May 10, 2023

Mr. Carl Chavez, CHMM
New Mexico Oil Conservation Division (Albuquerque Office)
Energy, Minerals and Natural Resources Department
5200 Oakland Avenue, NE
Albuquerque, NM 87113

RE: FFY 2023 2nd Quarter Injection Report for HF Sinclair UIC Wells WDW-1, WDW-2, WDW-3 and WDW-4

Dear Mr. Chavez,

Enclosed, please find the federal fiscal year 2023 (FFY 2023) second quarter (Q2) report for fluids injected into WDW-1, WDW-2, WDW-3 and WDW-4. This report has been prepared in accordance with Class I Non-Hazardous Waste Injection Well Discharge Permit UICI-8 (approved December 2017) and covers data collection efforts from January 1, 2023 through March 31, 2023. Condition 2.I of the permit requires reporting of the following four items:

Item #1: Physical, chemical and other relevant characteristics of injected fluids (per Condition 2.A)

One sampling event occurred during FFY 2023 Q2 on March 14, 2023. Table 1 presents results for this event; the corresponding lab report is given in Attachment A. For parameters identified as toxic contaminants in 40 CFR 261.24(b) (EPA Hazardous waste No. D004 through D043), all results were less than the Toxicity Characteristic Leaching Procedure (TCLP) regulatory level and do not exhibit the characteristic of toxicity. TCLP parameters were analyzed as total fractions; results were less than the corresponding reporting level (RL).

Item #2: Monthly average, maximum and minimum values for injection pressure, flow rate, injected volume, and annular pressure (per Condition 3.C)

A summary of monthly injection pressure, flow rate, injected volume, and annular pressure for FFY 2023 Q2 is given in Table 2. Statistics for injection pressure, flow rate and annular pressure for each month were calculated from continuous monitoring recorded on an hourly basis. For example, a month containing 31 days would have a total 744 hourly data results, assuming no issues with signal communication. For injection flowrate, hourly readings reported as 0 gpm were deleted from the database (representative of either a signal communication issue or a well down for maintenance, testing, etc.). Totalized volume is not recorded hourly, therefore the monthly injected volume was calculated as the average monthly flow rate multiplied by the number of days in the corresponding month.

HF Sinclair disposed a total of 1,751,442 barrels of fluid into the four wells during FFY 2023 Q2. The total Q2 volume per well was:

- 321,338 barrels into WDW-1: 30-015-27592
- 161,219 barrels into WDW-2: 30-015-20894
- 348,326 barrels into WDW-3: 30-015-26575
- 920,559 barrels into WDW-4: 30-015-44677

HollyFrontier Navajo Refining LLC
501 East Main, Artesia, NM 88210
575-748-3311 | HFSinclair.com

In terms of Discharge Permit UICI-8 compliance, the hourly maximum injection pressures (occurring during FFY 2023 Q2) were within limits given in Condition 3.B as follows:

- WDW-1: max = 1,364 psi (limit = 1,585 psi)
- WDW-2: max = 1,359 psi (limit = 1,514 psi)
- WDW-3: max = 1,395 psi (limit = 1,530 psi)
- WDW-4: max = 974 psi (limit = 2,080 psi)

There were no significant losses as measured from the glycol expansion tanks Well Annulus Monitoring System (WAMS).

Item #3: Groundwater monitoring well Information from Condition 2.B

Discharge Permit UICI-8 Condition 2.B requires the installation of at least one downgradient monitoring well in the proximity of each injection well (WDW-1, 2, 3, and 4). These wells have not been installed at this time so historical characterization data do not exist. HF Sinclair submitted the "Work Plan for Monitor Well Installation and Sampling" to OCD on November 9, 2022 detailing planned well installation and monitoring procedures. After OCD approval of the Work Plan and completion of well installation, future quarterly reports will include monitoring well data for the agreed list of parameters and sampling frequency.

Item #4: Continuous monitoring charts and information from Permit Condition 3.C

Discharge Permit UICI-8 Condition 3.C requires the use of a continuous monitoring device to measure and record hourly values of injection pressure, injection rate, totalized injection volume, and annular pressure. HF Sinclair uses a digital recording device that can log the results of the above parameters at a user defined-frequency (i.e., can be greater or less than a one-hour interval). This recording/logging system is known as the "PI Historian" system and does not use any pen/chart apparatus described in Condition 3.C. The logged hourly data have been processed graphically and are given for each well in Figures 1 to 3 (Jan 2023), Figures 4 to 6 (Feb 2023), and Figures 7 to 9 (Mar 2023). As mentioned in Item #2 above, "gaps" in charted data reflect periods where signal communication issues occurred or when hourly injection flow was reported as 0 gpm. Archived spreadsheets of the FFY 2023 Q2 data used to generate the graphs are available upon request.

Conclusions and Recommendations

From the observations presented in the Items #1, #2, #3, and #4 above, HF Sinclair concludes that the injection of fluids (i.e., treated wastewater) into UIC Wells WDW-1, WDW-2, WDW-3, and WDW-4 during FFY 2023 Q2 was in compliance with the requirements and limitations given in Discharge Permit UICI-8. Specifically, the injection concentrations did not exhibit toxicity as regulated in Discharge Permit Condition 2.A (per reference of 40 CFR 261.24(b)). Further, injection pressures did not exceed limitations given Discharge Permit Condition 3.B for each well.

Other UIC activities during FFY 2023 Q2 included:

1. Revisions of Monitoring Well Work Plan per OCD comments, on-going negotiation of access agreements for WDW-1 with ConocoPhillips and WDW-2, WDW-3, and WDW-4 with the Bureau of Land Management (BLM), and revision to Request for Proposal (RFP) based on Work Plan revisions.

2. Submission of the Renewable Diesel Unit Pilot Sampling Plan (PSP) Summary Report to OCD on March 7, 2023. Major findings were:
    a. WWTP effluent discharged to the UIC wells was deemed non-hazardous under RCRA (i.e., all pre-RDU and post-RDU concentrations were below corresponding 40 CFR 261.24 regulatory levels).
    b. Hazardous characteristics for ignitability (261.21), corrosivity (261.22) and reactivity (261.23) were also not present.
    c. The RDU wastewater stream was not identified to significantly affect/change the concentration characteristics of the Refinery WWTP discharge to the UIC well network in a negative manner.
    d. The addition of RDU activities does not alter the operation, maintenance, or monitoring nor contribute to significant increases in pollutant concentrations of the four underground injection wells.

3. Submission of the FFY 2022 Annual Class I Non-Hazardous Waste Injection Well Report to OCD on March 31, 2023. This report was prepared in accordance with Discharge Permit UICI-8, Condition 2.I. No concerns relevant to continued operation, safety or containment were identified in FFY 2022. During FFY 2022 testing, each well satisfactorily demonstrated mechanical integrity pursuant to the applicable UIC permits, guidelines and regulations.

4. Receipt of draft UICI-8 Discharge Permits from OCD on February 17, 2023. Shortly thereafter, HF Sinclair began review of the draft permits which will serve to renew the UICI-8 Discharge Permit issued in December 2017.

Planned activities for FFY 2023 Q3 include:

1. Providing OCD with final comments on the Feb 17, 2023 draft UICI-8 Discharge Permits.

2. Responding to any OCD comments/concerns on the March 7, 2023 PSP Report.

3. Conducting Part I MIT and falloff testing for WDW-1, WDW-2, and WDW-3 during the weeks of May 8, June 5, and June 26, respectively. In addition, a coiled tubing cleanout is tentatively planned for WDW-2 during the week of June 5, 2023. Dates are subject to change based on vendor availability and operational constraints.

4. Obtaining access for the installation of OCD-approved groundwater monitoring wells at each UIC well, selection of a driller for well installation, and, depending on access and driller schedules, installation of the wells.

This report is signed and certified in accordance with NMAC Section 20.6.2.5101.G. If there are any questions or comments, please contact Jason Roberts at 575-748-6733.

Respectfully,

Kawika Tupou
Environmental Manager
HF Sinclair

TABLE 1. FFY 2023 Q2 CONCENTRATIONS OF WASTEWATER INJECTED INTO WELLS WDW-1, WDW-2, WDW-3, AND WDW-4
"<" = value less than the laboratory reporting level (RL)

Parameter	Units	UICI-8 Condition 2.A Regulatory Level	3/14/2023 Concentration
Alkalinity, bicarbonate	mg/L	--	482.8
Alkalinity, carbonate	mg/L	--	<2
Alkalinity, total	mg/L	--	482.8
Conductivity	uS/cm	--	5100
Cyanide (Reactivity)	mg/L	--	<0.0050
Flashpoint (Ignitability)	deg F	--	>170
Oxidation Reduction Potential	mV	--	21.1
pH (Corrosivity)	su	--	7.28
Specific Gravity	su	--	0.9992
Sulfide (Reactivity)	mg/L	--	0.18
Total Dissolved Solids	mg/L	--	3250
Total Suspended Solids	mg/L	--	120
Bromide	mg/L	--	<0.5
Chloride	mg/L	--	500
Fluoride	mg/L	--	35
Nitrate	mg/L	--	<0.5
Nitrite	mg/L	--	<0.5
Phosphorus, total	mg/L	--	<2.5
Sulfate	mg/L	--	1500
Calcium	mg/L	--	380
Magnesium	mg/L	--	120
Potassium	mg/L	--	120
Sodium	mg/L	--	360
Arsenic	mg/L	TCLP=5	<5
Barium	mg/L	TCLP=100	<100
Cadmium	mg/L	TCLP=1	<1
Chromium	mg/L	TCLP=5	<5
Lead	mg/L	TCLP=5	<5
Mercury	mg/L	TCLP=0.2	<0.02
Selenium	mg/L	TCLP=1	<1
Silver	mg/L	TCLP=5	<5
Chlordane	mg/L	TCLP=0.03	<0.03
1,1-Dichloroethene	mg/L	TCLP=0.7	<0.7
1,2-Dichloroethane	mg/L	TCLP=0.5	<0.5
1,4-Dichlorobenzene	mg/L	TCLP=7.5	<7.5
2,4,5-Trichlorophenol	mg/L	TCLP=400	<400
2,4,6-Trichlorophenol	mg/L	TCLP=2	<2
2,4-Dinitrotoluene	mg/L	TCLP=0.13	<0.13
2-Butanone	mg/L	TCLP=200	<200
2-Methylphenol	mg/L	TCLP=200	<200
3+4-Methylphenol	mg/L	TCLP=200	<200
Benzene	mg/L	TCLP=0.5	<0.5
Carbon tetrachloride	mg/L	TCLP=0.5	<0.5
Chlorobenzene	mg/L	TCLP=100	<100
Chloroform	mg/L	TCLP=6	<6
Cresols	mg/L	TCLP=200	<200
Hexachlorobenzene	mg/L	TCLP=0.13	<0.13
Hexachlorobutadiene	mg/L	TCLP=0.5	<0.5
Hexachloroethane	mg/L	TCLP=3	<3
Nitrobenzene	mg/L	TCLP=2	<2
Pentachlorophenol	mg/L	TCLP=100	<100
Pyridine	mg/L	TCLP=5	<5
Tetrachloroethene	mg/L	TCLP=0.7	<0.7
Trichloroethene	mg/L	TCLP=0.5	<0.5
Vinyl chloride	mg/L	TCLP=0.2	<0.2

TCLP = Toxicity Characteristic Leaching Procedure with regulatory level given in 40 CFR 261.24(b)

TABLE 2. FFY 2023 SECOND QUARTER MONTHLY INJECTION PRESSURE, FLOW RATE, ANNULAR PRESSURE, AND VOLUME

Based on continuous monitors that record pressure and flow rate data on an hourly basis (per UICI-8 Condition 3.C)

Month	Injection Pressure			Injection Flowrate			Annular Pressure			Totalized Injected Volume	
	Average (psi)	Maximum (psi)	Minimum (psi)	Average (gpm)	Maximum (gpm)	Minimum (gpm)	Average (psi)	Maximum (psi)	Minimum (psi)	Monthly (barrels)	Cumulative (barrels)
30-015-27592 WDW-1											50,621,615
Jan-23	993	1,314	684	104	146	80	503	1,051	191	110,147	50,731,762
Feb-23	1,001	1,345	847	103	148	95	409	863	247	98,532	50,830,294
Mar-23	1,041	1,364	741	106	151	80	469	1,032	208	112,659	50,942,954
30-015-20894 WDW-2											31,277,697
Jan-23	1,187	1,359	812	56	86	0.5	816	1,000	351	59,899	31,337,596
Feb-23	1,187	1,356	884	50	82	8	960	1,112	834	48,275	31,385,871
Mar-23	1,122	1,319	739	50	91	0.02	831	1,181	493	53,045	31,438,916
30-015-26575 WDW-3											23,042,310
Jan-23	1,150	1,395	886	116	156	76	706	824	460	123,691	23,166,001
Feb-23	1,181	1,315	930	115	146	65	817	936	607	110,717	23,276,719
Mar-23	1,147	1,373	930	107	155	63	746	907	452	113,918	23,390,637
30-015-44677 WDW-4											10,674,773
Jan-23	299	398	160	318	437	32	303	445	188	337,603	11,012,376
Feb-23	309	974	171	310	400	20	258	412	72	297,432	11,309,808
Mar-23	282	357	168	269	363	28	259	421	17	285,524	11,595,332

