GW - 028

RO Reject Water Discharge Fields Site Investigation

July 2013

HOLLYFRONTIER
THE HOLLYFRONTIER COMPANIES

Mr. Carl Chavez
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

July 12, 2013

RE: Submittal of *Reverse Osmosis Reject Water Discharge Fields Site Investigation Second Quarter 2013 Interim Report*

Dear Mr. Chavez:

Enclosed are two paper copies and one electronic copy of the *Reverse Osmosis Reject Water Discharge Fields Site Investigation Second Quarter 2013 Interim Report*. This document is being submitted as required by Section 6 of the Discharge Permit GW-028.

If you have any questions or comments regarding this report, please feel free to contact me at 575-746-5487.

Sincerely,

Robert Combs
Environmental Specialist
Navajo Refining Company, LLC

c: Pamela R. Krueger, ARCADIS

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Reverse Osmosis Reject Water Discharge Fields Site Investigation Second Quarter 2013 Interim Report

OCD Discharge Permit GW-028

Artesia Refinery
Artesia, New Mexico

July 12, 2013

ARCADIS

Pamela Krueger
Senior Project Manager, ARCADIS

Reverse Osmosis Reject Water Discharge Fields Site Investigation Second Quarter 2013 Interim Report

Prepared for:
New Mexico Environment Department
Hazardous Waste Bureau
and
New Mexico Energy, Minerals and Natural Resources Department - Oil Conservation Division

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Our Ref.:
TX001027.0002.00001

Date:
July12, 2013

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Appendices *(all on compact disc)*

Acronyms and Abbreviations

CGWSL	Critical Groundwater Screening Level
COC	constituent of concern
GW-28	Discharge Permit GW-028
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
Navajo	Navajo Refining Company
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
OCD	New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division
ORO	oil-range organics
PCC Permit	Post-Closure Care Permit
QA/QC	quality assurance/quality control
Refinery	Artesia Refinery
RO	reverse osmosis
SVOC	semivolatile organic compound
TPH	total petroleum hydrocarbons
VOC	volatile organic compound
WQCC	Water Quality Control Commission

Executive Summary

Navajo Refining Company (Navajo) owns and operates the Artesia Refinery (refinery) in Artesia, New Mexico (Figure 1). The refinery has been in operation since the 1920s and processes crude oil into asphalt, fuel oil, gasoline, diesel, jet fuel, and liquefied petroleum gas. Navajo maintains a groundwater monitoring program according to the requirements of the Post-Closure Care Permit (PCC Permit), which is administered by the New Mexico Environment Department (NMED) Hazardous Waste Bureau, and Discharge Permit GW-028 (GW-028) which is administered by the Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural Resources Department.

Navajo operates a reverse osmosis (RO) unit that processes fresh water as a means to remove contaminants such as minerals and salts. The fresh water is a blend of fresh groundwater and publicly supplied water from the City of Artesia. The RO unit is a pretreatment step in the production of cooling tower makeup water and boiler grade feedwater. The RO unit produces two effluent streams: the RO permeate stream, which is the purified water, and the RO reject water stream, which contains the concentrated salts and minerals that cannot pass through the RO membranes. The RO reject water stream is discharged to the surface of one of two vacant fields located northeast of the refinery operations areas to water native grass in those fields (Figure 2). This discharge occurs in accordance with the April 1993 approved GW-028, issued by OCD.

On August 22, 2012, OCD issued a renewal and update to GW-028 for the refinery (OCD 2012). Section 6.D of GW-028 requires an investigation of groundwater beneath the two RO reject water discharge fields to determine if impacts to groundwater quality have occurred as a result of the discharge of RO fluid. Section 6.D.3 requires a Final Site Investigation Report to be submitted within 90 days following the completion of the fourth quarter sampling event and quarterly interim reports to be submitted 30 days following the receipt of analytical data during each event. This document presents the results from the second quarter sampling event.

This report provides the analytical results from groundwater samples collected during the second quarter of 2013. The following conclusions are based upon the information obtained from the monitoring activities:

- Groundwater concentrations of organic constituents were below reporting limits or screening levels in all samples collected. These results are consistent with the first quarter groundwater sampling results.

- Concentrations of several metals were detected above groundwater screening levels, including arsenic, manganese, and uranium. These results are consistent with the first quarter groundwater sampling results.

- Concentrations of anions including chloride, fluoride, and sulfate were detected above screening levels. These results are consistent with the first quarter groundwater sampling results.

According to the requirements of Section 6.D.3 of GW-028, two additional quarterly monitoring events will be conducted, an interim report will be submitted 30 days following the receipt of analytical data from the third quarter 2013 sampling event, and a final report will be submitted 90 days after the fourth quarter sampling event has been completed.

1. Introduction

Navajo Refining Company (Navajo) owns and operates the Artesia Refinery (refinery) in Artesia, New Mexico (Figure 1). The refinery has been in operation since the 1920s and processes crude oil into asphalt, fuel oil, gasoline, diesel, jet fuel, and liquefied petroleum gas. Navajo maintains a groundwater monitoring program according to the requirements of the Post-Closure Care Permit (PCC Permit; NMED, 2010), which is administered by the New Mexico Environment Department (NMED) Hazardous Waste Bureau, and Discharge Permit GW-028 (GW-028) which is administered by the Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural Resources Department.

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2. Scope of Services

This section describes groundwater monitoring activities performed during the second quarter sampling event.

2.1 Groundwater Sampling

Groundwater samples were collected from monitoring wells MW-114 through MW-120 on May 15 and 16, 2013. Prior to sampling, each well was gauged to determine the water level. Table 1 contains a summary of the water level measurements from the RO reject discharge field wells for both the first and second quarterly monitoring events.

Prior to collection of samples, each monitoring well was purged using low-flow procedures with a peristaltic pump and dedicated tubing. During the well purging process, water quality parameters, including pH, conductivity, temperature, and turbidity, were measured at regular intervals using a YSI multiparameter water quality meter with a flow-through cell. Purging continued until water quality parameters stabilized for at least four consecutive readings, indicating that collected water was characteristic of the surrounding formation. Field logs for the purging and sample collection from each well are provided in Appendix A, and final water quality parameters are summarized in Table 2.

Following completion of purging, groundwater samples were collected directly into laboratory prepared containers. Collected samples were placed in padded packing sleeves to prevent breakage and packed with ice in shipping containers. Samples were submitted to ALS Laboratory in Houston, Texas with chain-of-custody documentation and analyzed in accordance with the laboratory analytical methods referenced in Table 3. A copy of the chain-of-custody form is included in Appendix B in the laboratory analytical data reports.

2.2 RO Reject Discharge Sampling

A sample of the RO reject discharge was collected on May 16, 2013 from the discharge location in the north RO reject discharge field. The sample was collected as a grab sample by placing a clean bucket beneath the discharge stream and transferring water into the appropriate sample containers. The RO Reject sample was submitted to ALS Laboratory in Houston, Texas with chain-of-custody documentation and analyzed in accordance with the laboratory analytical methods

referenced in Table 3. A copy of the chain-of-custody form is included in Appendix B with the analytical data reports.

2.3 Quality Assurance/Quality Control Samples

Quality Assurance/Quality Control (QA/QC) samples were collected during the second quarter sampling event to ensure activities were conducted according to standard sample collection procedures. One field duplicate, one equipment blank and multiple trip blanks were included as part of the QA/QC sampling.

2.4 Decontamination Procedures

All sampling equipment in contact with groundwater (downhole probes) was decontaminated between each sampling location to prevent cross-contamination. The equipment was washed in a bath of non-phosphate soap (such as Alconox™) and water then rinsed with distilled water.

2.5 Investigation-Derived Waste Disposal

All solid waste, which included gloves and paper towels, was collected temporarily in trash bag, then placed into the refinery trash bins for disposal.

All collected water from equipment decontamination and purging was collected and subsequently disposed of within the refinery process wastewater system, upstream of the oil-water separator.

2.6 Deviations from Site Investigation Work Plan

All activities were conducted as specified in the approved 2012 Reverse Osmosis Reject Water Discharge Fields Site Investigation Work Plan (ARCADIS 2012).

3. Regulatory Criteria

Regulatory standards used to evaluate analytical results of the groundwater sampling events are based on the presumption that the shallow groundwater might be used as a source of drinking water. The primary screening level value used for each contaminant of concern (COC) is the New Mexico Water Quality Control Commission (WQCC) standard from 20.6.2.3103 New Mexico Administrative Code (NMAC). If no WQCC standard exists for a COC, the Maximum Contaminant Level (MCL) from the National Primary Drinking Water Standards is used. For COCs where neither a WQCC standard or MCL exists, the screening level value used is the NMED Tap Water Standard listed in the updated Table A-1 (NMED, 2012b) of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a). For total petroleum hydrocarbons (TPH), the TPH Screening Guidelines for Potable Groundwater for unknown oil included in Table 6-2 of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a) were used, as corrected by subsequent correspondence from the NMED.

The Critical Groundwater Screening Level (CGWSL) for each COC is provided in the groundwater data summary table (Table 4).

4. Analytical Results and Discussion

Groundwater samples collected were analyzed for site COCs to delineate the extent of potential groundwater impacts underlying the RO discharge fields. Validated results from groundwater samples collected are included in Table 4. In addition, the analytical results for the sample of RO discharge water collected from the discharge point are presented in Table 4 and are discussed below.

4.1 Laboratory Analytical Methods

As discussed previously, collected samples were analyzed for COCs in accordance with the laboratory analytical methods referenced in Table 3. The laboratory analytical reports are included in electronic format in Appendix B.

4.2 Data Validation

Data validation reports will be included in the final report.

4.3 Results and Discussion

Concentrations of radium, TPH, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs) were either not detected above laboratory reporting limits or were below screening levels for all samples collected in both the first and second quarters of 2013. Exceedances of screening levels at the sampled locations are discussed by analytical group in detail in the following subsections.

4.3.1 Metals

None of the reported concentrations of metals were above the CGWSLs for samples collected from MW-117 and MW-119. Similarly, none of the reported concentrations of metals were above the CGWSLs for the samples collected from the RO reject discharge.

Concentrations of metals above CGWSLs were detected in samples collected from monitoring wells MW-114, MW-115, MW-116, and MW-118. Exceedances of CGWSLs were as follows:

- Arsenic was reported above the CGWSL in both the first and second quarter samples collected from MW-118, at concentrations of 0.011 milligrams per liter (mg/L) and 0.0146 mg/L, respectively. Arsenic was not reported above the

CGWSL in samples collected from the other five monitoring wells in the RO reject discharge fields or in the samples collected from the RO reject discharge.

- Boron was reported at a concentration of 0.865 mg/L, above the CGWSL in the sample collected from monitoring well MW-115 during the first quarter. The reported concentration of boron (0.605 mg/L) in the sample collected from well MW-115 during the second quarter was below the CGWSL. Boron was not reported above the CGWSL in samples collected from the other five monitoring wells in the RO reject discharge fields or in the samples collected from the RO reject discharge.

- Manganese was reported at concentrations above the CGWSL in samples collected from MW-114 during both quarters (1.51 mg/L and 0.844 mg/L, respectively), and in the sample collected from MW-115 (0.255 mg/L) during the first quarter. The reported concentration of manganese (0.0267 mg/L) in the sample collected from well MW-115 during the second quarter was below the CGWSL. Manganese was not reported above the CGWSL in samples collected from the other four monitoring wells in the RO reject discharge fields or in the samples collected from the RO reject discharge.

- Uranium was reported at concentrations above the CGWSL in samples collected during both quarters from MW-115 (0.0843 mg/L, 0.0825 mg/L and 0.0731 mg/L [duplicate], respectively), MW-116 (0.0331 mg/L and 0.0343 mg/L, respectively), and MW-118 (0.037 mg/L and 0.033 mg/L, respectively). Uranium was not reported above the CGWSL in samples collected from the other three monitoring wells in the RO reject discharge fields or in the samples collected from the RO reject discharge.

4.3.2 Anions

Concentrations of anions above CGWSLs were detected in all samples collected during the monitoring event. Exceedances of CGWSLs observed for chloride, fluoride, and sulfate are detailed below.

- Chloride was reported at concentrations above the CGWSL in samples collected during both quarters from monitoring wells MW-115 (422 mg/L, 373 mg/L and 364 mg/L [duplicate], respectively), MW-116 (389 mg/L and 330 mg/L, respectively), and MW-118 (296 mg/L and 287 mg/L). Chloride was not reported

above the CGWSL in samples collected from the other three monitoring wells in the RO reject discharge fields or in the samples collected from the RO reject discharge.

- Fluoride was reported at concentrations above the CGWSL in samples collected during both quarters from monitoring wells MW-114 (1.76 mg/L and 1.91 mg/L, respectively), MW-117 (2.73 mg/L and 2.29 mg/L, respectively), MW-118 (5.16 mg/L and 5.39 mg/L), and MW-119 (2.36 mg/L and 2.43 mg/L, respectively). Fluoride was reported at concentrations above the CGWSL in samples collected from the RO reject discharge during both quarters at concentrations of 3.32 mg/L and 2.15 mg/L, respectively. Fluoride was not reported above the CGWSL in samples collected from the other two monitoring wells in the RO reject discharge fields.

- The reported concentrations of sulfate exceeded the CGWSL in all samples collected during the first and second quarters of 2013. Concentrations detected varied from 1,080 mg/L (RO reject discharge, second quarter) to 2,790 mg/L (MW-115, first quarter). In general, the sulfate concentrations reported in the second quarter samples were lower than those reported in the first quarter samples.

5. Summary and Conclusions

The second quarterly monitoring event has been completed according to the approved work plan.

Review of field and validated laboratory analytical data indicates the following:

- Concentrations of organic constituents in groundwater samples were below reporting limits or screening levels in all samples collected. These results confirm that no impacts from hydrocarbons have occurred as a result of discharge of the RO reject stream to the two fields.

- Reported concentrations of arsenic in well MW-118 exceed the CGWSL, while all other samples contain concentrations of arsenic below the CGWSL. The concentrations of arsenic in the RO reject discharge samples are below the screening level.

- Reported concentrations of boron in samples collected during the second quarter were all below the CGWSL.

- The reported concentrations of manganese from wells MW-114 and MW-115 were lower in the second quarter samples than the first quarter samples. The reported concentration from MW-114 during the second quarter was above the CGWSL while the reported concentration from MW-115 was below the CGWSL. The reported concentrations of manganese in the remaining four wells and in the RO reject discharge samples are all below the CGWSL.

- The reported concentrations of uranium from wells MW-115, MW-116, and MW-118 during the second quarter remained above the CGWSL, with concentrations similar to the first quarter results.

- The reported concentrations of chloride, fluoride and sulfate during the second quarter were similar to the concentrations from the first quarter, with exceedances of the CGWSL for chloride in wells MW-115, MW-116, and MW-118; for fluoride in wells MW-114, MW-117, MW-118, and MW-119; and for sulfate in all six wells. Exceedances of the CGWSL were present in the RO reject discharge samples for fluoride and sulfate.

- Radium-226 was present in the sample collected from well MW-118 at a concentration below the screening level during both the first and second

quarterly event. Radium-226 was also present in the sample collected from the RO reject discharge stream but was below the screening level. None of the remaining samples collected during the second quarter contained detectable amounts of radium.

The second quarterly sampling event has been completed. Two additional quarterly groundwater sampling events will be performed in order to establish trends in concentration and evaluate potential impacts due to historic discharge.

A thorough comparison of the data from the four quarterly monitoring events will be presented in the final report along with an evaluation of potential impacts and potential sources of any impacts identified.

6. References

ARCADIS. 2012. Reverse Osmosis Reject Water Discharge Fields Site Investigation Work Plan, OCD Discharge Permit GW-028. November.

New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division (OCD). 2012. Discharge Permit (GW-028), Navajo Refining Company – Artesia Refinery. August.

NMED. 2010. Navajo Refining Company, Artesia Refinery, Post-Closure Care Permit. December.

NMED. 2012a. Risk Assessment Guidance for Site Investigations and Remediation. February.

NMED. 2012b. Table A-1 from the Risk Assessment Guidance for Site Investigations and Remediation, updated. June.

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Tables

Table 1 - Water Level Measurements

Second Quarter 2013 Interim Report - RO Reject Discharge Fields

Navajo Refining Company, Artesia Refinery, New Mexico

Well ID	Screen Interval (feet bgs)	Northing	Easting	Top of Casing Elevation (ft amsl)	Date Measured	Depth to Water (ft btoc)	Water Elevation (ft amsl)
MW-114	20-35	673082.16	523818.86	3361.68	2/3/2013	8.59	3353.09
					5/15/2013	7.75	3353.93
MW-115	10-25	673997.34	523932.93	3359.31	2/3/2013	7.49	3351.82
					5/15/2013	8.10	3351.21
MW-116	10-25	673966.06	525339.63	3353.77	2/3/2013	9.91	3343.86
					5/16/2013	10.25	3343.52
MW-117	10-25	674301.52	522979.73	3363.01	2/3/2013	7.07	3355.94
					5/15/2013	8.52	3354.49
MW-118	10-25	674819.18	523375.94	3361.95	2/5/2013	13.71	3348.24
					5/15/2013	4.63	3357.32
MW-119	10-25	674860.11	524575.80	3356.11	2/5/2013	6.67	3349.44
					5/15/2013	7.65	3348.46

Abbreviations:

amsl = above mean sea level

bgs = below ground surface

btoc = below top of casing

ft = feet

Notes:

1. Northing and easting are New Mexico State Plane Coordinate System Eastern Zone, NAD 83, referenced to NGS OPUS solution from the WSMN WHITE SANDS, NMRO ROSWELL, and PORTALESAP_NM2005 CORS sites.
2. Elevations are NAVD 88 datum, determined with Leitz Engineer level referenced to NGS benchmark designated G-416 with an elevation of 3368.79 feet.
3. Measuring point for all wells is top of casing on the north side.

Table 2 - Well Purging and Water Quality Measurement Data

Second Quarter 2013 Interim Report - RO Reject Discharge Fields

Navajo Refining Company, Artesia Refinery, New Mexico

Well	Date	Time	Temperature (°C)	Conductivity (mS/cm)	pH (std units)	DO (mg/L)	ORP (mV)	Turbidity (NTU)
MW-114	05/15/2013	13:35	20.04	4.026	6.51	0.64	37.3	2.93
MW-115	05/15/2013	15:29	20.17	5.293	6.65	0.03	63.1	2.79
MW-116	05/16/2013	10:00	16.09	5.364	6.35	2.64	103.5	162
MW-117	05/15/2013	10:05	19.83	4.228	6.51	0.25	132.5	2.35
MW-118	05/15/2013	18:03	19.15	4.954	6.73	5.15	90.6	1.61
MW-119	05/15/2013	18:05	15.15	4.436	6.50	7.65	88.4	2.77

Notes:

°C = degrees Celsius

DO = dissolved oxygen

mg/L = milligrams per liter

mS/cm = milli-Siemens per centimeter

mV = millivolts

NTU = nephelometric turbidity units

ORP = oxygen reduction potential

std units = standard pH units

Table 3 - Laboratory Analytical Methods for Groundwater Samples

Second Quarter 2013 Interim Report - RO Reject Discharge Fields

Navajo Refining Company, Artesia Refinery, New Mexico

Sample Matrix	Method	Analyte Group	Specific Compounds
Groundwater / RO Reject	8015 Mod	Total Petroleum Hydrocarbons	Gasoline Range Organics Diesel Range Organics Oil Range Organics
Groundwater / RO Reject	6020 and 7470/7471	Metals, Dissolved	Aluminum Arsenic Barium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Manganese Mercury Molybdenum Nickel Potassium Selenium Silver Sodium Uranium Zinc
Groundwater / RO Reject	8260	Volatile Organic Compounds	Target Compound List to include specific compounds listed in 20.6.2.7(WW), 20.6.2.3103.A, 20.6.2.3103.B, and 20.6.2.3103.C
Groundwater / RO Reject	8270	Semivolatile Organic Compounds	Target Compound List to include specific compounds listed in 20.6.2.7(WW), 20.6.2.3103.A, 20.6.2.3103.B, and 20.6.2.3103.C
Groundwater / RO Reject	9014	Cyanide	Cyanide
Groundwater / RO Reject	300	Anions/Cations	Chloride Fluoride Sulfate Nitrite/Nitrate
Groundwater / RO Reject	903.1	Radioactive Parameters	Radioactivity (combined Radium-226 and Radium-228)
Groundwater / RO Reject	2540C	Water Quality	Total Dissolved Solids
Groundwater / RO Reject	Field instrument	Water Quality	pH

Note:

RO = reverse osmosis

Table 4 - Summary of Groundwater Sampling Analytical Results

Second Quarter 2013 Interim Report - RO Reject Discharge Fields

Navajo Refining Company, Artesia Refinery, New Mexico

			Well:	MW-114						MW-115									MW-116					
			Date:	2/3/2013			5/15/2013			2/3/2013			5/15/2013			5/15/2013 - Duplicate			2/3/2013			5/16/2013		
Analyte	CGWSL	CGWSL Source		Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
Dissolved Metals (mg/L)																								
Aluminum	5.00E+00	20.6.2.3103.C		0.0265		0.01	0.0072	J	0.01	0.00888	J	0.01	0.00816	J	0.01	0.0087	J	0.01	0.00797	J	0.01	0.349		0.01
Arsenic	1.00E-02	USEPA MCL		0.00561		0.005	0.0044	J	0.005	0.00499	J	0.005	0.00478	J	0.01	0.0043	J	0.005	0.00274	J	0.005	0.00502		0.005
Barium	1.00E+00	20.6.2.3103.A		0.0204		0.005	0.0129		0.005	0.0309		0.005	0.0107		0.005	0.011		0.005	0.0161		0.005	0.0111		0.005
Boron	7.50E-01	20.6.2.3103.C		0.139		0.1	0.101		0.1	***0.865***		0.5	0.605		0.5	0.635		0.1	0.22		0.1	0.238		0.1
Cadmium	5.00E-03	USEPA MCL			U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002
Calcium	---	---		600		5	576		5	518		5	511		5	495		5	624		10	578		5
Chromium	5.00E-02	20.6.2.3103.A			U	0.005		U	0.005		U	0.005		U	0.01		U	0.005		U	0.005	0.00119	J	0.005
Cobalt	5.00E-02	20.6.2.3103.C		0.00738		0.005	0.0045	J	0.005	0.0029	J	0.005		U	0.01		U	0.005		U	0.005		U	0.005
Copper	1.00E+00	20.6.2.3103.B			U	0.005		U	0.005	0.00704	<0.005	0.005		U	0.01	.00151	J	0.005		U	0.005	0.00176	J	0.005
Iron	1.00E+00	20.6.2.3103.B			U	0.2		U	0.2		U	0.2		U	0.4		U	0.2		U	0.2	0.201		0.2
Lead	1.50E-02	USEPA MCL			U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.01
Manganese	2.00E-01	20.6.2.3103.B		***1.51***		0.005	***0.844***		0.005	***0.255***		0.005	0.0267		0.01	0.023		0.005	0.0437		0.005	0.0342		0.005
Mercury	2.00E-03	20.6.2.3103.A			U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002	0.000131	J	0.0002	0.000046	J	0.0002
Molybdenum	1.00E+00	20.6.2.3103.C		0.0103		0.005	0.0098		0.005	0.00877		0.005	0.0075		0.005	0.0072		0.005	0.00348	J	0.005	0.00308	J	0.005
Nickel	2.00E-01	20.6.2.3103.C		0.00651		0.005	0.0041	J	0.005	0.00483	J	0.005		U	0.005	0.0023	J	0.005	0.0012	J	0.005	0.00204	J	0.005
Potassium	---	---		2.86		0.2	2.76		0.2	1.78		0.2	0.780		0.2	0.766		0.2	1.06		0.2	1.38		0.2
Selenium	5.00E-02	20.6.2.3103.A		0.00222	J	0.005	0.0064		0.005	0.0081		0.005	0.00654	J	0.01	0.0073		0.005	0.00203	J	0.005	0.00733		0.005
Silver	5.00E-02	20.6.2.3103.A			U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005
Sodium	---	---		146		0.2	123		0.2	199		2	206		2	201		2	206		4	194		2
Uranium	3.00E-02	20.6.2.3103.A		0.0156		0.005	0.0108		0.005	***0.0843***		0.005	***0.0825***		0.005	***0.0731***		0.005	***0.0331***		0.005	***0.0343***		0.01
Zinc	1.00E+01	20.6.2.3103.B		0.00343	J	0.005		U	0.005	0.00973		0.005	0.00821		0.01		U	0.005	0.00291	J	0.005		U	0.005
Anions (mg/L)																								
Chloride	2.50E+02	20.6.2.3103.B		158		25	150		50	***422***		25	***373***		50	***364***		50	***389***		25	***330***		50
Fluoride (F-, Anion)	1.60E+00	20.6.2.3103.A		***1.76***		0.1	***1.91***		0.1	1.1		0.1	1.18		0.1	1.15		0.1	1.31		0.1	1.19		0.1
Nitrate-N	1.00E+01	20.6.2.3103.A		1.43	H	0.1	NA			0.821	H	0.1	NA			NA			1.37	H	0.1	NA		
Nitrite	---	---			HU	0.1	NA			0.141	H	0.1	NA			NA				HU	0.1	NA		
Nitrate/Nitrite as N	1.00E+01	20.6.2.3103.A		NA				U	2	NA				U	2		U	2	NA				U	2
Sulfate	6.00E+02	20.6.2.3103.B		***2,200***		25	***1,800***		50	***2,790***		25	***2,490***		50	***2,420***		50	***2,250***		25	***2,080***		50
Cyanide	2.00E-01	20.6.2.3103.A			U	0.02	0.0043	J	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.02
Radium (pCi/L)																								
Radium-226	---	---		0.43	LT	0.23		U	0.36		U	0.23		U	0.58		Y1,U	0.54		U	0.32		U	0.36
Radium-228	---	---		0.74	LT	0.49		U	0.55		U	0.52		U	0.64		Y1,U	0.55		U	0.55		U	0.46
Radium-226 & Radium-228	3.00E+01	20.6.2.3103.A		1.17			NA			NA			NA			NA			NA			NA		
Total Dissolved Solids (mg/L)																								
Residue, filterable	1.00E+04	20.6.2.3103		3,760		10	3,900		10	4,960		10	5,510		10	4,990		10	3,650		10	4,480		10
TPH (mg/L)																								
Gasoline Range Organics	---	---			U	0.05		U	0.05		U	0.05		U	0.05		U	0.05		U	0.05		U	0.05
Diesel Range Organics	2.00E-01	NMED RA			U	0.052		U	0.052		U	0.051		U	0.051		U	0.052		U	0.051		U	0.052
Oil Range Organics	2.00E-01	NMED RA			U	0.1		U	0.1		U	0.1		U	0.1		U	0.1		U	0.1		U	0.1

