EPA United States Environmental Protection Agency

Region 6 Compliance Assurance and Enforcement Division
INSPECTION REPORT

Inspection Date(s):	07/16-19/2018		
Media:	Air		
Regulatory Program(s)	Consent Decree, Civil Action 3:11-cv-00276		
Company Name:	**Western Refining Company LP**		
Facility Name:	**Western El Paso Refinery**		
Facility Physical Location:	6501 Trowbridge Dr.		
(city, state, zip code)	El Paso, TX 79905		
Mailing address:	212 N Clark St.		
(city, state, zip code)	El Paso, TX 79905		
County/Parish:	El Paso County		
Facility Contact:	Kevin Adams	Environmental Superintendent	
	Kevin.M.Adams@andeavor.com		
FRS Number:	110042061238		
Identification/Permit Number:	18897, O1348		
Media Number:	AFS # 48-141-00004		
NAICS:	324110		
SIC:	2999		
Personnel participating in inspection			
Prince Nfodzo	Environmental Engineer	US EPA, Region 6, 6EN-AA	(214)665-7491
Jim Gold	Environmental Engineer	US EPA, Region 6, 6EN-AT	(281)983-2153
Kevin Adams	Environmental Superintendent	Western (Andeavor) El Paso	(915)775-7864
Sean Woodard	Environmental Engineer	Western (Andeavor) El Paso	(915)771-5110
Ruben Iguaran	Environmental Engineer	Western (Andeavor) El Paso	(915)471-7836
Yvonne Ojeda	Environmental Engineer	Western (Andeavor) El Paso	(915)775-3235
Treena Piznar	Director, Environmental	Western (Andeavor) El Paso	(210)626-4771
EPA Lead Inspector Signature/Date	Nfodzo		08/30/2018
	Prince Nfodzo		Date
Supervisor Signature/Date	Darrin Larson		8/30/2018
	Darrin Larson		Date

Section I – INTRODUCTION

PURPOSE OF THE INSPECTION

Jim Gold and I, Prince Nfodzo, Environmental Protection Agency (EPA) Region 6 credentialed inspectors, conducted a consent decree (CD) follow-up inspection of Western Refining Company LP El Paso Refinery (WER) from July 16, 2018 through July 19, 2018. The refinery is located at 6501 Trowbridge Drive, El Paso, Texas. We arrived at the facility July 16, 2018 at hours 9:50, and conducted a fence line survey. We met with representatives of WER at 10:40 hours for an opening conference for introductions and briefing on the purpose, and an overview of the inspection. We presented our EPA Inspector credentials to Mr. Kevin Adam, Environmental Superintendent. I informed the representatives that this was an EPA inspection to evaluate compliance with the requirements of the federally-issued consent decree (CD), Civil Action 3:11-cv-00276, which is a national priority for EPA.

On July 19, 2018, we met with the WER representatives at 12:27 hours for the closing conference and presented preliminary findings of the inspection. I informed the representatives of the procedures that will follow the field inspection, and that the inspection report will be made public on EPA's website. The sign-in sheets for the opening and closing conferences are included as **Appendix 2**.

The CD was entered September 2, 2011, and consists of 17 Parts. The inspection was a Partial Compliance Evaluation (PCE) that focused on Part V which requires injective relief to address nitrogen oxides (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter (PM), volatile organic compounds (VOCs), and benzene emission reductions through various construction projects, process additives, and process and program enhancements. The inspection included an evaluation of four marquee issues:

- NO_x, CO, SO_2 and PM reductions;
- leak detection and repair (LDAR);
- benzene waste operations: National Emission Standards for Hazardous Air Pollutants (NESHAPS) [BWON]; and,
- flaring acid gases and hydrocarbons.

FACILITY OVERVIEW

WER has North and South sides that are separated by a public road, and has a crude capacity of approximately 135,000 barrels per day, with operations including catalytic cracking, alkylation, and reforming. Crude oil is delivered to the refinery via pipeline, and processed products including liquefied petroleum gas (LPG), butane, gasoline, diesel, kerosene, jet fuel, fuel oil, carbon black and asphalt, are delivered from the refinery by truck, rail, and pipeline. A plant-wide process flow diagram and detailed facility description is included as **APPENDIX 3**.

Section II – OBSERVATIONS

PART V: AFFIRMATIVE RELIEF

A. NO_x Emissions Reductions from the fluid catalytic cracking unit (FCCU)

Status: On schedule

Program Summary: WER shall implement a program to reduce NO_x emissions from the covered FCCUs as specified in Section V.A., incorporate NO_x emission limits into federally-enforceable permits, and demonstrate future compliance with such limits with continuous emission monitoring systems (CEMS).

WER is meeting the NO_x emission limits of 50 parts per million by volume, dry basis (ppmvd) on a 365-day rolling average basis and 90 ppmvd on a 7-day rolling average basis, at 0% oxygen (O_2) with a NO_x-reducing catalyst additive system. WER has incorporated the NO_x emission limits in permit 18897 issued February 28, 2018 and amended May 24, 2018 as an attachment to the permit **[*see Area of concern (AOC) #1*]**. We observed that WER has installed and is operating NO_x and O_2 CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. I verified that WER conducted cylinder gas audits (CGA) and relative accuracy test audits (RATA) for the period January 2015 through December 2017 in accordance with the applicable requirements, except for RATA conducted during the second quarter of 2017 ***(see AOC #2)***. A photograph of the CEMS analyzer is included as **Photo No. 1** in **Appendix 1.**

The trends for the FCCU NO_x emission limits of 50 ppmvd on a 365-day rolling average basis, and 90 ppmvd on a 7-day rolling average basis, both at 0% O_2 from July 1, 2017 – June 30, 2018 are included as **Appendix 4**. No exceedances of the limits occurred during the period.

B. SO_2 Emissions Reductions from the FCCU

Status: On schedule

Program Summary: WER shall implement a program to reduce SO_2 emissions from the covered FCCUs as specified in Section V.B., incorporate the lower SO_2 emission limits at the covered FCCUs into federally-enforceable permits, and demonstrate future compliance with such limits with CEMS.

WER installed a wet gas scrubber (WGS) to meet SO_2 emission limits of 25 ppmvd on a 365-day rolling average basis, and 50 ppmvd on a 7-day rolling average basis, at 0% oxygen. WER has incorporated the SO_2 emission limits in permit 18897 issued February 28, 2018 and amended May 24, 2018 as an attachment to the permit **(*see AOC #3*)**. We observed that WER has installed and is operating SO_2 and O_2 CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. I verified that WER conducted CGA and RATA for the period January 2015 through December 2017 in accordance with the applicable requirements, except for RATA conducted during the second quarter of 2017 **(*see AOC #2*)**. A photograph of the CEMS analyzer is included as **Photo No. 1** in **Appendix 1.**

The trends for the FCCU SO_2 emission limits of 25 ppmvd on a 365-day rolling average basis, and 50 ppmvd on a 7-day rolling average basis, both at 0% oxygen from July 1, 2017 – June 30, 2018 are included as **Appendix 5**. No exceedances of the limits occurred during the period.

C. Particulate Matter Emissions Reductions from the FCCU

Status: On schedule

Program Summary: WER shall implement a program to reduce PM emissions from the covered

FCCUs as specified in Section V.C., incorporate the lower PM emission limits at the covered FCCUs into federally-enforceable permits, and demonstrate future compliance with the lower emission limits with PM testing.

WER is required to comply with PM emission limits of 0.5 pound (lb.) PM per 1000 lb. of coke burned on a 3-hour average based on the average of three runs. WER shall conduct annual PM testing in accordance with test protocol specified in 40 Code of Federal Regulations (C. F. R.) § 60.106(b)(2). WER has incorporated the PM emission limit in permit number 18897 issued February 28, 2018 and amended May 24, 2018 as an attachment to the permit **(*see AOC #4*)**. We reviewed annual PM performance testing for the years 2015 through 2017 and verified that WER conducted PM testing as required. The PM tests were conducted June 5, 2015; May 19, 2016; and July 28, 2017.

D. **Carbon Monoxide Emissions Reductions from the FCCU**

Status: On schedule

Program Summary: WER shall comply with CO emission limits at the covered FCCUs as specified in Section V.D., incorporate CO emission limits into federally-enforceable permits, and demonstrate future compliance with the emission limits with CEMS.

WER is required to comply with CO emission limits of 500 ppmvd corrected to at 0 percent (%) oxygen on a 1-hour average basis; and 100 ppmvd corrected to 0% oxygen on a 365-day rolling average basis. WER has incorporated the CO emission limits in permit 18897 issued February 28, 2018 and amended May 24, 2018 as an attachment to the **(*see AOC #5*)**. We observed that WER has installed and is operating CO and O_2 CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. I verified that WER conducted CGA and RATA for the period January 2015 through December 2017 in accordance with the applicable requirements, except for RATA conducted during the second quarter of 2017 **(*see AOC #2*)**. A photograph of the CEMS analyzer is included as **Photo No. 2** in **Appendix 1.**

The trends for the FCCU CO emission limits of 500 ppmvd on a 1-hour average basis, and 100 ppmvd on a 365-day average basis both at 0% oxygen from July 1, 2017 – June 30, 2018 are included as **Appendix 6**. WER exceeded the emission limit multiple times during the period **(*see AOC #6*)**. I verified that WER properly reported the exceedances.

E. New Source Performance Standards (NSPS) Applicability to the FCCU Catalyst Regenerator

Status: On schedule

Program Summary: The FCCU catalyst regenerators shall be subject to and comply with requirements of NSPS Subparts A and J for SO_2, PM and CO.

EPA approved WER's alternative monitoring plan (AMP) for opacity in lieu of continuous opacity monitoring system (COMS) per letter dated February 20, 1992. The approved AMP requires WER to continuously monitor and record (i) the pressure drop (ΔP) across the WGS (ii) the scrubber liquid to gas (L/G) ratio, and (iii) the effluent temperature immediately downstream of the demister section of the control device. WER has not incorporated all the AMP parameters in permit 18897 issued February 28, 2018 and amended May 24, 2018 **(*see AOC #7*)**.

The FCCU opacity monitoring parameter trends are included as **Appendix 7**. WER exceeded the monitoring parameters multiple times during the period **(*see AOC #6*)**. I verified that WER properly reported the exceedances.

F. **NO_x Emissions Reductions from Combustion Units**

Status: On schedule

Program Summary: WER shall implement a program to reduce and monitor NO_x emissions from the combustion units, incorporate NO_x emission limits at the covered combustion units into permits, and demonstrate compliance with CEMS, PEMS or stack tests.

WER operates 11 heaters and boilers that are required to comply with various NO_x emission limits (lb./MMBtu) on a 365-day rolling average basis, and demonstrate compliance with CEMS. WER has incorporated the NO_x emission limits in permit 18897 issued February 28, 2018 and amended May 24, 2018.

The heaters and boilers are equipped with NO_x reduction control devices to meet NO_x emission limits. We observed that WER has installed and is operating NO_x and O_2 CEMS on all the heaters and boilers in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. I verified that WER conducted CGA and RATA for the period January 2015 through December 2017 in accordance with the applicable requirements, except for RATAs conducted during the fourth quarter of 2015 on CEMS at boilers H-901 and H-903 **(*see AOC #8*),** and fourth quarter of 2016 at heater H-1601 **(*see AOC #9*)**. Photographs of the CEMS analyzers are included as **Photo Nos. 3-12** in **Appendix 1.**

The trends for the heaters and boilers NO_x emission limits on a 365-day rolling average basis, at 0% oxygen from July 1, 2017 – June 30, 2018 are included as **Appendix 8.** WER exceeded the emission limit at boiler H-903 in the month of June 2018 (***see AOC #6***).

G. **SO_2 Emissions Reduction from and NSPS Applicability to Heaters, Boilers, and other fuel gas combustion devices**

Status: On Schedule

Program Summary: Each heater or boiler that is used to combust refinery fuel gas shall be subject to and shall comply with the requirements of NSPS Subparts A and J for fuel combustion devices. WER shall undertake measures to reduce SO_2 emissions from refinery heaters and boilers and other specified equipment by restricting hydrogen sulfide (H_2S) in fuel gas and by agreeing not to burn fuel oil except as specifically permitted.

WER is required to comply with H_2S emission limit of 162 ppmv on a 3-hour rolling average basis for fuel gas combusted in heaters and boilers. WER has incorporated the H_2S emission limit in permit 18897 issued February 28, 2018 and amended May 24, 2018, but the requirement that WER will not burn fuel oil in any combustion device is not incorporated in the permit **(*see AOC #10*)**.

WER monitors the refinery fuel gas at six different locations (Plant 38/39, Plant 41, # 6 crude unit, North boiler, old mix drum and new mix drum). We observed that WER has installed and is operating the H_2S CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. I verified that WER conducted CEMS audits in accordance with the applicable requirements except for RATA conducted during the second quarter of 2017 on fuel gas CEMS at the North boiler **(*see AOC #11*)**.

The trends for the refinery fuel gas H_2S emission limit on a 3-hour rolling average basis from July 1, 2017 – June 30, 2018 are included as **Appendix 9.** WER exceeded the emission limit multiple times during the period **(*see AOC #6*)**. I verified that WER properly reported the exceedances.

H. **Sulfur Recovery Plant (SRP) Operations**

Status: Not applicable

Program Summary: The North SRP, and the associated tail gas unit (TGU) and the South SRP have been shut down permanently. WER shall not reactivate the SRPs unless and until WER obtains an appropriate authorization.

We verified that the SRPs have been permanently shut down. WER routes stripped H2S to a third-party acid gas processing facility, Chemours.

I. **Flaring Devices**

Status: On schedule

Program Summary: Flaring devices shall be "affected facilities" (as that term is used in NSPS, 40 C. F. R. Part 60) and shall comply with all applicable requirements of 40 C. F. R. Part 60 Subparts A and J, for fuel gas combustion devices.

WER is operating and maintaining a flare gas recovery system (FGRS) to control continuous or routine combustion in the flaring devices, and is complying with H_2S emission limits of 162 ppmv on a 3-hour rolling average basis for fuel gas combusted in the flares.

WER monitors H_2S and total sulfur (TS) concentrations. We observed that WER installed and is operating CEMS in accordance with the applicable requirements, and certification and concentrations of calibration gases were accurate and current. I verified that WER conducted CEMS audits for the period October 2015 through December 2017 in accordance with the applicable requirements.

A description of the FGRS and trends for the H_2S emission limit on a 3-hour rolling average basis from July 1, 2017 – June 30, 2018 are included as **Appendices 10 and 11**, respectively**.** WER exceeded the emission limit multiple times during the period **(*see AOC #6*).** I verified that WER properly documented and reported exceedances of limit during the period.

We did not observe visible emissions from the flares during the inspection. We observed the flares with the forward looking infra-red (FLIR) camera and did not see any trail of unburned hydrocarbons.

J. **Control of Acid Gas Flaring Devices**

Status: On schedule

Program Summary: WER shall investigate the causes of future Acid Gas Flaring Incidents, take reasonable steps to correct the conditions that have caused or contributed to such Acid Gas Flaring Incidents, and minimize Acid Gas Flaring Incidents. at the El Paso Refinery.

WER did not experience any acid gas flaring incidents during the period of January 1, 2015 through December 31, 2017.

K. **Hydrocarbon Flaring Incidents**

Status: On schedule

Program Summary: WER shall investigate the causes of Hydrocarbon Flaring Incidents (HFIs), take reasonable steps to correct the conditions that have caused or contributed to such Hydrocarbon Flaring Incidents, and minimize Acid Gas Flaring Incidents. at the El Paso Refinery.

WER experienced four (4) HFIs during the period of January 1, 2015 through December 31, 2017. I verified that WER investigated and corrected the causes of the HFIs.

L. **Benzene Waste Operations NESHAP Program Enhancements (CD Section V.M.)**

Status: On Schedule

Program Summary: WER shall undertake to ensure compliance with Subpart FF and to minimize or eliminate fugitive benzene waste emission. In addition, HFC shall undertake refinery wide measures to minimize or eliminate fugitive benzene waste emissions at the refinery.

The CD requires WER to comply with the compliance option set forth at 40 C.F.R. § 61.342(e) (6BQ compliance option) of Subpart FF using upstream controls, and replace any single carbon canisters (CCs) or dual canister systems in parallel with primary and secondary CCs, and operate them in series.

A schematic of the BWON process is included as **APPENDIX 12**. We verified that WER is complying with the requirements of NESHAP Subpart FF. We reviewed the sampling procedure that WER uses. The procedure was written in a non-formal standard operating procedure (SOP) and is consistent with BWON sampling techniques required by 40 CFR § 61.355 **(*see AOC #12*)**. Photographs of the BWON sampling set-up, and CC monitoring are included as **Photo Nos. 13 & 14** in **Appendix 1**. We verified that WER conducted annual employee training and lab audits as required. We observed tanks in BWON service with the FLIR camera and did not observe any leaks.

WER has engaged Dexter Field Services for implementing its BWON program. We observed that WER monitored CC breakthrough, and conducted waste sampling consistent with regulatory requirements.

M. **Leak Detection and Repair (LDAR) Program Enhancements (CD Section V.N.)**

Status: On Schedule

Program Summary: In order to minimize or eliminate fugitive emissions of VOCs, benzene, volatile hazardous air pollutants (VHAPs), and organic hazardous air pollutants (HAPs) from equipment in light liquid and/or in gas/vapor service, WER shall implement enhancements to its LDAR program including to develop and maintain a written LDAR program for compliance with all regulations, conduct LDAR training, conduct internal and third party audits, maintain an electronic database for storing and reporting data, and retain a third party contractor to develop and implement procedures for QA/QC reviews of data generated by monitoring.

WER uses Dexter Field Services to implement the LDAR program. We verified that WER conducts end of shift drift checks, as required by the CD. We observed that WER carried out instrument calibration (Phoenix 21) accurately. We verified that certification and concentrations of calibration gases were accurate and current, and that WER uses electronic data collection for LDAR monitoring by using data loggers, and leak tracking and reporting software (LeakDAS). A photograph of the LDAR instrument calibration set-up is included as **Photo No. 15** in **Appendix 1**.

I reviewed records which showed that WER consistently maintains equipment calibration records and conducts annual training and audits, as required. We walked through the units and observed that components were properly tagged. We queried the LDAR monitoring and reporting software with randomly selected tag numbers from the units, and we did not find any discrepancy.

N. **Incorporation of Consent Decree Requirements into Federally Enforceable Permits**

Status: WER has incorporated CD requirements into permit as an attachment

Program Summary: WER shall submit appropriate applications, amendments and/or supplements to the applicable state/local agency to incorporate the emission limits and standards required by the CD into federally enforceable minor or major new source review permits or other permits that will ensure that the underlying emission limits or standards survives the termination of this CD.

WER has incorporated the CD required emission limits and standards into permit 18897 as an attachment to the permit, and federal operating permit, O1348, does not include some emission sources ***(see AOC #s 1, 3, 4, 5, 9, and 13)***.

Section III – AREAS OF CONCERN

1. Paragraph 15 of CD requires WER to comply with NO_x limits of 50 ppmvd on a 365-day rolling average, and 90 ppmvd on a 7-day rolling average, both corrected to 0% oxygen. Permit 18897, Special Condition (SC) 23.A. specifies only the 365-day rolling average of 50 ppmvd, however, WER provided both limits in Attachment E (Consent Decree Requirements) as referenced in SC 72.

2. WER conducted successive quarterly audits within less two months at the FCCU CEMS. CD Paragraphs 17, 20 and 26 require WER to certify, calibrate, maintain and operate FCCU NO_x, SO_2 and CO CEMS in accordance with the provisions of 40 C.F.R. § 60.13 and Part 60 Appendices A and F, and applicable specification test of 40 C.F.R. Part 60 Appendix B. Appendix F Section 5.1 states "*Auditing Requirements. Each CEMS must be audited at least once each calendar quarter.*

Successive quarterly audits shall occur no closer than 2 months." WER conducted CGA and RATA at the FCCU 3/23/2017 and 5/16/2017, respectively.

3. Paragraph 18 of CD requires WER to comply with SO_2 limits of 25 ppmvd on a 365-day rolling average, and 50 ppmvd on a 7-day rolling average, both corrected to 0% oxygen. Permit 18897, SC 23.A. specifies only the 365-day rolling average of 25 ppmvd, however, WER provided both limits in Attachment E (Consent Decree Requirements) as referenced in SC 72.

4. Paragraph 21 of CD requires WER to comply with PM emission limit of 0.5 pounds (lb.) PM per 1000 lb. of coke burned, on a 3-hour average based on the average of three runs. Permit 18897, SC 23.C. specifies a PM emission limit of 1 lb. per 1000 lb. of coke burned, however, WER provided the CD requirement of 0.5 lb./1000 lb. of coke burned in Attachment E (Consent Decree Requirements) as referenced in SC 72.

5. Paragraph 24 of CD requires WER to comply with CO limits of 100 ppmvd on a 365-day rolling average, and 500 ppmvd on a 1-hour average, both corrected to 0% oxygen. Permit 18897, SC 23.A. specifies only the 365-day rolling average of 100 ppmvd, and does not include the requirement for CO emissions to be corrected to 0% oxygen, however, WER provided both limits in Attachment E (Consent Decree Requirements) as referenced in SC 72.

6. The CD requires WER to comply with emission limits at several units. During the period of July 1, 2017 through June 30, 2018, WER exceeded the FCCU CO emission limit of 500 ppmvd on a 1-hour average basis, FCCU opacity monitoring parameters, NO_x emission limit of 0.062 lb./MMBtu on a 365-day rolling average basis at Heater H-903, and H_2S emission limit of 162 ppmvd in fuel gas combustion devices at Plant 38/39, Plant 41, No. 6 Crude Unit Furnaces, North boilers, North Main Flare, South Main Flare and Rheniformer Flare.

7. The February 2, 1992, EPA approved alternative monitoring plan (AMP) requires WER to monitor the L/G ratio, ΔP across the WGS, and the effluent temperature immediately downstream of the demister section of the control device. Permit 18897, SC 23.D. does not include monitoring the effluent temperature. SC 23.D. also states that "Prior to the initial stack test, liquid flow rate, liquid to gas ratio, and gas pressure drop shall be maintained equal to or greater than the levels identified in the COMS AMP, approved by the EPA on February 2, 1992". This statement is no longer relevant and should be removed from the permit, since the initial stack test has already been conducted.

8. WER conducted successive quarterly audits within less than two months. CD Paragraph 36 requires WER to certify, calibrate, maintain and operate NO_x CEMS in accordance with the provisions of 40 C.F.R. Part 60 Appendices A and F, and applicable specification test of 40 C.F.R. Part 60 Appendix B. Appendix F Section 5.1 states "*Auditing Requirements. Each CEMS must be audited at least once each calendar quarter. Successive quarterly audits shall occur no closer than 2 months."* WER conducted CGA and RATA at boiler H-901 9/19/2015 and 11/16/2015, respectively and at boiler H-903 9/19/2015 and 11/17/2015, respectively.

9. WER conducted successive quarterly audits within less than two months. CD Paragraph 36 requires WER to certify, calibrate, maintain and operate NO_x CEMS in accordance with the provisions of 40 C.F.R. Part 60 Appendices A and F, and applicable specification test of 40 C.F.R.

Part 60 Appendix B. Appendix F Section 5.1 states "*Auditing Requirements. Each CEMS must be audited at least once each calendar quarter. Successive quarterly audits shall occur no closer than 2 months.*" WER conducted CGA and RATA at heater H-1601 9/9/2016 and 11/8/2016 respectively.

10. Paragraph 40 of CD states that "Western shall not burn Fuel Oil in any combustion unit at the El Paso Refinery except during periods of Natural Gas Curtailment or operator training." Permit 18897, SC 21. states the emission limit and monitoring requirements for fuel combustion at the refinery but does not include the requirement not to burn fuel oil in any combustion unit, however, WER provided this requirement in Attachment E (Consent Decree Requirements) as referenced in SC 72.

11. WER conducted successive quarterly audits within less than two months. CD Paragraph 39 requires WER to comply with 40 C.F.R. Part 60, Subparts A and J. 40 C. F. R. §60.13 requires WER to comply with Appendix F. Appendix F, Section 5.1 states "*Auditing Requirements. Each CEMS must be audited at least once each calendar quarter. Successive quarterly audits shall occur no closer than 2 months.*" WER conducted CGA and RATA at boiler the North boiler fuel gas CEMS 3/20/2017 and 5/18/2017, respectively.

12. Although WER did not have a formal SOP for BWON sampling, the sampling technician had developed a sampling procedure for his own use. We recommend that WER reviews this sampling procedure and incorporate it as an official SOP.

13. Permit 18897, SC 72 states "The permit holder shall comply with all requirements in the consent decree incorporated in Attachment E of these special conditions". The CD requirements should be individually incorporated into the permit special conditions instead of referencing an attachment to the permit. This is necessary to ensure that the CD required emission limits and standards survive termination of the CD. Also, CD Paragraph 39 states that "Each heater and boiler that is used to combust refinery fuel gas at the El Paso Refinery has been and is an "affected facility" as that term is used in 40 C.F.R. Part 60, Subparts A and J. On and after the Entry Date, each such heater and boiler shall continue to be subject to and shall comply with the requirements of NSPS Subparts A and J for fuel gas combustion devices. Federal operating permit O1348 does not include combustion devices B-1, B-3, F-1011, F-1602, F-4132, F-4150, F-4160, F-4170, and F-4180 in the Applicable Requirements Summary table. These units are wrongly included in the Permit Shield table as not being subject to NSPS Subpart J or Ja.

Section IV – FOLLOW UP

Additional information requested during the inspection was received July 20, 2018.