Figure 1. FFY 2023 Q2 Injection Pressure - January 2023

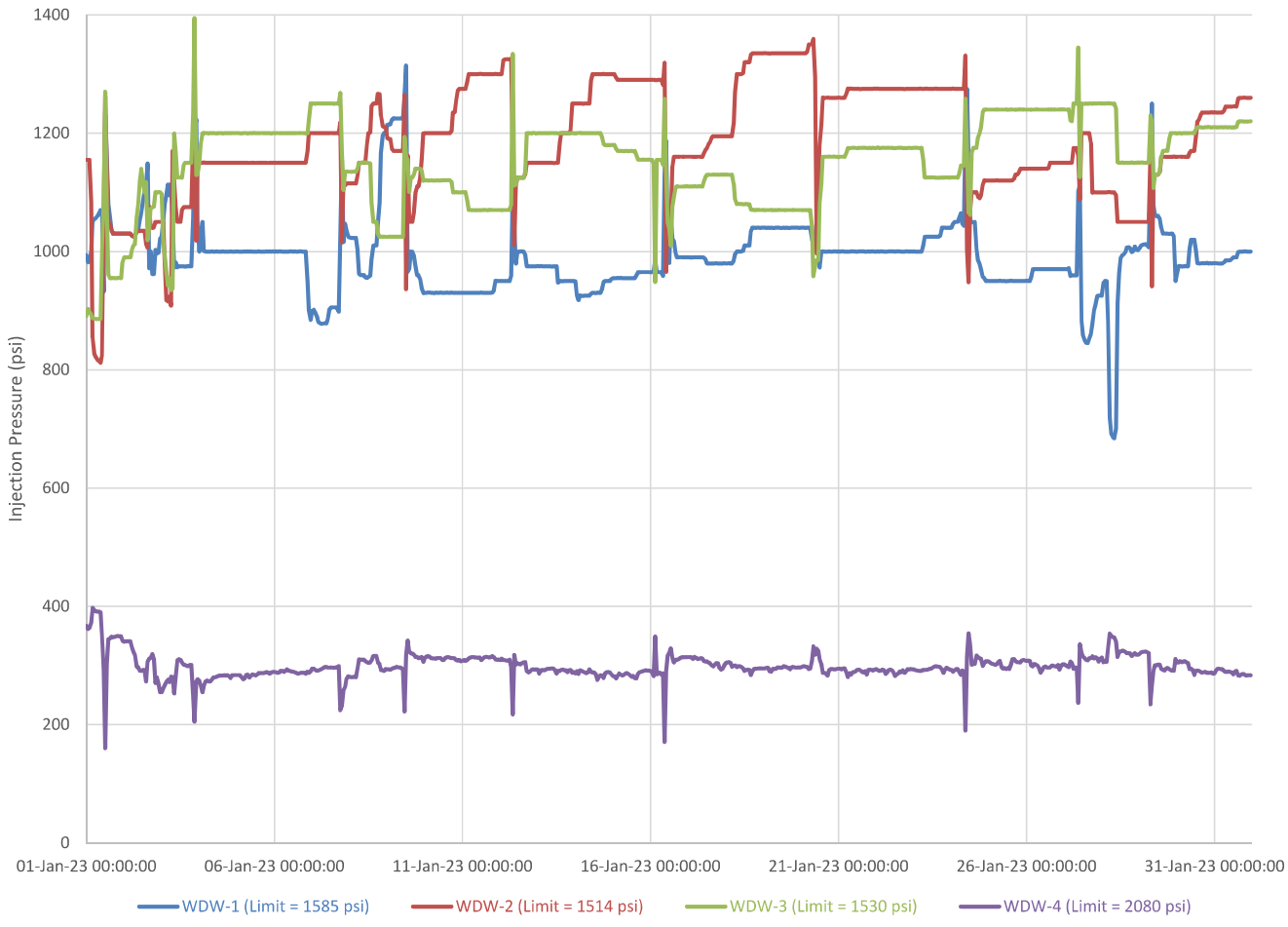


Figure 2. FFY 2023 Q2 Annular Pressure - January 2023

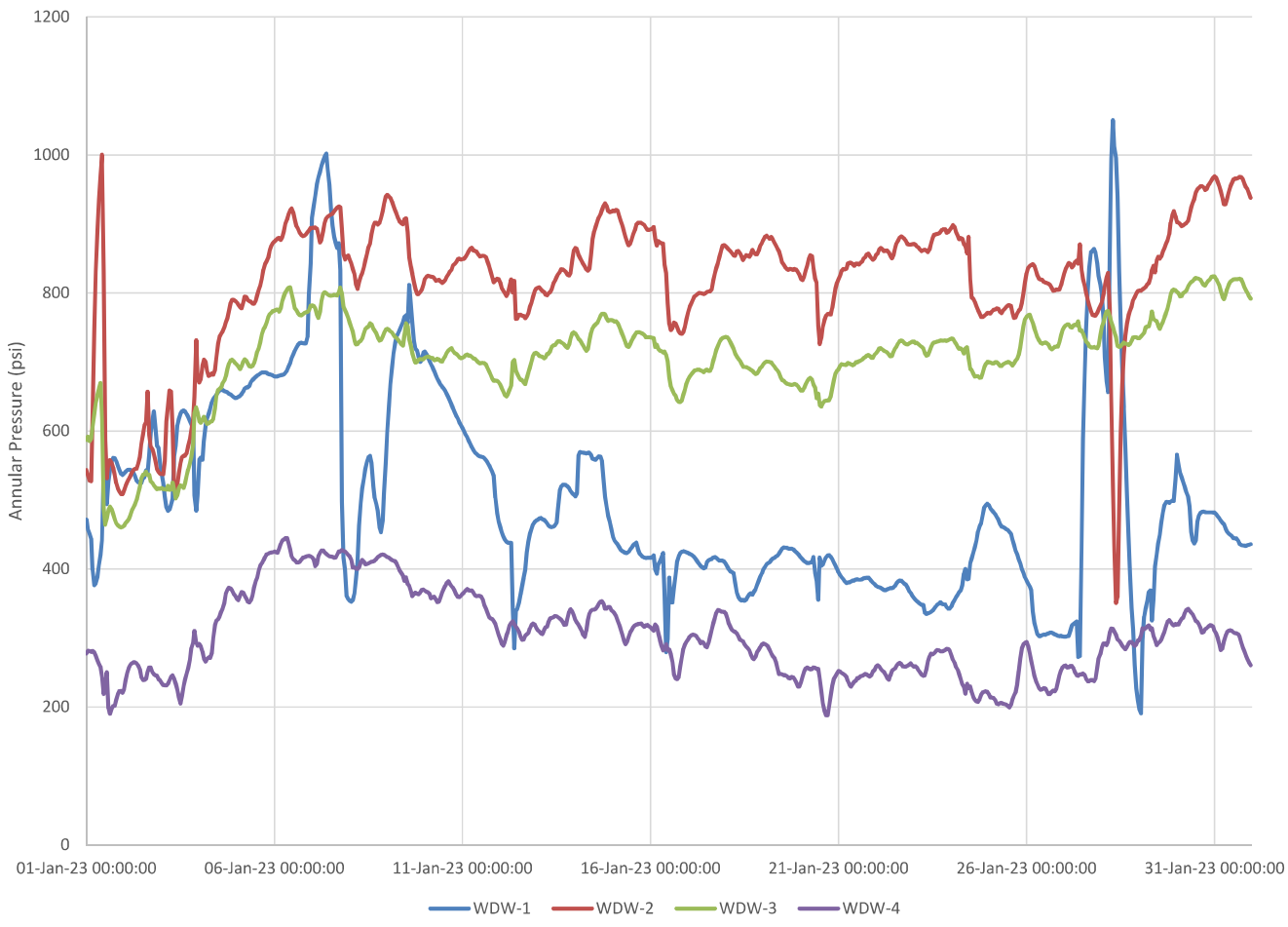


Figure 3. FFY 2023 Q2 Injection Flowrate - January 2023

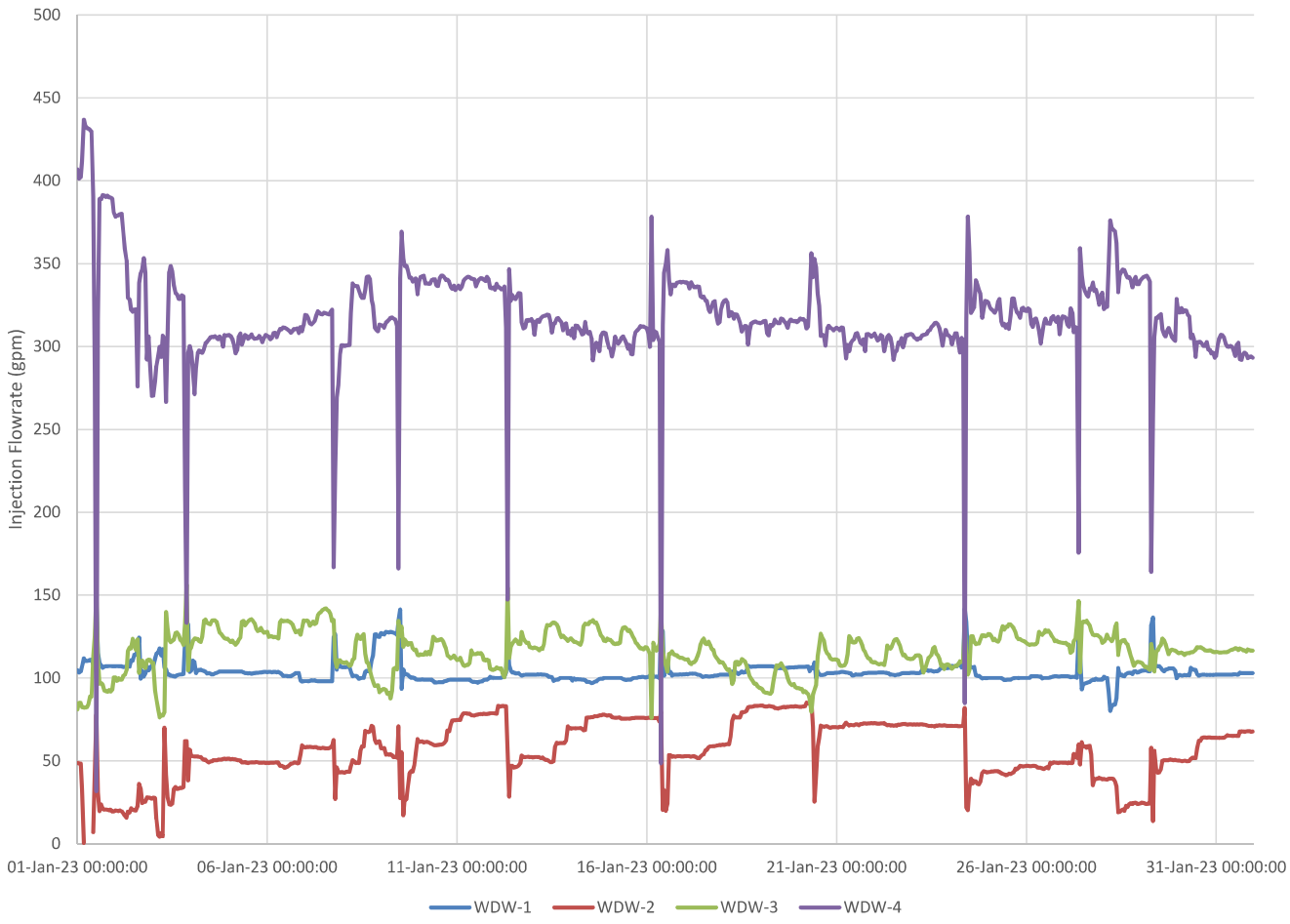


Figure 4. FFY 2023 Q2 Injection Pressure - February 2023

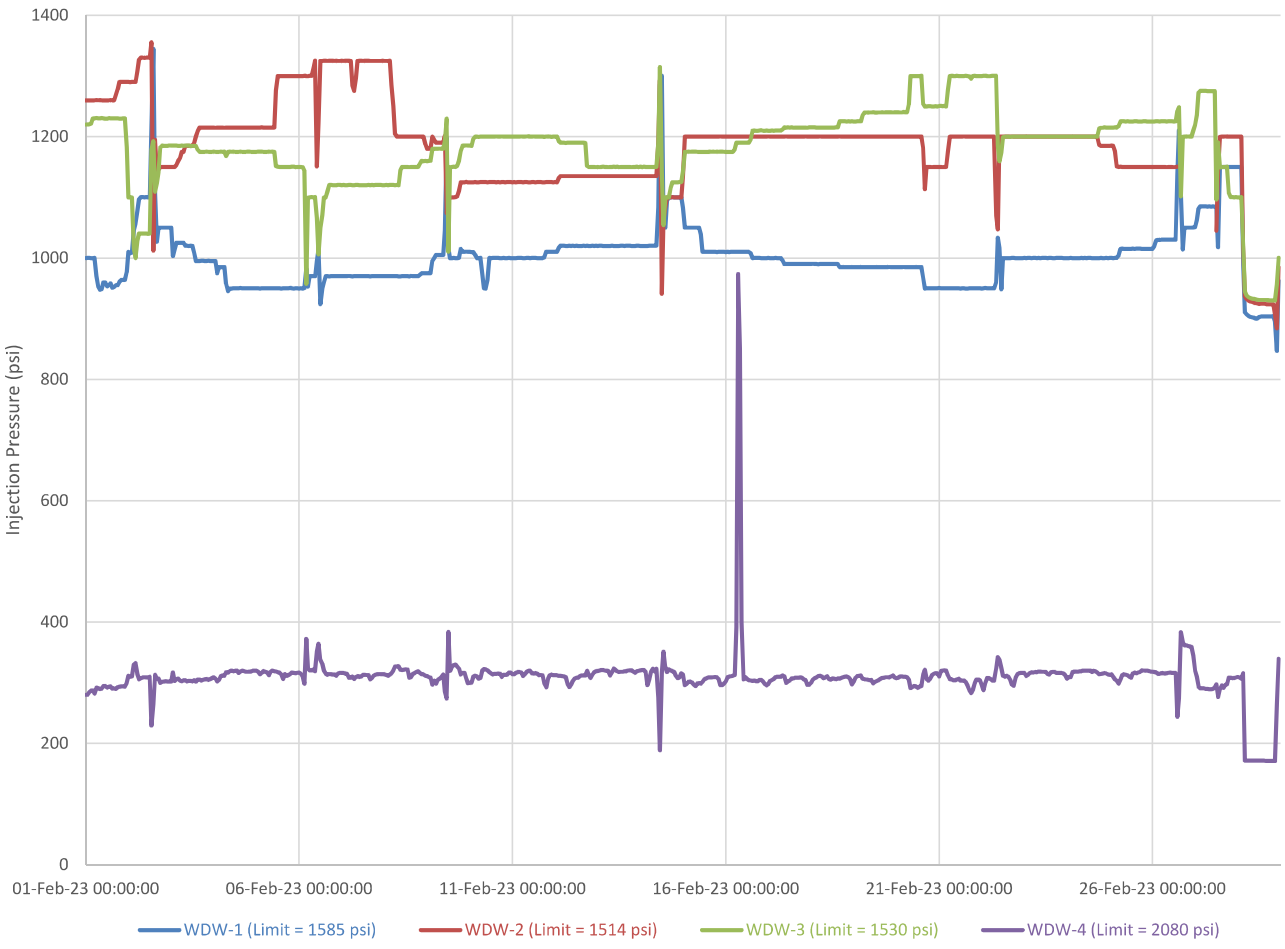


Figure 5. FFY 2023 Q2 Annular Pressure - February 2023

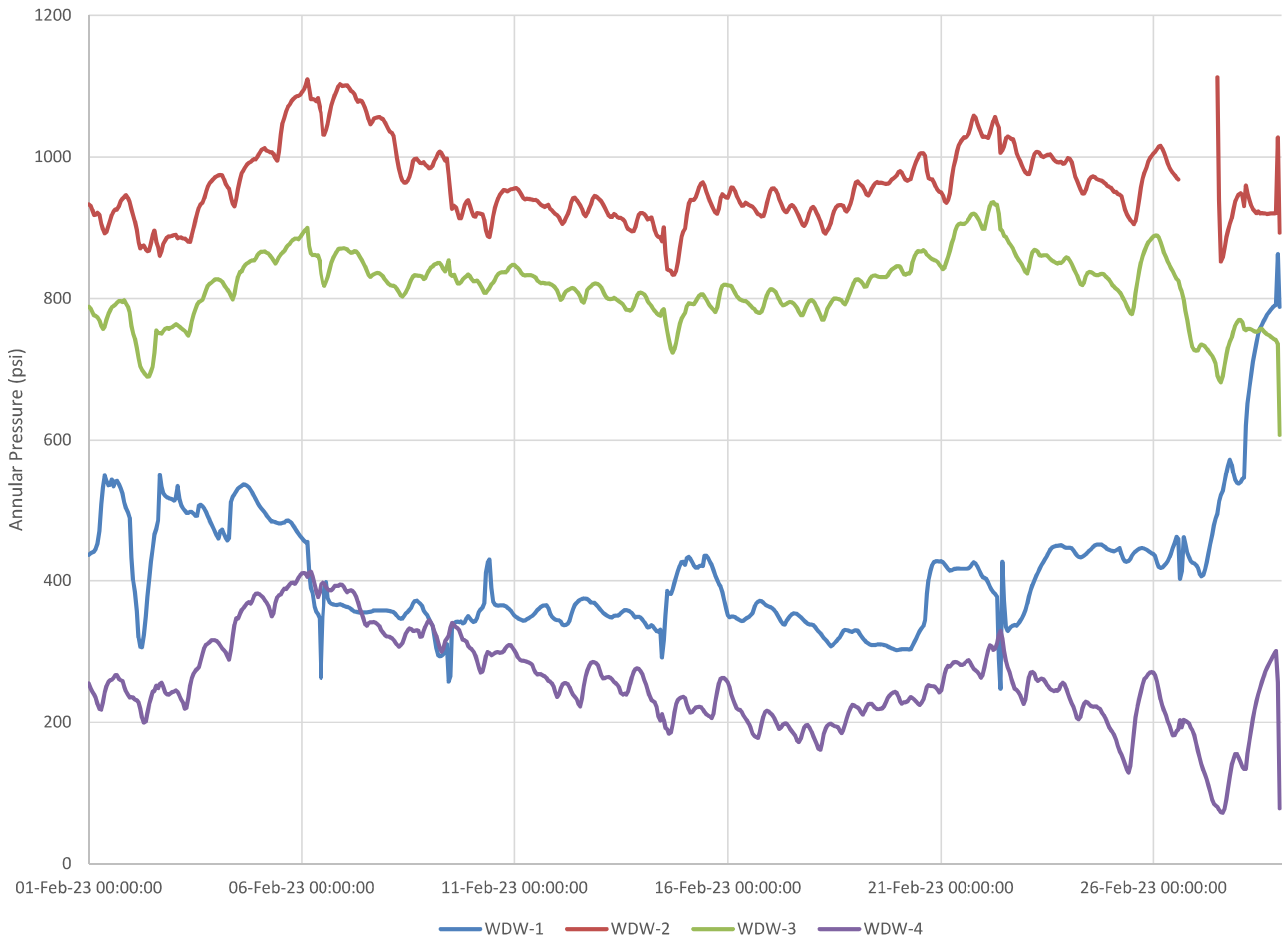


Figure 6. FFY 2023 Q2 Injection Flowrate - February 2023

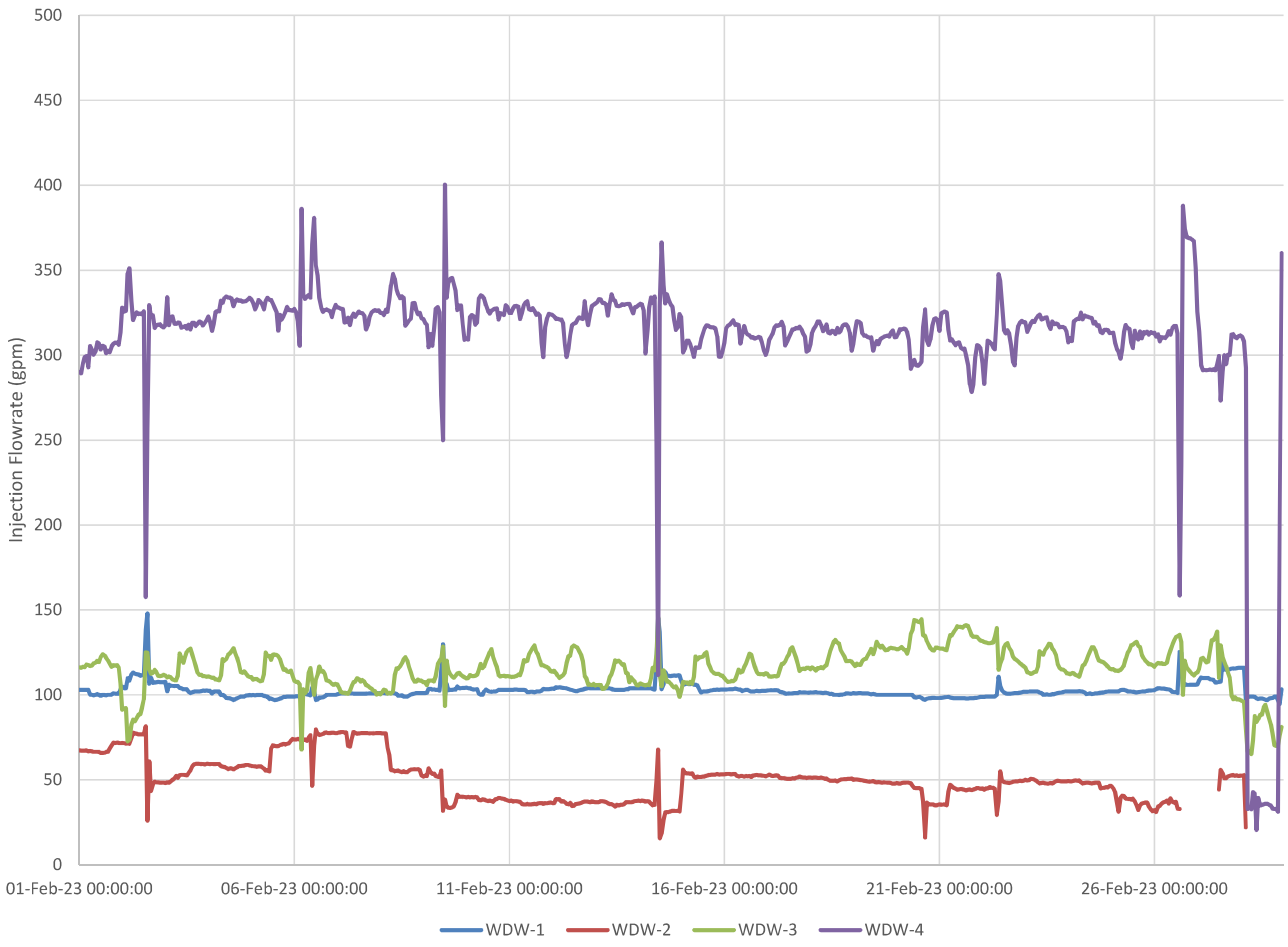


Figure 7. FFY 2023 Q2 Injection Pressure - March 2023

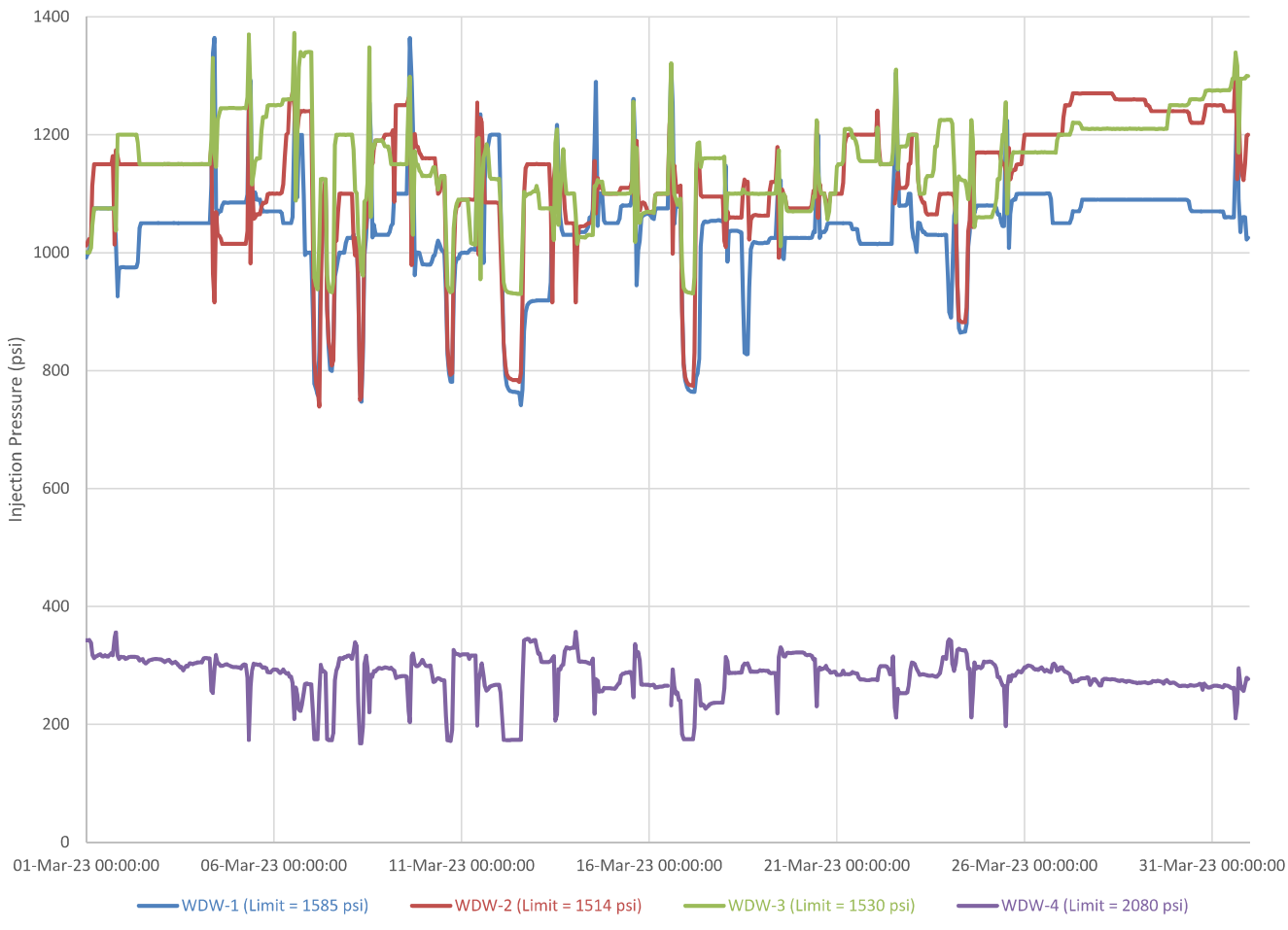


Figure 8. FFY 2023 Q2 Annular Pressure - March 2023

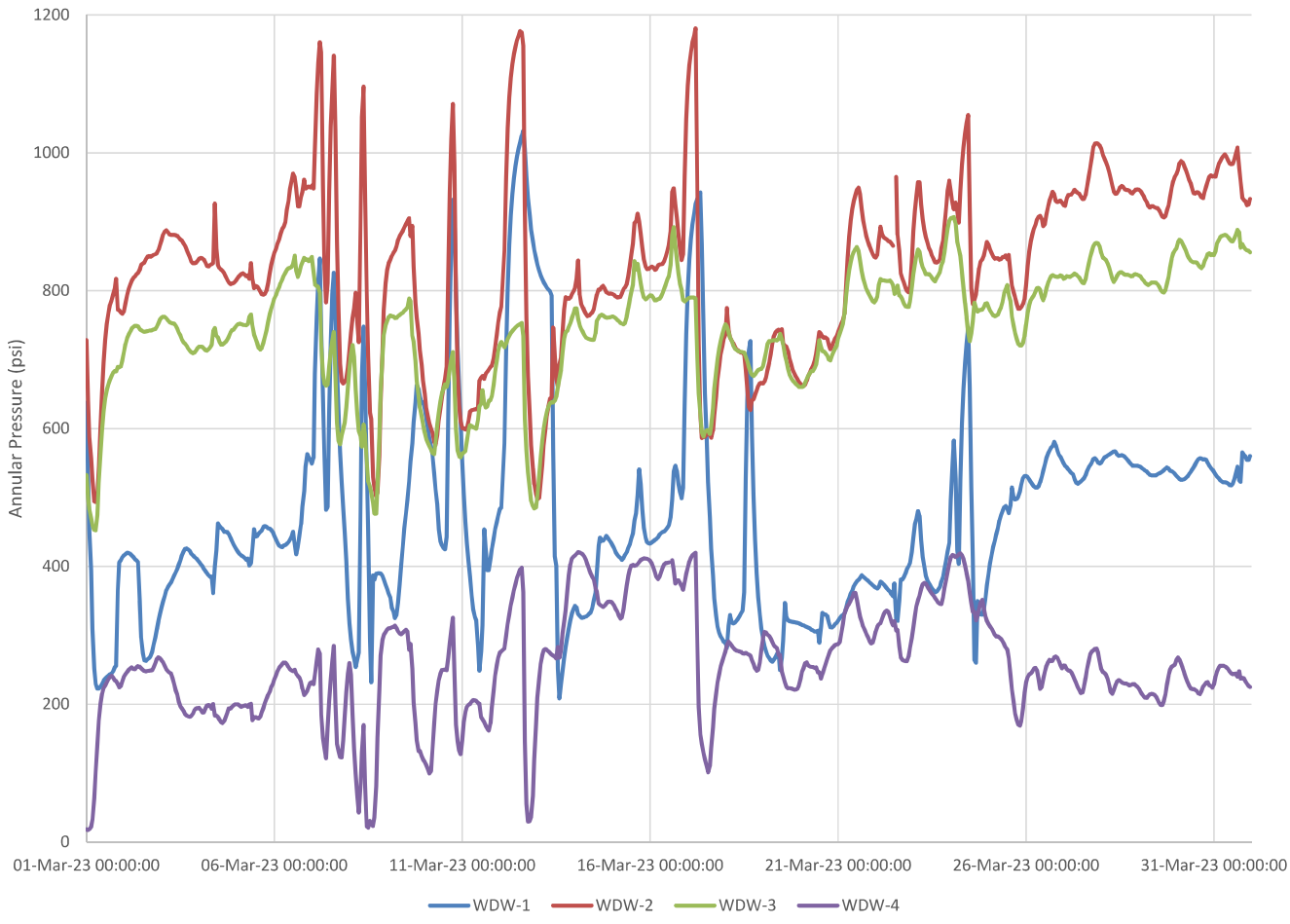
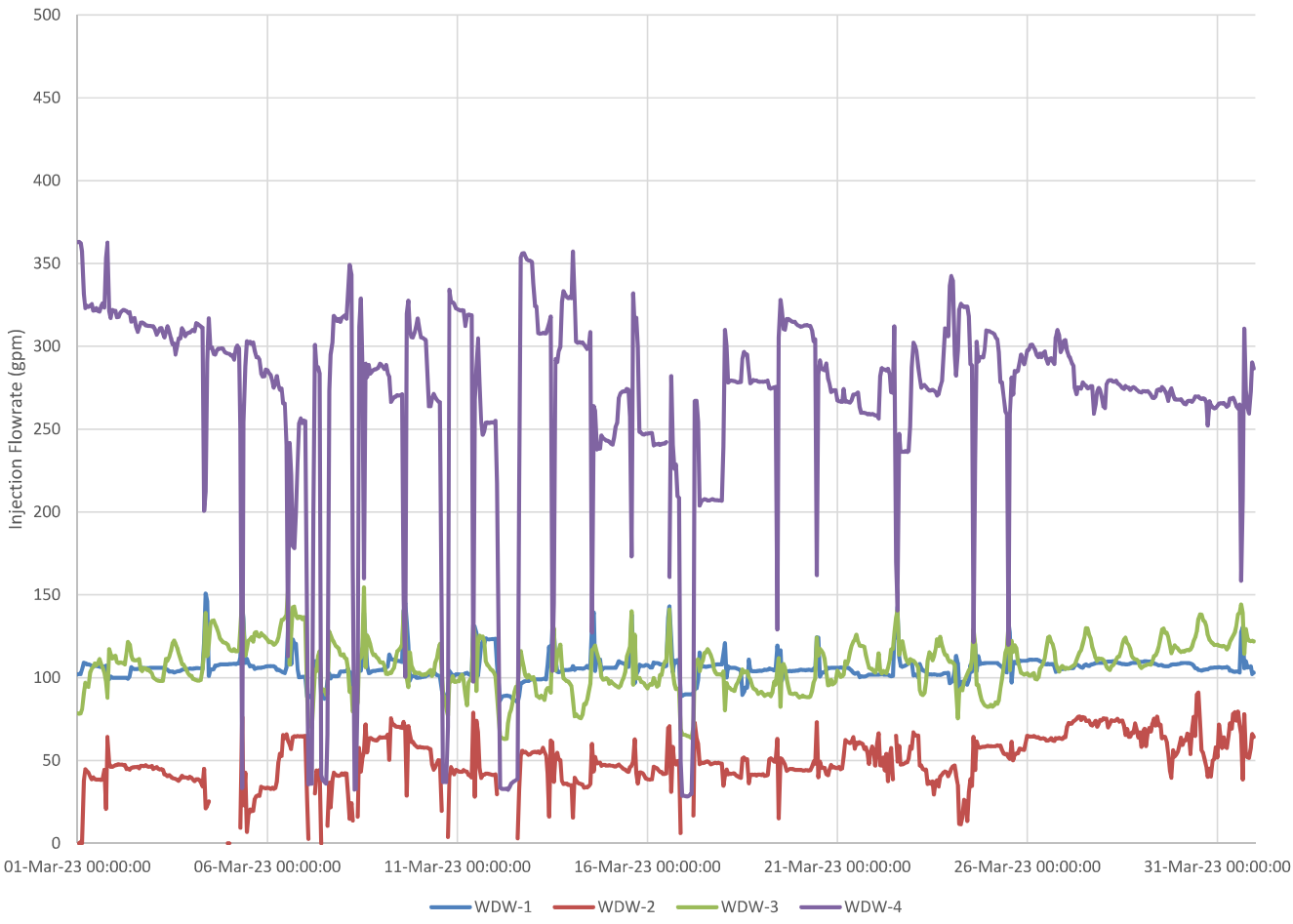


Figure 9. FFY 2023 Q2 Injection Flowrate - March 2023



ATTACHMENT A

Analytical Lab Report(s)

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

April 13, 2023

Jason Roberts

Navajo Refining Company
P.O. Box 159
Artesia, NM 88211-0159
TEL: (575) 748-3311
FAX:

RE: Quarterly WDW 1 2 3 4 Inj Well OrderNo.: 2303762

Dear Jason Roberts:

Hall Environmental Analysis Laboratory received 2 sample(s) on 3/15/2023 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Case Narrative

WO#: **2303762**
Date: **4/13/2023**

CLIENT: Navajo Refining Company
Project: Quarterly WDW 1 2 3 4 Inj Well

Analytical Notes:
TCLP parameters were requested for the sample in this report. Per the TCLP Method 1311, "If a total analysis of the waste demonstrates that individual analytes are not present in the waste, or that they are present but at such low concentrations that the appropriate regulatory levels could not possibly be exceeded, the TCLP need not be run". All TCLP compounds are reported as totals in this report, at the TCLP Limits, since the low solids content did not require filtration. The TCLP term is used in the method header; this is used to represent that the compounds listed are the specific TCLP compounds and that these compounds are reported at the TCLP regulatory limits.
The cations were filtered using a 0.45um filter for the C/A balance determination.

Analytical Report
Lab Order **2303762**
Date Reported: **4/13/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Client Sample ID: WDW-1,2,3 & 4 Effluent
Project: Quarterly WDW 1 2 3 4 Inj Well
Collection Date: 3/14/2023 10:20:00 AM
Lab ID: 2303762-001 **Matrix:** AQUEOUS **Received Date:** 3/15/2023 7:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8081: PESTICIDES TCLP							Analyst: **SB**	
Chlordane	ND	0.00050	0.030		mg/L	1	3/22/2023 3:09:44 PM	73837
Surr: Decachlorobiphenyl	79.4	0	40.9-111		%Rec	1	3/22/2023 3:09:44 PM	73837
Surr: Tetrachloro-m-xylene	77.2	0	15-107		%Rec	1	3/22/2023 3:09:44 PM	73837
EPA METHOD 300.0: ANIONS							Analyst: **CAS**	
Fluoride	35	0.92	2.0	*	mg/L	20	3/15/2023 4:58:20 PM	R95307
Chloride	500	12	25	*	mg/L	50	3/27/2023 5:02:12 PM	R95590
Nitrogen, Nitrite (As N)	0.19	0.057	0.50	J	mg/L	5	3/15/2023 4:45:27 PM	R95307
Bromide	0.43	0.25	0.50	J	mg/L	5	3/15/2023 4:45:27 PM	R95307
Nitrogen, Nitrate (As N)	ND	0.10	0.50		mg/L	5	3/15/2023 4:45:27 PM	R95307
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5		mg/L	5	3/15/2023 4:45:27 PM	R95307
