

GW – 028

**Annual DP
Report
(Part 13 of 16)**

2015

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512236

06-Jan-16

Client: Navajo Refining Company

Project: Monthly RO Reject

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID:	A30709	RunNo:	30709					
Prep Date:		Analysis Date:	12/8/2015	SeqNo:	937841	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		103	70	130			
Surr: Dibromofluoromethane	10		10.00		104	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID	100ng lcs	SampType:	LCS	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID:	A30709	RunNo:	30709					
Prep Date:		Analysis Date:	12/8/2015	SeqNo:	937842	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	0	114	70	130			
Toluene	22	1.0	20.00	0	109	70	130			
Chlorobenzene	22	1.0	20.00	0	110	70	130			

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512236

06-Jan-16

Client: Navajo Refining Company

Project: Monthly RO Reject

Sample ID	100ng lcs	SampType: LCS			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID: A30709			RunNo: 30709					
Prep Date:	Analysis Date: 12/8/2015			SeqNo: 937842		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	22	1.0	20.00	0	110	70	130			
Trichloroethene (TCE)	21	1.0	20.00	0	106	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		106	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512236

06-Jan-16

Client: Navajo Refining Company

Project: Monthly RO Reject

Sample ID	MB-22700		SampType: MBLK		TestCode: EPA Method 8310: PAHs					
Client ID:	PBW		Batch ID: 22700		RunNo: 30775					
Prep Date:	12/9/2015		Analysis Date: 12/11/2015		SeqNo: 940029		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	2.0								
2-Methylnaphthalene	ND	2.0								
Benzo(a)pyrene	ND	0.070								
Surr: Benzo(e)pyrene	13		20.00		63.6	33.4	129			

Sample ID	LCS-22700		SampType: LCS		TestCode: EPA Method 8310: PAHs					
Client ID:	LCSW		Batch ID: 22700		RunNo: 30775					
Prep Date:	12/9/2015		Analysis Date: 12/11/2015		SeqNo: 940030		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	69	2.0	80.00	0	86.7	54.6	110			
1-Methylnaphthalene	69	2.0	80.20	0	86.6	49.1	116			
2-Methylnaphthalene	69	2.0	80.00	0	86.8	52.5	111			
Benzo(a)pyrene	0.45	0.070	0.5020	0	89.6	62	107			
Surr: Benzo(e)pyrene	13		20.00		66.6	33.4	129			

Sample ID	1512236-001DMS		SampType: MS		TestCode: EPA Method 8310: PAHs					
Client ID:	R.O. Reject		Batch ID: 22700		RunNo: 30775					
Prep Date:	12/9/2015		Analysis Date: 12/11/2015		SeqNo: 940035		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	67	2.0	80.00	0	83.3	21.6	109			
1-Methylnaphthalene	69	2.0	80.20	0	85.5	15.8	102			
2-Methylnaphthalene	68	2.0	80.00	0	85.2	11.4	99			
Benzo(a)pyrene	0.45	0.070	0.5020	0	89.6	25	123			
Surr: Benzo(e)pyrene	14		20.00		68.2	33.4	129			

Sample ID	1512236-001DMSD		SampType:	MSD		TestCode:	EPA Method 8310: PAHs				
Client ID:	R.O. Reject		Batch ID:	22700		RunNo:	30775				
Prep Date:	12/9/2015		Analysis Date:	12/11/2015		SeqNo:	940036		Units: µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Naphthalene	57	2.0	80.00	0	70.8	21.6	109	16.2	20		
1-Methylnaphthalene	58	2.0	80.20	0	72.2	15.8	102	16.9	20		
2-Methylnaphthalene	58	2.0	80.00	0	72.2	11.4	99	16.5	20		
Benzo(a)pyrene	0.39	0.070	0.5020	0	77.7	25	123	14.3	20		
Surr: Benzo(e)pyrene	12		20.00		57.8	33.4	129	0			

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512236

06-Jan-16

Client: Navajo Refining Company

Project: Monthly RO Reject

Sample ID	MB-22770		SampType:	MBLK		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	PBW		Batch ID:	22770		RunNo:	30802				
Prep Date:	12/14/2015		Analysis Date:	12/14/2015		SeqNo:	941057		Units: µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Phenolics, Total Recoverable	ND	2.5									

Sample ID	LCS-22770		SampType:	LCS		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	LCSW		Batch ID:	22770		RunNo:	30802				
Prep Date:	12/14/2015		Analysis Date:	12/14/2015		SeqNo:	941058		Units: µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Phenolics, Total Recoverable	22	2.5	20.00	0	111	64.4	135				

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512236

06-Jan-16

Client: Navajo Refining Company

Project: Monthly RO Reject

Sample ID	MB-R31007		SampType:	MBLK		TestCode:	EPA 335.4: Total Cyanide Subbed				
Client ID:	PBW		Batch ID:	R31007		RunNo:	31007				
Prep Date:			Analysis Date:	12/9/2015		SeqNo:	948210		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Cyanide	ND	0.0100									

Sample ID	LCS-R31007		SampType: LCS		TestCode: EPA 335.4: Total Cyanide Subbed					
Client ID:	LCSW		Batch ID: R31007		RunNo: 31007					
Prep Date:			Analysis Date: 12/9/2015		SeqNo: 948211		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide	0.504		0.5000	0	101	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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512236

06-Jan-16

Client: Navajo Refining Company

Project: Monthly RO Reject

Sample ID	MB-R31278		SampType:	MBLK		TestCode:	EPA 903.1: Ra 226 and EPA 904.0: Ra 228-Subbed				
Client ID:	PBW		Batch ID:	R31278		RunNo:	31278				
Prep Date:			Analysis Date:	12/17/2016		SeqNo:	957749		Units:	pCi/L	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Radium-226	0.341	0.735									
Radium-226 ±	0.446	0.735									
Radium-228	0.0606	0.609									
Radium-228 ±	0.268	0.609									

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512236

06-Jan-16

Client: Navajo Refining Company

Project: Monthly RO Reject

Sample ID	MB-22696	SampType:	MBLK	TestCode:	SM2540C MOD: Total Dissolved Solids					
Client ID:	PBW	Batch ID:	22696	RunNo:	30818					
Prep Date:	12/9/2015	Analysis Date:	12/13/2015	SeqNo:	941671	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID	LCS-22696	SampType:	LCS	TestCode:	SM2540C MOD: Total Dissolved Solids					
Client ID:	LCSW	Batch ID:	22696	RunNo:	30818					
Prep Date:	12/9/2015	Analysis Date:	12/13/2015	SeqNo:	941672	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	101	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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit



Hall Environmental Analysis Laboratory
4901 Howkins 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 CO

Work Order Number: 1512236

RcptNo: 1

Received by/date: JA 12/04/15

Logged By: Celina Sessa 12/4/2015 9:20:00 AM

Completed By: Celina Sessa 12/4/2015 2:30:37 PM

Reviewed By: AG 12/04/15

Celina Sessa

Celina Sessa

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒
2. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
3. How was the sample delivered? Courier

Log In

4. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
5. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☒ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
9. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
10. VOA vials have zero headspace? Yes ☒ No ☐ No VOA Vials ☐
11. Were any sample containers received broken? Yes ☐ No ☒
12. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
13. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
14. Is it clear what analyses were requested? Yes ☒ No ☐
15. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH: 6 or 12 unless noted

Adjusted? No

Checked by: JA

Special Handling (if applicable)

16. 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: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.3	Good	Yes			



Navajo Refining Company, LLC
501 E. Main
Artesia, NM 88210
(Tel) 575.748.3311
(Fax) 575.746.5451

Monthly RO Reject Sample Details Attachment



Project Name	Biannual RO Reject
Samplers Name	Elizabeth Sasberry
Samplers Affiliation	Navajo Refining Co. LLC
Start Date and Time	12/3/2015 @ 8:55 a.m.
End Date and Time	12/3/2015 @ 9:10 a.m.

