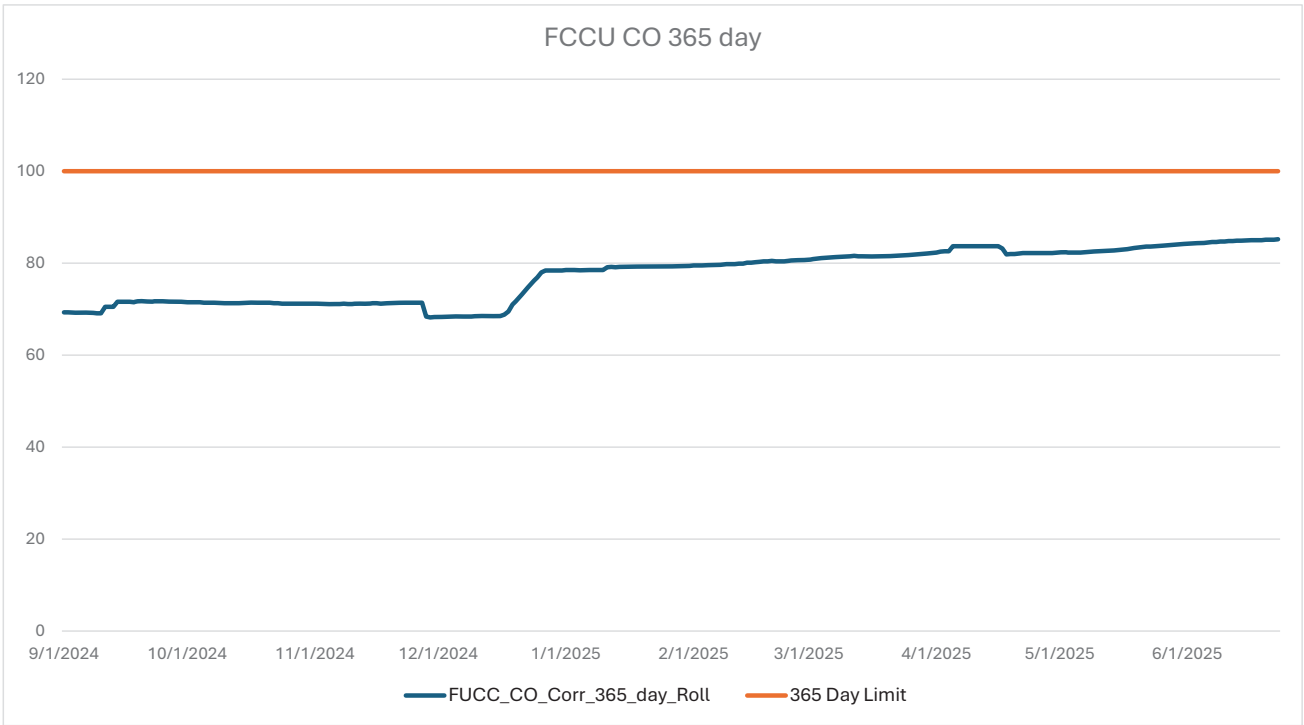
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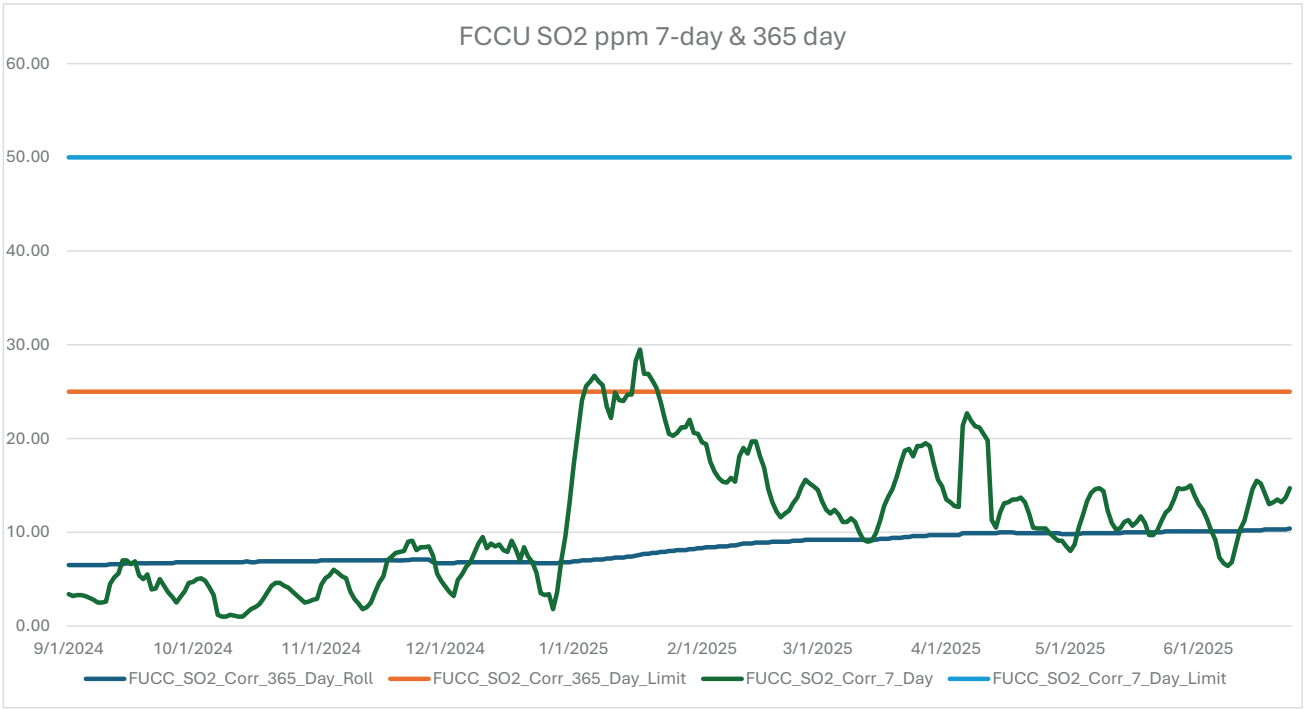
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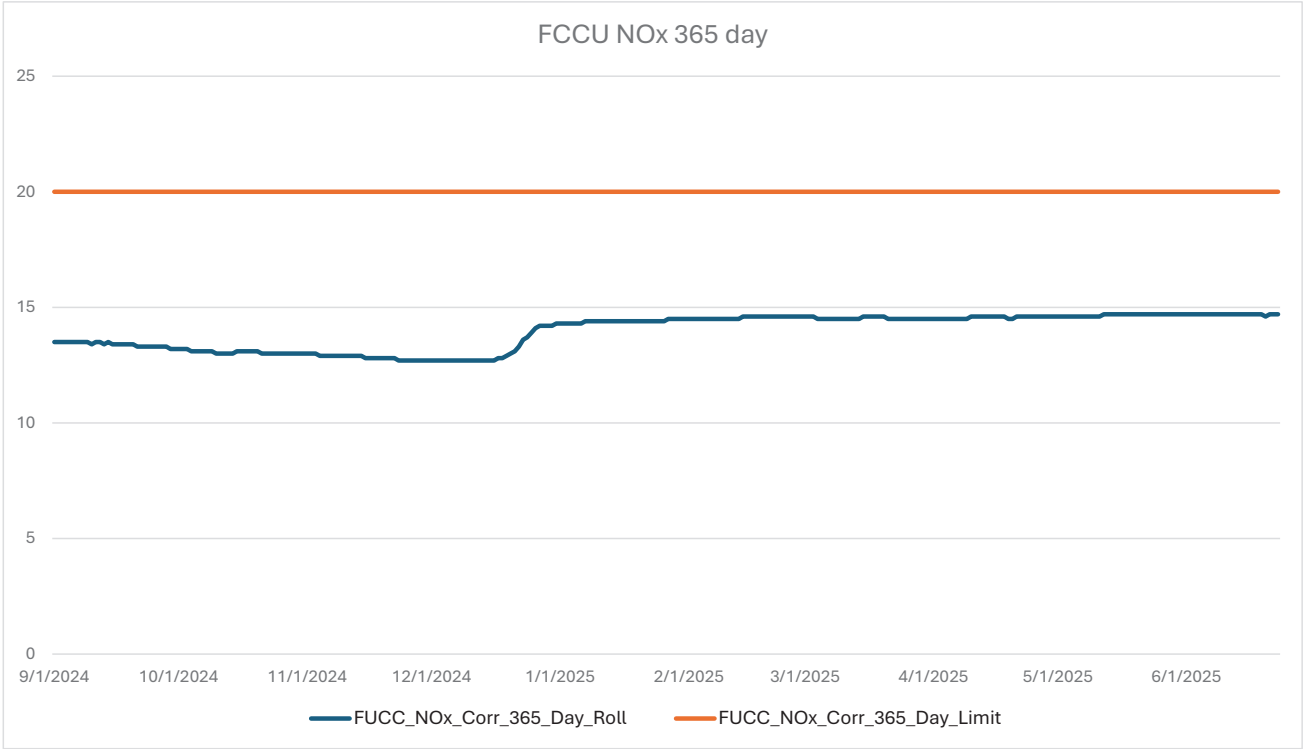
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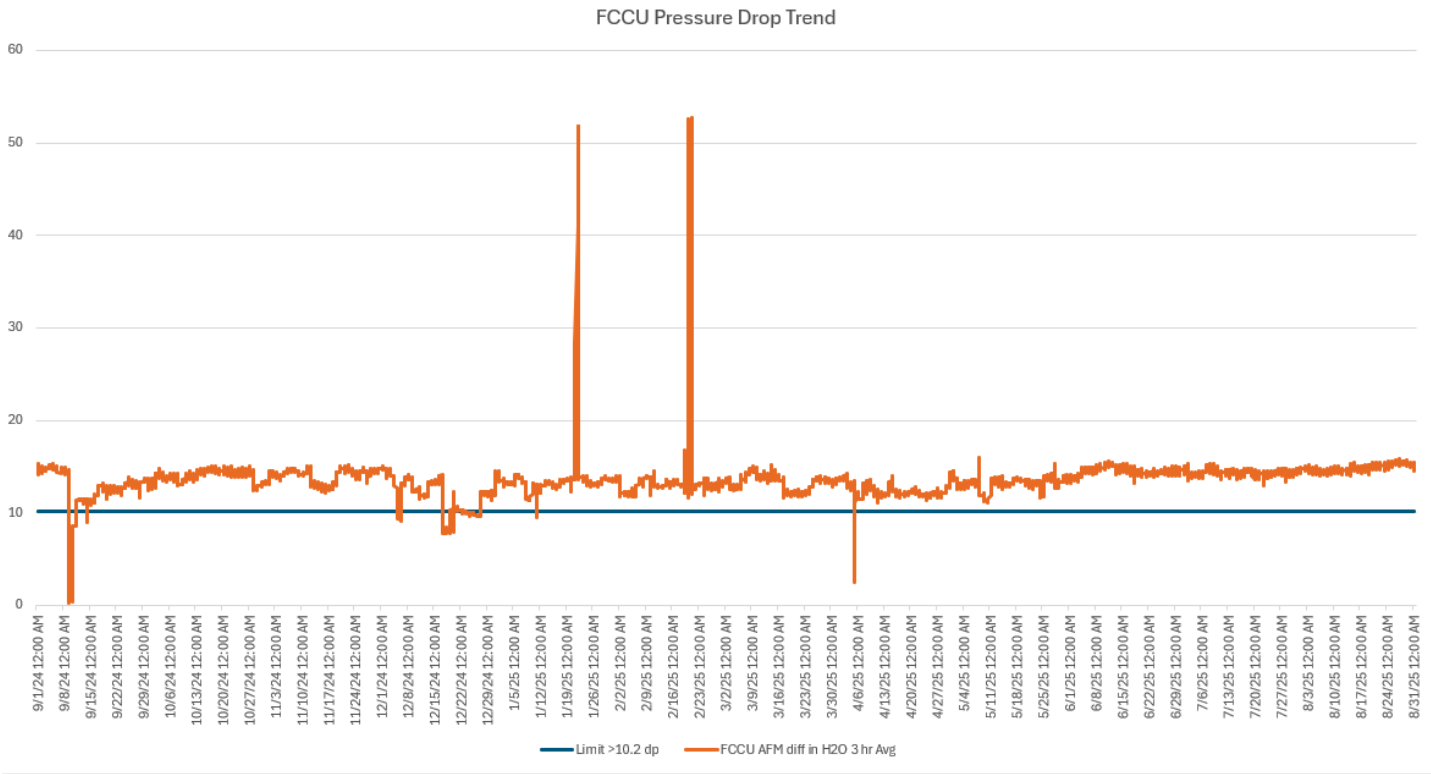
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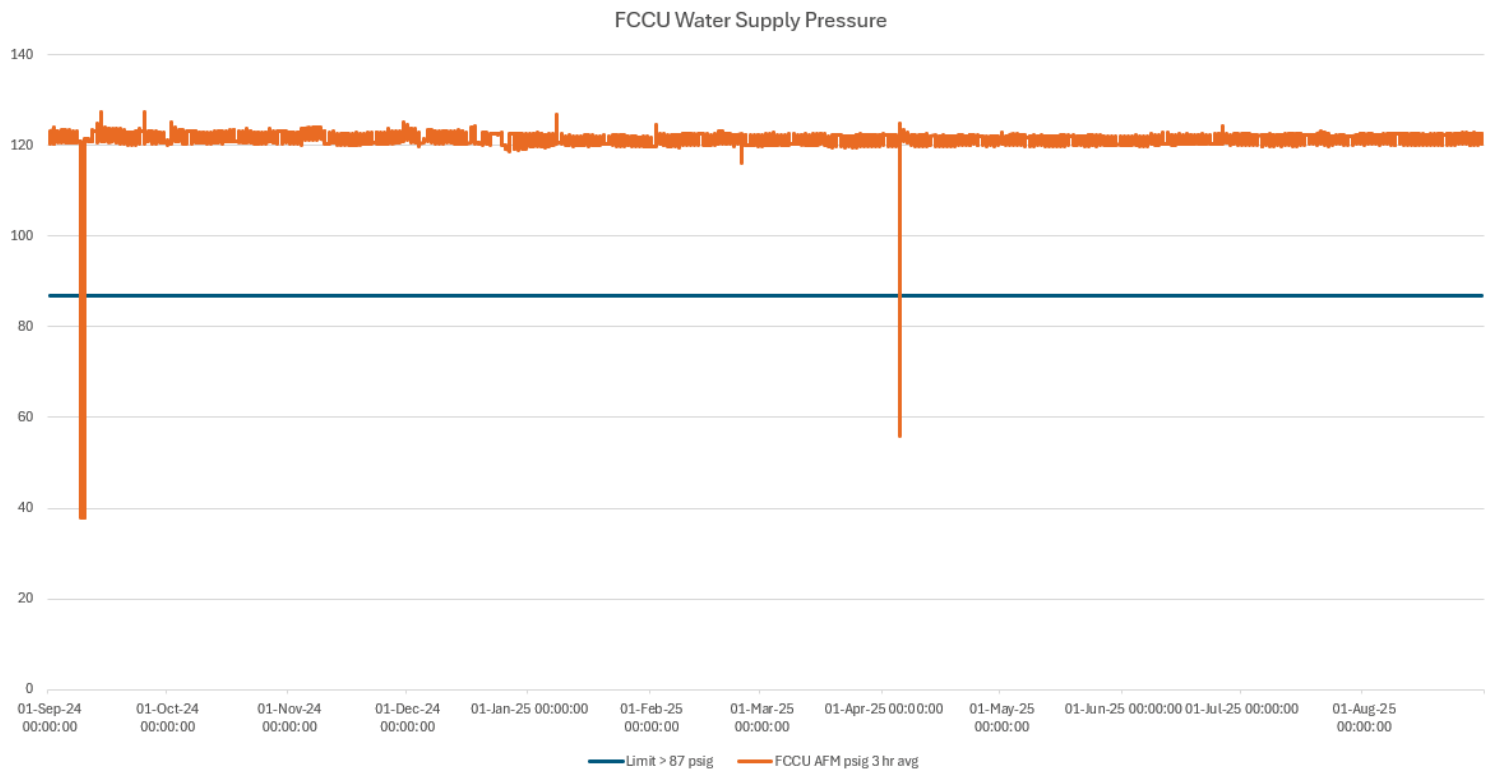
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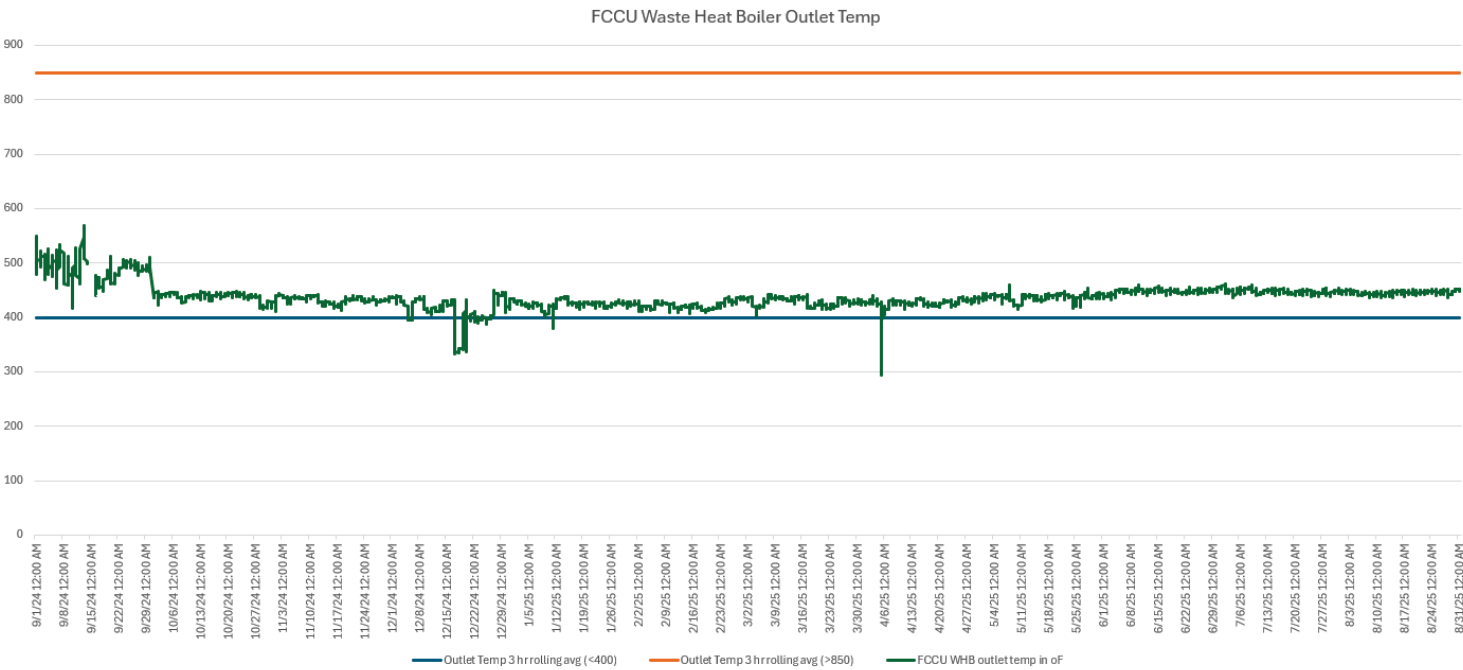
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Raw data from PI, not managed for monitor downtime, analyzer issues, DAS issue, etc. CEMS Qtrly Reports will have data quality checks.



Air Emissions Performance Test

for
Delek-US

at the
El Dorado Refinery in El Dorado, AR

on a
**Fluid Catalytic Cracking Unit (FCCU)
Wet Gas Scrubber
Unit: SN 809
Permit No. 0868-AOP-R24**

Prepared for:



Test Date: May 28, 2025
Erthwrks Project No. 10101.1



2.0 SUMMARY OF RESULTS

**The Coke Burn and Liquid to Gas Ratio Raw Data and Calculation Data is found in Appendix G*

3.0 SOURCE DESCRIPTION

3.1 Process Description

The FCCU is designed to convert approximately 20,000 BPD of gas oil from the refinery crude units and other sources into more useful products. Gas oil entering the unit is first heated to 675°F in the #7 FCCU Furnace (SN-808) which is fired with NSPS Subpart J quality gas and equipped with low NO_x burners. In addition, the NO_x emissions are controlled by ozone injection. The hot oil is then contacted with hot fluidized catalyst which causes the gas oil to crack into lighter products. The catalyst is then separated from the products in the Reactor and returned to the Regenerator. In the Regenerator, coke which has deposited on the catalyst is burned off and the catalyst is recycled. The hot flue gas leaving the Regenerator passes through two sets of cyclones to remove any catalyst fines and is then used to produce steam in the waste heat boiler. The hot gases are then cooled to less than 500°F before exiting the #7 Catalyst Regenerator Stack (SN-809). The light products produced in the reactor are separated in the Fractionator Tower and used for various purposes. The FCCU Catalyst Regenerator Stack (SN-809) is equipped with a wet gas scrubber for the control of SO₂ and PM₁₀ emissions.

3.2 Applicable permit and source designation

Delek-US operates the FCCU/Wet Gas Scrubber (SN-809) under Permit Number 0868-AOP-R24 and is required to conduct annual PM monitoring. This project was conducted in order to demonstrate compliance while operating at normal coke burn rates.

Summary of Results - Isokinetic Sampling

Client: Delek
Project: 10101
Facility: El Dorado, AR
Unit ID: FCCU WGS

Run Designation						
Run Number		1	2	3	Average	
Date		5/28/2025	5/28/2025	5/28/2025		mm:dd:yyyy
Run Start Time		7:40	9:32	11:44		hh:mm
Run End Time		8:44	10:35	12:54		hh:mm

Operating Conditions						
Liquid to Gas Ratio		0.0050	0.0050	0.0051	0.0050	liquid/gas
Coke Burn Rate (lb/hr)		10,524	10,548	10,436	10,503	lb/hr

Stack Gas Composition						
Oxygen Concentration	(%O ₂)	2.92	3.02	2.95	2.96	%
Carbon Dioxide Concentration	(%CO ₂)	15.49	15.41	15.46	15.45	%
Stack Moisture Content	(B _{ws})	0.152	0.146	0.134	0.14	(unitless)
Stack Dry Molecular Weight	(M _d)	30.59	30.59	30.59	30.59	lb/lb-mole
Stack Wet Molecular Weight	(M _s)	28.68	28.74	28.91	28.78	lb/lb-mole

Sampling Parameters						
Meter Box Volume (imperial)	(V _{std})	42.4	42.6	42.4	42.5	dscf
Meter Box Volume (standard)	(V _{std})	1.20	1.20	1.20	1.20	dscm

Stack Gas Volumetric Flow Calculations						
Absolute Stack Pressure	(P _s)	29.6	29.6	29.6	29.6	in Hg
Average Stack Temperature	(t _s) _{avg}	601	601	601	601	°R
Average Square Root of ΔP's	(Δp ^{1/2}) _{avg}	0.6525	0.6532	0.6535	0.6530	%
Average Stack Gas Velocity	(v _s)	2365	2364	2357	2362	ft/min
Average Stack Gas Flow	(Q _{aw})	5.96E+04	5.96E+04	5.94E+04	5.96E+04	acfm
Wet Standard Stack Flow Rate	(Q _{sw})	3.11E+06	3.11E+06	3.11E+06	3.11E+06	wscfh
Dry Standard Stack Flow Rate	(Q _{sd})	2.64E+06	2.66E+06	2.69E+06	2.66E+06	dscfh

Emission Rate Calculations						
Mass of Filterable PM (M.5)	mg	18.16	16.47	15.23	16.62	mg
Mass of Condensable PM (M.202)	mg	23.12	11.87	16.69	17.23	mg
Total Mass of Particulates	mg	41.28	28.34	31.92	33.85	mg
Filterable PM Mass Concentration	lb/dscf	9.43E-07	8.53E-07	7.91E-07	8.63E-07	lb/dscf
Total PM Mass Concentration	lb/dscf	2.14E-06	1.47E-06	1.66E-06	1.76E-06	lb/dscf
Filterable PM Mass Emission Rate	lb/hr	2.49	2.27	2.13	2.30	lb/hr
Total PM Mass Emission Rate	lb/hr	5.66	3.90	4.46	4.67	lb/hr
Filterable PM Mass Emission Rate	lb/1000lb coke	0.236	0.215	0.204	0.219	lb/1000lb coke
Total PM Mass Emission Rate	lb/1000lb coke	0.538	0.370	0.428	0.445	lb/1000lb coke