Table 4 - Summary of Groundwater Sampling Analytical Results

Second Quarter 2013 Interim Report - RO Reject Discharge Fields

Navajo Refining Company, Artesia Refinery, New Mexico

			Well:	MW-114					MW-115									MW-116					
			Date:	2/3/2013			5/15/2013			2/3/2013			5/15/2013			5/15/2013 - Duplicate			2/3/2013			5/16/2013		
Analyte	CGWSL	CGWSL Source		Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
VOCs (mg/L)																							
1,1,1-Trichloroethane	6.00E+01	20.6.2.3103.A			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1,2,2-Tetrachloroethane	1.00E+01	20.6.2.3103.A			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1,2-Trichloroethane	5.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1-Dichloroethane	2.50E+01	20.6.2.3103.A			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1-Dichloroethene	7.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,2-Dibromoethane	5.00E-02	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,2-Dichloroethane	5.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Benzene	5.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Carbon Tetrachloride	5.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Chloroform	8.00E+01	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Dichloromethane	5.00E+00	USEPA MCL			U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002
Ethylbenzene	7.00E+02	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Tetrachloroethene	5.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Toluene	7.50E+02	20.6.2.3103.A			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Total Xylenes	6.20E+02	20.6.2.3103.A			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Trichloroethene	5.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Vinyl Chloride	1.00E+00	20.6.2.3103.A			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
SVOCs (mg/L)																							
1-Methylnaphthalene	---	---			U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
2-Methylnaphthalene	---	---			U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Naphthalene	---	---			U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Total PAHs	3.00E+01	20.6.2.3103.A	NA			NA			NA			NA			NA			NA			NA		
Benzo(a)Pyrene	2.00E-01	USEPA MCL			U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002

Table 4 - Summary of Groundwater Sampling Analytical Results

Second Quarter 2013 Interim Report - RO Reject Discharge Fields

Navajo Refining Company, Artesia Refinery, New Mexico

			Well:	MW-117					MW-118						MW-119						RO Reject Discharge					
			Date:	2/3/2013			5/15/2013			2/5/2013			5/15/2013			2/5/2013			5/15/2013			2/3/2013			5/16/2013		
Analyte	CGWSL	CGWSL Source		Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
Dissolved Metals (mg/L)																											
Aluminum	5.00E+00	20.6.2.3103.C		0.0289		0.01	0.0184		0.01	0.0146		0.01	0.00796	J	0.01	0.00994	J	0.01	0.0296		0.01	0.00668	J	0.01	0.00529	J	0.01
Arsenic	1.00E-02	USEPA MCL		0.00498	J	0.005	0.00367	J	0.01	***0.011***		0.005	***0.0146***		0.005	0.00294	J	0.005	0.00537		0.005	0.00494	J	0.005	0.0025	J	0.01
Barium	1.00E+00	20.6.2.3103.A		0.0235		0.005	0.0113		0.005	0.0145		0.005	0.00919		0.005	0.00981		0.005	0.00625		0.005	0.0628		0.005	0.0464		0.005
Boron	7.50E-01	20.6.2.3103.C		0.207		0.1	0.175		0.1	0.226		0.05	0.230		0.1	0.0987		0.05	0.13		0.1	0.143		0.1	0.104		0.1
Cadmium	5.00E-03	USEPA MCL			U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002
Calcium	---	---		568		5	524		5	563		10	530		5	494		10	491		5	625		25	397		5
Chromium	5.00E-02	20.6.2.3103.A			U	0.005		U	0.01		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.01
Cobalt	5.00E-02	20.6.2.3103.C		0.00256	J	0.005		U	0.01		U	0.005		U	0.005	0.000871	J	0.005		U	0.005		U	0.005		U	0.01
Copper	1.00E+00	20.6.2.3103.B		0.0141		0.005		U	0.01	0.00156	J	0.005	0.00156	J	0.005	0.00309	J	0.005	0.00137	J	0.005	0.00177	J	0.005		U	0.01
Iron	1.00E+00	20.6.2.3103.B			U	0.2		U	0.4		U	0.2		U	0.2		U	0.2		U	0.2		U	0.2		U	0.4
Lead	1.50E-02	USEPA MCL			U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.01
Manganese	2.00E-01	20.6.2.3103.B		0.108		0.005	0.00978	J	0.01	0.0232		0.005		U	0.005	0.0424		0.005		U	0.005		U	0.005		U	0.01
Mercury	2.00E-03	20.6.2.3103.A			U	0.0002		U	0.0002	0.000042	J	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Molybdenum	1.00E+00	20.6.2.3103.C		0.0112		0.005	0.00664		0.005	0.0195		0.005	0.0179		0.005	0.0083		0.005	0.00745		0.005	0.0125		0.005	0.00622		0.005
Nickel	2.00E-01	20.6.2.3103.C		0.00413	J	0.005		U	0.01	0.00173	J	0.005	0.00184	J	0.005	0.00174	J	0.005	0.00163	J	0.005	0.00264	J	0.005		U	0.01
Potassium	---	---		6.92		0.2	4.37		0.2	7.95		0.2	7.2		0.2	0.87		0.2	0.794		0.2	4.41		0.2	2.91		0.2
Selenium	5.00E-02	20.6.2.3103.A		0.00427	J	0.005	0.00585	J	0.01	0.00861		0.005	0.0127		0.005	0.00246	J	0.005	0.00506		0.005	0.013		0.005	0.0075	J	0.01
Silver	5.00E-02	20.6.2.3103.A			U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005
Sodium	---	---		176		0.2	160		0.2	218		4	229		2	127		4	120		0.2	65.4		0.2	40.4		0.2
Uranium	3.00E-02	20.6.2.3103.A		0.0263		0.005	0.0247		0.005	***0.037***		0.005	***0.033***		0.005	0.0244		0.005	0.0222		0.005	0.00601		0.005		U	0.01
Zinc	1.00E+01	20.6.2.3103.B		0.0123		0.005		U	0.01		U	0.005		U	0.005		U	0.005		U	0.005	0.0132		0.005	0.00516	J	0.01
Anions (mg/L)																											
Chloride	2.50E+02	20.6.2.3103.B		154		25	137		50	***296***		25	***287***		50	116		25	118		50	67.5		0.5	38.2		0.5
Fluoride (F-, Anion)	1.60E+00	20.6.2.3103.A		***2.73***		0.1	***2.29***		0.1	***5.16***		0.1	***5.39***		0.1	***2.36***		0.1	***2.43***		0.1	***3.32***		0.1	***2.15***		0.1
Nitrate-N	1.00E+01	20.6.2.3103.A			HU	0.1	NA			2.39		0.1	NA			2.35		0.1	NA			3.22	H	0.1	NA		
Nitrite	---	---			HU	0.1	NA				U	0.1	NA				U	0.1	NA				HU	0.1	NA		
Nitrate/Nitrite as N	1.00E+01	20.6.2.3103.A		NA				U	2	NA			2.09		2	NA			1.91	J	2	NA			2.11		2
Sulfate	6.00E+02	20.6.2.3103.B		***2,310***		25	***2,010***		50	***2,450***		25	***2,250***		50	***2,090***		25	***1,970***		50	***1,690***		25	***1,080***		50
Cyanide	2.00E-01	20.6.2.3103.A			U	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.02	0.00487	J	0.02
Radium (pCi/L)																											
Radium-226	---	---		0.54	LT	0.09		U	0.45	0.38	Y1,LT	0.21	0.22	LT	0.2		U	0.25		Y1,U	0.31	NA			0.49	LT	0.24
Radium-228	---	---		0.89	LT	0.48		U	0.53	0.87	Y1,LT	0.49		U	0.48		U	0.52		Y1,U	0.47	NA				U	0.52
Radium-226 & Radium-228	3.00E+01	20.6.2.3103.A		1.43			NA			1.25			0.22			NA			NA						0.49		
Total Dissolved Solids (mg/L)																											
Residue, filterable	1.00E+04	20.6.2.3103		3,910		10	4,260		10	4,610		10	5,090		10	3,670		10	4,030		10	3,150		10	2,410		10
TPH (mg/L)																											
Gasoline Range Organics	---	---			U	0.05		U	0.05	0.0436	J	0.05		U	0.05	0.0371	J	0.05		U	0.05		U	0.05		U	0.05
Diesel Range Organics	2.00E-01	NMED RA			U	0.052		U	0.052		U	0.052		U	0.051		U	0.051		U	0.052		U	0.052		U	0.053
Oil Range Organics	2.00E-01	NMED RA			U	0.1		U	0.1		U	0.1		U	0.1		U	0.1		U	0.1	0.17		0.1		U	0.11

Table 4 - Summary of Groundwater Sampling Analytical Results

Second Quarter 2013 Interim Report - RO Reject Discharge Fields

Navajo Refining Company, Artesia Refinery, New Mexico

			Well:	MW-117					MW-118					MW-119					RO Reject Discharge				
			Date:	2/3/2013			5/15/2013		2/5/2013			5/15/2013		2/5/2013			5/15/2013		2/3/2013			5/16/2013	
Analyte	CGWSL	CGWSL Source		Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
VOCs (mg/L)																										
1,1,1-Trichloroethane	6.00E+01	20.6.2.3103.A			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1,2,2-Tetrachloroethane	1.00E+01	20.6.2.3103.A			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1,2-Trichloroethane	5.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1-Dichloroethane	2.50E+01	20.6.2.3103.A			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1-Dichloroethene	7.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,2-Dibromoethane	5.00E-02	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,2-Dichloroethane	5.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Benzene	5.00E+00	USEPA MCL			U	0.001		U	0.001	0.0042		0.001		U	0.001	0.0036		0.001		U	0.001		U	0.001		U	0.001
Carbon Tetrachloride	5.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Chloroform	8.00E+01	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Dichloromethane	5.00E+00	USEPA MCL			U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002
Ethylbenzene	7.00E+02	USEPA MCL			U	0.001		U	0.001	0.0024		0.001		U	0.001	0.0021		0.001		U	0.001		U	0.001		U	0.001
Tetrachloroethene	5.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Toluene	7.50E+02	20.6.2.3103.A			U	0.001		U	0.001	0.0033		0.001		U	0.001	0.0027		0.001		U	0.001		U	0.001		U	0.001
Total Xylenes	6.20E+02	20.6.2.3103.A			U	0.001		U	0.001	0.0047		0.001		U	0.001	0.0037		0.001		U	0.001		U	0.001		U	0.001
Trichloroethene	5.00E+00	USEPA MCL			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Vinyl Chloride	1.00E+00	20.6.2.3103.A			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
SVOCs (mg/L)																										
1-Methylnaphthalene	---	---			U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
2-Methylnaphthalene	---	---			U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Naphthalene	---	---			U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Total PAHs	3.00E+01	20.6.2.3103.A	NA			NA			NA			NA			NA			NA			NA			NA		
Benzo(a)Pyrene	2.00E-01	USEPA MCL			U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002

Notes:

CGWSL is the lowest of the following sources:
New Mexico Water Quality Standards found in NMAC 20.6.2.3103.
If no value in NMAC 20.6.2.3103 was available, then the EPA Federal MCL was used.
TPH results are screened against the "unknown oil" SSL from Table 6-2, 2012 NMED RAG.
Bold, italic font with yellow highlighting indicates a result reported above the CGWSL.
RLs shown in italics font with gray highlighting exceed the CGWSL for that compound.

Blank cells indicate that the analyte was not detected at the RL shown, no qualifier exists, or that the compound was not analyzed for that sample (if no RL is shown).

Screening level for radium is for combined Radium-226 and Radium-228.
Detected values were added to obtain the combined value for screening. Non-detect results were treated as a value of 0.

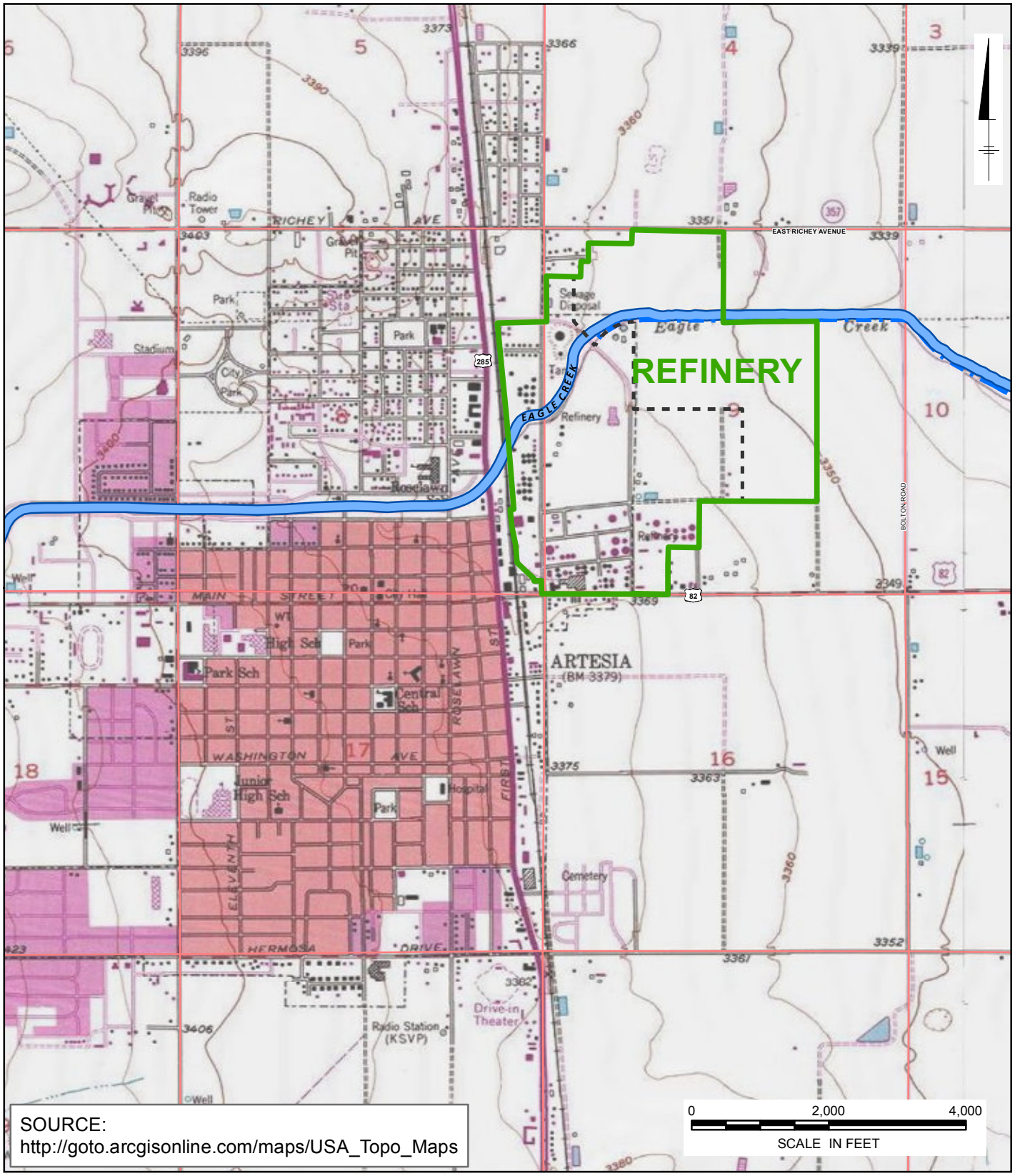
Total PAHs are defined in NMAC 20.6.2.3103 as naphthalene plus mono-methylnaphthalenes. Although no detected values were present, if concentrations had been reported for 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene, the values would have been added to obtain the Total PAHs concentration.

Abbreviations:

--- = not available
CGWSL = Critical Groundwater Screening Level
H = analyzed outside of holding time
J = estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).
LCS = laboratory control sample
LT = the sample has a detection above the achieved minimum detectable concentration but below the requested.
MCL = maximum contaminant level
mg/L = milligrams per liter
NA = not applicable
NMAC = New Mexico Administrative Code
NMED RAG = 2012 New Mexico Environment Department Risk Assessment Guidance
PAHs = polycyclic aromatic hydrocarbons
pci/L = average picocuries per liter
Qual = qualifier from laboratory or data validation
RL = laboratory reporting limit
SVOC = semivolatile organic compounds
VOC = volatile organic compounds
TPH = total petroleum hydrocarbons
U = indicates the compound was analyzed for but not detected
USEPA = United States Environmental Protection Agency

ARCADIS

Figures



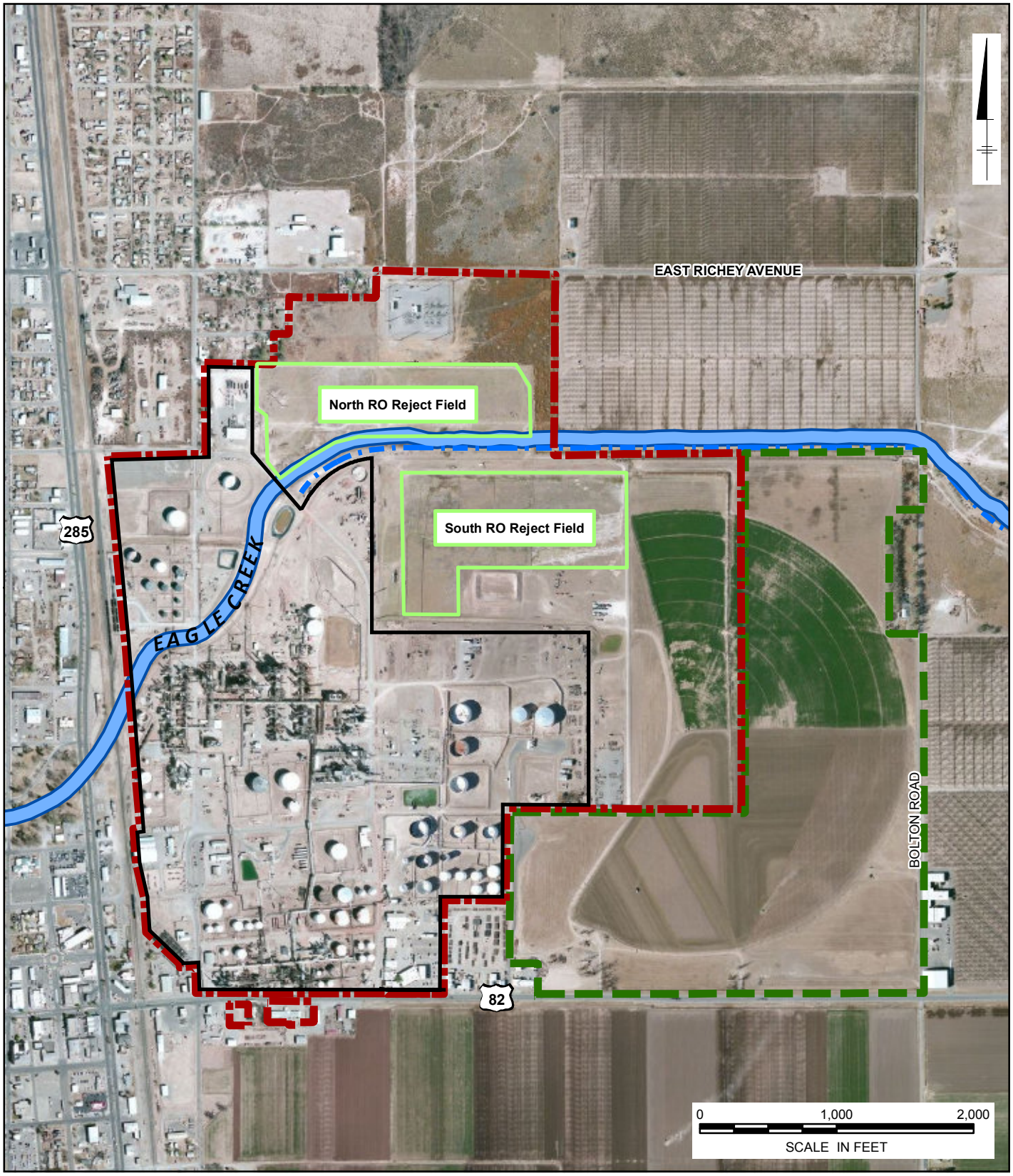
NAVAJO REFINING COMPANY
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

SITE LOCATION MAP

ARCADIS

FIGURE
1

CITY: (KNOXVILLE) DIV/GROUP:(ENV) DB: LD: PIC: PM: TM:
PROJECT:
Path: C:\NavajoRefiningArtesiaRefinery\RO_RejectFieldWorkPlan\mxd\SiteLocationMap.mxd Date Saved: 3/29/2013 1:25:22 PM



LEGEND:

- REFINERY FENCELINE
- REJECT FIELD
- NAVAJO REFINING PROPERTY LINE
- MONTANA REFINING PROPERTY LINE
- APPROXIMATE LOCATION OF FORMER THREE-MILE DITCH AND EXISTING UNDERGROUND DISCHARGE PIPING
- WATERWAYS

NAVAJO REFINING COMPANY
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

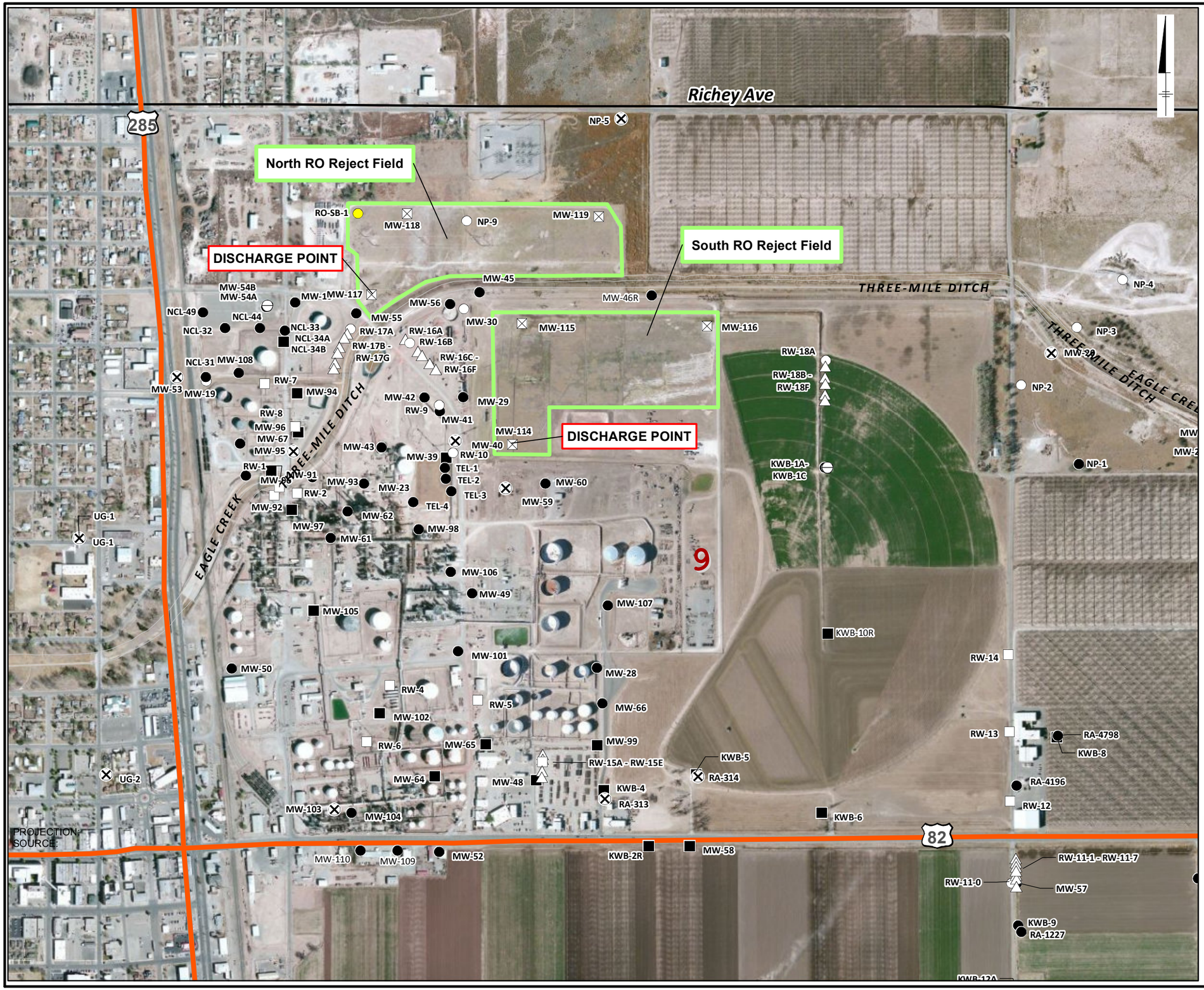
RO REJECT FIELDS SITE INVESTIGATION

SITE FEATURES

ARCADIS

FIGURE
2

CITY: (KNOXVILLE) DIV/GROUP:(ENV) DB: LD: PIC: PM: TM:
PROJECT:
Path: C:\NavajoRefiningArtesiaRefinery\RO_RejectFieldWorkPlan\mxd\SiteFeatures.mxd Date Saved: 12/18/2012 10:04:04 AM



Legend

- SOIL BORING LOCATION
- NOT SAMPLED AS PART OF ROUTINE MONITORING PROGRAM
- SAMPLES TO BE COLLECTED QUARTERLY
- SAMPLES COLLECTED BIENNIALLY
- SAMPLES COLLECTED ANNUALLY
- SAMPLES COLLECTED SEMIANNUALLY
- SAMPLES COLLECTED ANNUALLY IF PSH <0.03 FT
- SAMPLES COLLECTED SEMIANNUALLY IF PSH <0.03 FT
- RECOVERY TRENCH WELL LOCATION NOT SAMPLED AS PART OF ROUTINE MONITORING PROGRAM
- US HIGHWAY
- LOCAL ROADS
- REJECT FIELD

NOTES:
1. SEE FACILITY WIDE GROUNDWATER MONITORING WORK PLAN FOR ANALYTICAL SUITE

2. PSH = PHASE SEPARATED HYDROCARBONS

0 700 1,400

SCALE IN FEET

NAVAJO REFINING COMPANY
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO
RO REJECT FIELDS SITE INVESTIGATION

SOIL BORING AND MONITORING WELL LOCATIONS

ARCADIS

FIGURE 3

CITY:(GREENVILLE) DIV/GROUP:(ENV/GIS) DB: LD: PIC: PM: TM:
PROJECT: XX000000.0000.00000 PATH: C:\Navajo Refining\Artesia Refinery\RO_RejectFieldWorkPlan\mxd\Monitoring Well and Soil Locs.mxd

Appendix A

Field Sampling Notes
(on compact disk)