Sulfate	1500	12	25	*	mg/L	50	3/27/2023 5:02:12 PM	R95590
EPA METHOD 7470A: MERCURY							Analyst: **tem**	
Mercury	0.00018	0.000081	0.020	J	mg/L	1	3/16/2023 5:32:55 PM	73736
EPA METHOD 6010B: DISSOLVED METALS							Analyst: **JRR**	
Calcium	380	0.89	10		mg/L	10	3/22/2023 3:16:38 PM	A95518
Magnesium	120	0.98	10		mg/L	10	3/22/2023 3:16:38 PM	A95518
Potassium	120	1.3	10		mg/L	10	3/22/2023 3:16:38 PM	A95518
Sodium	360	3.0	10		mg/L	10	3/22/2023 3:16:38 PM	A95518
EPA 6010B: TCLP METALS							Analyst: **JRR**	
Arsenic	ND	0.083	5.0		mg/L	5	3/29/2023 2:44:30 PM	73845
Barium	0.053	0.0022	100	J	mg/L	5	3/22/2023 4:32:40 PM	73845
Cadmium	ND	0.0061	1.0		mg/L	5	3/22/2023 4:32:40 PM	73845
Chromium	ND	0.0058	5.0		mg/L	5	3/22/2023 4:32:40 PM	73845
Lead	ND	0.068	5.0		mg/L	5	3/22/2023 4:32:40 PM	73845
Selenium	ND	0.13	1.0		mg/L	5	3/22/2023 4:32:40 PM	73845
Silver	0.0079	0.0065	5.0	J	mg/L	5	3/22/2023 4:32:40 PM	73845
EPA METHOD 8270C TCLP							Analyst: **DAM**	
2-Methylphenol	ND	0.0050	200		mg/L	1	4/5/2023 12:37:13 AM	73826
3+4-Methylphenol	ND	0.0051	200		mg/L	1	4/5/2023 12:37:13 AM	73826
2,4-Dinitrotoluene	ND	0.0049	0.13		mg/L	1	4/5/2023 12:37:13 AM	73826
Hexachlorobenzene	ND	0.019	0.13		mg/L	1	4/5/2023 12:37:13 AM	73826
Hexachlorobutadiene	ND	0.017	0.50		mg/L	1	4/5/2023 12:37:13 AM	73826
Hexachloroethane	ND	0.014	3.0		mg/L	1	4/5/2023 12:37:13 AM	73826
Nitrobenzene	ND	0.0049	2.0		mg/L	1	4/5/2023 12:37:13 AM	73826
Pentachlorophenol	ND	0.027	100		mg/L	1	4/5/2023 12:37:13 AM	73826
Pyridine	ND	0.014	5.0		mg/L	1	4/5/2023 12:37:13 AM	73826
2,4,5-Trichlorophenol	ND	0.0063	400		mg/L	1	4/5/2023 12:37:13 AM	73826