Sample Type	Grab <input checked="" type="checkbox"/>
Time Weighted Composite	<input type="checkbox"/>
Flow Weighted Composite	<input type="checkbox"/>

Physical Property	Solid <input type="checkbox"/>
	Liquid <input checked="" type="checkbox"/>
	Sludge <input type="checkbox"/>

Type of Sampler	Directly to sample jars
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Parts / Sample Intervals	One
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Outfall / Sample Location:	<input checked="" type="checkbox"/> North Field R.O. Reject Discharge <input type="checkbox"/> South Field R.O. Reject Discharge
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Container	Size	Material	# of Containers	Neat (None)	Preservatives						Analysis and/or Method Requested
					HCL	HNO3	H2SO4	NaOH	Na2S2O3	NaHSO4	
1	500ml	Plastic	2	X			X				pH, Cl, F, SO4, NO2/NO3, TDS
2	40ml	VOA	3		X						8015 GRO
3	500ml	Plastic	1			X					6020 total metals, 7470 Hg
4	125ml	Plastic	1			X					6020 Dissolved Metals
5	500ml	Plastic	2				X				Cyanide
6	1L	Plastic	3			X					Radium 226/228
7	40ml	VOA	2		X						8260 see attached list
8	1L	Glass	1	X							8270 see attached list
9	1L	Glass	2	X							8082 PCBs
10	40ml	VOA	2	X							8015 DRO
11	40ml	VOA	2		X						Radium 226/228

Field Data (Weather, Observations, Etc):	12/3/2015 Temp. 35.6 °F, Humidity 70%, Wind Dir. North, Wind Speed 6.9 mph, Conditions Clear
Date and Time:	

Field Temp. 62.5F Field pH 7.46

Storage Method	Ice <input checked="" type="checkbox"/>
	Refrigerated <input type="checkbox"/>
	Other <input type="checkbox"/>

Shipping Media	Ice <input checked="" type="checkbox"/>
	Other <input type="checkbox"/>



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

January 06, 2016

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

RE: Monthly Temporary RO Reject

OrderNo.: 1512238

Dear Robert Combs:

Hall Environmental Analysis Laboratory received 2 sample(s) on 12/4/2015 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 #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1512238

Date Reported: 1/6/2016

CLIENT: Navajo Refining Company

Client Sample ID: Temporary R.O. Reject

Project: Monthly Temporary RO Reject

Collection Date: 12/3/2015 9:30:00 AM

Lab ID: 1512238-001

Matrix: AQUEOUS

Received Date: 12/4/2015 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: DISSOLVED METALS							Analyst: JLF
Arsenic	ND	0.0010		mg/L	1	12/11/2015 2:40:29 PM	A30798
Lead	ND	0.00050		mg/L	1	12/11/2015 2:40:29 PM	A30798
Selenium	ND	0.0010		mg/L	1	12/11/2015 2:40:29 PM	A30798
Uranium	ND	0.00050		mg/L	1	12/11/2015 2:40:29 PM	A30798
EPA 903.1: RA 226 AND EPA 904.0: RA 228-SUBBED							Analyst: SUB
Radium-226	1.44	0.825		pCi/L	1	12/17/2016	R31278
Radium-226 ±	0.725	0.825		pCi/L	1	12/17/2016	R31278
Radium-228	0.534	0.587		pCi/L	1	12/17/2016	R31278
Radium-228 ±	0.304	0.587		pCi/L	1	12/17/2016	R31278
EPA METHOD 300.0: ANIONS							Analyst: LGT
Fluoride	2.5	0.10		mg/L	1	12/5/2015 4:17:53 AM	A30652
Chloride	53	25		mg/L	50	12/23/2015 3:24:38 AM	A31049
Sulfate	1300	25		mg/L	50	12/23/2015 3:24:38 AM	A31049
Nitrate+Nitrite as N	1.7	1.0		mg/L	5	12/23/2015 3:49:28 AM	R31049
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: SRM
Total Dissolved Solids	2550	20.0	*	mg/L	1	12/13/2015 1:47:00 PM	22696
EPA 335.4: TOTAL CYANIDE SUBBED							Analyst: SUB
Cyanide	ND	0.0100		mg/L	1	12/15/2015	R31009
SM4500-H+B: PH							Analyst: MRA
pH	7.92	1.68	H	pH units	1	12/7/2015 1:42:27 PM	R30658
EPA METHOD 200.7: DISSOLVED METALS							Analyst: ELS
Aluminum	ND	0.020		mg/L	1	12/14/2015 2:36:49 PM	B30821
Barium	ND	0.0020		mg/L	1	12/14/2015 2:36:49 PM	B30821
Boron	ND	0.040		mg/L	1	12/14/2015 2:36:49 PM	B30821
Cadmium	ND	0.0020		mg/L	1	12/16/2015 3:13:38 PM	B30889
Chromium	ND	0.0060		mg/L	1	12/14/2015 2:36:49 PM	B30821
Cobalt	ND	0.0060		mg/L	1	12/14/2015 2:36:49 PM	B30821
Copper	0.014	0.0060		mg/L	1	12/14/2015 2:36:49 PM	B30821
Iron	ND	0.020		mg/L	1	12/14/2015 2:36:49 PM	B30821
Manganese	ND	0.0020		mg/L	1	12/14/2015 2:36:49 PM	B30821
Molybdenum	ND	0.0080		mg/L	1	12/17/2015 2:24:13 PM	B30929
Nickel	ND	0.010		mg/L	1	12/16/2015 3:13:38 PM	B30889
Silver	ND	0.0050		mg/L	1	12/17/2015 2:24:13 PM	B30929
Zinc	0.021	0.010		mg/L	1	12/16/2015 3:13:38 PM	B30889
EPA METHOD 245.1: MERCURY							Analyst: DBD
Mercury	ND	0.00020		mg/L	1	12/11/2015 11:08:25 AM	22710

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	Value above quantitation range
	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
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1512238

Date Reported: 1/6/2016

CLIENT: Navajo Refining Company

Client Sample ID: Temporary R.O. Reject

Project: Monthly Temporary RO Reject

Collection Date: 12/3/2015 9:30:00 AM

Lab ID: 1512238-001

Matrix: AQUEOUS

Received Date: 12/4/2015 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8011/504.1: EDB							Analyst: JME
1,2-Dibromoethane	ND	0.010		µg/L	1	12/9/2015	22664
EPA METHOD 8082: PCB'S							Analyst: SCC
Aroclor 1016	ND	1.0		µg/L	1	12/11/2015 4:36:04 PM	22699
Aroclor 1221	ND	1.0		µg/L	1	12/11/2015 4:36:04 PM	22699
Aroclor 1232	ND	1.0		µg/L	1	12/11/2015 4:36:04 PM	22699
Aroclor 1242	ND	1.0		µg/L	1	12/11/2015 4:36:04 PM	22699
Aroclor 1248	ND	1.0		µg/L	1	12/11/2015 4:36:04 PM	22699
Aroclor 1254	ND	1.0		µg/L	1	12/11/2015 4:36:04 PM	22699
Aroclor 1260	ND	1.0		µg/L	1	12/11/2015 4:36:04 PM	22699
Surr: Decachlorobiphenyl	73.2	17.7-151		%REC	1	12/11/2015 4:36:04 PM	22699
Surr: Tetrachloro-m-xylene	53.2	20.6-151		%REC	1	12/11/2015 4:36:04 PM	22699
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: TOM
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	12/7/2015 2:27:15 PM	22645
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	12/7/2015 2:27:15 PM	22645
Surr: DNOP	92.8	72-136		%REC	1	12/7/2015 2:27:15 PM	22645
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	12/10/2015 1:17:04 AM	A30727
Surr: BFB	85.9	49.5-130		%REC	1	12/10/2015 1:17:04 AM	A30727
EPA METHOD 8310: PAHS							Analyst: SCC
Naphthalene	ND	2.0		µg/L	1	12/11/2015 8:41:32 AM	22700
1-Methylnaphthalene	ND	2.0		µg/L	1	12/11/2015 8:41:32 AM	22700
2-Methylnaphthalene	ND	2.0		µg/L	1	12/11/2015 8:41:32 AM	22700
Benzo(a)pyrene	ND	0.070		µg/L	1	12/11/2015 8:41:32 AM	22700
Surr: Benzo(e)pyrene	56.1	33.4-129		%REC	1	12/11/2015 8:41:32 AM	22700
EPA METHOD 8260B: VOLATILES							Analyst: AG
Benzene	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM R30770	
Toluene	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM R30770	
Ethylbenzene	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM R30770	
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM R30770	
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM R30770	
Carbon Tetrachloride	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM R30770	
Chloroform	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM R30770	
1,1-Dichloroethane	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM R30770	
1,1-Dichloroethene	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM R30770	
Methylene Chloride	ND	3.0		µg/L	1	12/10/2015 11:52:43 AM R30770	
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	12/10/2015 11:52:43 AM R30770	
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM R30770	

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 Value above quantitation range
	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
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1512238

Date Reported: 1/6/2016

CLIENT: Navajo Refining Company

Client Sample ID: Temporary R.O. Reject

Project: Monthly Temporary RO Reject

Collection Date: 12/3/2015 9:30:00 AM

Lab ID: 1512238-001

Matrix: AQUEOUS

Received Date: 12/4/2015 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES				Analyst: AG			
1,1,1-Trichloroethane	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM	R30770
1,1,2-Trichloroethane	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM	R30770
Trichloroethene (TCE)	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM	R30770
Vinyl chloride	ND	1.0		µg/L	1	12/10/2015 11:52:43 AM	R30770
Xylenes, Total	ND	1.5		µg/L	1	12/10/2015 11:52:43 AM	R30770
Surr: 1,2-Dichloroethane-d4	108	70-130		%REC	1	12/10/2015 11:52:43 AM	R30770
Surr: 4-Bromofluorobenzene	93.4	70-130		%REC	1	12/10/2015 11:52:43 AM	R30770
Surr: Dibromofluoromethane	93.9	70-130		%REC	1	12/10/2015 11:52:43 AM	R30770
Surr: Toluene-d8	96.6	70-130		%REC	1	12/10/2015 11:52:43 AM	R30770
TOTAL PHENOLICS BY SW-846 9067				Analyst: SCC			
Phenolics, Total Recoverable	ND	2.5		µg/L	1	12/14/2015	22770