ARCADIS Groundwater Sampling Form

Page 1 of 1

Project No. _____ Well ID MW-114

Date 5/15/2013

Project Name/Location NAVAJO/RO REJECT FIELDS

Weather SUNNY/WIND

Measuring Pt. Description _____ Screen Setting (ft-bmp) _____ Casing Diameter (in.) 2"

Well Material X PVC ___ SS

Static Water Level (ft-bmp) 7.75 Total Depth (ft-bmp) 38.20 Water Column/ Gallons in Well _____

MP Elevation _____ Pump Intake (ft-bmp) _____ Purge Method: peristaltic Centrifugal Submersible Other

Sample Method low-flow

Pump On/Off 1207/1213 Volumes Purged ~2 gal

Sample Time: Label 1312/1415/1350 Start 1336 End 1415 Replicate/ Code No. _____

Sampled by MJB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1212	5			~1/8	6.64	4.058		1.82	23.39	70.0		
1215	8											
1218	11		PUMP DIES									
1221	14											
1224	17											
1227	20											
1317	5		7.76	~1/4	6.48	4.025	1.91	0.83	20.44	5.2	clear	—
1320	8		7.74	~1/2	6.50	4.042	1.59	0.86	19.93	15.6		
1323	11		7.74	~3/4	6.49	4.028	0.96	0.81	19.84	21.9		
1326	14		7.75	~1	6.58	4.030	1.55	0.73	19.84	26.5		
1329	17		7.74	~1¼	6.50	4.032	2.38	0.64	20.06	28.6		
1332	20		7.74	~1½	6.51	4.026	0.78	0.69	20.13	33.5		
1335	23		7.74	~1¾	6.51	4.026	2.93	0.69	20.04	37.3		

Constituents Sampled	Container	Number	Preservative
✓ Dissolved Metals	500 mL plastic	1	HNO_3
✓ SVOCs	1L Amber	2	—
✓ TPH - GRO	40 mL VOA	3	HCl
✓ TPH - DRO & ORO	40 mL Amber	3	—
✓ ANIONS / TDS (Chloride / Fluoride / Sulfate)	1L plastic	1	—
✓ CYANIDE (TOTAL)	250 mL plastic	1	NaOH
✓ Radium 226/228	1L plastic	1	HNO_3
✓ ANIONS (NITRATE/NITRITE)	1L Plastic	1	H_2SO_4
✓ VOCs	40 mL VOA	3	HCl
		16	

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

Well Information

Well Location: SOUTH REJECT Field

Condition of Well: GOOD

Well Completion: Flush Mount / Stick Up

Well Locked at Arrival: Yes / No

Well Locked at Departure: Yes / No

Key Number To Well:

GW Samp Form
5/10/2012

ARCADIS Groundwater Sampling Form

Project No. _____ Well ID MW-115 Page 1 of 1

Project Name/Location NAVAJO / REJECT FIELDS Date 5/15/13

Weather Hot / Sunny

Measuring Pt. Description _____ Screen Setting (ft-bmp) _____ Casing Diameter (in.) 2" .15 1.50 Well Material ☒ PVC ☐ SS

Static Water Level (ft-bmp) 8.10 Total Depth (ft-bmp) 27.55 Water Column/ Gallons in Well _____

MP Elevation _____ Pump Intake (ft-bmp) _____ Purge Method: Peristaltic / Centrifugal / Submersible / Other _____ Sample Method Low-flow

Pump On/Off 15:08 Volumes Purged ~1.5

Sample Time: Label 1550 Start _____ End _____ Replicate/ Code No. DUP-02

0001 → 16.64

Sampled by McNiff

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
15:11	11		8.10	.25	6.63	5.300	1.19	2.5	14.70	98.5	clear	None
15:14	14		8.15	.125	6.62	5.315	1.51	.10	13.84	97.3		
15:17	17		8.15	.50	6.63	5.292	2.37	.07	19.25	86.0		
15:20	20		8.15	.75	[illegible]	5.295	2.70	.06	19.57	79.2		
15:23	23		8.14	.85	[illegible]	5.296	1.12	.05	19.79	74.8		
15:26	26				6.64			[illegible]				
15:26	26		8.16	1	6.64	5.298	1.56	.05	20.05	67.4		
15:29	29		8.15	1.25	6.65	5.293	2.71	.03	20.17	63.1		

Constituents Sampled	Container	Number	Preservative
✓ DISSOLVED METALS	500 mL PLASTIC	1	HNO_3
✓ SVOCs	1L AMBER	2	—
✓ TPH - GRO	40 mL VOA	3	HCl
✓ TPH - DRO/ORO	40 mL AMBER	3	—
✓ ANIONS / TDS (CHLORIDE/SULFATE)	1L PLASTIC	1	—
✓ CYANIDE (TOTAL)	250 mL PLASTIC	1	NaOH
✓ RADIUM 226/228	1L PLASTIC	1	HNO_3
✓ ANIONS (NITRATE/NITRITE)	1L PLASTIC	1	H_2SO_4
✓ VOCs	40 mL VOA	3	HCl
		16	

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: South Reject Field

Condition of Well: Good

Well Completion: Flush Mount / Stick Up

Well Locked at Arrival: Yes / No

Well Locked at Departure: Yes / No

Key Number To Well: _____

GW Samp Form 5/10/2013

ARCADIS Groundwater Sampling Form

Project No. _____ Well ID MW-116

Project Name/Location NAVAJO/REJECT FIELDS

Page ____ of ____

Date 5/16/13

Weather Sunny

Measuring Pt. Description _____

Screen Setting (ft-bmp) _____

Casing Diameter (in.) 2"

Well Material ± PVC ___ SS

Static Water Level (ft-bmp) 10.25

Total Depth (ft-bmp) 27.50

Water Column/ Gallons in Well _____

MP Elevation _____

Pump Intake (ft-bmp) _____

Purge Method: Peristaltic / Centrifugal / Submersible / Other

Pump On/Off 9:25 AM

Volumes Purged ~2.5

Sample Method Low Flow

Sample Time: Label 1016 Start 10:15 End 11:00

Replicate/ Code No. _____

Sampled by ML

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
9:30	5		10.25	.25	6.14	5.289	618	9.00	17.11	69.3	Grey	None
9:33	8		10.25	.25	6.35	5.302	643	6.51	17.81	90.9	Cloudy	"
9:36	11		10.25	.50	6.39	5.330	643	5.99	17.66	94.1	"	"
9:39	14		10.25	.65	6.38	5.355	456	4.53	17.76	97.6	Cloudy	"
9:42	17		10.24	.75	6.40	5.355	364	3.91	17.94	99.3	"	"
9:45	21		10.25	1	6.38	5.356	312	3.65	17.93	100.4	"	"
9:48	23		10.24	1.25	6.37	5.360	300	3.64	18.01	101.3	"	✓
9:51	25		10.25	1.50	6.38	5.362	220	2.65	17.90	102.3	"	
9:54	28		10.25	1.75	6.37	5.364	212	2.66	17.94	102.6	✓	
9:57	31		10.24	2	6.36	5.363	183	2.64	18.08	103.4		
10:00	34		10.25	2.25	6.35	5.364	167		16.09	103.5		
~~10:03~~	~~37~~											

Constituents Sampled

Constituents Sampled	Container	Number	Preservative
Dissolved Metals	500 mL plastic	1	HNO_3
SVOCs	1L Amber	2	—
TPH-GRO	40 mL VOA	3	HCl
TPH-DRO/ORO	40 mL Amber	3	—
ANIONS/TDS (CHLORIDE/Sulfate)	1L plastic	1	—
CYANIDE (TOTAL)	250 mL plastic	1	NaOH
RADIUM 226/228	1L plastic	2	HNO_3
ANIONS (NITRATE/NITRITE)	1L plastic	1	H_2SO_4
VOCs	40 mL VOA	3	HCl

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: South Reject Field

Condition of Well: Good

Well Completion: Flush Mount / Stick Up

Well Locked at Arrival: Yes / No

Well Locked at Departure: Yes / No

Key Number To Well: _____

GW Samp Form 5/10/2013

22

ARCADIS Groundwater Sampling Form

Project No. NAVAJO | Well ID MW-117 | Page 1 of 1

Project Name/Location NAVAJO/RO PROJECT FIELDS | Date 5/15/13 | Weather SUNNY/WIND

Measuring Pt. Description | Screen Setting (ft-bmp) | Casing Diameter (in.) 2" | Well Material X PVC ___ SS

Static Water Level (ft-bmp) 8.52 | Total Depth (ft-bmp) 27.60 | Water Column/ Gallons in Well

MP Elevation | Pump Intake (ft-bmp) | Purge Method: Bennett Pump / Centrifugal / Submersible / Other

Pump On/Off 947/1052 | Volumes Purged 21.75 gal | Sample Method Low flow

Sample Time: Label 1030 | Start 1009 | End 1050 | Replicate/ Code No.

Sampled by MB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
947	5		8.52	~¼	6.47	4.232	23.0	0.35	19.77	156.1	clear	—
950	8		8.52	~¼	6.48	4.232	4.69	0.33	19.69	154.7		
953	11		8.53	~½	6.49	4.223	4.28	0.32	19.77	139.4		
956	14		8.52	~¾	6.51	4.225	3.39	0.29	19.72	138.7		
959	17		8.52	~1	6.50	4.223	2.41	0.28	19.80	135.6		
1002	20		8.52	~1¼	6.51	4.220	2.52	0.27	19.79	133.4		
1005	23		8.52	~1½	6.51	4.228	2.35	0.25	19.83	132.5		

Constituents Sampled	Container	Number	Preservative
✓ DISSOLVED METALS	500 mL PLASTIC	1	HNO3
SVOCs	1L AMBER	2	—
✓ TPH-GRO	40 mL VOA	3	HCl
✓ TPH-ORO< DRO	40 mL AMBER	3	—
✓ ANIONS/TDS (CHLORIDE/FLUORIDE)	1L PLASTIC	1	—
✓ CYANIDE (TOTAL)	250 mL PLASTIC	1	NaOH
✓ RADIUM (226/228)	1L PLASTIC	1	HNO3
✓ ANIONS (NITRATE/NITRITE)	1L PLASTIC	1	H2SO4
✓ VOC's	40 mL VOA	3	HCl

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

Well Information

Well Location: NORTH REDUCTION Field | Well Locked at Arrival: Yes / No

Condition of Well: GOOD | Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up | Key Number To Well:

GW Samp Form 5/10/2012

ARCADIS Groundwater Sampling Form

5:23

Page ___ of ___

Project No. ___ Well ID MW-118 Date 5/15/13

Project Name/Location NAVAJO REJECT Fields Weather SUNNY / WINDY

Measuring Pt. Description ___ Screen Setting (ft-bmp) ___ Casing Diameter (in.) 2 Well Material X PVC ___ SS

Static Water Level (ft-bmp) 4.63 Total Depth (ft-bmp) 24.35 Water Column/ Gallons in Well ___

MP Elevation ___ Pump Intake (ft-bmp) ___ Purge Method: Peristaltic / Centrifugal / Submersible / Other ___ Sample Method Low-Flow

Pump On/Off ___ Volumes Purged ~3 gal

Sample Time: Label MW-118 Start ~~1730~~ End 1830 for SAMPLE Replicate/ Code No. ___ Sampled by Malini

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
17:30	5		4.60	.25	6.71	4.851	3.48	2.85	17.59	107.5	clear	—
17:33	8		4.60	.50	6.69	4.913	1.65	5.05	17.84	104.3		
17:36	11		4.61	.75	6.70	4.965	.97	5.95	17.70	101.1		
17:39	14		4.59	1	6.72	4.982	.89	5.89	17.64	96.1		
17:42	17		4.60	1.25	6.72	4.945	.94	6.60	18.41	92.4		
17:45	20		4.60	1.50	6.74	4.979	1.03	5.49	19.37	89.4		
17:49	23		4.60	1.75	6.72	4.974	.93	5.50	18.46	91.5		
17:51	26		4.60	2	6.73	4.963	.91	5.35	19.18	91.6		
17:54	29		4.61	2.25	6.73	4.973	.75	5.50	18.91	91.6		
17:57	32		4.61	2.50	6.75	4.955	.94	5.16	19.72	88.3		
18:00	35		4.60	2.75	6.74	4.954	.95	5.17	19.66	89.7		
18:03	38		4.61	3.0	6.73	4.954	1.61	5.15	19.25	90.6		

Constituents Sampled	Container	Number	Preservative
Dissolved Metals	500 mL Plastic	1	HNO_3
SVOCs	1L Amber	2	—
TPH-GRO	40 mL VOA	3	HCl
TPH-DRO & ORO	40 mL Amber	3	—
Anions/TDS (Chloride/Fluoride)	1L Plastic	1	—
Cyanide (Total)	250 mL Plastic	1	NaOH
Radium 226/228	1L Plastic	2	HNO_3
Anions (Nitrate/Nitrite)	1L Plastic	1	H_2SO_4
VOCs	40 mL VOA	3	HCl

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

Well Information

Well Location:	NORM Reject Field	Well Locked at Arrival:	(Yes) / No
Condition of Well:	GOOD	Well Locked at Departure:	(Yes) / No
Well Completion:	Flush Mount / (Stick Up)	Key Number To Well:	

GW Samp Form

ARCADIS Groundwater Sampling Form

Page 1 of 1

Project No. _____ Well ID MW-119 Date 5/15/13

Project Name/Location NAVAJO / RO REJECT FIELDS Weather SUNNY/WINDY

Measuring Pt. Description _____ Screen Setting (ft-bmp) _____ Casing Diameter (in.) 2" Well Material ☒ PVC ☐ SS

Static Water Level (ft-bmp) ~~8.05~~ 7.65 Total Depth (ft-bmp) 28.32 Water Column/ Gallons in Well _____

MP Elevation _____ Pump Intake (ft-bmp) _____ Purge Method: ☒ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other _____ Sample Method LOW-FLOW

Pump On/Off 1739/1845 Volumes Purged _____

Sample Time: Label 1810 Start 1806 End 1840 Replicate/ Code No. _____ Sampled by MRS

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1744	5		7.72	~¼	6.05	4.447	8.73	7.73	13.71	80.5	clear	—
1747	8		7.74	~½	6.26	4.431	2.54	7.37	14.54	81.5		
1750	11		7.69	~¾	6.43	4.440	1.47	7.24	15.10	90.8		
1753	14		7.68	~1	6.46	4.444	2.42	7.50	15.42	91.7		
1756	17		7.69	~1¼	6.48	4.434	0.55	7.44	15.43	93.6		
1759	20		7.69	~1½	6.47	4.444	0.46	7.64	15.10	95.7		
1802	23		7.68	~1¾	6.50	4.438	1.41	7.52	15.24	97.3		
1805	26		7.68	~2	6.50	4.436	2.77	7.65	15.15	98.4		

Constituents Sampled	Container	Number	Preservative
✓ DISSOLVED METALS	500 ML PLASTIC	1	HNO_3
✓ SVOCs	1L AMBER	2	—
✓ TPH - GRO	40 ML VOA	3	HCl
✓ TPH - DRO & ORO	40 ML AMBER	3	—
✓ ANIONS / TDS (CHLORIDE/FLUORIDE)	1L PLASTIC	1	—
✓ CYANIDE (TOTAL)	250 ML PLASTIC	1	NaOH
✓ RADIUM 226/228	1L PLASTIC	2	HNO_3
✓ ANIONS (NITRATE/NITRITE)	1L PLASTIC	1	H_2SO_4
✓ VOCs	40 ML VOA	3	HCl

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

Well Information

Well Location: NORM REJECT FIELDS Well Locked at Arrival: ☒ Yes / ☐ No

Condition of Well: GOOD Well Locked at Departure: ☒ Yes / ☐ No

Well Completion: Flush Mount / ☒ Stick Up Key Number To Well: _____

GW Samp Form

Appendix B

Laboratory Analytical Reports
(on compact disk)

12-Jun-2013

Aaron Strange
Navajo Refining Company
PO Box 159
Artesia, NM 88211

Tel: (575) 748-6733
Fax: (575) 746-5421

Re: RO Discharge Sampling 128823 Work Order: **1305797**

Dear Aaron,

ALS Environmental received 17 samples on 17-May-2013 09:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 89.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Electronically approved by: Luke F. Hernandez

Sonia West
Project Manager

Certificate No: T104704231-13-12

ALS Environmental

Date: 12-Jun-13

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Work Order: **1305797**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1305797-01	MW-114	Water		5/15/2013 13:50	5/17/2013 09:00	☐
1305797-01	MW-114	Water		5/15/2013 13:50	5/17/2013 09:00	☐
1305797-02	MW-115	Water		5/15/2013 15:50	5/17/2013 09:00	☐
1305797-02	MW-115	Water		5/15/2013 15:50	5/17/2013 09:00	☐
1305797-03	MW-117	Water		5/15/2013 10:30	5/17/2013 09:00	☐
1305797-03	MW-117	Water		5/15/2013 10:30	5/17/2013 09:00	☐
1305797-04	MW-118	Water		5/15/2013 18:30	5/17/2013 09:00	☐
1305797-04	MW-118	Water		5/15/2013 18:30	5/17/2013 09:00	☐
1305797-05	MW-119	Water		5/15/2013 18:10	5/17/2013 09:00	☐
1305797-05	MW-119	Water		5/15/2013 18:10	5/17/2013 09:00	☐
1305797-06	DUP-03	Water		5/15/2013 00:01	5/17/2013 09:00	☐
1305797-06	DUP-03	Water		5/15/2013 00:01	5/17/2013 09:00	☐
1305797-07	MW-116	Water		5/16/2013 10:15	5/17/2013 09:00	☐
1305797-07	MW-116	Water		5/16/2013 10:15	5/17/2013 09:00	☐
1305797-08	EQB-03	Water		5/16/2013 11:40	5/17/2013 09:00	☐
1305797-08	EQB-03	Water		5/16/2013 11:40	5/17/2013 09:00	☐
1305797-09	RO Discharge	Water		5/16/2013 08:30	5/17/2013 09:00	☐
1305797-09	RO Discharge	Water		5/16/2013 08:30	5/17/2013 09:00	☐
1305797-10	Trip Blank 050313-36	Water		5/16/2013	5/17/2013 09:00	☐
1305797-11	Trip Blank 050313-33	Water		5/16/2013	5/17/2013 09:00	☐
1305797-12	Trip Blank 050313-49	Water		5/16/2013	5/17/2013 09:00	☐
1305797-13	Trip Blank 050313-43	Water		5/16/2013	5/17/2013 09:00	☐
1305797-14	Trip Blank 050313-12	Water		5/16/2013	5/17/2013 09:00	☐
1305797-15	Trip Blank 050313-34	Water		5/16/2013	5/17/2013 09:00	☐
1305797-16	Trip Blank 050313-14	Water		5/16/2013	5/17/2013 09:00	☐
1305797-17	Trip Blank 050313-24	Water		5/16/2013	5/17/2013 09:00	☐

Client:	Navajo Refining Company
Project:	RO Discharge Sampling 128823
Work Order:	1305797

Case Narrative

The analyses for Radium 226 and Radium 228 were subcontracted to ALS Environmental in Ft. Collins, CO.

Batch 70138, Dissolved Metals 6020, Sample 1305631-07C: MS/MSD are for an unrelated sample.

Batch 70117, Semivolatile Organics 8270, Sample SLCSW1-130520: Insufficinet sample volume was received for MS/MSD.

Batch R147734, Volatile Organics 8260, Sample 1306842-01A: MS/MSD are for an unrelated sample.

Batch R147736, Volatile Organics 8260, Sample 1306818-01A: MS/MSD are for an unrelated sample.

Batch R147882, Si;fate, Sample 1306966-06E: MS/MSD are for an unrelated sample.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-114
Collection Date: 5/15/2013 01:50 PM

Work Order: 1305797
Lab ID: 1305797-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO		Method: **SW8015M**			Prep: SW3511 / 5/20/13		Analyst: **RPM**
TPH (Diesel Range)	U		0.021	0.052	mg/L	1	5/22/2013 19:03
TPH (Oil Range)	U		0.042	0.10	mg/L	1	5/22/2013 19:03
Surr: 2-Fluorobiphenyl	*93.7*			*60-135*	*%REC*	1	5/22/2013 19:03
GASOLINE RANGE ORGANICS - SW8015C		Method: **SW8015**					Analyst: **RPM**
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	5/23/2013 17:08
Surr: 4-Bromofluorobenzene	*105*			*70-130*	*%REC*	1	5/23/2013 17:08
DISSOLVED MERCURY BY 7470A		Method: **SW7470**			Prep: SW7470 / 5/20/13		Analyst: **OFO**
Mercury	U		0.000042	0.000200	mg/L	1	5/20/2013 14:20
DISSOLVED METALS		Method: **SW6020**			Prep: SW3010A / 5/20/13		Analyst: **ALR**
Aluminum	**0.00722**	J	**0.0040**	**0.0100**	**mg/L**	1	5/22/2013 06:14
Arsenic	**0.00437**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 06:14
Barium	**0.0129**		**0.00090**	**0.00500**	**mg/L**	1	5/22/2013 06:14
Boron	**0.101**		**0.040**	**0.100**	**mg/L**	2	5/22/2013 15:51
Cadmium	U		0.00080	0.00200	mg/L	1	5/22/2013 06:14
Calcium	**576**		**0.86**	**5.00**	**mg/L**	10	5/22/2013 05:13
Chromium	U		0.0010	0.00500	mg/L	1	5/22/2013 06:14
Cobalt	**0.00451**	J	**0.00080**	**0.00500**	**mg/L**	1	5/22/2013 06:14
Copper	U		0.0010	0.00500	mg/L	1	5/22/2013 06:14
Iron	U		0.078	0.200	mg/L	1	5/22/2013 06:14
Lead	U		0.00070	0.00500	mg/L	1	5/22/2013 06:14
Manganese	**0.844**		**0.0025**	**0.00500**	**mg/L**	1	5/22/2013 06:14
Molybdenum	**0.00978**		**0.0015**	**0.00500**	**mg/L**	1	5/22/2013 06:14
Nickel	**0.00410**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 06:14
Potassium	**2.76**		**0.084**	**0.200**	**mg/L**	1	5/22/2013 06:14
Selenium	**0.00636**		**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 06:14
Silver	U		0.00080	0.00500	mg/L	1	5/22/2013 06:14
Sodium	**123**		**0.085**	**0.200**	**mg/L**	1	5/22/2013 06:14
Uranium	**0.0108**		**0.0050**	**0.00500**	**mg/L**	1	5/22/2013 06:14
Zinc	U		0.0025	0.00500	mg/L	1	5/22/2013 06:14
LOW-LEVEL SEMIVOLATILES		Method: **SW8270**			Prep: SW3510 / 5/20/13		Analyst: **ACN**
1-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/22/2013 21:25
2-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/22/2013 21:25
Benzo(a)pyrene	U		0.000050	0.00020	mg/L	1	5/22/2013 21:25
Naphthalene	U		0.000050	0.00020	mg/L	1	5/22/2013 21:25
Surr: 2,4,6-Tribromophenol	*0*			*34-129*	*%REC*	1	5/22/2013 21:25
Surr: 2-Fluorobiphenyl	*0*			*40-125*	*%REC*	1	5/22/2013 21:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-114
Collection Date: 5/15/2013 01:50 PM

Work Order: 1305797
Lab ID: 1305797-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	*0*			*20-120*	*%REC*	1	5/22/2013 21:25
Surr: 4-Terphenyl-d14	*0*			*40-135*	*%REC*	1	5/22/2013 21:25
Surr: Nitrobenzene-d5	*0*			*41-120*	*%REC*	1	5/22/2013 21:25
Surr: Phenol-d6	*0*			*20-120*	*%REC*	1	5/22/2013 21:25
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 17:17
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/21/2013 17:17
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 17:17
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 17:17
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/21/2013 17:17
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/21/2013 17:17
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 17:17
Benzene	U		0.00020	0.0010	mg/L	1	5/21/2013 17:17
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/21/2013 17:17
Chloroform	U		0.00030	0.0010	mg/L	1	5/21/2013 17:17
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/21/2013 17:17
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/21/2013 17:17
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/21/2013 17:17
Toluene	U		0.00030	0.0010	mg/L	1	5/21/2013 17:17
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/21/2013 17:17
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/21/2013 17:17
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/21/2013 17:17
Surr: 1,2-Dichloroethane-d4	*104*			*71-125*	*%REC*	1	5/21/2013 17:17
Surr: 4-Bromofluorobenzene	*102*			*70-125*	*%REC*	1	5/21/2013 17:17
Surr: Dibromofluoromethane	*101*			*74-125*	*%REC*	1	5/21/2013 17:17
Surr: Toluene-d8	*97.5*			*78-123*	*%REC*	1	5/21/2013 17:17
MISCELLANEOUS ANALYSIS		Method: **NA**					Analyst: **SUB**
Miscellaneous Analysis	**See Attached**		**0**			1	6/12/2013
ANIONS - EPA 300.0 (1993)		Method: **E300**					Analyst: **JKP**
Chloride	**150**		**20**	**50.0**	**mg/L**	100	5/23/2013 21:56
Fluoride	**1.91**		**0.050**	**0.100**	**mg/L**	1	5/24/2013 11:34
Sulfate	**1,800**		**20**	**50.0**	**mg/L**	100	5/23/2013 21:56
Nitrate/Nitrite (as N)	U		0.30	2.00	mg/L	10	5/22/2013 17:33
Surr: Selenate (surr)	*104*			*85-115*	*%REC*	10	5/22/2013 17:33
Surr: Selenate (surr)	*94.6*			*85-115*	*%REC*	100	5/23/2013 21:56
Surr: Selenate (surr)	*96.6*			*85-115*	*%REC*	1	5/24/2013 11:34
CYANIDE - SM4500CN E		Method: **M4500CN E&G**					Analyst: **EDG**
Cyanide	**0.00432**	J	**0.0040**	**0.0200**	**mg/L**	1	5/22/2013 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-114
Collection Date: 5/15/2013 01:50 PM

Work Order: 1305797
Lab ID: 1305797-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **KAH**
Total Dissolved Solids (Residue, Filterable)	**3,990**		**5.0**	**10.0**	**mg/L**	1	5/22/2013 09:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-115
Collection Date: 5/15/2013 03:50 PM