Section V – LIST OF APPENDICES

Appendix 1 - Photograph Log
Appendix 2 - Opening and closing conference sign-in sheets
Appendix 3 - Plant wide process flow diagram and written facility description
Appendix 4 - FCCU NO_x emission trends
Appendix 5 - FCCU SO_2 emission trends

Appendix 6 - FCCU CO emission trends
Appendix 7 - FCCU opacity AMP trends
Appendix 8 - Heaters and boilers NO_x emission trends
Appendix 9 - Refinery fuel gas H_2S emission trends
Appendix 10 - Description of flare gas recovery system
Appendix 11 - Flare H_2S emission trends
Appendix 12 - BWON process schematic

Appendix 1
Photograph Log

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 1

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

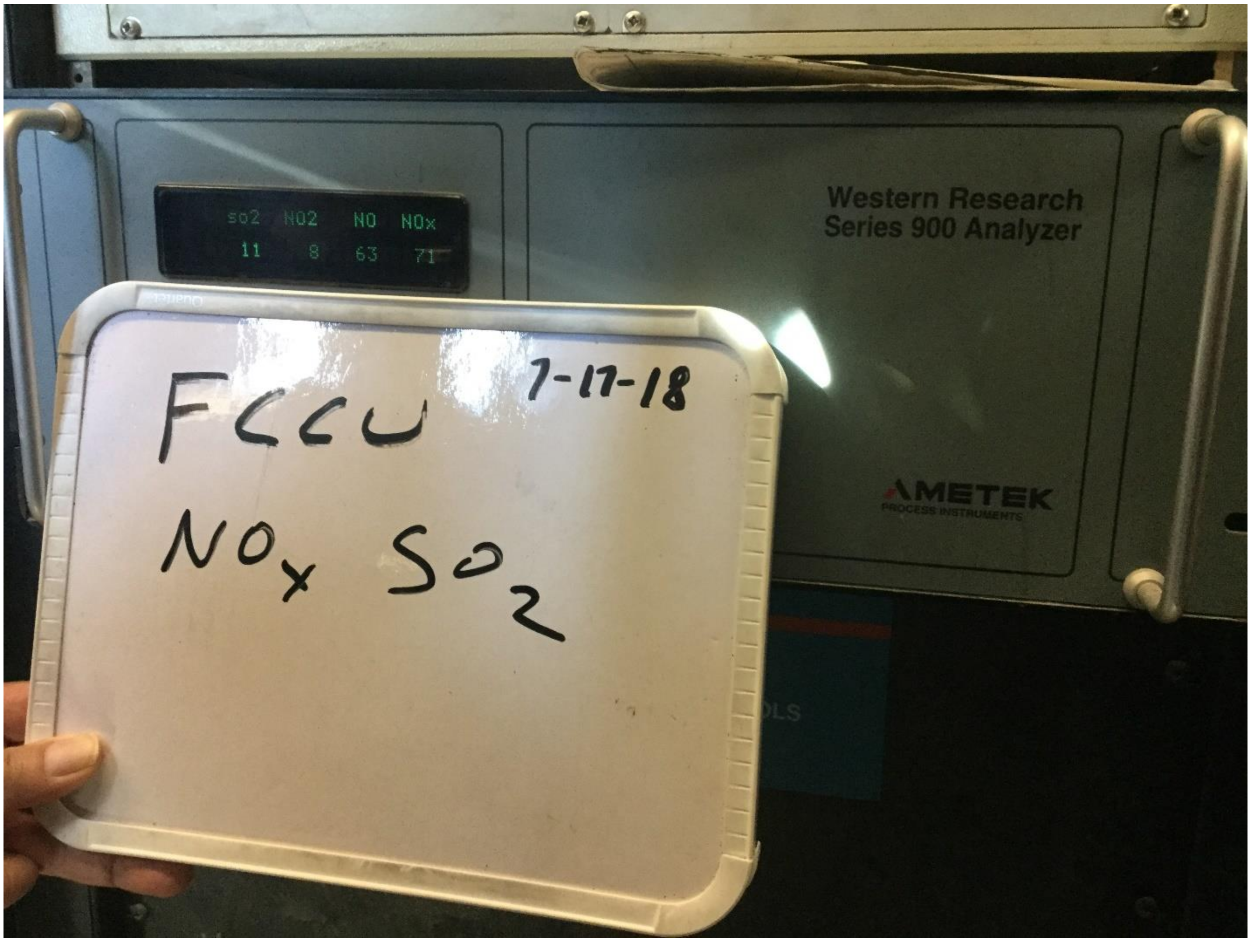


Photo File Name: IMG_1740.JPG
Date of Photo: 07/17/2018
Time of Photo: 9:03 am
Photographer: Sean Woodard, Environmental Engineer, Western El Paso Refinery
Description: FCCU NO_x and SO_2 CEMS Analyzer
NO_x = 71 ppm
SO_2 = 12 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 2

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

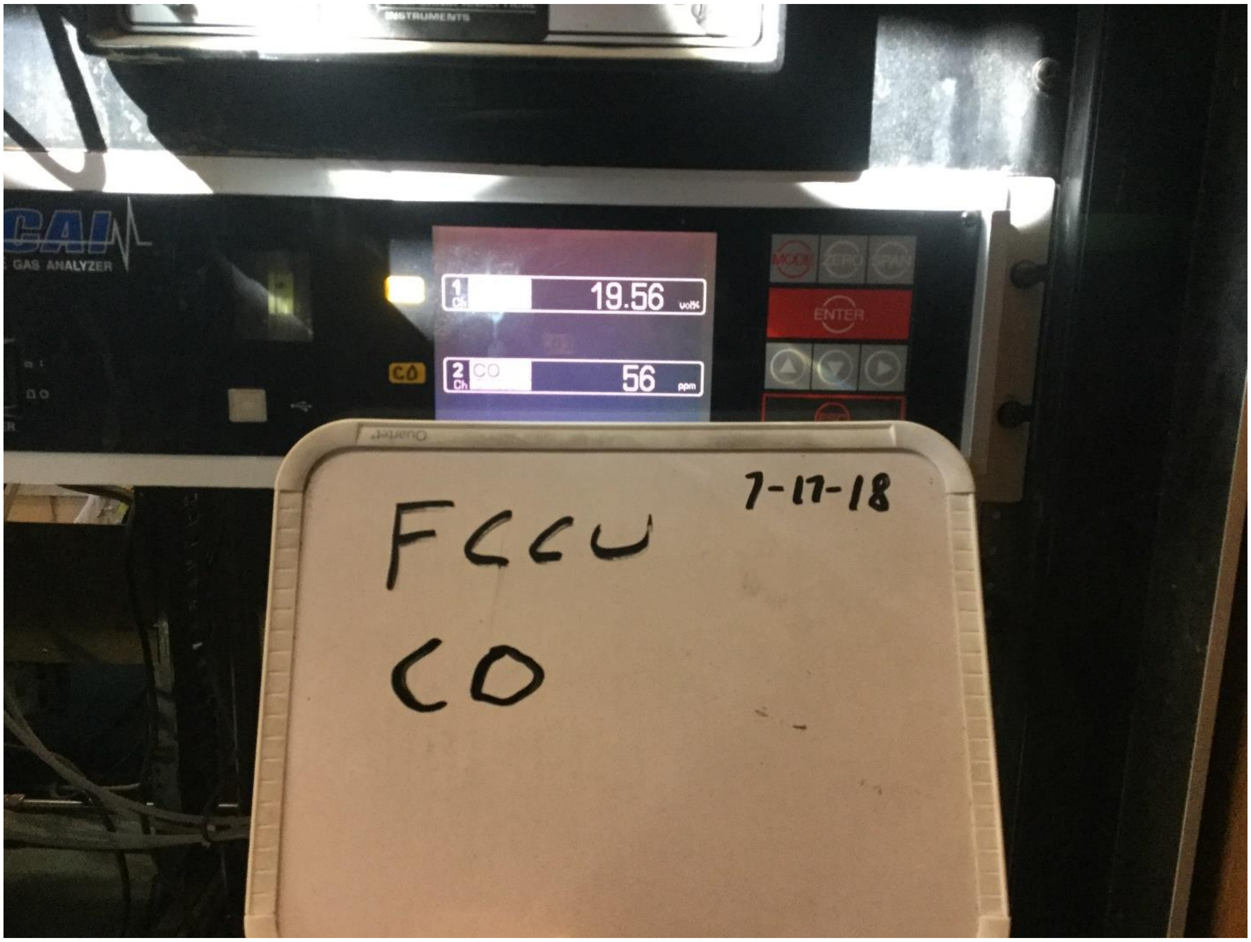


Photo File Name: IMG_1741.JPG
Date of Photo: 07/17/2018
Time of Photo: 9:04 am
Photographer: Sean Woodard, Environmental Engineer, Western El Paso Refinery
Description: FCCU CO CEMS Analyzer
CO = 56 ppm

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 3

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

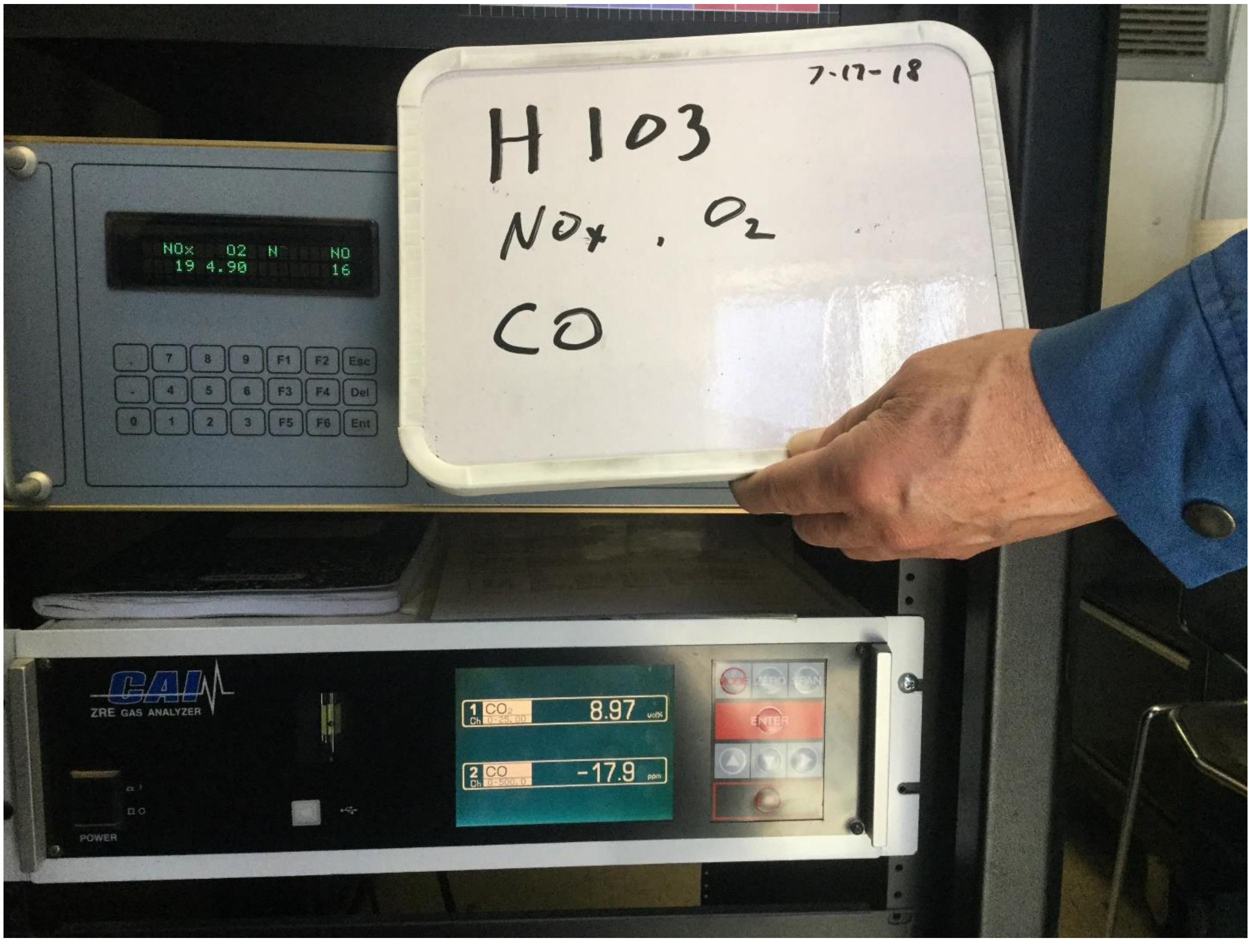


Photo File Name: IMG_1742.JPG
Date of Photo: 07/17/2018
Time of Photo: 9:22 am
Photographer: Sean Woodard, Environmental Engineer, Western El Paso Refinery
Description: CPS crude heater CEMS Analyzer
NO_x = 19 ppm
O_2 = 4.75 %

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 4

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

Photo File Name: IMG_1743.JPG
Date of Photo: 07/17/2018
Time of Photo: 9:38 am
Photographer: Sean Woodard, Environmental Engineer, Western El Paso Refinery
Description: Vacuum unit heater CEMS Analyzer
NO_x = 48.6 ppm
O_2 = 9.57 %

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 5

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

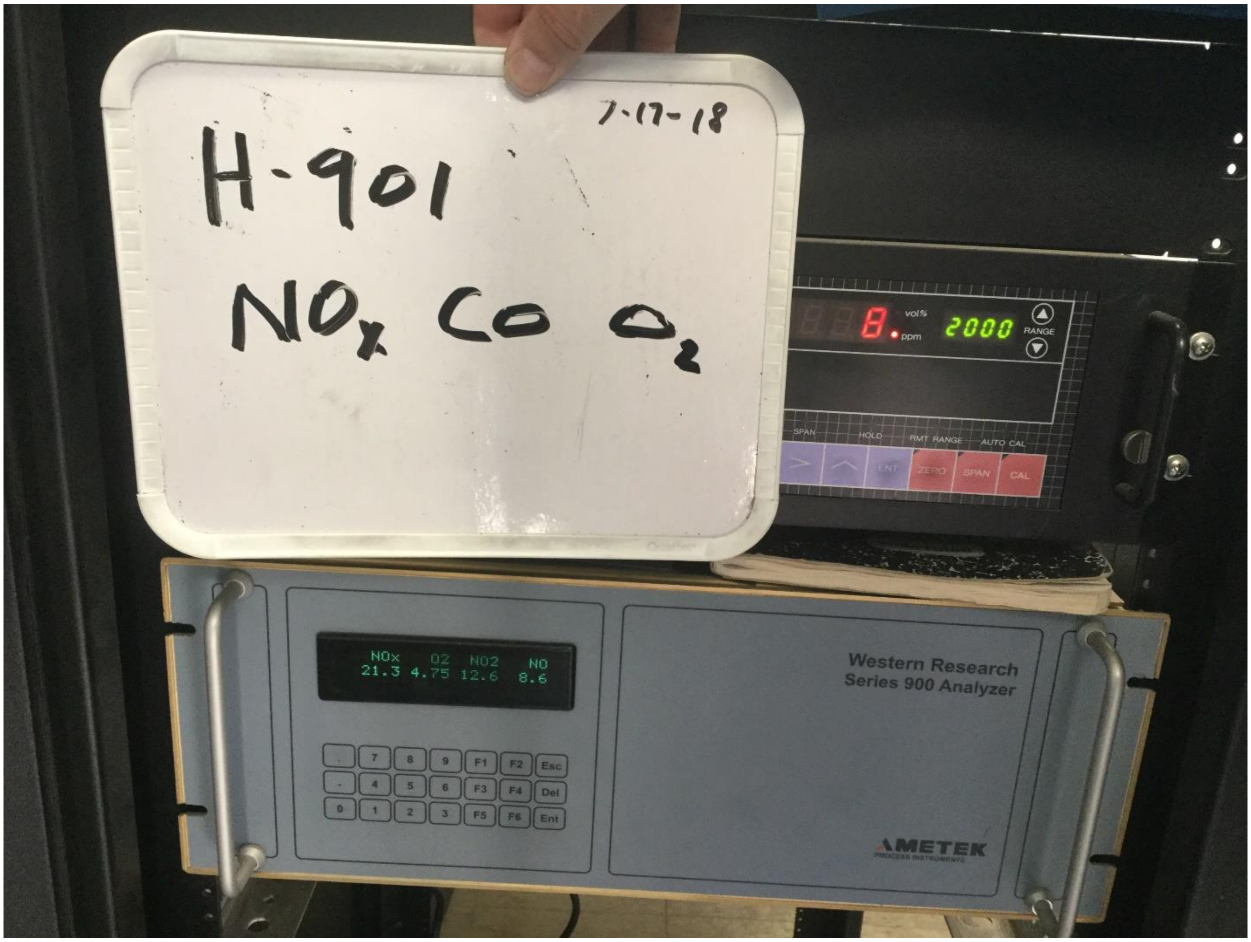


Photo File Name: IMG_1744.JPG
Date of Photo: 07/17/2018
Time of Photo: 10:00 am
Photographer: Sean Woodard, Environmental Engineer, Western El Paso Refinery
Description: Boiler No. 1 CEMS Analyzer
NO_x = 21.1 ppm
O_2 = 4.8 %

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 6

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

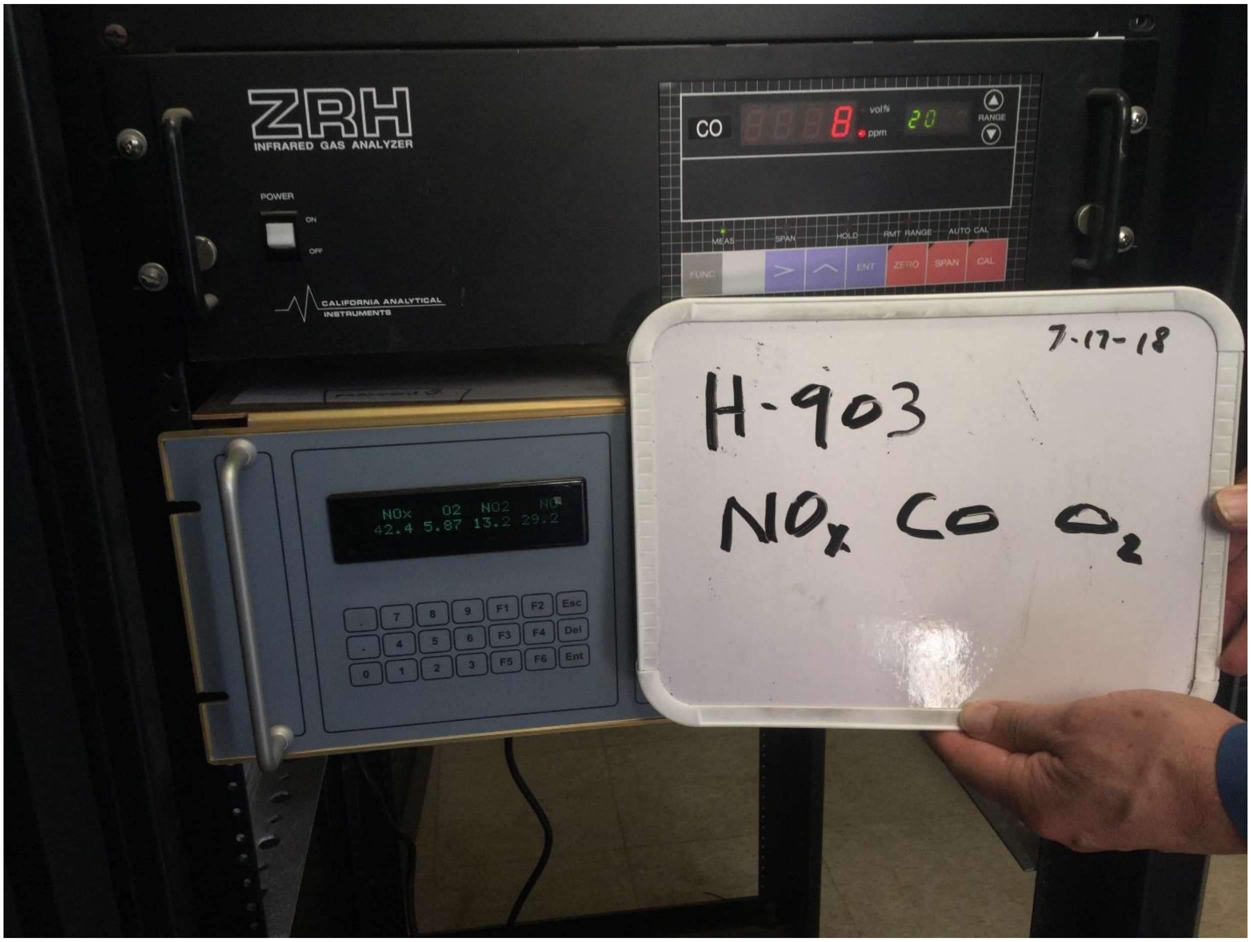


Photo File Name: IMG_1745.JPG
Date of Photo: 07/17/2018
Time of Photo: 10:05 am
Photographer: Sean Woodard, Environmental Engineer, Western El Paso Refinery
Description: Boiler No. 1 CEMS Analyzer
NO_x = 42.7 ppm
O_2 = 5.95 %

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 7

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

Photo File Name: IMG_1746.JPG
Date of Photo: 07/17/2018
Time of Photo: 10:32 am
Photographer: Sean Woodard, Environmental Engineer, Western El Paso Refinery
Description: No. 11 Boiler CEMS Analyzer
NO_x = 53.6 ppm
O_2 = 2.92%

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 8

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

Photo File Name: IMG_1748.JPG
Date of Photo: 07/17/2018
Time of Photo: 10:50 am
Photographer: Sean Woodard, Environmental Engineer, Western El Paso Refinery
Description: Plant 39 furnace burners

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 9

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

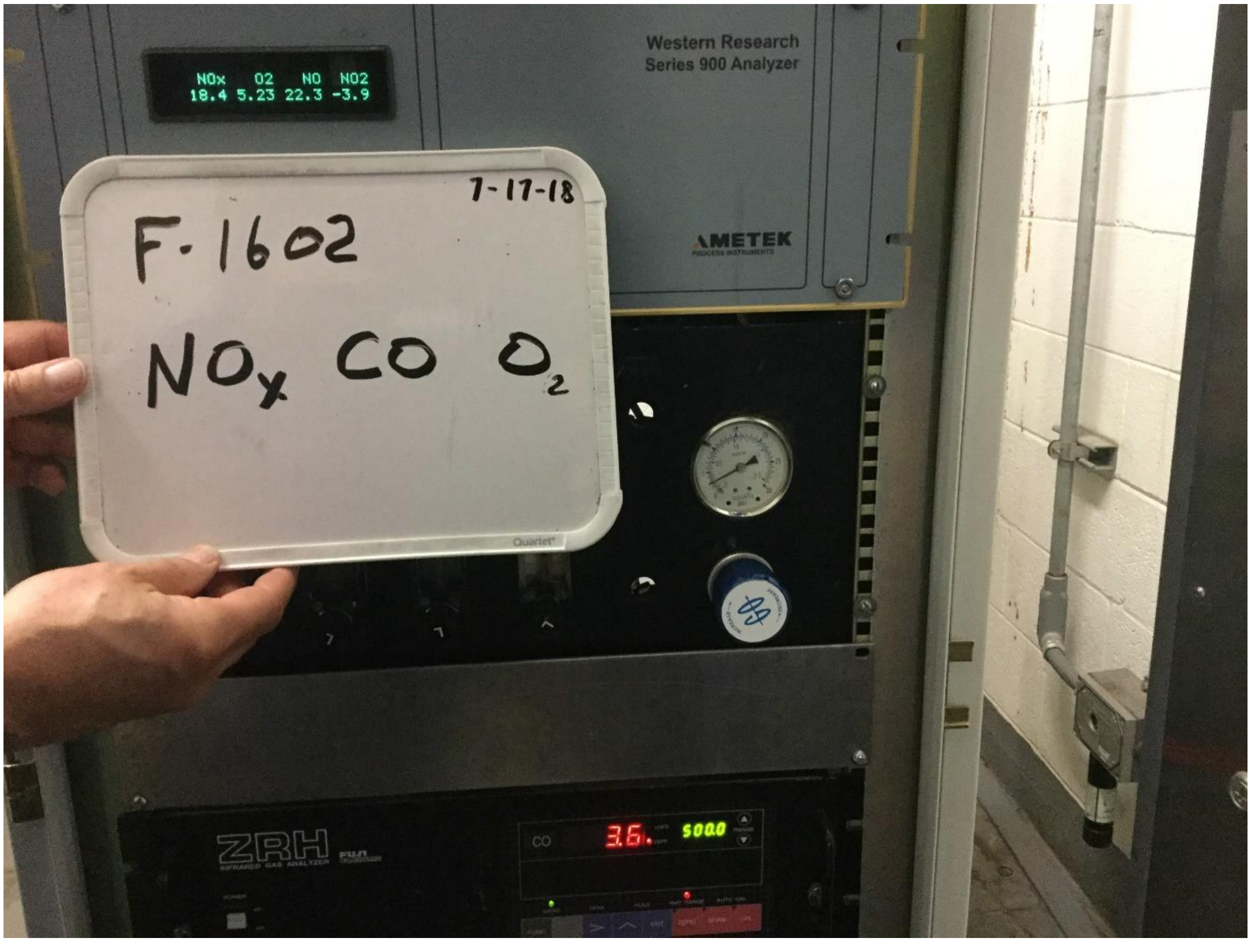


Photo File Name: IMG_1750.JPG
Date of Photo: 07/17/2018
Time of Photo: 11:16 am
Photographer: Sean Woodard, Environmental Engineer, Western El Paso Refinery
Description: No.6 crude unit furnace 2 CEMS Analyzer
NO_x = 18.0 ppm
O_2 = 5.23 %

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 10

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

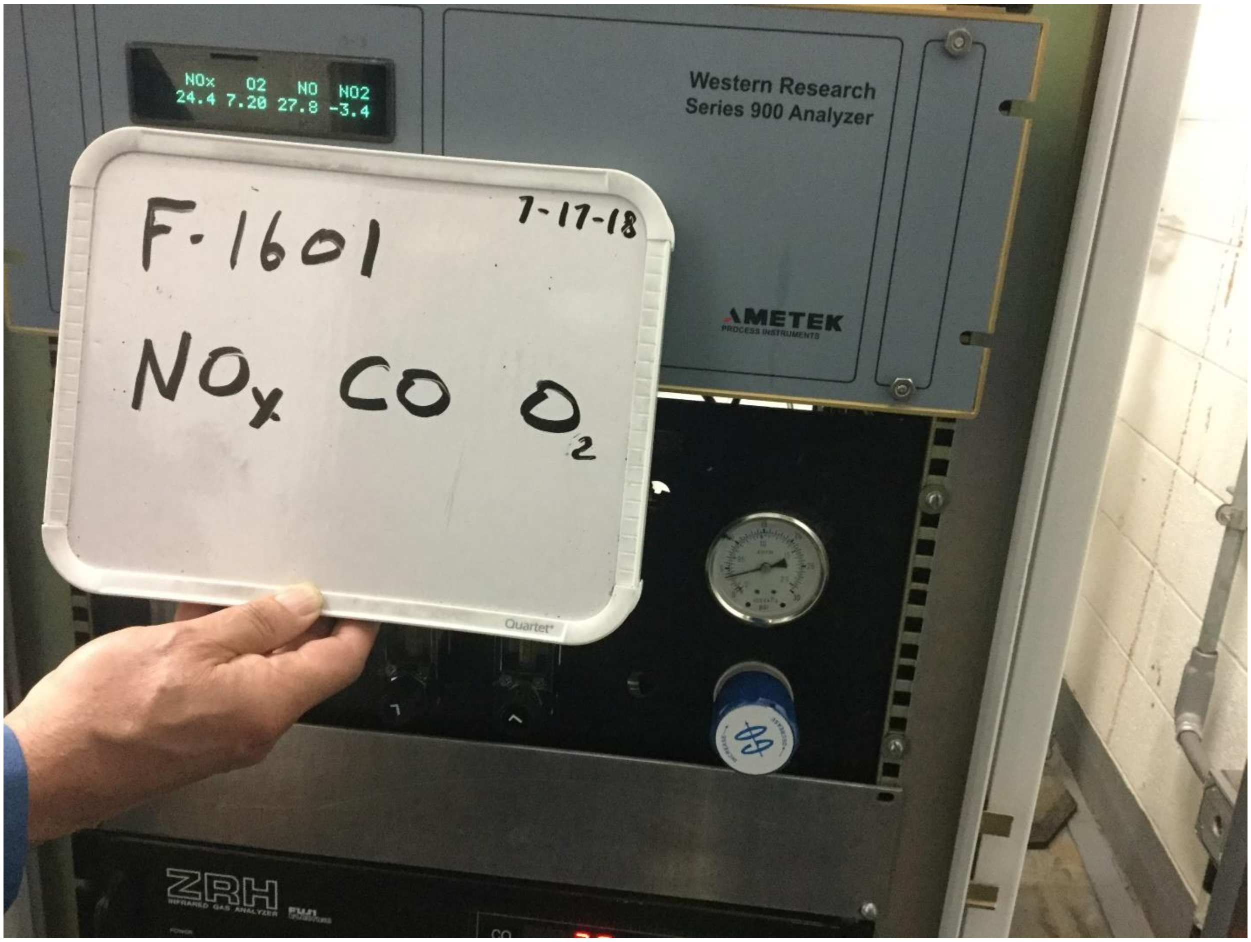


Photo File Name: IMG_1751.JPG
Date of Photo: 07/17/2018
Time of Photo: 11:25 am
Photographer: Sean Woodard, Environmental Engineer, Western El Paso Refinery
Description: No.6 crude unit furnace 1 CEMS Analyzer
NO_x = 24.0 ppm
O_2 = 7.23 %

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 11

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

Photo File Name: IMG_1733.JPG
Date of Photo: 07/17/2018
Time of Photo: 11:35 am
Photographer: Sean Woodard, Environmental Engineer, Western El Paso Refinery
Description: Rheniformer reactor furnace F4150/F4160 CEMS Analyzer
NO_x = 23.1 ppm
O_2 = 5.28 %

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 12

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

Photo File Name: IMG_1763.JPG
Date of Photo: 07/17/2018
Time of Photo: 11:43 am
Photographer: Sean Woodard, Environmental Engineer, Western El Paso Refinery
Description: Rheniformer reactor furnace F4150/F4160 CEMS Analyzer
NO_x = 32.4 ppm
O_2 = 4.75%

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 13

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

Photo File Name: IMG_1772.JPG
Date of Photo: 07/18/2018
Time of Photo: 9:07 am
Photographer: Ruben Iguaran, Environmental Engineer, Western El Paso Refinery
Description: BWON sampling set up

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 14

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

Photo File Name: IMG_1774.JPG
Date of Photo: 07/18/2018
Time of Photo: 9:56 am
Photographer: Ruben Iguaran, Environmental Engineer, Western El Paso Refinery
Description: Carbon canister set-up

Appendix 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 15

Location: **Western Refining Company LP - El Paso Refinery**		
City: **El Paso**	**El Paso County**	State: **TX**

Photo File Name: IMG_1775.JPG
Date of Photo: 07/19/2018
Time of Photo: 9:04 am
Photographer: Ruben Iguaran, Environmental Engineer, Western El Paso Refinery
Description: LDAR instrument calibration set-up

Appendix 2
Opening and closing conference sign-in sheets

United States Environmental Protection Agency

Region 6 Compliance Assurance and Enforcement Division

INSPECTION LOG BOOK

Opening/Pre-Inspection Meeting

Commence opening/pre-inspection meeting 07/16/2018 Time: 10:40

Name	Title	Representing	e-Mail	Phone
Prince Nfodzo	Environmental Engineer	US EPA	Nfodzo.prince@epa.gov	(214)665-7491
Jim Gold	" "	US EPA	Gold. Jim @epa.gov	281/983-2153
Yvonne Ojeda	Environmental Engr.	Andeavor	yvonne.d.ojeda@andeavor.com	915-775-3235
Dean Ven[illegible]los	Ops Mgr	And.	dean.venealis@andeavor.com	915-775-5406
Ruben Iguaren	ENV. ENGINEER	ANDEAVOR	ruben.iguaren@andeavor	915-775-3478
Sean Woodard	Env. Engineer	Andeavor	~~[illegible]~~ christopher.s.woodard@andeavor.com	915-771-5110
Kevin Adams	Env Superintendent	Andeavor	Kevin.m.Adams@andeavor.com	915-775-7864

Conclude opening/pre-inspection meeting 07/16/2018 Time: 11:05

Initials / Date: PN / 7/16/18

EPA United States Environmental Protection Agency

Region 6 Compliance Assurance and Enforcement Division
INSPECTION LOG BOOK

Exit interview / Out-briefing Meeting

Commenced meeting 07/19/2018 Time: 12:27

Name	Title	Representing	e-Mail	Phone
Prince Nfodzo	Environmental Engineer	US EPA	Nfodzo.prince@epa.gov	(214)665-7491
Jim Gold	" "	"	Gold.Jim@epa.gov	281 983 2153
Ruben Iguaran	Environmental Engr.	Andeavor	Ruben.iguaran@andeavor.com	915-775-3478
Yvonne Ojeda	Environmental Engineer	Andeavor	yvonne.d.ojeda@andeavor.com	915-775-3235
Kevin Adams	Superintendent Env Eng	Andeavor	Kevin.m.adams@andeavor.com	915-775-7864
Treena Piznar	Director, Environmental	"	treena.s.piznar@andeavor.com	2106264771
Matthew Buell	EHS Manager	"	matthew.w.buell@andeavor.com	915.775.3341
Sean Woodard	Env. Engineer	"	christopher.s.woodard@andeavor.com	915-771-5110

Conclude meeting 07/19/2018 Time: 12:50

Initials / Date: PN, 7/19/18

Appendix 3

Plant-wide process flow diagram and written facility description

Western Refining – El Paso Refinery Overview

1. El Paso Refinery History

The El Paso Refinery is divided into a North Side and South Side by a public road. A map of the refinery is presented in Figure 1. The North Side is legacy Chevron and was started in 1928 and has had the following major projects:

- Modernization 1957 & 1972
- Integrated with South Side - 1993
- DHT Revamp – 2005
- Amine 1/SWS Built – 2006
- Hydrogen Plant Built - 2007
- Amine 2 Built - 2009
- BSU Built – 2011
- DuPont Acid Plant Built – 2008

The South Side is Legacy Texaco and has had the following major projects:

- Modernized – 1954
- Vacuum/Pre-Flash Built - 1990
- Sale – El Paso Refining – 1986
- Capacity Increased Three Fold
- Bankruptcy - 1992
- Acquired by Refinery Holding Company
- Integrated with North Side – Chevron – 1993
- Name Changed to Western Refining Company – 2002
- Chevron Sells North Side to Western Refining 2003

2. Process Description

The El Paso Refinery is designed to process crude oils (both sweet and sour) to produce a variety of petroleum products, such as liquefied petroleum gas (LPG), butane, gasoline, diesel, kerosene, jet fuel, fuel oil, and other heavy products such as carbon black oil and asphalt. The refinery has three main processing areas that are thoroughly integrated through operations, utilities, and shipping:

- North Plant;
- South Plant;
- Marketing Terminal; and
- Asphalt Plant.