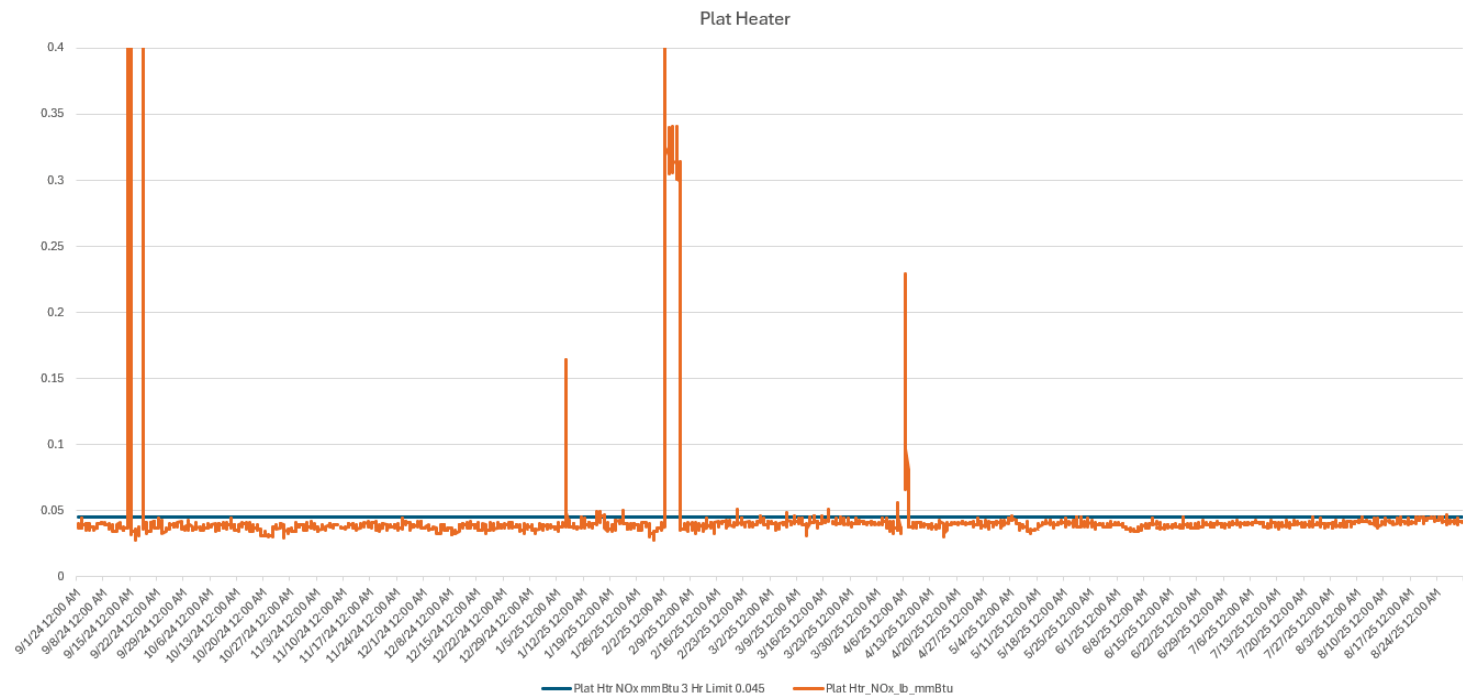
Appendix 6

Heaters and Boilers: NO_x Trends and Updated list of Units with
CEMS and NO_x controls

CEMS Boilers and Heaters List with NO_x Technology

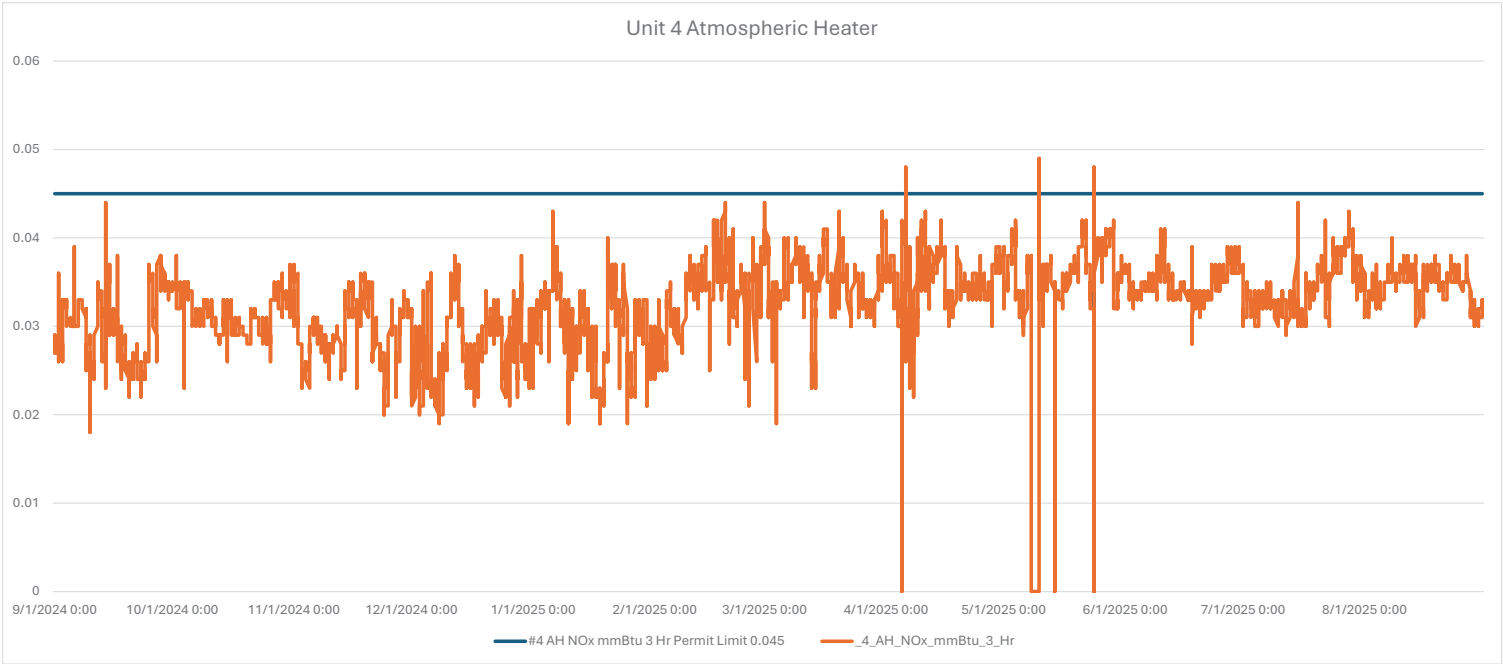
Common Name	Source Number	Pollutants	Burner NO _x Technology
Boiler 18	821.a	SO ₂	Ultra Low NO _x Burners
		NO _x	
		lb _{NO_x} /MMBTU	
		CO	
		O ₂	
Boiler 19	821.b	SO ₂	Ultra Low NO _x Burners
		NO _x	
		lb _{NO_x} /MMBTU	
		CO	
		O ₂	
Boiler 20	821.c	SO ₂	Ultra Low NO _x Burners
		NO _x	
		lb _{NO_x} /MMBTU	
		CO	
		O ₂	
#4 Vacuum Heater	805N	SO ₂	Ultra Low NO _x Burners
		NO _x	
		O ₂	
		lb _{NO_x} /MMBTU	
#9 Platformer Heater	811	SO ₂	Ultra Low NO _x Burners
		NO _x	
		O ₂	
		lb _{NO_x} /MMBTU	
#4 Atmospheric Heater	804	SO ₂	Ultra Low NO _x Burners
		NO _x	
		O ₂	
		lb _{NO_x} /MMBTU	
#7 FCCU Belco Scrubber	809	SO ₂	-
		NO _x	
		CO	
		O ₂	
Sulfur Recovery Unit	844	SO ₂	-
		O ₂	
		SO ₂	

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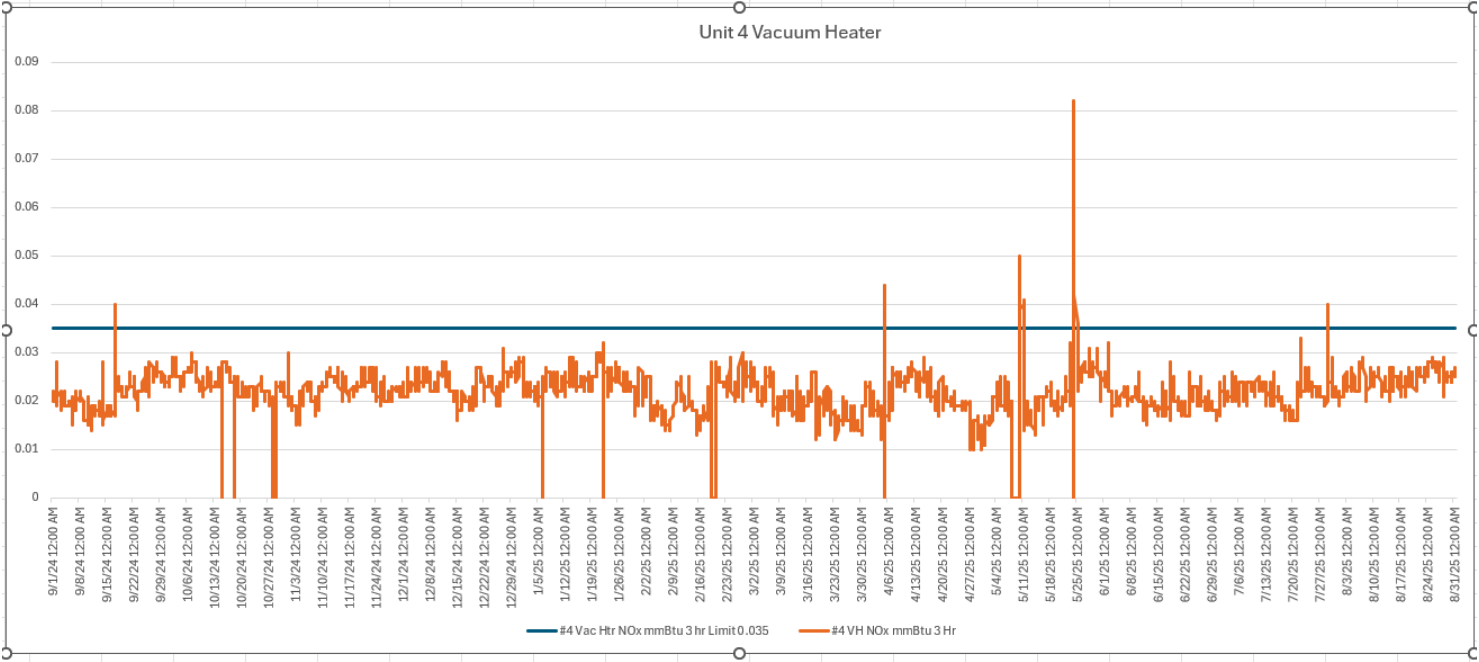
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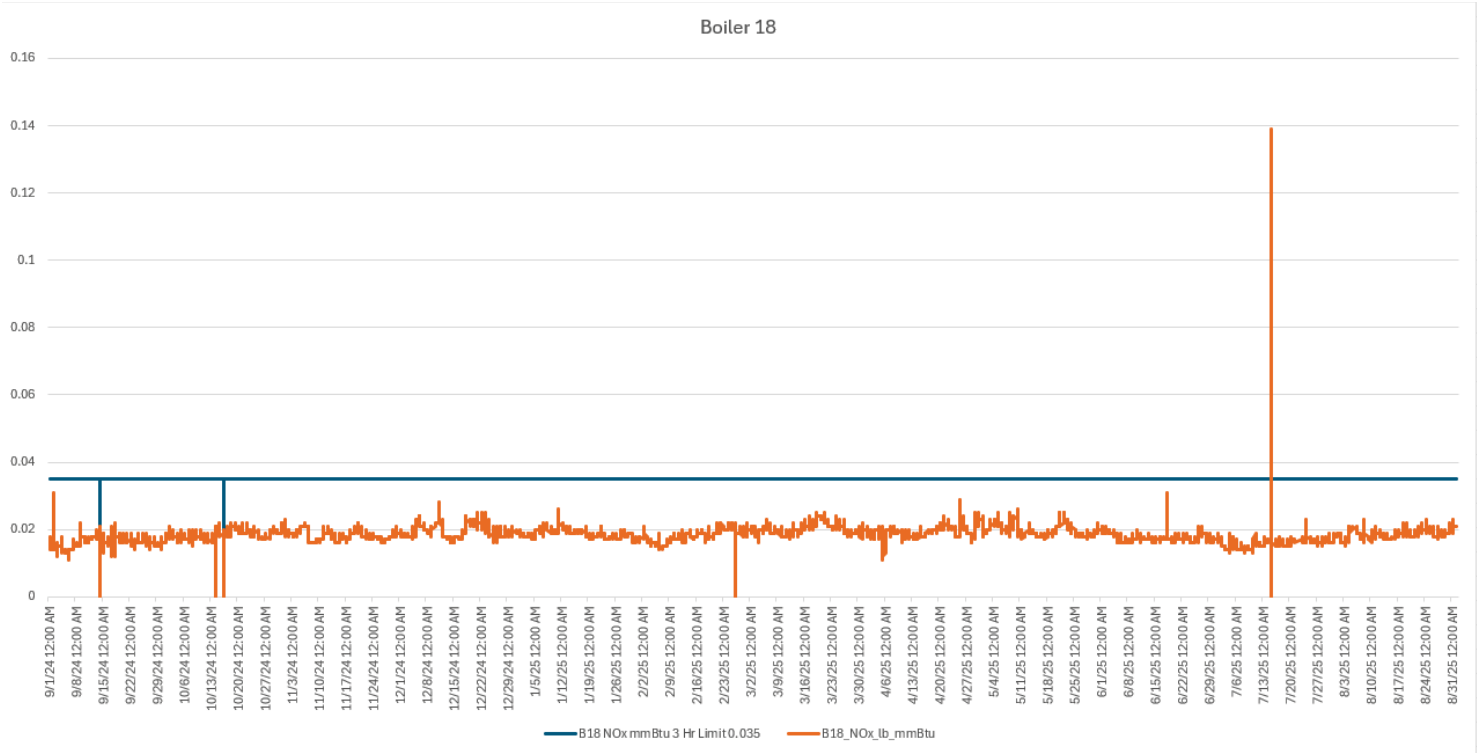
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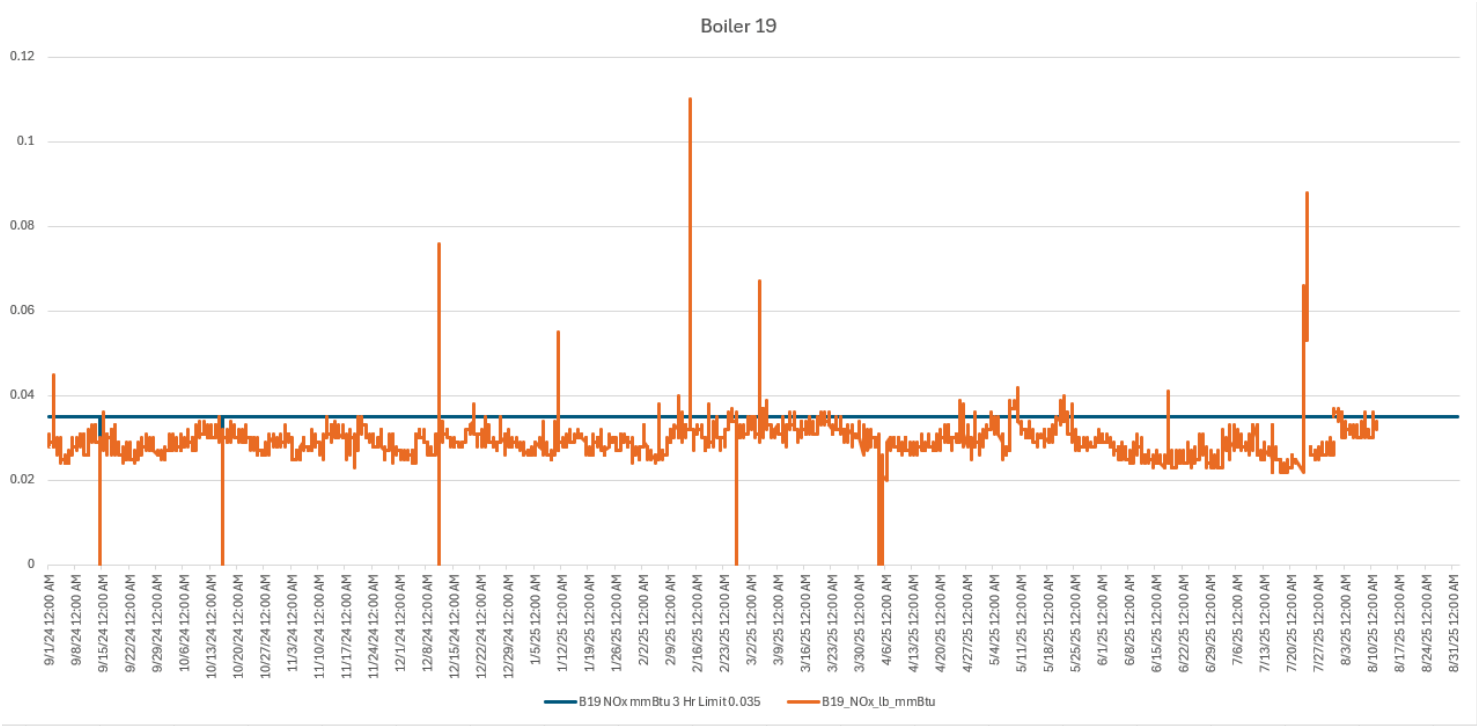
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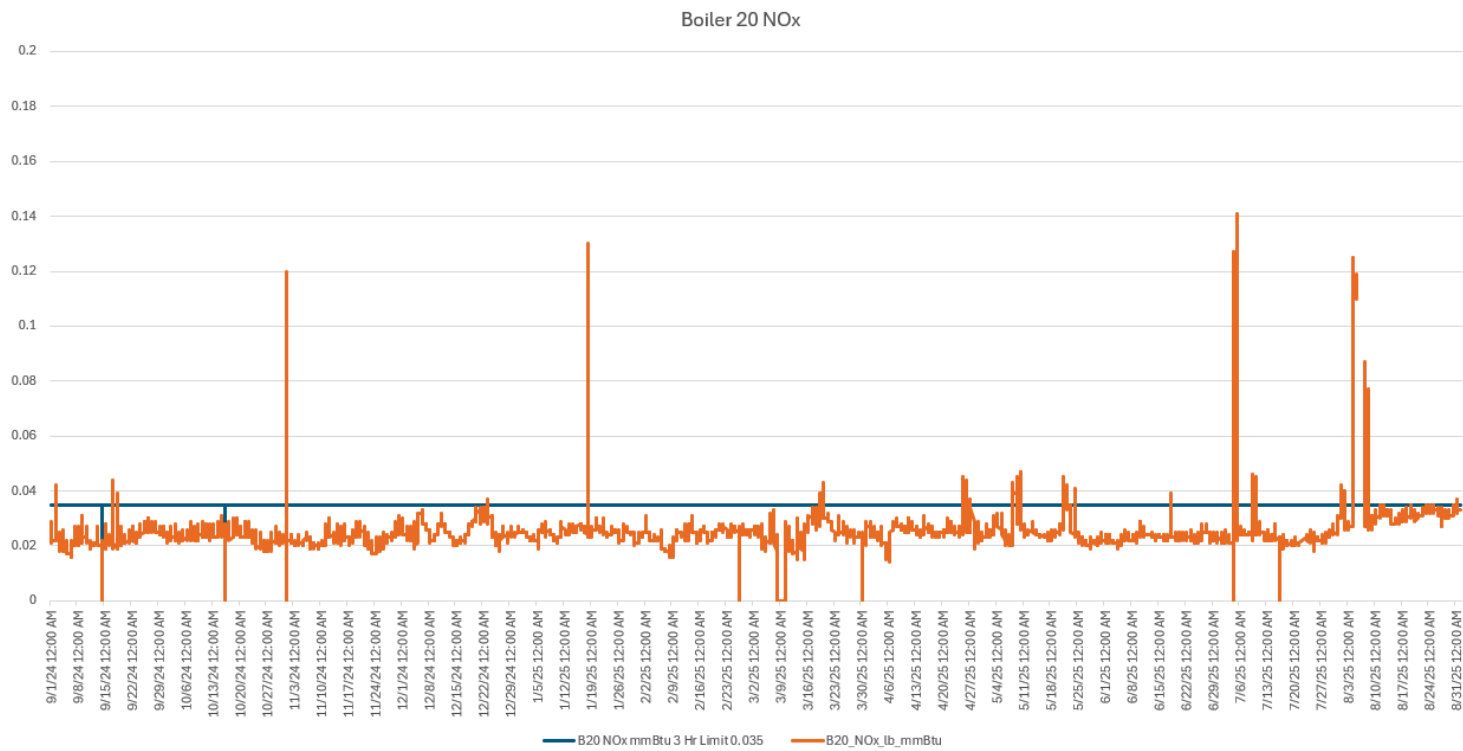


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Raw data from PI, not managed for monitor downtime, analyzer issues, DAS issue, etc. CEMS Qtrly Reports will have data quality checks.

Appendix 7

Refinery Fuel Gas System Permit Requirements and SO₂ Trends

Lion Oil Company
Permit #: 0868-AOP-R24
AFIN: 70-00016

12. All sources specified as fuel gas combustion devices under the provisions of 40 C.F.R. § 60, Subpart J-*Standards of Performance for Petroleum Refineries* in the specific conditions of this permit are subject to the requirements outlined below: [Rule 19.304 and 40 C.F.R. § 60.100]

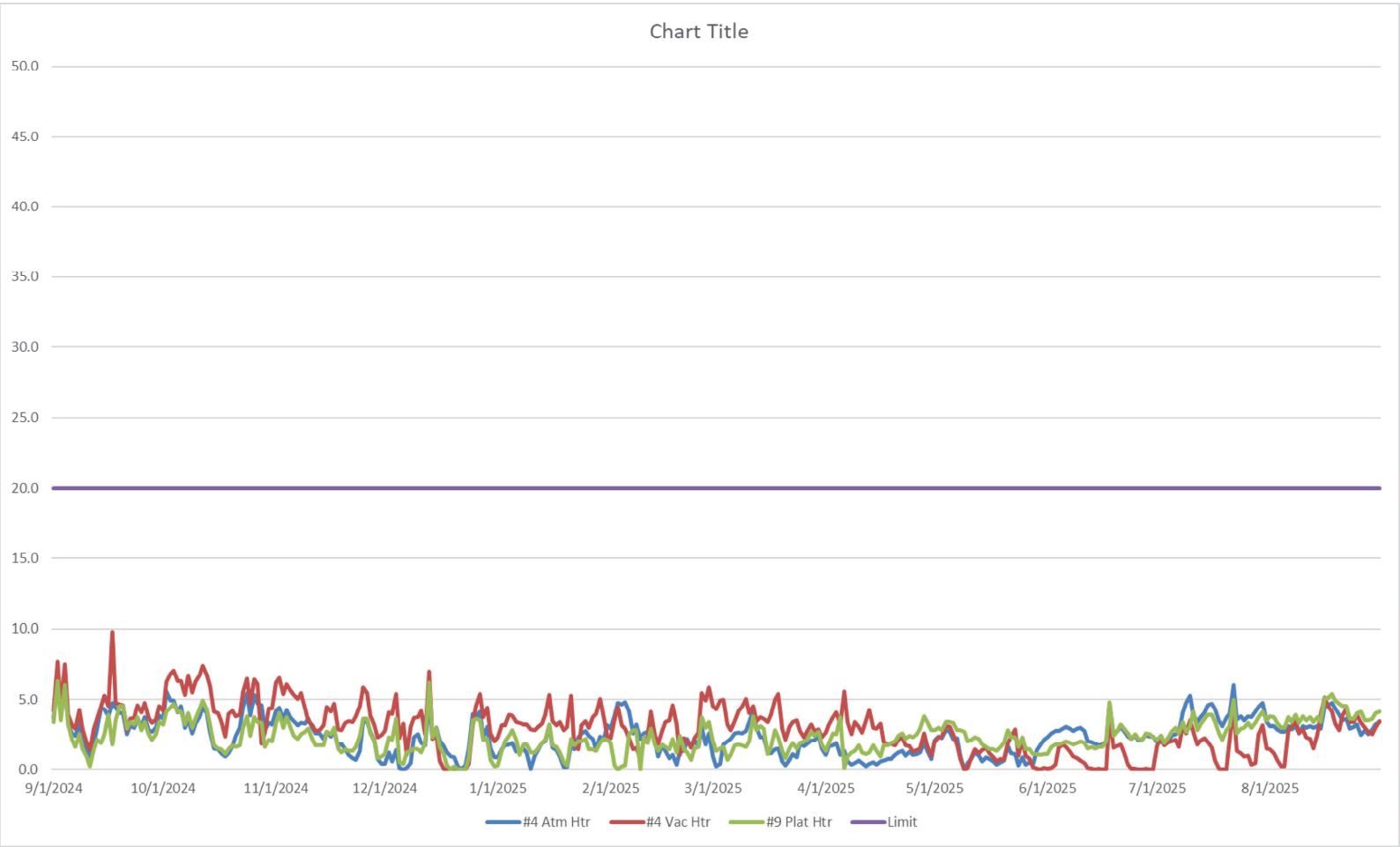
- a. “NSPS Subpart J quality gas” or “Refinery fuel gas” is defined as any gas which is generated at a petroleum refinery and which is combusted, with the exception of gases generated by catalytic cracking unit catalyst regenerators and fluid coking burners. “Fuel gas” is defined as any gas which is generated at a petroleum refinery and which is combusted with the exception of gases generated by catalytic cracking unit catalyst regenerators and fluid coking burners. Fuel gas also includes natural gas when the natural gas is combined and combusted in any proportion with a gas generated at a refinery. [§ 60.101(d)]
- b. The permittee shall not burn fuel gas that exceeds the concentration set forth in the following table. Compliance with this condition shall be demonstrated by compliance with Subpart J. [§ 60.104]

Table 1 – Fuel Gas Sulfur Limits

Sources	Pollutant	mg/dscm	gr/dscf	ppmv
All refinery Fuel Gas Combustion Devices	H ₂ S	230	0.10	162
	SO ₂	-	-	20

- c. The facility shall monitor emissions and operations by installing one of the following:
 - i. An SO₂ CEMS on the fuel gas combustion exhaust [§ 60.105(a)(3)], or
 - ii. SO₂ CEMS on the fuel gas before being combusted. [§ 60.105(a)(4)]
- d. Excess emissions that shall be determined and reported are defined as follows: [60.105(e)]
 - i. All rolling 3-hour periods during which the average concentration of SO₂ as measured by the SO₂ continuous monitoring system under § 60.105(a)(3) exceeds 20 ppm (dry basis, zero percent excess air ; or
 - ii. All rolling 3-hour periods during which the average concentration of H₂S as measured by the H₂S continuous monitoring system under § 60.105(a)(4) exceeds 230 mg/dscm (0.10 gr/dscf).
- e. The test methods shall be conducted according to § 60.106(e)(1) for H₂S CEMs or § 60.106(e)(2) and § 60.106(f)(1) for SO₂ CEMs. [§ 60.106]

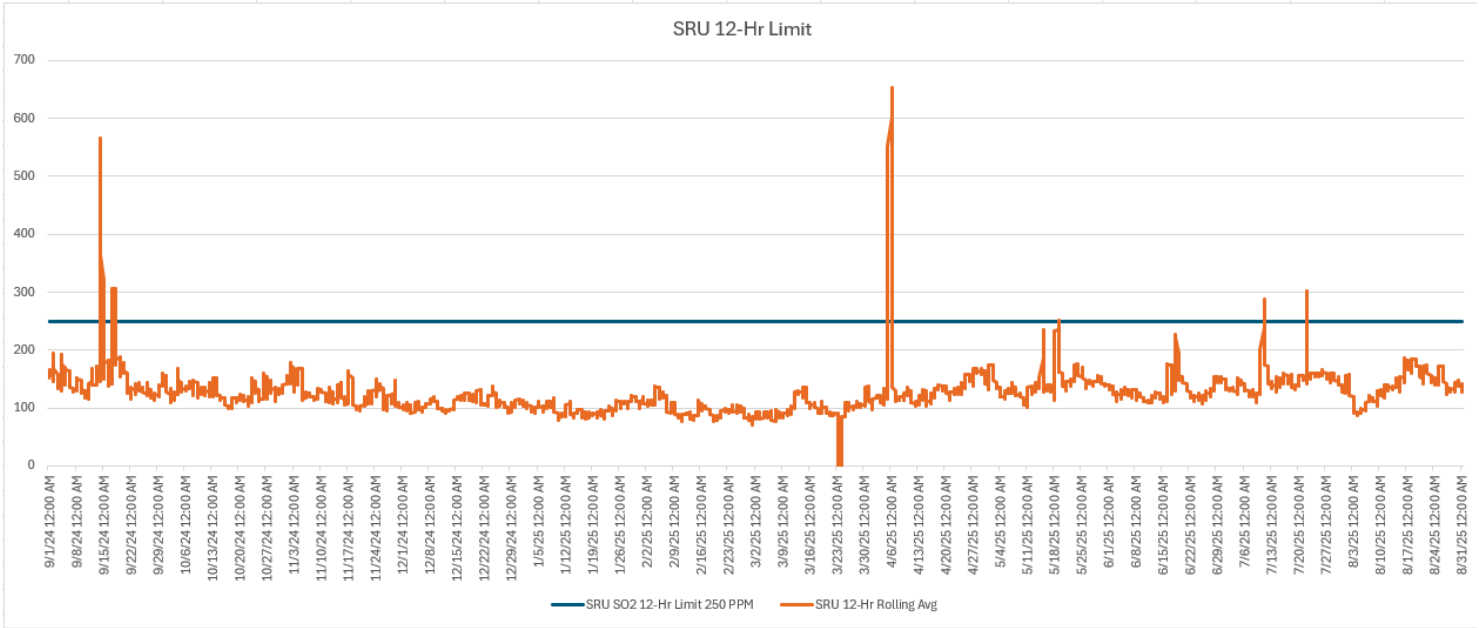
ENCLOSURE 7



Appendix 8

Sulfur Recovery Plant SO₂ Emission Trend

R1-014287



Raw data from PI, not managed for monitor downtime, analyzer issues, DAS issue, etc. CEMS Qtrly Reports will have data quality checks.