Work Order: 1305797
Lab ID: 1305797-02
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO		Method: **SW8015M**			Prep: SW3511 / 5/20/13		Analyst: **RPM**
TPH (Diesel Range)	U		0.020	0.051	mg/L	1	5/22/2013 17:42
TPH (Oil Range)	U		0.041	0.10	mg/L	1	5/22/2013 17:42
Surr: 2-Fluorobiphenyl	*111*			*60-135*	*%REC*	1	5/22/2013 17:42
GASOLINE RANGE ORGANICS - SW8015C		Method: **SW8015**					Analyst: **RPM**
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	5/24/2013 01:37
Surr: 4-Bromofluorobenzene	*105*			*70-130*	*%REC*	1	5/24/2013 01:37
DISSOLVED MERCURY BY 7470A		Method: **SW7470**			Prep: SW7470 / 5/20/13		Analyst: **OFO**
Mercury	U		0.000042	0.000200	mg/L	1	5/20/2013 14:21
DISSOLVED METALS		Method: **SW6020**			Prep: SW3010A / 5/20/13		Analyst: **ALR**
Aluminum	**0.00816**	J	**0.0040**	**0.0100**	**mg/L**	1	5/22/2013 06:20
Arsenic	**0.00478**	J	**0.0020**	**0.0100**	**mg/L**	2	5/22/2013 15:56
Barium	**0.0107**		**0.00090**	**0.00500**	**mg/L**	1	5/22/2013 06:20
Boron	**0.605**		**0.040**	**0.100**	**mg/L**	2	5/22/2013 15:56
Cadmium	U		0.00080	0.00200	mg/L	1	5/22/2013 06:20
Calcium	**511**		**0.86**	**5.00**	**mg/L**	10	5/22/2013 05:19
Chromium	U		0.0020	0.0100	mg/L	2	5/22/2013 15:56
Cobalt	U		0.0016	0.0100	mg/L	2	5/22/2013 15:56
Copper	U		0.0020	0.0100	mg/L	2	5/22/2013 15:56
Iron	U		0.16	0.400	mg/L	2	5/22/2013 15:56
Lead	U		0.00070	0.00500	mg/L	1	5/22/2013 06:20
Manganese	**0.0267**		**0.0050**	**0.0100**	**mg/L**	2	5/22/2013 15:56
Molybdenum	**0.00750**		**0.0015**	**0.00500**	**mg/L**	1	5/22/2013 06:20
Nickel	U		0.0020	0.0100	mg/L	2	5/22/2013 15:56
Potassium	**0.780**		**0.084**	**0.200**	**mg/L**	1	5/22/2013 06:20
Selenium	**0.00654**	J	**0.0020**	**0.0100**	**mg/L**	2	5/22/2013 15:56
Silver	U		0.00080	0.00500	mg/L	1	5/22/2013 06:20
Sodium	**206**		**0.85**	**2.00**	**mg/L**	10	5/22/2013 05:19
Uranium	**0.0825**		**0.0050**	**0.00500**	**mg/L**	1	5/22/2013 06:20
Zinc	**0.00821**	J	**0.0050**	**0.0100**	**mg/L**	2	5/22/2013 15:56
LOW-LEVEL SEMIVOLATILES		Method: **SW8270**			Prep: SW3510 / 5/20/13		Analyst: **ACN**
1-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 08:56
2-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 08:56
Benzo(a)pyrene	U		0.000050	0.00020	mg/L	1	5/21/2013 08:56
Naphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 08:56
Surr: 2,4,6-Tribromophenol	*0*			*34-129*	*%REC*	1	5/21/2013 08:56
Surr: 2-Fluorobiphenyl	*0*			*40-125*	*%REC*	1	5/21/2013 08:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-115
Collection Date: 5/15/2013 03:50 PM

Work Order: 1305797
Lab ID: 1305797-02
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	*0*			*20-120*	*%REC*	1	5/21/2013 08:56
Surr: 4-Terphenyl-d14	*0*			*40-135*	*%REC*	1	5/21/2013 08:56
Surr: Nitrobenzene-d5	*0*			*41-120*	*%REC*	1	5/21/2013 08:56
Surr: Phenol-d6	*0*			*20-120*	*%REC*	1	5/21/2013 08:56
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 17:44
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/21/2013 17:44
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 17:44
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 17:44
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/21/2013 17:44
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/21/2013 17:44
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 17:44
Benzene	U		0.00020	0.0010	mg/L	1	5/21/2013 17:44
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/21/2013 17:44
Chloroform	U		0.00030	0.0010	mg/L	1	5/21/2013 17:44
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/21/2013 17:44
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/21/2013 17:44
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/21/2013 17:44
Toluene	U		0.00030	0.0010	mg/L	1	5/21/2013 17:44
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/21/2013 17:44
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/21/2013 17:44
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/21/2013 17:44
Surr: 1,2-Dichloroethane-d4	*104*			*71-125*	*%REC*	1	5/21/2013 17:44
Surr: 4-Bromofluorobenzene	*99.9*			*70-125*	*%REC*	1	5/21/2013 17:44
Surr: Dibromofluoromethane	*98.6*			*74-125*	*%REC*	1	5/21/2013 17:44
Surr: Toluene-d8	*96.7*			*78-123*	*%REC*	1	5/21/2013 17:44
MISCELLANEOUS ANALYSIS		Method: **NA**					Analyst: **SUB**
Miscellaneous Analysis	**See Attached**		**0**			1	6/12/2013
ANIONS - EPA 300.0 (1993)		Method: **E300**					Analyst: **JKP**
Chloride	**373**		**20**	**50.0**	**mg/L**	100	5/23/2013 22:11
Fluoride	**1.18**		**0.050**	**0.100**	**mg/L**	1	5/24/2013 11:48
Sulfate	**2,490**		**20**	**50.0**	**mg/L**	100	5/23/2013 22:11
Nitrate/Nitrite (as N)	U		0.30	2.00	mg/L	10	5/22/2013 17:48
Surr: Selenate (surr)	*104*			*85-115*	*%REC*	10	5/22/2013 17:48
Surr: Selenate (surr)	*99.4*			*85-115*	*%REC*	100	5/23/2013 22:11
Surr: Selenate (surr)	*95.0*			*85-115*	*%REC*	1	5/24/2013 11:48
CYANIDE - SM4500CN E		Method: **M4500CN E&G**					Analyst: **EDG**
Cyanide	U		0.0040	0.0200	mg/L	1	5/22/2013 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-115
Collection Date: 5/15/2013 03:50 PM

Work Order: 1305797
Lab ID: 1305797-02
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **KAH**
Total Dissolved Solids (Residue, Filterable)	**5,510**		**5.0**	**10.0**	**mg/L**	1	5/22/2013 09:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-117
Collection Date: 5/15/2013 10:30 AM

Work Order: 1305797
Lab ID: 1305797-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO		Method: **SW8015M**			Prep: SW3511 / 5/20/13		Analyst: **RPM**
TPH (Diesel Range)	U		0.021	0.052	mg/L	1	5/22/2013 16:22
TPH (Oil Range)	U		0.042	0.10	mg/L	1	5/22/2013 16:22
Surr: 2-Fluorobiphenyl	*105*			*60-135*	*%REC*	1	5/22/2013 16:22
GASOLINE RANGE ORGANICS - SW8015C		Method: **SW8015**					Analyst: **RPM**
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	5/24/2013 01:55
Surr: 4-Bromofluorobenzene	*106*			*70-130*	*%REC*	1	5/24/2013 01:55
DISSOLVED MERCURY BY 7470A		Method: **SW7470**			Prep: SW7470 / 5/20/13		Analyst: **OFO**
Mercury	U		0.000042	0.000200	mg/L	1	5/20/2013 14:27
DISSOLVED METALS		Method: **SW6020**			Prep: SW3010A / 5/20/13		Analyst: **ALR**
Aluminum	**0.0184**		**0.0040**	**0.0100**	**mg/L**	1	5/22/2013 06:25
Arsenic	**0.00367**	J	**0.0020**	**0.0100**	**mg/L**	2	5/22/2013 16:01
Barium	**0.0113**		**0.00090**	**0.00500**	**mg/L**	1	5/22/2013 06:25
Boron	**0.175**		**0.040**	**0.100**	**mg/L**	2	5/22/2013 16:01
Cadmium	U		0.00080	0.00200	mg/L	1	5/22/2013 06:25
Calcium	**524**		**0.86**	**5.00**	**mg/L**	10	5/22/2013 05:24
Chromium	U		0.0020	0.0100	mg/L	2	5/22/2013 16:01
Cobalt	U		0.0016	0.0100	mg/L	2	5/22/2013 16:01
Copper	U		0.0020	0.0100	mg/L	2	5/22/2013 16:01
Iron	U		0.16	0.400	mg/L	2	5/22/2013 16:01
Lead	U		0.00070	0.00500	mg/L	1	5/22/2013 06:25
Manganese	**0.00978**	J	**0.0050**	**0.0100**	**mg/L**	2	5/22/2013 16:01
Molybdenum	**0.00664**		**0.0015**	**0.00500**	**mg/L**	1	5/22/2013 06:25
Nickel	U		0.0020	0.0100	mg/L	2	5/22/2013 16:01
Potassium	**4.37**		**0.084**	**0.200**	**mg/L**	1	5/22/2013 06:25
Selenium	**0.00585**	J	**0.0020**	**0.0100**	**mg/L**	2	5/22/2013 16:01
Silver	U		0.00080	0.00500	mg/L	1	5/22/2013 06:25
Sodium	**160**		**0.085**	**0.200**	**mg/L**	1	5/22/2013 06:25
Uranium	**0.0247**		**0.0050**	**0.00500**	**mg/L**	1	5/22/2013 06:25
Zinc	U		0.0050	0.0100	mg/L	2	5/22/2013 16:01
LOW-LEVEL SEMIVOLATILES		Method: **SW8270**			Prep: SW3510 / 5/20/13		Analyst: **ACN**
1-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/22/2013 21:45
2-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/22/2013 21:45
Benzo(a)pyrene	U		0.000050	0.00020	mg/L	1	5/22/2013 21:45
Naphthalene	U		0.000050	0.00020	mg/L	1	5/22/2013 21:45
Surr: 2,4,6-Tribromophenol	*70.7*			*34-129*	*%REC*	1	5/22/2013 21:45
Surr: 2-Fluorobiphenyl	*64.6*			*40-125*	*%REC*	1	5/22/2013 21:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-117
Collection Date: 5/15/2013 10:30 AM

Work Order: 1305797
Lab ID: 1305797-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	*51.9*			*20-120*	*%REC*	1	5/22/2013 21:45
Surr: 4-Terphenyl-d14	*73.0*			*40-135*	*%REC*	1	5/22/2013 21:45
Surr: Nitrobenzene-d5	*59.9*			*41-120*	*%REC*	1	5/22/2013 21:45
Surr: Phenol-d6	*49.9*			*20-120*	*%REC*	1	5/22/2013 21:45
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:07
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/21/2013 18:07
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:07
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:07
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/21/2013 18:07
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:07
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:07
Benzene	U		0.00020	0.0010	mg/L	1	5/21/2013 18:07
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/21/2013 18:07
Chloroform	U		0.00030	0.0010	mg/L	1	5/21/2013 18:07
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/21/2013 18:07
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/21/2013 18:07
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/21/2013 18:07
Toluene	U		0.00030	0.0010	mg/L	1	5/21/2013 18:07
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/21/2013 18:07
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/21/2013 18:07
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/21/2013 18:07
Surr: 1,2-Dichloroethane-d4	*102*			*71-125*	*%REC*	1	5/21/2013 18:07
Surr: 4-Bromofluorobenzene	*98.3*			*70-125*	*%REC*	1	5/21/2013 18:07
Surr: Dibromofluoromethane	*99.1*			*74-125*	*%REC*	1	5/21/2013 18:07
Surr: Toluene-d8	*96.0*			*78-123*	*%REC*	1	5/21/2013 18:07
MISCELLANEOUS ANALYSIS		Method: **NA**					Analyst: **SUB**
Miscellaneous Analysis	**See Attached**		**0**			1	6/12/2013
ANIONS - EPA 300.0 (1993)		Method: **E300**					Analyst: **JKP**
Chloride	**137**		**20**	**50.0**	**mg/L**	100	5/23/2013 22:26
Fluoride	**2.29**		**0.050**	**0.100**	**mg/L**	1	5/24/2013 12:03
Sulfate	**2,010**		**20**	**50.0**	**mg/L**	100	5/23/2013 22:26
Nitrate/Nitrite (as N)	U		0.30	2.00	mg/L	10	5/22/2013 18:02
Surr: Selenate (surr)	*100*			*85-115*	*%REC*	10	5/22/2013 18:02
Surr: Selenate (surr)	*98.9*			*85-115*	*%REC*	100	5/23/2013 22:26
Surr: Selenate (surr)	*99.4*			*85-115*	*%REC*	1	5/24/2013 12:03
CYANIDE - SM4500CN E		Method: **M4500CN E&G**					Analyst: **EDG**
Cyanide	U		0.0040	0.0200	mg/L	1	5/22/2013 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-117
Collection Date: 5/15/2013 10:30 AM

Work Order: 1305797
Lab ID: 1305797-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **KAH**
Total Dissolved Solids (Residue, Filterable)	**4,260**		**5.0**	**10.0**	**mg/L**	1	5/22/2013 09:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-118
Collection Date: 5/15/2013 06:30 PM

Work Order: 1305797
Lab ID: 1305797-04
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO		Method: **SW8015M**		Prep: SW3511 / 5/20/13			Analyst: **RPM**
TPH (Diesel Range)	U		0.020	0.051	mg/L	1	5/22/2013 18:36
TPH (Oil Range)	U		0.041	0.10	mg/L	1	5/22/2013 18:36
Surr: 2-Fluorobiphenyl	*98.2*			*60-135*	*%REC*	1	5/22/2013 18:36
GASOLINE RANGE ORGANICS - SW8015C		Method: **SW8015**					Analyst: **RPM**
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	5/24/2013 02:13
Surr: 4-Bromofluorobenzene	*105*			*70-130*	*%REC*	1	5/24/2013 02:13
DISSOLVED MERCURY BY 7470A		Method: **SW7470**		Prep: SW7470 / 5/20/13			Analyst: **OFO**
Mercury	U		0.000042	0.000200	mg/L	1	5/20/2013 14:29
DISSOLVED METALS		Method: **SW6020**		Prep: SW3010A / 5/20/13			Analyst: **ALR**
Aluminum	**0.00796**	J	**0.0040**	**0.0100**	**mg/L**	1	5/22/2013 08:05
Arsenic	**0.0146**		**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:05
Barium	**0.00919**		**0.00090**	**0.00500**	**mg/L**	1	5/22/2013 08:05
Boron	**0.230**		**0.040**	**0.100**	**mg/L**	2	5/22/2013 16:06
Cadmium	U		0.00080	0.00200	mg/L	1	5/22/2013 08:05
Calcium	**530**		**0.86**	**5.00**	**mg/L**	10	5/22/2013 05:30
Chromium	U		0.0010	0.00500	mg/L	1	5/22/2013 08:05
Cobalt	U		0.00080	0.00500	mg/L	1	5/22/2013 08:05
Copper	**0.00156**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:05
Iron	U		0.078	0.200	mg/L	1	5/22/2013 08:05
Lead	U		0.00070	0.00500	mg/L	1	5/22/2013 08:05
Manganese	U		0.0025	0.00500	mg/L	1	5/22/2013 08:05
Molybdenum	**0.0179**		**0.0015**	**0.00500**	**mg/L**	1	5/22/2013 08:05
Nickel	**0.00184**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:05
Potassium	**7.20**		**0.084**	**0.200**	**mg/L**	1	5/22/2013 08:05
Selenium	**0.0127**		**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:05
Silver	U		0.00080	0.00500	mg/L	1	5/22/2013 08:05
Sodium	**229**		**0.85**	**2.00**	**mg/L**	10	5/22/2013 05:30
Uranium	**0.0330**		**0.0050**	**0.00500**	**mg/L**	1	5/22/2013 08:05
Zinc	U		0.0025	0.00500	mg/L	1	5/22/2013 08:05
LOW-LEVEL SEMIVOLATILES		Method: **SW8270**		Prep: SW3510 / 5/20/13			Analyst: **ACN**
1-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 09:37
2-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 09:37
Benzo(a)pyrene	U		0.000050	0.00020	mg/L	1	5/21/2013 09:37
Naphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 09:37
Surr: 2,4,6-Tribromophenol	*0*			*34-129*	*%REC*	1	5/21/2013 09:37
Surr: 2-Fluorobiphenyl	*0*			*40-125*	*%REC*	1	5/21/2013 09:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-118
Collection Date: 5/15/2013 06:30 PM

Work Order: 1305797
Lab ID: 1305797-04
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	*0*			*20-120*	*%REC*	1	5/21/2013 09:37
Surr: 4-Terphenyl-d14	*0*			*40-135*	*%REC*	1	5/21/2013 09:37
Surr: Nitrobenzene-d5	*0*			*41-120*	*%REC*	1	5/21/2013 09:37
Surr: Phenol-d6	*0*			*20-120*	*%REC*	1	5/21/2013 09:37
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:31
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/21/2013 18:31
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:31
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:31
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/21/2013 18:31
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:31
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:31
Benzene	U		0.00020	0.0010	mg/L	1	5/21/2013 18:31
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/21/2013 18:31
Chloroform	U		0.00030	0.0010	mg/L	1	5/21/2013 18:31
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/21/2013 18:31
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/21/2013 18:31
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/21/2013 18:31
Toluene	U		0.00030	0.0010	mg/L	1	5/21/2013 18:31
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/21/2013 18:31
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/21/2013 18:31
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/21/2013 18:31
Surr: 1,2-Dichloroethane-d4	*106*			*71-125*	*%REC*	1	5/21/2013 18:31
Surr: 4-Bromofluorobenzene	*100*			*70-125*	*%REC*	1	5/21/2013 18:31
Surr: Dibromofluoromethane	*99.0*			*74-125*	*%REC*	1	5/21/2013 18:31
Surr: Toluene-d8	*97.4*			*78-123*	*%REC*	1	5/21/2013 18:31
MISCELLANEOUS ANALYSIS		Method: **NA**					Analyst: **SUB**
Miscellaneous Analysis	**See Attached**		**0**			1	6/12/2013
ANIONS - EPA 300.0 (1993)		Method: **E300**					Analyst: **JKP**
Chloride	**287**		**20**	**50.0**	**mg/L**	100	5/23/2013 22:40
Fluoride	**5.39**		**0.050**	**0.100**	**mg/L**	1	5/24/2013 12:25
Sulfate	**2,250**		**20**	**50.0**	**mg/L**	100	5/23/2013 22:40
Nitrate/Nitrite (as N)	**2.09**		**0.30**	**2.00**	**mg/L**	10	5/22/2013 18:30
Surr: Selenate (surr)	*103*			*85-115*	*%REC*	10	5/22/2013 18:30
Surr: Selenate (surr)	*94.6*			*85-115*	*%REC*	100	5/23/2013 22:40
Surr: Selenate (surr)	*95.9*			*85-115*	*%REC*	1	5/24/2013 12:25
CYANIDE - SM4500CN E		Method: **M4500CN E&G**					Analyst: **EDG**
Cyanide	U		0.0040	0.0200	mg/L	1	5/22/2013 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-118
Collection Date: 5/15/2013 06:30 PM

Work Order: 1305797
Lab ID: 1305797-04
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **KAH**
Total Dissolved Solids (Residue, Filterable)	**5,090**		**5.0**	**10.0**	**mg/L**	1	5/22/2013 09:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-119
Collection Date: 5/15/2013 06:10 PM

Work Order: 1305797
Lab ID: 1305797-05
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO			Method: **SW8015M**		Prep: SW3511 / 5/20/13		Analyst: **RPM**
TPH (Diesel Range)	U		0.021	0.052	mg/L	1	5/22/2013 17:16
TPH (Oil Range)	U		0.041	0.10	mg/L	1	5/22/2013 17:16
Surr: 2-Fluorobiphenyl	*101*			*60-135*	*%REC*	1	5/22/2013 17:16
GASOLINE RANGE ORGANICS - SW8015C			Method: **SW8015**				Analyst: **RPM**
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	5/24/2013 02:31
Surr: 4-Bromofluorobenzene	*104*			*70-130*	*%REC*	1	5/24/2013 02:31
DISSOLVED MERCURY BY 7470A			Method: **SW7470**		Prep: SW7470 / 5/20/13		Analyst: **OFO**
Mercury	U		0.000042	0.000200	mg/L	1	5/20/2013 14:31
DISSOLVED METALS			Method: **SW6020**		Prep: SW3010A / 5/20/13		Analyst: **ALR**
Aluminum	**0.0296**		**0.0040**	**0.0100**	**mg/L**	1	5/22/2013 08:10
Arsenic	**0.00537**		**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:10
Barium	**0.00625**		**0.00090**	**0.00500**	**mg/L**	1	5/22/2013 08:10
Boron	**0.130**		**0.040**	**0.100**	**mg/L**	2	5/22/2013 16:21
Cadmium	U		0.00080	0.00200	mg/L	1	5/22/2013 08:10
Calcium	**491**		**0.86**	**5.00**	**mg/L**	10	5/22/2013 05:36
Chromium	U		0.0010	0.00500	mg/L	1	5/22/2013 08:10
Cobalt	U		0.00080	0.00500	mg/L	1	5/22/2013 08:10
Copper	**0.00137**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:10
Iron	U		0.078	0.200	mg/L	1	5/22/2013 08:10
Lead	U		0.00070	0.00500	mg/L	1	5/22/2013 08:10
Manganese	U		0.0025	0.00500	mg/L	1	5/22/2013 08:10
Molybdenum	**0.00745**		**0.0015**	**0.00500**	**mg/L**	1	5/22/2013 08:10
Nickel	**0.00163**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:10
Potassium	**0.794**		**0.084**	**0.200**	**mg/L**	1	5/22/2013 08:10
Selenium	**0.00506**		**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:10
Silver	U		0.00080	0.00500	mg/L	1	5/22/2013 08:10
Sodium	**120**		**0.085**	**0.200**	**mg/L**	1	5/22/2013 08:10
Uranium	**0.0222**		**0.0050**	**0.00500**	**mg/L**	1	5/22/2013 08:10
Zinc	U		0.0025	0.00500	mg/L	1	5/22/2013 08:10
LOW-LEVEL SEMIVOLATILES			Method: **SW8270**		Prep: SW3510 / 5/20/13		Analyst: **ACN**
1-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/22/2013 22:06
2-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/22/2013 22:06
Benzo(a)pyrene	U		0.000050	0.00020	mg/L	1	5/22/2013 22:06
Naphthalene	U		0.000050	0.00020	mg/L	1	5/22/2013 22:06
Surr: 2,4,6-Tribromophenol	*0*			*34-129*	*%REC*	1	5/22/2013 22:06
Surr: 2-Fluorobiphenyl	*0*			*40-125*	*%REC*	1	5/22/2013 22:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-119
Collection Date: 5/15/2013 06:10 PM

Work Order: 1305797
Lab ID: 1305797-05
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	*0*			*20-120*	*%REC*	1	5/22/2013 22:06
Surr: 4-Terphenyl-d14	*0*			*40-135*	*%REC*	1	5/22/2013 22:06
Surr: Nitrobenzene-d5	*0*			*41-120*	*%REC*	1	5/22/2013 22:06
Surr: Phenol-d6	*0*			*20-120*	*%REC*	1	5/22/2013 22:06
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:57
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/21/2013 18:57
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:57
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:57
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/21/2013 18:57
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:57
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 18:57
Benzene	U		0.00020	0.0010	mg/L	1	5/21/2013 18:57
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/21/2013 18:57
Chloroform	U		0.00030	0.0010	mg/L	1	5/21/2013 18:57
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/21/2013 18:57
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/21/2013 18:57
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/21/2013 18:57
Toluene	U		0.00030	0.0010	mg/L	1	5/21/2013 18:57
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/21/2013 18:57
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/21/2013 18:57
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/21/2013 18:57
Surr: 1,2-Dichloroethane-d4	*105*			*71-125*	*%REC*	1	5/21/2013 18:57
Surr: 4-Bromofluorobenzene	*100*			*70-125*	*%REC*	1	5/21/2013 18:57
Surr: Dibromofluoromethane	*102*			*74-125*	*%REC*	1	5/21/2013 18:57
Surr: Toluene-d8	*97.5*			*78-123*	*%REC*	1	5/21/2013 18:57
MISCELLANEOUS ANALYSIS		Method: **NA**					Analyst: **SUB**
Miscellaneous Analysis	**See Attached**		**0**			1	6/12/2013
ANIONS - EPA 300.0 (1993)		Method: **E300**					Analyst: **JKP**
Chloride	**118**		**20**	**50.0**	**mg/L**	100	5/23/2013 22:55
Fluoride	**2.43**		**0.050**	**0.100**	**mg/L**	1	5/24/2013 12:39
Sulfate	**1,970**		**20**	**50.0**	**mg/L**	100	5/23/2013 22:55
Nitrate/Nitrite (as N)	**1.91**	J	**0.30**	**2.00**	**mg/L**	10	5/22/2013 18:45
Surr: Selenate (surr)	*105*			*85-115*	*%REC*	10	5/22/2013 18:45
Surr: Selenate (surr)	*98.5*			*85-115*	*%REC*	100	5/23/2013 22:55
Surr: Selenate (surr)	*96.0*			*85-115*	*%REC*	1	5/24/2013 12:39
CYANIDE - SM4500CN E		Method: **M4500CN E&G**					Analyst: **EDG**
Cyanide	U		0.0040	0.0200	mg/L	1	5/22/2013 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-119
Collection Date: 5/15/2013 06:10 PM

Work Order: 1305797
Lab ID: 1305797-05
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **KAH**
Total Dissolved Solids (Residue, Filterable)	**4,030**		**5.0**	**10.0**	**mg/L**	1	5/22/2013 09:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: DUP-03
Collection Date: 5/15/2013 12:01 AM