The following process description addresses the functional areas of the refinery and the sources of air emissions in each area. In general, most of the refinery unit operations are only sources of process equipment leak fugitive emissions. Individual facilities associated with the unit operations that are sources of emissions are described below and include combustion sources, storage tanks, cooling towers, loading racks, Rheniformer regeneration, and wastewater collection and treatment systems. A basic block flow diagram is presented in Figure 2.

Figure 1 - El Paso Refinery Map

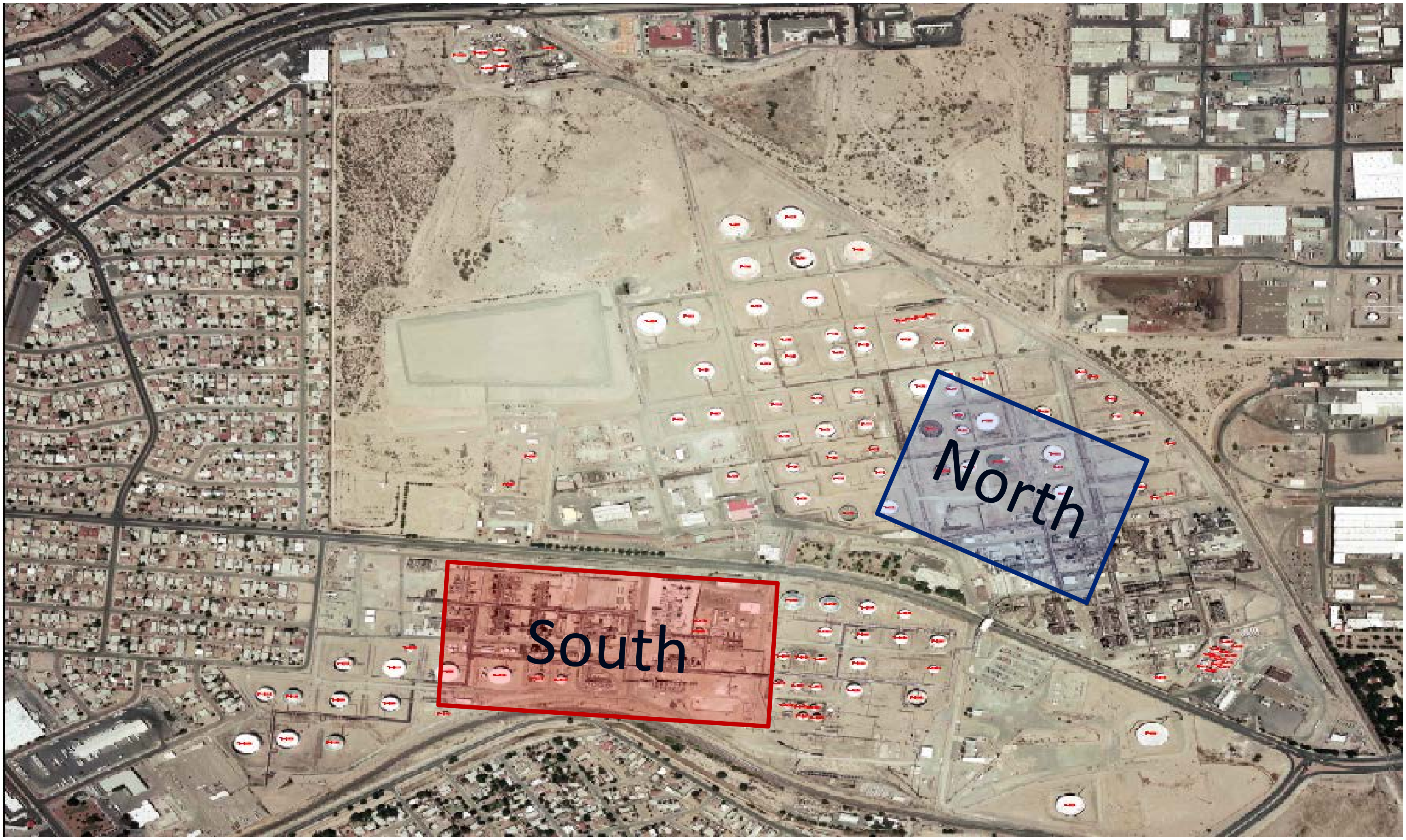
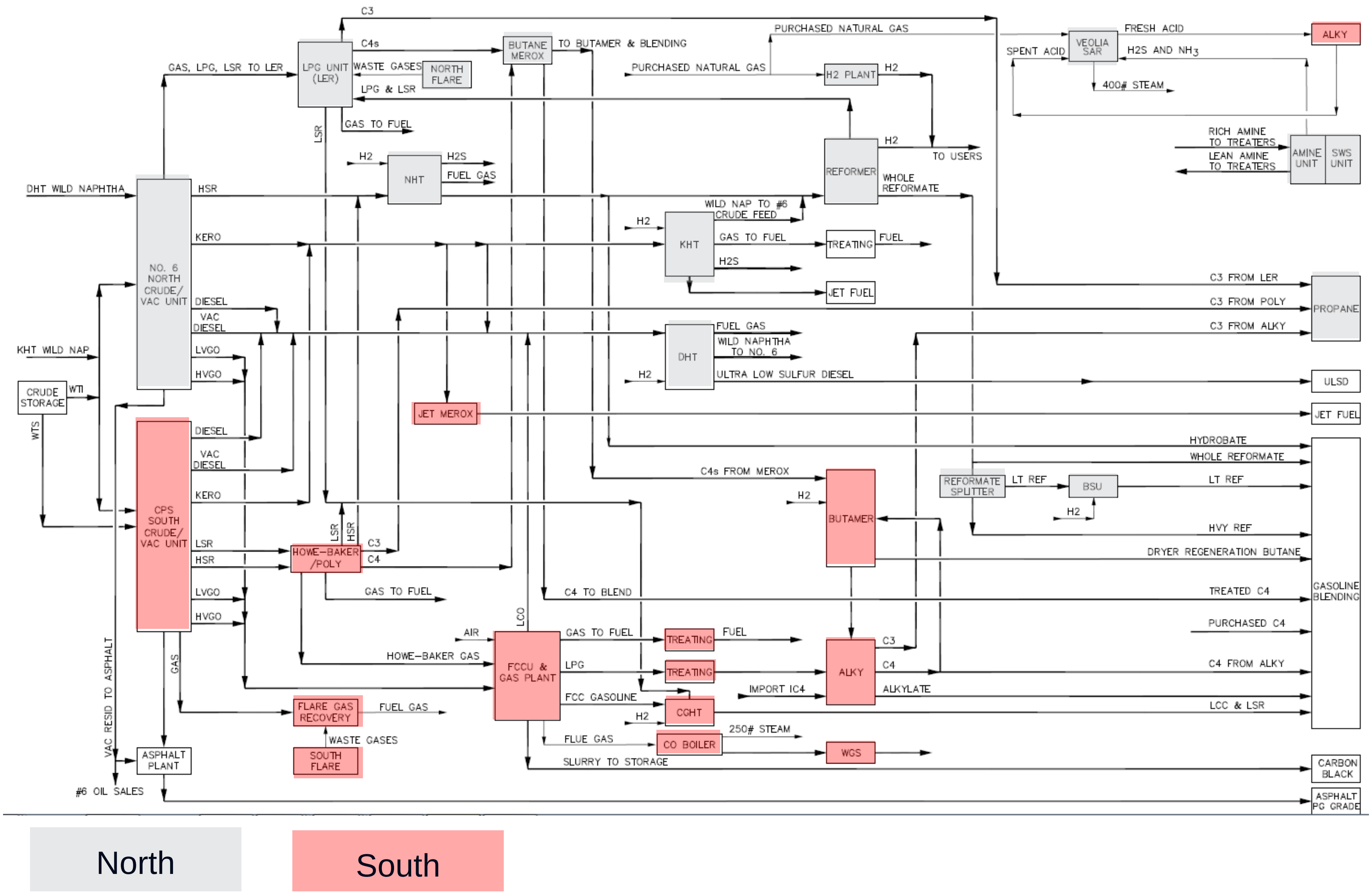


Figure 2 - El Paso Refinery Block Flow Diagram



Western Refining – El Paso Refinery Overview

2.1. Crude/Vacuum Distillation Units

Western receives crude oil via pipeline into the crude oil storage tanks. The crude oil feedstocks are desalted and fed to two crude oil distillation units at the El Paso Refinery:

- No. 6 Crude Unit [Permit 18897, EPN F-16N]
- CPS Crude Unit [Permit 18897, EPN F-1/2]/Vac Unit [Permit 18897, EPN F-18]

The crude oil feed is heated by the following combustion sources, which fire refinery fuel gas, to separate the petroleum fractions:

- No. 6 Crude Oil Heater [Permit 18897, EPN XF1601]
- CPS Heater [Permit 18897, EPN XH-103]
- Crude Unit Furnace F-1602 [Permit 18897, EPN XF1602]
- Vacuum Preflash Reboiler H-1101 [Permit 18897, EPN 125]
- Vacuum Unit Heater H-1601 [Permit 18897, EPN 109]

Crude oil desalter water is sent to the controlled north wastewater collection and treatment system (EPNs WWCTS, WWCTS2, PK-853, PK-854, and PK-855) for pretreatment of wastewater prior to discharge to the City of El Paso wastewater treatment system. Some petroleum fractions are hydrotreated or sweetened to meet federal fuel specifications. Other petroleum fractions are further processed in conversion units to recover additional petroleum products. The Crude/Vacuum Unit processes are sources of process equipment leak fugitive emissions, which are explained in detail in a separate section of this application.

2.2. Naphtha & Light Ends Fractionating, Hydrotreating, and Rheniforming Units

The gasoline petroleum fraction (i.e., naphtha) cuts from the crude unit distillation are further separated into LPG (propane, butanes), light straight run (LSR) gasoline and heavy straight run (HSR) gasoline in the Naphtha and, Light Ends Fractionating processes. LSR and HSR products are hydrotreated or sweetened prior to storage and blending for shipment as fuel.

Light ends (propane, butanes) are either processed in the Alky Feed Prep Unit (South Poly Plant) or collected and sent to the Light Ends Recovery (LER) Unit (North Plant) for fractionation into blend stock or final products.

HSR streams from Naphtha Fractionation are heated in the following two Naphtha Hydrotreater Furnaces, which fire refinery fuel gas:

- Naphtha Hydrotreater Furnace No. 1 [Permit 18897, EPN XF4131]
- Naphtha Hydrotreater Furnace No. 2 [Permit 18897, EPN XF4132]

The Naphtha Hydrotreater (NHT) Unit and Alky Feed Prep Unit (South Poly Plant) is a source of fugitive emissions:

- Naphtha Hydrotreater Unit [Permit 18897, EPN F-41]
- South Poly Plant [Permit 18897, EPN F-8]

Western Refining – El Paso Refinery Overview

Hydrotreated HSR is fed to the Rheniformer (catalytic reformer) reactors through the four fuel gas fired Rheniformer Reactor Heaters, including:

- Rheniformer Reactor Furnace [Permit 18897, FIN F-4150, EPN XF4150-60]
- Rheniformer Reactor Furnace [Permit 18897, FIN F-4160, EPN XF4150-60]
- Rheniformer Reactor Furnace [Permit 18897, FIN F-4170, EPN XF4170-80]
- Rheniformer Reactor Furnace [Permit 18897, FIN F-4180, EPN XF4170-80]

Hydrogen gas, a byproduct of the Rheniformer, is exported to and consumed in the hydrotreating processes. The balance of the excess hydrogen gas is recovered into the refinery fuel gas system. Reformate, the product of the Rheniformer, is stored prior to blending into gasoline products.

Light ends produced by the Rheniformer are compressed by the natural gas fired relief gas (also known as "Clark") compressors and sent to the Light Ends Recovery (LER) system.

The Rheniformer reactor catalyst is periodically regenerated using a chlorinated hydrocarbon (e.g., perchloroethylene). The hydrogen chloride (HCl) gas that evolves from the regeneration process is controlled to meet MACT UUU standards for HCl emissions using a packed column scrubber [Permit 18897, EPN RHENSCRUB].

2.3. Distillate Hydrotreating and Sweetening Units

Distillate fractions (diesel, kerosene and jet fuels) from crude distillation are processed to sulfur specifications suitable for fuel blending in the Diesel Hydrotreater (DHT) and the Jet Hydrotreater (JHT):

- Diesel Hydrotreater (DHT) [Permit 18897, EPN F-39]
- Jet Hydrotreater (JHT) [Permit 18897, EPN F-38]

The distillate feeds are heated by the following combustion sources, which fire refinery fuel gas:

- Plant 39 Diesel Furnace [Permit 18897, EPN XF3901];
- Plant 39 Furnace H-3902 [Permit 18897, EPN XF3902]; and
- Plant 38 Feed Furnace [Permit 18897, EPN XF3804].

Hydrogen is supplied to the hydrotreating reactors from the Rheniformer Unit and hydrogen plant. The hydrotreater gas off-gas is recovered into the relief gas system that feeds the Light Ends Recovery (LER) Unit.

Distillate streams that are not hydrotreated are sweetened in the Merox process [Permit 18897, EPN F-9] in the rundown from the CPS Crude Unit to fuel blending and storage.

2.4. Fluidized Catalytic Cracking Unit

Heavy gas oil, a petroleum fraction from the crude oil distillation process, is fed to the Fluidized Catalytic Cracking Unit (FCCU). The FCCU catalytically cracks the large gas oil hydrocarbons into smaller hydrocarbon molecules that are suitable for gasoline blending stock. Coproducts of the FCC product fractionation include heavy cycle oil (carbon black oil), light cycle oil for diesel blending, butanes, and fuel gas.

Western Refining – El Paso Refinery Overview

Emissions from the FCCU result from process equipment leaks and catalyst regeneration. FCC catalyst is continuously regenerated. In the catalyst regeneration section of the FCCU, air and pure oxygen (O_2) are used in a "full burn" mode of operation. The wet gas scrubber (WGS) provides control of SO_2 and PM emissions. Emission points at the FCCU include the following:

- Fluidized Catalytic Cracking Unit (FCCU) [Permit 18897, EPN F-11]
- FCCU Wet Gas Scrubber [Permit 18897, EPN 111]

2.5. Alkylation/Butamer/Isom Units

The sulfuric acid Alkylation Unit produces high quality gasoline blending stock (alkylate) by the reaction of light olefinic feedstock with isobutane. Feedstocks to the Alkylation Unit are both purchased and produced from the FCCU and Butamer process. LPG (propane and butane) are recovered and stored in pressure vessels. Emission points in Alkylation Unit, Butamer Unit, and Isom Unit include:

- Alkylation Unit [Permit 18897, EPN F-5]
- Alky II [Permit 18897, EPN F-20S]
- Butamer [Permit 18897, EPN F-19]
- Isom Unit [Permit 18897, EPN F-20N]

2.6. Light Ends Recovery (LER) Unit

The relief gas system and LER Unit recover light off-gas and light liquid streams from certain processes and unit operations throughout the refinery. The relief gas is compressed in the four natural gas driven relief gas (also known as "Clark") compressors and fed to the LER Unit. The LER Unit fractionates the light feedstocks into LSR gasoline, butane, propane, and fuel gas streams. The liquid streams are stored prior to blending and/or shipment as products. The non-condensable light gas stream (ethane, methane, hydrogen) is used as fuel gas. Emission points in Light End Recovery Unit include:

- LER Unit [Permit 18897, EPN LE-FUG]
- Clark Compressors [Permit 18897, EPN K501-04]

2.7. Merox Unit

Light straight run (LSR) from naphtha splitter is sent to Merox Unit for sweetening and then into gasoline blend stock. Emission units at the Merox Units include the following:

- Merox III Fugitives [Permit 18897, EPN F-22]
- Naphtha Merox Fugitives [Permit 18897, EPN F-10SP]

2.8. Catalytic Gasoline Hydrotreating (CGHT) Unit

Catalytic Gasoline Hydrotreater (CGHT) removes sulfur impurities in product gasoline. Gasoline to be treated enters the CGHT directly from the upstream Fluidized Catalytic Cracking Unit (FCCU). A small amount of hydrogen is mixed with the stream and is heated by process fluid and steam. The combined stream passes over a proprietary catalyst to remove di-olefins. This is necessary to prevent fouling of the first and second stage hydrotreater catalysts. A significant amount of hydrogen is then mixed with this stream prior

Western Refining – El Paso Refinery Overview

to entering the First Stage Reactor. The combined stream is then reheated with process fluid and a fuel gas-fired heater. As the heated stream passes over the proprietary catalyst, a portion of the sulfur contained in the heated stream is converted to hydrogen sulfide (H_2S).

From the First Stage Reactor, the stream is fed to the First Stage Separator. In the First Stage Separator, the vapor is routed to an amine scrubber which uses diethanolamine (DEA) to absorb the H_2S from the gas stream. DEA, which has a low vapor pressure, is a standard solution routinely used in petroleum refineries for removing H_2S from hydrocarbons. The H_2S stripped from the DEA solution will be routed to the third party (Chemhours) acid gas processing facility. The First Stage Separator liquid is heated by process fluid and then fed into the top of the stripper. Hydrogen is used to remove ("strip") the small amount of H_2S that was dissolved in the liquid stream.

The stripper off-gas is mixed with the First Stage Reactor effluent so that the H_2S can be routed to the amine scrubber. The stripper hydrocarbon liquid is mixed with recycle hydrogen prior to entering the Second Stage Reactor. The combined stream is then reheated with process fluid in a fuel gas-fired heater. As the heated stream passes over the proprietary catalyst, the remaining sulfur contained in the heated stream is converted to H_2S.

From the Second Stage Reactor, the stream is fed to the Second Stage Separator. Vapor from the Second Stage Separator is routed to an amine scrubber to absorb the H_2S from the gas stream using DEA. The Second Stage Separator liquid is heated by process fluid and then fed to the stabilizer tower. Steam is used to reheat a portion of the stabilizer bottoms liquid to provide fractionation. The stabilizer vapor stream is condensed by air and cooling water and enters the Overhead Drum. The liquid is returned to the top of the stabilizer as reflux. The gas is routed through the Stabilizer Off-gas Amine Absorber, where DEA removes any remaining H_2S. Finally, the Stabilizer bottoms liquid (i.e., treated gasoline) is cooled and routed to the storage tank. Emissions points at the CGHT unit include the following:

- CGHT First Stage Heater [PBR 81841, EPN XH8901]
- CGHT Second Stage Heater [PBR 81841, EPN XH8902]
- GCHT Stabilizer Reboiler [PBR 81841, EPN XH8903]
- CGHT Fugitives A [PBR 81841, EPN F-25_SPA]
- CGHT Fugitives B [Permit 18897, EPN F-25_SPB]

2.9. Mobile Source Air Toxic (MSAT) Plant

To meet the standard established in the MSAT rule, Western operates a MSAT Plant that reduces the benzene content in gasoline product. The MSAT Plant contains two units, the Reformate Splitter Unit and Benzene Saturation Unit (BSU). In the Reformate Splitter, reformate from the existing Rheniformer Unit will be split into light and heavy streams. The benzene-rich light reformate stream will be sent to the BSU. In the BSU, hydrogen will be added to the light reformate stream to convert the benzene into cyclohexane. The hydrogen required for the BSU process will be supplied by the Hydrogen Plant. The outlet light reformate stream from the BSU and the heavy stream from the Reformate Splitter will be transferred back to the refinery gasoline pool for blending. Overhead gas generated in the BSU will be sent to the refinery fuel gas system. Emission points at the MSAT Plant include the following:

Western Refining – El Paso Refinery Overview

- Reformate Splitter Reboiler [Permit 18897, EPN XF4301]
- MSAT Plant Fugitives [Permit 18897, EPNs F-90 and F-90MSS]

2.10. Hydrogen Plant

Western operates a Hydrogen Plant that produces hydrogen for the removal of sulfur from various hydrocarbon fuels produced at the El Paso Refinery. Emission points at the Hydrogen Plant include the following:

- Hydrogen Plant Fugitives [Permit 18897, EPN H2FUG]
- Steam Reformer Heater F-8801 [Permit 18897, EPN XF8801/2]
- Steam Reformer Heater F-8802 [Permit 18897, EPN XF8801/2]

2.11. Plant Utilities

The El Paso refinery operates five steam boilers for the generation of process and utility steam. Each boiler is fired with refinery fuel gas (no liquid fuel is used). These boilers are:

- No. 11 Boiler [Permit 18897, EPN XF1011]
- No. 12 Boiler [Permit 18897, EPN XF1012]
- Boiler No. 1 (H-901) [Permit 18897, EPN 6]
- Boiler No. 3 (H-903) [Permit 18897, EPN 8]
- Boiler F-1013 [Permit 18897, EPN XF1013], being proposed in this permit action

2.12. Wastewater Units

Plant wastewater is collected via a network of above and below-ground drains and piping, which drain to the South Plant API separator or the North Plant API separator. Individual drains in the process areas are controlled using P-traps with water seals. The process unit drains are potential sources of fugitive emissions, and are routinely monitored as part of the plant-wide leak detection and repair program in accordance with the Benzene Waste NESHAP. The wastewater collection and treatment system is controlled to meet regulatory requirements, such as the Benzene Waste Operations NESHAP (BWON) in 40 CFR Part 61 Subpart FF, as follows:

- The South API separator vents to a carbon absorber system (series of two canisters) [Permit 18897, EPN 98].
- The North Plant API, API central sump, skimmed oil sump, and oily water sump are controlled using a carbon absorber system [Permit 18897, EPNs PK-854 and PK-855].
- The north plant wastewater collection and treatment system vents to a thermal oxidizer for overall control of VOC (including benzene) [Permit 18897, EPN PK-853].
- The Marketing Terminal sumps, vent to the loading rack vapor recovery unit (VRU) [Permit 93546, EPN CA-SK].

2.13. Asphalt Plant

Heavy liquid asphalt feed is received from El Paso Refinery processes via pipeline and from other suppliers via railcar where it is stored in tanks. The furnace (Furnace F-3601) is used

Western Refining – El Paso Refinery Overview

to maintain the temperature of a heat transfer oil that circulates throughout the plant, warming tank contents and keeping the asphalt conduits from hardening up. Asphalt product is stored in product tanks. Final product is shipped either as a liquid or emulsion in railcars or tanktrucks. The fixed roof storage tanks are heated, insulated and vented to a vapor collection system. The vapor collection system is used to reduce the nuisance odor potential in neighboring communities. A similar vent system is in place on the railcar loading racks (TCLR) and tanktruck loading racks (TTLR). All vapors are routed to the furnace for destruction. The vapor collection system was installed for purposes of odor control, and not for compliance with any state or federal regulations. The furnace is fired on natural gas. Steam needed for the plant is provided by the El Paso Refinery processes (the plant does not have any means of producing its own steam). Sources of fugitive emissions at the plant are natural gas piping, asphalt process piping, and the vapor collection system.

Wastewater at the plant is routed through an American Petroleum Institute (API) style oil-water separator. Water is received at the separator from knockout drums between the air stills and the furnace, as well as from other sources of process steam condensate. The API separator also receives surface runoff water during storms. From the API separator, wastewater is routed to the El Paso Refinery processes for final treatment and disposal. Emissions points at the Asphalt Plant include the following:

- Asphalt Plant Furnace F-3601 [Proposed for consolidation in Permit 18897, EPN XF3601]
- Asphalt Plant Loading Rack [Proposed for consolidation in Permit 18897, EPN TTLR/TCLR]
- Asphalt Plant Fugitives [Proposed for consolidation in Permit 18897, EPN FUELFUG]
- Numerous Asphalt Plant Tanks

2.14. Process Equipment Leak Fugitives

Fugitive emissions result from process equipment in VOC service throughout the refinery. Each area of the refinery is included in the leak detection and repair (LDAR) program and is routinely monitored [multiple EPNs]. Appendix A contains a list of all process equipment leak fugitive sources being considered in this permit application.

2.15. Storage Tanks

The El Paso Refinery operates fixed roof, floating roof, and pressurized storage tanks for feedstocks, intermediates, final products, and utility services.

2.16. Loading and Unloading Facilities

The El Paso Refinery operates loading and unloading facilities for the receipt of feedstocks and shipping final products, by-products and waste streams. Loading racks are separated into bulk fuel loading and solid waste loading as outlined below.

2.16.1. Bulk Fuel Loading

The following product fuels are loaded into tanktrucks at the Marketing Terminal:

- Motor gasolines for all markets

Western Refining – El Paso Refinery Overview

- Distillates (diesel fuel, jet fuels, kerosene, fuel oil)

An activated carbon vapor recovery unit (VRU) controls emissions from each loading lane and fuel riser via a vacuum loading system to NSPS Subpart XX standards of less than 0.083 lb/1,000 gallon loaded. Emission points for Marketing Terminal loading rack include the Marketing Terminal Loading Rack VRU [Permit 93546, EPN CA-SK].

LPG (e.g., propane) is loaded into pressurized tanktrucks at the marketing terminal resulting in a small quantity of fugitive emissions:

- Terminal Fugitives [Permit 18897, EPN FUG, and Permit 93546, EPN FUG-T]
- Terminal Loading Rack Hose Fugitives [Permit 93546, EPN LRACK-FUG]

LPG is also loaded into pressurized vessels at the following refinery loading racks:

- South Railcar Loading Rack [Permit 93546, EPN SLR1]
- South LPG Tanktruck Loading Rack [Permit 93546, EPN SLR2]
- North LPG Railcar Loading Rack [Permit 93546, EPN LLPG-TC]
- North LPG Tanktruck Loading Rack [Permit 93546, EPN LLPG-TC]

2.16.2. Asphalt Feed

The crude vacuum heavy fractions include asphalt feed, which may be shipped via railcar or tanktruck. Asphalt feed is loaded at the following loading rack:

- North Asphalt Feed Loading Rack [Permit 93546, EPN NLR-7]
- Vacuum Resid Loading [Permit 93546, EPN VACLR]

2.16.3. Spent Acid and Caustic Loading

Spent acid and caustic that are used in the petroleum refining processes are loaded and shipped for processing offsite. Spent acid and caustic are loaded at the following loading racks:

- South Acid/Caustic Tanktruck Loading Rack [Permit 93546, EPN SLR4]
- North Caustic Loading Rack [Permit 93546, EPN NLR2-5]

2.16.4. Solid Waste Loading

Solid waste generated at the site, including scrap equipment, clean soil, etc., is loaded via the Solid Waste Gondola Loading Rack [Permit 93546, EPN NLR-6] for shipment off site.

2.16.5. Other Distillate/Heavy Product Loading

Distillate/heavy products at the El Paso Refinery may be loaded at the following loading racks:

- South Railcar Loading Rack [Permit 93546, EPN SLR1]
- North Railcar Loading Rack [Permit 93546, EPN NLR2-5]
- North Tanktruck Loading Rack [Permit 93546, EPN NLR2-5]

Western Refining – El Paso Refinery Overview

2.16.6. Various Material Unloading

Various materials are unloaded at the North Loading Rack NLR3 (EPN NLR2-5, FIN NLR3). Materials unloaded at NRL3 include biodiesel, transmix, fuel oil, light cycle oil (LCO), crude oil, toluene, xylene, and natural gasoline from railcars and tanktrucks. During the unloading operation, materials will be pumped out from the bottom of the transfer vehicle (i.e., railcar or tanktruck), through the transfer pumps and piping. To facilitate the unloading process, nitrogen will be introduced as the material in the railcar/tanktruck that is being pumped out. When all material is pumped out, the supply of nitrogen will be shut off. When completely unloaded, there is a pressure of 6 psig left in the railcar/tanktruck. Western can either return the railcar/tanktruck with the pressure still in the railcar/tanktruck or return the railcar/tanktruck after depressurization depending on the requirements from the vehicle owner. If depressurization is performed, the depressurized gas will be routed to the refinery fuel gas system and combusted in the refinery heaters and boilers. After depressurization, the unloading hose is then disconnected from the railcar/tanktruck.

The unloading operation is performed in an enclosed manner. Therefore, no emissions are released during the unloading process. When the vapor is routed to the refinery fuel gas system, uncaptured fugitive VOC emissions will be released. In addition, fugitive VOC emissions will be released during hose disconnection. Emissions points associated with NLR3 unloading include the North Loading Rack NLR3 (Unloading) [Permit 93546, EPN NLR2-5].