Appendix 9

BWON end-of-line Sampling Plan and Process Flow Diagrams

**United States, et al. v. Lion Oil Company (Civ. No. 03-1028):
Proposed Revised EOL Sampling Plan Pursuant to Paragraph 22**

1.0 BACKGROUND

The proposed revised End-of-Line Benzene Waste Stream Sampling Plan (Plan) is a tool to estimate uncontrolled benzene waste streams that are managed in wastewater collection systems at the Lion El Dorado Refinery (EDR), located in El Dorado, Arkansas. It also serves as an early identification procedure should increased amounts of uncontrolled benzene waste streams occur. Waste samples are collected and measured at a common, commingled location downstream of the process units (end of line, or EOL) to provide a broad view of upstream waste management practices. Lion has developed this plan in accordance with the requirement of Paragraph 22.1.ii of its Consent Decree. EDR is subject to the control requirements of the Benzene Waste Operations NESHAP (BWON, or 40 CFR 61, Subpart FF) and is implementing the 6BQ compliance alternative of 40 CFR 61.342(e).

In anticipation of USEPA approval, EDR will implement the provisions of this Plan upon submittal. EDR therefore rescinds the Plan submitted on May 19, 2017, replacing it with this submittal.

The purpose of the Plan is to present, for USEPA's approval, the EOL sampling locations and methods of flow determination that will be used to calculate the quarterly benzene quantity in uncontrolled waste streams. This Plan will be used to implement the EOL benzene determination program. Lion will submit a revised Plan for USEPA approval if, during the life of the Consent Decree, changes in refinery processes, operations, or other factors lead EDR to conclude that the sampling locations or methods for determining flow characteristics no longer provide an accurate measurement of EDR's EOL benzene quantity.

2.0 WASTE/WASTEWATER MANAGEMENT UNITS

Benzene-containing waste streams are collected and managed primarily in above-grade hard-piping that is associated with above-grade floating-roof tanks. Some wastewaters are also managed in below-ground sewers. The wastewater management system at EDR thus consists of individual drain systems, oil/water separators, storage tanks, oil recovery systems, and an enhanced biodegradation unit. Refer to Figure 1.

3.0 PROPOSED END-OF-LINE BENZENE WASTE STREAM SAMPLING LOCATIONS

EDR oily wastewaters subject to the BWON are managed such that the water phase becomes part of Equalization Tank effluent, which feeds the wastewater treatment plant (WWTP); and the oil phase becomes part of the throughput of the Cone Tanks, which is the recovered oil to be reprocessed in the EDR Crude Unit. Therefore, these two streams—Equalization Tank (water-phase) effluent and Cone Tank (oil-phase) discharges—are the only EOL locations needed to fully address downstream characterization of uncontrolled EDR wastewaters.

Importantly, note that all Equalization Tank wastewater effluent becomes uncontrolled at the dissolved gas flotation (DGF) unit, so that even if some wastewaters are controlled up through the Equalization Tanks, the total effluent of the tanks is characterized for EOL benzene loading calculations. On the other hand, the Cone Tanks are controlled and their disposition to reprocessing is controlled until the recovered oil returns to the process; therefore, because some waste oil is controlled from the point of generation through entry into the Cone Tanks, the designation of Cone Tank oil discharges as an EOL location means that some of the EOL loading is actually controlled. Nonetheless, this Plan calls for Lion to characterize and report the total benzene loading in Cone Tank discharges (from both controlled and uncontrolled sources) for EOL purposes, a circumstance discussed further following Table 1 below.

Table 1 describes the sample locations. The EOL sampling locations are identified on Figure 1 of this document.

TABLE 1 - Proposed End-of-Line Sampling Locations

EOL Location	Location Description	Waste Stream Description
1	Wastewater effluent from the Equalization Tanks	Combined wastewater
2	Discharged (recovered) oil from the Cone Tanks	Combined waste oil

EOL-2 enables an accurate means of characterizing total EDR waste oil, because the quantity is metered and Cone Tank contents are accessible for sampling. By designating Cone Tank recovered oil discharges as an EOL location, Lion has chosen to err on the side of overestimating the uncontrolled benzene quantity in BWON waste oil, emphasizing the value of accessing the good characterization features of EOL-2. Lion anticipates that EDR's quarterly EOL benzene loadings will be well below the 1.5-Mg/qtr ceiling for action, so Lion is prepared to accept the overestimation on a quarter-to-quarter basis. However, should a given quarter's EOL loading be higher than expected, Lion may choose to determine if controlled sources were responsible and investigate more closely the distribution of controlled and uncontrolled oil contributions to the Cone Tanks, and adjust the quarterly report accordingly.

4.0 PROPOSED METHODS OF FLOW DETERMINATION

Table 2 summarizes the proposed methodology for determining the flow quantities of the EOL locations.

TABLE 2 - Proposed Methods of Flow Determination

Location	Flow Determination Methodology
01	Flow meter
02	Flow meter

5.0 SAMPLING SCHEDULE

This sampling program will begin during the next full calendar quarter after submittal of this Plan. EOL benzene waste sampling will be conducted on a monthly basis in accordance with Paragraph 22.I of the Lion Consent Decree. EDR will collect for analysis representative samples from the EOL streams 1 and 2 in Table 1. A minimum of one monthly sample will be collected from the streams during each quarter. EDR may, however, collect more samples as deemed appropriate to better characterize the benzene quantities at the sample location (e.g., benzene concentration of the sample appears to be out of the typical historical range). Each sample taken during each quarter will be included in the quarterly benzene quantity determination, along with an explanation if more than three samples are taken from a location during the quarter. Flow-weighted average benzene concentrations will be estimated for multiple samples using the guidelines presented in Section 7.0 of this Plan.

6.0 SAMPLING PROCEDURES AND ANALYTICAL TESTING METHODS

Lion will conduct benzene waste stream sampling using the following sampling procedures, in accordance with 40 CFR 61.355(c)(3):

- Open channels, if applicable, obtain the sample by bailing or submerging collection vessel directly into the stream;
- Use 40-mL sampling vials or equivalent;
- If applicable, collect the water phase in one vial and the oil phase in a separate vial;
- Fill each vial completely to avoid headspace or air bubbles and cap the sample container immediately;
- Maintain the sample temperature below 10°C until delivery to the laboratory;
- Tank sampling, if applicable, collect a representative sample of the oil layer by sampling from different depths in the tank or at the center of the oil layer; and
- Conduct sampling by personnel who have been trained on proper benzene waste stream sampling techniques consistent with Paragraph 22.G of the Consent Decree.

The refinery will submit the collected samples to an analytical laboratory for analysis using one of the following USEPA testing methods for benzene, in accordance with 40 CFR 61.355(c)(3)(iv).

- Method 8020 -EPA Publication SW-846
- Method 8021 - EPA Publication SW-846
- Method 8240 -EPA Publication SW-846
- Method 8260 -EPA Publication SW-846
- Method 602 -40 CFR 136, Appendix A
- Method 624 - 40 CFR 136, Appendix A

Lion will use only approved laboratories. EDR will follow chain-of-custody procedures and maintain records with analytical results and chain-of-custody information.

7.0 CALCULATION RECORDS

Lion will use the average of the representative sample results and the flow calculations for the location to calculate the EOL benzene quantity.

7.1 Flow-Weighted Quarterly Benzene Concentration

If the waste flow is constant, the flow-weighted benzene concentration is the number average of each sample. If the waste flow is not constant, however, the flow must be weight-averaged using the following equation based on the test procedures in 40 CFR 61.355(c)(3)(v):

$$\overline{C} = \frac{1}{Q_i} \sum_{i=1}^n (Q_i)(C_i)$$

where:

$\overline{C}$ = Flow-weighted quarterly average benzene concentration for waste stream (ppmw)

Q_i = Total quarterly waste quantity for waste stream (Mg / calendar-quarter)

n = Number of waste samples

Q_i = Quarterly waste quantity for waste stream represented by C_i , (Mg / calendar-quarter)

C_i = Measured concentration of benzene in waste sample i (ppmw)

7.2 Quarterly Benzene Quantity

The quarterly benzene quantity is a sum of benzene contained both in water and oil phases of the waste stream. The following equation illustrates a method of the total quarterly benzene calculation:

$$Q_b = \sum_{i=1}^n (Q_i^{water} \times C_i^{water}) + \sum_{i=1}^n (Q_i^{oil} \times C_i^{oil})$$

where:

Q_b = Total quarterly benzene quantity (Mg / calendar-quarter)

M = Number of waste streams with a water phase

Q_i^{water} = Quarterly water quantity for waste stream represented by C_i^{water} (Mg / calendar-quarter)

C_i^{water} = Flow-weighted quarterly average benzene concentration in a water phase of waste stream i (ppmw)

N = Number of waste streams with an oil phase

Q_i^{oil} = Quarterly oil quantity for water phase waste stream represented by C_i^{oil} (Mg / calendar-quarter)

C_i^{oil} = Flow-weighted quarterly average benzene concentration in an oil phase of waste stream i (ppmw)

8.0 REPORTING REQUIREMENTS

Lion will continue to submit quarterly benzene quantity results as part of the reports required under Paragraph 22.M.ii.b of the Consent Decree.

Figure 1

EOL Sampling Locations

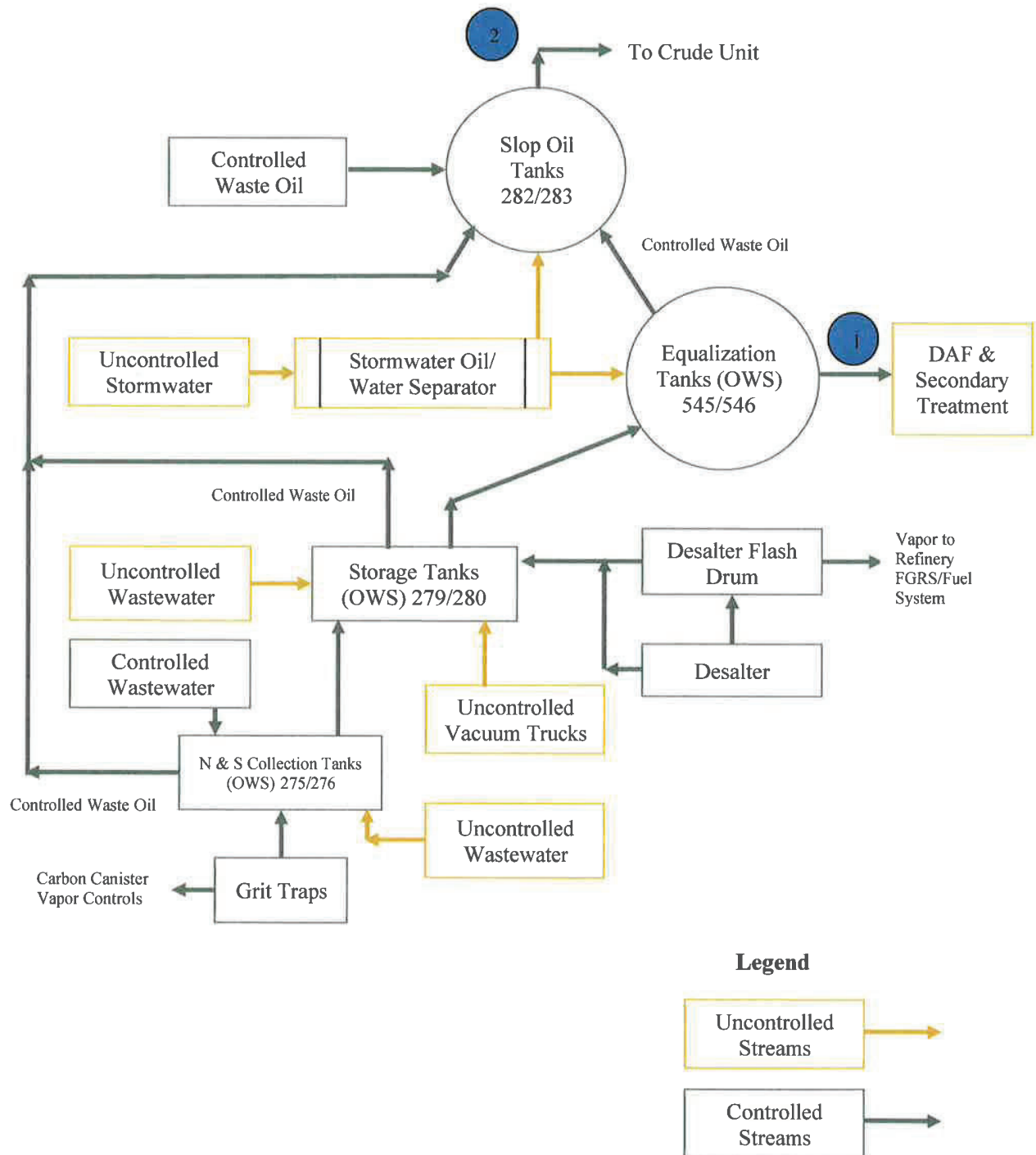


Figure 1: Lion Oil Refinery Wastewater System (Simplified)

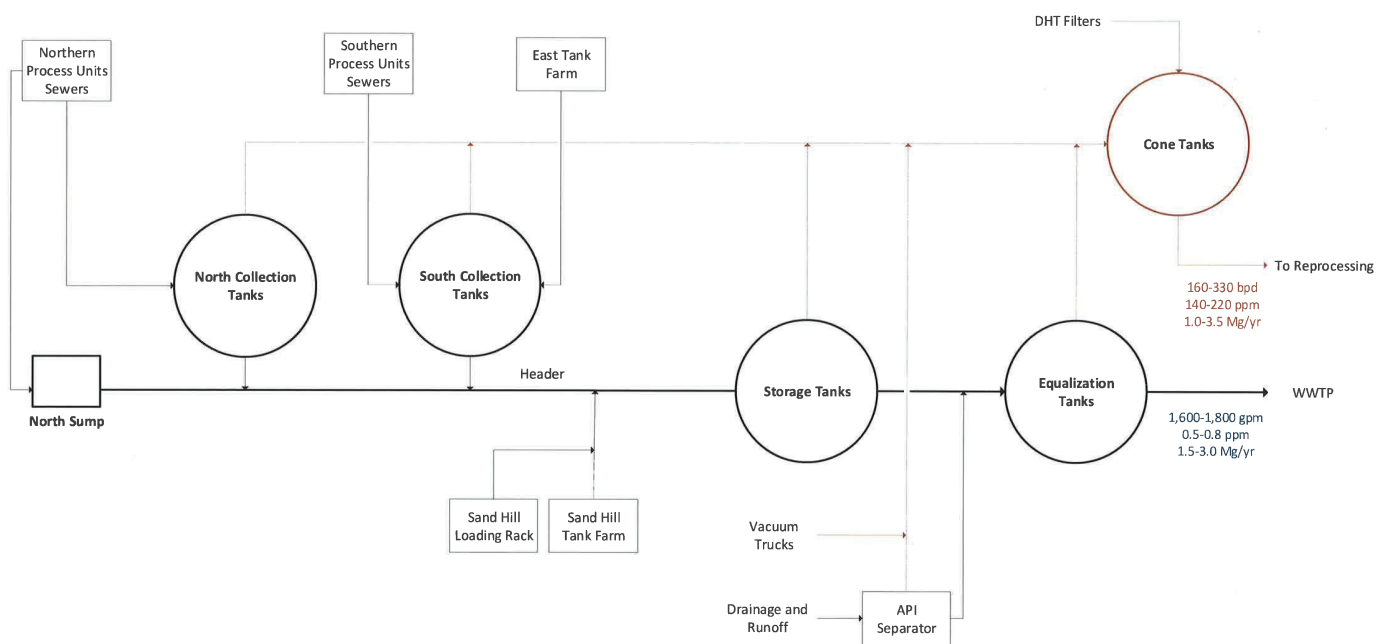
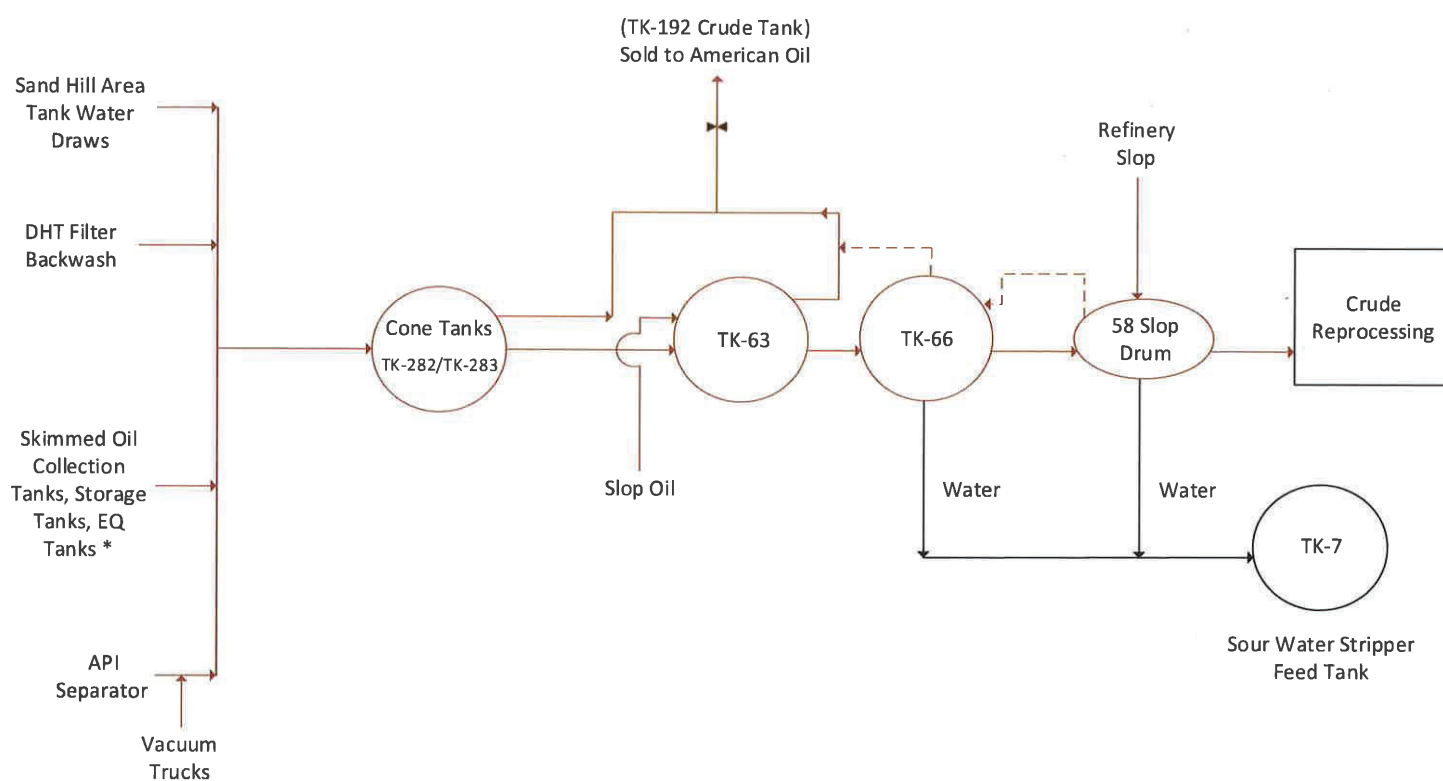


Figure 2: Lion Oil Refinery Downstream Oil Management**Oil Sources to Cone Tanks:****Note:**

* Includes desalter water after Flash Separator.

Appendix 10

Operating Permit Excerpts



DIVISION OF ENVIRONMENTAL QUALITY

OPERATING AIR PERMIT

PERMIT NUMBER: 0868-AOP-R24

IS ISSUED TO:

Lion Oil Company
1005 Robert E. Lee St.
El Dorado, AR 71730
Union County
AFIN: 70-00016

PURSUANT TO THE RULES OF THE ARKANSAS OPERATING AIR PERMIT PROGRAM, RULE 26: THIS PERMIT AUTHORIZES THE ABOVE REFERENCED PERMITTEE TO INSTALL, OPERATE, AND MAINTAIN THE EQUIPMENT AND EMISSION UNITS DESCRIBED IN THE PERMIT APPLICATION AND ON THE FOLLOWING PAGES. THIS PERMIT IS VALID BETWEEN:

December 2, 2021 AND December 1, 2026

THE PERMITTEE IS SUBJECT TO ALL LIMITS AND CONDITIONS CONTAINED HEREIN.

Signed:

A handwritten signature in black ink, appearing to read "Demetria Kimbrough", written over a horizontal line.