Work Order: 1305797
Lab ID: 1305797-06
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO		Method: **SW8015M**			Prep: SW3511 / 5/20/13		Analyst: **RPM**
TPH (Diesel Range)	U		0.021	0.052	mg/L	1	5/22/2013 18:09
TPH (Oil Range)	U		0.042	0.10	mg/L	1	5/22/2013 18:09
Surr: 2-Fluorobiphenyl	*87.4*			*60-135*	*%REC*	1	5/22/2013 18:09
GASOLINE RANGE ORGANICS - SW8015C		Method: **SW8015**					Analyst: **RPM**
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	5/24/2013 03:25
Surr: 4-Bromofluorobenzene	*103*			*70-130*	*%REC*	1	5/24/2013 03:25
DISSOLVED MERCURY BY 7470A		Method: **SW7470**			Prep: SW7470 / 5/20/13		Analyst: **OFO**
Mercury	U		0.000042	0.000200	mg/L	1	5/20/2013 14:33
DISSOLVED METALS		Method: **SW6020**			Prep: SW3010A / 5/20/13		Analyst: **ALR**
Aluminum	**0.00865**	J	**0.0040**	**0.0100**	**mg/L**	1	5/22/2013 08:16
Arsenic	**0.00427**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:16
Barium	**0.0110**		**0.00090**	**0.00500**	**mg/L**	1	5/22/2013 08:16
Boron	**0.635**		**0.040**	**0.100**	**mg/L**	2	5/22/2013 16:26
Cadmium	U		0.00080	0.00200	mg/L	1	5/22/2013 08:16
Calcium	**495**		**0.86**	**5.00**	**mg/L**	10	5/22/2013 05:41
Chromium	U		0.0010	0.00500	mg/L	1	5/22/2013 08:16
Cobalt	U		0.00080	0.00500	mg/L	1	5/22/2013 08:16
Copper	**0.00151**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:16
Iron	U		0.078	0.200	mg/L	1	5/22/2013 08:16
Lead	U		0.00070	0.00500	mg/L	1	5/22/2013 08:16
Manganese	**0.0230**		**0.0025**	**0.00500**	**mg/L**	1	5/22/2013 08:16
Molybdenum	**0.00723**		**0.0015**	**0.00500**	**mg/L**	1	5/22/2013 08:16
Nickel	**0.00225**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:16
Potassium	**0.766**		**0.084**	**0.200**	**mg/L**	1	5/22/2013 08:16
Selenium	**0.00734**		**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:16
Silver	U		0.00080	0.00500	mg/L	1	5/22/2013 08:16
Sodium	**201**		**0.85**	**2.00**	**mg/L**	10	5/22/2013 05:41
Uranium	**0.0731**		**0.0050**	**0.00500**	**mg/L**	1	5/22/2013 08:16
Zinc	U		0.0025	0.00500	mg/L	1	5/22/2013 08:16
LOW-LEVEL SEMIVOLATILES		Method: **SW8270**			Prep: SW3510 / 5/20/13		Analyst: **ACN**
1-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 10:18
2-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 10:18
Benzo(a)pyrene	U		0.000050	0.00020	mg/L	1	5/21/2013 10:18
Naphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 10:18
Surr: 2,4,6-Tribromophenol	*0*			*34-129*	*%REC*	1	5/21/2013 10:18
Surr: 2-Fluorobiphenyl	*0*			*40-125*	*%REC*	1	5/21/2013 10:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: DUP-03
Collection Date: 5/15/2013 12:01 AM

Work Order: 1305797
Lab ID: 1305797-06
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	*0*			*20-120*	*%REC*	1	5/21/2013 10:18
Surr: 4-Terphenyl-d14	*0*			*40-135*	*%REC*	1	5/21/2013 10:18
Surr: Nitrobenzene-d5	*0*			*41-120*	*%REC*	1	5/21/2013 10:18
Surr: Phenol-d6	*0*			*20-120*	*%REC*	1	5/21/2013 10:18
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 19:24
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/21/2013 19:24
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 19:24
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 19:24
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/21/2013 19:24
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/21/2013 19:24
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 19:24
Benzene	U		0.00020	0.0010	mg/L	1	5/21/2013 19:24
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/21/2013 19:24
Chloroform	U		0.00030	0.0010	mg/L	1	5/21/2013 19:24
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/21/2013 19:24
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/21/2013 19:24
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/21/2013 19:24
Toluene	U		0.00030	0.0010	mg/L	1	5/21/2013 19:24
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/21/2013 19:24
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/21/2013 19:24
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/21/2013 19:24
Surr: 1,2-Dichloroethane-d4	*107*			*71-125*	*%REC*	1	5/21/2013 19:24
Surr: 4-Bromofluorobenzene	*100*			*70-125*	*%REC*	1	5/21/2013 19:24
Surr: Dibromofluoromethane	*102*			*74-125*	*%REC*	1	5/21/2013 19:24
Surr: Toluene-d8	*97.6*			*78-123*	*%REC*	1	5/21/2013 19:24
MISCELLANEOUS ANALYSIS		Method: **NA**					Analyst: **SUB**
Miscellaneous Analysis	**See Attached**		**0**			1	6/12/2013
ANIONS - EPA 300.0 (1993)		Method: **E300**					Analyst: **JKP**
Chloride	**364**		**20**	**50.0**	**mg/L**	100	5/23/2013 23:09
Fluoride	**1.15**		**0.050**	**0.100**	**mg/L**	1	5/24/2013 15:29
Sulfate	**2,420**		**20**	**50.0**	**mg/L**	100	5/23/2013 23:09
Nitrate/Nitrite (as N)	U		0.30	2.00	mg/L	10	5/22/2013 19:00
Surr: Selenate (surr)	*104*			*85-115*	*%REC*	10	5/22/2013 19:00
Surr: Selenate (surr)	*98.6*			*85-115*	*%REC*	100	5/23/2013 23:09
Surr: Selenate (surr)	*95.6*			*85-115*	*%REC*	1	5/24/2013 15:29
CYANIDE - SM4500CN E		Method: **M4500CN E&G**					Analyst: **EDG**
Cyanide	U		0.0040	0.0200	mg/L	1	5/22/2013 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: DUP-03
Collection Date: 5/15/2013 12:01 AM

Work Order: 1305797
Lab ID: 1305797-06
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **JKP**
Total Dissolved Solids (Residue, Filterable)	**4,990**		**5.0**	**10.0**	**mg/L**	1	5/21/2013 10:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-116
Collection Date: 5/16/2013 10:15 AM

Work Order: 1305797
Lab ID: 1305797-07
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO		Method: **SW8015M**			Prep: SW3511 / 5/20/13		Analyst: **RPM**
TPH (Diesel Range)	U		0.021	0.052	mg/L	1	5/22/2013 16:49
TPH (Oil Range)	U		0.041	0.10	mg/L	1	5/22/2013 16:49
Surr: 2-Fluorobiphenyl	*105*			*60-135*	*%REC*	1	5/22/2013 16:49
GASOLINE RANGE ORGANICS - SW8015C		Method: **SW8015**					Analyst: **RPM**
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	5/24/2013 03:43
Surr: 4-Bromofluorobenzene	*103*			*70-130*	*%REC*	1	5/24/2013 03:43
DISSOLVED MERCURY BY 7470A		Method: **SW7470**			Prep: SW7470 / 5/20/13		Analyst: **OFO**
Mercury	**0.0000460**	J	**0.000042**	**0.000200**	**mg/L**	1	5/20/2013 14:35
DISSOLVED METALS		Method: **SW6020**			Prep: SW3010A / 5/20/13		Analyst: **ALR**
Aluminum	**0.349**		**0.0040**	**0.0100**	**mg/L**	1	5/22/2013 08:21
Arsenic	**0.00502**		**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:21
Barium	**0.0111**		**0.00090**	**0.00500**	**mg/L**	1	5/22/2013 08:21
Boron	**0.238**		**0.040**	**0.100**	**mg/L**	2	5/22/2013 16:31
Cadmium	U		0.00080	0.00200	mg/L	1	5/22/2013 08:21
Calcium	**578**		**0.86**	**5.00**	**mg/L**	10	5/22/2013 05:47
Chromium	**0.00119**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:21
Cobalt	U		0.00080	0.00500	mg/L	1	5/22/2013 08:21
Copper	**0.00176**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:21
Iron	**0.201**		**0.078**	**0.200**	**mg/L**	1	5/22/2013 08:21
Lead	U		0.0014	0.0100	mg/L	2	5/22/2013 16:31
Manganese	**0.0342**		**0.0025**	**0.00500**	**mg/L**	1	5/22/2013 08:21
Molybdenum	**0.00308**	J	**0.0015**	**0.00500**	**mg/L**	1	5/22/2013 08:21
Nickel	**0.00204**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:21
Potassium	**1.38**		**0.084**	**0.200**	**mg/L**	1	5/22/2013 08:21
Selenium	**0.00733**		**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 08:21
Silver	U		0.00080	0.00500	mg/L	1	5/22/2013 08:21
Sodium	**194**		**0.85**	**2.00**	**mg/L**	10	5/22/2013 05:47
Uranium	**0.0343**		**0.010**	**0.0100**	**mg/L**	2	5/22/2013 16:31
Zinc	U		0.0025	0.00500	mg/L	1	5/22/2013 08:21
LOW-LEVEL SEMIVOLATILES		Method: **SW8270**			Prep: SW3510 / 5/20/13		Analyst: **ACN**
1-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 10:39
2-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 10:39
Benzo(a)pyrene	U		0.000050	0.00020	mg/L	1	5/21/2013 10:39
Naphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 10:39
Surr: 2,4,6-Tribromophenol	*0*			*34-129*	*%REC*	1	5/21/2013 10:39
Surr: 2-Fluorobiphenyl	*0*			*40-125*	*%REC*	1	5/21/2013 10:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-116
Collection Date: 5/16/2013 10:15 AM

Work Order: 1305797
Lab ID: 1305797-07
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	*0*			*20-120*	*%REC*	1	5/21/2013 10:39
Surr: 4-Terphenyl-d14	*0*			*40-135*	*%REC*	1	5/21/2013 10:39
Surr: Nitrobenzene-d5	*0*			*41-120*	*%REC*	1	5/21/2013 10:39
Surr: Phenol-d6	*0*			*20-120*	*%REC*	1	5/21/2013 10:39
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 19:50
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/21/2013 19:50
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 19:50
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 19:50
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/21/2013 19:50
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/21/2013 19:50
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 19:50
Benzene	U		0.00020	0.0010	mg/L	1	5/21/2013 19:50
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/21/2013 19:50
Chloroform	U		0.00030	0.0010	mg/L	1	5/21/2013 19:50
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/21/2013 19:50
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/21/2013 19:50
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/21/2013 19:50
Toluene	U		0.00030	0.0010	mg/L	1	5/21/2013 19:50
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/21/2013 19:50
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/21/2013 19:50
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/21/2013 19:50
Surr: 1,2-Dichloroethane-d4	*107*			*71-125*	*%REC*	1	5/21/2013 19:50
Surr: 4-Bromofluorobenzene	*100*			*70-125*	*%REC*	1	5/21/2013 19:50
Surr: Dibromofluoromethane	*100*			*74-125*	*%REC*	1	5/21/2013 19:50
Surr: Toluene-d8	*97.1*			*78-123*	*%REC*	1	5/21/2013 19:50
MISCELLANEOUS ANALYSIS		Method: **NA**					Analyst: **SUB**
Miscellaneous Analysis	**See Attached**		**0**			1	6/12/2013
ANIONS - EPA 300.0 (1993)		Method: **E300**					Analyst: **JKP**
Chloride	**330**		**20**	**50.0**	**mg/L**	100	5/23/2013 23:24
Fluoride	**1.19**		**0.050**	**0.100**	**mg/L**	1	5/24/2013 12:54
Sulfate	**2,080**		**20**	**50.0**	**mg/L**	100	5/23/2013 23:24
Nitrate/Nitrite (as N)	U		0.30	2.00	mg/L	10	5/22/2013 19:43
Surr: Selenate (surr)	*105*			*85-115*	*%REC*	10	5/22/2013 19:43
Surr: Selenate (surr)	*97.2*			*85-115*	*%REC*	100	5/23/2013 23:24
Surr: Selenate (surr)	*92.1*			*85-115*	*%REC*	1	5/24/2013 12:54
CYANIDE - SM4500CN E		Method: **M4500CN E&G**					Analyst: **EDG**
Cyanide	U		0.0040	0.0200	mg/L	1	5/22/2013 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: MW-116
Collection Date: 5/16/2013 10:15 AM

Work Order: 1305797
Lab ID: 1305797-07
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **KAH**
Total Dissolved Solids (Residue, Filterable)	**4,480**		**5.0**	**10.0**	**mg/L**	1	5/22/2013 09:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: EQB-03
Collection Date: 5/16/2013 11:40 AM

Work Order: 1305797
Lab ID: 1305797-08
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO		Method: **SW8015M**			Prep: SW3511 / 5/20/13		Analyst: **RPM**
TPH (Diesel Range)	U		0.021	0.053	mg/L	1	5/22/2013 13:41
TPH (Oil Range)	U		0.042	0.11	mg/L	1	5/22/2013 13:41
Surr: 2-Fluorobiphenyl	*95.2*			*60-135*	*%REC*	1	5/22/2013 13:41
GASOLINE RANGE ORGANICS - SW8015C		Method: **SW8015**					Analyst: **RPM**
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	5/24/2013 04:01
Surr: 4-Bromofluorobenzene	*102*			*70-130*	*%REC*	1	5/24/2013 04:01
DISSOLVED MERCURY BY 7470A		Method: **SW7470**			Prep: SW7470 / 5/20/13		Analyst: **OFO**
Mercury	U		0.000042	0.000200	mg/L	1	5/20/2013 14:37
DISSOLVED METALS		Method: **SW6020**			Prep: SW3010A / 5/20/13		Analyst: **ALR**
Aluminum	**0.00413**	J	**0.0040**	**0.0100**	**mg/L**	1	5/22/2013 06:03
Arsenic	U		0.0010	0.00500	mg/L	1	5/22/2013 06:03
Barium	U		0.00090	0.00500	mg/L	1	5/22/2013 06:03
Boron	U		0.020	0.0500	mg/L	1	5/22/2013 15:46
Cadmium	U		0.00080	0.00200	mg/L	1	5/22/2013 06:03
Calcium	U		0.086	0.500	mg/L	1	5/22/2013 06:03
Chromium	U		0.0010	0.00500	mg/L	1	5/22/2013 06:03
Cobalt	U		0.00080	0.00500	mg/L	1	5/22/2013 06:03
Copper	U		0.0010	0.00500	mg/L	1	5/22/2013 06:03
Iron	U		0.078	0.200	mg/L	1	5/22/2013 06:03
Lead	U		0.00070	0.00500	mg/L	1	5/22/2013 06:03
Manganese	U		0.0025	0.00500	mg/L	1	5/22/2013 06:03
Molybdenum	U		0.0015	0.00500	mg/L	1	5/22/2013 06:03
Nickel	U		0.0010	0.00500	mg/L	1	5/22/2013 06:03
Potassium	U		0.084	0.200	mg/L	1	5/22/2013 06:03
Selenium	**0.00116**	J	**0.0010**	**0.00500**	**mg/L**	1	5/22/2013 06:03
Silver	U		0.00080	0.00500	mg/L	1	5/22/2013 06:03
Sodium	U		0.085	0.200	mg/L	1	5/22/2013 06:03
Uranium	U		0.0050	0.00500	mg/L	1	5/22/2013 06:03
Zinc	**0.00463**	J	**0.0025**	**0.00500**	**mg/L**	1	5/22/2013 06:03
LOW-LEVEL SEMIVOLATILES		Method: **SW8270**			Prep: SW3510 / 5/20/13		Analyst: **ACN**
1-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 10:59
2-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 10:59
Benzo(a)pyrene	U		0.000050	0.00020	mg/L	1	5/21/2013 10:59
Naphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 10:59
Surr: 2,4,6-Tribromophenol	*0*			*34-129*	*%REC*	1	5/21/2013 10:59
Surr: 2-Fluorobiphenyl	*0*			*40-125*	*%REC*	1	5/21/2013 10:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: EQB-03
Collection Date: 5/16/2013 11:40 AM

Work Order: 1305797
Lab ID: 1305797-08
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	*0*			*20-120*	*%REC*	1	5/21/2013 10:59
Surr: 4-Terphenyl-d14	*0*			*40-135*	*%REC*	1	5/21/2013 10:59
Surr: Nitrobenzene-d5	*0*			*41-120*	*%REC*	1	5/21/2013 10:59
Surr: Phenol-d6	*0*			*20-120*	*%REC*	1	5/21/2013 10:59
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:03
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/22/2013 01:03
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:03
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:03
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/22/2013 01:03
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:03
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:03
Benzene	U		0.00020	0.0010	mg/L	1	5/22/2013 01:03
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/22/2013 01:03
Chloroform	U		0.00030	0.0010	mg/L	1	5/22/2013 01:03
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/22/2013 01:03
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/22/2013 01:03
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/22/2013 01:03
Toluene	**0.00039**	J	**0.00030**	**0.0010**	**mg/L**	1	5/22/2013 01:03
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/22/2013 01:03
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/22/2013 01:03
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/22/2013 01:03
Surr: 1,2-Dichloroethane-d4	*103*			*71-125*	*%REC*	1	5/22/2013 01:03
Surr: 4-Bromofluorobenzene	*101*			*70-125*	*%REC*	1	5/22/2013 01:03
Surr: Dibromofluoromethane	*101*			*74-125*	*%REC*	1	5/22/2013 01:03
Surr: Toluene-d8	*97.7*			*78-123*	*%REC*	1	5/22/2013 01:03
MISCELLANEOUS ANALYSIS		Method: **NA**					Analyst: **SUB**
Miscellaneous Analysis	**See Attached**		**0**			1	6/12/2013
ANIONS - EPA 300.0 (1993)		Method: **E300**					Analyst: **JKP**
Chloride	U		0.20	0.500	mg/L	1	5/23/2013 23:38
Fluoride	U		0.050	0.100	mg/L	1	5/23/2013 23:38
Sulfate	**0.329**	J	**0.20**	**0.500**	**mg/L**	1	5/23/2013 23:38
Nitrate/Nitrite (as N)	U		0.30	2.00	mg/L	10	5/22/2013 19:58
Surr: Selenate (surr)	*87.7*			*85-115*	*%REC*	10	5/22/2013 19:58
Surr: Selenate (surr)	*98.0*			*85-115*	*%REC*	1	5/23/2013 23:38
CYANIDE - SM4500CN E		Method: **M4500CN E&G**					Analyst: **EDG**
Cyanide	U		0.0040	0.0200	mg/L	1	5/22/2013 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: EQB-03
Collection Date: 5/16/2013 11:40 AM

Work Order: 1305797
Lab ID: 1305797-08
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **KAH**
Total Dissolved Solids (Residue, Filterable)	**50.0**		**5.0**	**10.0**	**mg/L**	1	5/23/2013 09:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: RO Discharge
Collection Date: 5/16/2013 08:30 AM

Work Order: 1305797
Lab ID: 1305797-09
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO		Method: **SW8015M**			Prep: SW3511 / 5/20/13		Analyst: **RPM**
TPH (Diesel Range)	U		0.021	0.053	mg/L	1	5/22/2013 15:01
TPH (Oil Range)	U		0.042	0.11	mg/L	1	5/22/2013 15:01
Surr: 2-Fluorobiphenyl	*106*			*60-135*	*%REC*	1	5/22/2013 15:01
GASOLINE RANGE ORGANICS - SW8015C		Method: **SW8015**					Analyst: **RPM**
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	5/24/2013 04:19
Surr: 4-Bromofluorobenzene	*103*			*70-130*	*%REC*	1	5/24/2013 04:19
DISSOLVED MERCURY BY 7470A		Method: **SW7470**			Prep: SW7470 / 5/20/13		Analyst: **OFO**
Mercury	U		0.000042	0.000200	mg/L	1	5/20/2013 14:39
DISSOLVED METALS		Method: **SW6020**			Prep: SW3010A / 5/20/13		Analyst: **ALR**
Aluminum	**0.00529**	J	**0.0040**	**0.0100**	**mg/L**	1	5/22/2013 08:27
Arsenic	**0.00250**	J	**0.0020**	**0.0100**	**mg/L**	2	5/22/2013 16:36
Barium	**0.0464**		**0.00090**	**0.00500**	**mg/L**	1	5/22/2013 08:27
Boron	**0.104**		**0.040**	**0.100**	**mg/L**	2	5/22/2013 16:36
Cadmium	U		0.00080	0.00200	mg/L	1	5/22/2013 08:27
Calcium	**397**		**0.86**	**5.00**	**mg/L**	10	5/22/2013 06:09
Chromium	U		0.0020	0.0100	mg/L	2	5/22/2013 16:36
Cobalt	U		0.0016	0.0100	mg/L	2	5/22/2013 16:36
Copper	U		0.0020	0.0100	mg/L	2	5/22/2013 16:36
Iron	U		0.16	0.400	mg/L	2	5/22/2013 16:36
Lead	U		0.0014	0.0100	mg/L	2	5/22/2013 16:36
Manganese	U		0.0050	0.0100	mg/L	2	5/22/2013 16:36
Molybdenum	**0.00622**		**0.0015**	**0.00500**	**mg/L**	1	5/22/2013 08:27
Nickel	U		0.0020	0.0100	mg/L	2	5/22/2013 16:36
Potassium	**2.91**		**0.084**	**0.200**	**mg/L**	1	5/22/2013 08:27
Selenium	**0.00750**	J	**0.0020**	**0.0100**	**mg/L**	2	5/22/2013 16:36
Silver	U		0.00080	0.00500	mg/L	1	5/22/2013 08:27
Sodium	**40.4**		**0.085**	**0.200**	**mg/L**	1	5/22/2013 08:27
Uranium	U		0.010	0.0100	mg/L	2	5/22/2013 16:36
Zinc	**0.00516**	J	**0.0050**	**0.0100**	**mg/L**	2	5/22/2013 16:36
LOW-LEVEL SEMIVOLATILES		Method: **SW8270**			Prep: SW3510 / 5/20/13		Analyst: **ACN**
1-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 11:20
2-Methylnaphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 11:20
Benzo(a)pyrene	U		0.000050	0.00020	mg/L	1	5/21/2013 11:20
Naphthalene	U		0.000050	0.00020	mg/L	1	5/21/2013 11:20
Surr: 2,4,6-Tribromophenol	*0*			*34-129*	*%REC*	1	5/21/2013 11:20
Surr: 2-Fluorobiphenyl	*0*			*40-125*	*%REC*	1	5/21/2013 11:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: RO Discharge
Collection Date: 5/16/2013 08:30 AM

Work Order: 1305797
Lab ID: 1305797-09
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	*0*			*20-120*	*%REC*	1	5/21/2013 11:20
Surr: 4-Terphenyl-d14	*0*			*40-135*	*%REC*	1	5/21/2013 11:20
Surr: Nitrobenzene-d5	*0*			*41-120*	*%REC*	1	5/21/2013 11:20
Surr: Phenol-d6	*0*			*20-120*	*%REC*	1	5/21/2013 11:20
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 20:16
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/21/2013 20:16
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 20:16
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 20:16
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/21/2013 20:16
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/21/2013 20:16
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 20:16
Benzene	U		0.00020	0.0010	mg/L	1	5/21/2013 20:16
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/21/2013 20:16
Chloroform	U		0.00030	0.0010	mg/L	1	5/21/2013 20:16
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/21/2013 20:16
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/21/2013 20:16
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/21/2013 20:16
Toluene	U		0.00030	0.0010	mg/L	1	5/21/2013 20:16
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/21/2013 20:16
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/21/2013 20:16
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/21/2013 20:16
Surr: 1,2-Dichloroethane-d4	*107*			*71-125*	*%REC*	1	5/21/2013 20:16
Surr: 4-Bromofluorobenzene	*99.9*			*70-125*	*%REC*	1	5/21/2013 20:16
Surr: Dibromofluoromethane	*99.6*			*74-125*	*%REC*	1	5/21/2013 20:16
Surr: Toluene-d8	*97.1*			*78-123*	*%REC*	1	5/21/2013 20:16
MISCELLANEOUS ANALYSIS		Method: **NA**					Analyst: **SUB**
Miscellaneous Analysis	**See Attached**		**0**			1	6/12/2013
ANIONS - EPA 300.0 (1993)		Method: **E300**					Analyst: **JKP**
Chloride	**38.2**		**0.20**	**0.500**	**mg/L**	1	5/24/2013 13:08
Fluoride	**2.15**		**0.050**	**0.100**	**mg/L**	1	5/24/2013 13:08
Sulfate	**1,080**		**20**	**50.0**	**mg/L**	100	5/23/2013 20:15
Nitrate/Nitrite (as N)	**2.11**		**0.30**	**2.00**	**mg/L**	10	5/22/2013 20:12
Surr: Selenate (surr)	*99.2*			*85-115*	*%REC*	10	5/22/2013 20:12
Surr: Selenate (surr)	*101*			*85-115*	*%REC*	100	5/23/2013 20:15
Surr: Selenate (surr)	*92.1*			*85-115*	*%REC*	1	5/24/2013 13:08
CYANIDE - SM4500CN E		Method: **M4500CN E&G**					Analyst: **EDG**
Cyanide	**0.00487**	J	**0.0040**	**0.0200**	**mg/L**	1	5/22/2013 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: RO Discharge
Collection Date: 5/16/2013 08:30 AM

Work Order: 1305797
Lab ID: 1305797-09
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **KAH**
Total Dissolved Solids (Residue, Filterable)	**2,410**		**5.0**	**10.0**	**mg/L**	1	5/23/2013 09:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: Trip Blank 050313-36
Collection Date: 5/16/2013

Work Order: 1305797
Lab ID: 1305797-10
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
LOW LEVEL VOLATILES - SW8260C	Method: **SW8260**						Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 15:27
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/21/2013 15:27
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 15:27
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 15:27
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/21/2013 15:27
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/21/2013 15:27
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 15:27
Benzene	U		0.00020	0.0010	mg/L	1	5/21/2013 15:27
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/21/2013 15:27
Chloroform	U		0.00030	0.0010	mg/L	1	5/21/2013 15:27
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/21/2013 15:27
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/21/2013 15:27
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/21/2013 15:27
Toluene	U		0.00030	0.0010	mg/L	1	5/21/2013 15:27
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/21/2013 15:27
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/21/2013 15:27
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/21/2013 15:27
Surr: 1,2-Dichloroethane-d4	*104*			*71-125*	*%REC*	1	5/21/2013 15:27
Surr: 4-Bromofluorobenzene	*103*			*70-125*	*%REC*	1	5/21/2013 15:27
Surr: Dibromofluoromethane	*102*			*74-125*	*%REC*	1	5/21/2013 15:27
Surr: Toluene-d8	*97.5*			*78-123*	*%REC*	1	5/21/2013 15:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: Trip Blank 050313-33
Collection Date: 5/16/2013

Work Order: 1305797
Lab ID: 1305797-11
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 15:50
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/21/2013 15:50
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 15:50
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 15:50
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/21/2013 15:50
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/21/2013 15:50
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 15:50
Benzene	U		0.00020	0.0010	mg/L	1	5/21/2013 15:50
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/21/2013 15:50
Chloroform	U		0.00030	0.0010	mg/L	1	5/21/2013 15:50
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/21/2013 15:50
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/21/2013 15:50
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/21/2013 15:50
Toluene	U		0.00030	0.0010	mg/L	1	5/21/2013 15:50
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/21/2013 15:50
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/21/2013 15:50
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/21/2013 15:50
Surr: 1,2-Dichloroethane-d4	*105*			*71-125*	*%REC*	1	5/21/2013 15:50
Surr: 4-Bromofluorobenzene	*101*			*70-125*	*%REC*	1	5/21/2013 15:50
Surr: Dibromofluoromethane	*103*			*74-125*	*%REC*	1	5/21/2013 15:50
Surr: Toluene-d8	*98.6*			*78-123*	*%REC*	1	5/21/2013 15:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: Trip Blank 050313-49
Collection Date: 5/16/2013