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	Value above quantitation range
	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
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1512238

Date Reported: 1/6/2016

CLIENT: Navajo Refining Company

Client Sample ID: Trip Blank

Project: Monthly Temporary RO Reject

Collection Date:

Lab ID: 1512238-002

Matrix: TRIP BLANK

Received Date: 12/4/2015 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8011/504.1: EDB							Analyst: JME
1,2-Dibromoethane	ND	0.010		µg/L	1	12/9/2015	22664
EPA METHOD 8260B: VOLATILES							Analyst: AG
Benzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Toluene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Ethylbenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Naphthalene	ND	2.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1-Methylnaphthalene	ND	4.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
2-Methylnaphthalene	ND	4.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Acetone	11	10		µg/L	1	12/10/2015 1:47:44 PM	R30770
Bromobenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Bromodichloromethane	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Bromoform	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Bromomethane	ND	3.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
2-Butanone	ND	10		µg/L	1	12/10/2015 1:47:44 PM	R30770
Carbon disulfide	ND	10		µg/L	1	12/10/2015 1:47:44 PM	R30770
Carbon Tetrachloride	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Chlorobenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Chloroethane	ND	2.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Chloroform	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Chloromethane	ND	3.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
2-Chlorotoluene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
4-Chlorotoluene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
cis-1,2-DCE	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Dibromochloromethane	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Dibromomethane	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,2-Dichlorobenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,3-Dichlorobenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,4-Dichlorobenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Dichlorodifluoromethane	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,1-Dichloroethane	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,1-Dichloroethene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,2-Dichloropropane	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770

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 Value above quantitation range
	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
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1512238

Date Reported: 1/6/2016

CLIENT: Navajo Refining Company

Client Sample ID: Trip Blank

Project: Monthly Temporary RO Reject

Collection Date:

Lab ID: 1512238-002

Matrix: TRIP BLANK

Received Date: 12/4/2015 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: AG
1,3-Dichloropropane	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
2,2-Dichloropropane	ND	2.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,1-Dichloropropene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Hexachlorobutadiene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
2-Hexanone	ND	10		µg/L	1	12/10/2015 1:47:44 PM	R30770
Isopropylbenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
4-Isopropyltoluene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
4-Methyl-2-pentanone	ND	10		µg/L	1	12/10/2015 1:47:44 PM	R30770
Methylene Chloride	ND	3.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
n-Butylbenzene	ND	3.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
n-Propylbenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
sec-Butylbenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Styrene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
tert-Butylbenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
trans-1,2-DCE	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,1,1-Trichloroethane	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,1,2-Trichloroethane	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Trichloroethene (TCE)	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Trichlorofluoromethane	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
1,2,3-Trichloropropane	ND	2.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Vinyl chloride	ND	1.0		µg/L	1	12/10/2015 1:47:44 PM	R30770
Xylenes, Total	ND	1.5		µg/L	1	12/10/2015 1:47:44 PM	R30770
Surr: 1,2-Dichloroethane-d4	104	70-130		%REC	1	12/10/2015 1:47:44 PM	R30770
Surr: 4-Bromofluorobenzene	100	70-130		%REC	1	12/10/2015 1:47:44 PM	R30770
Surr: Dibromofluoromethane	104	70-130		%REC	1	12/10/2015 1:47:44 PM	R30770
Surr: Toluene-d8	110	70-130		%REC	1	12/10/2015 1:47:44 PM	R30770

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 Value above quantitation range
	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
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID MB-B	SampType: MBLK		TestCode: EPA Method 200.7: Dissolved Metals							
Client ID: PBW	Batch ID: B30821		RunNo: 30821							
Prep Date:	Analysis Date: 12/14/2015		SeqNo: 941747		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Boron	ND	0.040								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Copper	ND	0.0060								
Iron	ND	0.020								
Manganese	ND	0.0020								

Sample ID LCS-B	SampType: LCS		TestCode: EPA Method 200.7: Dissolved Metals							
Client ID: LCSW	Batch ID: B30821		RunNo: 30821							
Prep Date:	Analysis Date: 12/14/2015		SeqNo: 941748		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.52	0.020	0.5000	0	103	85	115			
Boron	0.51	0.040	0.5000	0	102	85	115			
Chromium	0.51	0.0060	0.5000	0	101	85	115			
Cobalt	0.50	0.0060	0.5000	0	99.5	85	115			
Copper	0.49	0.0060	0.5000	0	98.5	85	115			
Iron	0.53	0.020	0.5000	0	105	85	115			
Manganese	0.50	0.0020	0.5000	0	100	85	115			

Sample ID LLCS-B	SampType: LCSLL		TestCode: EPA Method 200.7: Dissolved Metals							
Client ID: BatchQC	Batch ID: B30821		RunNo: 30821							
Prep Date:	Analysis Date: 12/14/2015		SeqNo: 941749		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020	0.01000	0	104	50	150			
Boron	ND	0.040	0.04000	0	99.4	50	150			
Chromium	0.0067	0.0060	0.006000	0	112	50	150			
Cobalt	ND	0.0060	0.006000	0	70.0	50	150			
Copper	ND	0.0060	0.006000	0	91.2	50	150			
Iron	0.023	0.020	0.02000	0	114	50	150			
Manganese	0.0022	0.0020	0.002000	0	108	50	150			

Sample ID MB-B	SampType: MBLK		TestCode: EPA Method 200.7: Dissolved Metals							
Client ID: PBW	Batch ID: B30821		RunNo: 30821							
Prep Date:	Analysis Date: 12/14/2015		SeqNo: 941846		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	LCS-B		SampType:	LCS		TestCode:	EPA Method 200.7: Dissolved Metals				
Client ID:	LCSW		Batch ID:	B30821		RunNo:	30821				
Prep Date:			Analysis Date:	12/14/2015		SeqNo:	941847		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Barium	0.49	0.0020	0.5000	0	97.5	85	115				

Sample ID	LLCS-B		SampType:	LCSLL		TestCode:	EPA Method 200.7: Dissolved Metals				
Client ID:	BatchQC		Batch ID:	B30821		RunNo:	30821				
Prep Date:			Analysis Date:	12/14/2015		SeqNo:	941848		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Barium	ND	0.0020	0.002000	0	93.0	50	150				

Sample ID	MB-B	SampType:	MBLK	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	PBW	Batch ID:	B30889	RunNo:	30889					
Prep Date:		Analysis Date:	12/16/2015	SeqNo:	944219	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	ND	0.0020								
Nickel	ND	0.010								
Zinc	ND	0.010								

Sample ID	LCS-B			SampType:	LCS		TestCode:	EPA Method 200.7: Dissolved Metals			
Client ID:	LCSW			Batch ID:	B30889		RunNo:	30889			
Prep Date:				Analysis Date:	12/16/2015		SeqNo:	944220		Units: mg/L	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Cadmium	0.49	0.0020	0.5000	0	98.9	85	115				
Nickel	0.47	0.010	0.5000	0	94.5	85	115				
Zinc	0.48	0.010	0.5000	0	95.7	85	115				

Sample ID	LLCS-B		SampType:	LCSLL		TestCode:	EPA Method 200.7: Dissolved Metals				
Client ID:	BatchQC		Batch ID:	B30889		RunNo:	30889				
Prep Date:			Analysis Date:	12/16/2015		SeqNo:	944221		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Cadmium	ND	0.0020	0.002000	0	78.5	50	150				
Nickel	ND	0.010	0.005000	0	78.8	50	150				
Zinc	ND	0.010	0.005000	0	67.0	50	150				

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	1512238-001GMS			SampType:	MS		TestCode:	EPA Method 200.7: Dissolved Metals			
Client ID:	Temporary R.O. Rej		Batch ID:	B30889		RunNo:	30889				
Prep Date:			Analysis Date:	12/16/2015		SeqNo:	944261		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Cadmium	0.53	0.0020	0.5000	0	106	70	130				
Nickel	0.50	0.010	0.5000	0	99.2	70	130				
Zinc	0.52	0.010	0.5000	0.02057	100	70	130				

Sample ID	1512238-001GMSD			SampType:	MSD		TestCode:	EPA Method 200.7: Dissolved Metals			
Client ID:	Temporary R.O. Rej		Batch ID:	B30889		RunNo:	30889				
Prep Date:			Analysis Date:	12/16/2015		SeqNo:	944265		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Cadmium	0.51	0.0020	0.5000	0	103	70	130	3.15	20		
Nickel	0.48	0.010	0.5000	0	95.3	70	130	4.04	20		
Zinc	0.50	0.010	0.5000	0.02057	96.7	70	130	3.48	20		

Sample ID	MB-B		SampType:	MBLK		TestCode:	EPA Method 200.7: Dissolved Metals				
Client ID:	PBW		Batch ID:	B30929		RunNo:	30929				
Prep Date:			Analysis Date:	12/17/2015		SeqNo:	945585		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Molybdenum	ND	0.0080									
Silver	ND	0.0050									