Demetria Kimbrough
Associate Director, Office of Air Quality
Division of Environmental Quality

March 11, 2025

Date

Lion Oil Company
 Permit #: 0868-AOP-R24
 AFIN: 70-00016

FHR 6. Under the terms of 40 C.F.R. § 60 Subpart Dc-Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, SN-850 and 862 are affected facilities. The permittee shall maintain monthly records of the fuel combusted in SN-850 and 862. [Rule 19.304 and 40 C.F.R. § 60.40c]

FHR 7. All sources listed in Specific Condition FHR 1 are affected facilities under the provisions of 40 C.F.R. § 60, Subpart J-*Standards of Performance for Petroleum Refineries*. SN-813a will become NSPS Subpart Ja and not J after it is modified as permitted in permit 86-AOP-R14 and will not be required to comply with Subpart J. As such, these heaters shall burn either pipeline quality natural gas and/or NSPS Subpart J quality gas. They are defined in the subpart as fuel gas combustion devices subject to the Subpart J requirements summarized in Plantwide Condition #12. [Rule 19.304 and 40 C.F.R. § 60.100]

FHR 8. Except as provided in Specific Condition FHR 16, the permittee shall operate the #4 Atmospheric Furnace, SN-804, and the #9 Reformer furnace, SN-811, such that NO_x emissions to the atmosphere do not exceed 0.045 lb/MMBtu based on a 3-hour average. [Rule 19.501, Rule 19.901, 40 C.F.R. § 52 Subpart E, and Paragraph 16(D) of the consent agreement between Lion Oil, the US EPA, and ADEQ]

FHR 9. Except as provided in Specific Condition FHR 16, the permittee shall operate SN-803, SN-805, SN-808, SN-810, and SN-842 such that NO_x emissions to the atmosphere do not exceed 0.035 lb/MMBtu based on a 3 hour average. [Rule 19.901, 40 C.F.R. § 52 Subpart E, and Paragraph 16(D) of Consent Decree (Civ No. 03-0128)]

FHR 10. The permittee shall demonstrate compliance with the NO_x limits for SN-803, SN-805, SN-808, SN-810, and SN-842 by installing and operating a continuous parameter monitoring system to monitor oxygen concentration in the stack for each heater. The oxygen monitoring system shall be in continuous operation and shall meet minimum frequency of operation requirements of 95% up-time for each quarter. Lion shall maintain a 3-hour rolling average oxygen concentration between 2% and 7%. Hourly readings from when the burners are combusting fuel and have reached steady state operation shall be included as part of the 3-hour averaging. [Rule 19.901 *et seq.* and 40 C.F.R. § 52 Subpart E, and Paragraph 16(D) of Consent Decree (Civ No. 03-0128)]

FHR 11. The permittee shall install, certify, calibrate, maintain and operate a CEMS in the SN-811 exhaust stack for the purpose of monitoring NO_x emissions. The data from this monitor shall be recorded and compiled in order to demonstrate compliance with the NO_x limit in Specific Condition FHR 8. The CEMS shall be operated in accordance with the Department's CEM Conditions, §60.11, §60.13, and appendices A, B, and F. [Rule 19.901 *et seq.* and 40 C.F.R. § 52 Subpart E and Paragraph 16(D) of Consent Decree (Civ No. 03-0128)]

Lion Oil Company
 Permit #: 0868-AOP-R24
 AFIN: 70-00016

FHR 12. The permittee shall install, certify, calibrate, maintain and operate a CEMS in the #4 Atmospheric Furnace, SN-804, exhaust stack for the purposes of monitoring NO_x emissions. The data from this monitor shall be recorded and compiled in order to demonstrate compliance with the 3 hour average 0.045 lb/MMBtu NO_x limit contained in Specific Condition FHR 8. The CEMS shall be operated in accordance with the Department's CEM Conditions, §60.11, §60.13, and appendices A, B, and F. [Rule 19.901 *et seq.* and 40 C.F.R. § 52 Subpart E, and Paragraph 16(D) of Consent Decree (Civ No. 03-0128)]

FHR 13. Except as provided in Specific Condition FHR 16, the permittee shall not exceed the BACT limits in the following table. Compliance with this condition is demonstrated by complying with Specific Conditions FHR 11, FHR 14, FHR 15, and the NO_x CEMS required for SN-805N. [Rule 19.901 *et seq.* and 40 C.F.R. § 52 Subpart E]

Combustion Source	Pollutant	Control Technology	BACT Limit lb/MMBtu (3-hour average)
Current #4 Pre-Flash Column Reboiler (SN-803)	PM ₁₀	Good Combustion Practice	0.0075
Converted #4 Pre-Flash Column Reboiler (SN-805)	PM ₁₀	Good Combustion Practice	0.0075
No. 4 Atmospheric Furnace (SN-804)	PM ₁₀	Good Combustion Practice	0.0075
	NO _x	Existing NGULNB	See FHR 8
	CO	Good Combustion Practice	0.040
New No. 4 Vacuum Furnace (SN-805N)	PM ₁₀	Good Combustion Practice	0.0075
	NO _x	New NGULNB	0.035
	CO	Good Combustion Practice	0.040

FHR 14. The permittee shall demonstrate compliance with the particulate BACT limits for SN-803, SN-804, SN-805, and SN-805N by the use of NSPS quality gas and the compliance with opacity limits of Specific Condition FHR 5. [Rule 19.901 *et seq.* and 40 C.F.R. § 52 Subpart E]

FHR 15. The permittee shall demonstrate compliance with the CO BACT limit for SN-804 and SN-805N by initial and periodic testing every five years thereafter. The compliance with the CO BACT limits in Specific Condition FHR 13 shall be based upon a 3-hour average. The initial test shall take place 180 days after permit issuance. Testing shall be performed in accordance with EPA Reference Method 10 or other pre-approved test method. At the time of testing, the permittee shall operate the source at least within 10% of the maximum rated capacity. [Rule 19.901 *et seq.* and 40 C.F.R. § 52 Subpart E]

Lion Oil Company
 Permit #: 0868-AOP-R24
 AFIN: 70-00016

SN-809 – #7 FCCU Catalyst Regenerator Stack

Source Description

SN-809 is the exhaust stack from the catalyst regenerator. Hot flue gas leaving the regenerator passes through three sets of cyclones to remove catalyst fines and then is used to produce steam in the waste heat boiler before exiting the stack. This source was installed in 1973. Previously permitted source, SN-848, the vent system for two storage bins used to store catalyst in the catalytic cracking process, has been routed to the wet gas scrubber of the #7 FCCU unit. The #7 FCCU was modified in 2004 to install a wet gas scrubber for the control of PM₁₀ and SO₂ emissions. Simultaneous with the installation of the scrubber, the facility also accepted a limit of 500 ppmdv (1-hour average) and 100 ppmdv (365-day rolling average) as required by the Consent Decree (CIV. No. 03-1028) reached between Lion Oil, the US EPA, and ADEQ. CEMS were installed to monitor the stack concentrations of SO₂, CO, and O₂.

BACT Review

This source underwent a BACT review for particulate and CO as a result of the refinery expansion of the 868-AOP-R5. BACT was demonstrated to be similar controls and emission limits as those defined by the Consent Decree. An additional condensable and filterable PM₁₀ limit was added in 868-AOP-R9.

Specific Conditions

FCCU 1 The permittee shall not exceed the emission rates set forth in the following tables. Compliance with these limits shall be demonstrated by compliance with the throughput limits, monitoring requirements for this source or with other available emissions data for these sources. [Rule 19.501 *et seq.* and 40 C.F.R. § 52 Subpart E]

SN #	Source Description	Pollutant	lb/hr	tpy
809	#7 Catalyst Regenerator Stack	PM ₁₀	7.5	32.9
		SO ₂	13.3	58.3
		VOC	4.2	18.1
		CO	300.0	101.9
		NO _x	7.7	33.5
		Lead	1.7E-04	7.2E-04

FCCU 2 The permittee shall not exceed the emission rates set forth in the following tables. Compliance with these limits shall be demonstrated by compliance with the throughput limits, monitoring requirements for this source or with other available emissions data for these sources. [Rule 18.801 and Ark. Code Ann. § 8-4-203 as referenced by Ark. Code Ann. §§ 8-4-304 and 8-4-311]

SN #	Source Description	Pollutant	lb/hr	tpy
809	#7 Catalyst Regenerator Stack	PM	7.5	32.9
		Ammonia	0.6	2.5
		Total HAP ^a	0.22	0.96

^aIncluded in Facility HAP limits

Lion Oil Company
Permit #: 0868-AOP-R24
AFIN: 70-00016

FCCU 3 The facility shall not exceed 20% opacity from this source. Compliance with this condition will be demonstrated by compliance with 40 C.F.R. § 60 Subpart Ja, the operation of the wet gas scrubber (WGS). [Rule 19.503 and 40 C.F.R. § 52 Subpart E]

FCCU 4 The permittee shall meet the following outlet emissions limitations. Compliance with these limits in a, c and d will be shown by FCCU 5 as applicable. [Rule 19.501 *et seq.* and 40 C.F.R. § 52 Subpart E and Paragraphs 11(B) or 11(E), 12(B), 13(B), and 14(B) of the Consent Decree (CIV. No. 03-1028) between Lion Oil, ADEQ, and the US EPA]

a. For SO₂:

- i. No more than 25 ppmvd based on a 365-day rolling average, corrected to 0% oxygen.
- ii. No more than 50 ppmvd based on a 7-day rolling average, corrected to 0% oxygen
- iii. The SO₂ limits listed in a.i and a.ii of this Specific Condition do not apply during periods of startup and shutdown of the FCCU, and Malfunction of the either the FCCU or WGS, provided that good air pollution control practices are instituted during such events.

b. For PM:

- i. No more than 0.5 pounds of filterable particulate matter (PM) per 1000 pounds of coke burned, on a 3-hour average basis except during periods of startup and shutdown of the FCCU, and Malfunction of the WGS, provided that good air pollution control practices are instituted during such events.

c. For CO:

- i. 500 ppmvd corrected to 0% O₂, over a 1-hour average basis.
- ii. 100 ppmvd corrected to 0% O₂ as a 365-day rolling average basis.
- iii. The CO limits in c.i. and c.ii. of these Specific Conditions do not apply during periods of startup, shutdown, and Malfunction of the FCCU, provided that good air pollution control practices are instituted during such events.

Lion Oil Company
 Permit #: 0868-AOP-R24
 AFIN: 70-00016

- d. For NO_x:
- i. No more than 20 ppmvd based on a 365-day rolling average, corrected to 0% oxygen.
 - ii. No more than 40 ppmvd based on a 24-hour rolling average, corrected to 0% oxygen.
 - iii. The NO_x limits in i. and ii. above do not apply during periods of startup and shutdown of the FCCU, and malfunction of the Lo Tox System, provided that good air pollution practices are instituted during such events.

FCCU 5 On and after December 31, 2004, the permittee shall install, certify, calibrate, maintain and operate a NO_x CEMS, to monitor performance of the FCCU, and subsequently, the Lo Tox System, and SO₂, CO, and O₂, and to report compliance with the terms and conditions of the Consent Decree (CIV. No. 03-1028), as applicable. The CEMS shall be operated in accordance with the Department's CEM Conditions, §60.11, §60.13, and appendices A, B, and F. [Rule 19.703, 40 C.F.R. § 52 Subpart E, and Ark. Code Ann. § 8-4-203 as referenced by Ark. Code Ann. §§ 8-4-304 and 8-4-311, and the Consent Decree (CIV. No. 03-1028) between Lion Oil, ADEQ, and the US EPA]

FCCU 6 The FCCU is an affected facility under the terms of 40 C.F.R. § 60 Subpart Ja. The requirements of this subpart as they apply to this source are summarized below. [Rule 19.304 and 40 C.F.R. § 60.100a]

- a. The permittee shall not discharge from the #7 FCCU Catalyst Regenerator Stack (SN-809) any gases which contain particulate matter (PM) in excess of 1.0 lb/ton of coke burn-off in the catalyst regenerator. [§ 60.102a(b)(1)(i)]
- b. The permittee shall not discharge from the #7 FCCU Catalyst Regenerator Stack (SN-809) any gases which contain carbon monoxide (CO) in excess of 500 ppmvd, dry basis corrected to 0 percent excess air, on an hourly average basis. [§ 60.102a(b)(4)]
- c. The permittee shall not discharge from the #7 FCCU Catalyst Regenerator Stack (SN-809) any gases which contain SO₂ in excess of 50 ppmvd, dry basis corrected to 0 percent excess air, on a 7-day rolling average basis and 25 ppmv, dry basis corrected to 0 percent excess air, on a 365-day rolling average basis. [§ 60.102a(b)(3)]
- d. The permittee shall not discharge from the #7 FCCU Catalyst Regenerator Stack (SN-809) any gases which contain NO_x in excess of 80 ppmvd, dry basis corrected to 0 percent excess air, on a 7-day rolling average basis. [§ 60.102a(b)(2)]

Lion Oil Company
 Permit #: 0868-AOP-R24
 AFIN: 70-00016

SN-821a, 821b, 821c – Refinery Boilers (Three Boilers)

Source Description

Three refinery boilers were installed at the facility as part of the boiler replacement project required by the Consent Decree (CIV. No. 03-1028) reached between Lion Oil, ADEQ, and the US EPA. The total rated heat input capacity for all three boilers are 605 MMBtu/hr on an annual average basis. Individually the boilers each operate at a maximum of 221.8 MMBtu/hr for a total maximum heat input capacity of 665.5 MM Btu/hr. These boilers are permitted to burn NSPS Subpart J quality gas, or #2 fuel oil. Each of the boilers utilizes next-generation ultra-low-NO_x burners for NO_x emission control.

Regulations

All three of the refinery boilers are subject to each of the following regulations: 40 C.F.R. § 60 Subpart Db – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units and 40 C.F.R. § 60 Subpart J – Standards of Performance for Petroleum Refineries.

The emission limitations established for this source were relied upon in a PSD netting analysis. Future increases in these permitted levels may trigger PSD review for these sources.

Specific Conditions

BOI 1 The listed sources shall not exceed the emission rates set forth in the following table. The limits given in this table represent the combined emissions from all three boiler exhaust stacks. Compliance with these limits shall be demonstrated by compliance with Specific Conditions #BOI 3, #BOI 4, #BOI 6, #BOI 7, #BOI 8, #BOI 10 #BOI 12, #BOI 13 or with other available emissions data for these sources. The emission rates in the table below for #2 fuel oil combustion do not allow for the facility to make modifications in order to combust fuel oil. [Rule 19.501 *et seq.* and 40 C.F.R. § 52 Subpart E]

SN	Source Description	Pollutant	lb/hr	tpy
821 (a,b,c total)	Refinery Boilers (fuel gas/natural gas firing)	PM ₁₀	7.8	---
		SO ₂	22.4	---
		VOC	9.8	---
		CO	474.2	---
		NO _x	23.3	---
		Lead	1.4E-03	---
821 (a,b,c total)	Refinery Boilers (fuel oil firing)	PM ₁₀	15.7	---
		SO ₂	37.3	---
		VOC	20.0	---
		CO	474.2	---
		NO _x	66.6	---

Lion Oil Company
 Permit #: 0868-AOP-R24
 AFIN: 70-00016

Consent Decree (CIV. No. 03-1028) Requirements

The following conditions are required to be added to this permit by Paragraph 24 of the Consent Decree (CIV. No. 03-1028) reached between Lion Oil, the US EPA, and ADEQ. In many instances, these conditions are restatements of requirements which appear elsewhere in the Specific and/or Plantwide Conditions of this permit.

21. The heaters and boilers at Lion Oil are affected facilities, as that term is used in 40 C.F.R. Part 60 Subparts A and J, and are subject to and comply with the requirements of NSPS Subpart A and J. If there is a revision to NSPS Subpart J that excludes either certain fuel gas combustion devices or fuel gas streams from Subpart J, then that exemption shall comply to this condition as well.
22. The permittee shall not burn fuel oil in any combustion unit except under the following circumstances. Fuel Oil shall mean any liquid fossil fuel with a sulfur content of greater than 0.05% by weight. Torch Oil shall mean FCCU feedstock or light cycle oil that is combusted in the FCCU regenerator to assist in starting up or restarting the FCCU. [Rule 19.304 and 40 C.F.R. § 60.11(d)]
 - a. The permittee is permitted to burn torch oil in the FCCU regenerator during FCCU start-ups;
 - b. Lion Oil is permitted to burn Fuel Oil in combustion units after the establishment of FCCU NO_x emission limits pursuant to Paragraph 11.E. of the Consent Decree, provided that emissions from any such combustion units are routed through the FCCU Wet Gas Scrubber and Lion Oil demonstrates, with the approval of EPA, that the NO_x emission limits established therein and the SO₂ emissions limits set forth in Paragraph 12.B. of this Consent Decree will continue to be met.
 - c. During periods of natural gas curtailment where the permittee shall burn only LPG or low sulfur distillate (e.g. No. 2 oil at less than 0.5% sulfur by weight).
23. The Sulfur Recovery Plant (SN-844) is subject to and required to comply with all applicable provisions of 40 C.F.R. § 60 (NSPS) Subparts A and J. [Rule 19.304 and 40 C.F.R. § 60 Subparts A and J]
24. The permittee shall continue to route all sulfur pit emissions from the sulfur recovery plant (SN-844) such that sulfur pit emissions to the atmosphere are either eliminated or are included and monitored as part of the applicable sulfur recovery plant tail gas emissions that meet the NSPS Subpart J limit for SO₂: a 12-hour rolling average of 250 ppmvd SO₂ corrected to 0% oxygen. [Rule 19.304 and 40 C.F.R. § 60.104(a)(2)]
25. The permittee shall comply with the Preventive Maintenance and Operation Plan for the Sulfur Recovery Plant, including any modifications thereto, at all times, including periods of start up, shut down, and malfunction. [Rule 19.304 and 40 C.F.R. § 60.11(d)]

Lion Oil Company
Permit #: 0868-AOP-R24
AFIN: 70-00016

26. The permittee shall comply with the following requirements as they relate to tail gas incidents where tail gas is combusted in a thermal incinerator and results in excess emissions of 500 pounds or more of SO₂ emissions in any 24-hour period. Only those time periods which are in excess of an SO₂ concentration of 250 ppm (rolling 12-hour average) shall be used to determine the amount of excess SO₂ emissions from the incinerator. Lion Oil shall use engineering judgment and/or other monitoring data during periods in which the SO₂ CEMS has exceeded the range of the instrument or is out of service. [Rule 19.304 and 40 C.F.R. § 60.11(d)]
- a. For tail gas incidents the investigative and corrective action procedures shall be applied to TGU shutdowns, bypasses of a TGU, unscheduled shutdowns of a sulfur recovery plant, or other miscellaneous unscheduled sulfur recovery plant events which result in a tail gas incident.
 - b. The permittee shall investigate the root cause and all contributing causes of all tail gas incidents. The permittee shall take reasonable steps to correct the conditions that have caused or contributed to such incidents, and to minimize such incidents. The permittee shall evaluate whether tail gas incidents are due to malfunctions.
27. The permittee is prohibited from using the emissions reductions that result from the installation and operation of the controls required by the Consent Decree (CIV. No. 03-1028) ("CD Emissions Reductions") for the purpose of emissions netting or emissions offsets, while still allowing the permittee to use a fraction of the CD emissions reductions if: (1) the emission unit for which the permittee seeks to use the CD emissions reductions are modified or constructed for the purposes of compliance with Tier II gasoline or low-sulfur diesel requirements; and (2) the emissions from those modified or newly-constructed units are below the levels outlined in paragraph 27.C.ii of the Consent Decree (CIV. No. 03-1028) prior to the commencement of operations of the emissions units for which the permittee seeks to use the CD emissions reductions.
- a. **General Prohibition** – The permittee shall not generate or use any NO_x, SO₂, PM, VOC, or CO emissions reductions that result from any projects conducted or controls required pursuant to the Consent Decree (CIV. No. 03-1028) as netting reductions or emissions offsets in any PSD, major non-attainment, and/or minor New Source Review (NSR) permit or permit proceeding.
 - b. **Exception to General Prohibition:**
 - i. Utilization of the exception set forth in paragraph 27.C.ii of the Consent Decree (CIV. No. 03-1028) to the general prohibition against the generation or utilization of CD emissions reductions set forth in paragraph 27.B of the Consent Decree (CIV. No. 03-1028) is subject to the following conditions:

Lion Oil Company
Permit #: 0868-AOP-R24
AFIN: 70-00016

1. Under no circumstances shall the permittee use CD emissions reductions for netting and/or offsets prior to the time that actual CD emissions reductions have occurred.
 2. CD emissions reductions may only be used at the El Dorado refinery that generated them.
 3. The CD emissions reductions provisions of the Consent Decree (CIV. No. 03-1028) are for the purposes of the Consent Decree (CIV. No. 03-1028) only and neither the permittee nor any other entity may use CD emissions reductions for any purpose, including in any subsequent permitting or enforcement proceeding, except as provided herein.
 4. The permittee shall remain subject to all federal and state regulations applicable to the PSD, major non-attainment, and/or minor NSR permitting processes.
- ii. Notwithstanding the general prohibition set forth in Paragraph 27.B of the Consent Decree (CIV. No. 03-1028), the permittee may use 10 tons per year of NO_x, 10 tpy of PM, and 35 tpy of SO₂ from the CD emissions reductions as credits or offsets in any PSD, major non-attainment, and/or minor NSR permit or permit proceeding occurring after the date of lodging of the Consent Decree (CIV. No. 03-1028) (March 11, 2003), provided that the new or modified emissions unit: (1) is being constructed or modified for the purposes of compliance with Tier II gasoline or low-sulfur diesel requirements; and (2) has a federally enforceable permit that reflects:
1. For heaters and boilers, that next-generation ultra low-NO_x burners are installed and the limit is established pursuant to Paragraph 16.D of the Consent Decree (CIV. No. 03-1028).
 2. For heaters and boilers, a limit of 0.10 grains of hydrogen sulfide per dry standard cubic foot (dscf) of fuel gas or 20 ppmvd SO₂ corrected to 0% oxygen both on a 3-hour rolling average.
 3. For heaters and boilers, no liquid or solid fuel firing authorization.
 4. For the FCCU, a limit of 20 ppmvd NO_x or less corrected to 0% oxygen on a 365-day rolling average basis.
 5. For the FCCU, a limit of 25 ppmvd SO₂ corrected to 0% oxygen on a 365-day rolling average basis.
 6. For SRP's, NSPS Subpart J emission limits.

Lion Oil Company
Permit #: 0868-AOP-R24
AFIN: 70-00016

28. None of the conditions of this permit are intended to prohibit the permittee from seeking to: (1) utilize or generate emissions credits or reductions from refinery units that are covered by the Consent Decree (CIV. No. 03-1028) to the extent that the proposed credits or reductions represent the difference between the emissions limitations set forth in the Consent Decree (CIV. No. 03-1028) for these refinery units and the more stringent emissions limitations that the permittee may elect to accept for those refinery units in a permitting process; or (2) utilize or generate or generate emission credits or reductions on refinery units that are not covered by the Consent Decree (CIV. No. 03-1028).
29. By no later than December 31, 2004, Lion Oil shall install a VDU overhead recovery system on the Vacuum Distillation Tower pursuant to the terms and conditions in its October 9, 2002 submission to the Agencies. Lion has complied with this requirement by routing emissions to the Flare Gas Recovery system.
30. The permittee shall submit a modification to incorporate the provisions of regulations specifically addressed in the Compliance Plan and Schedule of this permit six months before the compliance date specified in the Compliance Plan and Schedule.
31. The permittee must meet the notification requirements in § 63.7545 according to the schedule in § 63.7545 and in subpart A of 40 C.F.R. Part 63. Some of the notifications must be submitted before you are required to comply with the emission limits and work practice standards in this subpart. [Rule 19.304 and 40 C.F.R. § 63 Subpart DDDDD]
32. At all times, the permittee must operate and maintain any affected source (as defined in § 63.7490), including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source. [Rule 19.304 and 40 C.F.R. § 63 Subpart DDDDD]
33. The permittee shall for SN-803, SN-804, SN-805, SN-805N, SN-806, SN-808, SN-810, SN-811, SN-812, SN-813a, SN-814, SN-821a, SN-821b, SN-821c, SN-828, SN-830, SN-842, SN-850, SN-857, SN-860, SN-861 East, SN-861 West, and SN-862 conduct annual tune ups. Burners part of SN-832 with a heat input capacity of less than or equal to 5 million Btu per hour must complete a tune-up every 5 years as specified in § 63.7540. [Rule 19.304 and 40 C.F.R. § 63 Subpart DDDDD]

Lion Oil Company
 Permit #: 0868-AOP-R24
 AFIN: 70-00016

34. The permittee must conduct an annual or 5-year performance tune-up according to § 63.7540(a)(10), (11), or (12), respectively. Each annual tune-up specified in § 63.7540(a)(10) must be no more than 13 months after the previous tune-up. Each 5-year tune-up specified in § 63.7540(a)(12) must be conducted no more than 61 months after the previous tune-up. [Rule 19.304 and 40 C.F.R. § 63 Subpart DDDDD]
35. The permittee shall for SN-803, SN-804, SN-805, SN-805N, SN-806, SN-808, SN-810, SN-811, SN-812, SN-813a, SN-814, SN-821a, SN-821b, SN-821c, SN-828, SN-830, SN-832, SN-842, SN-850, SN-857, SN-860, SN-861 East, SN-861 West, and SN-862 have a one-time energy assessment performed by a qualified energy assessor. An energy assessment completed on or after January 1, 2008, that meets or is amended to meet the energy assessment requirements in this table, satisfies the energy assessment requirement. A facility that operates under an energy management program compatible with ISO 50001 that includes the affected units also satisfies the energy assessment requirement. The energy assessment must include the following with extent of the evaluation for items a. to e. appropriate for the on-site technical hours listed in § 63.7575:
 - a. A visual inspection of the boiler or process heater system.
 - b. An evaluation of operating characteristics of the boiler or process heater systems, specifications of energy using systems, operating and maintenance procedures, and unusual operating constraints.
 - c. An inventory of major energy use systems consuming energy from affected boilers and process heaters and which are under the control of the boiler/process heater owner/operator.
 - d. A review of available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage.
 - e. A review of the facility's energy management practices and provide recommendations for improvements consistent with the definition of energy management practices, if identified.
 - f. A list of cost-effective energy conservation measures that are within the facility's control.
 - g. A list of the energy savings potential of the energy conservation measures identified.
 - h. A comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments. [Rule 19.304 and 40 C.F.R. § 63, Subpart DDDDD]

Appendix 11

Consent Decree Section V and CD Appendices

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF ARKANSAS**

UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	
	)	
and	)	
	)	Civil No.
STATE OF ARKANSAS,	)	
	)	
Plaintiff-Intervenor,	)	
	)	
v.	)	
	)	
LION OIL COMPANY ,	)	
	)	
Defendant.	)	
	)	

CONSENT DECREE

TABLE OF CONTENTS

I.	Jurisdiction and Venue (Paragraphs 1-3)	5
II.	Applicability and Binding Effect (Paragraphs 4-8)	5
III.	Objectives (Paragraph 9)	7
IV.	Definitions (Paragraph 10)	7
V.	Affirmative Relief/Environmental Projects	12
11.	NO _x Emissions Reductions from FCCU	12
12.	SO ₂ Emissions Reductions from FCCU	17
13.	PM Emissions Reductions from FCCU	18
14.	CO Emissions Reductions from FCCU	19
15.	NSPS Applicability of FCCU Regenerators	20
16.	NO _x Emissions Reductions from Heaters and Boilers, NO _x and/or CO Emission Reductions from Compressor	20
17.	SO ₂ Emissions Reductions from and NSPS Applicability of Heaters and Boilers	22
18.	NSPS Applicability of and Compliance for Sulfur Recovery Plant	24
19.	NSPS Applicability of and Compliance for Flaring Devices	27
20.	Control of Acid Gas Flaring Incidents and Tail Gas Incidents	28
21.	Control of Hydrocarbon Flaring Incidents	36
22.	Benzene Waste NESHAP Program Enhancements	37
23.	Leak Detection and Repair Program Enhancements	52
24.	Incorporation of Consent Decree Requirements into Federally- Enforceable Permits	62
25.	Obtaining Construction Permits	63
26.	Incorporation of State Compliance Plan and Schedule into Consent Decree ...	63

TABLE OF APPENDICES

Appendix A –	ADEQ Air Permit #868-AR-7 issued June 3, 1998; ADEQ Draft Air Permit #868-AOP-RI; Consent Administrative Order issued May 30, 2002
Appendix B –	List of Flaring Devices
Appendix C –	List of Controlled Heaters and Boilers and Compressors
Appendix D -	Reserved
Appendix E –	NSPS Subpart J Compliance Schedule for Flares
Appendix F –	Logic Diagram for Paragraph 20

RR. “Torch Oil” shall mean FCCU feedstock or light cycle oil that is combusted in the FCCU regenerator to assist in starting up or restarting the FCCU.