Work Order: 1305797
Lab ID: 1305797-12
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
LOW LEVEL VOLATILES - SW8260C	Method: **SW8260**						Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 16:15
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/21/2013 16:15
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 16:15
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 16:15
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/21/2013 16:15
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/21/2013 16:15
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/21/2013 16:15
Benzene	U		0.00020	0.0010	mg/L	1	5/21/2013 16:15
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/21/2013 16:15
Chloroform	U		0.00030	0.0010	mg/L	1	5/21/2013 16:15
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/21/2013 16:15
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/21/2013 16:15
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/21/2013 16:15
Toluene	U		0.00030	0.0010	mg/L	1	5/21/2013 16:15
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/21/2013 16:15
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/21/2013 16:15
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/21/2013 16:15
Surr: 1,2-Dichloroethane-d4	*106*			*71-125*	*%REC*	1	5/21/2013 16:15
Surr: 4-Bromofluorobenzene	*98.3*			*70-125*	*%REC*	1	5/21/2013 16:15
Surr: Dibromofluoromethane	*101*			*74-125*	*%REC*	1	5/21/2013 16:15
Surr: Toluene-d8	*95.9*			*78-123*	*%REC*	1	5/21/2013 16:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: Trip Blank 050313-43
Collection Date: 5/16/2013

Work Order: 1305797
Lab ID: 1305797-13
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
LOW LEVEL VOLATILES - SW8260C	Method: **SW8260**						Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:29
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/22/2013 01:29
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:29
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:29
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/22/2013 01:29
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:29
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:29
Benzene	U		0.00020	0.0010	mg/L	1	5/22/2013 01:29
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/22/2013 01:29
Chloroform	U		0.00030	0.0010	mg/L	1	5/22/2013 01:29
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/22/2013 01:29
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/22/2013 01:29
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/22/2013 01:29
Toluene	U		0.00030	0.0010	mg/L	1	5/22/2013 01:29
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/22/2013 01:29
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/22/2013 01:29
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/22/2013 01:29
Surr: 1,2-Dichloroethane-d4	*103*			*71-125*	*%REC*	1	5/22/2013 01:29
Surr: 4-Bromofluorobenzene	*99.8*			*70-125*	*%REC*	1	5/22/2013 01:29
Surr: Dibromofluoromethane	*101*			*74-125*	*%REC*	1	5/22/2013 01:29
Surr: Toluene-d8	*98.9*			*78-123*	*%REC*	1	5/22/2013 01:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: Trip Blank 050313-12
Collection Date: 5/16/2013

Work Order: 1305797
Lab ID: 1305797-14
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
LOW LEVEL VOLATILES - SW8260C	Method: **SW8260**						Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:55
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/22/2013 01:55
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:55
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:55
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/22/2013 01:55
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:55
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 01:55
Benzene	U		0.00020	0.0010	mg/L	1	5/22/2013 01:55
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/22/2013 01:55
Chloroform	U		0.00030	0.0010	mg/L	1	5/22/2013 01:55
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/22/2013 01:55
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/22/2013 01:55
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/22/2013 01:55
Toluene	U		0.00030	0.0010	mg/L	1	5/22/2013 01:55
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/22/2013 01:55
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/22/2013 01:55
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/22/2013 01:55
Surr: 1,2-Dichloroethane-d4	*103*			*71-125*	*%REC*	1	5/22/2013 01:55
Surr: 4-Bromofluorobenzene	*102*			*70-125*	*%REC*	1	5/22/2013 01:55
Surr: Dibromofluoromethane	*98.1*			*74-125*	*%REC*	1	5/22/2013 01:55
Surr: Toluene-d8	*98.3*			*78-123*	*%REC*	1	5/22/2013 01:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: Trip Blank 050313-34
Collection Date: 5/16/2013

Work Order: 1305797
Lab ID: 1305797-15
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 02:21
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/22/2013 02:21
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 02:21
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 02:21
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/22/2013 02:21
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/22/2013 02:21
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 02:21
Benzene	U		0.00020	0.0010	mg/L	1	5/22/2013 02:21
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/22/2013 02:21
Chloroform	U		0.00030	0.0010	mg/L	1	5/22/2013 02:21
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/22/2013 02:21
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/22/2013 02:21
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/22/2013 02:21
Toluene	U		0.00030	0.0010	mg/L	1	5/22/2013 02:21
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/22/2013 02:21
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/22/2013 02:21
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/22/2013 02:21
Surr: 1,2-Dichloroethane-d4	*107*			*71-125*	*%REC*	1	5/22/2013 02:21
Surr: 4-Bromofluorobenzene	*101*			*70-125*	*%REC*	1	5/22/2013 02:21
Surr: Dibromofluoromethane	*103*			*74-125*	*%REC*	1	5/22/2013 02:21
Surr: Toluene-d8	*96.3*			*78-123*	*%REC*	1	5/22/2013 02:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: Trip Blank 050313-14
Collection Date: 5/16/2013

Work Order: 1305797
Lab ID: 1305797-16
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 02:47
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/22/2013 02:47
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 02:47
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 02:47
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/22/2013 02:47
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/22/2013 02:47
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 02:47
Benzene	U		0.00020	0.0010	mg/L	1	5/22/2013 02:47
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/22/2013 02:47
Chloroform	U		0.00030	0.0010	mg/L	1	5/22/2013 02:47
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/22/2013 02:47
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/22/2013 02:47
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/22/2013 02:47
Toluene	U		0.00030	0.0010	mg/L	1	5/22/2013 02:47
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/22/2013 02:47
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/22/2013 02:47
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/22/2013 02:47
Surr: 1,2-Dichloroethane-d4	*104*			*71-125*	*%REC*	1	5/22/2013 02:47
Surr: 4-Bromofluorobenzene	*99.3*			*70-125*	*%REC*	1	5/22/2013 02:47
Surr: Dibromofluoromethane	*99.5*			*74-125*	*%REC*	1	5/22/2013 02:47
Surr: Toluene-d8	*96.3*			*78-123*	*%REC*	1	5/22/2013 02:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *12-Jun-13*

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
Sample ID: Trip Blank 050313-24
Collection Date: 5/16/2013

Work Order: 1305797
Lab ID: 1305797-17
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
LOW LEVEL VOLATILES - SW8260C		Method: **SW8260**					Analyst: **PC**
1,1,1-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 03:13
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	5/22/2013 03:13
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 03:13
1,1-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 03:13
1,1-Dichloroethene	U		0.00050	0.0010	mg/L	1	5/22/2013 03:13
1,2-Dibromoethane	U		0.00030	0.0010	mg/L	1	5/22/2013 03:13
1,2-Dichloroethane	U		0.00030	0.0010	mg/L	1	5/22/2013 03:13
Benzene	U		0.00020	0.0010	mg/L	1	5/22/2013 03:13
Carbon tetrachloride	U		0.00030	0.0010	mg/L	1	5/22/2013 03:13
Chloroform	U		0.00030	0.0010	mg/L	1	5/22/2013 03:13
Ethylbenzene	U		0.00030	0.0010	mg/L	1	5/22/2013 03:13
Methylene chloride	U		0.00040	0.0020	mg/L	1	5/22/2013 03:13
Tetrachloroethene	U		0.00040	0.0010	mg/L	1	5/22/2013 03:13
Toluene	U		0.00030	0.0010	mg/L	1	5/22/2013 03:13
Trichloroethene	U		0.00020	0.0010	mg/L	1	5/22/2013 03:13
Vinyl chloride	U		0.00040	0.0010	mg/L	1	5/22/2013 03:13
Xylenes, Total	U		0.00030	0.0010	mg/L	1	5/22/2013 03:13
Surr: 1,2-Dichloroethane-d4	*103*			*71-125*	*%REC*	1	5/22/2013 03:13
Surr: 4-Bromofluorobenzene	*101*			*70-125*	*%REC*	1	5/22/2013 03:13
Surr: Dibromofluoromethane	*102*			*74-125*	*%REC*	1	5/22/2013 03:13
Surr: Toluene-d8	*97.4*			*78-123*	*%REC*	1	5/22/2013 03:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **70151** Instrument ID **FID-16** Method: **SW8015M**

MBLK Sample ID: **LBLKW-130520-70151** Units: **mg/L** Analysis Date: **5/22/2013 10:34 AM**

Client ID: Run ID: **FID-16_130520A** SeqNo: **3228675** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	U	0.050								
TPH (Oil Range)	U	0.10								
Surr: 2-Fluorobiphenyl	0.06089	0.0050	*0.06061*	*0*	*100*	*60-135*	*0*			

LCS Sample ID: **LLCSW-130520-70151** Units: **mg/L** Analysis Date: **5/22/2013 11:01 AM**

Client ID: Run ID: **FID-16_130520A** SeqNo: **3228676** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.693	0.050	0.6061	0	114	70-130				
TPH (Oil Range)	0.5582	0.10	0.6061	0	92.1	70-130				
Surr: 2-Fluorobiphenyl	0.04578	0.0050	*0.06061*	*0*	*75.5*	*60-135*	*0*			

LCSD Sample ID: **LLCSDW-130520-70151** Units: **mg/L** Analysis Date: **5/22/2013 11:27 AM**

Client ID: Run ID: **FID-16_130520A** SeqNo: **3228677** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.7029	0.050	0.6061	0	116	70-130	0.693	1.43	20	
TPH (Oil Range)	0.5517	0.10	0.6061	0	91	70-130	0.5582	1.17	20	
Surr: 2-Fluorobiphenyl	0.04636	0.0050	*0.06061*	*0*	*76.5*	*60-135*	*0.04578*	*1.25*	*20*	

The following samples were analyzed in this batch:

1305797-01C	1305797-02C	1305797-03C
1305797-04C	1305797-05C	1305797-06C
1305797-07C	1305797-08C	1305797-09C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147859** Instrument ID **FID-9** Method: **SW8015**

MBLK Sample ID: **GBLKW-130523-R147859** Units: **mg/L** Analysis Date: **5/23/2013 04:46 PM**
Client ID: Run ID: **FID-9_130523A** SeqNo: **3228332** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	U	0.050								
Surr: 4-Bromofluorobenzene	0.1047	0.0050	*0.1*	*0*	*105*	*70-130*	*0*			

LCS Sample ID: **GLCSW-130523-R147859** Units: **mg/L** Analysis Date: **5/23/2013 04:07 PM**
Client ID: Run ID: **FID-9_130523A** SeqNo: **3228331** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.8025	0.050	1	0	80.3	70-130				
Surr: 4-Bromofluorobenzene	0.109	0.0050	*0.1*	*0*	*109*	*70-130*	*0*			

MS Sample ID: **1305797-01BMS** Units: **mg/L** Analysis Date: **5/24/2013 01:01 AM**
Client ID: **MW-114** Run ID: **FID-9_130523A** SeqNo: **3228334** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.7048	0.050	1	0	70.5	70-130				
Surr: 4-Bromofluorobenzene	0.1144	0.0050	*0.1*	*0*	*114*	*70-130*	*0*			

MSD Sample ID: **1305797-01BMSD** Units: **mg/L** Analysis Date: **5/24/2013 01:19 AM**
Client ID: **MW-114** Run ID: **FID-9_130523A** SeqNo: **3228335** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.707	0.050	1	0	70.7	70-130	0.7048	0.314	30	
Surr: 4-Bromofluorobenzene	0.1155	0.0050	*0.1*	*0*	*115*	*70-130*	*0.1144*	*0.892*	*30*	

The following samples were analyzed in this batch:

1305797-01B	1305797-02B	1305797-03B
1305797-04B	1305797-05B	1305797-06B
1305797-07B	1305797-08B	1305797-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **70093** Instrument ID **Mercury** Method: **SW7470** **(Dissolve)**

MBLK Sample ID: **GBLKW1-052013-70093** Units: **mg/L** Analysis Date: **5/20/2013 01:31 PM**
Client ID: Run ID: **MERCURY_130520A** SeqNo: **3222135** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.00020								

LCS Sample ID: **GLCSW1-052013-70093** Units: **mg/L** Analysis Date: **5/20/2013 01:45 PM**
Client ID: Run ID: **MERCURY_130520A** SeqNo: **3222136** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00512	0.00020	0.005	0	102	80-120				

MS Sample ID: **1305631-01CMS** Units: **mg/L** Analysis Date: **5/20/2013 01:56 PM**
Client ID: Run ID: **MERCURY_130520A** SeqNo: **3222139** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00505	0.00020	0.005	0.000018	101	80-120				

MSD Sample ID: **1305631-01CMSD** Units: **mg/L** Analysis Date: **5/20/2013 01:58 PM**
Client ID: Run ID: **MERCURY_130520A** SeqNo: **3222140** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00503	0.00020	0.005	0.000018	100	80-120	0.00505	0.397	20	

DUP Sample ID: **1305631-01CDUP** Units: **mg/L** Analysis Date: **5/20/2013 01:48 PM**
Client ID: Run ID: **MERCURY_130520A** SeqNo: **3222138** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.00020					0.000018	0	20	

The following samples were analyzed in this batch:

1305797-01E	1305797-02E	1305797-03E
1305797-04E	1305797-05E	1305797-06E
1305797-07E	1305797-08E	1305797-09E

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **70138** Instrument ID **ICP7500** Method: **SW6020** **(Dissolve)**

MBLK Sample ID: **MBLKW4-052013-70138** Units: **mg/L** Analysis Date: **5/20/2013 10:19 PM**
Client ID: Run ID: **ICP7500_130520A** SeqNo: **3222965** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.0050								
Barium	U	0.0050								
Cadmium	U	0.0020								
Calcium	U	0.50								
Chromium	U	0.0050								
Cobalt	U	0.0050								
Copper	U	0.0050								
Iron	U	0.20								
Lead	U	0.0050								
Manganese	U	0.0050								
Nickel	U	0.0050								
Selenium	U	0.0050								

MBLK Sample ID: **MBLKW4-052013-70138** Units: **mg/L** Analysis Date: **5/21/2013 02:58 PM**
Client ID: Run ID: **ICP7500_130521A** SeqNo: **3223790** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.00464	0.010								J
Boron	U	0.050								
Molybdenum	U	0.0050								
Potassium	U	0.20								
Silver	U	0.0050								
Sodium	U	0.20								
Uranium	U	0.0050								
Zinc	U	0.0050								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **70138** Instrument ID **ICP7500** Method: **SW6020** **(Dissolve)**

LCS Sample ID: **MLCSW4-052013-70138** Units: **mg/L** Analysis Date: **5/20/2013 10:24 PM**
Client ID: Run ID: **ICP7500_130520A** SeqNo: **3222969** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05045	0.0050	0.05	0	101	80-120				
Barium	0.0525	0.0050	0.05	0	105	80-120				
Cadmium	0.04981	0.0020	0.05	0	99.6	80-120				
Calcium	5.25	0.50	5	0	105	80-120				
Chromium	0.05135	0.0050	0.05	0	103	80-120				
Cobalt	0.05146	0.0050	0.05	0	103	80-120				
Copper	0.05218	0.0050	0.05	0	104	80-120				
Iron	5.323	0.20	5	0	106	80-120				
Lead	0.04737	0.0050	0.05	0	94.7	80-120				
Manganese	0.052	0.0050	0.05	0	104	80-120				
Nickel	0.05069	0.0050	0.05	0	101	80-120				
Selenium	0.05101	0.0050	0.05	0	102	80-120				

LCS Sample ID: **MLCSW4-052013-70138** Units: **mg/L** Analysis Date: **5/21/2013 02:53 PM**
Client ID: Run ID: **ICP7500_130521A** SeqNo: **3223789** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1153	0.010	0.1	0	115	80-120				
Boron	0.4901	0.050	0.5	0	98	80-120				
Molybdenum	0.04916	0.0050	0.05	0	98.3	80-120				
Potassium	5.131	0.20	5	0	103	80-120				
Silver	0.0508	0.0050	0.05	0	102	80-120				
Sodium	5.159	0.20	5	0	103	80-120				
Uranium	0.09877	0.0050	0.1	0	98.8	80-120				
Zinc	0.05252	0.0050	0.05	0	105	80-120				

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **70138** Instrument ID **ICP7500** Method: **SW6020** **(Dissolve)**

MS Sample ID: **1305631-07CMS** Units: **mg/L** Analysis Date: **5/20/2013 10:44 PM**
Client ID: Run ID: **ICP7500_130520A** SeqNo: **3222974** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05694	0.0050	0.05	0.002342	109	75-125				
Barium	0.06849	0.0050	0.05	0.01582	105	75-125				
Cadmium	0.04942	0.0020	0.05	0.000278	98.3	75-125				
Calcium	622.4	0.50	5	642.3	-398	75-125				SEO
Chromium	0.04974	0.0050	0.05	0.0009524	97.6	75-125				
Cobalt	0.05029	0.0050	0.05	0.00002101	101	75-125				
Copper	0.04902	0.0050	0.05	0.0005997	96.8	75-125				
Iron	5.278	0.20	5	0.01389	105	75-125				
Lead	0.04983	0.0050	0.05	0.0003501	99	75-125				
Manganese	0.08107	0.0050	0.05	0.03229	97.6	75-125				
Nickel	0.05048	0.0050	0.05	0.002087	96.8	75-125				
Selenium	0.0626	0.0050	0.05	0.0009735	123	75-125				

MS Sample ID: **1305631-07CMS** Units: **mg/L** Analysis Date: **5/21/2013 03:28 PM**
Client ID: Run ID: **ICP7500_130521A** SeqNo: **3224005** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1547	0.010	0.1	0.04429	110	75-125				
Boron	1.364	0.050	0.5	0.8347	106	75-125				
Molybdenum	0.05301	0.0050	0.05	0.002711	101	75-125				
Potassium	9.398	0.20	5	4.601	95.9	75-125				
Silver	0.04896	0.0050	0.05	-0.0001468	98.2	75-125				
Sodium	76.78	0.20	5	72.1	93.6	75-125				O
Uranium	0.104	0.0050	0.1	0.00107	103	75-125				
Zinc	0.05437	0.0050	0.05	0.005404	97.9	75-125				

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **70138** Instrument ID **ICP7500** Method: **SW6020** **(Dissolve)**

MSD Sample ID: **1305631-07CMSD** Units: **mg/L** Analysis Date: **5/20/2013 10:49 PM**
Client ID: Run ID: **ICP7500_130520A** SeqNo: **3222976** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.06137	0.0050	0.05	0.002342	118	75-125	0.05694	7.49	25	
Barium	0.07023	0.0050	0.05	0.01582	109	75-125	0.06849	2.51	25	
Cadmium	0.04904	0.0020	0.05	0.000278	97.5	75-125	0.04942	0.772	25	
Calcium	609.9	0.50	5	642.3	-648	75-125	622.4	2.03	25	SEO
Chromium	0.05014	0.0050	0.05	0.0009524	98.4	75-125	0.04974	0.801	25	
Cobalt	0.04994	0.0050	0.05	0.00002101	99.8	75-125	0.05029	0.698	25	
Copper	0.05063	0.0050	0.05	0.0005997	100	75-125	0.04902	3.23	25	
Iron	5.229	0.20	5	0.01389	104	75-125	5.278	0.933	25	
Lead	0.04982	0.0050	0.05	0.0003501	98.9	75-125	0.04983	0.0201	25	
Manganese	0.07971	0.0050	0.05	0.03229	94.8	75-125	0.08107	1.69	25	
Nickel	0.05067	0.0050	0.05	0.002087	97.2	75-125	0.05048	0.376	25	

MSD Sample ID: **1305631-07CMSD** Units: **mg/L** Analysis Date: **5/21/2013 03:33 PM**
Client ID: Run ID: **ICP7500_130521A** SeqNo: **3224006** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1652	0.010	0.1	0.04429	121	75-125	0.1547	6.56	25	
Boron	1.448	0.050	0.5	0.8347	123	75-125	1.364	5.97	25	
Molybdenum	0.05394	0.0050	0.05	0.002711	102	75-125	0.05301	1.74	25	
Potassium	9.774	0.20	5	4.601	103	75-125	9.398	3.92	25	
Selenium	0.05684	0.0050	0.05	-0.00005637	114	75-125	0.05635	0.866	25	
Silver	0.04969	0.0050	0.05	-0.0001468	99.7	75-125	0.04896	1.48	25	
Sodium	78.22	0.20	5	72.1	122	75-125	76.78	1.86	25	O
Uranium	0.1055	0.0050	0.1	0.00107	104	75-125	0.104	1.43	25	
Zinc	0.05742	0.0050	0.05	0.005404	104	75-125	0.05437	5.46	25	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **70138** Instrument ID **ICP7500** Method: **SW6020** **(Dissolve)**

DUP Sample ID: **1305631-07CDUP** Units: **mg/L** Analysis Date: **5/20/2013 10:34 PM**
Client ID: Run ID: **ICP7500_130520A** SeqNo: **3222971** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.002346	0.0050					0.002342	0	25	J
Barium	0.01622	0.0050					0.01582	2.5	25	
Cadmium	U	0.0020					0.000278	0	25	
Chromium	U	0.0050					0.0009524	0	25	
Cobalt	U	0.0050					0.00002101	0	25	
Copper	U	0.0050					0.0005997	0	25	
Iron	U	0.20					0.01389	0	25	
Lead	U	0.0050					0.0003501	0	25	
Manganese	0.03261	0.0050					0.03229	0.986	25	
Nickel	0.002229	0.0050					0.002087	0	25	J
Selenium	U	0.0050					0.0009735	0	25	

DUP Sample ID: **1305631-07CDUP** Units: **mg/L** Analysis Date: **5/21/2013 03:18 PM**
Client ID: Run ID: **ICP7500_130521A** SeqNo: **3224003** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.04555	0.010					0.04429	2.8	25	
Boron	0.859	0.050					0.8347	2.87	25	
Molybdenum	0.002438	0.0050					0.002711	0	25	J
Potassium	4.562	0.20					4.601	0.851	25	
Silver	U	0.0050					-0.0001468	0	25	
Sodium	73	0.20					72.1	1.24	25	
Uranium	U	0.0050					0.00107	0	25	
Zinc	0.004553	0.0050					0.005404	0	25	J

DUP Sample ID: **1305631-07CDUP** Units: **mg/L** Analysis Date: **5/21/2013 04:08 PM**
Client ID: Run ID: **ICP7500_130521A** SeqNo: **3224013** Prep Date: **5/20/2013** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	582.5	5.0					573.3	1.59	25	

The following samples were analyzed in this batch:

1305797-01E	1305797-02E	1305797-03E
1305797-04E	1305797-05E	1305797-06E
1305797-07E	1305797-08E	1305797-09E

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **70117** Instrument ID **SV-4** Method: **SW8270**

MBLK Sample ID: **SBLKW1-130520-70117** Units: **µg/L** Analysis Date: **5/21/2013 12:21 AM**

Client ID: Run ID: **SV-4_130520A** SeqNo: **3227420** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1-Methylnaphthalene	U	0.20								
2-Methylnaphthalene	U	0.20								
Benzo(a)pyrene	U	0.20								
Naphthalene	U	0.20								
Surr: 2,4,6-Tribromophenol	4.324	0.20	*5*	*0*	*0*	*34-129*	*0*			
Surr: 2-Fluorobiphenyl	3.77	0.20	*5*	*0*	*0*	*40-125*	*0*			
Surr: 2-Fluorophenol	3.455	0.20	*5*	*0*	*0*	*20-120*	*0*			
Surr: 4-Terphenyl-d14	3.896	0.20	*5*	*0*	*0*	*40-135*	*0*			
Surr: Nitrobenzene-d5	3.381	0.20	*5*	*0*	*0*	*41-120*	*0*			
Surr: Phenol-d6	3.62	0.20	*5*	*0*	*0*	*20-120*	*0*			

LCS Sample ID: **SLCSW1-130520-70117** Units: **µg/L** Analysis Date: **5/21/2013 12:42 AM**

Client ID: Run ID: **SV-4_130520A** SeqNo: **3227421** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1-Methylnaphthalene	3.72	0.20	5	0	0	45-120				
2-Methylnaphthalene	3.782	0.20	5	0	0	50-120				
Benzo(a)pyrene	3.858	0.20	5	0	0	45-120				
Naphthalene	3.35	0.20	5	0	0	45-120				
Surr: 2,4,6-Tribromophenol	4.147	0.20	*5*	*0*	*0*	*34-129*	*0*			
Surr: 2-Fluorobiphenyl	3.819	0.20	*5*	*0*	*0*	*40-125*	*0*			
Surr: 2-Fluorophenol	3.726	0.20	*5*	*0*	*0*	*20-120*	*0*			
Surr: 4-Terphenyl-d14	3.895	0.20	*5*	*0*	*0*	*40-135*	*0*			
Surr: Nitrobenzene-d5	3.365	0.20	*5*	*0*	*0*	*41-120*	*0*			
Surr: Phenol-d6	3.621	0.20	*5*	*0*	*0*	*20-120*	*0*			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **70117** Instrument ID **SV-4** Method: **SW8270**

LCSD Sample ID: **SLCSDW1-130520-70117** Units: **µg/L** Analysis Date: **5/21/2013 01:03 AM**
Client ID: Run ID: **SV-4_130520A** SeqNo: **3227422** Prep Date: **5/20/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1-Methylnaphthalene	3.727	0.20	5	0	0	45-120	3.72	0	20	
2-Methylnaphthalene	3.881	0.20	5	0	0	50-120	3.782	0	20	
Benzo(a)pyrene	3.791	0.20	5	0	0	45-120	3.858	0	20	
Naphthalene	3.486	0.20	5	0	0	45-120	3.35	0	20	
Surr: 2,4,6-Tribromophenol	4.081	0.20	*5*	*0*	*0*	*34-129*	*4.147*	*0*	*0*	
Surr: 2-Fluorobiphenyl	3.682	0.20	*5*	*0*	*0*	*40-125*	*3.819*	*0*	*0*	
Surr: 2-Fluorophenol	3.649	0.20	*5*	*0*	*0*	*20-120*	*3.726*	*0*	*0*	
Surr: 4-Terphenyl-d14	3.815	0.20	*5*	*0*	*0*	*40-135*	*3.895*	*0*	*0*	
Surr: Nitrobenzene-d5	3.368	0.20	*5*	*0*	*0*	*41-120*	*3.365*	*0*	*0*	
Surr: Phenol-d6	3.654	0.20	*5*	*0*	*0*	*20-120*	*3.621*	*0*	*0*	

The following samples were analyzed in this batch:

1305797-01H	1305797-02H	1305797-03H
1305797-04H	1305797-05H	1305797-06H
1305797-07H	1305797-08H	1305797-09H

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147734** Instrument ID **VOA6** Method: **SW8260**