2.17. Cooling Towers

Western operates ten (10) atmospheric cooling towers throughout the refinery:

- No. 5/6 cooling tower [Permit 18897, EPN F-14-5-6]
- No. 7 cooling tower [Permit 18897, EPN F-14-7]
- No. 8 cooling tower [Permit 18897, EPN F-14-8]
- No. 9 cooling tower [Permit 18897, EPN F-14-9]
- Main cooling tower [Permit 18897, EPN F-7]
- Alky cooling tower [Permit 18897, EPN F-21]
- No. 6 Crude Unit Auxiliary Cooling Tower [Permit 18897, EPN CT-CDU6], being proposed in this permit action
- Marketing Terminal Cooling Tower [Permit 18897, EPN CT-5301]
- Aux Alky Cooling Tower #1 [Permit 18897, EPN F-25]
- Aux Alky Cooling Tower #2 [Permit 18897, EPN F-26]
- Aux Alky Cooling Tower #3 [Permit 18897, EPN F-27]

Each cooling tower is a potential source of VOC emissions due to heat exchanger leaks. Western periodically and routinely monitors the cooling towers for the presence of VOC, in accordance with Permit 18897 and MACT CC.

Western Refining – El Paso Refinery Overview

2.18. Flares

Western employs the following flares to control emission releases due to emergencies as well as MSS activities.

- Relief Gas North Main Flare [Permit 18897, EPN D-2914]
- Rheniformer Flare [Permit 18897, EPN R-2911]
- South Main Flare [Permit 18897, EPN 112]

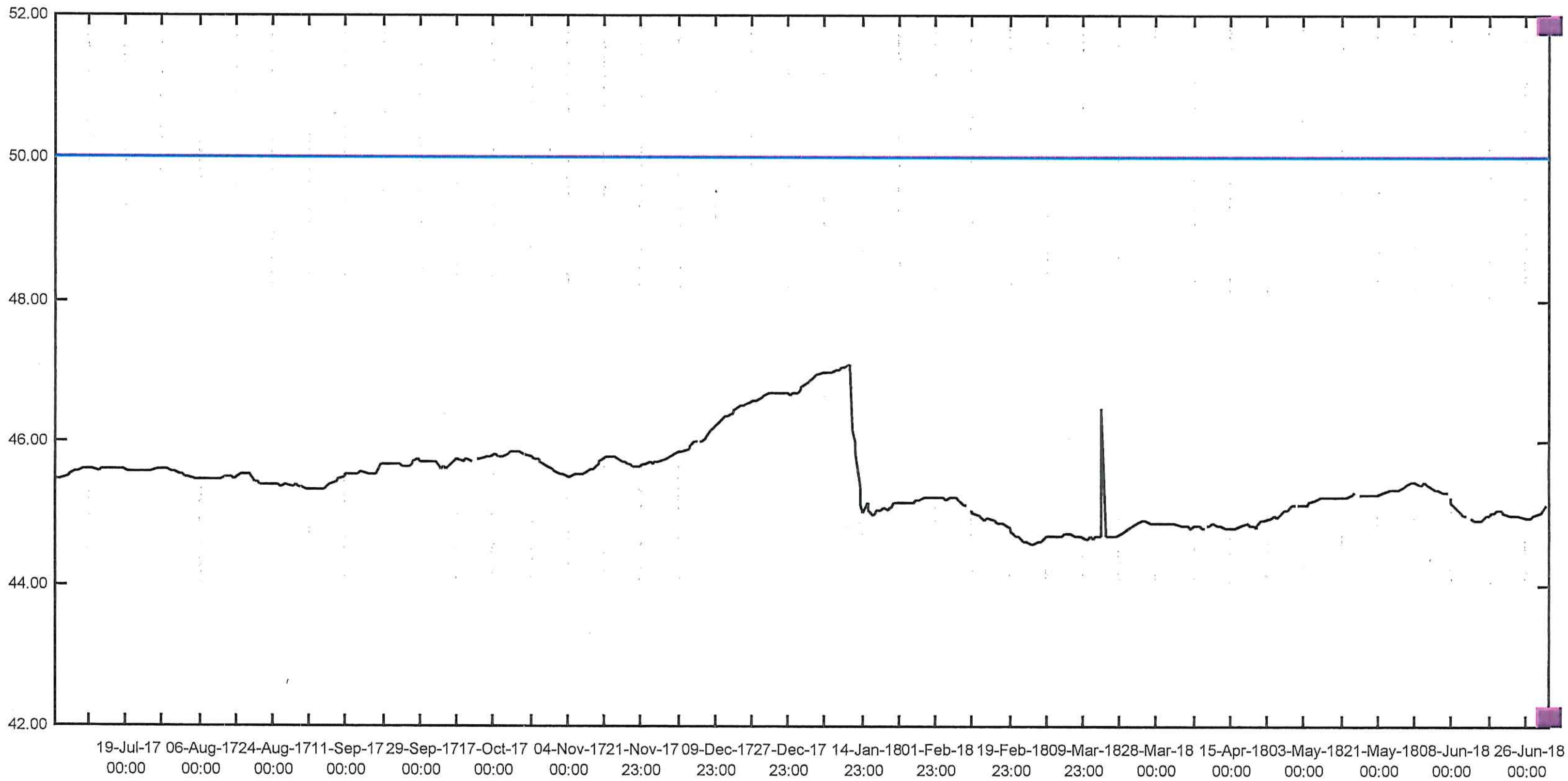
2.19. Miscellaneous Plant Emissions

Other sources of miscellaneous emissions resulting from routine plant operations (e.g., the fire water pump [EPN 97], air compressors, etc.) are likely to occur within the plant, but are not significant sources of emissions.

Appendix 4
FCCU NO_x emission trends

FCCU NOx 365-Day avg.

XHQ Trend

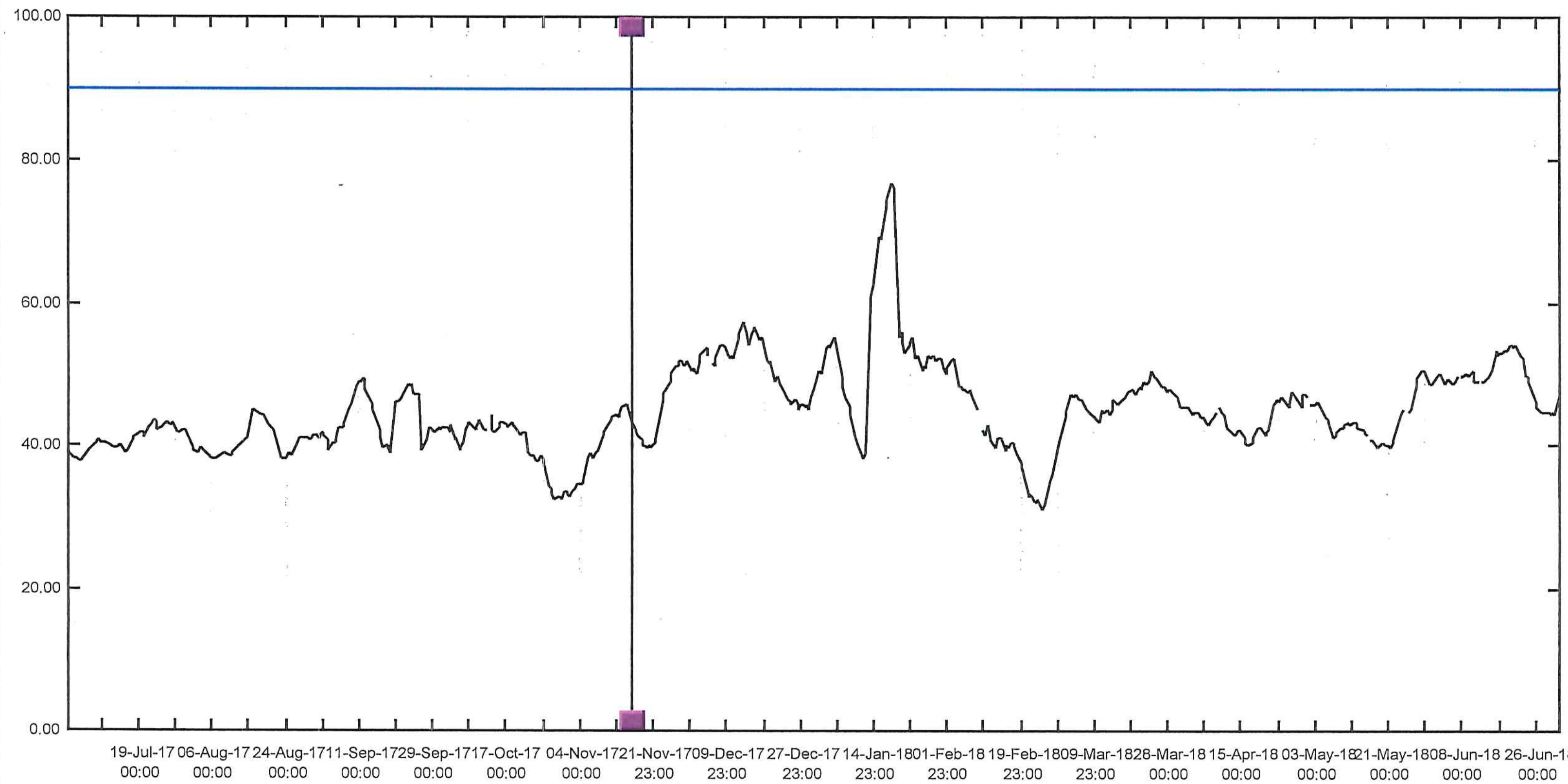


Start Time: 07/01/17 01:07:48 PM   Span: 365.0 Days   Scooter Time: 07/01/18 01:07:48 PM   End Time: 07/01/18 01:07:48 PM

	Description	Scooter Value	Current Value	Units	Min	Max	Scale	Aggregate	Tolerance (%)
31AI161B.365DAVG	NOX Emmission O2 Corrected 36		45.7	ppm	42.00	52.00	Left	Fits	50
50		50		None	42	52	Left	Fits	5

FCCU NOx 7-day avg.

XHQ Trend

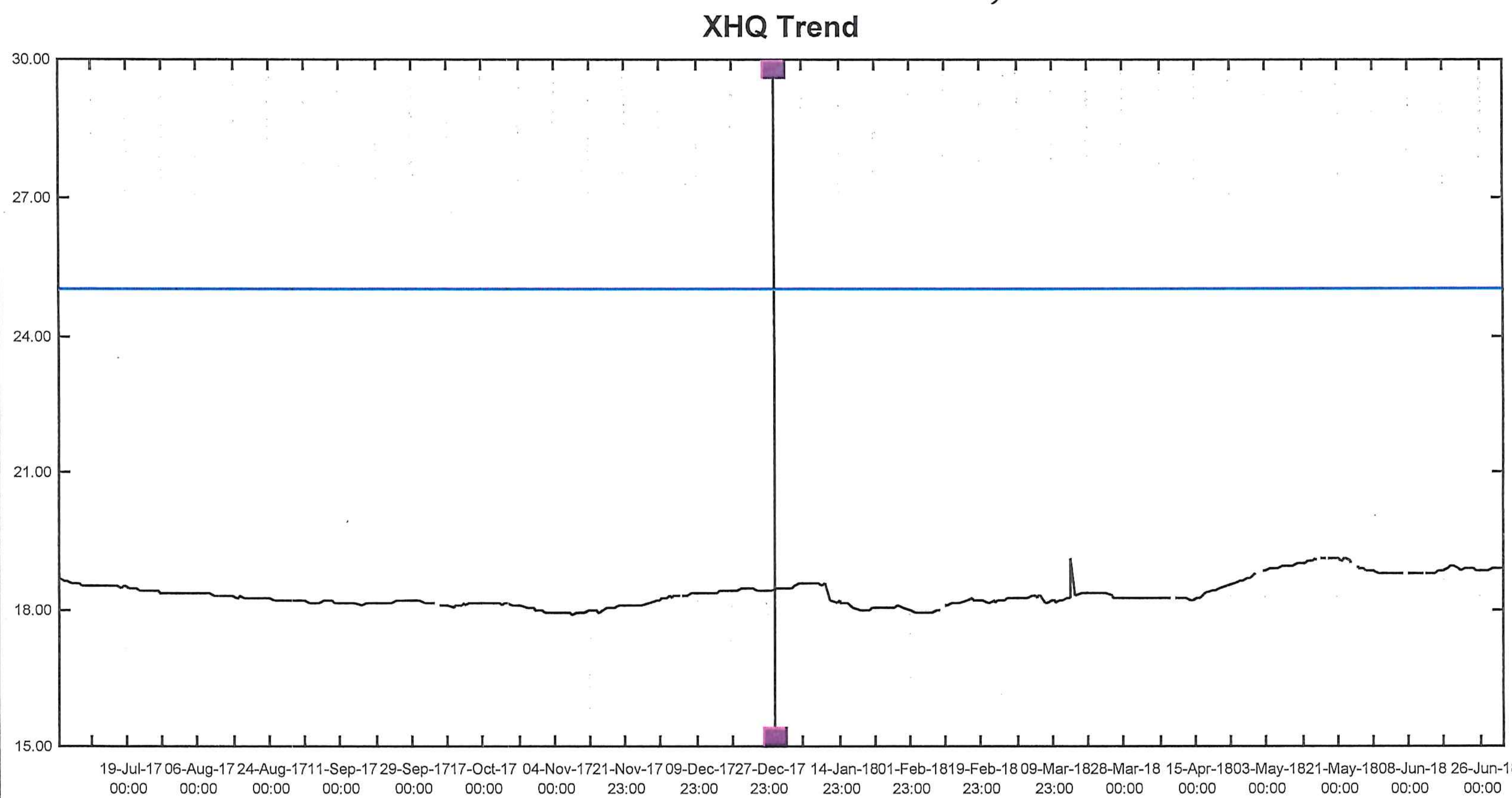


Start Time: 07/01/17 01:54:00 PM | Span: 365.0 Days | Scooter Time: 11/16/17 04:49:55 PM | End Time: 07/01/18 01:54:00 PM

	Description	Scooter Value	Current Value	Units	Min	Max	Scale	Aggregate	Tolerance (%)
31ai161b.7davg	NOX Emmission O2 Corrected 7	43.9	58.9	ppm	0.00	100.00	Left	Fits	50
90		90		None	0	100	Left	Fits	5

Appendix 5
FCCU SO_2 emission trends

FCCU SO2 365-Day avg

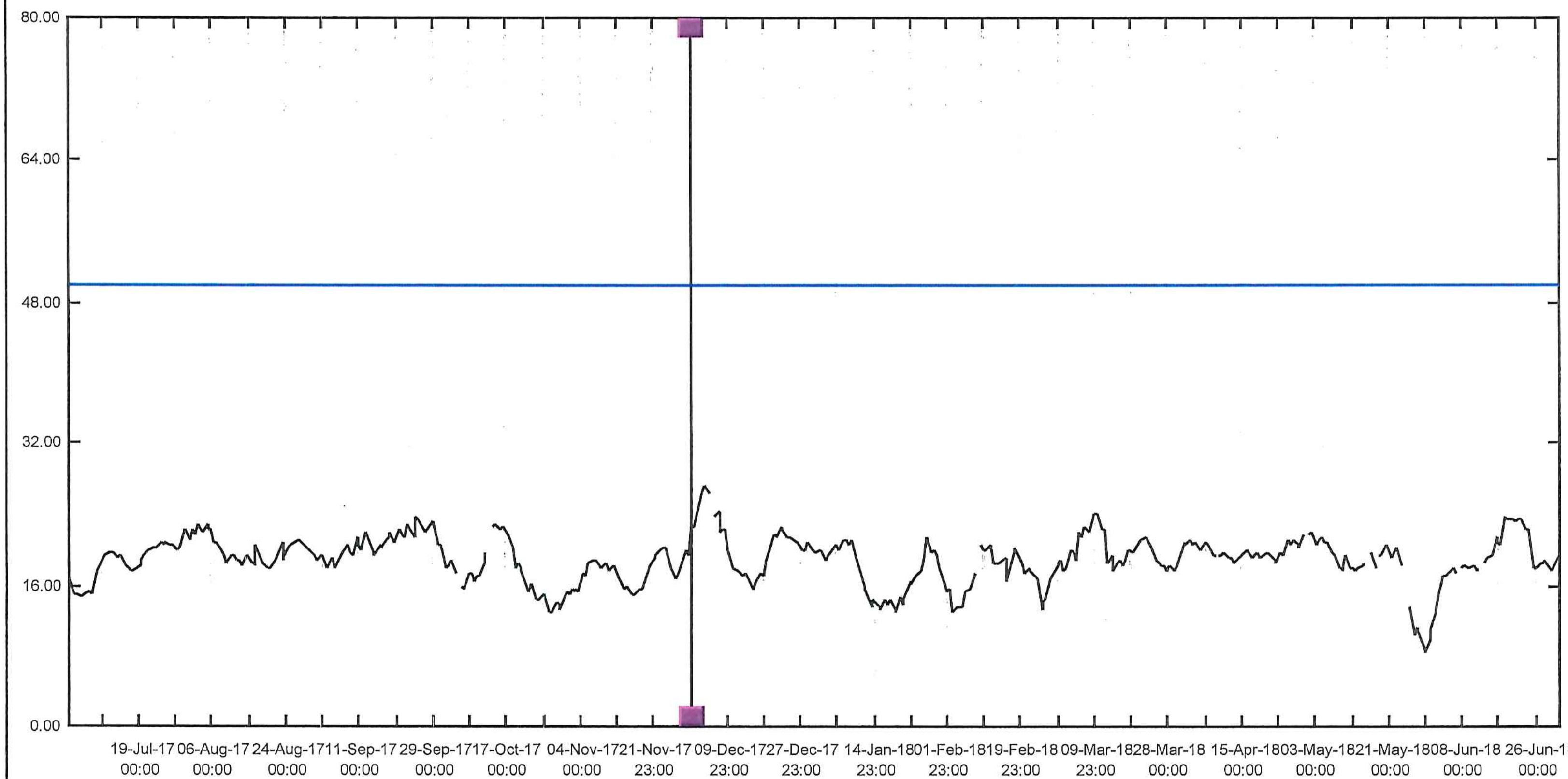


Start Time: 07/01/17 01:54:00 PM | Span: 365.0 Days | Scooter Time: 12/29/17 01:28:03 PM | End Time: 07/01/18 01:54:00 PM

	Description	Scooter Value	Current Value	Units	Min	Max	Scale	Aggregate	Tolerance (%)
31AI162C.365DAVG	WGS OUTLET SO2 - O2 CORR 365	18.5	19.0	ppm	15.00	30.00	Left	Fits	50
25		25		None	15	30	Left	Fits	5

FCCU $\cancel{NOx}$ SO2 7-Day avg.

XHQ Trend



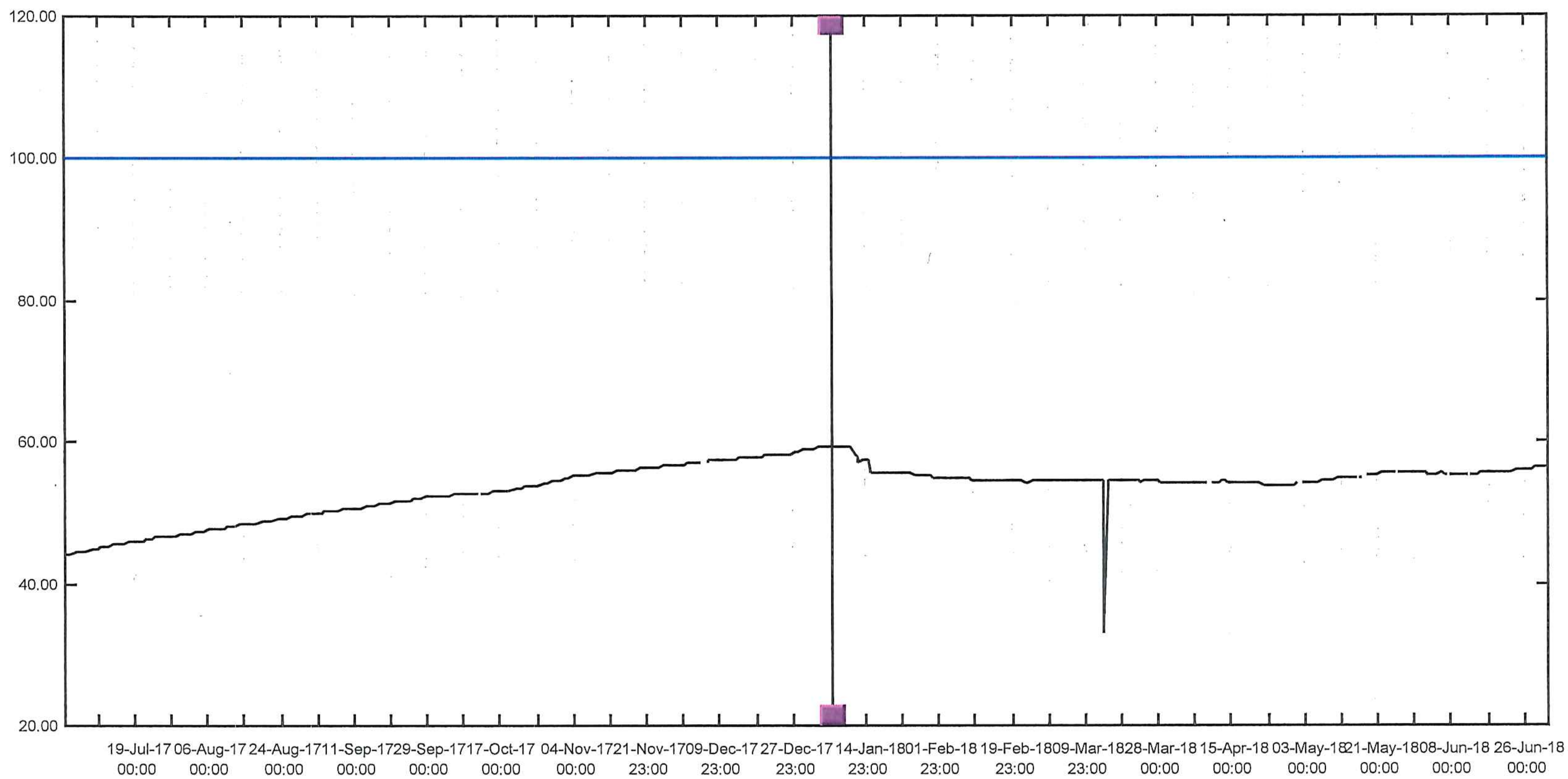
Start Time: 07/01/17 01:54:00 PM Span: 365.0 Days Scooter Time: 11/30/17 10:37:20 PM End Time: 07/01/18 01:54:00 PM

	Description	Scooter Value	Current Value	Units	Min	Max	Scale	Aggregate	Tolerance (%)
31ai162c.7davg	WGS OUTLET SO2 - O2 CORR 7 Da	20.3	19.8	ppm	0.00	80.00	Left	Fits	50
50		50		None	0	80	Left	Fits	5

Appendix 6
FCCU CO emission trends

FCCU CO 365-Day avg.

XHQ Trend

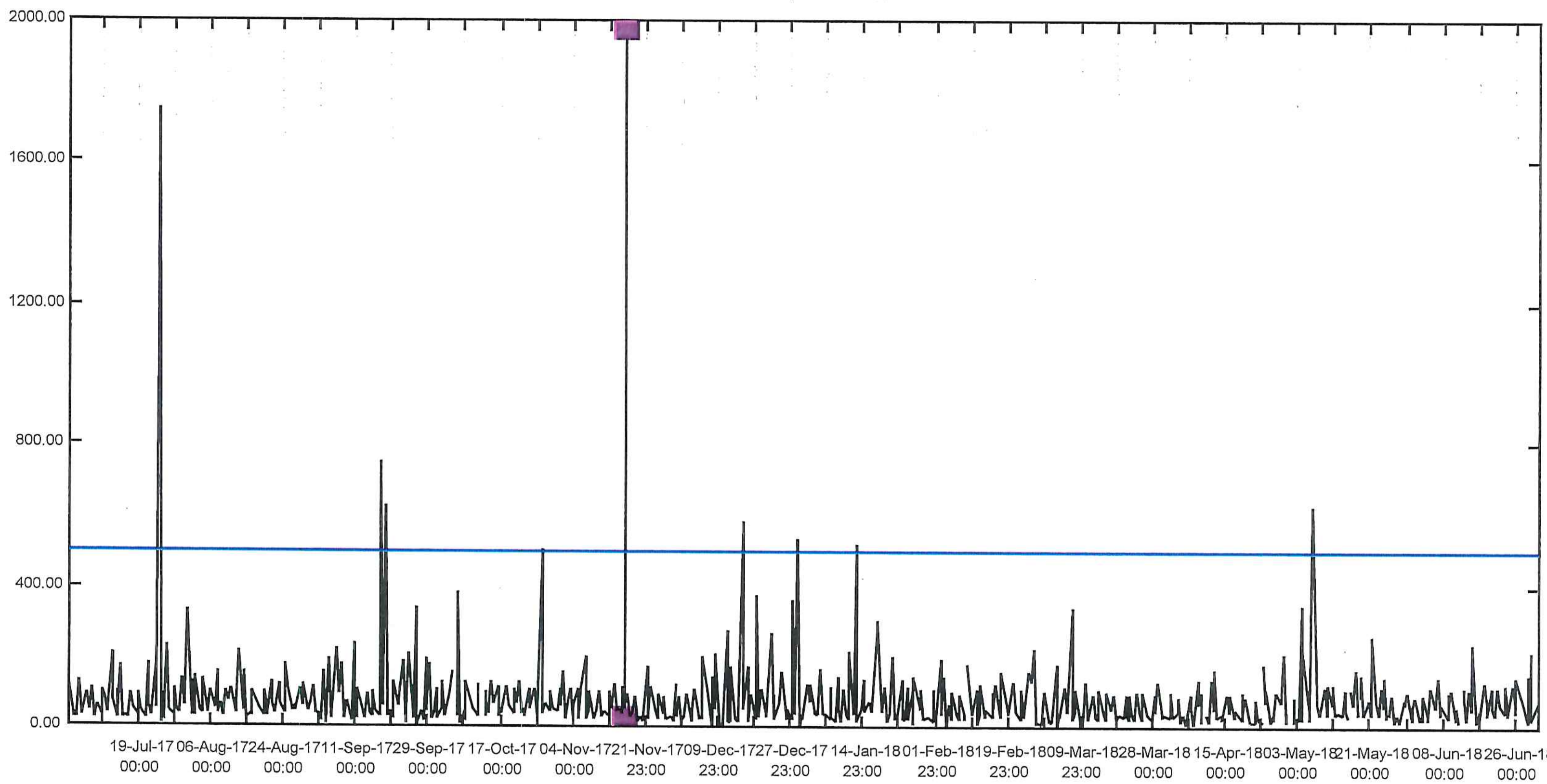


Start Time: 07/01/17 01:54:00 PM | Span: 365.0 Days | Scooter Time: 01/06/18 10:12:00 AM | End Time: 07/01/18 01:54:00 PM

	Description	Scooter Value	Current Value	Units	Min	Max	Scale	Aggregate	Tolerance (%)
30AI329B.365DAVG	CO Emission O2 Corrected 365	59.5	57.1	ppm	20.00	120.00	Left	Fits	50
100		100		None	20	120	Left	Fits	5

FCCU CO 1-hr avg.