SS. “Upstream Process Units” shall mean all amine contactors, amine scrubbers, and sour water strippers at the El Dorado Refinery, as well as all process units at the refinery that produce gaseous or aqueous waste streams that are processed at amine contactors, amine scrubbers, or sour water strippers.

TT. “Vacuum Distillation Tower” shall mean the vacuum distillation column used to distill a crude fraction under vacuum located within the vacuum distillation unit (SN-852). This term shall include the direct contact barometric condenser and associated cooling tower.

V. AFFIRMATIVE RELIEF/ENVIRONMENTAL PROJECTS

11. NOx Emissions Reductions from FCCU.

A. **Summary.** Lion Oil shall implement a program to reduce NOx emissions from its Fluid Catalytic Cracking Unit (“FCCU”) at the El Dorado Refinery by the installation of a Lo Tox System on emissions from the FCCU. Lion Oil shall conduct an Optimization Study to determine lower NOx emission limits and incorporate those lower NOx emission limits into permits. In the alternative, Lion Oil may opt to accept limits of 20 ppmvd on a 365-day rolling average and 40 ppmvd on a 24-hour rolling average basis, each at 0% oxygen and may use any technology to comply with the limits. Lion shall demonstrate future compliance through the use of CEMS.

B. **Early Acceptance of NOx Emission Limits.** If before December 31, 2005, Lion Oil notifies EPA in writing that it will accept emission limits of 20 ppmvd on a 365-day rolling average and 40 ppmvd on a 24-hour rolling average basis, each at 0% oxygen for emissions from its FCCU, then Paragraphs 11.C. through 11.E shall not apply provided that Lion Oil shall begin to comply with emission limits of 20 ppmvd on a 365-day rolling average and 40 ppmvd on a 24-hour rolling average basis, each at 0% oxygen, no later than June 30, 2007.

C. Lo Tox System Design.

- i. By no later than June 30, 2007, Lion Oil shall complete installation and

begin operation of a Lo Tox system designed to achieve a NOx concentration of 20 ppmvd on a 365-day rolling average at 0% oxygen on emissions from its FCCU. Lion Oil shall design a Lo Tox system to achieve a NOx concentration of 20 ppmvd, provided that:

- (a) the total cost of achieving such concentration does not exceed, on a design basis, \$10,000 of annualized estimated total installed cost plus projected annual operating cost per projected ton of NOx removed;
- (b) the incremental cost effectiveness for each 5 ppmvd increment from 40 ppmvd to 20 ppmvd at 0% O₂ is less than \$20,000 per projected ton of NOx removed; and
- (c) the cost effectiveness for a Lo Tox system to achieve 40 ppmvd at 0% O₂ is less than \$20,000 per ton of annualized estimated total installed cost plus projected annual operating cost.

If the cost effectiveness of a Lo Tox System designed to achieve 20 ppmvd on a 365-day rolling average at 0% oxygen exceeds \$10,000 per ton total cost effectiveness and \$20,000 per ton incremental cost effectiveness, Lion shall design the Lo Tox system to achieve the lowest NOx concentration at which these costs do not exceed \$10,000 per ton of NOx removed. If the cost effectiveness of a Lo Tox System designed to achieve 40 ppmvd on a 365-day rolling average at 0% oxygen exceeds \$20,000 per ton total cost effectiveness, Lion shall design the Lo Tox system to achieve the lowest NOx concentration at which these costs do not exceed \$20,000 per ton of NOx removed. Lion Oil will not be required to design a system that results in ozone emissions in excess of that allowed by state permitting. When annualizing capital costs, Lion Oil and EPA shall use a 15 year basis at a 10.3% interest rate.

ii. By no later than June 30, 2003, Lion Oil shall submit to EPA the process design specifications for the Quench Tower and Residence Time components of the Lo Tox System, and if available, the ozone injection port numbers, sizes, and locations. If the ozone injection port numbers, sizes, and locations are not available by June 30, 2003, Lion Oil shall

submit the design specifications for those components by not later than December 31, 2003. By no later than June 30, 2005, Lion Oil shall submit to EPA the process design specifications for the complete Lo Tox System. Lion Oil and EPA agree to consult on the development of the proposed process design specifications for the Lo Tox System prior to submission of Lion Oil's final proposal.

iii. The proposed process design specifications for the complete Lo Tox system shall, at a minimum, consider, quench capacity, optimal temperature, sufficient residence time, ozone generation capacity, oxygen supply, ozone injection port numbers, sizes, and locations, and shall include the cost effectiveness calculated as described in 11.B.i above. EPA will provide comments to Lion Oil within (180) one hundred eighty days of receipt of the process design specifications. Within ninety (90) days of receipt of EPA's comments on the proposed design, Lion Oil shall modify the proposal to address EPA's comments, and submit the design to EPA for final approval. Upon receipt of EPA's final approval, Lion Oil shall implement the design. Lion Oil shall notify EPA of any substantial changes to the design of the Lo Tox System, which may affect the performance of the Lo Tox System.

D. Lo Tox System Optimization Study.

i. By no later than September 30, 2007, Lion Oil shall begin a twenty-four (24) month study to optimize the performance of the Lo Tox System to minimize NOx emissions from its FCCU ("Optimization Study"). However, if prior to startup of the Lo Tox System or during the optimization study, Lion Oil elects to accept NOx concentration limits of 20 ppmvd on a 365-day rolling average and 40 ppmvd on a 24-hour rolling average basis, each at 0% oxygen, Paragraphs 11.D.ii through 11.E shall not apply.

ii. Lion Oil shall submit protocols for the Optimization Study to EPA that includes a consideration of all important operating parameters including, but not limited to, optimal post-quench flue gas temperature, amounts and locations of ozone addition, and ozone slip. During the first six (6) months of the Optimization Study, Lion Oil shall evaluate the effect

of these operating parameters and shall monitor NO_x emissions and the operating parameters to identify optimum operating levels for the parameters that minimize the NO_x emissions. During the remainder of the Optimization Study Lion shall make all reasonable efforts to operate at the optimal operating levels for those parameters that it can control and consistent with Paragraph 11.C.v.

iii. Lion Oil shall submit the results of the Optimization Study to EPA in a written report no later than ninety (90) days after the completion of the study. The report shall identify the relevant operating parameters and their levels that result in maximum reductions of NO_x emissions from its FCCU. The report shall include, at a minimum, the following information on a monthly average basis (unless otherwise noted below):

- (a) Regenerator flue gas temperature and flow rate;
- (b) Coke burn rate;
- (c) FCCU feed rate;
- (d) FCCU feed composition (i.e. volume % of feed components such as AGO, VGO, CGO, ATB, VTB, etc.);
- (e) Amount and type of hydrotreated feed (i.e. volume % of feed that is hydrotreated and the type of hydrotreated feed such as AGO, VGO, CGO, ATB, VTB, etc.)
- (d) FCCU feed sulfur and nitrogen content;
- (e) Ozone addition rates;
- (f) Quench Tower inlet and outlet temperature; and
- (g) Hourly average NO_x and O₂ concentrations at the point of emission to the atmosphere.
- (h) NO_x concentrations at the inlet to the Lo Tox System during the Optimization Study as available.

iv. As required in Paragraph 11.C.iii.(g) and (h), Lion Oil shall determine the

NOx and O2 concentrations at the point of emission to the atmosphere by CEMS, and NOx concentrations at the inlet to the Lo Tox System during the Optimization Study as available.

v. During the Optimization Study, Lion Oil will not be required to add ozone at a rate that results in total costs for electricity from ozone generation and oxygen production, and from purchased oxygen, for operation of the Lo Tox system in excess of \$550,000 per year.

E. FCCU NOx Emission Limits.

i. As part of its Optimization Study report, Lion Oil shall propose concentration based limits to EPA, short and long term, and rolling averaging times (i.e., 3-hour, 24-hour, or 7-day short term rolling averages and 365-day for a long term rolling average), each at 0% oxygen for FCCU NOx emissions, for optimized operation of the Lo Tox System consistent with the provisions of Paragraph 11. These proposed limits may include provisions for alternate operating scenarios for periods of hydrotreater outage, and an exemption for startup and shutdown of the FCCU, and Malfunction of the Lo Tox system, provided that good air pollution control practices are instituted during such events. Lion Oil shall comply with the limits it proposes beginning immediately upon submission of the Optimization Study report to EPA, until such time as Lion Oil is required to comply with the emissions limits set by EPA, pursuant to Paragraphs 11.E.ii. and 11.E.iii.

ii. EPA will use the CEMS data collected during the Optimization Studies and all other available and relevant information to establish limits for NOx emissions from Lion Oil's FCCU. EPA may establish NOx concentration limits based on a short term (e.g., 3-hour, 24-hour, or 7-day) rolling average and a long term (i.e., 365-day) rolling average, each at 0% oxygen. EPA will determine the NOx concentration limits and averaging times for the FCCU based on the level of performance during the Optimization Studies, a reasonable certainty of compliance, and any other available pertinent information. These proposed limits may include provisions for alternate operating scenarios for periods of hydrotreater outage. EPA will not establish emission limits that are lower than 20 ppmvd on a 365-day rolling average and 40

ppmvd on a 24-hour rolling average basis, each at 0% oxygen, and will allow for an exemption for startup and shutdown of the FCCU, and Malfunction of the Lo Tox system, provided that good air pollution control practices are instituted during such events.

iii. EPA will notify Lion Oil of its determination of NO_x concentration limits, averaging times, and alternate operating scenarios (if any), and Lion Oil shall immediately, or within 30 days if EPA's NO_x concentration limits are different from Lion Oil's proposed limit, comply with the established emissions limits.

F. Demonstrating Compliance with FCCU NO_x Emission limits.

i. Beginning no later than December 31, 2004, Lion Oil shall use a NO_x CEMS to monitor performance of the FCCU, and subsequently, the Lo Tox System, and to report compliance with the terms and conditions of this Consent Decree. Lion Oil shall make CEMS data available to EPA upon demand as soon as practicable.

ii. Lion Oil shall install, certify, calibrate, maintain, and operate all CEMS required by this Consent Decree in accordance with the requirements of 40 CFR §§ 60.11, 60.13 and Part 60 Appendix A, B, and F. The CEMS will be used to demonstrate compliance with the NO_x emission limits established pursuant to this Paragraph.

12. SO₂ Emissions Reductions from FCCU.

A. Summary. Lion Oil shall implement a program to reduce SO₂ emissions from its FCCU by the installation and operation of a Wet Gas Scrubber ("WGS") at the El Dorado FCCU. Lion Oil shall incorporate lower SO₂ emission limits into permits and will demonstrate future compliance with the lower emissions limits through the use of CEMS.

B. Installation and Operation of WGS on the El Dorado FCCU. By no later than December 31, 2004, Lion Oil shall complete installation and shall begin operation of a WGS on the El Dorado FCCU. Lion Oil shall design the WGS to achieve an SO₂ concentration of 25 ppmvd or lower on a 365-day rolling average basis and 50 ppmvd on a 7-day rolling average basis, each corrected to 0% oxygen. By December 31, 2004, Lion Oil shall comply with an SO₂

concentration limit of 25 ppmvd or lower on a 365-day rolling average basis and 50 ppmvd on a 7-day rolling average basis, each corrected to 0% oxygen, except during periods of startup and shutdown of the FCCU, and Malfunction of the WGS, provided that good air pollution control practices are instituted during such events.

C. Demonstrating Compliance with FCCU SO₂ Emission Limits. By no later than December 31, 2004, Lion Oil shall install and use a SO₂ and O₂ CEMS to monitor performance of the FCCU and to report compliance with the terms and conditions of this Consent Decree. Lion Oil shall make CEMS and process data available to the Applicable Federal and State Agencies upon demand as soon as practicable. Lion Oil shall install, certify, calibrate, maintain, and operate all CEMS required by this Consent Decree in accordance with the requirements of 40 C.F.R. §§ 60.11, 60.13 and Part 60 Appendix A, and the applicable performance specification test of 40 C.F.R. Part 60 Appendices B and F. These CEMS will be used to demonstrate compliance with the SO₂ emission limits established pursuant to Paragraph 12B.

13. PM Emissions Reductions from FCCU.

A. Summary. Lion Oil shall implement a program to reduce particulate matter (“PM”) emissions from the El Dorado FCCU by the installation and operation of a WGS.

B. Installation and Operation of WGS on the El Dorado FCCU. By no later than December 31, 2004, Lion Oil shall complete installation and shall begin operation of a WGS on its FCCU. Lion Oil shall design the WGS to achieve an emission limit of 0.5 pound PM per 1000 pounds of coke burned on a 3-hour average basis. By no later than December 31, 2004, Lion Oil shall comply with an emission limit of 0.5 pounds of PM per 1000 pounds of coke burned on a 3-hour average basis, except during periods of startup and shutdown of the FCCU, and Malfunction of either the FCCU or the Wet Gas Scrubber, provided that good air pollution control practices are instituted during such events. Lion Oil will examine the capability of the wet gas scrubber to meet the 0.5 pound PM per 1000 pounds of coke burned on

a 3-hour average basis during turn down events by stack testing during the next turn down event where stack testing can be scheduled after installation of the wet gas scrubber. Lion Oil shall submit a report of the PM emissions during the turn down event within 90 days after the scheduled turn down event. If the emissions data show that the wet gas scrubber cannot with reasonable certainty comply with the 0.5 pounds PM per 1000 pounds of coke burned on a 3-hour average basis during turn down events, Lion Oil shall apply to EPA for approval of an alternate emissions limit that shall apply during turn down events not to exceed 1.0 pound PM per 1000 pounds of coke burned on a 3-hour average basis, which shall include a definition of a “turn down” event, but also may include limitations on operating parameters. Until the stack test required by this Paragraph 13. B is completed and a new emissions limit is established, the United States, EPA, and the State of Arkansas agree not to seek civil or stipulated penalties for violations of the 0.5 pounds PM per 1000 pounds of coke burned on a 3-hour average basis that occur during turn down events.

14. CO Emissions Reductions from FCCU.

A. Summary. Lion Oil shall implement a program to reduce CO emissions from the El Dorado FCCU by the use of full combustion.

B. Emissions Limits. By no later than December 31, 2004, the El Dorado FCCU shall meet an emission limit of 500 ppmvd CO corrected to 0% O₂ on a 1-hour average basis and 100 ppmvd CO corrected to 0% O₂ on a 365-day rolling average basis, except during periods of startup, shutdown, and Malfunction of the FCCU, provided that good air pollution control practices are instituted during such events.

C. Demonstrating Compliance with Emission Limits. By no later than December 31, 2004, Lion Oil shall use a CO and O₂ CEMS to monitor compliance of the FCCU with the terms and conditions of this Consent Decree. Lion Oil shall make CEMS and process data

available to the Applicable Federal and State Agencies upon demand as soon as practicable.

Lion Oil shall install, certify, calibrate, maintain, and operate all CEMS required by this Consent Decree in accordance with the requirements of 40 C.F.R. §§ 60.11, 60.13 and Part 60 Appendix A and the applicable performance specification test of 40 C.F.R. Part 50 Appendices B and F. These CEMS will be used to demonstrate compliance with the CO emission limits established pursuant to Paragraph 14B.

15. NSPS Applicability of FCCU Regenerators.

A. Generally. The FCCU Regenerator at the EL Dorado Refinery shall be an affected facility, as that term is used in the Standards of Performance for New Stationary Sources (“NSPS”), 40 C.F.R. Part 60, and shall be subject to and comply with the requirements of NSPS Subparts A and J for each of the following pollutants by the following dates:

SO ₂	<u>December 31, 2004</u>
PM	<u>December 31, 2004</u>
CO	<u>December 31, 2004</u>
Opacity	<u>December 31, 2004</u>

16. NOx Emissions Reductions from Heaters and Boilers, and NOx and CO Emission Reductions from Air Compressor (SN-841).

A. Summary. Lion Oil will implement an eight-year program to reduce NOx emissions from the heaters and boilers listed in Appendix C (“Controlled Heaters and Boilers”) by installing Next Generation Ultra Low-NOx Burners (“Next Generation ULNBs”) or Alternative NOx Control Technology, and demonstrating continuous compliance with lower emission limits through the use of source testing, CEMS, and/or parametric monitoring. Lion Oil will reduce NOx emissions from the air compressor (SN-841, G398TA) by installing an air fuel ratio controller and a catalytic converter, and demonstrating continuous compliance with lower

emission limits through the use of source testing. Lion Oil will conduct a Best Available Control Technology (“BACT”) analysis to determine the best available control technology for reducing CO emissions from the air compressor (SN-841, G398TA). EPA will establish BACT limits for CO for the air compressor. If Lion Oil agrees to comply with the established BACT limit for CO for the air compressor, Lion Oil shall comply with such limit by December 31, 2004.

B. Installation of NOx and CO Control Technology.

i. **Installation of Nox Control Technology:** To achieve the lowest possible emissions of NOx, Lion Oil shall install Next Generation ULNBs for all Controlled Heaters and Boilers and shall control the air compressor (SN-841, G398TA) with an air fuel ratio controller and a catalytic converter listed in Appendix C by the dates specified therein.

ii. **BACT Analysis for CO Control Technology for Compressor SN-841:** To achieve the lowest possible emissions of CO, by no later than April 30, 2003, Lion Oil may conduct and submit to EPA a BACT analysis including proposed control technology and emission limits for CO in lb/mmBtu on a 3-hour average basis for the air compressor (SN-841, G398TA). EPA will review the BACT analysis and establish BACT limits for CO for the air compressor. Lion Oil shall notify EPA whether it accepts the EPA established CO limits within 90 days after EPA’s notice to Lion Oil of the CO emission limits. If Lion Oil agrees to comply with the established BACT limit for CO for the air compressor, Lion Oil shall install controls and comply with such limit by December 31, 2004.

C. **Testing and Monitoring NOx Emissions from Controlled Heaters and Boilers and NOx and CO Emissions for the Compressor.** Lion Oil shall monitor the Controlled Heaters and Boilers and Compressor to meet the requirements of Paragraph 16.B. as follows:

- i. For heaters and boilers with a heat input capacity greater than 100 mmBTU/hr (HHV), Lion Oil shall install or continue to operate CEMS to measure NOx and O₂ by no later than the date of the installation of the applicable NOx Control Technology on the heater or boiler. Lion Oil shall install and operate CEMS to measure NOx and O₂ emissions from the atmospheric heater by no later than December 31, 2004. Lion Oil shall

install, certify, calibrate, maintain, and operate all CEMS required by this Paragraph 16 in accordance with the requirements of 40 C.F.R. §§ 60.11, 60.13 and Part 60 Appendix A and the applicable performance specification test of 40 C.F.R. Part 60 Appendices B and F. These CEMS will be used to demonstrate compliance with emission limits. Lion Oil shall make CEMS and process data available to the Applicable Federal and State Agencies upon demand as soon as practicable; and

- ii. For heaters and boilers with a heat input capacity of equal to or less than 100 mmBTU/hr (HHV), Lion Oil shall, by no later than 60 days after the date of installation of the applicable NOx Control Technology, conduct an initial performance test. The results of this test shall be reported based upon the average of three (3) one hour testing periods and shall be used to develop representative operating parameters for each unit, which will be used as indicators of compliance.
- iii. For the compressor, Lion Oil shall, by no later than 60 days after the date of installation of the applicable NOx and/or CO Control Technology, conduct an initial performance test. The results of this test shall be reported based upon the average of three (3) one hour testing periods and shall be used to develop representative operating parameters for each unit, which will be used as indicators of compliance.

D. Establishing NOx Permit Limits for Heaters and Boilers and the

Compressor. Within 120 days after the start-up of the operation of any NOx Control Technology required by this Paragraph 16, Lion Oil shall submit a permit application to ADEQ in which Lion Oil proposes NOx emission limits in lb/mmBtu on a 3-hour average basis. The proposed permit limits shall be based on actual performance as demonstrated by CEMS and performance tests and shall be low enough to ensure proper operation of the Nox Control Technology and high enough to provide a reasonable certainty of compliance. For the atmospheric heater (SN-804), Lion Oil shall limit emissions to .045 lb/mmBtu of Nox on a 3-hour average basis as measured by a CEMS.

E. Recordkeeping and Reporting. Commencing in 2003 Lion Oil shall submit a report to EPA and the ADEQ on December 31 of each calendar year about the progress of installation of NOx Control Technology required by this Paragraph 16 and other requirements of this Paragraph. This report shall contain:

- (i) A list of all Controlled Heaters and Boilers on which NOx Control Technology was installed;
- (ii) The type of NOx Control Technology that was installed on each heater and boiler with a detailed description of the manufacturer name and model and the designed emission factors;
- (iii) The results of all performance tests conducted on each heater and boiler pursuant to the requirements of Paragraph 16.C;
- (iv) A list of all heaters and boilers scheduled to have NOx Control Technology installed during the next calendar year, the projected date of installation, and the type of NOx Control Technology that will be installed on those units; and
- (v) An identification of proposed and established permit limits applicable to each heater or boiler for which NOx Control Technology has been installed pursuant to this Paragraph.

17. SO₂ Emissions Reductions from and NSPS Applicability of Heaters and Boilers.

A. Summary. Lion Oil shall undertake measures to reduce SO₂ emissions from refinery heaters and boilers by restricting H₂S in refinery fuel gas and by agreeing not to continue and/or commence the burning of fuel oil except under the provisions set forth herein.

B. NSPS Applicability of Heaters and Boilers. Upon the Date of Lodging of the Consent Decree for Lion Oil, the heaters and boilers at the El Dorado Refinery shall be affected facilities, as that term is used in 40 C.F.R. Part 60, Subparts A and J, and shall be subject to and comply with the requirements of NSPS Subparts A and J, except for those heaters and boilers listed in Appendix C, which shall be affected facilities by the dates listed in Appendix C. If there is a revision to NSPS Subpart J that excludes either certain fuel gas combustion devices or fuel gas streams from Subpart J, then that exemption shall apply to this Paragraph as well. By no later than December 31, 2006, Lion Oil shall install, certify, calibrate, maintain and operate a fuel gas CEMS in accordance with the requirements of 40 C.F.R. §§

60.11, 60.13 and Part 60 Appendix A, and the applicable performance specification test of 40 C.F.R. Part 60 Appendices B and F. This CEMS will be used to demonstrate compliance with the SO₂ emission limits established pursuant to this Paragraph.

C. Elimination/Reduction of Fuel Oil Burning.

i. Lion Oil. From the Date of Lodging of this Consent Decree through and after termination, Lion Oil shall continue not to burn Fuel Oil in any combustion unit except:

- (a) Lion Oil shall be permitted to burn Torch Oil in the El Dorado FCCU Regenerator during FCCU start-ups; and
- (b) Lion Oil shall be permitted to burn Fuel Oil in combustion units after the establishment of FCCU NO_x emission limits pursuant to Paragraph 11.E. of this Consent Decree, provided that emissions from any such combustion units are routed through the FCCU Wet Gas Scrubber and Lion Oil demonstrates, with the approval of EPA, that the NO_x emission limits established therein and the SO₂ emissions limits set forth in Paragraph 12.B. of this Consent Decree will continue to be met.
- (c) during periods of natural gas curtailment where Lion Oil shall burn only LPG or low sulfur distillate (e.g. No. 2 oil at less than 0.5% sulfur).

18. NSPS Applicability of and Compliance for Sulfur Recovery Plant.

A. Summary. Lion Oil owns and operates a Sulfur Recovery Plant located at the El Dorado Refinery (“El Dorado SRP”) that was constructed and/or modified after October 4, 1976 and that is currently subject to, and required to comply with, the applicable provisions of 40 C.F.R. Part 60, Subparts A and J.

B. Sulfur Pit Emissions. As of the Date of Lodging, through and after termination of the Consent Decree, Lion Oil shall continue to route all El Dorado SRP sulfur pit emissions from the El Dorado SRP so that sulfur pit emissions to the atmosphere either are eliminated or are included and monitored as part of the applicable Sulfur Recovery Plants tail gas emissions that meet the NSPS Subpart J limit for SO₂: a 12-hour rolling average of 250 ppmvd SO₂ corrected to 0% oxygen, as required by 40 C.F.R. § 60.104(a)(2).

C. Sulfur Recovery Plant Emissions Compliance.

i. By no later than the Date of Lodging of the Consent Decree, Lion Oil shall, for all periods of operation of the El Dorado SRP, comply with 40 C.F.R. § 60.104(a)(2), except during periods of startup, shutdown or Malfunction of the El Dorado SRP, or during a Malfunction of the El Dorado TGU. For the purpose of determining compliance with the Sulfur Recovery Plant emission limits of 40 C.F.R. § 60.104(a)(2), the “start-up/shutdown” provisions set forth in NSPS Subpart A shall apply to the El Dorado SRP.

ii. As of the Date of Lodging of this Consent Decree, Lion Oil shall monitor all emission points (stacks) to the atmosphere for tail gas emissions from the El Dorado SRP, and shall report excess emissions, as required by 40 C.F.R. §§ 60.7(c), 60.13, and 60.105(a)(5). During the life of this Consent Decree, Lion Oil shall continue to conduct emissions monitoring from the El Dorado SRP with CEMS at all of the emission points, unless an SO₂ alternative monitoring procedure has been approved by EPA, per 40 C.F.R. § 60.13(i), for any of the emission points.

iii. At all times, including periods of startup, shutdown, and Malfunction, Lion Oil shall, to the extent practicable, operate and maintain the El Dorado SRP and TGU and any supplemental control devices, in accordance with Lion Oil’s obligation to minimize Sulfur Recovery Plant emissions through implementation of good air pollution control practices as required in 40 C.F.R. § 60.11(d).