Sample ID	LCS-B		SampType: LCS		TestCode: EPA Method 200.7: Dissolved Metals					
Client ID:	LCSW		Batch ID: B30929		RunNo: 30929					
Prep Date:			Analysis Date: 12/17/2015		SeqNo: 945586		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Molybdenum	0.49	0.0080	0.5000	0	98.3	85	115			
Silver	0.098	0.0050	0.1000	0	98.0	85	115			

Sample ID	LLLCS-B		SampType: LCSLL		TestCode: EPA Method 200.7: Dissolved Metals					
Client ID:	BatchQC		Batch ID: B30929		RunNo: 30929					
Prep Date:			Analysis Date: 12/17/2015		SeqNo: 945587		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Molybdenum	0.0097	0.0080	0.008000	0	122	50	150			
Silver	0.0051	0.0050	0.005000	0	103	50	150			

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	1512238-001GMS	SampType:	MS	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	Temporary R.O. Rej	Batch ID:	B30929	RunNo:	30929					
Prep Date:		Analysis Date:	12/17/2015	SeqNo:	945617	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Molybdenum	0.49	0.0080	0.5000	0.003550	97.6	70	130			
Silver	0.10	0.0050	0.1000	0	103	70	130			

Sample ID	1512238-001GMSD	SampType:	MSD	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	Temporary R.O. Rej	Batch ID:	B30929	RunNo:	30929					
Prep Date:		Analysis Date:	12/17/2015	SeqNo:	945621	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Molybdenum	0.49	0.0080	0.5000	0.003550	97.9	70	130	0.380	20	
Silver	0.11	0.0050	0.1000	0	105	70	130	2.48	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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID LCS	SampType: LCS			TestCode: EPA 200.8: Dissolved Metals						
Client ID: LCSW	Batch ID: A30798			RunNo: 30798						
Prep Date:	Analysis Date: 12/11/2015			SeqNo: 941051		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.025	0.0010	0.02500	0	98.6	85	115			
Lead	0.013	0.00050	0.01250	0	101	85	115			
Selenium	0.024	0.0010	0.02500	0	97.2	85	115			
Uranium	0.013	0.00050	0.01250	0	101	85	115			

Sample ID LLCS	SampType: LCSLL			TestCode: EPA 200.8: Dissolved Metals						
Client ID: BatchQC	Batch ID: A30798			RunNo: 30798						
Prep Date:	Analysis Date: 12/11/2015			SeqNo: 941054		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010	0.001000	0	94.6	50	150			
Lead	0.00052	0.00050	0.0005000	0	103	50	150			
Selenium	ND	0.0010	0.001000	0	90.5	50	150			
Uranium	0.00050	0.00050	0.0005000	0	101	50	150			

Sample ID MB	SampType: MBLK			TestCode: EPA 200.8: Dissolved Metals						
Client ID: PBW	Batch ID: A30798			RunNo: 30798						
Prep Date:	Analysis Date: 12/11/2015			SeqNo: 941056		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								
Uranium	ND	0.00050								

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	MB-22710	SampType:	MBLK	TestCode:	EPA Method 245.1: Mercury					
Client ID:	PBW	Batch ID:	22710	RunNo:	30788					
Prep Date:	12/9/2015	Analysis Date:	12/11/2015	SeqNo:	940469	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID	LCS-22710	SampType:	LCS	TestCode:	EPA Method 245.1: Mercury					
Client ID:	LCSW	Batch ID:	22710	RunNo:	30788					
Prep Date:	12/9/2015	Analysis Date:	12/11/2015	SeqNo:	940470	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0051	0.00020	0.005000	0	102	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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID MB	SampType: MBLK		TestCode: EPA Method 300.0: Anions							
Client ID: PBW	Batch ID: A30652		RunNo: 30652							
Prep Date:	Analysis Date: 12/5/2015		SeqNo: 936397		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								

Sample ID LCS	SampType: LCS		TestCode: EPA Method 300.0: Anions							
Client ID: LCSW	Batch ID: A30652		RunNo: 30652							
Prep Date:	Analysis Date: 12/5/2015		SeqNo: 936398		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.51	0.10	0.5000	0	102	90	110			

Sample ID 1512238-001EMS	SampType: MS		TestCode: EPA Method 300.0: Anions							
Client ID: Temporary R.O. Rej	Batch ID: A30652		RunNo: 30652							
Prep Date:	Analysis Date: 12/5/2015		SeqNo: 936404		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2.9	0.10	0.5000	2.456	82.0	75.3	111			

Sample ID 1512238-001EMSD	SampType: MSD		TestCode: EPA Method 300.0: Anions							
Client ID: Temporary R.O. Rej	Batch ID: A30652		RunNo: 30652							
Prep Date:	Analysis Date: 12/5/2015		SeqNo: 936405		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2.8	0.10	0.5000	2.456	77.0	75.3	111	0.876	20	

Sample ID MB	SampType: MBLK		TestCode: EPA Method 300.0: Anions							
Client ID: PBW	Batch ID: R31049		RunNo: 31049							
Prep Date:	Analysis Date: 12/22/2015		SeqNo: 949718		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	ND	0.20								

Sample ID LCS	SampType: LCS		TestCode: EPA Method 300.0: Anions							
Client ID: LCSW	Batch ID: R31049		RunNo: 31049							
Prep Date:	Analysis Date: 12/22/2015		SeqNo: 949719		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	3.4	0.20	3.500	0	95.9	90	110			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| 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 |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID MB	SampType: MBLK			TestCode: EPA Method 300.0: Anions						
Client ID: PBW	Batch ID: A31049			RunNo: 31049						
Prep Date:	Analysis Date: 12/23/2015			SeqNo: 949774		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: A31049			RunNo: 31049						
Prep Date:	Analysis Date: 12/23/2015			SeqNo: 949775		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.8	0.50	5.000	0	96.8	90	110			
Sulfate	10	0.50	10.00	0	99.7	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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	MB-22664		SampType:	MBLK		TestCode:	EPA Method 8011/504.1: EDB				
Client ID:	PBW		Batch ID:	22664		RunNo:	30705				
Prep Date:	12/8/2015		Analysis Date:	12/9/2015		SeqNo:	937923		Units:		µg/L
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
1,2-Dibromoethane	ND	0.010									

Sample ID	LCS-22664		SampType:	LCS		TestCode:	EPA Method 8011/504.1: EDB				
Client ID:	LCSW		Batch ID:	22664		RunNo:	30705				
Prep Date:	12/8/2015		Analysis Date:	12/9/2015		SeqNo:	937924		Units: µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
1,2-Dibromoethane	0.10	0.010	0.1000	0	101	70	130				

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	MB-22645		SampType:	MBLK		TestCode:	EPA Method 8015M/D: Diesel Range				
Client ID:	PBW		Batch ID:	22645		RunNo:	30655				
Prep Date:	12/7/2015		Analysis Date:	12/7/2015		SeqNo:	936459		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Diesel Range Organics (DRO)	ND	1.0									
Motor Oil Range Organics (MRO)	ND	5.0									
Surr: DNOP	0.98		1.000		98.3	72	136				

Sample ID	LCS-22645		SampType:	LCS		TestCode:	EPA Method 8015M/D: Diesel Range				
Client ID:	LCSW		Batch ID:	22645		RunNo:	30655				
Prep Date:	12/7/2015		Analysis Date:	12/7/2015		SeqNo:	936460		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Diesel Range Organics (DRO)	4.9	1.0	5.000	0	97.6	52.4	154				
Surr: DNOP	0.44		0.5000		87.9	72	136				

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	5ML RB	SampType:	MBLK	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	PBW	Batch ID:	A30727	RunNo:	30727					
Prep Date:		Analysis Date:	12/9/2015	SeqNo:	938906	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		92.4	49.5	130			

Sample ID	2.5UG GRO LCS	SampType:	LCS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	LCSW	Batch ID:	A30727	RunNo:	30727					
Prep Date:		Analysis Date:	12/9/2015	SeqNo:	938907	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.48	0.050	0.5000	0	95.4	80	120			
Surr: BFB	23		20.00		113	49.5	130			

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	MB-22699		SampType: MBLK		TestCode: EPA Method 8082: PCB's					
Client ID:	PBW		Batch ID: 22699		RunNo: 30771					
Prep Date:	12/9/2015		Analysis Date: 12/11/2015		SeqNo: 939925		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1016	ND	1.0								
Aroclor 1221	ND	1.0								
Aroclor 1232	ND	1.0								
Aroclor 1242	ND	1.0								
Aroclor 1248	ND	1.0								
Aroclor 1254	ND	1.0								
Aroclor 1260	ND	1.0								
Surr: Decachlorobiphenyl	2.0		2.500		78.4	17.7	151			
Surr: Tetrachloro-m-xylene	1.1		2.500		44.0	20.6	151			