XHQ Trend

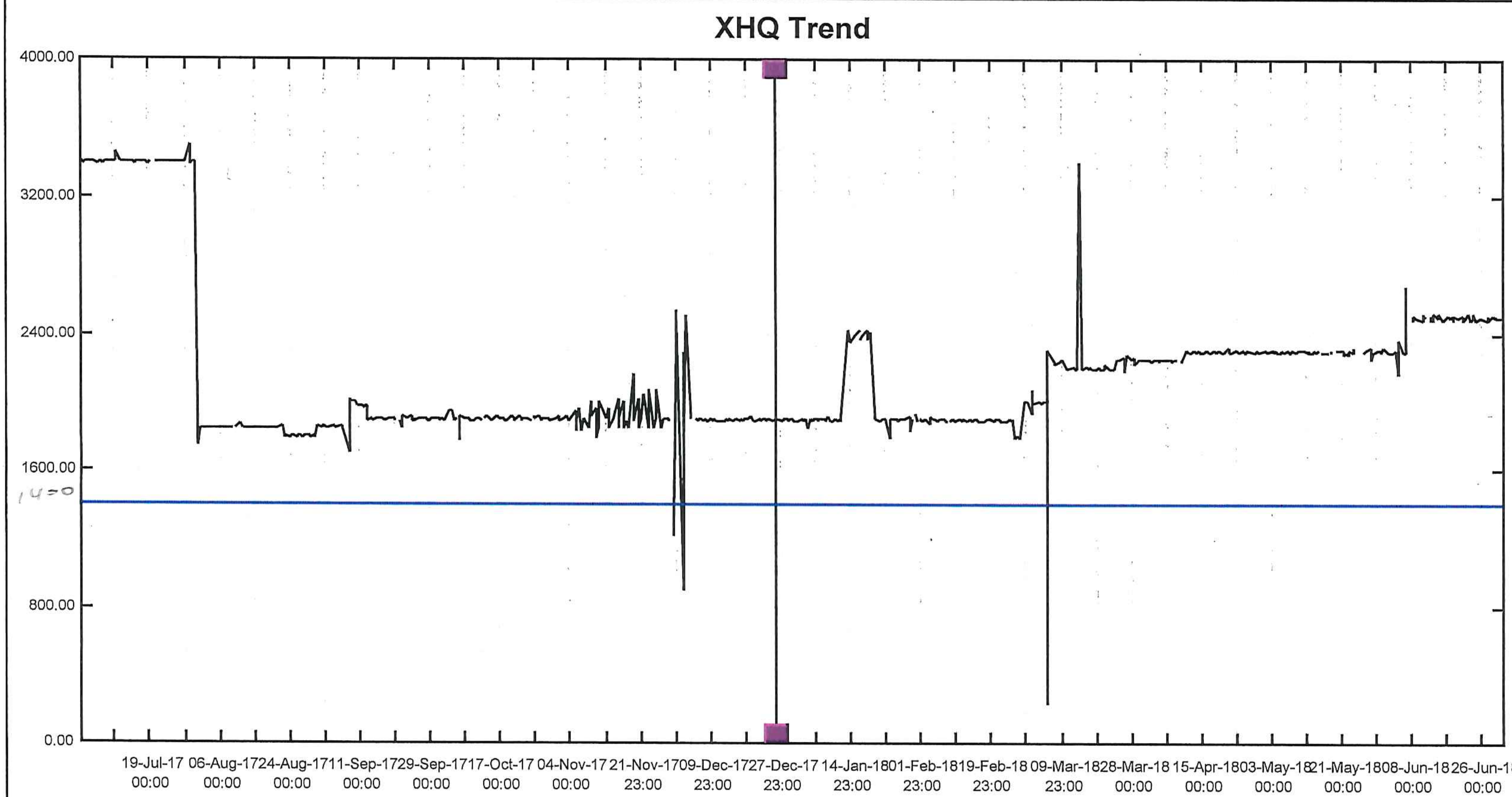


Start Time: 07/01/17 01:54:00 PM | Span: 365.0 Days | Scooter Time: 11/16/17 04:49:55 PM | End Time: 07/01/18 01:54:00 PM

	Description	Scooter Value	Current Value	Units	Min	Max	Scale	Aggregate	Tolerance (%)
30AI329B.1hravg	CO Emission O2 Corrected 1 Hr	88.6	174.0	ppm	0.00	2000.00	Left	Fits	50
500		500		None	0	2000	Left	Fits	5

Appendix 7
FCCU opacity AMP trends

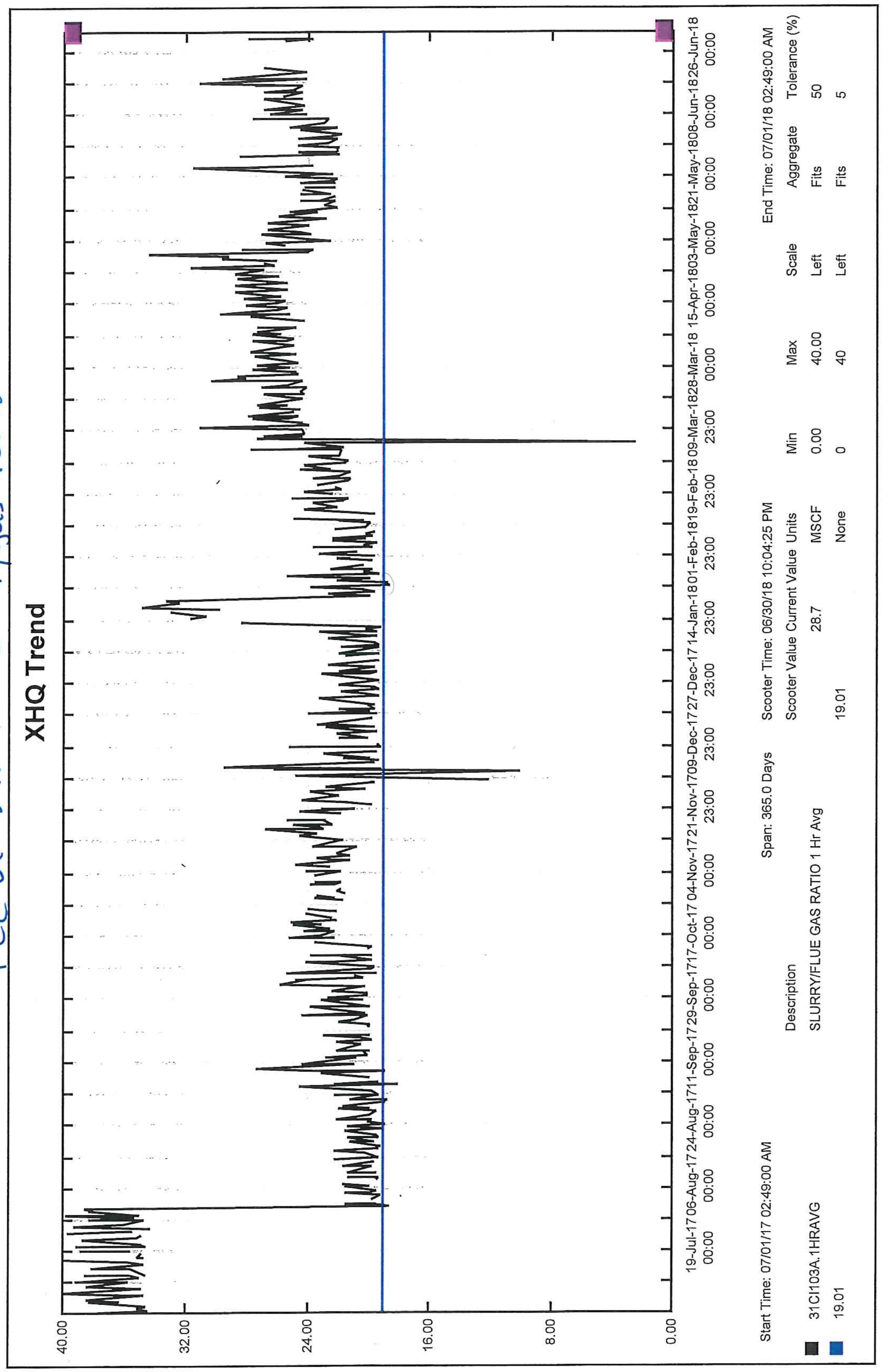
FCCU AMP Slurry Rate



Start Time: 07/01/17 02:49:00 AM | Span: 365.0 Days | Scooter Time: 12/26/17 07:04:01 AM | End Time: 07/01/18 02:49:00 AM

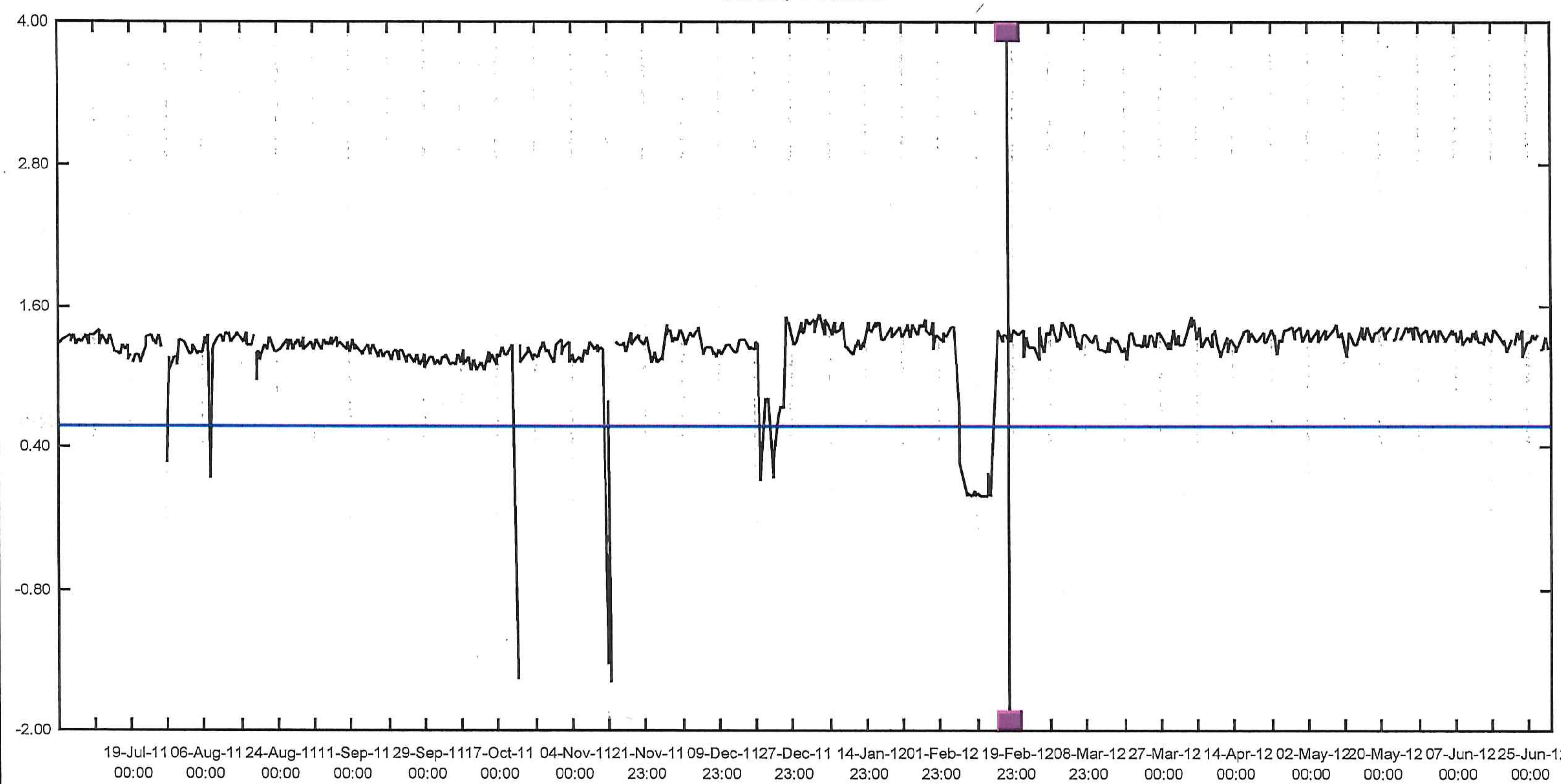
	Description	Scooter Value	Current Value	Units	Min	Max	Scale	Aggregate	Tolerance (%)
31FC105.1HRAVG	WATER SLURRY TO VENTURI 1 Hr	1898.4	2502.4	gal/min	0.00	4000.00	Left	Fits	50
1400		1400		None	0	4000	Left	Fits	5

FCCU AMP Slurry/gas ratio



FCCU AMP Venturi dP

XHQ Trend

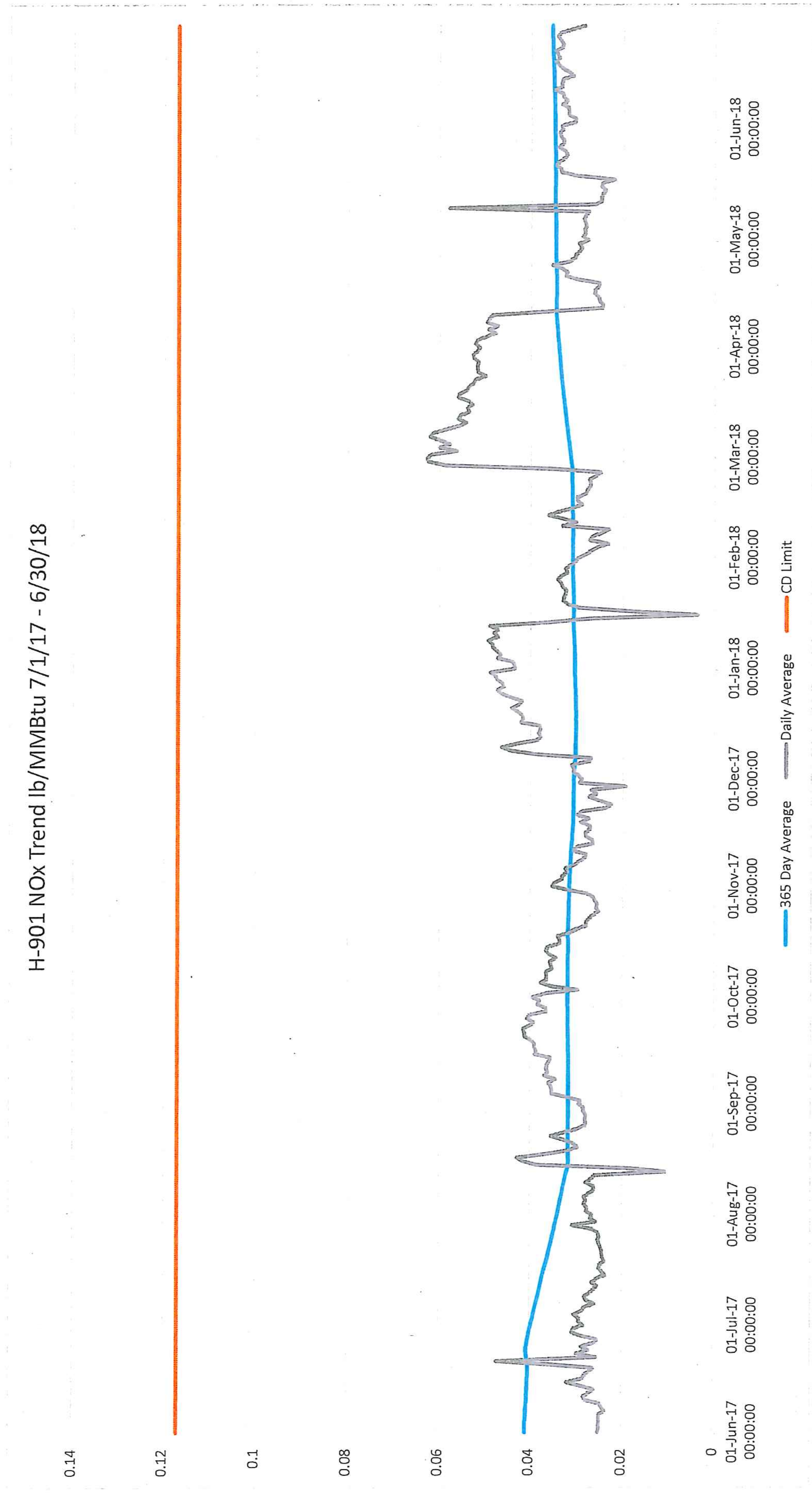


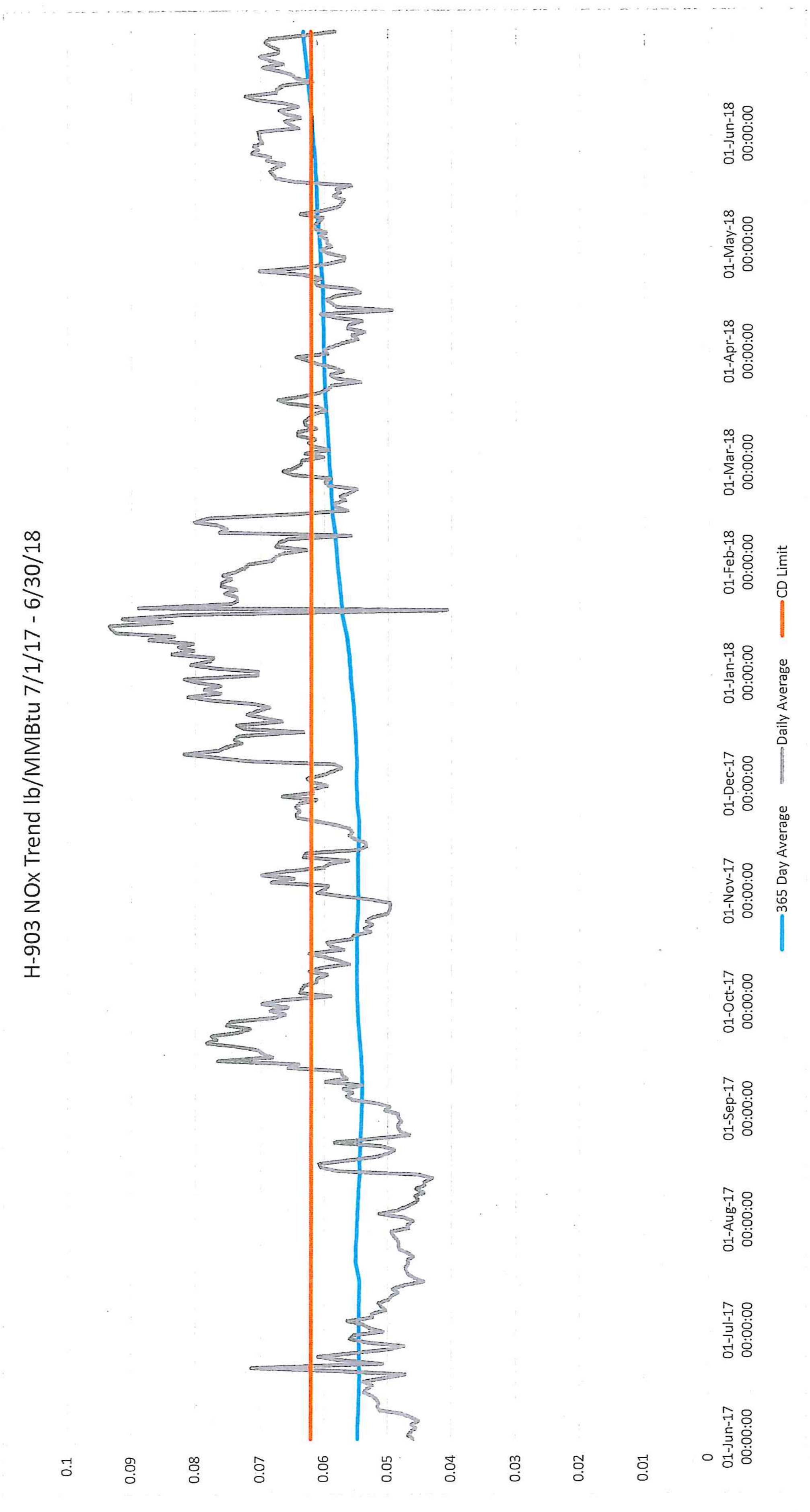
Start Time: 07/01/11 02:49:10 AM | Span: 365.0 Days | Scooter Time: 02/18/12 11:48:31 AM | End Time: 06/30/12 02:49:10 AM

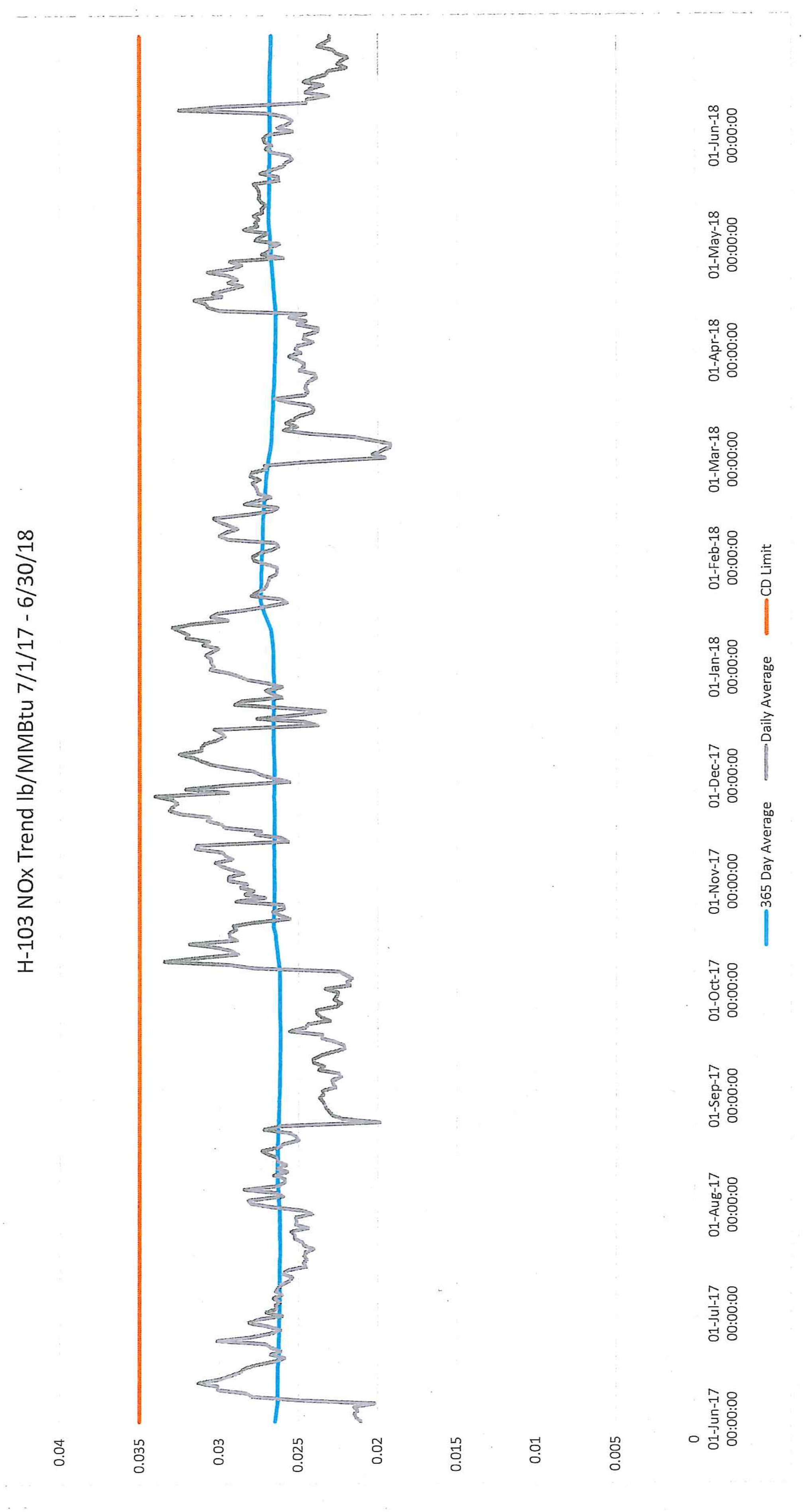
	Description	Scooter Value	Current Value	Units	Min	Max	Scale	Aggregate	Tolerance (%)
31PDI102.1HRAVG	WGS VENTURI DIFF PRESS 1 Hr A	1.3	0.9	psi	-2.00	4.00	Left	Fits	50
0.58		0.58		None	-2	4	Left	Fits	5

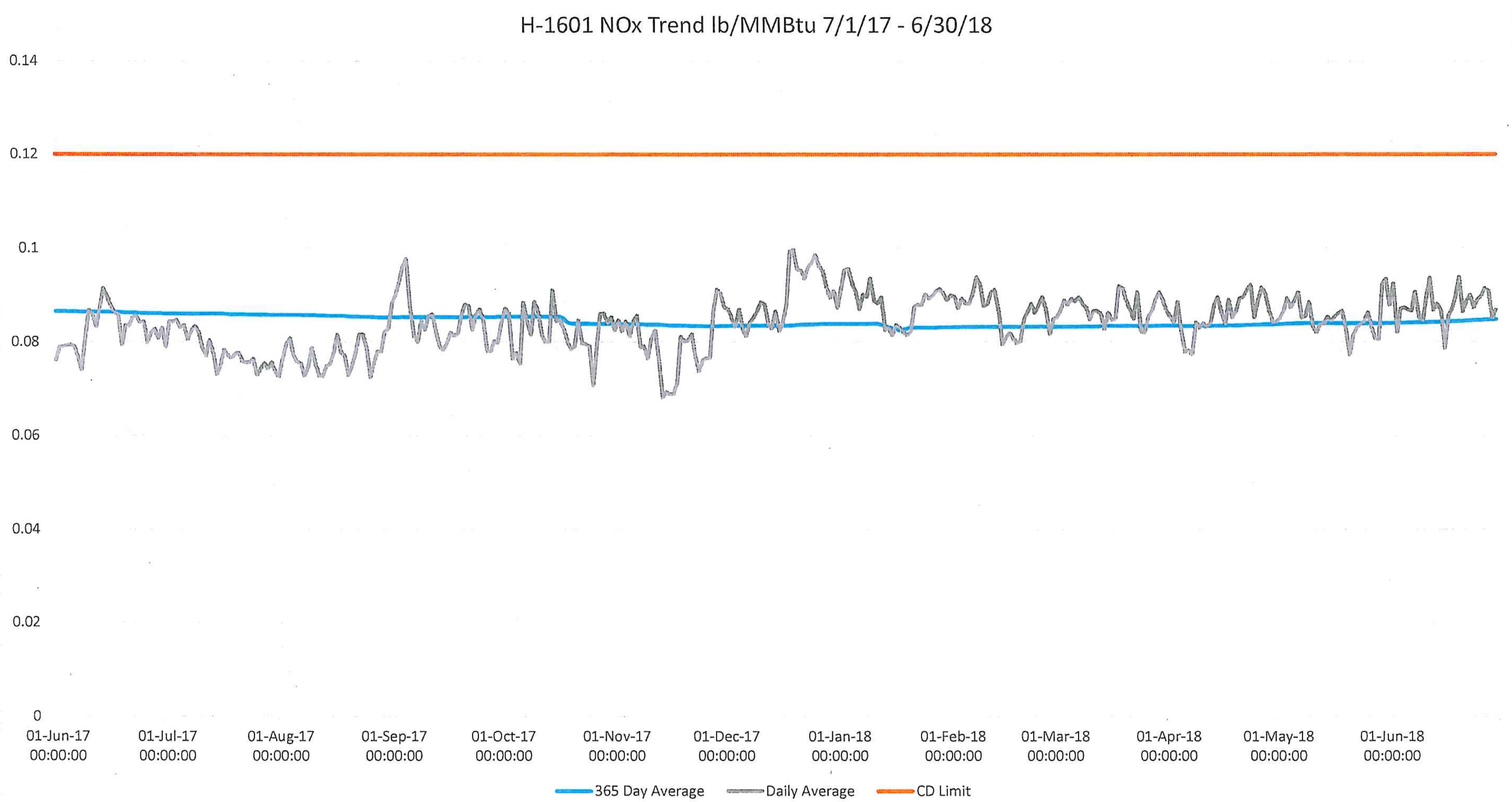
Appendix 8

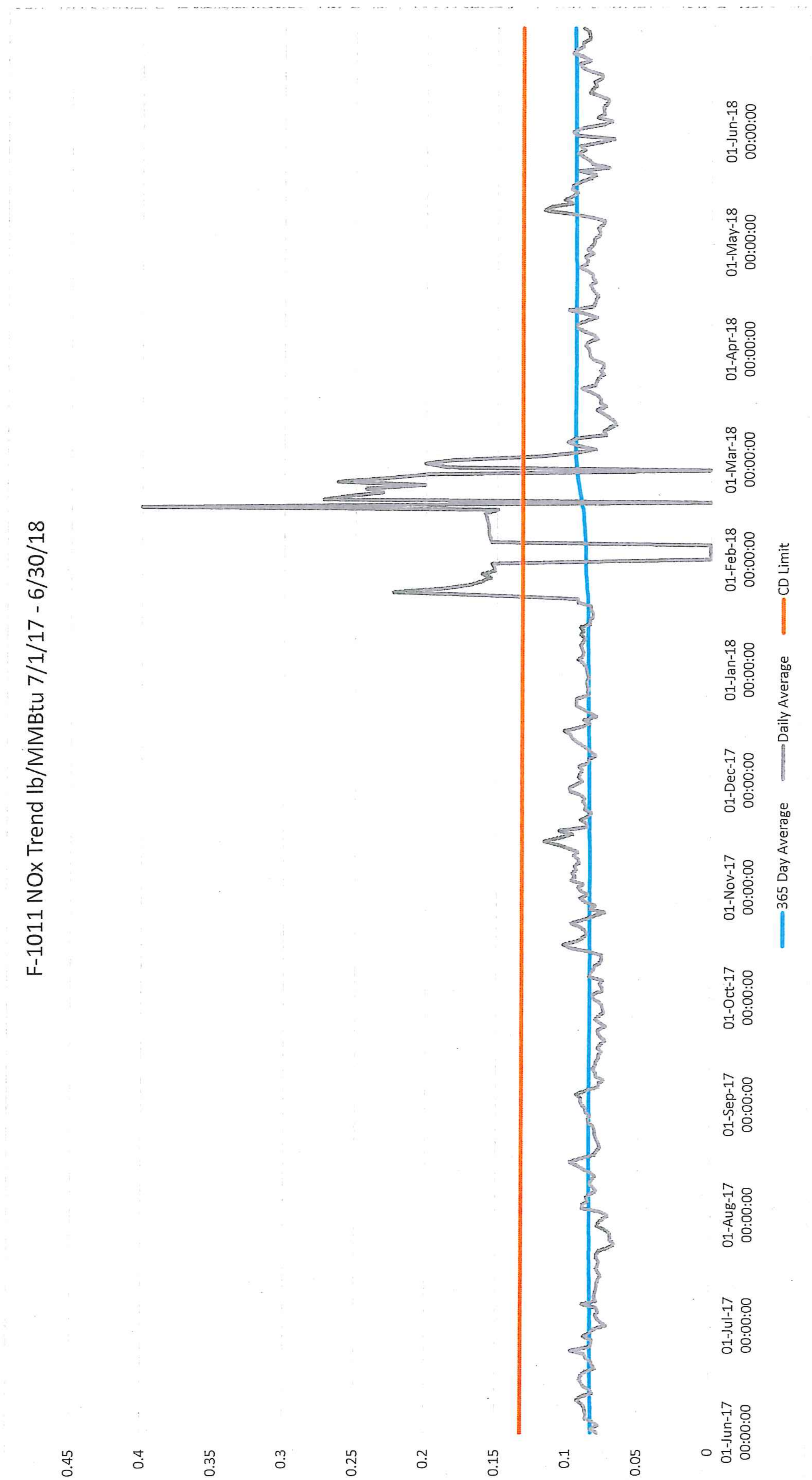
Heaters and boilers NO_x emission trends