D. Good Operation and Maintenance.

i. By no later than June 30, 2003, Lion Oil shall, for the El Dorado SRP, submit to EPA and ADEQ, a summary of a plan, implemented or to be implemented, for enhanced maintenance and operation of the El Dorado SRP, any supplemental control devices, and the appropriate Upstream Process Units. This plan shall be termed a Preventive Maintenance and Operation Plan (“PMO Plan”). The PMO Plan shall be a compilation of Lion Oil’s approaches for exercising good air pollution control practices for minimizing SO₂ emissions at the El Dorado Refinery. The PMO Plan shall provide for continuous operation of the El Dorado SRP between

scheduled maintenance turnarounds with minimization of emissions from the El Dorado SRP. The PMO Plan shall include, but not be limited to, sulfur shedding procedures, new startup and shutdown procedures, emergency procedures and schedules to coordinate maintenance turnarounds of the El Dorado SRP Claus trains and any supplemental control device to coincide with scheduled turnarounds of major Upstream Process Units. The PMO Plan shall have as a goal the elimination of Acid Gas Flaring. Lion Oil shall comply with the PMO Plan at all times, including periods of start up, shut down, and Malfunction of the El Dorado SRP through and after termination of the Consent Decree. Modifications related to minimizing Acid Gas Flaring and/or SO₂ emissions made by Lion Oil to the PMO Plan shall be summarized in an annual submission to EPA and the ADEQ until termination of the Consent Decree.

ii. EPA and the ADEQ do not, by their review of the PMO Plan and/or by their failure to comment on the PMO Plan, warrant or aver in any manner that any of the actions that Lion Oil may take pursuant to the PMO Plan will result in compliance with the provisions of the Clean Air Act, the Arkansas Water and Air Pollution Control Act, or their implementing regulations. Notwithstanding EPA's or ADEQ's review of the PMO Plan, Lion Oil shall remain solely responsible for compliance with the Clean Air Act, the Arkansas Air Pollution and Control Act, and their implementing regulations.

E. Optimization Study. By not later than December 31, 2004, Lion Oil shall complete an optimization study (internal or external) on the El Dorado SRP and report the results to EPA and the ADEQ. The optimization study shall consider:

- i. A detailed evaluation of plant design and capacity, operating parameters and efficiencies - including catalytic activity and material balances;
- ii. An analysis of the composition of the Acid Gas and Sour Water Stripper Gas resulting from the processing of the crude slate actually used, or expected to be used, in the El Dorado SRP;
- iii. A thorough review of each critical piece of process equipment and instrumentation within each Claus train that is designed to correct deficiencies or

problems that prevent each Claus train from achieving their optimal sulfur recovery efficiency and expanded periods of operation;

- iv. Establishment of baseline data through testing and measurement of key parameters throughout each Claus train;
- v. Establishment of a thermodynamic process model of each Claus train;
- vi. For any key parameters that have been determined to be at less than optimal levels, initiation of logical, sequential, or stepwise changes designed to move such parameters toward their optimal values;
- vii. Verification through testing, analysis of continuous emission monitoring data, or other means, of incremental and cumulative improvements in sulfur recovery efficiency, if any;
- viii. Establishment of new operating procedures for long term efficient operation; and
- ix. Each study shall be conducted to optimize the performance of the Claus trains in light of the actual characteristics of the feeds to the El Dorado SRP.

Lion Oil shall incorporate the results of the optimization study into the PMO Plan required under Paragraph 18.D.

19. NSPS Applicability of and Compliance for Flaring Devices.

A. **Summary.** Lion Oil owns and operates the Flaring Devices identified in Appendix B to this Consent Decree. The Flaring Devices in Appendix B already are affected facilities, as that term is used in NSPS, 40 C.F.R. Part 60, and are subject to and are required to comply with the requirements of 40 C.F.R. Part 60, Subparts A and J for fuel gas combustion devices.

B. Compliance with the Emission Limit at 40 C.F.R. § 60.104(a)(1).

i. Continuous or Intermittent, Routinely-Generated Refinery Fuel Gases. For continuous or intermittent, routinely-generated refinery fuel gases that are combusted in any of the Flaring Devices identified in Appendix B, Lion Oil shall either take the Flaring Device that is associated with such a gas stream out of service or shall comply with the emission limit at 40 C.F.R. § 60.104(a)(1) by the dates specified in Appendix E.

ii. Non-Routinely Generated Gases. The combustion of gases generated by the startup, shutdown, or Malfunction of a refinery process unit or released to a Flaring Device as a result of relief valve leakage or other emergency Malfunction are exempt from the requirement to comply with 40 C.F.R. § 60.104(a)(1).

C. Good Air Pollution Control Practices. For all Flaring Devices identified in Appendix B, Lion Oil shall comply with the NSPS obligation to implement good air pollution control practices as required by 40 C.F.R. § 60.11(d) to minimize HC and AG Flaring Incidents.

D. Monitoring the Flaring Devices and Reporting. Lion Oil shall insure that all continuous or intermittent, routinely-generated refinery fuel gases that are combusted in any Flaring Device are monitored by a CEMS as required by 40 C.F.R. § 60.105(a)(4) or with a parametric monitoring system approved by EPA as an alternative monitoring system under 40 C.F.R. § 60.13(i). Lion Oil shall comply with the reporting requirements of 40 C.F.R. Part 60, Subpart J, for all such Flaring Devices.

20. Control of Acid Gas Flaring Incidents and Tail Gas Incidents

By December 31, 2003, Lion Oil will identify the root causes of AG Flaring Incidents between January 1, 1997 and December 31, 2002 that occurred: (1) after installation of its flare gas recovery system; and (2) before the installation of the flare gas recovery system if the AG Flaring Incident would not have been prevented by the subsequent installation of the flare gas recovery system. Lion Oil has installed a flare gas recovery system and has implemented (or is in the process of identifying and implementing) corrective actions to minimize the number and duration of AG Flaring Incidents. Lion Oil also agrees to implement a program to investigate the cause of future AG Flaring Incidents, to take reasonable steps to correct the conditions that have caused or contributed to such AG Flaring Incidents, and to minimize AG Flaring Incidents through and after termination of the Consent Decree. Lion Oil shall follow the procedures in this Paragraph 20 to evaluate whether future AG Flaring Incidents are due to Malfunctions through and after termination of the Consent Decree or are subject to stipulated penalties through

termination of the Consent Decree. Lion Oil also agrees to undertake the investigative and evaluative procedures in this Paragraph for assessing if Tail Gas Incidents, as described in Paragraph 20.E, are due to Malfunctions through and after termination of the Consent Decree or are subject to stipulated penalties through termination of the Consent Decree. The procedures, as set forth below, require a root cause analysis and corrective action for all types of AG Flaring and Tail Gas Incidents and require stipulated penalties for AG Flaring and Tail Gas Incidents if the root causes were not due to Malfunctions.

A. Investigation and Reporting. No later than forty-five (45) days following the end of an Acid Gas Flaring Incident, until termination of the Consent Decree, Lion Oil shall submit to EPA and ADEQ a report that sets forth the following:

- i. The date and time that the Acid Gas Flaring Incident started and ended. To the extent that the Acid Gas Flaring Incident involved multiple releases either within a twenty-four (24) hour period or within subsequent, contiguous, non-overlapping twenty-four (24) hour periods, Lion Oil shall set forth the starting and ending dates and times of each release;
- ii. An estimate of the quantity of sulfur dioxide that was emitted and the calculations that were used to determine that quantity;
- iii. The steps, if any, that Lion Oil took to limit the duration and/or quantity of sulfur dioxide emissions associated with the Acid Gas Flaring Incident;
- iv. A detailed analysis that sets forth the Root Cause and all contributing causes of that Acid Gas Flaring Incident, to the extent determinable;
- v. An analysis of the measures, if any, that are available to reduce the likelihood of a recurrence of an Acid Gas Flaring Incident resulting from the same Root Cause or contributing causes in the future. The analysis shall discuss the alternatives, if any, that are available, the probable effectiveness and cost of the alternatives, and whether or not an outside consultant should be retained to assist in the analysis. Possible design, operation and maintenance changes shall be evaluated. If Lion Oil concludes that corrective action(s) is (are) required under Paragraph 20.B, the report shall include a description of the action(s) and, if not already completed, a schedule for its (their) implementation, including proposed commencement and completion dates. If Lion Oil concludes that corrective action is not required under Paragraph 20.B, the report shall explain the basis for that conclusion;

- vi. A statement that: (a) specifically identifies each of the grounds for stipulated penalties in Paragraphs 20.C.i and 20.C.ii of this Decree and describes whether or not the Acid Gas Flaring Incident falls under any of those grounds; (b) if an Acid Gas Flaring Incident falls under Paragraph 20.C.iii of this Decree, describes which Paragraph (20.C.iii.a or 20.C.iii.b) applies and why; and (c) if an Acid Gas Flaring Incident falls under either Paragraph 20.C.ii or Paragraph 20.C.iii.b, states whether or not Lion Oil asserts a defense to the Flaring Incident, and if so, a description of the defense; and
- vii. To the extent that investigations of the causes and/or possible corrective actions still are underway on the due date of the report, a statement of the anticipated date by which a follow-up report fully conforming to the requirements of this Paragraph 20.A.iv and 20.A.v shall be submitted; provided, however, that if Lion Oil has not submitted a report or a series of reports containing the information required to be submitted under this Paragraph within the 45 day time period set forth in Paragraph 20.A (or such additional time as EPA may allow) after the due date for the initial report for the Acid Gas Flaring Incident, the stipulated penalty provisions of Paragraph 49 shall apply, but Lion Oil shall retain the right to dispute, under the dispute resolution provision of this Consent Decree, any demand for stipulated penalties that was issued as a result of Lion Oil's failure to submit the report required under this Paragraph within the time frame set forth. Nothing in this Paragraph shall be deemed to excuse Lion Oil from its investigation, reporting, and corrective action obligations under this Section for any Acid Gas Flaring Incident which occurs after an Acid Gas Flaring Incident for which Lion Oil has requested an extension of time under this Paragraph 20.B.
- viii. To the extent that completion of the implementation of corrective action(s), if any, is not finalized at the time of the submission of the report required under this Paragraph, then, by no later than thirty (30) days after completion of the implementation of corrective action(s), Lion Oil shall submit a report identifying the corrective action(s) taken and the dates of commencement and completion of implementation.

B. Corrective Action.

i. In response to any AG Flaring Incident, through and after termination of the Consent Decree Lion Oil shall take, as expeditiously as practicable, such interim and/or long-term corrective actions, if any, as are consistent with good engineering practice to minimize the likelihood of a recurrence of the Root Cause and all contributing causes of that AG Flaring Incident.

ii. If EPA does not notify Lion Oil in writing within thirty (30) days of receipt of the report(s) required by Paragraph 20.A that it objects to one or more aspects of the proposed

corrective action(s), if any, and schedule(s) of implementation, if any, then that (those) action(s) and schedule(s) shall be deemed acceptable for purposes of compliance with Paragraph 20.B.i of this Decree. EPA does not, however, by its consent to the entry of this Consent Decree or by its failure to object to any corrective action that Lion Oil may take in the future, warrant or aver in any manner that any corrective actions in the future shall result in compliance with the provisions of the Clean Air Act or its implementing regulations. Notwithstanding EPA's review of any plans, reports, corrective actions or procedures under this Paragraph 20, Lion Oil shall remain solely responsible for non-compliance with the Clean Air Act and its implementing regulations. Nothing in this Paragraph 20 shall be construed as a waiver of EPA's rights under the Clean Air Act and its regulations for future violations of the Act or its regulations.

iii. If EPA does object, in whole or in part, to the proposed corrective action(s) and/or the schedule(s) of implementation, or, where applicable, to the absence of such proposal(s) and/or schedule(s), it shall notify Lion Oil of that fact within thirty (30) days following receipt of the report(s) required by Paragraph 20.A above. If EPA and Lion Oil cannot agree on the appropriate corrective action(s), if any, to be taken in response to a particular Acid Gas Flaring Incident, either Party may invoke the Dispute Resolution provisions of Section XV of the Consent Decree.

iv. Nothing in Paragraph 20 shall be construed to limit the right of Lion Oil to take such corrective actions as it deems necessary and appropriate immediately following an Acid Gas Flaring Incident or in the period during preparation and review of any reports required under this Section.

C. Stipulated Penalties. The provisions of Paragraph 20.C are intended to implement the process outlined in the logic diagram attached hereto as Appendix F to this Consent Decree. These provisions shall be interpreted and construed, to the maximum extent feasible, to be consistent with that Attachment. However, in the event of a conflict between the language of Paragraph 20 and Appendix F, the language of this Paragraph shall control.

i. The stipulated penalty provisions of Paragraph 49.A. shall apply to any Acid Gas Flaring Incident for which the Root Cause was one or more of the following acts, omissions, or events:

- a. Error resulting from careless operation by the personnel charged with the responsibility for the Sulfur Recovery Plant, TGU, or Upstream Process Units;
- b. Failure to follow written procedures;
- c. A failure of equipment that is due to a failure by Lion Oil to operate and maintain that equipment in a manner consistent with good engineering practice; or
- d. Hydrocarbon carryover from an amine unit or a sour water stripper.

ii. If the Acid Gas Flaring Incident is not a result of one of the root causes identified in Paragraph 20C. i., then the stipulated penalty provisions of Paragraph 49.A. shall apply if the Acid Gas Flaring Incident:

- a. Results in emissions of sulfur dioxide at a rate greater than twenty (20.0) pounds per hour continuously for three (3) consecutive hours or more; or
- b. Causes the total number of Acid Gas Flaring Incidents in a rolling twelve (12) month period to exceed five (5).

In the event that a Flaring Incident falls under both Paragraph 20.C.i and Paragraph 20.C.ii, then Paragraph 20.C.i shall apply.

iii. With respect to any Acid Gas Flaring Incident not identified in Paragraph 20.C.i. or 20.C.ii., the following provisions shall apply:

- a. If the Root Cause of the Acid Gas Flaring Incident was sudden, infrequent, and not reasonably preventable through the exercise of good engineering practice, then that cause shall be designated as an agreed-upon malfunction for purposes of reviewing subsequent Acid Gas Flaring Incidents, and the stipulated penalty provisions of paragraph 49.A shall not apply;
- b. First Time: If the Root Cause of the Acid Gas Flaring Incident was not sudden and infrequent, but the Acid Gas Flaring Incident was reasonably preventable

through the exercise of good engineering practices then Lion Oil shall implement corrective action(s) pursuant to Paragraph 20.B.i., and the stipulated penalty provisions of paragraph 49.A shall not apply;

- c. Recurrence: If the Root Cause of the Acid Gas Flaring Incident is a recurrence of the same Root Cause that caused a previous Acid Gas Flaring Incident occurring after the Effective Date of this Consent Decree, unless the Root Cause of the previous Acid Gas Flaring Incident was designated as an agreed-upon Malfunction under Paragraph 20.C.iii.a., then the stipulated penalty provisions of paragraph 49.A shall apply.

iv. Defenses: Lion Oil may raise the following affirmative defenses in response to a demand by the United States for stipulated penalties:

- a. Force majeure.
- b. As to Paragraphs 20.C.i.a, 20.C.i.b, 20.C.i.c and 20.C.iii.c only, the Acid Gas Flaring Incident does not meet their identified criteria.
- c. As to Paragraph 20.C.i.d only, the Root Cause substantially differs from the Root Causes that caused Acid Gas Flaring Incidents between January 1, 1997 and December 31, 2002 and that are identified by Lion Oil prior to December 31, 2003.
- d. As to Paragraphs 20.C.ii. and 20.C.iii.c only, Malfunction.
- e. As to Paragraph 20.C.iii.c only, Lion Oil was in the process of timely developing or implementing a corrective action plan under Paragraph 20.B.i for the previous Acid Gas Flaring Incident.

In the event a dispute under Paragraph 20.C.ii. or 20.C.iii.c is brought to the Court pursuant to the dispute resolution provisions of this Consent Decree, Lion Oil may also assert a start up, shutdown and/or upset defense, but the United States shall be entitled to assert that such defenses are not available. If Lion Oil prevails in persuading the Court that the defenses of startup, shutdown, and upset are available for AG Flaring Incidents under 40 C.F.R. 60.104(a)(1), Lion Oil shall not be liable for stipulated penalties for emissions resulting from startup, shutdown or upset. If the United States prevails in persuading the Court that the defenses or startup, shutdown, or upset are not available, Lion Oil shall be liable for such stipulated penalties.

v. Other than for a Malfunction or force majeure, if no Acid Gas Flaring Incident and no violation of the emission limit under Paragraph 18 occurs at the El Dorado Refinery for a rolling 36 month period, then the stipulated penalty provisions of Paragraph 49.A no longer apply. EPA may elect to reinstate the stipulated penalty provision if Lion Oil has an Acid Gas Flaring Incident which would otherwise be subject to stipulated penalties. EPA's decision shall not be subject to dispute resolution. Once reinstated, the stipulated penalty provision shall continue for the remaining life of this Consent Decree for the El Dorado Refinery.

D. Miscellaneous.

i. Calculation of the Quantity of Sulfur Dioxide Emissions resulting from AG Flaring. For purposes of this Consent Decree, the quantity of SO₂ emissions resulting from AG Flaring shall be calculated by the following formula:

$$\text{Tons of SO}_2 = [\text{FR}][\text{TD}][\text{ConcH}_2\text{S}][8.44 \times 10^{-5}].$$

The quantity of SO₂ emitted shall be rounded to one decimal point. (Thus, for example, for a calculation that results in a number equal to 10.050 tons, the quantity of SO₂ emitted shall be rounded to 10.1 tons.) For purposes of determining the occurrence of, or the total quantity of SO₂ emissions resulting from, a AG Flaring Incident that is comprised of intermittent AG Flaring, the quantity of SO₂ emitted shall be equal to the sum of the quantities of SO₂ flared during each such period of intermittent AG Flaring.

ii. Calculation of the Rate of SO₂ Emissions During AG Flaring. For purposes of this Consent Decree, the rate of SO₂ emissions resulting from AG Flaring shall be expressed in terms of pounds per hour, and shall be calculated by the following formula:

$$\text{ER} = [\text{FR}][\text{ConcH}_2\text{S}][0.169].$$

The emission rate shall be rounded to one decimal point. (Thus, for example, for a calculation that results in an emission rate of 19.95 pounds of SO₂ per hour, the emission rate shall be

rounded to 20.0 pounds of SO₂ per hour; for a calculation that results in an emission rate of 20.05 pounds of SO₂ per hour, the emission rate shall be rounded to 20.1.)

iii. Meaning of Variables and Derivation of Multipliers used in the Equations in Paragraph 20.D.i-ii:

ER =	Emission Rate in pounds of SO ₂ per hour
FR =	Average Flow Rate to Flaring Device(s) during Flaring, in standard cubic feet per hour
TD =	Total Duration of Flaring in hours
ConcH ₂ S =	Average Concentration of Hydrogen Sulfide in gas during Flaring (or immediately prior to Flaring if all gas is being flared) expressed as a volume fraction (scf H ₂ S/scf gas)
8.44×10^{-5} =	$[\text{lb mole H}_2\text{S}/379 \text{ scf H}_2\text{S}][64 \text{ lbs SO}_2/\text{lb mole H}_2\text{S}][\text{Ton}/2000 \text{ lbs}]$
0.169 =	$[\text{lb mole H}_2\text{S}/379 \text{ scf H}_2\text{S}][1.0 \text{ lb mole SO}_2/1 \text{ lb mole H}_2\text{S}][64 \text{ lb SO}_2/1.0 \text{ lb mole SO}_2]$

The flow of gas to the AG Flaring Device(s) (“FR”) shall be as measured by the relevant flow meter or reliable flow estimation parameters. Hydrogen sulfide concentration (“ConcH₂S”) shall be determined from the Sulfur Recovery Plant feed gas analyzer, from knowledge of the sulfur content of the process gas being flared, by direct measurement by tutwiler or draeger tube analysis or by any other method approved by EPA or the ADEQ. In the event that any of these data points is unavailable or inaccurate, the missing data point(s) shall be estimated according to best engineering judgment. The report required under Paragraph 20.A.i. shall include the data used in the calculation and an explanation of the basis for any estimates of missing data points.

E. Tail Gas Incidents.

i. Investigation, Reporting, Corrective Action and Stipulated Penalties. For Tail Gas Incidents, Lion Oil shall follow the same investigative, reporting, corrective action and assessment of stipulated penalty procedures as those outlined in Paragraphs 20.A - 20.C for Acid Gas Flaring Incidents. Those procedures shall be applied to TGU shutdowns, bypasses of a

TGU, unscheduled shutdowns of a Sulfur Recovery Plant, or other miscellaneous unscheduled Sulfur Recovery Plant events which result in a Tail Gas Incident. The investigative and corrective action procedures are applicable through and after termination of the Consent Decree.

ii. **Calculation of the Quantity of SO₂ Emissions resulting from a Tail Gas**

Incident: For the purposes of this Consent Decree, the quantity of SO₂ emissions resulting from a Tail Gas Incident shall be calculated by one of the following methods, based on the type of event:

- a. If the Tail Gas Incident is combusted in a flare the SO₂ emissions are calculated using the methods outlined in Paragraph 20.D.; or
- b. If the Tail Gas Incident is a event exceeding the 250 ppmvd (NSPS J limit), from a monitored Sulfur Recovery Plant incinerator, then the following formula applies:

$$ER_{TGI} = \frac{TD_{TGI}}{24} \cdot \prod_{i=1} \left[FR_{Inc.} \right]_i \left[Conc. SO_2 - 250 \right]_i \left[0.169 \times 10^{-6} \right] \left[\frac{20.9 - \% O_2}{20.9} \right]_i$$

Where:

ER_{TGI} = Emissions from Tail Gas at the Sulfur Recovery Plant incinerator, SO₂ lb over a 24 hour period

TD_{TGI} = Total Duration (number of hours) when the incinerator CEMS exceeded 250 ppmvd SO₂ corrected to 0% O₂ on a rolling twelve hour average, in each 24 hour period of the Incident

i = Each hourly average

$FR_{Inc.}$ = Incinerator Exhaust Gas Flow Rate (standard cubic feet per hour, dry basis) (actual stack monitor data or engineering estimate based on the acid gas feed rate to the SRP) for each hour of the Incident

$Conc. SO_2$ = Each actual 12 hour rolling average SO₂ concentration (CEMS data) that is greater than 250 ppm in the incinerator exhaust gas, ppmvd corrected to 0% O₂, for each hour of the Incident

$\% O_2$ = O₂ concentration (CEMS data) in the incinerator exhaust gas in volume % on dry basis for each hour of the Incident

$$0.169 \times 10^{-6} = \left[\text{lb mole of } SO_2 / 379 SO_2 \right] \left[64 \text{ lbs } SO_2 / \text{lb mole } SO_2 \right] \left[1 \times 10^{-6} \right]$$

Standard conditions = 60 degree F; 14.7 lb_{force}/sq.in. absolute

In the event the concentration SO₂ data point is inaccurate or not available or a flow meter for FR_{Inc} does not exist or is inoperable, then estimates will be used based on best engineering judgment.

21. Control of Hydrocarbon Flaring Incidents. Lion Oil will identify the causes of HC Flaring Incidents that occurred between January 1, 1997 and December 31, 2002 at the El Dorado Refinery. Lion Oil has installed a flare gas recovery system and has implemented (or is in the process of identifying and implementing) corrective actions to minimize the number and duration of HC Flaring Incidents. For future Hydrocarbon Flaring Incidents, Lion Oil shall follow the same investigative, reporting, and corrective action procedures as those outlined in Paragraphs 20.A - 20.B for Acid Gas Flaring Incidents; provided however, that in lieu of analyzing possible corrective actions under Paragraph 20.A.v and taking interim and/or long-term corrective action under Paragraph 20.B.i for a Hydrocarbon Flaring Incident attributable to the start up or shut down of a unit that Lion Oil has previously analyzed under this Paragraph 21, Lion Oil may identify such prior analysis when submitting the report required under this Paragraph 21. Stipulated penalties under either Paragraphs 20.C and 49 shall not apply to Hydrocarbon Flaring Incident(s). The formulas at Paragraph 20.D, used for calculating the quantity and rate of sulfur dioxide emissions during AG Flaring Incidents, shall be used to calculating the quantity and rate of sulfur dioxide emissions during HC Flaring Incidents. The investigative and corrective action procedures (only) are applicable through and after termination of the Consent Decree.

22. Benzene Waste NESHAP Program Enhancements.

In addition to continuing to comply with all applicable requirements of 40 C.F.R. Part 61, Subpart FF (“Benzene Waste NESHAP” or “Subpart FF”), Lion Oil agrees to undertake, at the El Dorado Refinery, the measures set forth in Paragraphs 22.B through 22.N to ensure continuing compliance with Subpart FF and to minimize or eliminate fugitive benzene waste emissions.

A. Current Compliance Status. As of the Date of Lodging of this Consent Decree, Lion Oil believes that the El Dorado Refinery has a Total Annual Benzene (“TAB”) of less than 10 Mg/yr. Lion Oil will review and verify the TAB at the El Dorado Refinery consistent with the requirements of Paragraph 22.C.

B. Refinery Compliance Status Changes. If at any time from the Date of Lodging of the Consent Decree until its termination, the El Dorado Refinery is determined to have a TAB equal to or greater than 10 Mg/yr, Lion Oil shall comply with the compliance option set forth at 40 C.F.R. § 61.342(e) (hereinafter referred to as the “6 BQ compliance option”).

C. One-Time Review and Verification of the El Dorado Refinery’s TAB.

i. **Phase One of the Review and Verification Process.** By no later than September 30, 2003, Lion Oil shall complete a review and verification of the TAB of the El Dorado Refinery. For the El Dorado Refinery, the review and verification process shall include, but is not limited to: (i) an identification of each waste stream that is required to be included in the El Dorado Refinery’s TAB (e.g., slop oil, tank water draws, spent caustic, desalter rag layer dumps, desalter vessel process sampling points, other sample wastes, maintenance wastes, and turnaround wastes); (ii) a review and identification of the calculations and/or measurements used to determine the flows of each waste stream for the purpose of ensuring the accuracy of the annual waste quantity for each waste stream; (iii) an identification of the benzene concentration in each waste stream, including sampling for benzene concentration at no less than 10 waste streams consistent with the requirements of 40 C.F.R. § 61.355(c)(1) and (3); provided however, that previous analytical data or documented knowledge of waste streams may be used, 40 C.F.R.