MBLK Sample ID: **VBLKW-130521-R147734** Units: **µg/L** Analysis Date: **5/21/2013 11:45 AM**

Client ID: Run ID: **VOA6_130521B** SeqNo: **3225043** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	1.0								
1,1,2,2-Tetrachloroethane	U	1.0								
1,1,2-Trichloroethane	U	1.0								
1,1-Dichloroethane	U	1.0								
1,1-Dichloroethene	U	1.0								
1,2-Dibromoethane	U	1.0								
1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Carbon tetrachloride	U	1.0								
Chloroform	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Tetrachloroethene	U	1.0								
Toluene	U	1.0								
Trichloroethene	U	1.0								
Vinyl chloride	U	1.0								
Xylenes, Total	U	3.0								
Surr: 1,2-Dichloroethane-d4	51.94	1.0	*50*	*0*	*104*	*71-125*	*0*			
Surr: 4-Bromofluorobenzene	50.79	1.0	*50*	*0*	*102*	*70-125*	*0*			
Surr: Dibromofluoromethane	50.85	1.0	*50*	*0*	*102*	*74-125*	*0*			
Surr: Toluene-d8	49.13	1.0	*50*	*0*	*98.3*	*78-123*	*0*			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147734** Instrument ID **VOA6** Method: **SW8260**

LCS Sample ID: **VLCSW-130521-R147734** Units: **µg/L** Analysis Date: **5/21/2013 10:32 AM**

Client ID: Run ID: **VOA6_130521B** SeqNo: **3225042** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	51.32	1.0	50	0	103	75-130				
1,1,2,2-Tetrachloroethane	51.63	1.0	50	0	103	74-123				
1,1,2-Trichloroethane	47.13	1.0	50	0	94.3	80-120				
1,1-Dichloroethane	50.8	1.0	50	0	102	80-120				
1,1-Dichloroethene	51.96	1.0	50	0	104	75-130				
1,2-Dibromoethane	48.2	1.0	50	0	96.4	80-120				
1,2-Dichloroethane	48.3	1.0	50	0	96.6	79-120				
Benzene	49.74	1.0	50	0	99.5	80-120				
Carbon tetrachloride	49.95	1.0	50	0	99.9	75-125				
Chloroform	50.88	1.0	50	0	102	70-130				
Ethylbenzene	48.66	1.0	50	0	97.3	80-120				
Methylene chloride	52.07	2.0	50	0	104	75-125				
Tetrachloroethene	49.84	1.0	50	0	99.7	75-130				
Toluene	48.77	1.0	50	0	97.5	80-121				
Trichloroethene	50.89	1.0	50	0	102	75-125				
Vinyl chloride	49.87	1.0	50	0	99.7	70-135				
Xylenes, Total	147.2	3.0	150	0	98.1	80-124				
Surr: 1,2-Dichloroethane-d4	50.68	1.0	*50*	*0*	*101*	*71-125*	*0*			
Surr: 4-Bromofluorobenzene	50.36	1.0	*50*	*0*	*101*	*70-125*	*0*			
Surr: Dibromofluoromethane	50.97	1.0	*50*	*0*	*102*	*74-125*	*0*			
Surr: Toluene-d8	49.04	1.0	*50*	*0*	*98.1*	*78-123*	*0*			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147734** Instrument ID **VOA6** Method: **SW8260**

MS Sample ID: **1305842-01AMS** Units: **µg/L** Analysis Date: **5/21/2013 01:21 PM**

Client ID: Run ID: **VOA6_130521B** SeqNo: **3225045** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	212.9	5.0	250	0	85.2	75-130				
1,1,2,2-Tetrachloroethane	261.3	5.0	250	0	105	74-123				
1,1,2-Trichloroethane	235	5.0	250	0	94	80-120				
1,1-Dichloroethane	218.5	5.0	250	0	87.4	80-120				
1,1-Dichloroethene	196.9	5.0	250	0	78.8	75-130				
1,2-Dibromoethane	237.2	5.0	250	0	94.9	80-120				
1,2-Dichloroethane	231.2	5.0	250	0	92.5	79-120				
Benzene	219	5.0	250	0	87.6	80-120				
Carbon tetrachloride	197.5	5.0	250	0	79	79-120				S
Chloroform	233.1	5.0	250	0	93.2	70-130				
Ethylbenzene	210.8	5.0	250	0	84.3	80-120				
Methylene chloride	240.2	10	250	7.578	93.1	75-125				
Tetrachloroethene	210	5.0	250	0	84	75-130				
Toluene	216.5	5.0	250	2.728	85.5	80-121				
Trichloroethene	618.7	5.0	250	429.6	75.7	75-125				
Vinyl chloride	162.7	5.0	250	0	65.1	70-135				S
Xylenes, Total	632	15	750	0	84.3	80-124				
Surr: 1,2-Dichloroethane-d4	260.9	5.0	*250*	*0*	*104*	*71-125*	*0*			
Surr: 4-Bromofluorobenzene	251.5	5.0	*250*	*0*	*101*	*70-125*	*0*			
Surr: Dibromofluoromethane	251.2	5.0	*250*	*0*	*100*	*74-125*	*0*			
Surr: Toluene-d8	245.9	5.0	*250*	*0*	*98.4*	*78-123*	*0*			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147734** Instrument ID **VOA6** Method: **SW8260**

MSD Sample ID: **1305842-01AMSD** Units: **µg/L** Analysis Date: **5/21/2013 01:47 PM**

Client ID: Run ID: **VOA6_130521B** SeqNo: **3225046** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	227.5	5.0	250	0	91	75-130	212.9	6.64	20	
1,1,2,2-Tetrachloroethane	268.7	5.0	250	0	107	74-123	261.3	2.78	20	
1,1,2-Trichloroethane	241.6	5.0	250	0	96.7	80-120	235	2.77	20	
1,1-Dichloroethane	226.5	5.0	250	0	90.6	80-120	218.5	3.57	20	
1,1-Dichloroethene	211.3	5.0	250	0	84.5	75-130	196.9	7.05	20	
1,2-Dibromoethane	243.2	5.0	250	0	97.3	80-120	237.2	2.49	20	
1,2-Dichloroethane	242.8	5.0	250	0	97.1	79-120	231.2	4.9	20	
Benzene	232.6	5.0	250	0	93	80-120	219	6.05	20	
Carbon tetrachloride	222.4	5.0	250	0	89	75-125	197.5	11.9	20	
Chloroform	237.4	5.0	250	0	94.9	70-130	233.1	1.83	20	
Ethylbenzene	228	5.0	250	0	91.2	80-120	210.8	7.86	20	
Methylene chloride	245.1	10	250	7.578	95	75-125	240.2	1.99	20	
Tetrachloroethene	224.6	5.0	250	0	89.8	75-130	210	6.67	20	
Toluene	225.8	5.0	250	2.728	89.2	80-121	216.5	4.18	20	
Trichloroethene	634.3	5.0	250	429.6	81.9	75-120	618.7	2.48	20	
Vinyl chloride	169.4	5.0	250	0	67.7	70-135	162.7	4.01	20	S
Xylenes, Total	683.5	15	750	0	91.1	80-124	632	7.83	20	
Surr: 1,2-Dichloroethane-d4	252	5.0	*250*	*0*	*101*	*71-125*	*260.9*	*3.49*	*20*	
Surr: 4-Bromofluorobenzene	251.4	5.0	*250*	*0*	*101*	*70-125*	*251.5*	*0.0386*	*20*	
Surr: Dibromofluoromethane	249.3	5.0	*250*	*0*	*99.7*	*74-125*	*251.2*	*0.757*	*20*	
Surr: Toluene-d8	243.2	5.0	*250*	*0*	*97.3*	*78-123*	*245.9*	*1.11*	*20*	

The following samples were analyzed in this batch:

1305797-01A	1305797-02A	1305797-03A
1305797-04A	1305797-05A	1305797-06A
1305797-07A	1305797-09A	1305797-10A
1305797-11A	1305797-12A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147736** Instrument ID **VOA6** Method: **SW8260**

MBLK Sample ID: **VBLKW-130521-R147736** Units: **µg/L** Analysis Date: **5/22/2013 12:37 AM**

Client ID: Run ID: **VOA6_130521D** SeqNo: **3225137** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	1.0								
1,1,2,2-Tetrachloroethane	U	1.0								
1,1,2-Trichloroethane	U	1.0								
1,1-Dichloroethane	U	1.0								
1,1-Dichloroethene	U	1.0								
1,2-Dibromoethane	U	1.0								
1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Carbon tetrachloride	U	1.0								
Chloroform	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Tetrachloroethene	U	1.0								
Toluene	U	1.0								
Trichloroethene	U	1.0								
Vinyl chloride	U	1.0								
Xylenes, Total	U	3.0								
Surr: 1,2-Dichloroethane-d4	52.1	1.0	*50*	*0*	*104*	*71-125*	*0*			
Surr: 4-Bromofluorobenzene	50.43	1.0	*50*	*0*	*101*	*70-125*	*0*			
Surr: Dibromofluoromethane	51.79	1.0	*50*	*0*	*104*	*74-125*	*0*			
Surr: Toluene-d8	49.01	1.0	*50*	*0*	*98*	*78-123*	*0*			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147736** Instrument ID **VOA6** Method: **SW8260**

LCS Sample ID: **VLCSW-130521-R147736** Units: **µg/L** Analysis Date: **5/21/2013 11:19 PM**

Client ID: Run ID: **VOA6_130521D** SeqNo: **3225136** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	50.46	1.0	50	0	101	75-130				
1,1,2,2-Tetrachloroethane	49.77	1.0	50	0	99.5	74-123				
1,1,2-Trichloroethane	46.9	1.0	50	0	93.8	80-120				
1,1-Dichloroethane	49.05	1.0	50	0	98.1	80-120				
1,1-Dichloroethene	50.38	1.0	50	0	101	75-130				
1,2-Dibromoethane	47.45	1.0	50	0	94.9	80-120				
1,2-Dichloroethane	47.39	1.0	50	0	94.8	79-120				
Benzene	48.8	1.0	50	0	97.6	80-120				
Carbon tetrachloride	49.7	1.0	50	0	99.4	75-125				
Chloroform	49.77	1.0	50	0	99.5	70-130				
Ethylbenzene	48.51	1.0	50	0	97	80-120				
Methylene chloride	50.04	2.0	50	0	100	75-125				
Tetrachloroethene	49.23	1.0	50	0	98.5	75-130				
Toluene	47.9	1.0	50	0	95.8	80-121				
Trichloroethene	50.81	1.0	50	0	102	75-125				
Vinyl chloride	47.34	1.0	50	0	94.7	70-135				
Xylenes, Total	144.9	3.0	150	0	96.6	80-124				
Surr: 1,2-Dichloroethane-d4	49.74	1.0	*50*	*0*	*99.5*	*71-125*	*0*			
Surr: 4-Bromofluorobenzene	49.76	1.0	*50*	*0*	*99.5*	*70-125*	*0*			
Surr: Dibromofluoromethane	50.14	1.0	*50*	*0*	*100*	*74-125*	*0*			
Surr: Toluene-d8	49.32	1.0	*50*	*0*	*98.6*	*78-123*	*0*			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147736** Instrument ID **VOA6** Method: **SW8260**

MS Sample ID: **1305818-01AMS** Units: **µg/L** Analysis Date: **5/22/2013 04:33 AM**

Client ID: Run ID: **VOA6_130521D** SeqNo: **3225145** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	202.6	5.0	250	0	81	75-130				
1,1,2,2-Tetrachloroethane	249.8	5.0	250	0	99.9	74-123				
1,1,2-Trichloroethane	232.1	5.0	250	0	92.8	80-120				
1,1-Dichloroethane	221.1	5.0	250	0	88.4	80-120				
1,1-Dichloroethene	182.1	5.0	250	0	72.8	75-130				S
1,2-Dibromoethane	233.2	5.0	250	0	93.3	80-120				
1,2-Dichloroethane	231.3	5.0	250	0	92.5	79-120				
Benzene	218.6	5.0	250	0	87.4	80-120				
Carbon tetrachloride	182.7	5.0	250	0	73.1	79-120				S
Chloroform	233.4	5.0	250	0	93.4	70-130				
Ethylbenzene	203.5	5.0	250	0	81.4	80-120				
Methylene chloride	236.1	10	250	3.798	92.9	75-125				
Tetrachloroethene	188.3	5.0	250	0	75.3	75-130				
Toluene	210.4	5.0	250	0	84.2	80-121				
Trichloroethene	215.4	5.0	250	0	86.2	75-125				
Vinyl chloride	153.7	5.0	250	0	61.5	70-135				S
Xylenes, Total	617.1	15	750	0	82.3	80-124				
Surr: 1,2-Dichloroethane-d4	254.5	5.0	*250*	*0*	*102*	*71-125*	*0*			
Surr: 4-Bromofluorobenzene	250.7	5.0	*250*	*0*	*100*	*70-125*	*0*			
Surr: Dibromofluoromethane	254.8	5.0	*250*	*0*	*102*	*74-125*	*0*			
Surr: Toluene-d8	247.6	5.0	*250*	*0*	*99*	*78-123*	*0*			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147736** Instrument ID **VOA6** Method: **SW8260**

MSD Sample ID: **1305818-01AMSD** Units: **µg/L** Analysis Date: **5/22/2013 04:59 AM**
Client ID: Run ID: **VOA6_130521D** SeqNo: **3225146** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	227.9	5.0	250	0	91.1	75-130	202.6	11.8	20	
1,1,2,2-Tetrachloroethane	264.9	5.0	250	0	106	74-123	249.8	5.84	20	
1,1,2-Trichloroethane	241.4	5.0	250	0	96.6	80-120	232.1	3.96	20	
1,1-Dichloroethane	226	5.0	250	0	90.4	80-120	221.1	2.17	20	
1,1-Dichloroethene	211.8	5.0	250	0	84.7	75-130	182.1	15.1	20	
1,2-Dibromoethane	241.2	5.0	250	0	96.5	80-120	233.2	3.35	20	
1,2-Dichloroethane	234.4	5.0	250	0	93.7	79-120	231.3	1.33	20	
Benzene	225.6	5.0	250	0	90.2	80-120	218.6	3.14	20	
Carbon tetrachloride	219	5.0	250	0	87.6	75-125	182.7	18.1	20	
Chloroform	237.8	5.0	250	0	95.1	70-130	233.4	1.89	20	
Ethylbenzene	228.8	5.0	250	0	91.5	80-120	203.5	11.7	20	
Methylene chloride	233.9	10	250	3.798	92	75-125	236.1	0.933	20	
Tetrachloroethene	223.7	5.0	250	0	89.5	75-130	188.3	17.2	20	
Toluene	224.6	5.0	250	0	89.8	80-121	210.4	6.53	20	
Trichloroethene	230.9	5.0	250	0	92.3	75-120	215.4	6.91	20	
Vinyl chloride	166.5	5.0	250	0	66.6	70-135	153.7	8	20	S
Xylenes, Total	677.9	15	750	0	90.4	80-124	617.1	9.39	20	
Surr: 1,2-Dichloroethane-d4	256.8	5.0	*250*	*0*	*103*	*71-125*	*254.5*	*0.933*	*20*	
Surr: 4-Bromofluorobenzene	246.3	5.0	*250*	*0*	*98.5*	*70-125*	*250.7*	*1.76*	*20*	
Surr: Dibromofluoromethane	250.9	5.0	*250*	*0*	*100*	*74-125*	*254.8*	*1.54*	*20*	
Surr: Toluene-d8	248.3	5.0	*250*	*0*	*99.3*	*78-123*	*247.6*	*0.286*	*20*	

The following samples were analyzed in this batch:

1305797-08A	1305797-13A	1305797-14A
1305797-15A	1305797-16A	1305797-17A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147754** Instrument ID **Balance1** Method: **M2540C** **(Dissolve)**

MBLK Sample ID: **WBLKW-R147754** Units: **mg/L** Analysis Date: **5/21/2013 10:00 AM**
Client ID: Run ID: **BALANCE1_130521F** SeqNo: **3225483** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filt	U	10								

LCS Sample ID: **WLCSW-R147754** Units: **mg/L** Analysis Date: **5/21/2013 10:00 AM**
Client ID: Run ID: **BALANCE1_130521F** SeqNo: **3225484** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filt	958	10	1000	0	95.8	85-115				

DUP Sample ID: **1305797-06FDUP** Units: **mg/L** Analysis Date: **5/21/2013 10:00 AM**
Client ID: **DUP-03** Run ID: **BALANCE1_130521F** SeqNo: **3225482** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filt	5310	10					4990	6.21	20	

The following samples were analyzed in this batch: 1305797-06F

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147779** Instrument ID **Gall01** Method: **M4500CN E&G (Dissolve)**

MBLK Sample ID: **WBLKW1-052213-R147779** Units: **mg/L** Analysis Date: **5/22/2013 01:00 PM**
Client ID: Run ID: **GALL01_130522A** SeqNo: **3225998** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide	U	0.020								

LCS Sample ID: **WLCSW1-052213-R147779** Units: **mg/L** Analysis Date: **5/22/2013 01:00 PM**
Client ID: Run ID: **GALL01_130522A** SeqNo: **3225999** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide	0.197	0.020	0.2	0	98.5	80-120				

MS Sample ID: **1305797-01DMS** Units: **mg/L** Analysis Date: **5/22/2013 01:00 PM**
Client ID: **MW-114** Run ID: **GALL01_130522A** SeqNo: **3226009** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide	0.2068	0.020	0.2	0.00432	101	80-120				

MSD Sample ID: **1305797-01DMSD** Units: **mg/L** Analysis Date: **5/22/2013 01:00 PM**
Client ID: **MW-114** Run ID: **GALL01_130522A** SeqNo: **3226010** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide	0.1883	0.020	0.2	0.00432	92	80-120	0.2068	9.36	20	

The following samples were analyzed in this batch:

1305797-01D	1305797-02D	1305797-03D
1305797-04D	1305797-05D	1305797-06D
1305797-07D	1305797-08D	1305797-09D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147841** Instrument ID **Balance1** Method: **M2540C** **(Dissolve)**

MBLK Sample ID: **WBLK-052213-R147841** Units: **mg/L** Analysis Date: **5/22/2013 09:55 AM**
Client ID: Run ID: **BALANCE1_130522E** SeqNo: **3227706** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filt	U	10								

LCS Sample ID: **WLCS-052213-R147841** Units: **mg/L** Analysis Date: **5/22/2013 09:55 AM**
Client ID: Run ID: **BALANCE1_130522E** SeqNo: **3227707** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filt	1008	10	1000	0	101	85-115				

DUP Sample ID: **1305730-08DDUP** Units: **mg/L** Analysis Date: **5/22/2013 09:55 AM**
Client ID: Run ID: **BALANCE1_130522E** SeqNo: **3227685** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filt	802	10					808	0.745	20	

DUP Sample ID: **1305797-07FDUP** Units: **mg/L** Analysis Date: **5/22/2013 09:55 AM**
Client ID: **MW-116** Run ID: **BALANCE1_130522E** SeqNo: **3227705** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filt	4520	10					4480	0.889	20	

The following samples were analyzed in this batch:

1305797-01F	1305797-02F	1305797-03F
1305797-04F	1305797-05F	1305797-07F

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147881** Instrument ID **Balance1** Method: **M2540C** **(Dissolve)**

MBLK Sample ID: **WBLK-052313-R147881** Units: **mg/L** Analysis Date: **5/23/2013 09:05 AM**
Client ID: Run ID: **BALANCE1_130523C** SeqNo: **3228897** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filt	U	10								

LCS Sample ID: **WLCS-052313-R147881** Units: **mg/L** Analysis Date: **5/23/2013 09:05 AM**
Client ID: Run ID: **BALANCE1_130523C** SeqNo: **3228898** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filt	1074	10	1000	0	107	85-115				

DUP Sample ID: **1305797-08FDUP** Units: **mg/L** Analysis Date: **5/23/2013 09:05 AM**
Client ID: **EQB-03** Run ID: **BALANCE1_130523C** SeqNo: **3228887** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filt	46	10					50	8.33	20	

DUP Sample ID: **1305966-08EDUP** Units: **mg/L** Analysis Date: **5/23/2013 09:05 AM**
Client ID: Run ID: **BALANCE1_130523C** SeqNo: **3231058** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filt	1094	10					1094	0	20	

The following samples were analyzed in this batch: 1305797-08F 1305797-09F

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147882** Instrument ID **ICS2100** Method: **E300** **(Dissolve)**

MBLK Sample ID: **WBLKW1-R147882** Units: **mg/L** Analysis Date: **5/23/2013 04:29 PM**
Client ID: Run ID: **ICS2100_130523A** SeqNo: **3228922** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	U	0.50								
Surr: Selenate (surr)	5.018	0.10	*5*	*0*	*100*	*85-115*	*0*			

LCS Sample ID: **WLCSW1-R147882** Units: **mg/L** Analysis Date: **5/23/2013 04:15 PM**
Client ID: Run ID: **ICS2100_130523A** SeqNo: **3228921** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	21.24	0.50	20	0	106	90-110				
Surr: Selenate (surr)	5.249	0.10	*5*	*0*	*105*	*85-115*	*0*			

MS Sample ID: **1305966-06EMS** Units: **mg/L** Analysis Date: **5/23/2013 02:48 PM**
Client ID: Run ID: **ICS2100_130523A** SeqNo: **3228915** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	475.4	0.50	10	474.2	12.8	80-120				SEO
Surr: Selenate (surr)	5.329	0.10	*5*	*0*	*107*	*85-115*	*0*			

MSD Sample ID: **1305966-06EMSD** Units: **mg/L** Analysis Date: **5/23/2013 03:02 PM**
Client ID: Run ID: **ICS2100_130523A** SeqNo: **3228916** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	448	0.50	10	474.2	-261	80-120	475.4	5.94	20	SEO
Surr: Selenate (surr)	5.032	0.10	*5*	*0*	*101*	*85-115*	*5.329*	*5.73*	*20*	

The following samples were analyzed in this batch: 1305797-09F

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147891** Instrument ID **ICS2100** Method: **E300** **(Dissolve)**

MBLK Sample ID: **WBLKW2-R147891** Units: **mg/L** Analysis Date: **5/23/2013 09:27 PM**
Client ID: Run ID: **ICS2100_130523C** SeqNo: **3229137** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.50								
Fluoride	U	0.10								
Sulfate	U	0.50								
Surr: Selenate (surr)	5.183	0.10	*5*	*0*	*104*	*85-115*	*0*			

LCS Sample ID: **WLCSW2-R147891** Units: **mg/L** Analysis Date: **5/23/2013 09:42 PM**
Client ID: Run ID: **ICS2100_130523C** SeqNo: **3229138** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.17	0.50	20	0	101	90-110				
Fluoride	3.957	0.10	4	0	98.9	90-110				
Sulfate	21.85	0.50	20	0	109	90-110				
Surr: Selenate (surr)	5.56	0.10	*5*	*0*	*111*	*85-115*	*0*			

MS Sample ID: **1305830-07AMSZ** Units: **mg/L** Analysis Date: **5/24/2013 03:46 AM**
Client ID: Run ID: **ICS2100_130523C** SeqNo: **3229169** Prep Date: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	2024	50	1000	1029	99.5	80-120				
Fluoride	178.8	10	200	0	89.4	80-120				
Sulfate	1094	50	1000	96.39	99.8	80-120				
Surr: Selenate (surr)	480.8	10	*500*	*0*	*96.2*	*85-115*	*0*			

MSD Sample ID: **1305830-07AMSDZ** Units: **mg/L** Analysis Date: **5/24/2013 04:00 AM**
Client ID: Run ID: **ICS2100_130523C** SeqNo: **3229170** Prep Date: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	2047	50	1000	1029	102	80-120	2024	1.17	20	
Fluoride	182.2	10	200	0	91.1	80-120	178.8	1.89	20	
Sulfate	1111	50	1000	96.39	101	80-120	1094	1.55	20	
Surr: Selenate (surr)	488.2	10	*500*	*0*	*97.6*	*85-115*	*480.8*	*1.53*	*20*	

The following samples were analyzed in this batch:

1305797-01F	1305797-02F	1305797-03F
1305797-04F	1305797-05F	1305797-06F
1305797-07F	1305797-08F	1305797-09F

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company
Work Order: 1305797
Project: RO Discharge Sampling 128823

QC BATCH REPORT

Batch ID: **R147896** Instrument ID **ICS2100** Method: **E300** **(Dissolve)**

MBLK Sample ID: **WBLKW-R147896** Units: **mg/L** Analysis Date: **5/22/2013 02:34 PM**
Client ID: Run ID: **ICS2100_130523D** SeqNo: **3229245** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrate/Nitrite (as N)	U	0.20								
Surr: Selenate (surr)	4.99	0.10	*5*	*0*	*99.8*	*85-115*	*0*			

LCS Sample ID: **WLCSW-R147896** Units: **mg/L** Analysis Date: **5/22/2013 02:19 PM**
Client ID: Run ID: **ICS2100_130523D** SeqNo: **3229244** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrate/Nitrite (as N)	7.5	0.20	8	0	93.8	90-110				
Surr: Selenate (surr)	5.018	0.10	*5*	*0*	*100*	*85-115*	*0*			

MS Sample ID: **1305797-09GMS** Units: **mg/L** Analysis Date: **5/22/2013 08:27 PM**
Client ID: **RO Discharge** Run ID: **ICS2100_130523D** SeqNo: **3229257** Prep Date: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrate/Nitrite (as N)	36.33	2.0	40	2.114	85.5	80-120				
Surr: Selenate (surr)	46.27	1.0	*50*	*0*	*92.5*	*85-115*	*0*			

MSD Sample ID: **1305797-09GMSD** Units: **mg/L** Analysis Date: **5/22/2013 08:41 PM**
Client ID: **RO Discharge** Run ID: **ICS2100_130523D** SeqNo: **3229258** Prep Date: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrate/Nitrite (as N)	39.54	2.0	40	2.114	93.6	80-120	36.33	8.46	20	
Surr: Selenate (surr)	50.6	1.0	*50*	*0*	*101*	*85-115*	*46.27*	*8.94*	*20*	

The following samples were analyzed in this batch:

1305797-01G	1305797-02G	1305797-03G
1305797-04G	1305797-05G	1305797-06G
1305797-07G	1305797-08G	1305797-09G

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 12-Jun-13

Client: Navajo Refining Company
Project: RO Discharge Sampling 128823
WorkOrder: **1305797**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Units Reported	Description
mg/L	Milligrams per Liter

ALS Environmental

Sample Receipt Checklist

Client Name: **NAVAJO REFINING** Date/Time Received: **17-May-13 09:00**

Work Order: **1305797** Received by: **RDH**

Checklist completed by Robert D. Harris (eSignature) 18-May-13 (Date) Reviewed by: Sonia West (eSignature) 21-May-13 (Date)