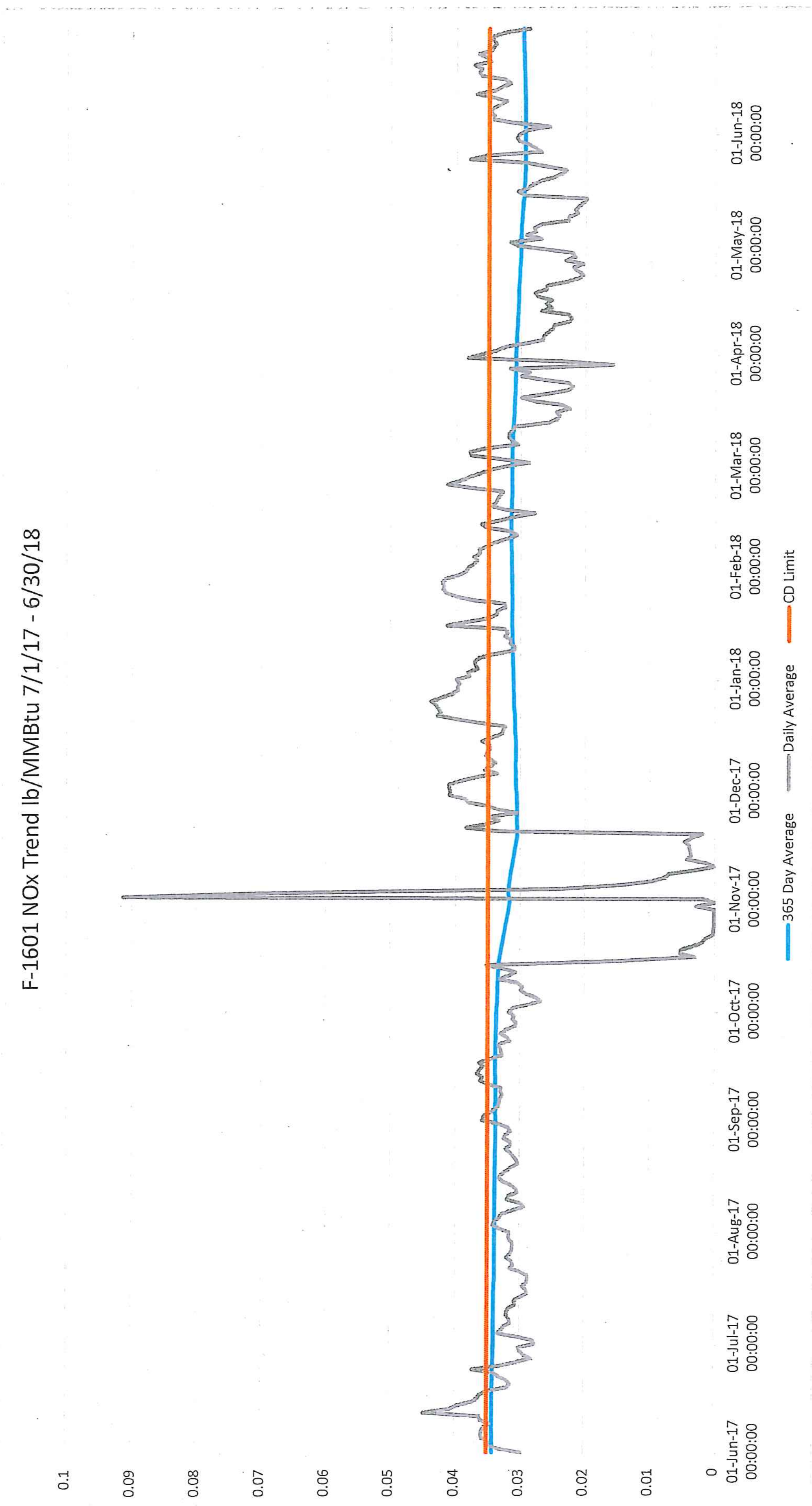

H-901 NOx Trend lb/MMBtu 7/1/17 - 6/30/18
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
01-Jun-17 00:00:00
01-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
365 Day Average
Daily Average
CD Limit


H-903 NOx Trend lb/MMBtu 7/1/17 - 6/30/18
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
01-Jun-17 00:00:00
01-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
365 Day Average
Daily Average
CD Limit

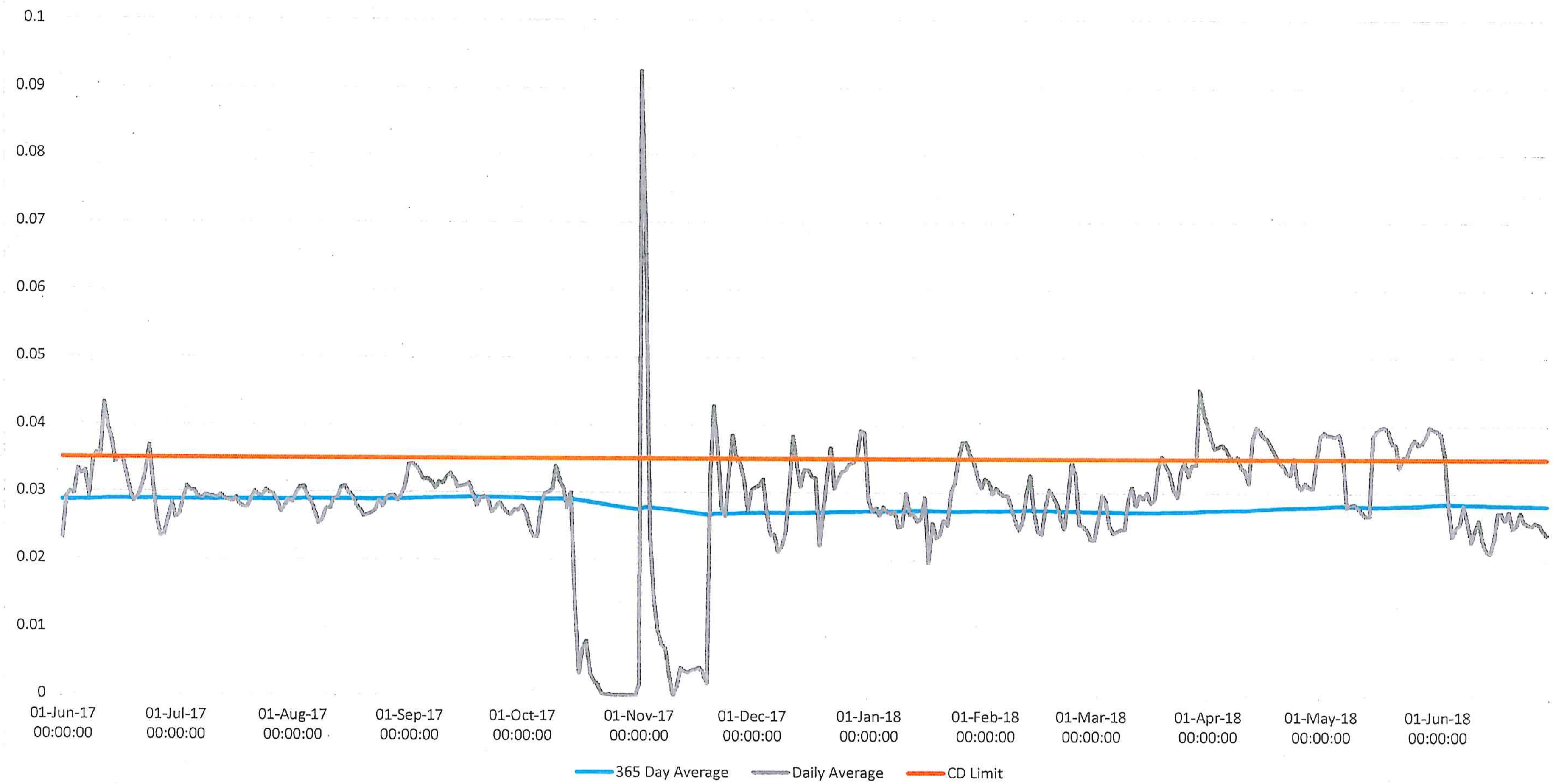

H-103 NOx Trend lb/MMBtu 7/1/17 - 6/30/18
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
01-Jun-17 00:00:00
01-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
365 Day Average
Daily Average
CD Limit

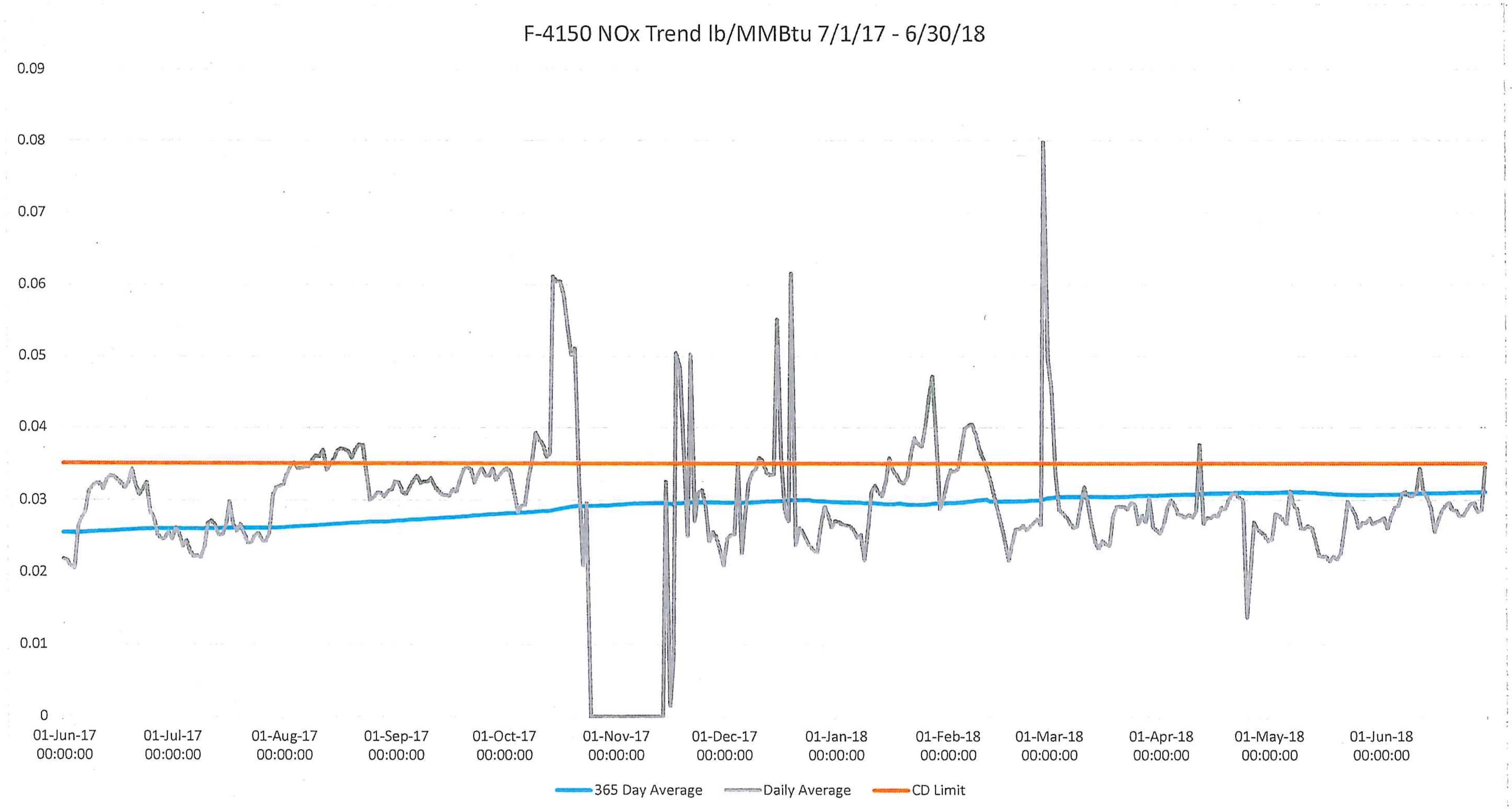

H-1601 NOx Trend lb/MMBtu 7/1/17 - 6/30/18
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
01-Jun-17 00:00:00
01-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
365 Day Average
Daily Average
CD Limit

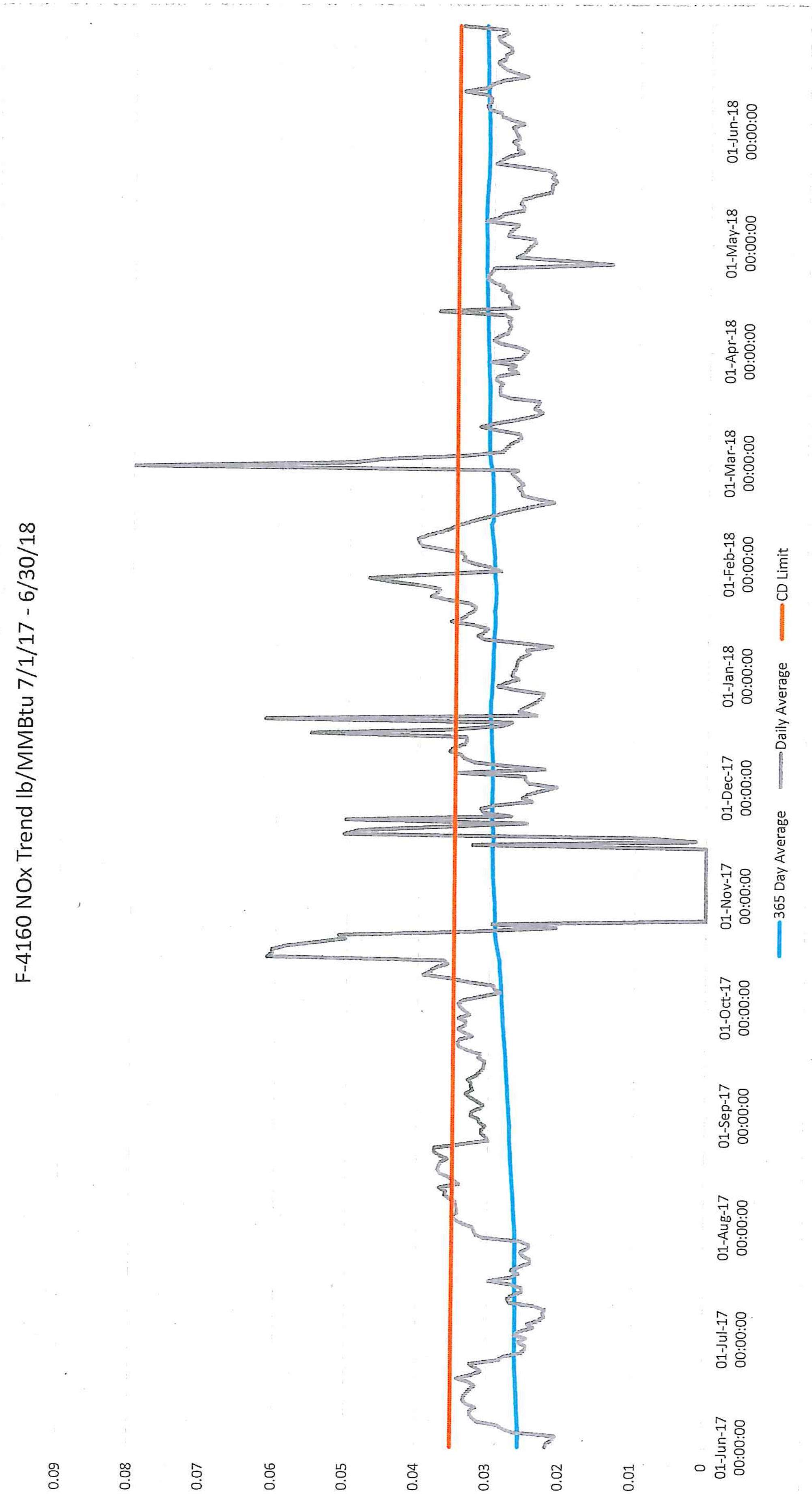

F-1011 NOx Trend lb/MMBtu 7/1/17 - 6/30/18
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
01-Jun-17 00:00:00
01-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
365 Day Average
Daily Average
CD Limit

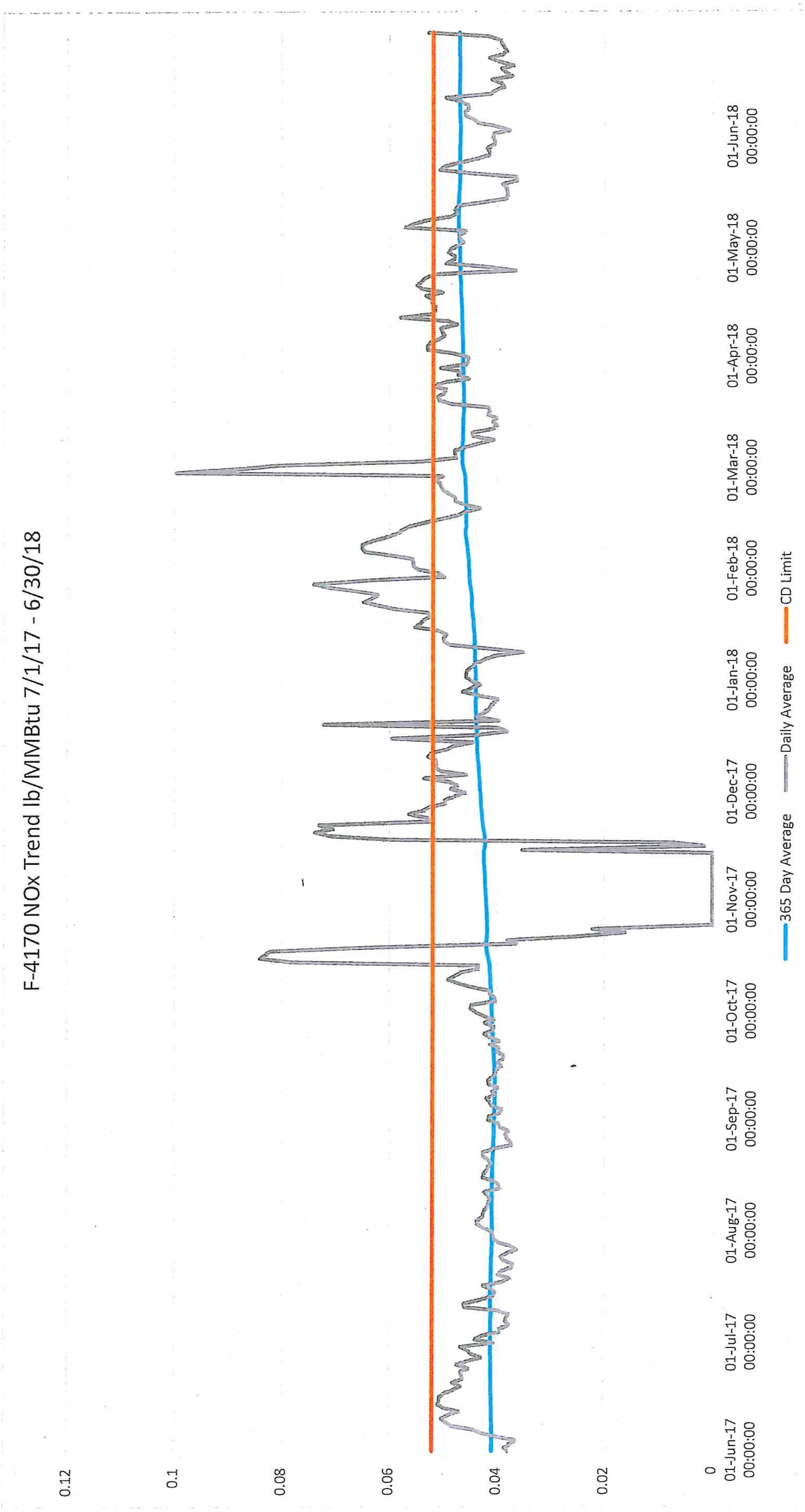

F-1601 NOx Trend lb/MMBtu 7/1/17 - 6/30/18
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
01-Jun-17 00:00:00
01-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
365 Day Average
Daily Average
CD Limit

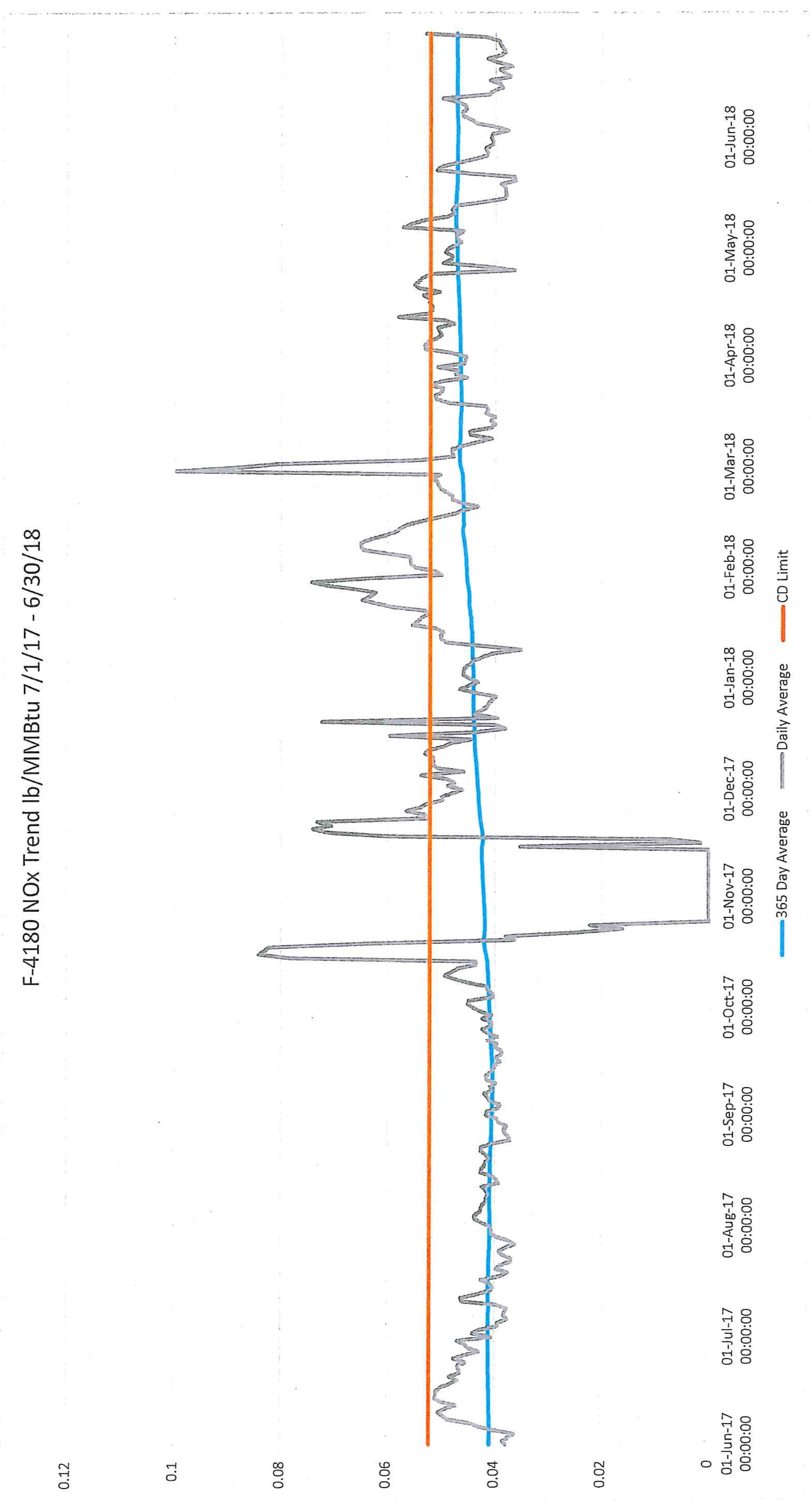
F-1602 NOx Trend lb/MMBtu 7/1/17 - 6/30/18




F-4150 NOx Trend lb/MMBtu 7/1/17 - 6/30/18
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
01-Jun-17 00:00:00
01-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
365 Day Average
Daily Average
CD Limit

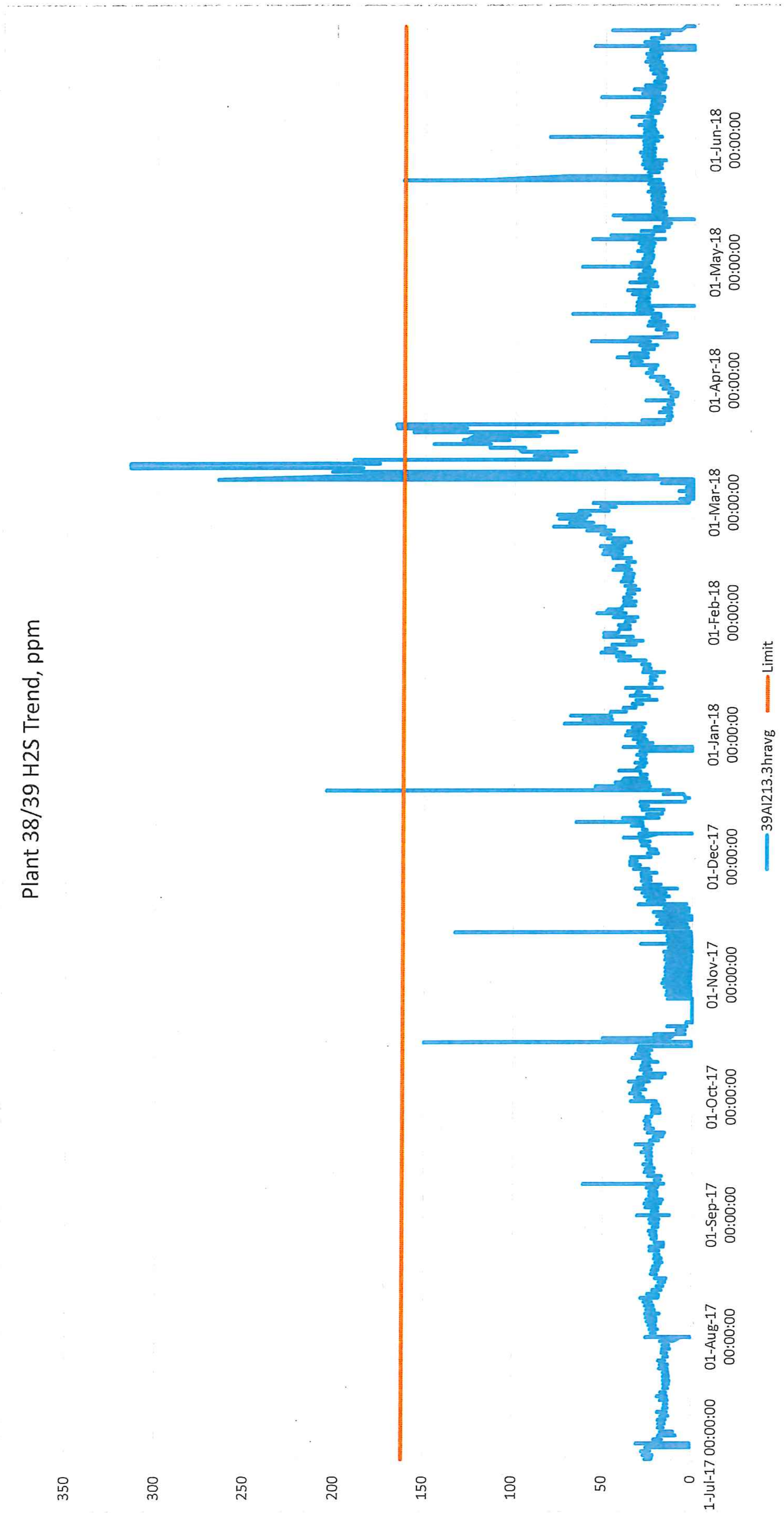

F-4160 NOx Trend lb/MMBtu 7/1/17 - 6/30/18
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
01-Jun-17 00:00:00
01-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
365 Day Average
Daily Average
CD Limit

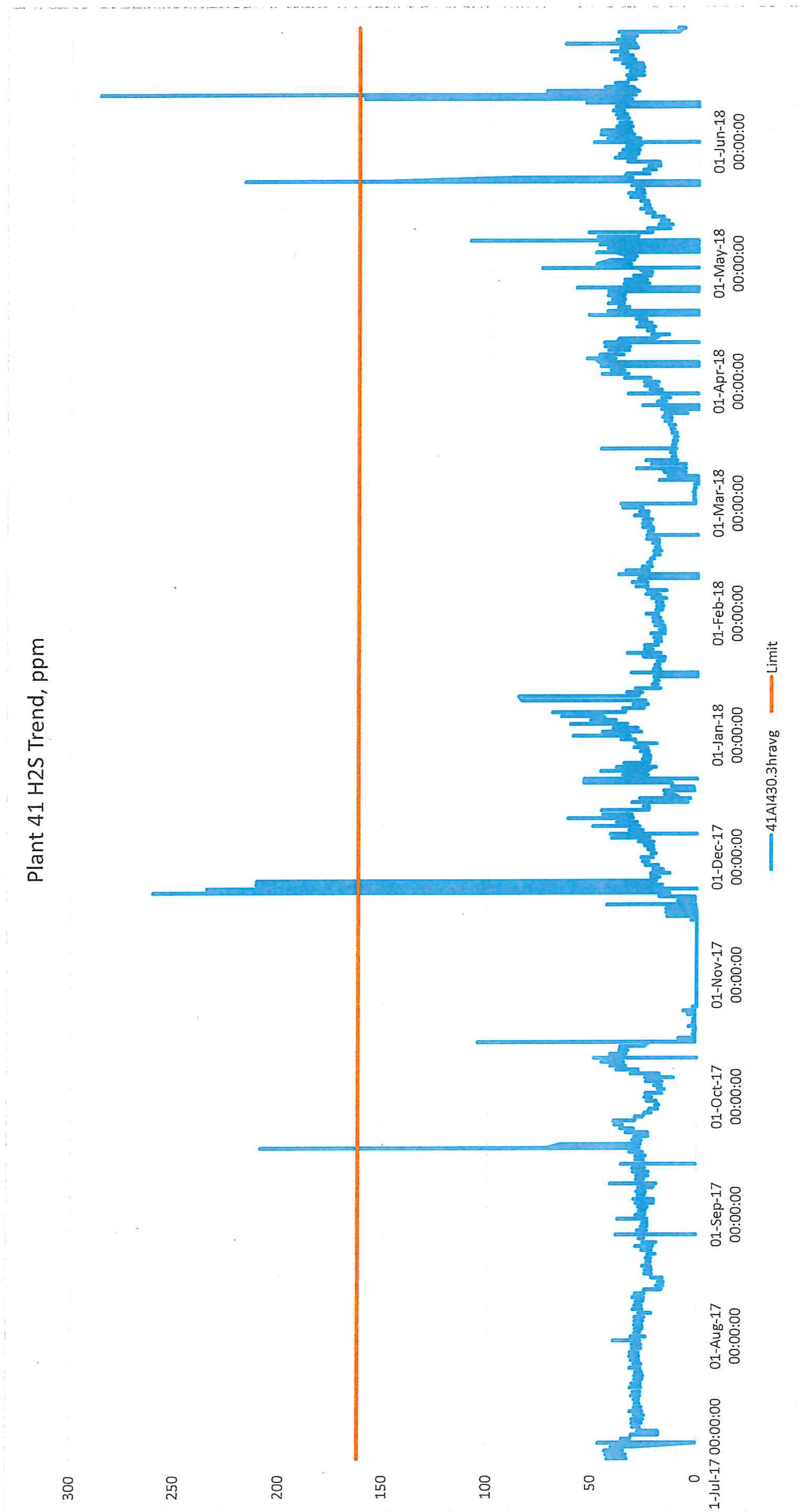

F-4170 NOx Trend lb/MMBtu 7/1/17 - 6/30/18
0.12
0.1
0.08
0.06
0.04
0.02
0
01-Jun-17 00:00:00
01-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
365 Day Average
Daily Average
CD Limit