Sample ID	LCS-22699			SampType:	LCS		TestCode:	EPA Method 8082: PCB's			
Client ID:	LCSW			Batch ID:	22699		RunNo:	30771			
Prep Date:	12/9/2015			Analysis Date:	12/11/2015		SeqNo:	940026		Units: µg/L	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Aroclor 1016	2.0	1.0	5.000	0	39.4	9.01	142				
Aroclor 1260	3.0	1.0	5.000	0	59.3	25.6	164				
Surr: Decachlorobiphenyl	1.8		2.500		73.2	17.7	151				
Surr: Tetrachloro-m-xylene	1.1		2.500		43.2	20.6	151				

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID 100ng lcs	SampType: LCS			TestCode: EPA Method 8260B: VOLATILES						
Client ID: LCSW	Batch ID: R30770			RunNo: 30770						
Prep Date:	Analysis Date: 12/10/2015			SeqNo: 939923		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	97.7	70	130			
Toluene	20	1.0	20.00	0	101	70	130			
Chlorobenzene	20	1.0	20.00	0	99.6	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	93.0	70	130			
Trichloroethene (TCE)	20	1.0	20.00	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		106	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		98.6	70	130			
Surr: Dibromofluoromethane	9.7		10.00		96.7	70	130			
Surr: Toluene-d8	9.6		10.00		96.2	70	130			

Sample ID rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES						
Client ID: PBW	Batch ID: R30770			RunNo: 30770						
Prep Date:	Analysis Date: 12/10/2015			SeqNo: 939927		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES						
Client ID: PBW	Batch ID: R30770			RunNo: 30770						
Prep Date:	Analysis Date: 12/10/2015			SeqNo: 939927	Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID rb	SampType: MBLK		TestCode: EPA Method 8260B: VOLATILES							
Client ID: PBW	Batch ID: R30770		RunNo: 30770							
Prep Date:	Analysis Date: 12/10/2015		SeqNo: 939927		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	8.7		10.00		87.4	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		97.2	70	130			
Surr: Dibromofluoromethane	8.7		10.00		87.5	70	130			
Surr: Toluene-d8	10		10.00		105	70	130			

Sample ID 1512238-001ams	SampType: MS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: Temporary R.O. Rej	Batch ID: R30770		RunNo: 30770							
Prep Date:	Analysis Date: 12/10/2015		SeqNo: 939930		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	17	1.0	20.00	0	83.3	70	130			
Toluene	21	1.0	20.00	0	106	70	130			
Chlorobenzene	19	1.0	20.00	0	96.8	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	95.6	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	87.8	70	130			
Surr: 1,2-Dichloroethane-d4	9.1		10.00		91.2	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.8	70	130			
Surr: Dibromofluoromethane	9.9		10.00		99.3	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID 1512238-001amsd	SampType: MSD		TestCode: EPA Method 8260B: VOLATILES							
Client ID: Temporary R.O. Rej	Batch ID: R30770		RunNo: 30770							
Prep Date:	Analysis Date: 12/10/2015		SeqNo: 939931		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	92.2	70	130	10.2	20	
Toluene	23	1.0	20.00	0	114	70	130	7.19	20	
Chlorobenzene	19	1.0	20.00	0	93.0	70	130	4.00	20	
1,1-Dichloroethene	17	1.0	20.00	0	82.9	70	130	14.2	20	
Trichloroethene (TCE)	19	1.0	20.00	0	94.0	70	130	6.87	20	
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130	0	0	
Surr: 4-Bromofluorobenzene	9.0		10.00		89.9	70	130	0	0	
Surr: Dibromofluoromethane	10		10.00		102	70	130	0	0	
Surr: Toluene-d8	12		10.00		117	70	130	0	0	

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| 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 |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	100ng lcs	SampType: LCS			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID: R30770			RunNo: 30770					
Prep Date:		Analysis Date: 12/10/2015			SeqNo: 939958		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	94.0	70	130			
Toluene	23	1.0	20.00	0	113	70	130			
Chlorobenzene	20	1.0	20.00	0	101	70	130			
1,1-Dichloroethene	17	1.0	20.00	0	83.9	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	97.5	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		106	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	11		10.00		114	70	130			

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	MB-22700		SampType:	MBLK		TestCode:	EPA Method 8310: PAHs				
Client ID:	PBW		Batch ID:	22700		RunNo:	30775				
Prep Date:	12/9/2015		Analysis Date:	12/11/2015		SeqNo:	940029		Units:	µg/L	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Naphthalene	ND	2.0									
1-Methylnaphthalene	ND	2.0									
2-Methylnaphthalene	ND	2.0									
Benzo(a)pyrene	ND	0.070									
Surr: Benzo(e)pyrene	13		20.00		63.6	33.4	129				

Sample ID	LCS-22700		SampType: LCS		TestCode: EPA Method 8310: PAHs					
Client ID:	LCSW		Batch ID: 22700		RunNo: 30775					
Prep Date:	12/9/2015		Analysis Date: 12/11/2015		SeqNo: 940030		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	69	2.0	80.00	0	86.7	54.6	110			
1-Methylnaphthalene	69	2.0	80.20	0	86.6	49.1	116			
2-Methylnaphthalene	69	2.0	80.00	0	86.8	52.5	111			
Benzo(a)pyrene	0.45	0.070	0.5020	0	89.6	62	107			
Surr: Benzo(e)pyrene	13		20.00		66.6	33.4	129			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
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
R RPD outside accepted recovery limits	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	MB-22770		SampType:	MBLK		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	PBW		Batch ID:	22770		RunNo:	30802				
Prep Date:	12/14/2015		Analysis Date:	12/14/2015		SeqNo:	941057		Units:	µg/L	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Phenolics, Total Recoverable	ND	2.5									

Sample ID	LCS-22770		SampType:	LCS		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	LCSW		Batch ID:	22770		RunNo:	30802				
Prep Date:	12/14/2015		Analysis Date:	12/14/2015		SeqNo:	941058	Units:	µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Phenolics, Total Recoverable	22	2.5	20.00	0	111	64.4	135				

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	MB-R31009		SampType:	MBLK		TestCode:	EPA 335.4: Total Cyanide Subbed				
Client ID:	PBW		Batch ID:	R31009		RunNo:	31009				
Prep Date:			Analysis Date:	12/15/2015		SeqNo:	948228	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Cyanide	ND	0.0100									

Sample ID	LCS-R31009			SampType:	LCS		TestCode:	EPA 335.4: Total Cyanide Subbed			
Client ID:	LCSW			Batch ID:	R31009		RunNo:	31009			
Prep Date:				Analysis Date:	12/15/2015		SeqNo:	948229	Units:	mg/L	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Cyanide	0.514		0.5000	0	103	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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	MB-R31278		SampType:	MBLK		TestCode:	EPA 903.1: Ra 226 and EPA 904.0: Ra 228-Subbed				
Client ID:	PBW		Batch ID:	R31278		RunNo:	31278				
Prep Date:			Analysis Date:	12/17/2016		SeqNo:	957749		Units: pCi/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Radium-226	0.341	0.735									
Radium-226 ±	0.446	0.735									
Radium-228	0.0606	0.609									
Radium-228 ±	0.268	0.609									

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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1512238

06-Jan-16

Client: Navajo Refining Company
Project: Monthly Temporary RO Reject

Sample ID	MB-22696		SampType:	MBLK		TestCode:	SM2540C MOD: Total Dissolved Solids			
Client ID:	PBW		Batch ID:	22696		RunNo:	30818			
Prep Date:	12/9/2015		Analysis Date:	12/13/2015		SeqNo:	941671	Units:	mg/L	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID	LCS-22696		SampType:	LCS		TestCode:	SM2540C MOD: Total Dissolved Solids			
Client ID:	LCSW		Batch ID:	22696		RunNo:	30818			
Prep Date:	12/9/2015		Analysis Date:	12/13/2015		SeqNo:	941672	Units:	mg/L	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	101	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
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit



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 CO

Work Order Number: 1512238

RcptNo: 1

Received by/date:

JA

12/04/15

Logged By: Celina Sessa

12/4/2015 9:20:00 AM

Celina Sessa

Completed By: Celina Sessa

12/4/2015 3:08:09 PM

Celina Sessa

Reviewed By:

[Signature]

12/07/15

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒
2. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
3. How was the sample delivered? Courier

Log In

4. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
5. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☒ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
9. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
10. VOA vials have zero headspace? Yes ☒ No ☐ No VOA Vials ☐
11. Were any sample containers received broken? Yes ☐ No ☒
12. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
13. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
14. Is it clear what analyses were requested? Yes ☒ No ☐
15. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved bottles checked for pH: 6
(<2 or >12 unless noted)
Adjusted? No
Checked by: JA

Special Handling (if applicable)

16. 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:

17. Additional remarks:

18. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.3	Good	Yes			



Navajo Refining Company, LLC
501 E. Main
Artesia, NM 88210
(Tel) 575.748.3311
(Fax) 575.746.5451

Monthly Temporary RO Reject Sample Details



Project Name	Biannual RO Reject
Samplers Name	Elizabeth Salsberry
Samplers Affiliation	Navajo Refining Co. LLC
Start Date and Time	12/3/2015 @ 9:20 a.m.
End Date and Time	12/3/2015 @ 9:35 a.m.