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303762**
Date Reported: **4/13/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW 1 2 3 4 Inj Well
Lab ID: 2303762-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,3 & 4 Effluent
Collection Date: 3/14/2023 10:20:00 AM
Received Date: 3/15/2023 7:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C TCLP							Analyst: **DAM**	
2,4,6-Trichlorophenol	ND	0.0059	2.0		mg/L	1	4/5/2023 12:37:13 AM	73826
Cresols, Total	ND	0.027	200		mg/L	1	4/5/2023 12:37:13 AM	73826
Surr: 2-Fluorophenol	73.3	0	20.8-71.9	S	%Rec	1	4/5/2023 12:37:13 AM	73826
Surr: Phenol-d5	57.0	0	16.2-54.5	S	%Rec	1	4/5/2023 12:37:13 AM	73826
Surr: 2,4,6-Tribromophenol	72.3	0	18.8-117		%Rec	1	4/5/2023 12:37:13 AM	73826
Surr: Nitrobenzene-d5	79.4	0	33-85.9		%Rec	1	4/5/2023 12:37:13 AM	73826
Surr: 2-Fluorobiphenyl	68.2	0	26.3-79.6		%Rec	1	4/5/2023 12:37:13 AM	73826
Surr: 4-Terphenyl-d14	98.9	0	53.9-124		%Rec	1	4/5/2023 12:37:13 AM	73826
TCLP VOLATILES BY 8260B							Analyst: **RAA**	
Benzene	ND	0.50	0.50		mg/L	200	3/22/2023 4:45:35 PM	B95496
1,2-Dichloroethane (EDC)	ND	0.50	0.50		mg/L	200	3/22/2023 4:45:35 PM	B95496
2-Butanone	ND	200	200		mg/L	200	3/22/2023 4:45:35 PM	B95496
Carbon Tetrachloride	ND	0.50	0.50		mg/L	200	3/22/2023 4:45:35 PM	B95496
Chloroform	ND	6.0	6.0		mg/L	200	3/22/2023 4:45:35 PM	B95496
1,4-Dichlorobenzene	ND	7.5	7.5		mg/L	200	3/22/2023 4:45:35 PM	B95496
1,1-Dichloroethene	ND	0.70	0.70		mg/L	200	3/22/2023 4:45:35 PM	B95496
Tetrachloroethene (PCE)	ND	0.70	0.70		mg/L	200	3/22/2023 4:45:35 PM	B95496
Trichloroethene (TCE)	ND	0.50	0.50		mg/L	200	3/22/2023 4:45:35 PM	B95496
Vinyl chloride	ND	0.20	0.20		mg/L	200	3/22/2023 4:45:35 PM	B95496
Chlorobenzene	ND	100	100		mg/L	200	3/22/2023 4:45:35 PM	B95496
Surr: 1,2-Dichloroethane-d4	93.3	0	70-130		%Rec	200	3/22/2023 4:45:35 PM	B95496
Surr: 4-Bromofluorobenzene	116	0	70-130		%Rec	200	3/22/2023 4:45:35 PM	B95496
Surr: Dibromofluoromethane	117	0	70-130		%Rec	200	3/22/2023 4:45:35 PM	B95496
Surr: Toluene-d8	104	0	70-130		%Rec	200	3/22/2023 4:45:35 PM	B95496
SM2510B: SPECIFIC CONDUCTANCE							Analyst: **CAS**	
Conductivity	5100	10	10		µmhos/c	1	3/21/2023 6:40:08 PM	R95461
SM4500-H+B / 9040C: PH							Analyst: **CAS**	
pH	7.46			H	pH units	1	3/21/2023 6:40:08 PM	A95461
SM2320B: ALKALINITY							Analyst: **CAS**	
Bicarbonate (As CaCO3)	482.8	20.00	20.00		mg/L Ca	1	3/21/2023 6:40:08 PM	R95461
Carbonate (As CaCO3)	ND	2.000	2.000		mg/L Ca	1	3/21/2023 6:40:08 PM	R95461
Total Alkalinity (as CaCO3)	482.8	20.00	20.00		mg/L Ca	1	3/21/2023 6:40:08 PM	R95461
SPECIFIC GRAVITY							Analyst: **CAS**	
Specific Gravity	0.9992	0	0			1	4/12/2023 10:26:00 AM	R95945
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: **KS**	
Total Dissolved Solids	3250	250	250	*D	mg/L	1	3/22/2023 1:29:00 PM	73827

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2303762**
Date Reported: **4/13/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW 1 2 3 4 Inj Well
Lab ID: 2303762-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,3 & 4 Effluent
Collection Date: 3/14/2023 10:20:00 AM
Received Date: 3/15/2023 7:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
SM 2540D: TSS							Analyst: **KS**	
Suspended Solids	120	20	20	D	mg/L	1	3/19/2023 2:03:00 PM	73771

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2303762**
Date Reported: **4/13/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Client Sample ID: TRIP BLANK
Project: Quarterly WDW 1 2 3 4 Inj Well
Collection Date:
Lab ID: 2303762-002 **Matrix:** TRIP BLANK **Received Date:** 3/15/2023 7:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
TCLP VOLATILES BY 8260B							Analyst: **RAA**	
Benzene	ND	0.50	0.50		mg/L	1	3/22/2023 5:12:41 PM	B95496
1,2-Dichloroethane (EDC)	ND	0.50	0.50		mg/L	1	3/22/2023 5:12:41 PM	B95496
2-Butanone	ND	200	200		mg/L	1	3/22/2023 5:12:41 PM	B95496
Carbon Tetrachloride	ND	0.50	0.50		mg/L	1	3/22/2023 5:12:41 PM	B95496
Chloroform	ND	6.0	6.0		mg/L	1	3/22/2023 5:12:41 PM	B95496
1,4-Dichlorobenzene	ND	7.5	7.5		mg/L	1	3/22/2023 5:12:41 PM	B95496
1,1-Dichloroethene	ND	0.70	0.70		mg/L	1	3/22/2023 5:12:41 PM	B95496
Tetrachloroethene (PCE)	ND	0.70	0.70		mg/L	1	3/22/2023 5:12:41 PM	B95496
Trichloroethene (TCE)	ND	0.50	0.50		mg/L	1	3/22/2023 5:12:41 PM	B95496
Vinyl chloride	ND	0.20	0.20		mg/L	1	3/22/2023 5:12:41 PM	B95496
Chlorobenzene	ND	100	100		mg/L	1	3/22/2023 5:12:41 PM	B95496
Surr: 1,2-Dichloroethane-d4	94.3	0	70-130		%Rec	1	3/22/2023 5:12:41 PM	B95496
Surr: 4-Bromofluorobenzene	106	0	70-130		%Rec	1	3/22/2023 5:12:41 PM	B95496
Surr: Dibromofluoromethane	109	0	70-130		%Rec	1	3/22/2023 5:12:41 PM	B95496
Surr: Toluene-d8	102	0	70-130		%Rec	1	3/22/2023 5:12:41 PM	B95496

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

ANALYTICAL REPORT

March 23, 2023

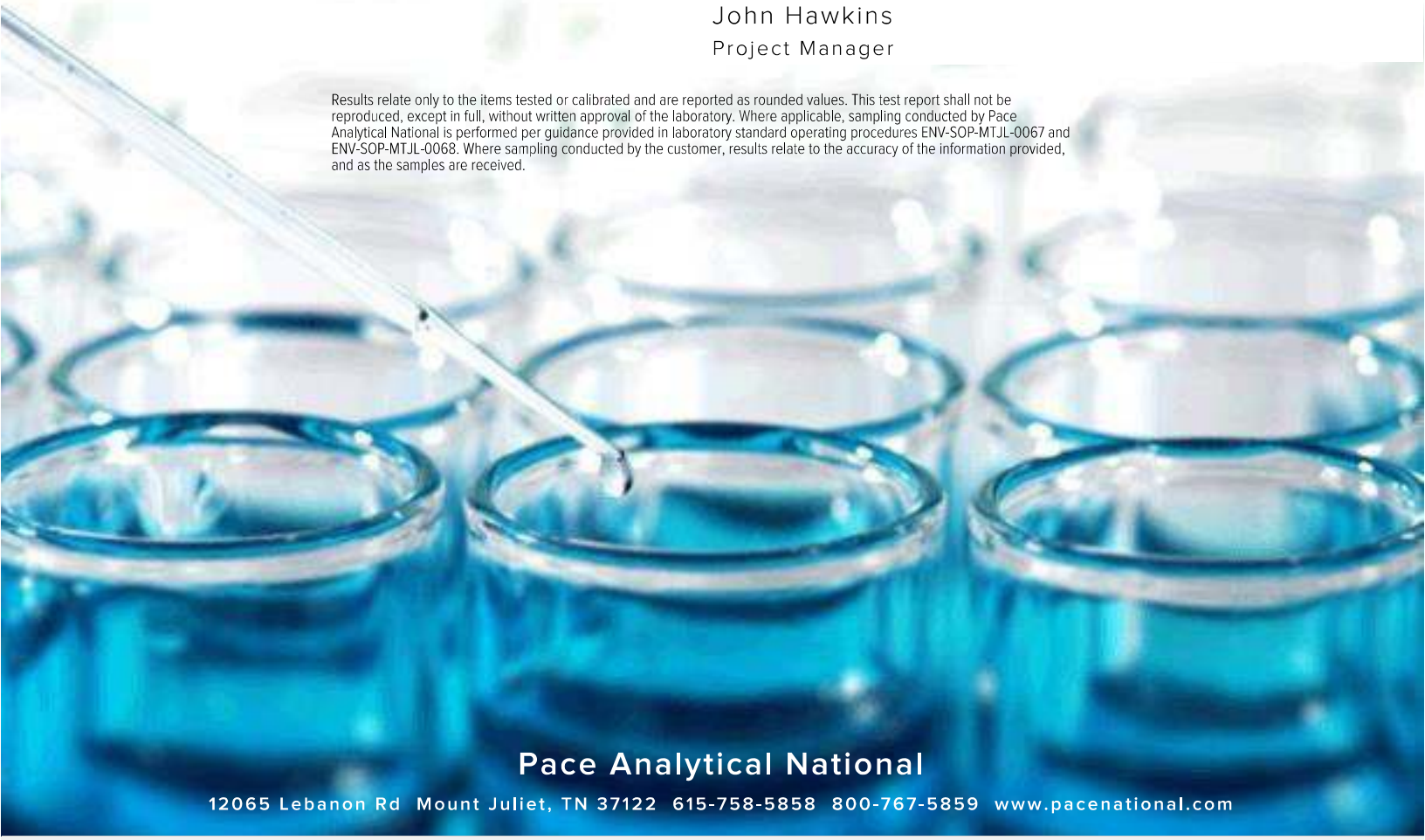
Hall Environmental Analysis Laboratory

Sample Delivery Group:	L1595428
Samples Received:	03/16/2023
Project Number:	
Description:	

Report To: Andy Freeman
4901 Hawkins NE
Albuquerque, NM 87109

Entire Report Reviewed By:

John Hawkins
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

SAMPLE SUMMARY

2303762-001G WDW-1,2,3 & 4 EFFLUENT L1595428-01 WW

Collected by	Collected date/time	Received date/time
	03/14/23 10:20	03/16/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2580	WG2027703	1	03/22/23 15:27	03/22/23 15:27	NTG	Mt. Juliet, TN
Wet Chemistry by Method 4500 CN E-2016	WG2024419	1	03/21/23 10:01	03/21/23 18:15	LDT	Mt. Juliet, TN
Wet Chemistry by Method 4500 S2 D-2011	WG2025083	1	03/17/23 09:27	03/17/23 09:27	RTW	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG2027526	1	03/22/23 09:17	03/22/23 09:17	DB	Mt. Juliet, TN
Wet Chemistry by Method D93/1010A	WG2026179	1	03/20/23 01:44	03/20/23 01:44	WOS	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

John Hawkins
Project Manager

Project Narrative

All Reactive Cyanide results reported in the attached report were determined as totals using method 4500 CN E-2016.
All Reactive Sulfide results reported in the attached report were determined as totals using method 4500 S2 D-2011.