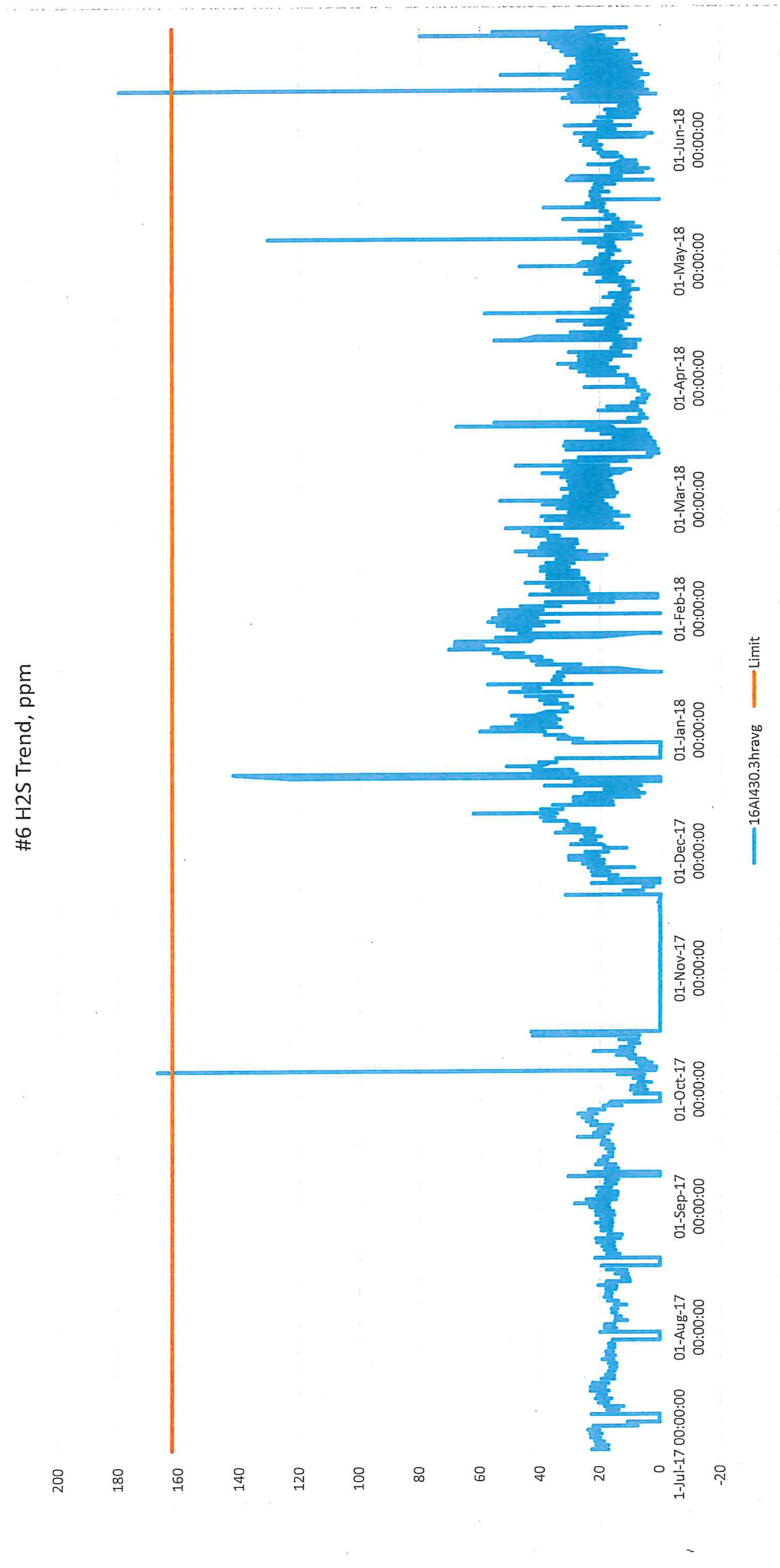

F-4180 NOx Trend lb/MMBtu 7/1/17 - 6/30/18
0.12
0.1
0.08
0.06
0.04
0.02
0
01-Jun-17 00:00:00
01-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
365 Day Average
Daily Average
CD Limit

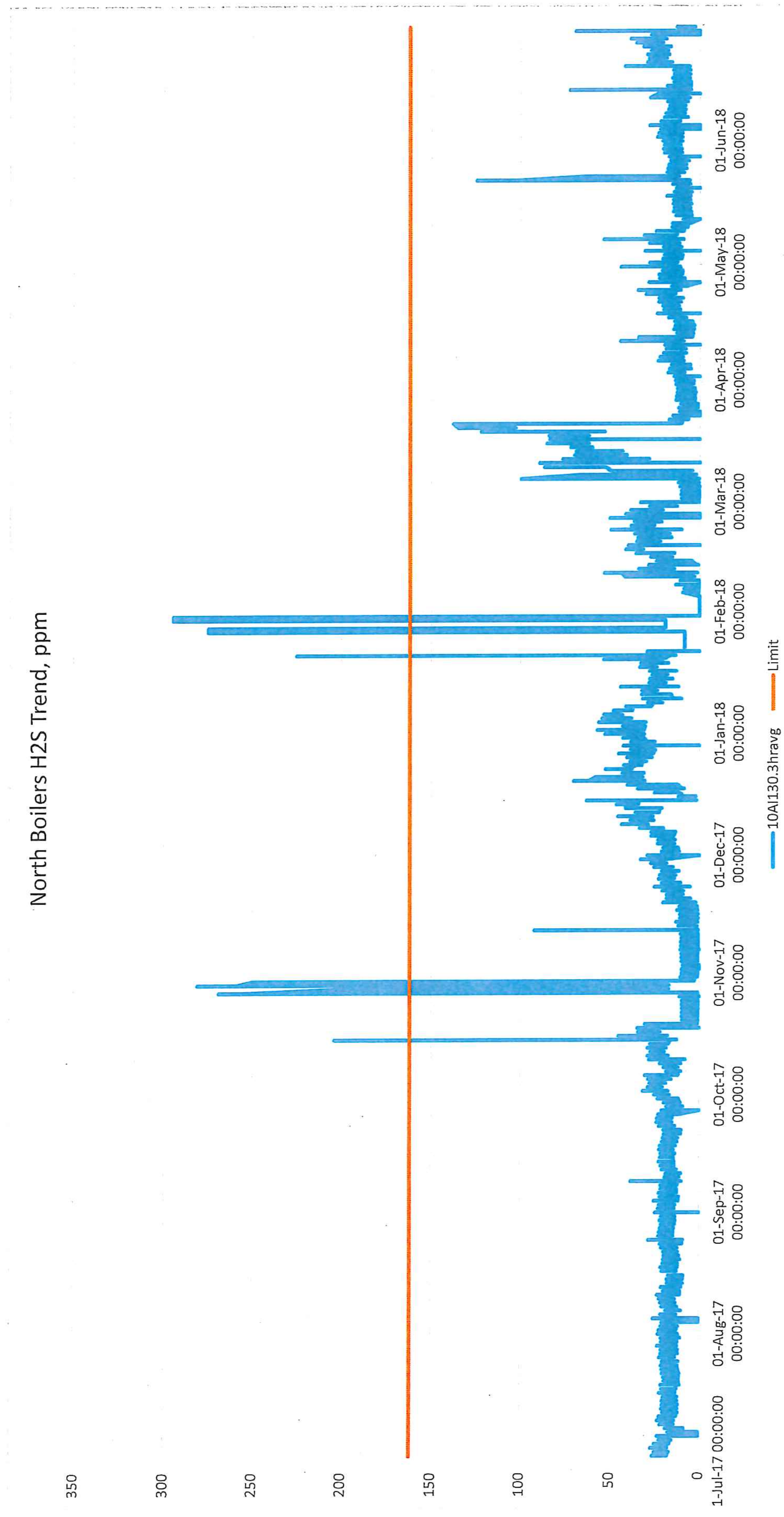
Appendix 9

Refinery fuel gas H_2S emission trends


Plant 38/39 H2S Trend, ppm
350
300
250
200
150
100
50
0
1-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
39AI213.3hravg
Limit


Plant 41 H2S Trend, ppm
300
250
200
150
100
50
0
1-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
41AI430.3hravg
Limit


#6 H2S Trend, ppm
200
180
160
140
120
100
80
60
40
20
0
-20
1-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
16AI430.3hravg
Limit


North Boilers H2S Trend, ppm
0
50
100
150
200
250
300
350
1-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
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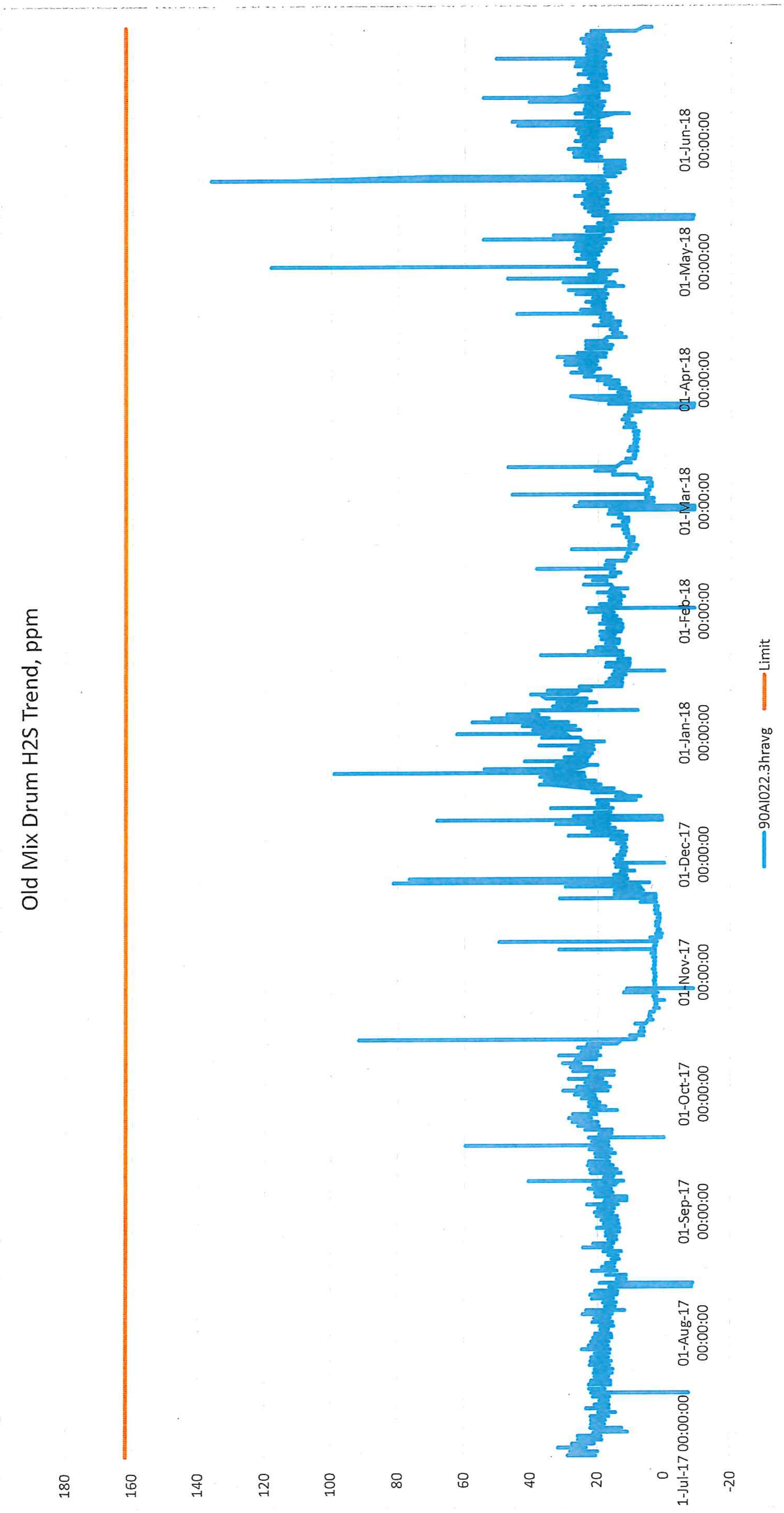
10AI130.3hravg
Limit



Old Mix Drum H2S Trend, ppm
180
160
140
120
100
80
60
40
20
0
-20
1-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
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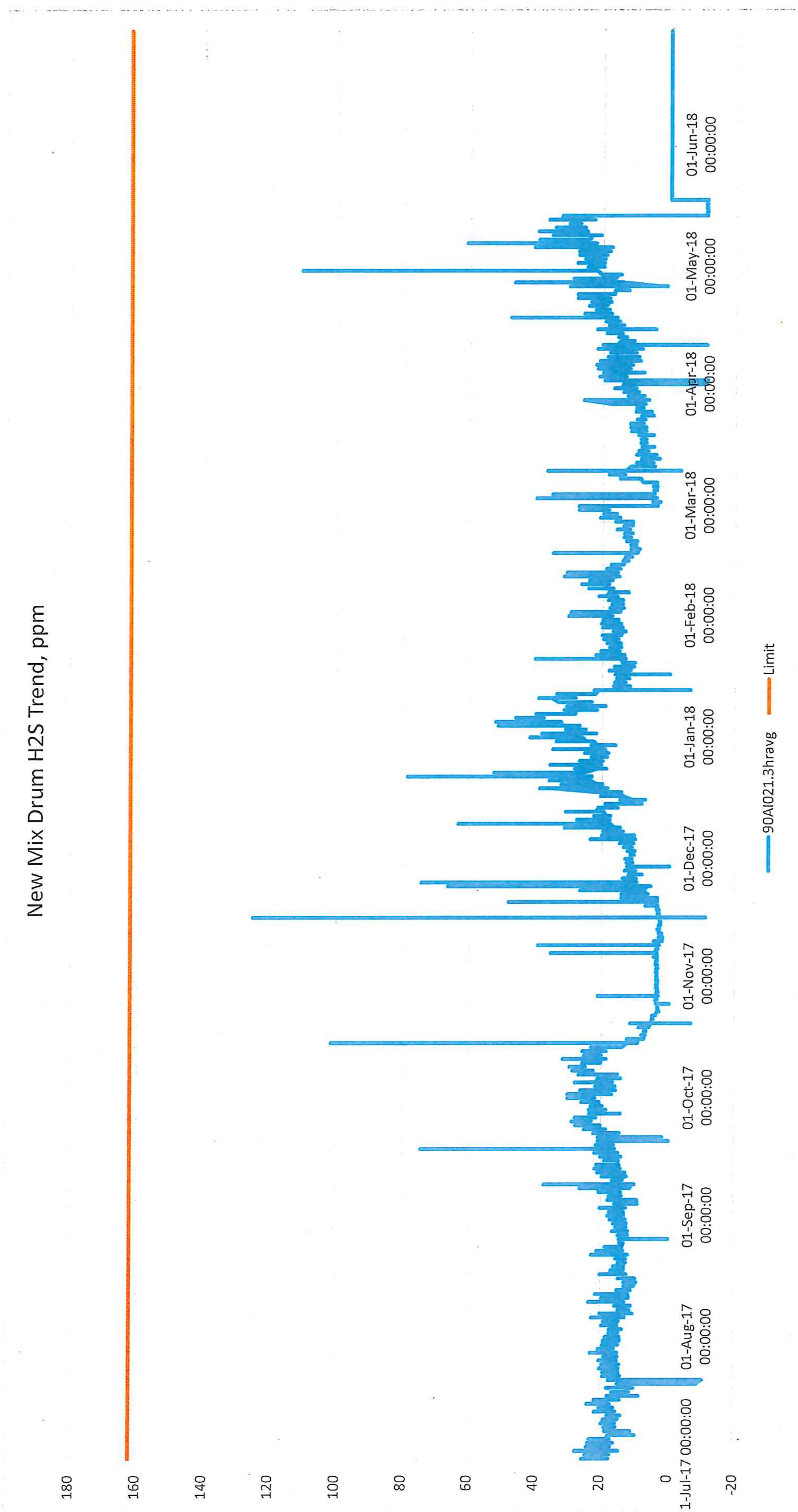
90AI022.3hravg
Limit


New Mix Drum H2S Trend, ppm
180
160
140
120
100
80
60
40
20
0
-20
1-Jul-17 00:00:00
01-Aug-17 00:00:00
01-Sep-17 00:00:00
01-Oct-17 00:00:00
01-Nov-17 00:00:00
01-Dec-17 00:00:00
01-Jan-18 00:00:00
01-Feb-18 00:00:00
01-Mar-18 00:00:00
01-Apr-18 00:00:00
01-May-18 00:00:00
01-Jun-18 00:00:00
90AI021.3hravg
Limit

Appendix 10

Description of flare gas recovery system

Flare Gas Recovery Unit
Process Description

Table of Contents

Section 1 – Process Overview

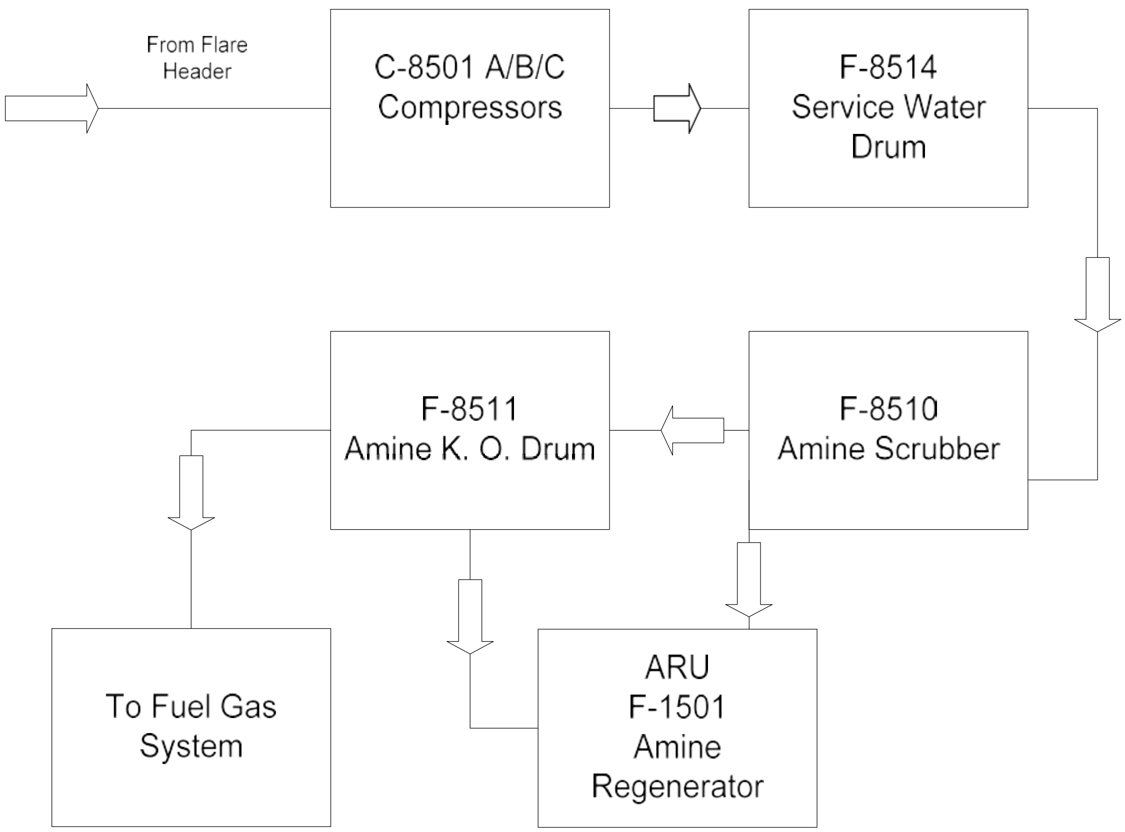
In order to prevent flaring of excess gasses on the south side, Western Refining has installed the Unit 85 Flare Gas Recovery Unit (FGRU). This unit is designed to recover over 84,000 scfh of excess gases.

Gas released into south side flare headers will be compressed by liquid ring compressors to about 100 psig. The gas is then separated from liquid, treated in an amine scrubber, and released to the fuel gas system.

At the very end of the south side flare system, just before the flare stack, a liquid seal drum has been installed. The level is held in this drum keeps the release point of flare gas submerged 36" under water. This holds a small backpressure on the flare header, and prevents the liquid ring compressors from pulling air down the stack.

Section 2 – Block Flow Diagram

The block flow diagram for the Fuel Gas Recovery Unit is as follows:



Section 3.0 Process Chemistry Fuel Gas Recovery Unit

Process Description

3.1. Summary

H2S is scrubbed with lean amine and the resulting rich amine is regenerated and returned for reuse

The physical processes in this unit consist of compression, scrubbing, and phase separation

3.2 Flow Description – Recovery Area

This is the area with the liquid ring compressors.

Just downstream of the Intermediate Flare KO Drum a 14" line branches out to serve as the suction header for the liquid ring compressors. In addition to this flare gas, the compressors are fed water, to create the internal liquid ring. This water feed is known as the service liquid. Three compressors are presently installed, and up to three can run at one time. The unit is designed for possible installation of a fourth compressor as a spare. The compressors discharge the gases and liquid at 102 psig into the service liquid separator. The service liquid separator separates this compressor discharge into sour gas, process water, and liquid hydrocarbon streams. The sour gas is routed to the amine scrubber. Most of the process water is recycled back to the liquid ring compressors as the service liquid. The hydrocarbon liquid is sent to the Intermediate Flare KO Drum.

The recycled water proceeds through service liquid coolers which remove most of the heat of compression. Only one set of coolers is on line at a time. A spare set of coolers is provided to allow for cleaning without shutting down the unit.

While recycled process water makes up most of the compressor's service liquid, 8 to 12 gpm of this water is purged to sour water, in order to decrease buildup of impurities in the service liquid. The purged water is made up by injecting softened water into the suction of each running compressor.

The sour gas from the service liquid separator proceeds to the Amine Scrubber where 30 gpm of lean DEA absorbs H2S from the gas, decreasing H2S content to below 50 ppm. The sweetened gas from the scrubber is routed to the refinery fuel gas system.

Pressure in the flare system is influenced by variation in the volume of waste gases released into the flare system, and by the number of compressors taking gas from the system. Each operating compressor can take roughly 470 scfm of flare gas.

PLC-based compressor controls will always run at least one compressor. When flare header pressure rises to 22" water, the controls will turn on another compressor. Once a compressor is on, it will be run a minimum of 20 minutes. When the flare header pressure decreases to 14" water, a compressor that has run at least the minimum time will be turned off. When the number of compressors running causes the flare header pressure to decrease below 10” water, a pressure controller will open a recycle valve, allowing sweetened gas from the amine scrubber to go back to the compressor suction.

3.3 Flow Description – Seal Drum Area

This is the area with the liquid seal drum and associated equipment.

The liquid seal drum has been installed just upstream of the south side flare stack. The seal drum holds an internal water level that is 36” above the flare gas opening inside the drum. Thus, the drum holds 36” of water backpressure on the flare headers, and prevents air from being sucked back down the stack.

A small control valve maintains a small flow of water to the seal drum, which results in a slow replacement of water in the drum. A larger control valve will provide larger water flow when water is displaced out of the drum during high flaring events.

Overflow of seal water spills into the Seal Water Drum. Water is pumped out of this drum as needed.

A natural gas purge into the vapor space of the liquid seal drum serves to prevent air from flowing down the stack to the drum.

3.4 NORMAL OPERATION – Recovery Area

Individual Compressor Operation and Controls

The first compressor on this inlet header has not been installed. It may or may not be installed in the future.

A 6" gas feed line to this compressor branches off of the 14" header.

Downstream of the 6" inlet block valve is an inlet check valve. This inlet check valve prevents a fast blowback of liquid and gas into the 14" header when the compressor shuts down. The 1" bypass around the check valve allows a smaller, controlled blowback.

Downstream of the check valve is a small spray nozzle where make-up water enters the compressor suction, supplying water to this spray nozzle, opens only when the compressor is operating and is either fully open or completely closed. The common make-up water line to all compressors, controls the total make-up water rate (usually about 3 gpm).

The service liquid inlet is a 2" connection on the front center of the compressor. Controller allows 100 to 115 gpm of service liquid to enter the compressor. The service liquid is water recycled from the service liquid separator and coolers. The service liquid flow set point is computed, based on flare gas inlet pressure, and pressure in the service liquid separator.

The 4" compressor discharge enters a discharge chamber made of 12" pipe. When the compressor is starting up, this chamber allows liquid to accumulate until the compressor discharge pressure builds up enough to open the 6" discharge check valve. The mixed liquid and gas discharge then proceeds out through this check valve and a 6" block valve into the compressor discharge header.

The Compressors are cycled on and off to control flare header pressure. Tentatively, the PLC is set to turn on another compressor at 22" H2O, and to turn off a compressor off at 14" H2O.

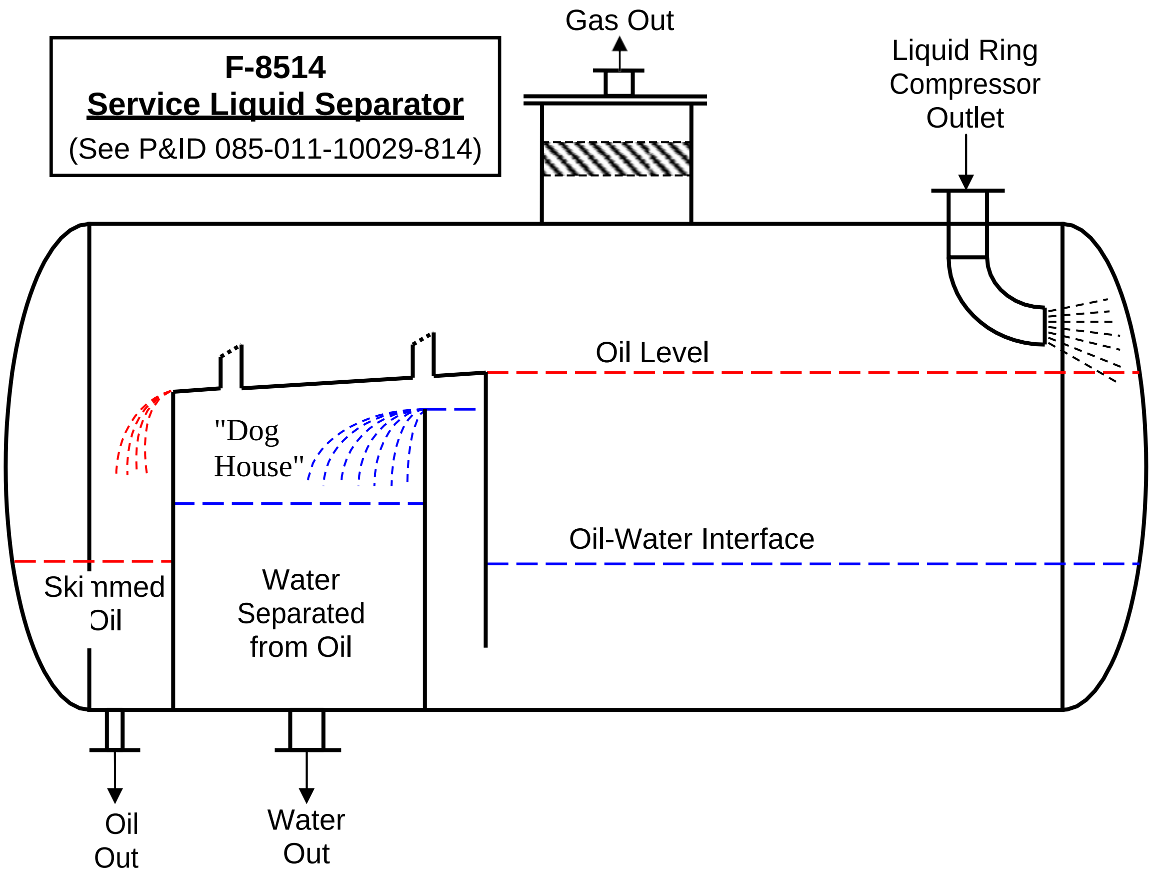
Even when pressure drops below the 14" H2O, one compressor will be left on. In order to prevent on-line compressors from pulling the flare header pressure too low, the controller allow FGRU product fuel gas to recycle back to the flare header. The set point for recycle control should be below the "compressor off" set point. It is recommended to start with a set point of 10" H2O.