Sample Type	
Grab	<input checked="" type="checkbox"/>
Time Weighted Composite	<input type="checkbox"/>
Flow Weighted Composite	<input type="checkbox"/>

Physical Property	
Solid	<input type="checkbox"/>
Liquid	<input checked="" type="checkbox"/>
Sludge	<input type="checkbox"/>

Parts / Sample Intervals	One
--------------------------	-----

Type of Sampler	Directly to sample jars
-----------------	-------------------------

☒ North Field R.O. Reject Discharge

☐ South Field R.O. Reject Discharge

Outfall / Sample Location:	
----------------------------	--

Container	Size	Material	# of Containers	Preservatives								Analysis and/or Method Requested
				Neat (None)	HCL	HNO3	H2SO4	NaOH	Na2S2O3	NaHSO4	Other	
1	500ml	Plastic	2	X			X				pH, Cl, F, SO4, NO2/NO3, TDS	
2	40ml	VOA	3		X						8015 GRO	
3	500ml	Plastic	1			X					6020 total metals, 7470 Hg	
4	125ml	Plastic	1			X					6020 Dissolved Metals	
5	500ml	Plastic	2					X			Cyanide	
6	1L	Plastic	3			X					Radium 226/228	
7	40ml	VOA	2		X						8260 see attached list	
8	1L	Glass	1	X							8270 see attached list	
9	1L	Glass	2	X							8082 PCBs	
10	40ml	VOA	2	X							8015 DRO	
11	40ml	VOA	2		X						Radium 226/228	

Storage Method	
Ice	<input checked="" type="checkbox"/>
Refrigerated	<input type="checkbox"/>
Other	<input type="checkbox"/>

Field Data (Weather, Observations, Etc):	12/3/2015 Tmp 39.2 °F, Humidity 61%, Wind Dir. NNE, Wind Speed 3.5 mph, Conditions Clear
Date and Time:	

Field Temp. 66.3F Field pH 7.56

Shipping Media	
Ice	<input checked="" type="checkbox"/>
Other	<input type="checkbox"/>

Appendix C

Leaks, Spills, and Releases

**C.1 April 12, 2015 – Wastewater
Pipeline near the Evaporation
Ponds Area**

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in
accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: Navajo Refining Company, L.L.C.	Contact: Micki Schultz	
Address: 501 E. Main St., Artesia, NM 88210	Telephone No.: 575-746-5281	
Facility Name: Navajo Refining Company, L.L.C.	Facility Type: Petroleum Refinery	
Surface Owner: Navajo Refining Company, L.L.C.	Mineral Owner N/A	API No. N/A

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County

Latitude 32°51'0.32"N Longitude 104°20'20.03"W

NATURE OF RELEASE

Type of Release: Non-hazardous treated wastewater effluent	Volume of Release: > 25 bbls	Volume Recovered: 75 bbls
Source of Release: Small hole in pipeline approximately 3 miles east of Artesia	Date and Hour of Occurrence: 04/12/15, Unknown time	Date and Hour of Discovery: 04/12/15 10:30 am
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? NM Oil Conservation Division Santa Fe - Left message to Carl Chavez NM Oil Conservation Division Artesia - Left message, return call by Randy Dade NMED Hazardous Waste Bureau - Left message National Response Center - Incident report # 1113386	
By Whom? Ray Smalts	Date and Hour 04/12/15 ~13:15 - 13:30	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse. None	
If a Watercourse was Impacted, Describe Fully.* N/A		


Describe Cause of Problem and Remedial Action Taken.*

Pipeline leak was discovered during daily visual monitoring of the pipeline route. Wastewater effluent discharge pumps located at the refinery were shut down and a vacuum truck was dispatched to the scene to remove the water which had accumulated with rain water in a low-lying depression in the pipeline path across a field. The vacuumed water was returned to the refinery wastewater treatment unit.

Describe Area Affected and Cleanup Action Taken.*

Pooled water was removed by vacuum truck and the pipeline was repaired. Any additional corrective actions will be presented in a Final C-141 report including analytical reports, map markups, photos, and any waste disposal records.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: 		OIL CONSERVATION DIVISION	
Printed Name: Robert Combs		Approved by Environmental Specialist:	
Title: Environmental Specialist		Approval Date:	Expiration Date:
E-mail Address:		Conditions of Approval:	
Date:	Phone:	Attached <input type="checkbox"/>	

* Attach Additional Sheets If Necessary

Markovich, Michelle

From: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Sent: Thursday, December 10, 2015 3:51 PM
To: Combs, Robert
Cc: Denton, Scott; Griswold, Jim, EMNRD
Subject: RE: Navajo Refinery (GW-028) Wastewater Pipeline Break near the Evaporation Ponds Area Revised Work Plan Review

Robert:

Please see OCD requirements in red text below.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
Environmental Engineer
Oil Conservation Division- Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
Phone: (505) 476-3490
Main Phone: (505) 476-3440
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: www.emnrd.state.nm.us/ocd

Why not prevent pollution, minimize waste, reduce operation costs, and move forward with the rest of the Nation? To see how, go to "Publications" and "Pollution Prevention" on the OCD Website.

From: Combs, Robert [mailto:Robert.Combs@HollyFrontier.com]
Sent: Wednesday, December 02, 2015 5:32 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Denton, Scott <Scott.Denton@HollyFrontier.com>
Subject: RE: Navajo Refinery (GW-028) Wastewater Pipeline Break near the Evaporation Ponds Area Revised Work Plan Review

Carl,
Please see below for our responses to comments, as well as the attached, updated workplan. It looks as though our discussion was on 10/13/15; some content is to that effect. Please feel free to call if we need to discuss further.
Thanks,
Robert

The New Mexico Oil Conservation Division (OCD) reviewed the Work Plan (WP) dated August 21, 2015 and has the following comments/recommendations:

- 1) Pg. 2/4: OCD discussed the statistically developed UTLs developed in the Evaporation Pond Area and NMED indicated that no background values have been accepted by NMED at the time of this review. Therefore, OCD cannot condone the use of UTLs for comparison in the Soil Borings and Groundwater at this time. Table 1 includes UTLs and that is ok, but it is not appropriate to use the UTLs from this background soil study as alternative action levels for screening potential impacts from the wastewater line release. Navajo understands that the purpose of the upgradient boring and temporary monitor well is to determine soil and groundwater

concentrations from an area not impacted by the release. **[Chavez, Carl J, EMNRD] No, the temporary MW serves as a background location to assess pollutants in soils and water media at both locations.**

- 2) Pg. 2/4: OCD prefers a location for the alternate Soil Boring (SB) / Temporary MW (TMW) toward the SW away from the evaporation pond area and in a location that is not suspect for contamination. The environmental analytical laboratory test data results will be used for comparison with this SB/TMW. The reasoning behind the proposed location of the 'background' well is that the area NW of the release is topographically and hydraulically upgradient/crossgradient from the spill area. We feel that this area is appropriate for the soil boring/TMW installation, not southwest of the spill area.
- 3) Pg. 3/4: OCD requires in addition to the WP that soil sampling occur every 10 ft. from ground surface to the water table. Groundwater sampling at the water table is required. As we discussed this morning, depth to groundwater in the area at approximately 10 ft. below ground surface. We proposed in the WP to sample the intervals 0-1', 3-4' and the capillary zone. We will modify the WP to collect samples at 0-1', 4-5' and the capillary zone (just above the water table). **[Chavez, Carl J, EMNRD] A groundwater sample must also be taken.**
- 4) Pg. 3/4: The soil and groundwater sampling constituents of concern shall include WQCC Metals. In groundwater, Total Dissolved Solids and pH shall be added to the list. PSH shall be reported within 24 hours of discovery to the OCD. As we discussed, we will change the groundwater analyte list to be the same as the soil analytes, and add TDS and pH. We will continue to run only iron and manganese, as these were the only metals that exceeded WQCC in the sample of the effluent water. We do not believe that there would be other metals present that would be attributable to this release. **[Chavez, Carl J, EMNRD] Run RCRA 8 Metals.**
- 5) Pg. 3/4: Same as No. 1 above. The SB/TMW data results will be compared against each other and the Tables 1 and 2 to develop conclusions. As indicated in No. 1 above, UTLs will not be considered in the evaluation of data. The TMWs shall be properly abandoned per No. 6 below after OCD approves a proposal to PA the TMWs. Noted, no comment.
- 6) Pg. 3/4 Second Paragraph from Bottom: The WP as proposed with the exception that at least 10 ft. of screen w/ top of screen set ~ 5 ft. above the water table. Also, OCD would like the wells to be pulled out after use w/ bentonite pellets inserted into the borehole to surface and then hydrated to expand. We will add a description of our planned plugging and abandonment activities in the workplan. Sorry for this oversight.
- 7) Pg. 4/4 Second Paragraph: The constituents of concern list should be similar to No. 4 above. Please see response to #4.