Wet Chemistry by Method 2580

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	mV			date / time	
ORP	21.1	T8	1	03/22/2023 15:27	WG2027703

Wet Chemistry by Method 4500 CN E-2016

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Reactive Cyanide	ND		0.00500	1	03/21/2023 18:15	WG2024419

Wet Chemistry by Method 4500 S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Reactive Sulfide	0.180		0.0500	1	03/17/2023 09:27	WG2025083

Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.28	T8	1	03/22/2023 09:17	WG2027526

Sample Narrative:

L1595428-01 WG2027526: 7.28 at 19.2C

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	deg F			date / time	
Flashpoint	DNF at 170		1	03/20/2023 01:44	WG2026179

WG2027703
Wet Chemistry by Method 2580

QUALITY CONTROL SUMMARY

L1595428-01

L1595428-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1595428-01 03/22/23 15:27 • (DUP) R3904147-3 03/22/23 15:27

Analyte	Original Result mV	DUP Result mV	Dilution	DUP Diff mV	DUP Qualifier	DUP Diff Limits mV
ORP	21.1	22.7	1	1.60		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3904147-1 03/22/23 15:27 • (LCSD) R3904147-2 03/22/23 15:27

Analyte	Spike Amount mV	LCS Result mV	LCSD Result mV	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	Diff mV	Diff Limits mV
ORP	98.0	91.4	91.0	93.3	92.9	90.0-110			0.400	20

WG2024419
Wet Chemistry by Method 4500 CN E-2016

QUALITY CONTROL SUMMARY

L1595428-01

Method Blank (MB)

(MB) R3903695-1 03/21/23 17:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Reactive Cyanide	U		0.00180	0.00500

L1595430-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1595430-07 03/21/23 18:27 • (DUP) R3903695-3 03/21/23 18:29

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Cyanide	0.0120	0.0122	1	1.65		20

L1595430-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1595430-08 03/21/23 18:30 • (DUP) R3903695-4 03/21/23 18:31

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Cyanide	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3903695-2 03/21/23 17:55

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Reactive Cyanide	0.100	0.0927	92.7	87.1-120	

L1595430-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1595430-09 03/21/23 18:33 • (MS) R3903695-5 03/21/23 18:34 • (MSD) R3903695-6 03/21/23 18:36

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Cyanide	0.100	ND	0.0950	0.0914	95.0	91.4	1	90.0-110			3.86	20

WG2025083
Wet Chemistry by Method 4500 S2 D-2011

QUALITY CONTROL SUMMARY

L1595428-01

Method Blank (MB)

(MB) R3902168-1 03/17/23 09:26

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Reactive Sulfide	U		0.0250	0.0500

L1595428-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1595428-01 03/17/23 09:27 • (DUP) R3902168-3 03/17/23 09:27

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Sulfide	0.180	0.174	1	3.39		20

Laboratory Control Sample (LCS)

(LCS) R3902168-2 03/17/23 09:26

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Reactive Sulfide	0.500	0.551	110	85.0-115	

L1595428-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1595428-01 03/17/23 09:27 • (MS) R3902168-4 03/17/23 09:28 • (MSD) R3902168-5 03/17/23 09:28

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Sulfide	0.500	0.180	0.622	0.629	88.4	89.8	1	80.0-120			1.12	20

WG2027526
Wet Chemistry by Method 4500H+ B-2011

QUALITY CONTROL SUMMARY

L1595428-01

L1595136-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1595136-04 03/22/23 09:17 • (DUP) R3903835-2 03/22/23 09:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.64	7.66	1	0.261		1

Sample Narrative:
OS: 7.64 at 19.3C
DUP: 7.66 at 19.5C

L1596591-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1596591-04 03/22/23 09:17 • (DUP) R3903835-3 03/22/23 09:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.75	7.73	1	0.258		1

Sample Narrative:
OS: 7.75 at 19.5C
DUP: 7.73 at 19.5C

Laboratory Control Sample (LCS)

(LCS) R3903835-1 03/22/23 09:17

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:
LCS: 10 at 20.5C

WG2026179
Wet Chemistry by Method D93/1010A

QUALITY CONTROL SUMMARY

L1595428-01

L1595765-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1595765-01 03/20/23 01:44 • (DUP) R3902813-3 03/20/23 01:44

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	deg F	deg F		%		%
Flashpoint	162	160	1	1.24		10

L1596248-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1596248-01 03/20/23 01:44 • (DUP) R3902813-4 03/20/23 01:44

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	deg F	deg F		%		%
Flashpoint	DNF at 200	DNF at 200	1	0.000		10

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3902813-1 03/20/23 01:44 • (LCSD) R3902813-2 03/20/23 01:44

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	deg F	deg F	deg F	%	%	%			%	%
Flashpoint	126	128	130	102	103	96.0-104			1.55	10

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
T8	Sample(s) received past/too close to holding time expiration.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

CHAIN OF CUSTODY RECORD

PAGE: 1 OF: 1

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975
FAX: 505-345-4107
Website: www.hallenvironmental.com

SUB CONTRATOR: Pace TN	COMPANY: PACE TN	PHONE: (800) 767-5859	FAX: (615) 758-5859
ADDRESS: 12065 Lebanon Rd		ACCOUNT #:	EMAIL: A144
CITY, STATE, ZIP: Mt. Juliet, TN 37122			

L1595428

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2303762-001G	WDW-1,2,3 & 4 Effluent	500HDPE	Aqueous	3/14/2023 10:20:00 AM	3	RCI, ORP

NL RC✓ -01

Sample Receipt Checklist

COC Seal Present/Intact:	Y N	If Applicable	
COC Signed/Accurate:	Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	Y N	Pres.Correct/Check:	Y N
Correct bottles used:	Y N		
Sufficient volume sent:	Y N		
RAD Screen <0.5 mR/hr:	Y N		

SPECIAL INSTRUCTIONS / COMMENTS:

Please include the LAB ID and the CLIENT SAMPLE ID on all final reports. Please e-mail results to lab@hallenvironmental.com. Please return all coolers and blue ice. Thank you.

6094 5470 0140

	Date	Time	Received By	Date	Time
Relinquished By: SGA	3/15/2023	11:31 AM	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By: Hawley Robertson	Date: 3/16/23	Time: 0845

REPORT TRANSMITTAL DESIRED:
☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

FOR LAB USE ONLY
Temp of samples 3.7+0=3.7 AB NC Attempt to Cool ? _____
Comments: _____

TAT: Standard ☑ RUSH Next BD ☐ 2nd BD ☐ 3rd BD ☐

HALL ENVIRONMENTAL ANALYSIS LABORATORY

CATION/ANION BALANCE SHEET FOR WATER ANALYSES

HEAL LAB NUMBER	VDW-1,2,3&4 Effluen 2303762-001											
CATIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L
Sodium	360	15.66										
Potassium	120	3.07										
Calcium	380	18.96										
Magnesium	120	9.88										
Total Cations		47.57										
ANIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L
Sulfate	1500	31.23										
Chloride	500	14.10										
Bicarbonate (CaCO3)	482.8	9.65	-									
Carbonate (CaCO3)												
Phosphate (P)												
Nitrite (N)												
Nitrate (N)					-							
Fluoride	35	1.84										
Bromide												
Total Anions		56.83										
Elect. Cond. (µMhos/cm)	5100											
CATION/ANION RATIO		0.84										
% Difference		9										
TOTAL DISSOLVED SOLIDS RATIOS												
TDS (measured)	3250											
TDS (calculated)	3305											
Ratio meas TDS:calc TDS		1.0										
Ratio Meas. TDS:EC		0.64										
Ratio Calc. TDS:EC		0.65										
Ratio of anion sum:EC		1.1										
Ratio of cation sum:EC		0.9										

* Analyte not detected (below method detection limit).

** Values below 0.55 can be obtained in waters containing appreciable concentrations of free acid or alkalinity, or not within pH 6 to 9. Values much higher than 0.7 are possible in highly saline waters.

GENERALLY ACCEPTED RANGES

Cation/Anion balance: 0-3 meq/L- 0.2 meq/L, 3-10 meq/L- 2%, >10 meq/L - 5%

Ratio measured TDS:calculated TDS -- 1.0-1.2. Ratio Calculated TDS:EC -- 0.55-0.7. Ratio Measured TDS:EC--0.55-0.7. Ratio of anion sum:EC -- 0.9-1.1.

Ratio of cation sum:EC -- 0.9-1.1

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303762**

14-Apr-23

Client: Navajo Refining Company

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R95307**	RunNo: **95307**
Prep Date:	Analysis Date: **3/15/2023**	SeqNo: **3447185** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Nitrogen, Nitrite (As N)	ND	0.10								
Bromide	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Phosphorus, Orthophosphate (As P)	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R95307**	RunNo: **95307**
Prep Date:	Analysis Date: **3/15/2023**	SeqNo: **3447186** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.48	0.10	0.5000	0	96.3	90	110			
Nitrogen, Nitrite (As N)	0.97	0.10	1.000	0	96.8	90	110			
Bromide	2.4	0.10	2.500	0	95.7	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	99.3	90	110			
Phosphorus, Orthophosphate (As P)	4.8	0.50	5.000	0	95.1	90	110			

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R95590**	RunNo: **95590**
Prep Date:	Analysis Date: **3/27/2023**	SeqNo: **3458744** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Sulfate	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R95590**	RunNo: **95590**
Prep Date:	Analysis Date: **3/27/2023**	SeqNo: **3458745** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	93.8	90	110			
Sulfate	9.7	0.50	10.00	0	96.9	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303762**

14-Apr-23

Client: Navajo Refining Company

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **TCLP Volatiles by 8260B**
Client ID: **LCSW**	Batch ID: **B95496**	RunNo: **95496**
Prep Date:	Analysis Date: **3/22/2023**	SeqNo: **3454338** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.021	0.010	0.02000	0	104	70	130			
1,1-Dichloroethene	0.018	0.010	0.02000	0	90.2	70	130			
Trichloroethene (TCE)	0.018	0.010	0.02000	0	91.6	70	130			
Chlorobenzene	0.020	0.010	0.02000	0	98.5	70	130			
Surr: 1,2-Dichloroethane-d4	0.011		0.01000		106	70	130			
Surr: 4-Bromofluorobenzene	0.011		0.01000		114	70	130			
Surr: Dibromofluoromethane	0.011		0.01000		113	70	130			
Surr: Toluene-d8	0.011		0.01000		106	70	130			

Sample ID: **mb**	SampType: **MBLK**	TestCode: **TCLP Volatiles by 8260B**
Client ID: **PBW**	Batch ID: **B95496**	RunNo: **95496**
Prep Date:	Analysis Date: **3/22/2023**	SeqNo: **3454341** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.50								
1,2-Dichloroethane (EDC)	ND	0.50								
2-Butanone	ND	200								
Carbon Tetrachloride	ND	0.50								
Chloroform	ND	6.0								
1,4-Dichlorobenzene	ND	7.5								
1,1-Dichloroethene	ND	0.70								
Tetrachloroethene (PCE)	ND	0.70								
Trichloroethene (TCE)	ND	0.50								
Vinyl chloride	ND	0.20								
Chlorobenzene	ND	100								
Surr: 1,2-Dichloroethane-d4	0.011		0.01000		110	70	130			
Surr: 4-Bromofluorobenzene	0.011		0.01000		109	70	130			
Surr: Dibromofluoromethane	0.011		0.01000		108	70	130			
Surr: Toluene-d8	0.011		0.01000		108	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303762**

14-Apr-23

Client: Navajo Refining Company

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: **mb-73826**	SampType: **MBLK**	TestCode: **EPA Method 8270C TCLP**
Client ID: **PBW**	Batch ID: **73826**	RunNo: **95787**
Prep Date: **3/21/2023**	Analysis Date: **4/4/2023**	SeqNo: **3470594** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylphenol	ND	200								
3+4-Methylphenol	ND	200								
2,4-Dinitrotoluene	ND	0.13								
Hexachlorobenzene	ND	0.13								
Hexachlorobutadiene	ND	0.50								
Hexachloroethane	ND	3.0								
Nitrobenzene	ND	2.0								
Pentachlorophenol	ND	100								
Pyridine	ND	5.0								
2,4,5-Trichlorophenol	ND	400								
2,4,6-Trichlorophenol	ND	2.0								
Cresols, Total	ND	200								
Surr: 2-Fluorophenol	0.14		0.2000		68.9	20.8	71.9			
Surr: Phenol-d5	0.11		0.2000		53.5	16.2	54.5			
Surr: 2,4,6-Tribromophenol	0.15		0.2000		74.3	18.8	117			
Surr: Nitrobenzene-d5	0.076		0.1000		76.3	33	85.9			
Surr: 2-Fluorobiphenyl	0.066		0.1000		65.6	26.3	79.6			
Surr: 4-Terphenyl-d14	0.088		0.1000		88.5	53.9	124			