Motor controls will only allow the compressor motor a maximum of one hot start and two cold starts per hour. Once a compressor is started, The PLC will run it a minimum of 20 minutes. If motor controls or some other condition prevent a compressor's availability to start when needed, excess flare gas will build up to 36" H2O pressure, and be released to the stack through the liquid seal drum.

When flare header pressure decreases to the "compressor off" set point, the PLC will shut down the compressor which has been running longest. When flare header pressure rises to the "compressor on" set point, the PLC will start the compressor which has been off the longest. This rotates the on and off time among the three compressors. Because each compressor will periodically turn on and off, each compressor must be left in a ready to run state when turned off

3.5 Service Liquid Separator

From the discharge header for all 3 compressors, gas proceeds to the 10" inlet of the service liquid separator (F-8514). Here, gas, water and oil are
parated.



"Water Out" from the "Dog House" gets re-circulated back to the compressors as service liquid and controls the level in the dog house by bleeding off excess water to the SWS flash drum.

The Controller controls the level of the oil compartment in the South end of the separator. When oil level builds up to about 2 feet, oil is dumped to the intermediate flare K.O. drum.

Over time, an oil level may build up in the dog house. There are 3 level gauges in the dog house, which are placed to see any oil layer. Also, an Agar probe, is located low in the dog house, and it will alarm when it is not surrounded by water. Thus, it alarms when the oil layer is very thick, or when the water level in the dog house is very low.

Two 2" valves are provided to drain oil from the dog house to the oil compartment through a level bridle on the oil compartment.

3.6 Service Liquid Cooling, Recirculation and Control

Before going to the coolers, water from the service liquid separator proceeds through a strainer. There is an installed spare strainer to allow for cleaning of one strainer while the other is in service.

There is an East set (E-8501A/B) and a West set (E-8501C/D) of Service liquid coolers. Only one set at a time is to be used. The other set is an installed spare to allow for cleaning without shutting down. Service Liquid flows up through the shells of these coolers, in stead of down, in order to keep any vapor bubbles swept out. Cooling water flowing down through the tubes is designed to cool the service liquid to 100°F or below.

The cooling water headers serving the Flare Gas unit have limited capacity, and cannot provide adequate flow for both sets of coolers at the same time. It is therefore important to close the 6" cooling water return valve (near ground level) on the set of coolers not in service. The 2" bypass around this 6" valve should be left open, in order to maintain a small flow of cooling water through the off-line coolers. The upper 6" cooling water supply valve for the off-line coolers should also be left open.

From the coolers, the service liquid (water) proceeds to the compressors. The individual service liquid controllers to each compressor will normally control flow rate at about 110 gpm. When a compressor is shut down, the service liquid controller to that compressor is shut.

The actual set point for service liquid flow rate is computed by the PLC. The PLC looks at the pressure in the service liquid separator and the pressure in the 14" inlet header, and determines a ratio of absolute pressure for compressor discharge to compressor suction. The service liquid flow rate is then a function of that pressure ratio.

As stated in the section 2.3 above, excess service liquid is bled off from the separator by. This bleed-off rate will average around 11 gpm. Uncontrolled sources of water making up into the system are as follows:

- Softened water to the compressor primary seals averages about 2.6 gpm per compressor
- Water vapor entering the flare system will tend to be condensed in the FGRU. This water vapor content in the flare gas can vary considerably.

It is recommended to adjust make-up water in order to ensure a minimum bleed rate of at least 5 gpm. This is to keep impurities, such as dirt, iron sulfide and ammonia from building up. Make-up water from enters suction of operating compressors through spray nozzles just ahead of each compressor.

3.7 Amine Scrubber and K.O.

Gas from the service liquid separator proceeds directly to the amine scrubber Lean amine, normally set at 30 gpm enters the top of the scrubber, and proceeds down 17 trays to scrub the H2S out of the compressed flare gas.

Rich amine from the bottom of the scrubber proceeds to the existing rich amine flash drum. Amine captured in the K.O. drum goes into the same rich amine return line.

Gas from the top of the scrubber proceeds through the K.O. drum which is below the scrubber. This K.O. drum captures any amine carried over from the scrubber. A 4" gas bypass line around the scrubber and K.O. has been provided for maintenance.

Gas from the K.O. drum is maintained at 100 psig, which releases the gas to the South Side fuel gas system. The FGRU was designed to produce fuel gas at 100 psig. However, if the set point is reduced to 90 psig, the compressors will use less power, and each compressor's capacity will increase by 9 to 10 scfm. The fuel gas system normally runs at about 80-85 psig. Experience will tell if setting at 90 psig results in a good and stable operation.

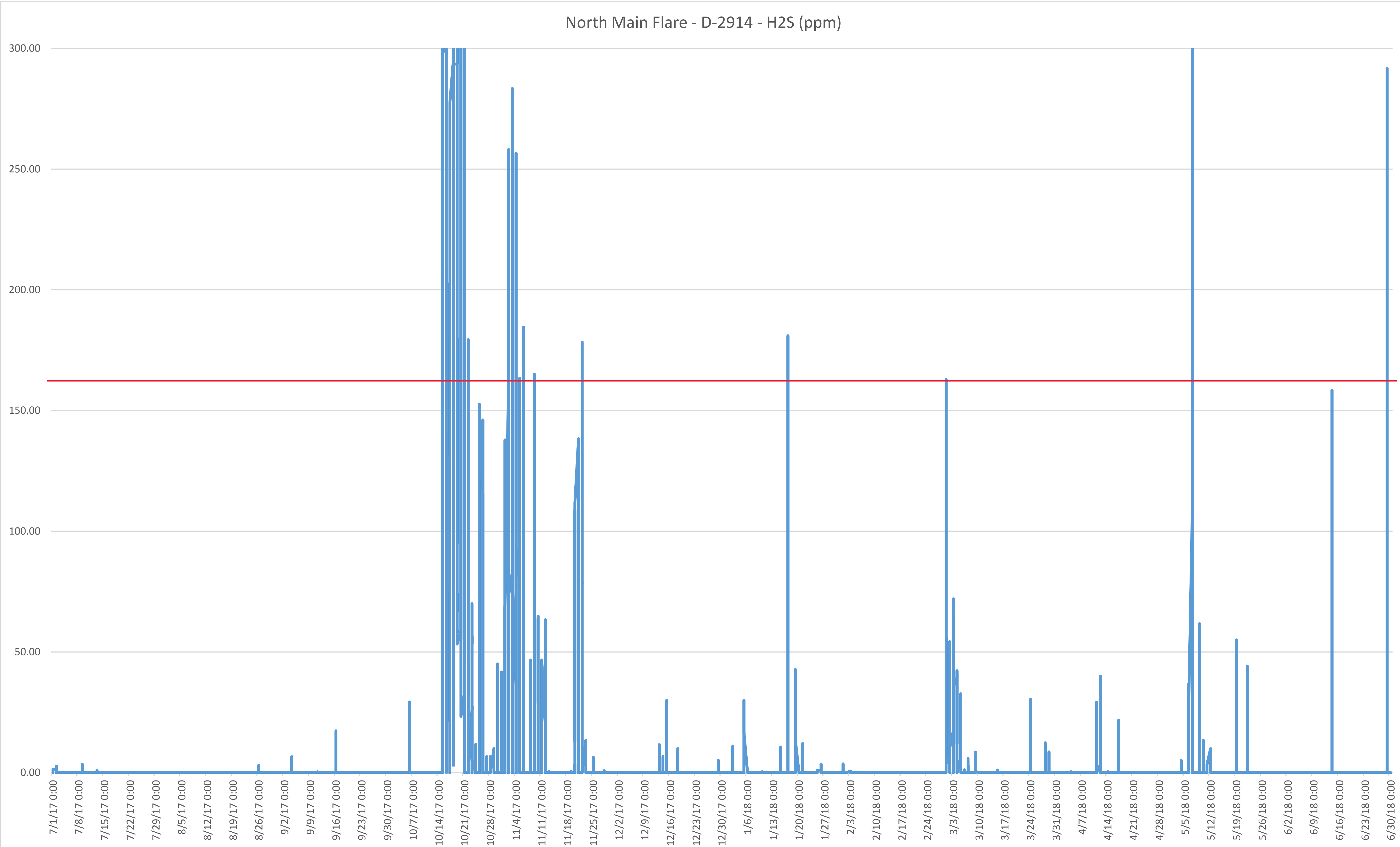
Gas from the K.O. drum can also be routed to the flare gas header. This is how the controller controls flare header pressure.

A 4" line from the product fuel gas starts and proceeds all the way to the Liquid Seal Drum outlet. This line is provided in case the fuel gas system cannot take all the product gas from the FGRU. It is preferable to flare FGRU product gas rather than shutting the FGRU down, because the product gas has been scrubbed free of H2S.

This line can also be used to flare FGRU product when the amine scrubber must be temporarily bypassed. Most of the FGRU can then continue to run without sending sour gas to the fuel system.

Appendix 11

Flare H_2S emission trends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150.00
100.00
50.00
0.00
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7/8/17 0:00
7/15/17 0:00
7/22/17 0:00
7/29/17 0:00
8/5/17 0:00
8/12/17 0:00
8/19/17 0:00
8/26/17 0:00
9/2/17 0:00
9/9/17 0:00
9/16/17 0:00
9/23/17 0:00
9/30/17 0:00
10/7/17 0:00
10/14/17 0:00
10/21/17 0:00
10/28/17 0:00
11/4/17 0:00
11/11/17 0:00
11/18/17 0:00
11/25/17 0:00
12/2/17 0:00
12/9/17 0:00
12/16/17 0:00
12/23/17 0:00
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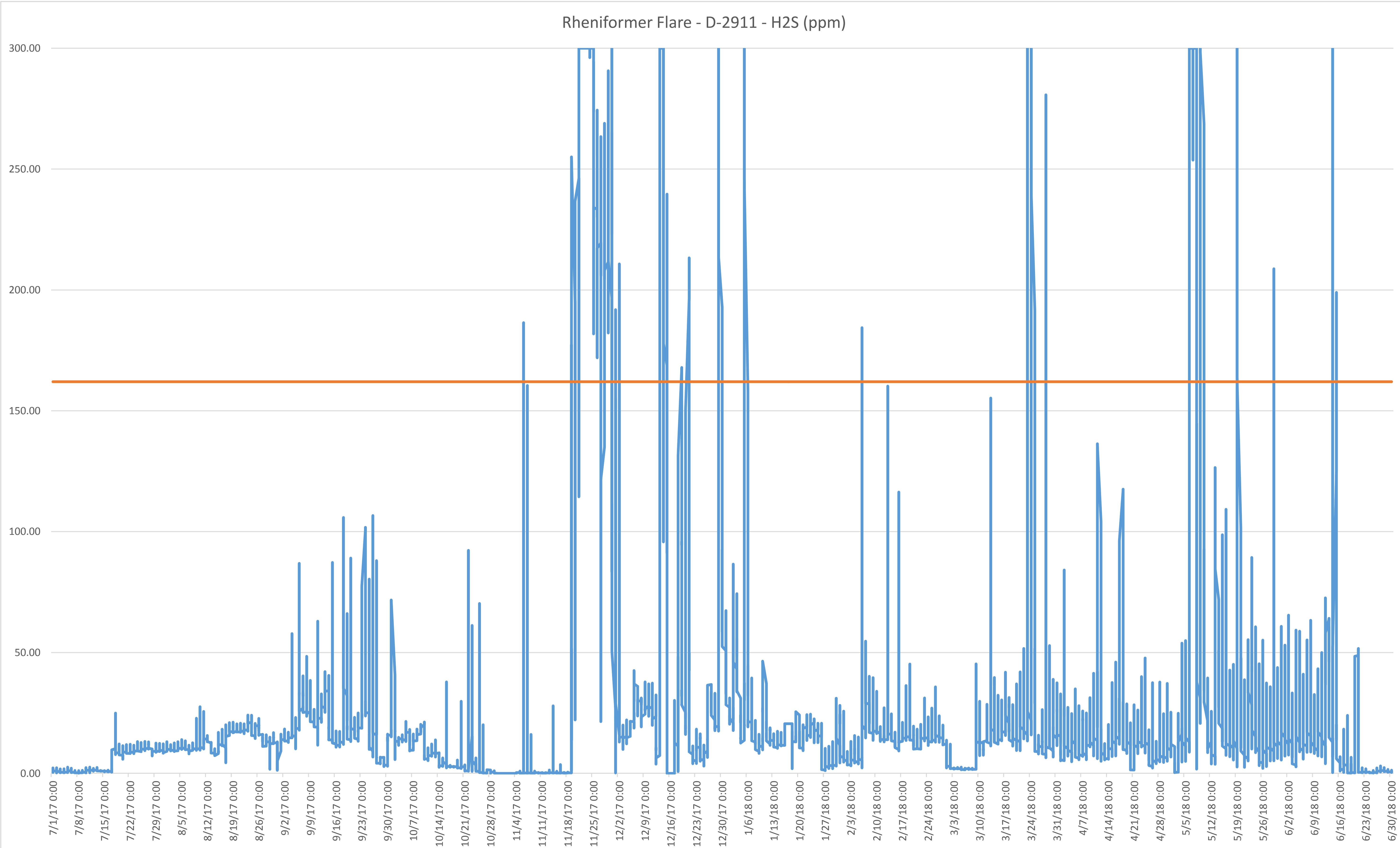
6/30/18 0:00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50.00
0.00
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7/8/17 0:00
7/15/17 0:00
7/22/17 0:00
7/29/17 0:00
8/5/17 0:00
8/12/17 0:00
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8/26/17 0:00
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9/16/17 0:00
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11/11/17 0:00
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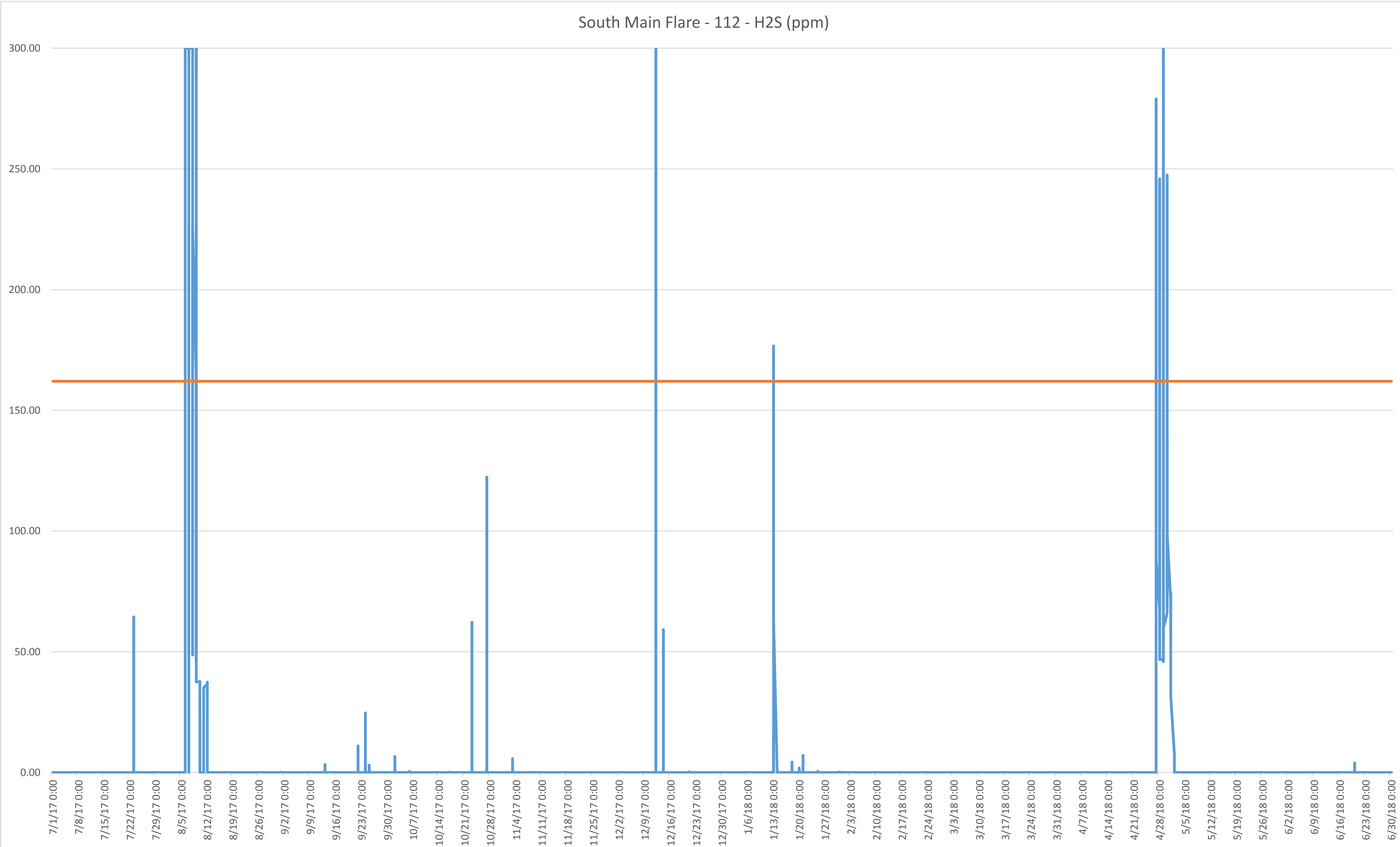
6/30/18 0:00


South Main Flare - 112 - H2S (ppm)
300.00
250.00
200.00
150.00
100.00
50.00
0.00
7/1/17 0:00
7/8/17 0:00
7/15/17 0:00
7/22/17 0:00
7/29/17 0:00
8/5/17 0:00
8/12/17 0:00
8/19/17 0:00
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5/19/18 0:00
5/26/18 0:00
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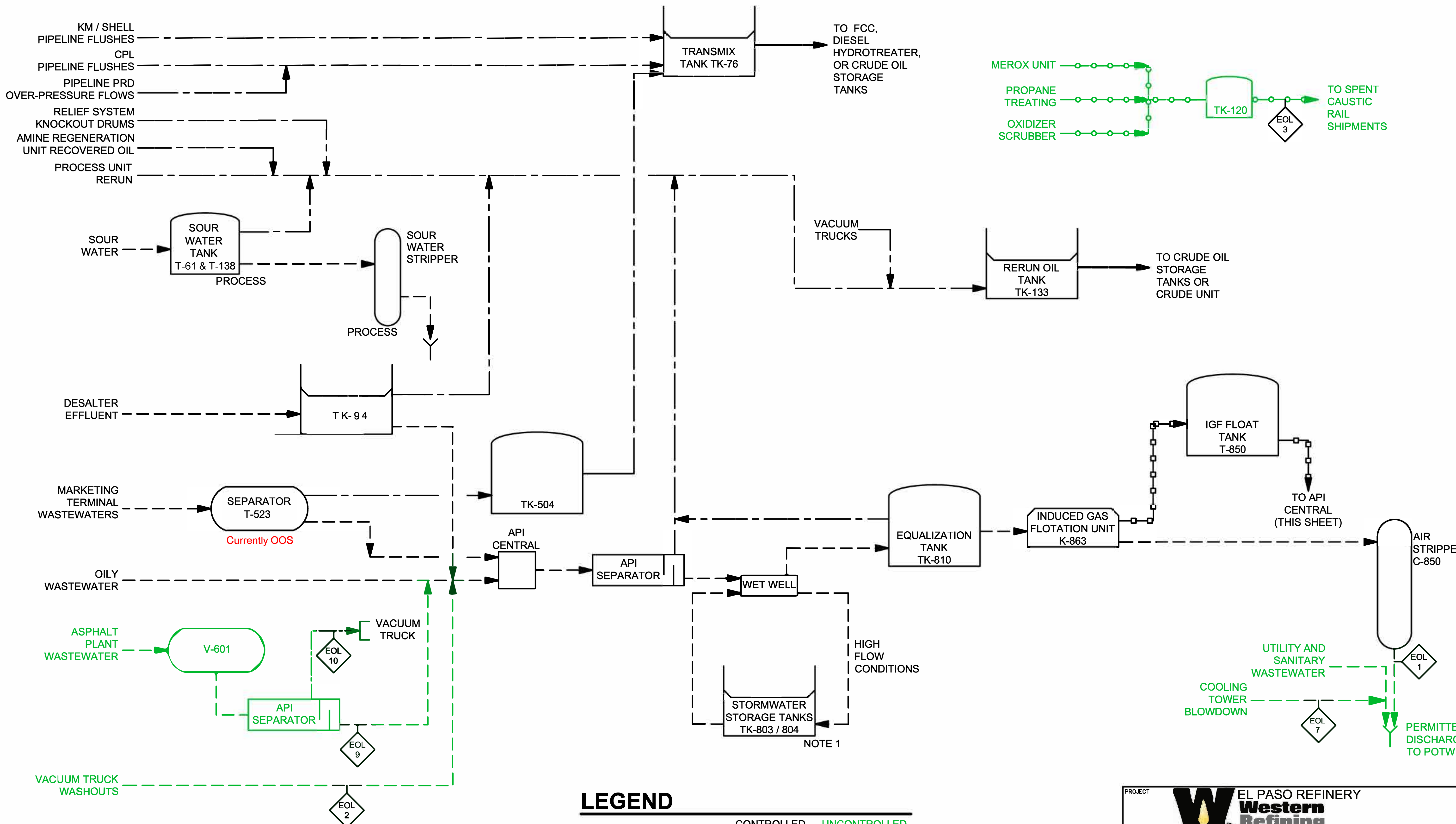
6/30/18 0:00

Appendix 12
BWON process schematic



LEGEND

	CONTROLLED	UNCONTROLLED
WASTEWATER	— — — —	— — — —
HYDROCARBON WASTE	—·—·—	—·—·—
SPENT CAUSTIC	—o—o—o—	—o—o—o—
SLUDGE	—□—□—□—	—□—□—□—
PROCESS FLUIDS	———	

NOTES

NOTE 1 - HYDROCARBON CAN BE REMOVED BY VACUUM TRUCK.

MISCELLANEOUS - INCLUDING, BUT NOT LIMITED TO, BENZENE-CONTAINING AQUEOUS SOLID WASTE, TURNAROUND WASTES, MAINTENANCE WASTES, AND SPILLS.

EOL 6

PROJECT: EL PASO REFINERY
Western Refining

TITLE: NORTH PLANT SLOP OIL SCHEMATIC

Golder Associates

PROJECT No.	113-81990	FILE No.	11381990A001
DESIGN	BD	11/23/11	SCALE N\A REV. 1
CADD	DBS	11/23/11	
CHECK	BD	11/23/11	FIGURE 1
REVIEW	BD	11/23/11	

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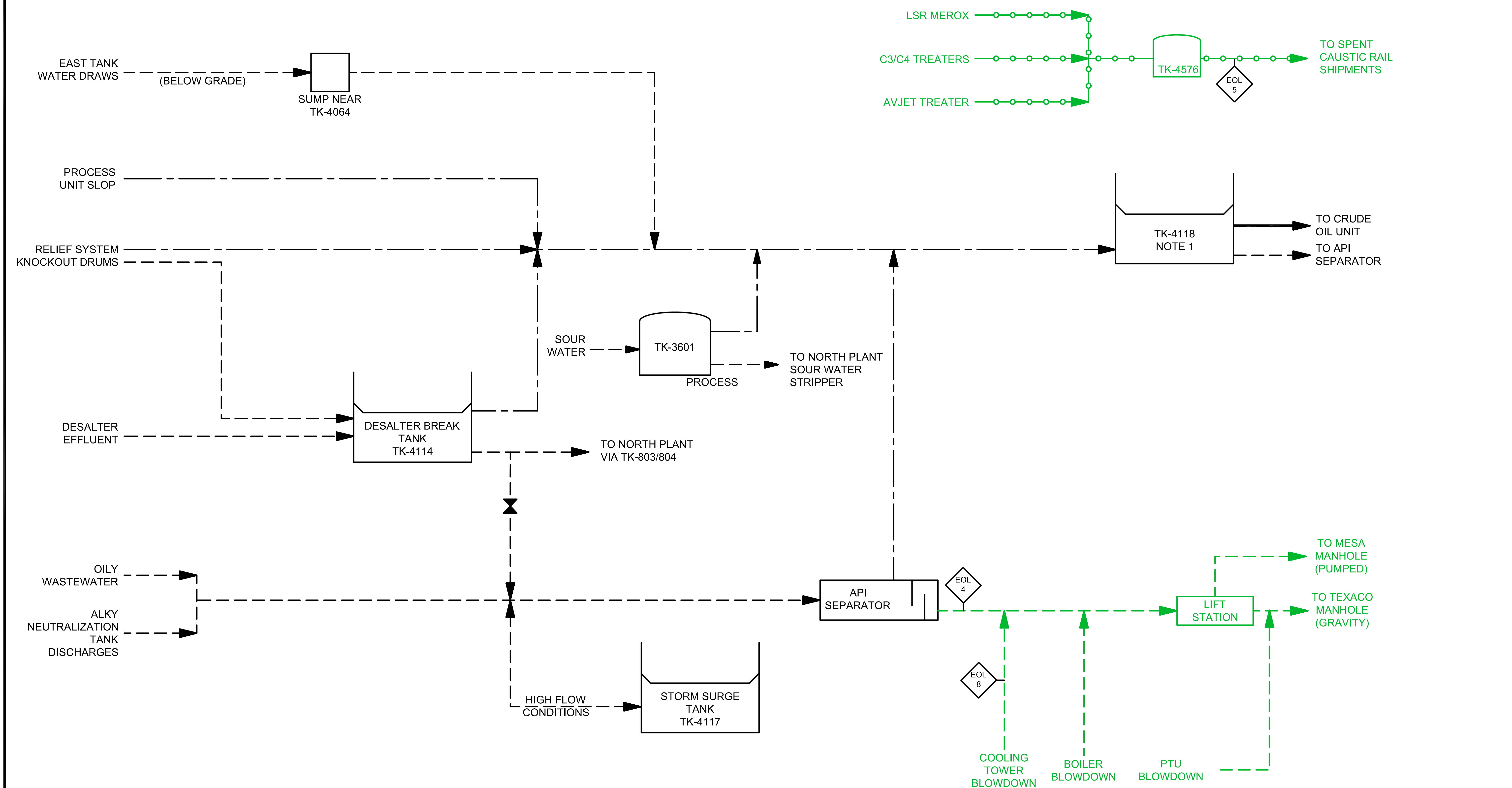

LEGEND

	CONTROLLED	UNCONTROLLED
WASTEWATER	— — — —	— — — —
HYDROCARBON WASTE	—·—·—	—·—·—
SPENT CAUSTIC	—o—o—o—	—o—o—o—
SLUDGE	—□—□—□—	—□—□—□—
PROCESS FLUIDS	———	

NOTES

NOTE 1 - TK-4119 (OR OTHER TANK) CAN BE USED AS ALTERNATE RERUN OIL TANK, AS NEEDED.

MISCELLANEOUS - INCLUDING, BUT NOT LIMITED TO, BENZENE-CONTAINING AQUEOUS SOLID WASTE, TURNAROUND WASTES, MAINTENANCE WASTES, AND SPILLS.

EOL 6

PROJECT EL PASO REFINERY Western Refining

TITLE SOUTH PLANT SLOP OIL SCHEMATIC

Golder Associates

PROJECT No.	113-81990		FILE No.	11381990A002
DESIGN	BD	11/23/11	SCALE N\A	REV. 1
CADD	DBS	11/23/11		
CHECK	BD	11/23/11		
REVIEW	BD	11/23/11		

FIGURE 2

Drawing File: N:\11\113-81990_A Figures\ 11381990A002.dwg | Layout: 11x17 | Modified: Dec 16, 2011 10:36 NRosenthal | Plotted: 12/16/11 10:36am NRosenthal

Western Refining – BWON Process Description

North Side

Oily wastewater is collected in controlled sewers and flows to a central collection box which feeds an in-ground controlled API separator followed by an equalization tank and induced nitrogen flotation unit to remove suspended and dispersed oil and further to an air stripper to remove benzene before being combined with utility and sanitary wastewater and discharged to a local POTW. Stripper feed can be routed back to equalization during periods when the stripper is not in operation. Stormwater surge tanks receive excess wastewater during high flow conditions for reprocessing.

Waste management units in the API and BWON treatment areas are vented to carbon canister control devices. The vent from the air stripper is directed to a thermal oxidizer.
Process sewers and tank field water draw sewers are equipped with water seal controls. The seals are checked on a regular basis and replenished as necessary. Junction boxes are equipped with water sealed p-traps on the vent lines to prevent evaporation to the atmosphere.

Hydrocarbon wastes from process wastewater streams are separated in various tanks and the API separator and routed to either a transmix tank or a rerun oil tank for reprocessing in the crude unit or other process units. The transmix and rerun oil tanks also manage hydrocarbon wastes from other sources, such as off-spec product. Vacuum truck pick-ups are sent to the rerun oil tank while vacuum truck washout waste is sent to the API separator.

Sludge from the API separator and tank clean out is dewatered and sent off-site for disposal in controlled roll-off boxes.

South Side

Oily wastewater is collected in controlled sewers before entering an in-ground controlled API separator where oil is skimmed off and sent back to the crude unit via a floating roof tank. The de-oiled wastewater is sent to a lift station where it is combined with cooling tower blowdown, boiler blowdown, and PTU blowdown (a non-benzene containing process wastewater stream) before discharge to the POTW.

Stormwater surge tanks receive excess wastewater for reprocessing during high flow conditions.

Desalter effluent is sent first to a floating roof break tank and then to the North side API separator to access the benzene removal provided by the stripper located on the north side.
Process sewers and tank field water draw sewers are equipped with water seal controls. The seals are checked on a regular basis and replenished as necessary. Junction boxes are equipped with water sealed p-traps on the vent lines to prevent evaporation to the atmosphere.

Tank water draws from the East tank field are routed to a tank before being sent back for reprocessing through the slop oil collection system.

The East tank field tank and the API area are vented to carbon canister control devices.