Robert Combs

Environmental Specialist
The HollyFrontier Companies
P.O. Box 159
Artesia, NM 88211-0159
office: 575-746-5382
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From: [Robert.Combs@hollyfrontier.com](#)
Sent: Friday, April 2, 2010 10:00 AM
To: [Erickson, Carl](#)
Cc: [HollyFrontier](#)
Subject: [Re: \[Chavez, Carl J, EMNRD\] No, the temporary MW serves as a background location to assess pollutants in soils and water media at both locations.](#)

Robert and Scott:

The New Mexico Oil Conservation Division (OCD) reviewed the Work Plan (WP) dated August 21, 2015 and has the following comments/recommendations:

- 1) Pg. 2/4: OCD discussed the statistically developed UTLs developed in the Evaporation Pond Area and NMED indicated that no background values have been accepted by NMED at the time of this review. Therefore, OCD cannot condone the use of UTLs for comparison in the Soil Borings and Groundwater at this time. Table 1 includes UTLs and that is ok, but it is not appropriate to use the UTLs from this background soil study as alternative action levels for screening potential impacts from the wastewater line release.
- 2) Pg. 2/4: OCD prefers a location for the alternate Soil Boring (SB) / Temporary MW (TMW) toward the SW away from the evaporation pond area and in a location that is not suspect for contamination. The environmental analytical laboratory test data results will be used for comparison with this SB/TMW.
- 3) Pg. 3/4: OCD requires in addition to the WP that soil sampling occur every 10 ft. from ground surface to the water table. Groundwater sampling at the water table is required.
- 4) Pg. 3/4: The soil and groundwater sampling constituents of concern shall include WQCC Metals. In groundwater, Total Dissolved Solids and pH shall be added to the list. PSH shall be reported within 24 hours of discovery to the OCD.
- 5) Pg. 3/4: Same as No. 1 above. The SB/TMW data results will be compared against each other and the Tables 1 and 2 to develop conclusions. As indicated in No. 1 above, UTLs will not be considered in the evaluation of data. The TMWs shall be properly abandoned per No. 6 below after OCD approves a proposal to PA the TMWs.
- 6) Pg. 3/4 Second Paragraph from Bottom: The WP as proposed with the exception that at least 10 ft. of screen w/ top of screen set ~ 5 ft. above the water table. Also, OCD would like the wells to be pulled out after use w/ bentonite pellets inserted into the borehole to surface and then hydrated to expand.
- 7) Pg. 4/4 Second Paragraph: The constituents of concern list should be similar to No. 4 above.

Please contact me if you have questions. Thank you.

From: Combs, Robert [<mailto:Robert.Combs@HollyFrontier.com>]
Sent: Tuesday, September 01, 2015 10:42 AM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Subject: Test 2

Carl,
Please let me know if you receive this file or if it again is encrypted. You should not have to register to read our emails. This is a problem on our end and we will work to resolve it.
Thanks,
Robert

Robert Combs
Environmental Specialist
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Mr. Scott Denton
Environmental Manager
Navajo Refining Company, LLC
501 East Main
Artesia, New Mexico 88211

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2929 Briarpark Drive
Suite 300
Houston
Texas 77042
Tel 713 953 4800
Fax 713 977 4620
www.arcadis-us.com

Subject:

Final Work Plan for the Soil and Groundwater Investigation at the Wastewater Pipeline Break near the Evaporation Ponds Area, Navajo Refining Company Artesia Refinery

ENVIRONMENT

Dear Mr. Denton:

Date:
October 14, 2015

Arcadis is providing this final work plan discussing soil and groundwater investigation to be performed in relation to the reported release of wastewater that occurred approximately 1,500 feet south of the inactive former Evaporation Ponds (EPs) associated with the Navajo Refining Company, L.L.C. (NRC) Artesia Refinery (Refinery). The EPs are a Resource Conservation and Recovery Act (RCRA) regulated unit. Documentation of the information relevant to the release was provided on June 11, 2015. Based on several conversations with the New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division (OCD), the proposed assessment has been revised as discussed in this final work plan.

Contact:
Pamela R. Krueger

Phone:
713.953.4816

Email:
pam.krueger@arcadis-us.com

Our ref:
TX001155

It is our understanding that the release occurred due to a break in the pipeline that conveys treated wastewater from the Refinery to injection wells located approximately 12 miles east of the Refinery. The break occurred approximately three miles east of the Refinery, and south of the Evaporation Ponds (Figure 1).

The wastewater that is conveyed through the pipeline is sampled quarterly and analyzed for waste characterization purposes. A copy of the first quarter 2015 wastewater analytical report is provided in Attachment 1 to this letter. The sample was analyzed for total metals, anions, cations, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), corrosivity, reactivity, ignitability, specific conductance, specific gravity, total dissolved solids (TDS), and pH. In addition, the sample was analyzed for eight metals using the toxicity characteristic leaching procedure (TCLP).

The analytical results indicate that the wastewater is not corrosive, not reactive, not ignitable, not toxic (no TCLP metals detected), and contains no VOCs above the New Mexico Water Quality Control Commission (WQCC) standards. The following compounds were reported above the WQCC standards:

Imagine the result

- Phenol was reported at 0.0081 mg/L, above the WQCC standard of 0.005mg/L
- Iron was reported at 3.7 mg/L, above the WQCC standard of 1.0 mg/L
- Manganese was reported at 0.25 mg/L, above the WQCC standard of 0.2 mg/L
- Chloride was reported at 300 mg/L, above the WQCC standard of 250 mg/L
- Fluoride was reported at 11 mg/L, above the WQCC standard of 1.6 mg/L
- Sulfate was reported at 2,100 mg/L, above the WQCC standard of 600 mg/L
- TDS was reported at 3,710 mg/L, above the WQCC standard of 1,000 mg/L

Arcadis understands that the OCD requested that a soil and groundwater investigation be performed to evaluate whether additional remedial actions are required.

Although the wastewater sample analytical results do exceed the WQCC standards for water quality parameters, including chloride, it should be noted that the area in which the release occurred is known to have elevated chloride concentrations in soil and groundwater, along with other cations, anions and total metals. In 2013, as part of the Phase IV Corrective Action Investigation of the EPs, Arcadis collected soil samples from 12 soil borings and analyzed the samples for thirteen total metals and for three anions, including chloride, fluoride, and sulfate. A statistical evaluation of the background soil sample results was performed to determine an appropriate upper tolerance limit (UTL) for the data obtained. A copy of the statistical evaluation memo is provided as Attachment 2 to this letter, including a table with a summary of the UTLs calculated for each parameter evaluated.

Figure 1 shows the locations of the background soil samples collected in 2013 (locations BG-01 through BG-12). The borings were located on both sides of the Pecos River, in locations both to the east and west of the EPs. These areas were selected based on their proximity to the EPs, yet outside of the RCRA-regulated unit and outside of the area of potential impacts from the operation of the EPs. Thus, these soil borings were considered representative of the native conditions of soil in the vicinity of the EPs. As a result, it should be appropriate to use the UTLs from this background soil study as alternative action levels for screening potential impacts from the wastewater line release. However, the New Mexico Environment Department (NMED) has not yet reviewed and accepted the background soil UTLs and thus OCD has stated that they may not accept the UTLs as screening criteria. Therefore, the UTLs are presented for informational purposes and will not be used to

evaluate whether additional soil remediation is warranted as a result of the wastewater pipeline release.

As per the OCD requests, soil samples and groundwater samples will be collected as close as possible to the pipeline break and from a location approximately 50 feet to the northwest, or hydraulically upgradient, of the pipeline break. The OCD requested that a background location be selected southwest of the pipeline break; however, NRC reiterated that a location to the northwest of the pipeline break would be more representative of upgradient, background conditions. Data from soil and groundwater samples collected from the location closest to the pipeline break will be compared to the data from soil and groundwater samples collected from the location to the northwest of the pipeline break. The two soil boring locations are shown on Figure 1.

The soil borings will be installed by a State of New Mexico licensed well driller, using a truck-mounted hollow-stem auger rig. Soil samples will be collected continuously and screened using a photo-ionization detector (PID) and visual observations. Discrete soil samples will be collected for laboratory analysis from the following depths below ground surface: 0-1 feet (surface), 4-5 feet (1 foot below the bottom of the pipeline), and capillary zone above encountered groundwater. The soil samples will be analyzed for the following:

- Total Petroleum Hydrocarbons (TPH):
 - Gasoline Range Organics (GRO)
 - Diesel Range Organics (DRO)
 - Oil Range Organics (ORO)
- Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)
- Chloride
- Fluoride
- Sulfate
- Iron
- Manganese
- Phenol

The soil analytical results from the location closest to the pipeline break will be compared to the soil analytical results from the upgradient, background location as well as to the lower of the OCD spill cleanup guidelines and/or the residential or soil-leaching-to-groundwater soil screening levels (SSLs) published by the NMED. Table 1 presents the proposed screening levels for the analytical suite.

The soil borings will be extended to five feet below the observed depth of groundwater, which is anticipated to be approximately 10 feet below the ground surface. The temporary monitoring wells will be constructed of 2-inch polyvinyl chlorinated (PVC) casing with 5 feet of 0.010-inch well screen. Solid 2-inch diameter PVC casing will be attached to the screen interval and extended to the ground surface. Clean sand will be placed in the annular space to approximately 2 feet above the well screen top as filter pack, then a two-foot bentonite seal will be placed above the filter pack. The PVC casing will be cut off approximately 3 feet above the ground surface. Since the wells will be temporary, a manhole and pad will not be installed.