Sample ID: **lcs-73826**	SampType: **LCS**	TestCode: **EPA Method 8270C TCLP**
Client ID: **LCSW**	Batch ID: **73826**	RunNo: **95787**
Prep Date: **3/21/2023**	Analysis Date: **4/4/2023**	SeqNo: **3470595** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylphenol	0.078	0.0050	0.1000	0	78.3	26.8	92.9			
3+4-Methylphenol	0.16	0.0051	0.2000	0	81.4	23.7	100			
2,4-Dinitrotoluene	0.069	0.0049	0.1000	0	69.2	22.3	71.2			
Hexachlorobenzene	0.067	0.019	0.1000	0	67.1	26.1	91.6			
Hexachlorobutadiene	0.045	0.017	0.1000	0	44.7	15	74.2			
Hexachloroethane	0.049	0.014	0.1000	0	48.8	15	85.4			
Nitrobenzene	0.074	0.0049	0.1000	0	73.9	26.1	89.6			
Pentachlorophenol	0.062	0.027	0.1000	0	62.3	21.7	89.4			
Pyridine	0.050	0.014	0.1000	0	50.1	15	68.4			
2,4,5-Trichlorophenol	0.081	0.0063	0.1000	0	81.3	27	97.9			
2,4,6-Trichlorophenol	0.085	0.0059	0.1000	0	84.7	27.9	92.6			
Cresols, Total	0.24	0.027	0.3000	0	80.3	24.8	97.7			
Surr: 2-Fluorophenol	0.13		0.2000		64.2	20.8	71.9			
Surr: Phenol-d5	0.10		0.2000		50.9	16.2	54.5			
Surr: 2,4,6-Tribromophenol	0.15		0.2000		73.3	18.8	117			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303762**

14-Apr-23

Client: Navajo Refining Company

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: **lcs-73826**	SampType: **LCS**	TestCode: **EPA Method 8270C TCLP**
Client ID: **LCSW**	Batch ID: **73826**	RunNo: **95787**
Prep Date: **3/21/2023**	Analysis Date: **4/4/2023**	SeqNo: **3470595** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Nitrobenzene-d5	0.080		0.1000		79.6	33	85.9			
Surr: 2-Fluorobiphenyl	0.069		0.1000		69.0	26.3	79.6			
Surr: 4-Terphenyl-d14	0.089		0.1000		89.0	53.9	124			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303762**

14-Apr-23

Client: Navajo Refining Company

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: **lcs-1 99.4uS eC**	SampType: **lcs**	TestCode: **SM2510B: Specific Conductance**
Client ID: **LCSW**	Batch ID: **R95461**	RunNo: **95461**
Prep Date:	Analysis Date: **3/21/2023**	SeqNo: **3453363** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	100	10	99.40	0	103	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303762**

14-Apr-23

Client: Navajo Refining Company

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: **MB-73736**	SampType: **MBLK**	TestCode: **EPA Method 7470A: Mercury**
Client ID: **PBW**	Batch ID: **73736**	RunNo: **95341**
Prep Date: **3/15/2023**	Analysis Date: **3/16/2023**	SeqNo: **3448311** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID: **LCSLL-73736**	SampType: **LCSLL**	TestCode: **EPA Method 7470A: Mercury**
Client ID: **BatchQC**	Batch ID: **73736**	RunNo: **95341**
Prep Date: **3/15/2023**	Analysis Date: **3/16/2023**	SeqNo: **3448312** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00022	0.00020	0.0001500	0	149	50	150			

Sample ID: **LCS-73736**	SampType: **LCS**	TestCode: **EPA Method 7470A: Mercury**
Client ID: **LCSW**	Batch ID: **73736**	RunNo: **95341**
Prep Date: **3/15/2023**	Analysis Date: **3/16/2023**	SeqNo: **3448314** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0054	0.00020	0.005000	0	108	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303762**

14-Apr-23

Client: Navajo Refining Company

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: **MB-A**	SampType: **MBLK**	TestCode: **EPA Method 6010B: Dissolved Metals**
Client ID: **PBW**	Batch ID: **A95518**	RunNo: **95518**
Prep Date:	Analysis Date: **3/22/2023**	SeqNo: **3454889** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID: **LCS-A**	SampType: **LCS**	TestCode: **EPA Method 6010B: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **A95518**	RunNo: **95518**
Prep Date:	Analysis Date: **3/22/2023**	SeqNo: **3454891** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	55	1.0	50.00	0	110	80	120			
Magnesium	54	1.0	50.00	0	108	80	120			
Potassium	53	1.0	50.00	0	106	80	120			
Sodium	53	1.0	50.00	0	107	80	120			

Sample ID: **LCSD-A**	SampType: **LCSD**	TestCode: **EPA Method 6010B: Dissolved Metals**
Client ID: **LCSS02**	Batch ID: **A95518**	RunNo: **95518**
Prep Date:	Analysis Date: **3/22/2023**	SeqNo: **3454892** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	59	1.0	50.00	0	118	80	120	6.91	20	
Magnesium	58	1.0	50.00	0	115	80	120	6.48	20	
Potassium	57	1.0	50.00	0	113	80	120	6.66	20	
Sodium	57	1.0	50.00	0	114	80	120	6.29	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303762**

14-Apr-23

Client: Navajo Refining Company

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: **MB-73845**	SampType: **MBLK**	TestCode: **EPA 6010B: TCLP Metals**
Client ID: **PBW**	Batch ID: **73845**	RunNo: **95518**
Prep Date: **3/21/2023**	Analysis Date: **3/22/2023**	SeqNo: **3454885** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Lead	ND	0.020								
Selenium	ND	0.050								
Silver	ND	0.0050								

Sample ID: **LCS-73845**	SampType: **LCS**	TestCode: **EPA 6010B: TCLP Metals**
Client ID: **LCSW**	Batch ID: **73845**	RunNo: **95518**
Prep Date: **3/21/2023**	Analysis Date: **3/22/2023**	SeqNo: **3454887** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.46	0.0020	0.5000	0	92.5	80	120			
Cadmium	0.47	0.0020	0.5000	0	93.5	80	120			
Chromium	0.47	0.0060	0.5000	0	94.5	80	120			
Lead	0.47	0.020	0.5000	0	94.6	80	120			
Selenium	0.48	0.050	0.5000	0	95.1	80	120			
Silver	0.090	0.0050	0.1000	0	89.6	80	120			

Sample ID: **LCSD-73845**	SampType: **LCSD**	TestCode: **EPA 6010B: TCLP Metals**
Client ID: **LCSS02**	Batch ID: **73845**	RunNo: **95518**
Prep Date: **3/21/2023**	Analysis Date: **3/22/2023**	SeqNo: **3454888** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.46	0.0020	0.5000	0	92.0	80	120	0.521	20	
Cadmium	0.47	0.0020	0.5000	0	93.7	80	120	0.219	20	
Chromium	0.47	0.0060	0.5000	0	93.9	80	120	0.689	20	
Lead	0.48	0.020	0.5000	0	96.4	80	120	1.87	20	
Selenium	0.46	0.050	0.5000	0	91.0	80	120	4.36	20	
Silver	0.089	0.0050	0.1000	0	89.2	80	120	0.443	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303762**

14-Apr-23

Client: Navajo Refining Company

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: **mb-1 alk**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**
Client ID: **PBW**	Batch ID: **R95461**	RunNo: **95461**
Prep Date:	Analysis Date: **3/21/2023**	SeqNo: **3453284** Units: **mg/L CaCO3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID: **lcs-1 alk**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**
Client ID: **LCSW**	Batch ID: **R95461**	RunNo: **95461**
Prep Date:	Analysis Date: **3/21/2023**	SeqNo: **3453285** Units: **mg/L CaCO3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	78.76	20.00	80.00	0	98.4	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303762**

14-Apr-23

Client: Navajo Refining Company

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: **MB-73827**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **73827**	RunNo: **95471**
Prep Date: **3/21/2023**	Analysis Date: **3/22/2023**	SeqNo: **3453549** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	50.0								

Sample ID: **LCS-73827**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **73827**	RunNo: **95471**
Prep Date: **3/21/2023**	Analysis Date: **3/22/2023**	SeqNo: **3453550** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	999	50.0	1000	0	99.9	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303762**

14-Apr-23

Client: Navajo Refining Company

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: **MB-73771**	SampType: **MBLK**	TestCode: **SM 2540D: TSS**							
Client ID: **PBW**	Batch ID: **73771**	RunNo: **95378**							
Prep Date: **3/17/2023**	Analysis Date: **3/19/2023**	SeqNo: **3450202**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	ND	4.0								

Sample ID: **LCS-73771**	SampType: **LCS**	TestCode: **SM 2540D: TSS**							
Client ID: **LCSW**	Batch ID: **73771**	RunNo: **95378**							
Prep Date: **3/17/2023**	Analysis Date: **3/19/2023**	SeqNo: **3450203**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	94	4.0	91.90	0	102	83.89	119.7			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Navajo Refining | Work Order Number: 2303762 | RcptNo: 1

Received By: Juan Rojas 3/15/2023 7:05:00 AM

Completed By: Sean Livingston 3/15/2023 9:20:58 AM

Reviewed By: 3-15-23

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   samples not frozen.
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes ☑ No ☐ NA ☐
10. Were any sample containers received broken? Yes ☐ No ☑
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: 3 2 (<2 or >12 unless noted)
Adjusted? NO
Checked by: JR 3/15/23

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	-1.4	Good	Not Present	Morty		

Chain-of-Custody Record

Client: Navajo Refining Co.

Mailing Address: P.O. Box 159

Artesia, NM 88211-0159

Phone #: 575-748-6733

email or Fax#: Jason.Roberts@HFSinclair.com

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Quarterly WDW-1, 2, 3 & 4 Inj Well

Project #: PO #251841

Project Manager:

Jason Roberts

Sampler: Brady Hubbard

On Ice: ☒ Yes ☐ No

# of Coolers: 1 Monty

Cooler Temp(including CF): -1.5 +6.1 = +4.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2303702	Analysis Request: Specific Gravity, C/A Balance, ORP, pH, TSS	8260 TCLP Compounds	8270 TCLP Compounds	RCI	RCRA 8 Metals TCLP	8081 TCLP Chlordane (ONLY)
3/14/2023	10:20	Liquid	WDW-1, 2, 3 & 4 Effluent	**	**	001	x					
3/14/2023		Liquid	WDW-1, 2, 3 & 4 Effluent	3-40ml VOA	HCL			x				
3/14/2023		Liquid	WDW-1, 2, 3 & 4 Effluent	1-1L Amber	none				x			
3/14/2023		Liquid	WDW-1, 2, 3 & 4 Effluent	***	***					x		
3/14/2023		Liquid	WDW-1, 2, 3 & 4 Effluent	1-250ml P	HNO3						x	
3/14/2023		Liquid	WDW-1, 2, 3 & 4 Effluent	1-1L Amber	none							x
	per sample		Trip Blanks			-002						
	bottles		per sample bottle Jm 3/15/23									
	Jm 3/15/23											

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
3.14.23	11:15	Brady Hubbard			3/14/23	1115
3/14/23	1900			Courier	3/15/23	7:50

Remarks: Dissolved Cations by EPA Method 200.7. ** 1-500ml unpreserved plastic, 1-125ml H2SO4 plastic, 1-125ml HNO3 plastic. *** 1-500ml unpreserved plastic, 1-500ml NaOH plastic, 1-500ml NaOH/ZnAcetate plastic

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

EPA/600/R-07/041
October 2015
www.epa.gov

ProUCL Version 5.1 User Guide

Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations

Prepared for:

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ORD Site Characterization and Monitoring Technical Support Center (SCMTSC)
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IS&GS-CIVIL
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Office of Research and Development
Washington, DC 20460

Notes: Even though the DL/2 substitution method has been incorporated in ProUCL, its use is **not recommended** due to its poor performance. The DL/2 substitution method has been retained in ProUCL 5.1 for historical and comparison purposes. NERL-EPA, Las Vegas strongly recommends avoiding the use of this method even when the percentage of NDs is as low as 5% to 10%.

1.11.2 ProUCL Does Not Distinguish between Detection Limits, Reporting limits, or Method Detection Limits

ProUCL 5.1 (and all previous versions) does not make distinctions between method detection limits (MDLs), adjusted MDLs, sample quantitation limits (SQLs), reporting limits (RLs), or DLs. Multiple DLs (or RLs) in ProUCL mean different values of the detection limits. It is user's responsibility to understand the differences between these limits and use appropriate values (e.g., DLs) for nondetect values below which the laboratory cannot reliably detect/measure the presence of the analyte in collected samples (e.g., soil samples). A data set consisting of values less than the DLs (or MDLs, RLs) is considered a left-censored data set. ProUCL uses statistical methods available in the statistical literature for left-censored data sets for computing statistics of interest including mean, *sd*, UCL, and estimates of BTVs.

The user determines which qualifiers (e.g., J, U, UJ) will be considered as nondetects. Typically, all values with U or UJ qualifiers are considered as nondetect values. It is the user's responsibility to enter a value which can be used to represent a ND value. For NDs, the user enters the associated DLs or RLs (and not zeros or half of the detection limits). An indicator column/variable, D_x taking a value, 0, for all nondetects and a value, 1, for all detects is assigned to each variable, x, with NDs. It is the user's responsibility to supply the numerical values for NDs (should be entered as reported DLs) not qualifiers (e.g., J, U, B, UJ). For example, for thallium with nondetect values, the user creates an associated column labeled as D_thallium to tell the software that the data set will have nondetect values. This column, D_thallium consists of only zeros (0) and ones (1); zeros are used for all values reported as NDs and ones are used for all values reported as detects.