§ 61.355(c)(2), for streams not sampled; and (iv) an identification of whether or not the stream is controlled consistent with the requirements of Subpart FF. By no later than sixty (60) days following the completion of Phase One of the review and verification process, Lion Oil shall submit a Benzene Waste NESHAP Compliance Review and Verification report (“BWN Compliance Review and Verification Report”) that sets forth the results of Phase One, including but not limited to the items identified in (i) through (iv) of this Paragraph 22.C.i.

ii. Phase Two of the Review and Verification Process. Based on EPA’s review of the BWN Compliance Review and Verification Report(s), EPA may select up to 20 additional waste streams at the El Dorado Refinery for sampling for benzene concentration. Lion Oil will conduct the required sampling and submit the results to EPA within ninety (90) days of receipt of EPA’s request. Lion Oil will use the results of this additional sampling to recalculate the TAB and to amend the BWN Compliance Review and Verification Report, as needed. To the extent that EPA requires Lion Oil to re-sample a Phase One waste stream as part of this Phase Two review, Lion Oil may average the results of the two sampling events. Lion Oil shall submit an amended BWN Compliance Review and Verification Report within ninety (90) days following the date of the completion of the required Phase Two sampling, if Phase Two sampling is required by EPA.

D Implementation of Actions Necessary to Correct Non-Compliance.

i. Amended TAB Reports. If the results of the BWN Compliance Review and Verification Report(s) indicate(s) that the El Dorado Refinery has failed to file the reports required by 40 C.F.R. § 61.357(c), or that the El Dorado Refinery’s most recently-filed report is inaccurate and/or does not satisfy the requirements of Subpart FF, Lion Oil shall submit, by no later than sixty (60) days after completion of the BWN Compliance Review and Verification Report(s), an amended TAB report to the Applicable State Agency. Lion Oil’s BWN Compliance Review and Verification Report(s) shall be deemed an amended TAB report for purposes of Subpart FF reporting to EPA.

ii. If the results of the BWN Compliance Review and Verification Report indicate that the El Dorado Refinery has a TAB of over 10 Mg/yr, Lion Oil shall submit to the Applicable Federal and State Agencies by no later than 180 days after completion of the BWN Compliance Review and Verification Report, a plan that identifies with specificity the compliance strategy and schedule that Lion Oil will implement to ensure that the El Dorado Refinery complies with the 6 BQ compliance option as soon as practicable.

iii. Review and Approval of Plans Submitted Pursuant to Paragraph 22.D.ii. Any plan submitted pursuant to Paragraph 22.D.ii shall be subject to the approval of, disapproval of, or modification by EPA, which shall act in consultation with the Applicable State Agency. Within sixty (60) days after receiving any notification of disapproval or request for modification from EPA, Lion Oil shall submit to the Applicable Federal and State Agencies a revised plan that responds to all identified deficiencies. Upon receipt of approval or approval with conditions, Lion Oil shall implement the plan. Disputes arising under this Paragraph 22.D.iii. shall be resolved in accordance with the dispute resolution provisions of this Decree.

iv. Certification of Compliance with the 6 BQ Compliance Option. By no later than thirty (30) days after completion of the implementation of all actions, if any, required pursuant to Paragraph 22.D.ii or pursuant to Paragraph 22.J.vi to come into compliance with the 6 BQ Compliance Option, Lion Oil shall submit a report to the Applicable Federal and State Agencies that, as to the Refinery, the Refinery complies with the Benzene Waste NESHAP.

E. Annual Program. Lion Oil shall establish an annual program of reviewing process information for the El Dorado Refinery, including but not limited to construction projects, to ensure that all new benzene waste streams are included in the El Dorado Refinery's waste stream inventory.

F. Benzene Spills. For each spill at the El Dorado Refinery, Lion Oil shall review such spills to determine if benzene waste was generated. Lion Oil shall include benzene generated by such spills in the TAB for the El Dorado Refinery.

G. Training.

i. If and when the El Dorado's TAB reaches 1 Mg/yr or more, then by no later than 180 days from the receipt of the information showing that the El Dorado Refinery's TAB has reached or exceeded 1 Mg/yr, Lion Oil shall develop and begin implementation of annual (i.e., once each calendar year) training for all employees asked to draw benzene waste samples.

ii. If and when the El Dorado Refinery's TAB reaches 10 Mg/yr or more, Lion Oil shall complete the development of standard operating procedures for all control equipment used to comply with the Benzene Waste NESHAP. Lion Oil shall complete an initial training program regarding these procedures for all operators assigned to this equipment. Comparable training shall be provided to any persons who subsequently become operators, prior to their assumption of this duty. "Refresher" training shall be performed on a periodic basis. Lion Oil shall propose a schedule for the initial and refresher training at the same time that Lion Oil proposes a plan, pursuant to either Paragraph 22.D.ii, or Paragraph 22.J.vi, that identifies the compliance strategy and schedule that Lion Oil will implement to come into compliance with the 6 BQ compliance option.

iii. As part of Lion Oil's training program, they must ensure that the employees of any contractors hired to perform the requirements of this Paragraph are properly trained to implement all provisions of this Paragraph at the El Dorado Refinery.

H. Waste/Slop/Off-Spec Oil Management.

i. By no later than June 30, 2003, Lion Oil shall submit to the Applicable Federal and State Agencies, for the El Dorado Refinery, schematics that: (a) depict the waste management units (including sewers) that handle, store, and transfer waste/slop/off-spec oil streams; (b) identify the control status of each waste management unit; and (c) show how such oil is transferred within the Refinery. Representatives from Lion Oil and EPA thereafter shall confer about the appropriate characterization of the Refinery's waste/slop/off-spec oil streams for the waste management units handling such oil streams, for purposes of the El Dorado

Refinery's TAB calculation. At a mutually-agreed upon time, Lion Oil shall submit, if necessary, revised schematics that reflect the agreements between EPA and Lion Oil regarding the characterization of these oil streams and the appropriate control standards.

ii. Organic Benzene Waste Streams. If and when the El Dorado Refinery's TAB reaches 10 Mg/yr and a compliance strategy is approved, all waste management units handling "organic" benzene wastes, as defined in Subpart FF, shall meet the applicable control standards of Subpart FF. If, as a result of the discussions between the EPA and Lion Oil, pursuant to Paragraph 22.H.i, EPA and Lion Oil agree that controls not already in place are necessary on any waste management unit handling organic benzene wastes, the Parties shall agree, in writing, to a schedule, not to exceed two years, for the completion of the installation of the necessary controls.

iii. Aqueous Benzene Waste Streams. For purposes of calculating the El Dorado Refinery's TAB pursuant to the requirements of 40 C.F.R. § 61.342(a), Lion Oil shall include all waste/slop/off-spec oil streams that become "aqueous" until such streams are recycled to a process or put into a process feed tank (unless the tank is used primarily for the storage of wastes). If and when the El Dorado Refinery's TAB reaches 10 Mg/yr, then, for purposes of complying with the 6BQ compliance option, all waste management units handling aqueous benzene waste streams shall either meet the applicable control standards of Subpart FF or shall have their uncontrolled benzene quantity count toward the applicable 6 megagram limit.

iv. Plan to Quantify Uncontrolled Waste/Slop/Off-Spec Oil Streams. By no later than ninety (90) days after EPA has approved the schematics (revised if necessary) required under Paragraph 22.H.i., Lion Oil shall submit, for the El Dorado Refinery, a plan(s) to quantify waste/slop/off-spec oil movements for all benzene waste streams which are not controlled. EPA will review the plan and may recommend revisions consistent with Subpart FF. Upon plan approval, Lion Oil shall maintain records quantifying such movements.

v. Disputes under this Paragraph 22.H. shall be resolved in accordance with the dispute resolution provisions of this Consent Decree.

I. End of Line Sampling (If the El Dorado Refinery is Found to Have a TAB of 10 Mg/yr or More).

The provisions of this Paragraph 22.I shall apply after the El Dorado Refinery's TAB reaches or exceeds 10 Mg/yr and after the El Dorado Refinery has completed implementation of an approved compliance plan submitted pursuant to either Paragraph 22.D.ii, or Paragraph 22.J.vi. The provisions shall continue to apply until termination ("Applicability Dates for Paragraph 22.I.").

i. By no later than sixty (60) days after the certification required by Paragraph 22.D.iv, Lion Oil shall submit to EPA for approval a plan(s) for an "end of the line" ("EOL") determination of the benzene quantity in uncontrolled waste streams. A copy of this plan shall be submitted to the Applicable State Agency. The proposed plan of Lion Oil, as applicable, shall include, but not be limited to, sampling locations, methods for flow calculations, and the assumed volatilization rate(s) to be used in calculating the uncontrolled benzene quantity. Any disputes regarding plan approval under this Paragraph 22.I. shall be resolved in accordance with the dispute resolution provisions of the Consent Decree.

ii. If, during the Applicability Dates for Paragraph 22.I, changes in processes, operations, or other factors lead Lion Oil, as applicable, to conclude that the approved sampling locations, approved methods for determining flow calculations, and/or assumed volatilization rates no longer provide an accurate measure of the El Dorado Refinery's EOL benzene quantity, Lion Oil shall submit a revised plan to EPA for approval. A copy of this revised plan also shall be provided to the Applicable State Agency.

iii. On a monthly basis, Lion Oil shall conduct EOL sampling, commencing during the first month of the first full calendar quarter after Lion Oil receives written approval from EPA of the sampling plan for the El Dorado Refinery. Lion Oil shall take, and have analyzed, three

representative samples from each approved sampling location. Lion Oil shall use the average of these three samples as the benzene concentration for the stream at the approved location. Based on the EOL monthly sampling results, the approved flow calculations, and the volatilization assumptions, Lion Oil shall calculate the sum of the EOL benzene quantity for the three months contained within the respective quarter. Nothing in this Paragraph 22.I shall preclude Lion Oil from taking representative samples more frequently within any calendar month, provided that Lion Oil identifies the basis for the additional samples. Such samples shall be included in calculating the average monthly EOL benzene quantity.

iv. If the sum of the EOL benzene quantity for the three month period contained within a quarter equals or exceeds 1.2 Mg, Lion Oil shall take and have analyzed three representative samples, drawn on separate days during the subsequent calendar quarter, of each uncontrolled stream containing benzene over 0.05 Mg/yr, as identified in the later of (i) the final BWN Compliance Review and Verification Report; or (ii) the most recently submitted TAB report (hereinafter “Sampling of >0.05 Streams”). Lion Oil shall undertake Sampling of >0.05 Streams for the purpose of trying to identify the cause or source of the potentially elevated benzene quantities.

v. Lion Oil shall continue to undertake Sampling of >0.05 Streams in the second quarter after the EOL benzene quantity exceeded 1.2 Mg unless either: (i) the EOL benzene quantity in the first quarter of the Sampling of > 0.05 Streams demonstrates that the El Dorado Refinery’s EOL benzene quantity, prorated on a yearly basis, will be below 4.8 Mg/yr; or (ii) Lion Oil discovers and corrects the cause of the potentially elevated benzene quantities and EPA concurs in the diagnosis and corrective measures of Lion Oil.

vi If the sum of the EOL benzene quantity for two consecutive quarters indicates that the EOL benzene quantity, prorated on a yearly basis, will exceed 4.8 Mg/yr, and Lion Oil has not discovered and corrected the cause of the potentially elevated benzene through the process of Sampling of >0.05 Streams, Lion Oil shall take and have analyzed three

representative samples, drawn on separate days during the third calendar quarter, of each uncontrolled stream containing benzene over 0.03 Mg/yr, as identified in the later of (i) the final BWN Compliance Review and Verification Report; or (ii) most recently submitted TAB report (hereinafter “Sampling of > 0.03 Streams”). Lion Oil shall undertake Sampling of >0.03 Streams for the purpose of continuing to try to identify the cause or source of the potentially elevated benzene quantities.

vii. Sampling of >0.05 and/or >0.03 Streams shall not be required if Lion Oil advises EPA, and EPA concurs, that the potentially elevated benzene quantities can be attributed to an identifiable event, such as a spill to the sewer or a turnaround. After such an identifiable event, however, Lion Oil shall calculate its projected uncontrolled benzene quantity for the calendar year in which the event occurs. If that projection is greater than 6 mg/yr, then Lion Oil shall submit to EPA for approval a plan that either (a) identifies with specificity the compliance strategy and schedule that Lion Oil will implement to ensure that the El Dorado Refinery does not exceed 6 Megagrams of uncontrolled benzene for the calendar year; or (b) if as a result of the quantity of benzene released during the event Lion Oil is unable to propose a plan to ensure that the El Dorado Refinery’s uncontrolled benzene for the calendar year will be 6 Megagrams or less, then Lion Oil shall identify the actions to be taken to minimize the uncontrolled benzene for the remainder of the year. A copy of this plan shall be submitted to the Applicable State Agency. Lion Oil shall submit this plan within thirty (30) days after the end of the quarter which resulted in a projection of greater than 6 Mg/yr of uncontrolled benzene. Sampling of >0.05 and/or >0.03 Streams shall not excuse Lion Oil from continuing to take monthly EOL samples.

viii. If in three consecutive quarters (a) the sum of the benzene quantity indicates that the EOL benzene quantity, prorated on a yearly basis, will exceed 4.8 Mg; or (b) the sampling of >0.05 and/or >0.03 streams indicates that projected uncontrolled benzene for the calendar year will exceed 6 Megagrams, and Lion Oil has not discovered and corrected, with EPA’s concurrence, the cause of the potentially elevated benzene through the process of

Sampling of >0.05 and >0.03 Streams, then, in the fourth quarter, Lion Oil shall retain a third party contractor to undertake a comprehensive TAB study and compliance review (“Third-Party TAB Study and Compliance Review”). By no later than the last day of the fourth quarter, Lion Oil shall submit a proposal to the Applicable Federal and State Agencies that identifies the contractor, the contractor’s scope of work, and the contractor’s schedule for the Third-Party TAB Study and Compliance Review. Unless, within thirty (30) days after EPA receives this proposal, EPA disapproves or seeks modifications, Lion Oil shall authorize the contractor to commence work. By no later than thirty (30) days after Lion Oil receives the results of the Third-Party TAB Study and Compliance Review, Lion Oil shall submit the results to the Applicable Federal and State Agencies. EPA, the Applicable State Agency, Lion Oil subsequently shall discuss informally the results of the Third-Party TAB Study and Compliance Review. By no later than one-hundred twenty (120) days after Lion Oil receives the results of the Third-Party TAB Study and Compliance Review, or such other time as Lion Oil and EPA may agree, Lion Oil shall submit to EPA for approval a plan that addresses any deficiencies identified in the Third-Party TAB Study and Compliance Review and any deficiencies that EPA brought to the attention of Lion Oil as a result of the Third-Party TAB Study and Compliance Review. A copy of this plan shall be submitted to the Applicable State Agency. The review and approval of this Plan shall be done in accordance with Paragraph 22.D.iii of this Decree. Certification of Compliance shall be done in accordance with Paragraph 22.D.iv.

J. End of Line Sampling (TAB is equal to or greater than 1 Mg/yr but less than 10 Mg/yr). The provisions of this Paragraph 22.J shall apply from the date that the final BWN Compliance Review and Verification Report submitted for the El Dorado Refinery pursuant to Paragraph 22.C shows that the El Dorado Refinery’s TAB is equal to or greater than 1 Mg/yr but less than 10 Mg/yr, through the earlier of: (1) the time that the El Dorado Refinery reaches a TAB of 10 Mg/yr or more (in which case, the provisions of Paragraph 22.I shall begin to apply); or (2) termination of the Consent Decree.

i. Lion Oil shall once per calendar year, conduct sampling, consistent with the requirements of 40 C.F.R. § 61.355(c)(1) and (3), of all waste streams containing benzene that contributed 0.05 Mg/yr or more to the TAB set forth in the final BWN Compliance Review and Verification Report or in the previous year's TAB, whichever is later;

ii. By no later than ninety (90) days after the date of submitting the final BWN Compliance Review and Verification Report, representatives from EPA and the Applicable State Agency shall meet at the El Dorado Refinery with representatives from Lion Oil for the purpose of identifying an appropriate procedure for conducting EOL sampling and measuring EOL benzene quantities at the El Dorado Refinery. EPA, the Applicable State Agency, and Lion Oil shall confer about potential EOL sample locations and shall review process and flow information and oil movement transfers. By no later than sixty (60) days after EPA and the Applicable State Agency have met with Lion Oil at the El Dorado Refinery, Lion Oil shall submit a plan to EPA for approval that contains proposed sampling locations and methods for flow calculations to be used in the EOL determination of benzene quantity. A copy of this plan shall be submitted to the Applicable State Agency. Any disputes regarding plan approval under this Paragraph 22.J shall be resolved in accordance with the dispute resolution provisions of this Consent Decree. If, during the life of this Consent Decree, changes in processes, operations, or other factors lead Lion Oil to conclude that either the approved sampling locations and/or the approved methods for determining flow calculations no longer provide an accurate measure of the El Dorado Refinery's EOL benzene quantity, Lion Oil shall submit a revised plan to EPA for approval. A copy of this revised plan also shall be submitted to the Applicable State Agency.

iii. On a quarterly basis, Lion Oil shall conduct an EOL determination of benzene quantity, commencing in the first full calendar quarter after Lion Oil receives written approval from EPA of the sampling plan for the El Dorado Refinery. Lion Oil shall take, and have analyzed, at least three representative samples from each approved sampling location. Lion Oil

shall use the average of these three samples as the benzene concentration for the stream at the approved location. Based on the EOL quarterly sampling results and the approved flow calculations, Lion Oil shall calculate the quarterly EOL benzene quantity.

iv. If the quarterly EOL benzene quantity exceeds 2.5 Mg, Lion Oil shall submit to the Applicable Federal and State Agencies a plan that identifies with specificity the actions that Lion Oil shall take, and the schedule for such actions, to ensure that the TAB for the El Dorado Refinery does not exceed 10 Mg in the calendar year.

v. On a quarterly basis, Lion Oil shall also calculate a projected calendar year TAB, utilizing all EOL results for that calendar year and any other information (such as process turnarounds) to undertake the projection. If the projected calendar year calculation of the TAB at a El Dorado Refinery equals or exceeds 10 Mg, Lion Oil shall submit to the Applicable Federal and State Agencies a plan that identifies with specificity the actions that Lion Oil shall take, and the schedule for such actions, to ensure that the TAB for the El Dorado Refinery does not exceed 10 Mg in the calendar year. Lion Oil shall submit this plan within thirty (30) days after the end of the quarter which resulted in a projection of greater than 10 Mg.

vi. If it appears that appropriate actions cannot be taken to ensure that the El Dorado Refinery maintains a TAB of under 10 Mg/yr, then Lion Oil shall retain a third party contractor to undertake a comprehensive TAB study and compliance review (“Third-Party TAB Study and Compliance Review”). At a mutually agreed upon date, Lion Oil shall submit a proposal to the Applicable Federal and State Agencies that identifies the contractor, the contractor’s scope of work, and the contractor’s schedule for the Third-Party TAB Study and Compliance Review. Unless, within thirty (30) days after EPA receives this proposal, EPA disapproves or seeks modifications, Lion Oil, as applicable, shall authorize the contractor to commence work. By no later than sixty (60) days after Lion Oil receives the results of the Third-Party TAB Study and Compliance Review, Lion Oil shall submit the results to the Applicable Federal and State Agencies. EPA, the Applicable State Agency, and Lion Oil

subsequently shall discuss informally the results of the Third-Party TAB Study and Compliance Review. By no later than 120 days after Lion Oil receives the results of the Third-Party TAB Study and Compliance Review, or such other time as Lion Oil and EPA may agree, Lion Oil shall submit to EPA for approval a plan that identifies with specificity the compliance strategy and schedule that Lion Oil will implement to ensure that the El Dorado Refinery complies with the 6BQ compliance option as soon as practicable. A copy of this Plan shall be submitted to the Applicable State Agency. The review and approval of this Plan shall be done in accordance with Paragraph 22.D.iii of this Decree. Certification of Compliance shall be done in accordance with Paragraph 22.D.iv.

K. Miscellaneous Measures.

i. Lion Oil, as and to the extent applicable, shall comply with the Benzene Waste NESHAP provisions applicable to groundwater remediation conveyance systems if its Refinery has such a system.

ii. The provisions of this Paragraph 22.K.ii shall apply after the El Dorado Refinery's TAB reaches or exceeds 10 Mg/yr (if prior to termination of the Consent Decree) and after the El Dorado Refinery has completed implementation of an approved compliance plan submitted pursuant to either Paragraph 22.D.ii or Paragraph 22.J.vi. The provisions shall continue to apply until termination of the Consent Decree. Lion Oil shall:

- a. Conduct monthly visual inspections of all water traps within the El Dorado Refinery's individual drain systems; and
- b. On a weekly basis, visually inspect all conservation vents or indicators on process sewers for detectable leaks; reset any vents where leaks are detected; and record the results of the inspections. After two (2) years of weekly inspections, and based upon an evaluation of the recorded results, Lion Oil may submit a request to the applicable EPA Region to modify the frequency of the inspections. EPA shall not unreasonably withhold its consent. Nothing in this Paragraph 22.K.ii.b. shall require Lion Oil to monitor conservation vents on fixed roof tanks.

iii. From the date that the final BWN Compliance Review and Verification Report submitted for the El Dorado Refinery pursuant to Paragraph 22.C shows that the El Dorado Refinery's TAB is equal to or greater than 1 Mg/yr but less than 10 Mg/yr, and through termination of this Consent Decree, Lion Oil shall identify and mark all area drains that are segregated stormwater drains.

L. Projects/Investigations.

Unless and until the TAB of the El Dorado Refinery reaches or exceeds 10 Mg/yr (or the Consent Decree is terminated), Lion Oil will not be required to undertake any projects or any investigations relating to the Benzene Waste NESHAP other than those required in Paragraphs 22.C - 22.K. Within 60 days of receipt of information indicating that the TAB of the El Dorado Refinery has reached or exceeded 10 Mg/yr, EPA and Lion Oil shall meet and confer to discuss and establish an appropriate project or investigation relating to the Benzene Waste NESHAP.

M. Recordkeeping and Reporting Requirements for this Paragraph

i. **Outside of the Reports Required under 40 C.F.R. § 61.357 and under the Quarterly Progress Report Procedures of Section IX (Recordkeeping and Reporting).** At the times specified in the applicable provisions of this Paragraph, Lion Oil shall submit, as and to the extent required, the following reports to the Applicable Federal and State Agencies:

- a. BWN Compliance Review and Verification Report (§ 22.C.i.), as amended, if necessary (§ 22.C.ii.);
- b. Amended TAB Report, if necessary (§ 22.D.i.);
- c. Plan for the El Dorado Refinery to come into compliance with the 6 BQ compliance option upon discovering that its TAB equals or exceeds 10 Mg/yr through the BWN Compliance Review and Verification Report (§ 22.D.ii.), or the Third-Party TAB Study and Compliance Review that may result from EOL sampling (§ 22.J.vi);
- d. Compliance certification, if necessary (§ 22.D.iv.);

- e. Schematics of waste/slop/off-spec oil movements (§ 22.H.i.), as revised, if necessary (§ 22.H.i.);
- f. Schedule to complete implementation of controls on waste management units handling organic benzene waste, if necessary (§ 22.H.ii.);
- g. Plan to quantify uncontrolled waste/slop/off-spec oil movements (§ 22.H.iv.)
- h. EOL Sampling Plans (§§ 22.I.i., 22.J.ii.), and revised EOL Sampling Plans, if necessary (§§ 22.I.ii., 22.J.ii.);
- i. Plan, if necessary, to ensure that uncontrolled benzene does not equal or exceed, as applicable, 6 or 10 Mg/yr -- or is minimized -- based on projected calendar year uncontrolled benzene quantities as determined through EOL sampling (§§ 22.I.vii., 22.J.iv.-v.)
- j. Proposal for a Third-Party TAB Study and Compliance Review, if necessary (§§ 22.I.viii., 22.J.vi.);
- k. Third-Party TAB Study and Compliance Review, if necessary (§§ 22.I.viii., 22.J.vi.);
- l. Plan to implement the results of the Third-Party TAB Study and Compliance Review, if necessary (§§ 22.I.viii., 22.J.vi.);

ii. As part of the Reports Required under the Quarterly Progress Report

Procedures of Section IX (Recordkeeping and Reporting).

a. TAB is equal to or greater than 1 Mg/yr but less than 10 Mg/yr. From the date that the final BWN Compliance Review and Verification Report submitted for the El Dorado Refinery pursuant to Paragraph 22.C shows that the El Dorado Refinery's TAB is equal to or greater than 1 Mg/yr but less than 10 Mg/yr, until the earlier of: (1) the time that the El Dorado Refinery reaches a TAB of 10 Mg/yr or more (in which case, the provisions of Paragraph 22.M.ii.b shall begin to apply); or (2) termination of the Consent Decree, Lion Oil shall submit the following information in Quarterly Progress Reports pursuant to the requirements of Section IX of this Consent Decree:

- (1) A description of the measures that it/they took to comply with the training provisions of Paragraph 22;

- (2) The annual, non-EOL sampling required at the El Dorado Refinery pursuant to the requirements of Paragraph 22.J.i (this information shall be submitted in the first quarterly progress report for the first calendar quarter of each year);
- (3) The results of the quarterly EOL sampling undertaken pursuant to Paragraph 22.J.iii. for the calendar quarter. The report shall include a list of all waste streams sampled, the results of the benzene analysis for each sample, and the computation of the EOL benzene quantity for the respective quarter. The El Dorado Refinery shall identify whether the quarterly benzene quantity equals or exceeds 2.5 Mg and whether the projected calendar year benzene quantity equals or exceeds 10 Mg. If either condition is met, the El Dorado Refinery shall include in the quarterly report the plan required pursuant to Paragraph 22.J.iv and/or 22.J.v., and shall specifically seek EPA's concurrence in the plan.

b. TAB is 10 Mg/yr or More. The provisions of this Paragraph 22.M.ii.b shall apply after a El Dorado Refinery's TAB reaches or exceeds 10 Mg/yr (if this occurs prior to termination of the Consent Decree) and after the El Dorado Refinery has completed implementation of an approved compliance plan submitted pursuant to either Paragraph 22.D.ii, or Paragraph 22.J.vi. The provisions shall continue to apply until termination. Lion Oil shall submit the following information in Quarterly Progress Reports pursuant to the requirements of Section IX of this Consent Decree:

- (1) A description of the measures that it/they took to comply with the training provisions of Paragraph 22;
- (2) The results of the three months of monthly EOL sampling undertaken pursuant to Paragraph 22.I.iii. for the calendar quarter. The report shall include a list of all waste streams sampled, the results of the benzene analysis for each sample, and the computation of the EOL benzene quantity for the three months contained within the respective quarter;
- (3) If the quarter is one in which Lion Oil is required to undertake Sampling of >0.05 Streams or Sampling of >0.03 Streams at the El Dorado Refinery, Lion Oil also shall: (A) submit the results of those sampling events; (B) describe the actions that Lion Oil is taking to identify and correct the source of the potentially elevated benzene quantities; and (C) to the extent that Lion Oil identifies actions to correct the potentially elevated benzene quantities, specifically seek EPA's concurrence with the proposal of Lion Oil.

iii. A summary of the reports, plans, and certifications due under the provisions of Paragraph 22 is attached as Appendix G to this Consent Decree.