Both temporary wells will be developed by bailing or pumping to remove fine-grained materials. Water quality parameters will be monitored throughout the development process and development will be considered complete when the parameters have stabilized. The volume of development water will be recorded and the development water will be disposed of in the refinery process wastewater system.

Groundwater samples will be collected from each of the two temporary monitoring wells, unless there is more than 0.03 feet of phase-separated hydrocarbons (PSH) present in the wells. Groundwater samples will be collected no sooner than 24 hours after the temporary wells have been developed. The groundwater samples will be analyzed for the same parameters as the soil samples (listed above) plus pH and total dissolved solids.

After the groundwater samples have been collected, the temporary wells will be removed and the borings will be properly abandoned. The PVC casing and screen will be removed and disposed of in refinery waste bins. The borings will be filled with bentonite chips and hydrated, or may be filled with lean cement using a tremie tool. The driller will prepare and submit both well installation permits and well abandonment plans for both of the temporary well locations and obtain approval from the Office of the State Engineer (OSE) prior to installation and abandonment of the temporary wells. A final plugging report will be submitted to the OSE by the driller following completion of the abandonment of the temporary wells.

The groundwater analytical results from the temporary well closest to the pipeline break will be compared to the results from the upgradient, background temporary well as well as the WQCC standards. The WQCC standards do not include a value for TPH, therefore, the NMED screening value for TPH in groundwater will be used for comparison purposes. Table 2 provides a summary of the groundwater screening values.

A letter report will be prepared and submitted to OCD, documenting the field activities and the analytical results of the investigation. The letter report will include documentation submitted to OSE, analytical reports, and survey information for the

boring and temporary well locations. Summary tables will be included in the letter report comparing the soil and groundwater analytical results from the location closest to the pipeline break to the results from the upgradient, background location. The tables will also provide comparisons of all analytical results to the soil and groundwater screening levels presented in this work plan. If additional delineation or remedial actions are warranted, they will be proposed in the letter report.

Should you have any questions or comments, please feel free to contact me at 713.953.4816.

Sincerely,

Arcadis U.S., Inc.



Pamela R. Krueger
Principal-in-Charge

Enclosures:

Figure 1

Table 1

Table 2

Attachment 1: Wastewater Analytical Report

Tables

Table 1
Proposed Action Levels for Soil Delineation
Wastewater Line Leak, Artesia, NM

Parameter	OCD Spill Guideline ^a (mg/kg)	Residential SSL (mg/kg)	DAF 20 SSL (mg/kg)	Background UTL (mg/kg)
TPH GRO	100	--	--	--
TPH DRO	100	1000	--	--
TPH ORO	100	1000	--	--
Benzene	10	17.8	0.0380	--
Ethylbenzene	--	75.1	0.262	--
Toluene	--	5228	12.1	--
Xylenes	--	871	2.98	--
BTEX	50	--	--	--
Chloride	--	--	--	5264
Fluoride	--	--	--	17.9
Sulfate	--	--	--	9336
Iron	--	--	--	17344
Manganese	--	--	--	488
Phenol	--	18490	52.3	--

^a Ranking criteria score of >19 based on depth to groundwater

Values shaded in grey are the proposed action levels

BTEX = benzene, toluene, ethylbenzene, total xylenes combined

DAF 20 = dilution attenuation factor of 20

DRO = diesel range organics

GRO = gasoline range organics

mg/kg = milligrams per kilogram

ORO = oil range organics

SSL = soil screening level

TPH = total petroleum hydrocarbons

UTL = upper tolerance limit, provided for informational purposes only

Table 2
Proposed Action Levels for Groundwater Delineation
Wastewater Line Leak, Artesia, NM

Parameter	WQCC Standard (mg/L)	NMED TPH Screening Level (mg/L)
TPH GRO	--	--
TPH DRO	--	0.2
TPH ORO	--	0.2
Benzene	0.01	--
Ethylbenzene	0.75	--
Toluene	0.75	--
Xylenes	0.62	--
Chloride	250	--
Fluoride	1.6	--
Sulfate	600	--
Iron	1	--
Manganese	0.2	--
Phenol	0.005	--

DRO = diesel range organics

GRO = gasoline range organics

mg/kg = milligrams per kilogram

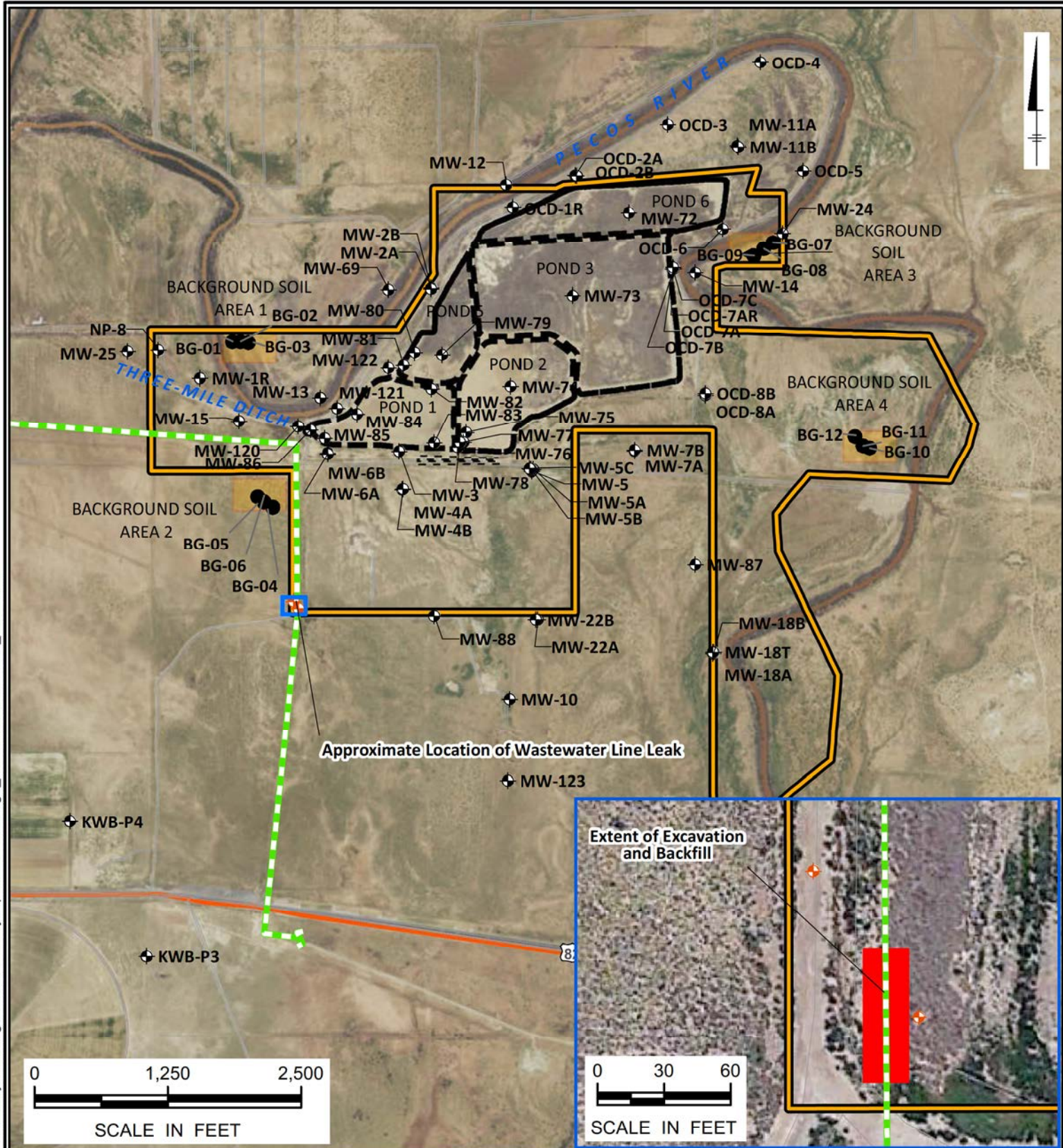
NMED = New Mexico Environment Department

ORO = oil range organics

TPH = total petroleum hydrocarbons

WQCC = Water Quality Control Commission

Figure



LEGEND

- EXISTING MONITORING WELLS
- PROPOSED BORINGS/TEMPORARY WELLS
- BACKGROUND SOIL SAMPLES
- WASTE WATER
- APPROXIMATE PIPELINE LOCATION
- NAVAJO PROPERTY BOUNDARY
- POND BOUNDARIES
- PHASE IV BACKGROUND SAMPLE LOCATION
- EXTENT OF EXCAVATION AND BACKFILL

NAVAJO REFINING COMPANY
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

APPROXIMATE LOCATION OF WASTEWATER LINE LEAK



FIGURE

1



Attachment 1

Wastewater Analytical Report