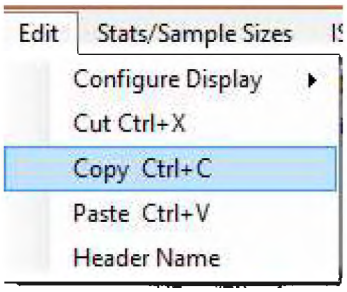
1.12 Samples with Low Frequency of Detection

When all of the sampled values are reported as NDs, the EPC term and other statistical limits should also be reported as a ND value, perhaps by the maximum RL or the maximum RL/2. The project team will need to make this determination. Statistics (e.g., UCL95) based upon only a few detected values (e.g., < 4) cannot be considered reliable enough to estimate EPCs which can have a potential impact on human health and the environment. When the number of detected values is small, it is preferable to use ad hoc methods rather than using statistical methods to compute EPCs and other upper limits. Specifically, for data sets consisting of < 4 detects and for small data sets (e.g., size < 10) with low detection frequency (e.g., < 10%), the project team and the decision makers should decide, on a site-specific basis, how to estimate the average exposure (EPC) for the constituent and area under consideration. For data sets with low detection frequencies, other measures such as the median or mode represent better estimates (with lesser uncertainty) of the population measure of central tendency.

Additionally, when most (e.g., > 95%) of the observations for a constituent lie below the DLs, the sample median or the sample mode (rather than the sample average) may be used as an estimate of the EPC. Note that when the majority of the data are NDs, the median and the mode may also be represented by a ND value. The uncertainty associated with such estimates will be high. The statistical properties, such as the bias, accuracy, and precision of such estimates, would remain unknown. In order to be able to compute defensible estimates, it is always desirable to collect more samples.

2.7 Editing

Click on the Edit menu item to reveal the following drop-down options.



- **Cut** option: similar to a standard Windows Edit option, such as in Excel. It performs standard edit functions on selected highlighted data (similar to a buffer).

- **Copy** option: similar to a standard Windows Edit option, such as in Excel. It performs typical edit functions on selected highlighted data (similar to a buffer).

  Paste option: similar to a standard Windows Edit option, such as in Excel. It performs typical edit functions of pasting the selected (highlighted) data to the designated spreadsheet cells or area.

2.8 Handling Nondetect Observations and Generating Files with Nondetects

- Several modules of ProUCL (e.g., Statistical Tests, Upper limits/BTVs, UCLs/EPCs) handle data sets containing ND observations with single and multiple DLs.

- The user informs the program about the status of a variable consisting of NDs. For a variable with ND observations (e.g., arsenic), the detected values, and the numerical values of the associated detection limits (for less than values) are entered in the appropriate column associated with that variable. No qualifiers or flags (e.g., J, B, U, UJ, X) should be entered in data files with ND observations.

- Data for variables with ND values are provided in two columns. One column consists of numerical values of detected observations and numerical values of detection limits (or reporting limits) associated with observations reported as NDs; and the second column represents their detection status consisting of only 0 (for ND values) and 1 (for detected values) values. The name of the corresponding variable representing the detection status should start with d_, or D_ (not case sensitive) and the variable name. The detection status column with variable name starting with a D_ (or a d_) should have only two values: 0 for ND values, and 1 for detected observations.

- For example, the header name, D_Arsenic is used for the variable, Arsenic having ND observations. The variable D_Arsenic contains a 1 if the corresponding Arsenic value represents a detected entry, and contains a 0 if the corresponding entry represents a ND entry. If this format is not followed, the program will not recognize that the data set has NDs. An

example data set illustrating these points is given as follows. ProUCL does not distinguish between lowercase and uppercase letters.

D:\example.wst

	0	1	2	3	4	5	6
	Arsenic	D_Arsenic	Mercury	D_Mercury	Vanadium	Zinc	Group
1	4.5	0	0.07	1	16.4	89.3	Surface
2	5.6	1	0.07	1	16.8	90.7	Surface
3	4.3	0	0.11	0	17.2	95.5	Surface
4	5.4	1	0.2	0	19.4	113	Surface
5	9.2	1	0.61	1	15.3	266	Surface
6	6.2	1	0.12	1	30.8	80.9	Surface
7	6.7	1	0.04	1	29.4	80.4	Surface
8	5.8	1	0.06	1	13.8	89.2	Surface
9	8.5	1	0.99	1	18.9	182	Surface
10	5.65	1	0.125	1	17.25	80.4	Surface
11	5.4	1	0.18	1	17.2	91.9	Subsurface
12	5.5	1	0.21	1	16.3	112	Subsurface
13	5.9	1	0.29	1	16.8	172	Subsurface
14	5.1	1	0.44	1	17.1	99	Subsurface
15	5.2	1	0.12	1	10.3	90.7	Subsurface
16	4.5	0	0.055	1	15.1	66.3	Subsurface
17	6.1	1	0.055	1	24.3	75	Subsurface
18	6.1	1	0.21	1	18	185	Subsurface
19	6.8	1	0.67	1	16.9	184	Subsurface
20	5	1	0.1	1	12	68.4	Subsurface
21			0.8	1			
22			0.26	1			
23			0.97	1			
24			0.05	1			
25			0.26	1			

2.9 Caution

- Care should be taken to avoid any misrepresentation of detected and nondetected values. Specifically, do not include any missing values (blanks, characters) in the D_column (detection status column). If a missing value is located in the D_column (and not in the associated variable column), the corresponding value in the variable column is treated as a ND, even if this might not have been the intention of the user.

- It is mandatory that the user makes sure that only a 1 or a 0 are entered in the detection status D_column. If a value other than a 0 or a 1 (such as qualifiers) is entered in the D_ column (the detection column), results may become unreliable, as the software defaults to any number other than 0 or 1 as a ND value.

- When computing statistics for full uncensored data sets without any ND values, the user should select only those variables (from the list of available variables) that contain no ND observations. Specifically, ND values found in a column chosen for the summary statistics (full-uncensored data set) will be treated as a detected value; whatever value (e.g., detection limit) is entered in that column will be used to compute summary statistics for a full-uncensored data set without any ND values.

- It is mandatory that the header name of a nondetect column associated with a variable such as XYZ should be D_XYZ (or d_Xyz). No other characters or blanks are allowed. However, the header (column) names are not case sensitive. If the nondetect column is not labeled properly, methods to handle nondetect data will not be activated and shown.

- **Two-Sample Hypotheses:** When using two-sample hypotheses tests (WMW test, Gehan test, and T-W test) on data sets with NDs, both samples or variables (e.g., site-As, Back-As) should be specified as having NDs, even though one of the variables may not have any ND observations. This means that a ND column (with 0 = ND, and 1 = detect) should be provided for each variable (here D_site-As, and D_Back-As) to be used in this comparison. *If a variable (e.g., site-As) does not have any NDs, still a column with label D_site-As should be included in the data set with all entries = 1 (detected values).*

- The sample data set given on the previous page illustrates points related to this option and issues listed above. The data set contains some ND measurements for arsenic and mercury. It should be noted that mercury concentrations are used to illustrate the points related to ND observations; arsenic and zinc concentrations are used to illustrate the use of the group variable, Group (Surface, Subsurface).

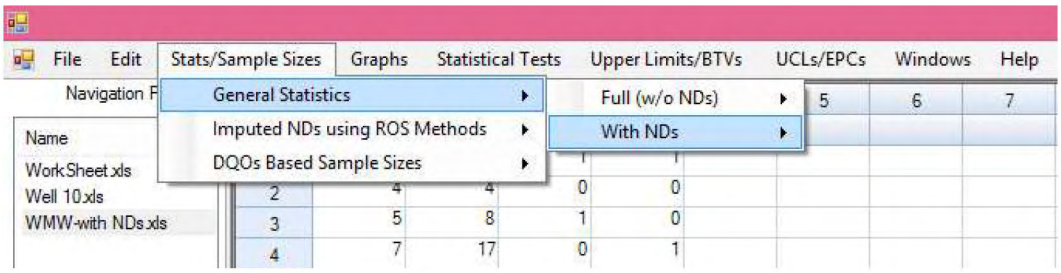
- If for mercury, one computes summary statistics (assuming no ND values) using "Full" data set option, then all ND values (with "0" entries in D_Mercury column) will be treated as detected values, and summary statistics will be computed accordingly.

2.10 Summary Statistics for Data Sets with Nondetect Observations

- To compute statistics of interest (e.g., background statistics, GOF test, UCLs, WMW test) for variables with ND values, one should choose the ND option, **With NDs**, from the available menu options such as **Stats/Sample Sizes**, **Graphs**, **Statistical Tests**, **Upper Limits/BTVs**, and **UCLs/EPCs**.

- The NDs option of these modules gets activated only when your data set contains NDs.

- For data sets with NDs, the **Stats/Sample Sizes** module of ProUCL 5.0 computes summary statistics and other general statistics such as the KM mean and KM standard deviation based upon raw as well as log-transformed data.



- The **General Statistics/With NDs** option also provides simple statistics (e.g., % NDs, Max detect, Min detect, Mean) based upon detected values. The statistics computed in log-scale (e.g., *sd* of log-transformed detected values) may help a user to determine the degree of skewness (e.g., mild, moderate, high) of a data set based upon detected values. These statistics may also help the user to choose the most appropriate method (e.g., KM bootstrap-t UCL or KM percentile bootstrap UCL) to compute UCLs, UPLs, and other limits used to compute decision statistics.

- All other parametric and nonparametric statistics and estimates of population mean, variance, percentiles (e.g., KM, and ROS estimates) for variables with ND observations are provided in other menu options such as **Upper Limits/BTVs** and **UCLs/EPCs**.

2.11 Warning Messages and Recommendations for Data Sets with an Insufficient Amount of Data

- ProUCL provides warning messages and recommendations for data sets with an insufficient amount of data for calculating meaningful estimates and statistics of interest. For example, it is not desirable to compute an estimate of the EPC term based upon a discrete (as opposed to composite or ISM) data set of size less than 5, especially when NDs are also present in the data set.

- However, to accommodate the computation of UCLs and other limits based upon ISM data sets, ProUCL 5.0 allows users to compute UCLs, UPLs, and UTLs based upon data sets of sizes as small as 3. The user is advised to follow the guidance provided in the ITRC ISM Technical Regulatory Guidance Document (2012) to select an appropriate UCL95 to estimate the EPC term. Due to lower variability in ISM data, the minimum sample size requirements for statistical methods used on ISM data are lower than the minimum sample size requirements for statistical methods used on discrete data sets.

- It is suggested that for data sets composed of observations resulting from discrete sampling, at least 10 observations should be collected to compute UCLs and various other limits.

- Some examples of data sets with insufficient amount of data include data sets with less than 3 distinct observations, data sets with only one detected observation, and data sets consisting of all nondetects.

- Some of the warning messages generated by ProUCL 5.0 are shown as follows.

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	[redacted]
From File	[redacted]
Full Precision	OFF
Confidence Coefficient	[redacted]
Number of Bootstrap Operations	2000

x

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	2	Mean	4.5
Maximum	7	Median	4.5

Warning: This data set only has 2 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable x was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	3/13/2013 9:27:39 PM
From File	Not-enough-data-set.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

y

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
Number of Detects	2	Number of Non-Detects	5
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	10	Minimum Non-Detect	1
Maximum Detect	13	Maximum Non-Detect	5
Variance Detects	4.5	Percent Non-Detects	71.43%
Mean Detects	11.5	SD Detects	2.121
Median Detects	11.5	CV Detects	0.184
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	2.434	SD of Logged Detects	0.186

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Not-enough-data-set_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

yy

General Statistics

Total Number of Observations	7	Number of Missing Observations	0
Number of Distinct Observations	6		
Number of Detects	0	Number of Non-Detects	7
Number of Distinct Detects	0	Number of Distinct Non-Detects	6
Minimum Detect	N/A	Minimum Non-Detect	1
Maximum Detect	N/A	Maximum Non-Detect	13
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable yy was not processed!

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

COMMENTS

Action 215501

COMMENTS

Operator: HF Sinclair Navajo Refining LLC ATTN: GENERAL COUNSEL Dallas, TX 75201	OGRID: 15694
	Action Number: 215501
	Action Type: [UF-DP] Discharge Permit (DISCHARGE PERMIT)

COMMENTS

Created By	Comment	Comment Date
cchavez	Quarterly Report Federal FY23 Q2 (WDW-1, WDW-2, WDW-3 & WDW-4)	5/11/2023

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 215501

CONDITIONS

Operator: HF Sinclair Navajo Refining LLC ATTN: GENERAL COUNSEL Dallas, TX 75201	OGRID: 15694
	Action Number: 215501
	Action Type: [UF-DP] Discharge Permit (DISCHARGE PERMIT)

CONDITIONS

Created By	Condition	Condition Date
cchavez	1. Submit sundries prior to well entry for OCD Approval, i.e., C-103G NOI Work Over & C-103R NOI subsequent Report; and for Well Testing, i.e., MITs, Bradenheads, Logging, etc. require C-103X Gen. Sundry & C-103Z Final Report. 2. VOA sample vials shall be filled completed without any headspace. 3. Evaluate added EPA Statistical "Non-Detect" Guidance herein for Statistical Population Sizes GT 10 to determine whether to report environmental analytical lab data results that "ND" as the RL instead of following EPA recommendations for reporting "NDs" in quarterly sampling reports.	5/11/2023