N. Agencies to Receive Reports, Plans and Certifications Required in the Paragraph; Number of Copies. Lion Oil shall submit all reports, plans and certifications required to be submitted under this Paragraph to the Applicable Federal and State Agencies. For each submission, Lion Oil shall submit two copies to EPA, to the applicable Region, and to the Applicable State Agency. By agreement between each of the offices that are to receive the materials in this Paragraph and Lion Oil the materials may be submitted electronically.

23. Leak Detection and Repair (“LDAR”) Program Enhancements.

In order to minimize or eliminate fugitive emissions of volatile organic compounds (“VOCs”), benzene, volatile hazardous air pollutants (“VHAPs”), and organic hazardous air pollutants (“HAPs”) from equipment in light liquid and/or in gas/vapor service, Lion Oil shall undertake at the El Dorado Refinery the enhancements at Paragraph 23.A through Paragraph 23.P to the El Dorado Refinery’s LDAR program under Title 40 of the Code of Federal Regulations, Part 60, Subpart GGG; Part 61, Subparts J and V; Part 63, Subparts F, H, and CC; and applicable state LDAR requirements. The terms “equipment,” “in light liquid service” and “in gas/vapor service” shall have the definitions set forth in the applicable provisions of Title 40 of the Code of Federal Regulations, Part 60, Subpart GGG; Part 61, Subparts J and V; Part 63, Subparts F, H and CC; and applicable state LDAR regulations. Lion Oil is not required to include in the enhanced program described herein any equipment or units not otherwise subject to any applicable federal or state LDAR regulation.

A. Written Refinery-Wide LDAR Program. By no later than June 30, 2004, Lion Oil shall develop and maintain, for the El Dorado Refinery, a written Refinery program for compliance with all applicable federal and state LDAR regulations. Until termination of this Decree, Lion Oil shall implement this program at the El Dorado Refinery, and Lion Oil shall

update the El Dorado Refinery's program as necessary to ensure continuing compliance. The Refinery program shall include at a minimum:

- i. An overall, Refinery leak rate goal that will be a target for achievement on a process-unit-by-process-unit basis;
- ii. An identification of all equipment in light liquid and/or in gas/vapor service that has the potential to leak VOCs, HAPs, VHAPs, and benzene within process units that are owned and maintained by the Refinery;
- iii. Procedures for identifying leaking equipment within process units that are owned and maintained by the Refinery;
- iv. Procedures for repairing and keeping track of leaking equipment;
- v. Procedures for identifying and including in the LDAR program new equipment; and
- vi. A process for evaluating new and replacement equipment to promote consideration and installation of equipment that will minimize leaks and/or eliminate chronic leakers.

B. Training. By no later than December 31, 2004, Lion Oil shall implement the following training programs at the Refinery:

- i. For personnel newly-assigned to LDAR responsibilities, Lion Oil shall require LDAR training prior to each employee beginning such work;
- ii. For all personnel assigned LDAR responsibilities, Lion Oil shall provide and require completion of annual LDAR training; and
- iii. For all other Refinery operations and maintenance personnel (including contract personnel), Lion Oil shall provide and require completion of an initial training program that includes instruction on aspects of LDAR that are relevant to the person's duties. Until termination of this Decree, "refresher" training in LDAR shall be performed on a three year cycle.

C. LDAR Audits. Commencing upon the Date of Lodging of the Consent Decree, Lion Oil shall implement at the El Dorado Refinery, the Refinery audits set forth in Paragraphs 23.C.i. and 23.C.ii., to ensure the Refinery's compliance with all applicable LDAR requirements. The LDAR audits shall include but not be limited to, comparative monitoring, records review, tagging, data management, and observation of the LDAR technicians' calibration and monitoring techniques.

i. **Third-Party Audits.** Lion Oil shall retain a contractor(s) to perform a third-party audit of the Refinery's LDAR program at least once every four years. The first third-party audit for the El Dorado Refinery shall be completed no later than December 31, 2003.

ii. **Internal Audits.** Lion Oil shall conduct internal audits of the El Dorado Refinery's LDAR program. Lion Oil shall complete the first round of these internal LDAR audits by no later than two years from the date of the completion of the third-party audits required in Paragraph 23.C.i. An internal audit of the El Dorado Refinery shall be held every four years thereafter for the life of this Consent Decree.

iii. To ensure that an audit at the El Dorado Refinery occurs every two years, third-party and internal audits shall be separated by two years.

iv. **Alternative.** As an alternative to the internal audit required by Paragraph 23.C.ii., Lion Oil may elect to retain third-parties to undertake the internal audit, provided that an audit of the El Dorado Refinery occurs every two (2) years.

D. Implementation of Actions Necessary to Correct Non-Compliance.

If the results of any of the audits conducted pursuant to Paragraph 23.C at the El Dorado Refinery identify any areas of non-compliance, Lion Oil shall implement, as soon as practicable, all steps necessary to correct the area(s) of non-compliance, and to prevent, to the extent practicable, a recurrence of the cause of the non-compliance. Until termination of the Consent Decree, Lion Oil shall retain the audit reports generated pursuant to Paragraphs 23.C.i and 23.C.ii and shall maintain a written record of the corrective actions that Lion Oil take at the El

Dorado Refinery in response to any deficiencies identified in any audits. In the quarterly report submitted pursuant to the provisions of Section IX of this Consent Decree (Recordkeeping and Reporting) for the first calendar quarter of each year, Lion Oil shall submit the audit reports and corrective action records for audits performed and actions taken during the previous year.

E. Internal Leak Definition for Valves and Pumps; Compressor Compliance.

Lion Oil shall utilize the following internal leak definitions for valves and pumps in light liquid and/or gas/vapor service, unless other permit(s), regulations, or laws require the use of lower leak definitions.

- i. Leak Definition for Valves. By no later than December 31, 2004, Lion Oil shall utilize an internal leak definition of 500 ppm VOCs for the Refineries' valves, excluding pressure relief devices.
- ii. Leak Definition for Pumps. Lion Oil shall utilize an internal leak definition of 2000 ppm for the Refineries' pumps by the following dates:
 - a. By no later than June 30, 2004, Lion Oil shall utilize this definition for 50% of the total number of pumps that each of them has at the El Dorado Refinery;
 - b. By no later than December 31, 2004, Lion Oil shall utilize this definition for 85% of the total number of pumps that each of them has at the El Dorado Refinery;
 - c. By no later than March 30, 2006, Lion Oil shall utilize this definition for all of the pumps that it has at the El Dorado Refinery.

F. Reporting, Recording, Tracking, Repairing and Remonitoring Leaks of Valves and Pumps Based on the Internal Leak Definitions.

- i. Reporting. For regulatory reporting purposes, Lion Oil may continue to report leak rates in valves and pumps against the applicable regulatory leak definition, or may use the lower, internal leak definitions specified in Paragraph 23.E.
- ii. Recording, Tracking, Repairing and Remonitoring Leaks. Lion Oil shall record, track, repair and re-monitor all leaks in excess of the internal leak definitions of

Paragraphs 23.E.i and 23.E.ii at such time as those definitions become applicable, except that Lion Oil shall have thirty (30) days to make repairs and re-monitor leaks that are greater than the internal leak definitions but less than the applicable regulatory leak definitions.

G. First Attempt at Repairs on Valves. Beginning no later than March 30, 2003, Lion Oil shall make a “first attempt” at repair on any valve that has a reading greater than 200 ppm of VOCs, excluding control valves, pumps, and components that LDAR personnel are not authorized to repair. Lion Oil or its designated contractor, however, shall re-monitor, within five (5) business days, all valves that LDAR personnel attempted to repair. Unless the re-monitored leak rate is greater than the applicable leak definition, no further action will be necessary. If, after two years from the commencement of the “first attempt at repair” program set forth in this Paragraph 23.G, Lion Oil can demonstrate with sufficient monitoring data that the “first attempt” repair at 200 ppm will worsen or not improve the Refinery’s leak rates, Lion Oil may request that EPA reconsider or amend this requirement.

H. LDAR Monitoring Frequency.

i. **Pumps.** When the lower leak definition for pumps becomes applicable pursuant to Paragraph 23.E.ii, Lion Oil shall monitor pumps at the lower leak definition on a monthly basis.

ii. **Valves.** At the El Dorado refinery, on and after the Date of Lodging of the Consent Decree, Lion Oil shall continue to implement a program to monitor valves more frequently than is required by applicable regulations by monitoring valves -- other than difficult to monitor or unsafe to monitor valves -- on a quarterly basis, with no ability to skip periods on a process-unit-by-process-unit basis.

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

i. **Electronic Storing and Reporting of LDAR Data.** At the El Dorado Refinery, Lion Oil has and will continue to maintain an electronic database for storing and reporting LDAR data. By no later than June 30, 2003, the electronic database shall include data identifying the

date and time of the monitored event, and the operator and instrument used in the monitored event.

ii. Electronic Data Collection During LDAR Monitoring and Transfer Thereafter.

By no later than June 30, 2003, Lion Oil shall submit to the Applicable Federal and State Agencies operational specifications for the data logger, software, and monitoring equipment. Lion Oil shall use dataloggers and/or electronic data collection devices during all LDAR monitoring. Lion Oil, or its designated contractor, shall use its/their best efforts to transfer, by the end of the next business day electronic data from electronic data logging devices to the electronic database of Paragraph 23.I.i. For all monitoring events in which an electronic data collection device is used, the collected monitoring data shall include a time and date stamp. Lion Oil may use paper logs where necessary or more feasible (e.g., small rounds, re-monitoring, or when data loggers are not available or broken), and shall record, at a minimum, the identification of the technician undertaking the monitoring, the date, and the identification of the monitoring equipment. Lion Oil shall use its best efforts to transfer any manually recorded monitoring data to the electronic database of Paragraph 23.I.i within seven days of monitoring.

J. QA/QC of LDAR Data. By no later than March 30, 2004, Lion Oil, or a third party contractor retained by Lion Oil shall develop and implement a procedure to ensure a quality assurance/quality control (“QA/QC”) review of all data generated by LDAR monitoring technicians. Lion Oil shall ensure that monitoring data provided to Lion Oil by its contractors is reviewed for QA/QC before the contractor submits the data to Lion Oil. At least once per calendar quarter, Lion Oil shall perform QA/QC of the contractor’s monitoring data which shall include, but not be limited to: number of components monitored per technician, time between monitoring events, and abnormal data patterns.

K. LDAR Personnel. Lion Oil has established a program that holds LDAR personnel accountable for LDAR performance. Lion Oil shall continue to maintain a position

within the El Dorado Refinery responsible for LDAR management, with the authority to implement improvements.

L. Adding New Valves and Pumps. By no later than June 30, 2004, Lion Oil shall establish a tracking program for maintenance records (e.g., a Management of Change program) to ensure that valves and pumps added to the Refinery during maintenance and construction is integrated into the LDAR program.

M. Calibration/Calibration Drift Assessment.

i. Calibration. Lion Oil shall conduct all calibrations of LDAR monitoring equipment using methane as the calibration gas, in accordance with 40 C.F.R. Part 60, EPA Reference Test Method 21.

ii. Calibration Drift Assessment. Beginning no later than the Date of Lodging of the Consent Decree, Lion Oil shall conduct calibration drift assessments of LDAR monitoring equipment at the end of each monitoring shift, at a minimum. Lion Oil shall conduct the calibration drift assessment using, at a minimum, a 500 ppm calibration gas. If any calibration drift assessment after the initial calibration shows a negative drift of more than 10% from the previous calibration, Lion Oil shall re-monitor all valves that were monitored since the last calibration that had a reading greater than 100 ppm and shall re-monitor all pumps that were monitored since the last calibration that had a reading greater than 500 ppm.

N. Delay of Repair. Beginning no later than the Date of Lodging of the Consent Decree, for any equipment for which Lion Oil is allowed, under the applicable regulations, to place on the "delay of repair" list for repair:

i. For all equipment, Lion Oil shall:

a. Require sign-off by the unit supervisor that the piece of equipment is technically infeasible to repair without a process unit shutdown, before the component is eligible for inclusion on the "delay of repair" list; and

b. Include equipment that is placed on the “delay of repair” list in Lion Oil’s regular LDAR monitoring.

ii. For valves: For valves, other than control valves, leaking at a rate of 10,000 ppm or greater, Lion Oil shall continue to use its “drill and tap” method for fixing such leaking valves, rather than placing the valve on the “delay of repair” list, unless Lion Oil can demonstrate that there is a safety, mechanical, or major environmental concern posed by repairing the leak in this manner. After two unsuccessful attempts to repair a leaking valve through the drill and tap method, Lion Oil may place the leaking valve on its “delay of repair” list. If a new method develops for repairing such valves, Lion Oil will advise EPA prior to implementing such new method.

iii. For pumps: At such time as the lower leak rate definition applies pursuant to Paragraph 23.E.ii, for pumps leaking at a rate of 2000 ppm or greater, Lion Oil shall undertake its best efforts to isolate and repair such pumps with a first attempt at fifteen (15) days.

O. Recordkeeping and Reporting Requirements for this Paragraph.

i. Outside of the Reports Required under 40 C.F.R. § 63.654 and the Quarterly Progress Report Procedures of Section IX (Recordkeeping and Reporting).

a. Written Refinery-Wide LDAR Program No later than thirty (30) days after completion of the development of the written refinery-wide LDAR programs that Lion Oil develop pursuant to Paragraph 23.A, Lion Oil shall submit a copy of the Refinery’s Program to the Applicable Federal and State Agencies.

b. Submission of Operational Specifications for Electronic Data Collection during LDAR Monitoring and Certification of Use of Electronic Data Collection during LDAR Monitoring. By no later than June 30, 2003, Lion Oil shall submit to the Applicable Federal and State Agencies operational specifications designed to minimize the use of any form of data collection and data transfer during and after LDAR monitoring other than electronic data collection and transfer.

ii. As Part of Either the Reports Required under 40 C.F.R. § 63.654 or the Quarterly Progress Report Procedures of Section IX (Recordkeeping and Reporting). Consistent with the requirements of Section IX (Recordkeeping and Reporting), Lion Oil shall include the following information, at the following times, in their quarterly progress reports:

a. First Quarterly Progress Report Due under the Consent Decree. At the later of: (i) the first quarterly progress report due under the Consent Decree; or (ii) the first quarterly progress report in which the requirement becomes due, Lion Oil shall include the following:

- (1) A certification of the implementation of the “first attempt at repair” program of Paragraph 23.G;
- (2) A certification of the implementation of QA/QC procedures for review of data generated by LDAR technicians as required by Paragraph 23.J;
- (3) An identification of the individual at the Refinery responsible for LDAR performance as required by Paragraph 23.K;
- (4) A certification of the development of a tracking program for new valves and pumps added during maintenance and construction as required by Paragraph 23.L;
- (5) A certification of the implementation of the calibration drift assessment procedures of Paragraph 23.M; and
- (6) A certification of the implementation of the “delay of repair” procedures of Paragraph 23.N.

b. Quarterly Progress Report for the First Calendar Quarter of Each Year. Until termination of the Consent Decree, in the quarterly progress report that Lion Oil submit pursuant to Section XI for the first calendar quarter of each year, Lion Oil shall include an identification of each audit that was conducted pursuant to the requirements of Paragraph 23.C in the previous calendar year including, for the El Dorado Refinery, an identification of the auditors, a summary of the audit results, and a summary of the actions that Lion Oil took or intend to take to correct all deficiencies identified in the audits.

c. In Each Report due under 40 C.F.R. § 63.654. In each report due under 40 C.F.R. § 63.654, Lion Oil shall include:

- (1) Training. Information identifying the measures that Lion Oil took to comply with the provisions of Paragraph 23.B; and
- (2) Monitoring. The following information on LDAR monitoring: (a) a list of the process units monitored during the quarter; (b) the number of valves and pumps monitored in each process unit; (c) the number of valves and pumps found leaking; (d) the number of “difficult to monitor” pieces of equipment monitored; (e) the projected month of the next monitoring event for that unit; and (f) a list of all equipment currently on the “delay of repair” list and the date each component was placed on the list.

iii. A summary of the reports, plans, and certifications due under the provisions of Paragraph 23 is attached as Appendix H to this Consent Decree.

P. Agencies to Receive Reports, Plans and Certifications Required in this Paragraph; Number of Copies. Lion Oil shall submit all reports, plans and certifications required to be submitted under this Paragraph to the Applicable Federal and State Agencies. For each submission, Lion Oil shall submit two copies to EPA, to the applicable Region, and to the Applicable State Agency. By agreement between each of the offices that are to receive the materials in this Paragraph and Lion Oil the materials may be submitted electronically.

24. Incorporation of Consent Decree Requirements into Federally-Enforceable Permits.

A. By June 30, 2003. As soon as practicable following the Date of Lodging of the Consent Decree, but in no event later than June 30, 2003, Lion Oil shall submit applications to the Applicable State Agency to incorporate the surviving emission limits and standards required by the Consent Decree that are effective as of the Date of Lodging of the Consent Decree into minor or major new source review permits or other permits (other than Title V permits) which are federally enforceable. Following submission of the permit application, Lion Oil shall cooperate with the Applicable State Agency by promptly submitting to the ADEQ all information that the

Applicable State Agency seeks following its receipt of the permit application. Upon issuance of such permits, Lion Oil shall file any applications necessary to incorporate the requirements of those permits into the Title V permit for the El Dorado Refinery. **B. At Variable Times.** As soon as practicable, but in no event later than sixty (60) days after the effective date or establishment of any surviving emission limits and standards under Section V of this Consent Decree, Lion Oil shall submit applications to the Applicable State Agency to incorporate those emission limitations and standards into minor or major new source review permits or other permits (other than Title V permits) which are federally enforceable. Following submission of the permit application, Lion Oil shall cooperate with the Applicable State Agency by promptly submitting to the Applicable State Agency all information that the Applicable State Agency seeks following its receipt of the permit application. Upon issuance of such permit, Lion Oil shall file any applications necessary to incorporate the requirements of that permit into the Title V permit of the El Dorado Refinery.

C. Mechanism for Title V Incorporation. The Parties agree that the incorporation of the requirements of this Consent Decree into the Title V permit shall be in accordance with state Title V rules.

D. Survival of Obligations. The following requirements will continue after termination of the Consent Decree under Section XVIII (Paragraph 93): 11.B or 11.E, 11. F, 12.B, 12.C, 13.B, 14.B, 14.C., 15, 16.B (as specified therein in subparagraph ii), 16.C, 16.D, 17.B, 17.C, 18.A, 18.B, 18.D (as specified in subparagraph i), 19, first paragraph of 20 (as specified therein), 20.B.i (as specified therein), 20.E.i. (as specified therein), 21 (as specified therein), 24A, 24B, 27A, 27B, 27C, 27D, 30, and 31.

25. Obtaining Construction Permits. Lion Oil agrees to use best efforts to obtain all required, federally enforceable permits for the construction of the pollution control technology and/or the installation of equipment necessary to implement the affirmative relief and environmental projects set forth in this Section V and in Section VIII. ADEQ agrees to use best

efforts to issue such permits to enable Lion Oil to fulfill its obligations under the Consent Decree in a timely manner. To the extent that Lion Oil must submit permit applications for this construction or installation to the Applicable State Agencies, Lion Oil shall cooperate with the Applicable State Agency by promptly submitting to the Applicable State Agency all information that the Applicable State Agency seeks following its receipt of the permit application. This Paragraph 25 is not intended to prevent Lion Oil from applying to the Applicable State Agency for a pollution control project exemption.

26. **Title V Compliance Certification** ADEQ issued Permit 868-AOP-R0, a Major Source Title V Permit to Lion Oil on December 11, 2000. Lion Oil appealed Permit 868-AOP-R0. Lion Oil and ADEQ entered into a Permit Appeal Resolution, and ADEQ issued a new Draft Permit 868-AOP-R1 to Lion Oil on May 21, 2002. In a Consent Administrative Order issued on May 30, 2002, ADEQ authorized Lion Oil to operate in accordance with the terms and conditions of Draft Permit 868-AOP-R1, until such time as ADEQ issues a final permitting decision.

i. To satisfy the annual compliance certification requirements of Arkansas Pollution Control & Ecology Commission Regulation 26, Section 26.703(E)(3) and 40 CFR 70.6(c)(5)(iii) for the compliance period January 1, 2001 through December 31, 2001, Lion Oil certified compliance with the appealed and unappealed terms and conditions of Permit 868-AOP-R0, as well as certain of the underlying requirements of the State Operating Permit in effect prior to the issuance of 868-AOP-R0.

ii. To satisfy the annual compliance certification requirements of Arkansas Pollution Control & Ecology Commission Regulation 26, Section 26.703(E)(3) and 40 CFR 70.6(c)(5)(iii) for the compliance period January 1, 2002 through December 31, 2002, until such time as ADEQ issues a final permitting decision, Lion Oil shall certify its compliance with the terms and conditions of Draft Permit 868-AOP-R1 and not the underlying requirements of Permit 868-AOP-R0, 868-AR-7, or any combination thereof.

APPENDIX A

**ADEQ AIR PERMIT #868-AR-7
ISSUED ON JUNE 3, 1998;**

**ADEQ CONSENT ADMINISTRATIVE ORDER
ISSUED ON MAY 30, 2002**

APPENDIX B

LIST OF FLARING DEVICES AT THE EL DORADO REFINERY

A. ACID GAS FLARING DEVICES

- 1. Low Pressure Flare (SN-822)**
- 2. High Pressure Flare (SN-823)**

B. HYDROCARBON FLARING DEVICES

- 1. Low Pressure Flare (SN-822)**
- 2. High Pressure Flare (SN-823)**

APPENDIX C

LIST OF CONTROLLED HEATERS , BOILERS AND COMPRESSORS

Source	Installation Deadline
#4 Pre-flash Column Reboiler (SN-803)	December 31, 2009
#4 Atm Atmospheric Furnace (S-804)	December 31, 2004
#4 Vacuum Furnace (SN-805)	December 31, 2009
#7 FCCU Furnace (SN-808)	December 31, 2009
#9 Hydrotreater Furnace/Reboiler (SN-810)	December 31, 2009
#9 Reformer Furnace (SN-811)	December 31, 2009
#10 Hydrotreater Furnace/Reboiler (SN-813)	December 31, 2009
#12 Distillate Hydrotreater Furnace (SN-842)	December 31, 2009
#10 Boiler (SN-816) Shutdown by	December 31, 2006
#11 Boiler (SN-817) Shutdown by	December 31, 2006
#12 Boiler (SN-818) Shutdown by	December 31, 2006
#13 Boiler (SN-819) Shutdown by	December 31, 2006
#14 Boiler (SN-820) Shutdown by	December 31, 2006
New Boiler #1	December 31, 2006
New Boiler #2	December 31, 2006
New Boiler #3	December 31, 2006
G398TA Air Compressor (SN-841)	December 31, 2004
8GTL Compressor (SN-836) ("C" Compressor)	December 31, 2006

Source	NSPS Applicability Deadline
#10 Boiler (SN-816)	January 31, 2006
#11 Boiler (SN-817)	January 31, 2006
New Boiler #1	December 31, 2006
New Boiler #2	December 31, 2006
New Boiler #3	December 31, 2006
Asphalt Fume Incinerator (SN-824)	December 31, 2008

APPENDIX E

NSPS SUBPART J COMPLIANCE SCHEDULE FOR FLARES

<u>Source</u>	<u>Date of Compliance</u>	<u>Method/Proof of Compliance</u>
SN-822, SN-823	Immediate	For each routinely-generated refinery fuel gas stream that is directed to this flare on a continuous or intermittent basis, Lion Oil will monitor this stream with either (i) a CEMS; or (ii) will submit for EPA approval, a fully-approvable alternative monitoring plan (“AMP”) by no later than 90 days after the Date of Lodging of this Consent Decree.

APPENDIX F
(LOGIC DIAGRAM FOR PARAGRAPH 20)

ALL FLARING INCIDENTS

• •

Was the Root Cause:

- error resulting from careless operation by the personnel charged with the responsibility for the SRP, TGU, or Upstream Process Units? Or
- equipment failure due to a failure by Lion to operate and maintain that equipment in a manner consistent with good engineering practices? or

yes

- • Paragraph 51 applies except in cases of Force Majeure

• • No

Did the Flaring incident:

- result in emissions of SO₂ at a rate greater than 20 lbs/hr continuously for three consecutive hours and no scheduled maintenance exception? or
- cause the total number of Flaring Incidents in a rolling 12 month period to exceed 5?

yes

- • Paragraph 51 applies with caveats set forth in Paragraph 20.C.ii

NO • •

Is this the first time for the Root Cause of this Flaring Incident?

Is the Root Cause on the list of agreed upon Malfunctions?

yes

• •

STOP

NO

• •

Was the Root Cause sudden, infrequent, and not reasonable preventable through the exercise of good engineering practice?

NO

Implement Corrective Action Pursuant to Paragraph 20.B

Yes • •

Establish and update a list of agreed-upon Malfunctions

• •

STOP

Paragraph 51.d applies With caveats set forth in Paragraph 22.C.i.c.2