Matrices: waters
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	5.6c/5.6c,5.3c/5.3c,4.2c/4.2c,4.1c/4.1c,5.8c/5.8c,5.6c/5.6c,1.5c/1.5c,2.1c	IR1	
Cooler(s)/Kit(s):	4611,3112,5160,3095,3192,3178,3160,4051		
Date/Time sample(s) sent to storage:	5/18/13 12:10		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☐	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

ALS Environmental

Cincinnati, OH +1 513 733 5336 | Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600 | Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 81090

1305797

NAVAJO REFINING: Navajo Refining Company

Project: RO Discharge Sampling

ALS Project Manager:

Customer Information		Project Information			
Purchase Order		Project Name	RO Discharge/Sampling	A	VOC (8260) NM GW List
Work Order		Project Number	123823	B	GRO (8015M)
Company Name	Navajo Refining Company	Bill To Company	Navajo Refining Company	C	DRO (8015M) ORO (8015M)
Send Report To	Robert Combs	Invoice Attn	Robert Combs	D	LL SVOC (8270) NM GW List
Address	501 East Main	Address	501 East Main	E	Dissolved Metals (6020/7000) Al,As,Ba,B,Cd,Ca,Cr,Co,Cu,Fe,Pb,
				F	Mn,Hg,Mo,Ni,K,Se,Ag,Na,U,Zn
City/State/Zip	Artesia, NM 88211	City/State/Zip	Artesia, NM 88211	G	Anions (300) Cl,F,SO4,Nitrate,Nitrite
Phone	(575) 748-6733	Phone	(575) 748-6733	H	Total Cyanide (SM 4500)
Fax	(575) 746-5421	Fax	(575) 746-5421	I	TDS
e-Mail Address		e-Mail Address		J	Radium 226/228

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-114	5/15/13	1350	WATER	SEE BOTTLES	16	X	X	X	X	X		X	X	X	X	
2	MW-115	5/15/13	1550	WATER	SEE BOTTLES	16	X	X	X	X	X		X	X	X	X	
3	MW-117	5/15/13	1030	WATER	SEE BOTTLES	16	X	X	X	X	X		X	X	X	X	
4	MW-118	5/15/13	1830	WATER	SEE BOTTLES	17	X	X	X	X	X		X	X	X	X	
5	MW-119	5/15/13	1810	WATER	SEE BOTTLES	18&17	X	X	X	X	X		X	X	X	X	
6	DUP-03	5/15/13	0001	WATER	SEE BOTTLES	16	X	X	X	X	X		X	X	X	X	
7	MW-116	5/16/13	1015	WATER	SEE BOTTLES	17	X	X	X	X	X		X	X	X	X	
8	EQB-03	5/16/13	1140	WATER	SEE BOTTLES	17	X	X	X	X	X		X	X	X	X	
9	RO DISCHARGE	5/16/13	0830	WATER	SEE BOTTLES	17	X	X	X	X	X		X	X	X	X	
10	TRIP BLANKS	5/16/13	—	WATER	—	6	X	X	X	X	X		X	X	X	X	

Sampler(s) Please Print & Sign: MALLORY BAILEY

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) ☑ Std 10 WK Days ☐ 5 WK Days ☐ Other ☐ 2 WK Days ☐ 24 Hour

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
	5/16/13	1330	
Relinquished by:	Date:	Time:	Received by (Laboratory):
			5/17/13 0950
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

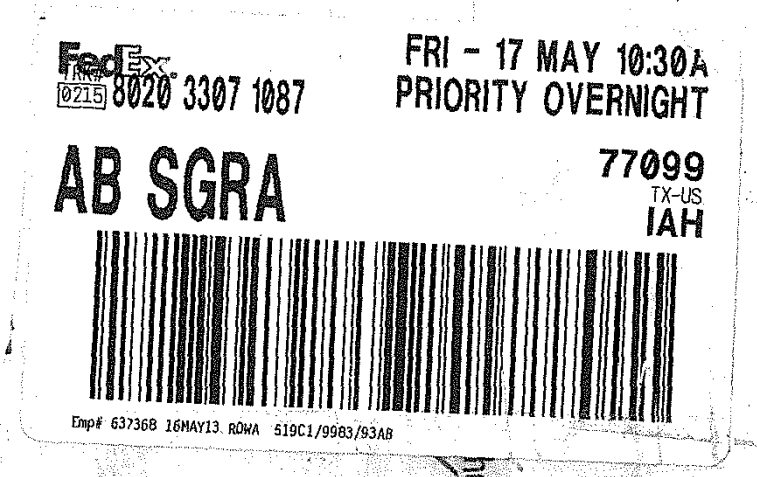
Notes: 10 Day TAT. CC Pam Krueger with Arcadis.

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
☑ Level II Std QC ☐ TRRP CheckList
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other / EDD

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.



ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

5160

Date: 5/16/13
Name:
Company:

CUSTODY SEAL
Time: 1315

Seal Broken By:
Date: 5/17/13

ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

3595

Date: 5/16/13
Name:
Company:

CUSTODY SEAL
Time: 1315

Seal Broken By:
Date: 5/17/13

1305


FedEx
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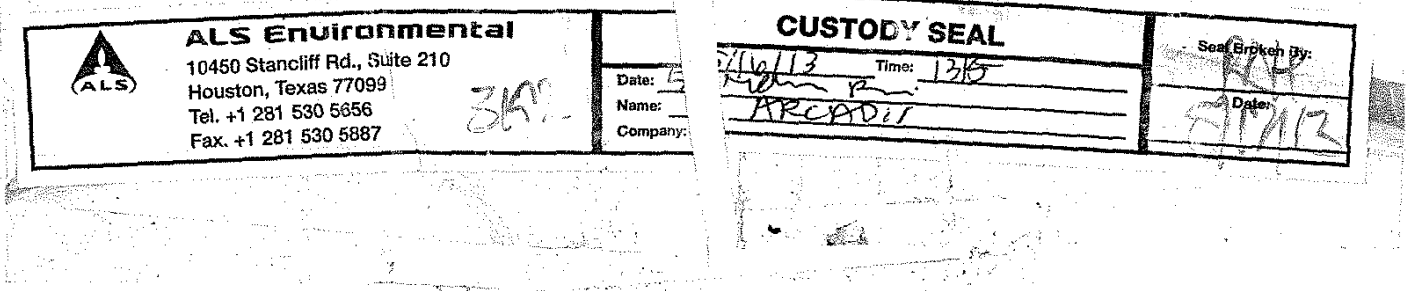
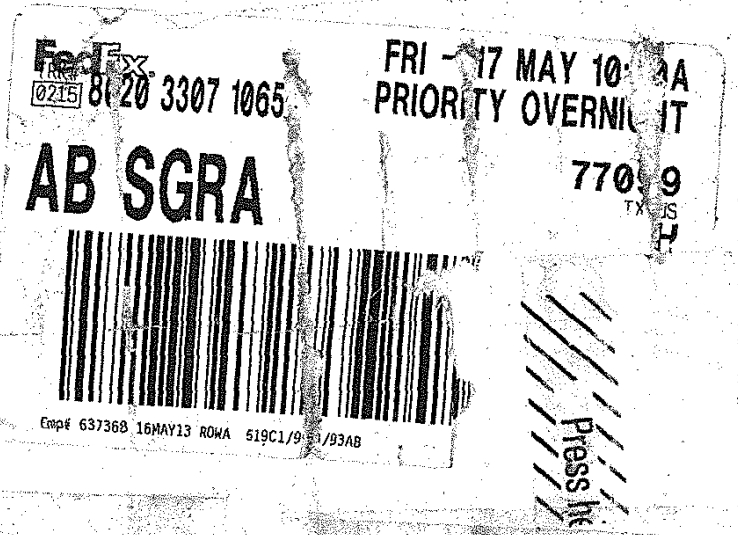

ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
Date:
Name:
Company:
CUSTODY SEAL
Time: 1315
ARCADIS
Seal Broken By:
Date: 5/17/13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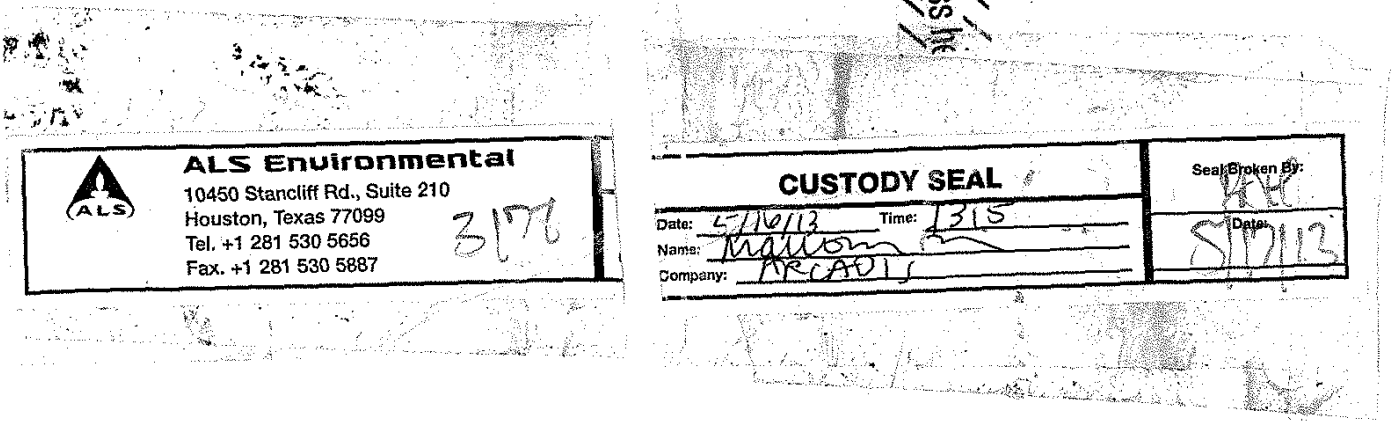
ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 5/16/13
Time: 1315
Name: Mallon
Company: ARCADIS
Seal Broken By:
Date: 5/17/13

130579

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PRIORITY O

AB SGRA

Emp# 637368 16MAY13 ROWA 519C1/9903/93AB

ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

3140

Date:
Name:
Company:

CUSTODY SEAL

Time: 1315

ARCADIS

Seal Broken By:

Date: 5/17/13

FedEx TRK# 0215 8020 3307 1076

FRI - 17 MAY 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

Emp# 637368 16MAY13 ROWA 519C1/9903/93AB

ALS Environmental
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4051

Date
Nam
Com

CUSTODY SEAL

Time: 1315

ARCADIS

Seal Broken By:

Date: 5/17/13

June 12, 2013

Ms. Sonia West
ALS Environmental
10450 Stancliff Rd, Suite 210
Houston, TX 77099

Re: ALS Workorder: 13-05-319
Project Name: None Submitted
Project Number: 1305797

Dear Ms. West:

Nine water samples were received from ALS Environmental on May 21, 2013. The samples were scheduled for the following analyses:

Radium-226
Radium-228

The results for these analyses are contained in the enclosed report.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

for ALS Environmental
Jeff Kujawa
Project Manager

JRK/mlc
Enclosure (s): Report

ALS is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

Accreditation Body	License or Certification Number
Alaska (AK)	UST-086
Alaska (AK)	CO00078
Arizona (AZ)*	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO00078
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Maryland (MD)	285
Missouri	175
Nebraska	NE-OS-24-13
Nevada (NV)	CO000782008A
New Jersey (NJ)**	CO003
North Dakota (ND)	R-057
Oklahoma	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241-09-1
Utah (UT)	CO00078
Washington	C1280

1305319

Radium-228:

The samples were analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac, which is the ingrown progeny of ^{228}Ra, according to the current revision of SOP 724.

All acceptance criteria were met.

Radium-226:

The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1305319
Client Name: ALS Environmental
Client Project Name:
Client Project Number: 1305797
Client PO Number: 10-1305797

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
MW-114	1305319-1		WATER	15-May-13	13:50
MW-115	1305319-2		WATER	15-May-13	15:50
MW-117	1305319-3		WATER	15-May-13	10:30
DUP-03	1305319-4		WATER	15-May-13	
MW-118	1305319-5		WATER	15-May-13	18:30
MW-119	1305319-6		WATER	15-May-13	18:10
MW-116	1305319-7		WATER	16-May-13	10:15
EQB-03	1305319-8		WATER	16-May-13	11:40
RO Discharge	1305319-9		WATER	16-May-13	8:30

Subcontractor:
ALS Environmental
225 Commerce Drive
Fort Collins, CO 80524
TEL: (800) 443-1511
FAX: (970) 490-1522
Acct #:

CHAIN-OF-CUSTODY RECORD

Date: 18-May-13
COC ID: 14099
Due Date 23-May-13

1305319

Salesperson: Houston House Acct

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	1305797	A	Radium 226 .228 Sub to ALS Ft. Collins
Work Order		Project Number		B	
Company Name	ALS Group USA, Corp.	Bill To Company	ALS Group USA, Corp.	C	
Send Report To	Sonia West	Inv Attn	Accounts Payable	D	
Address	10450 Stancliff Rd, Suite 210	Address	10450 Stancliff Rd, Suite 210	E	
				F	
City/State/Zip	Houston, Texas 77099-4338	City/State/Zip	Houston, Texas 77099-4338	G	
Phone	(281) 530-5656	Phone	(281) 530-5656	H	
Fax	(281) 530-5887	Fax	(281) 530-5887	I	
eMail Address	Sonia.West@alsglobal.com	eMail CC	jumoke.lawal@alsglobal.com	J	

Sample ID		Matrix	Collection Date 24hr	Bottle	A	B	C	D	E	F	G	H	I	J
1305797-01I (MW-114)	(1)	Water	15/May/2013 13:50	(1) 1LPHNO3	X									
1305797-02I (MW-115)	(2)	Water	15/May/2013 15:50	(1) 1LPHNO3	X									
1305797-03I (MW-117)	(3)	Water	15/May/2013 10:30	(1) 1LPHNO3	X									
1305797-06I (DUP-03)	(4)	Water	15/May/2013	(1) 1LPHNO3	X									
1305797-04I (MW-118)	(5)	Water	15/May/2013 18:30	(2) 1LPHNO3	X									
1305797-05I (MW-119)	(6)	Water	15/May/2013 18:10	(2) 1LPHNO3	X									
1305797-07I (MW-116)	(7)	Water	16/May/2013 10:15	(2) 1LPHNO3	X									
1305797-08I (EQB-03)	(8)	Water	16/May/2013 11:40	(2) 1LPHNO3	X									
1305797-09I (RO Discharge)	(9)	Water	16/May/2013 8:30	(2) 1LPHNO3	X									

74 of 89

Comments:

Please analyze for Radium 226/228. Report is due on 5/23/13. Send report to Sonia West, sonia.west@alsglobal.com, and CC: results to Jumoke Lawal jumoke.lawal@alsglobal.com and Luke Hernandez luke.hernandez@alsglobal.com

Relinquished by:	Date/Time	Received by:	Date/Time	Cooler IDs	Report/QC Level
					Std
Relinquished by:	Date/Time: 5/20/13 1800	Received by:	Date/Time 5/21/13 0930		

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS TX Workorder No: 1305319

Project Manager: JRK Initials: LAS Date: 5/21/13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2. Are custody seals on shipping containers intact?	NONE	(YES)	NO
3. Are Custody seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5. Are the COC and bottle labels complete and legible?		(YES)	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	(YES)	NO
9. Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10. Is there sufficient sample for the requested analyses?		(YES)	NO
11. Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12. Are all samples within holding times for the requested analyses?		(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		(YES)	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	(NO)
16. Were the samples shipped on ice?		YES	(NO)
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	(RAD ONLY)	YES	(NO)

Cooler #:	1							
Temperature (°C):	AMB							
No. of custody seals on cooler:	1							
DOT Survey/ Acceptance Information — External µR/hr reading:	15							
Background µR/hr reading:	13							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **(YES) / NO / NA** (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO / (NA) Contact: _____ Date/Time: _____

Project Manager Signature / Date: 5-22-13

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

1305319

9.16

ORIGIN ID: SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 20MAY13
ACTWGT: 45.2 LB
CAD: 300130/CAFE2608
DIMS: 26x14x14 IN

BILL SENDER

TO ROY FRENCH
ALS ENVIRONMENTAL
225 COMMERCE DRIVE

FORT COLLINS CO 80524
(970) 490-1611
DEPT: ENVIRONMENTAL

REF: BF/JBAGFRO

FedEx Express

TRK# 0201 4340 2175 7911

TUE - 21 MAY 10:30
PRIORITY OVERNIGH

AG FTCA

80524
CO-US DEN

Part # 156148-434 RITE 04/12

Client:	ALS Environmental	**Date:**	*10-Jun-13*
Project:	1305797	**Work Order:**	1305319
Sample ID:	MW-114	**Lab ID:**	1305319-1
Legal Location:		**Matrix:**	WATER
Collection Date:	5/15/2013 13:50	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
RA-226 BY RADON EMANATION - METHOD 903.1			**PAI 783**		Prep Date: **5/29/2013**	PrepBy: **PJW**
Ra-226	ND (+/- 0.25)	U	0.36	pCi/l	NA	6/7/2013 13:29
Carr: BARIUM	*97.2*		*40-110*	*%REC*	NA	6/7/2013 13:29
RADIUM-228 ANALYSIS BY GFPC			**PAI 724**		Prep Date: **5/28/2013**	PrepBy: **JTL**
Ra-228	ND (+/- 0.29)	U	0.55	pCi/l	NA	5/31/2013 10:39
Carr: BARIUM	*97.2*		*40-110*	*%REC*	NA	5/31/2013 10:39

Client:	ALS Environmental	**Date:**	*10-Jun-13*
Project:	1305797	**Work Order:**	1305319
Sample ID:	MW-115	**Lab ID:**	1305319-2
Legal Location:		**Matrix:**	WATER
Collection Date:	5/15/2013 15:50	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
RA-226 BY RADON EMANATION - METHOD 903.1			**PAI 783**		Prep Date: **5/29/2013**	PrepBy: **PJW**
Ra-226	ND (+/- 0.31)	U	0.58	pCi/l	NA	6/7/2013 13:29
Carr: BARIUM	*98*		*40-110*	*%REC*	NA	6/7/2013 13:29
RADIUM-228 ANALYSIS BY GFPC			**PAI 724**		Prep Date: **5/28/2013**	PrepBy: **JTL**
Ra-228	ND (+/- 0.33)	U	0.64	pCi/l	NA	5/31/2013 10:39
Carr: BARIUM	*98*		*40-110*	*%REC*	NA	5/31/2013 10:39

Client:	ALS Environmental	**Date:**	*10-Jun-13*
Project:	1305797	**Work Order:**	1305319
Sample ID:	MW-117	**Lab ID:**	1305319-3
Legal Location:		**Matrix:**	WATER
Collection Date:	5/15/2013 10:30	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
RA-226 BY RADON EMANATION - METHOD 903.1			**PAI 783**		Prep Date: **5/29/2013**	PrepBy: **PJW**
Ra-226	ND (+/- 0.24)	U	0.45	pCi/l	NA	6/7/2013 13:29
Carr: BARIUM	*99.1*		*40-110*	*%REC*	NA	6/7/2013 13:29
RADIUM-228 ANALYSIS BY GFPC			**PAI 724**		Prep Date: **5/28/2013**	PrepBy: **JTL**
Ra-228	ND (+/- 0.29)	U	0.53	pCi/l	NA	5/31/2013 10:39
Carr: BARIUM	*99.1*		*40-110*	*%REC*	NA	5/31/2013 10:39

Client:	ALS Environmental	**Date:**	*10-Jun-13*
Project:	1305797	**Work Order:**	1305319
Sample ID:	DUP-03	**Lab ID:**	1305319-4
Legal Location:		**Matrix:**	WATER
Collection Date:	5/15/2013	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
RA-226 BY RADON EMANATION - METHOD 903.1			**PAI 783**		Prep Date: **5/29/2013**	PrepBy: **PJW**
Ra-226	ND (+/- 0.3)	Y1,U	0.54	pCi/l	NA	6/7/2013 13:29
Carr: BARIUM	*101*	Y1	*40-110*	*%REC*	NA	6/7/2013 13:29
RADIUM-228 ANALYSIS BY GFPC			**PAI 724**		Prep Date: **5/28/2013**	PrepBy: **JTL**
Ra-228	ND (+/- 0.29)	Y1,U	0.55	pCi/l	NA	5/31/2013 10:39
Carr: BARIUM	*101*	Y1	*40-110*	*%REC*	NA	5/31/2013 10:39

Client:	ALS Environmental	**Date:**	*10-Jun-13*
Project:	1305797	**Work Order:**	1305319
Sample ID:	MW-118	**Lab ID:**	1305319-5
Legal Location:		**Matrix:**	WATER
Collection Date:	5/15/2013 18:30	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
RA-226 BY RADON EMANATION - METHOD 903.1			**PAI 783**		Prep Date: **5/29/2013**	PrepBy: **PJW**
Ra-226	0.22 (+/- 0.18)	LT	0.2	pCi/l	NA	6/7/2013 13:29
Carr: BARIUM	*96.6*		*40-110*	*%REC*	NA	6/7/2013 13:29
RADIUM-228 ANALYSIS BY GFPC			**PAI 724**		Prep Date: **5/28/2013**	PrepBy: **JTL**
Ra-228	ND (+/- 0.25)	U	0.48	pCi/l	NA	5/31/2013 10:28
Carr: BARIUM	*96.6*		*40-110*	*%REC*	NA	5/31/2013 10:28

Client:	ALS Environmental	**Date:**	*10-Jun-13*
Project:	1305797	**Work Order:**	1305319
Sample ID:	MW-119	**Lab ID:**	1305319-6
Legal Location:		**Matrix:**	WATER
Collection Date:	5/15/2013 18:10	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
RA-226 BY RADON EMANATION - METHOD 903.1			**PAI 783**		Prep Date: **5/29/2013**	PrepBy: **PJW**
Ra-226	ND (+/- 0.19)	Y1,U	0.31	pCi/l	NA	6/7/2013 13:29
Carr: BARIUM	*100*	Y1	*40-110*	*%REC*	NA	6/7/2013 13:29
RADIUM-228 ANALYSIS BY GFPC			**PAI 724**		Prep Date: **5/28/2013**	PrepBy: **JTL**
Ra-228	ND (+/- 0.21)	Y1,U	0.47	pCi/l	NA	5/31/2013 10:28
Carr: BARIUM	*100*	Y1	*40-110*	*%REC*	NA	5/31/2013 10:28

Client:	ALS Environmental	**Date:**	*10-Jun-13*
Project:	1305797	**Work Order:**	1305319
Sample ID:	MW-116	**Lab ID:**	1305319-7
Legal Location:		**Matrix:**	WATER
Collection Date:	5/16/2013 10:15	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
RA-226 BY RADON EMANATION - METHOD 903.1			**PAI 783**		Prep Date: **5/29/2013**	PrepBy: **PJW**
Ra-226	ND (+/- 0.21)	U	0.36	pCi/l	NA	6/7/2013 13:29
Carr: BARIUM	*97.2*		*40-110*	*%REC*	NA	6/7/2013 13:29
RADIUM-228 ANALYSIS BY GFPC			**PAI 724**		Prep Date: **5/28/2013**	PrepBy: **JTL**
Ra-228	ND (+/- 0.21)	U	0.46	pCi/l	NA	5/31/2013 10:28
Carr: BARIUM	*97.2*		*40-110*	*%REC*	NA	5/31/2013 10:28

Client:	ALS Environmental	**Date:**	*10-Jun-13*
Project:	1305797	**Work Order:**	1305319
Sample ID:	EQB-03	**Lab ID:**	1305319-8
Legal Location:		**Matrix:**	WATER
Collection Date:	5/16/2013 11:40	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
RA-226 BY RADON EMANATION - METHOD 903.1			**PAI 783**		Prep Date: **5/29/2013**	PrepBy: **PJW**
Ra-226	ND (+/- 0.13)	U	0.2	pCi/l	NA	6/7/2013 13:29
Carr: BARIUM	*97.6*		*40-110*	*%REC*	NA	6/7/2013 13:29
RADIUM-228 ANALYSIS BY GFPC			**PAI 724**		Prep Date: **5/28/2013**	PrepBy: **JTL**
Ra-228	ND (+/- 0.21)	U	0.45	pCi/l	NA	5/31/2013 10:28
Carr: BARIUM	*97.6*		*40-110*	*%REC*	NA	5/31/2013 10:28

Client:	ALS Environmental	**Date:**	*10-Jun-13*
Project:	1305797	**Work Order:**	1305319
Sample ID:	RO Discharge	**Lab ID:**	1305319-9
Legal Location:		**Matrix:**	WATER
Collection Date:	5/16/2013 08:30	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
RA-226 BY RADON EMANATION - METHOD 903.1			**PAI 783**		Prep Date: **5/29/2013**	PrepBy: **PJW**
Ra-226	0.49 (+/- 0.3)	LT	0.24	pCi/l	NA	6/7/2013 13:29
Carr: BARIUM	*88.2*		*40-110*	*%REC*	NA	6/7/2013 13:29
RADIUM-228 ANALYSIS BY GFPC			**PAI 724**		Prep Date: **5/28/2013**	PrepBy: **JTL**
Ra-228	ND (+/- 0.25)	U	0.52	pCi/l	NA	5/31/2013 10:28
Carr: BARIUM	*88.2*		*40-110*	*%REC*	NA	5/31/2013 10:28

Client:	ALS Environmental	**Date:**	*10-Jun-13*
Project:	1305797	**Work Order:**	1305319
Sample ID:	RO Discharge	**Lab ID:**	1305319-9
Legal Location:		**Matrix:**	WATER
Collection Date:	5/16/2013 08:30	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

Diesel Range Organics:

Client:	ALS Environmental	**Date:**	*10-Jun-13*
Project:	1305797	**Work Order:**	1305319
Sample ID:	RO Discharge	**Lab ID:**	1305319-9
Legal Location:		**Matrix:**	WATER
Collection Date:	5/16/2013 08:30	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

QC BATCH REPORT

Batch ID: **RE130529-2-1** Instrument ID: **Alpha Scin** Method: **Ra-226 by Radon Emanation - Me**

LCS Sample ID: **RE130529-2** Units: **pCi/l** Analysis Date: **6/7/2013 14:01**

Client ID: Run ID: **RE130529-2A** Prep Date: **5/29/2013** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	DER Ref Value	DER	DER Limit	Qual
Ra-226	30.4 (+/- 7.7)	0.4	29.99		101	67-120				P
Carr: BARIUM	32650		33170		98.4	40-110				

LCSD Sample ID: **RE130529-2** Units: **pCi/l** Analysis Date: **6/7/2013 14:01**

Client ID: Run ID: **RE130529-2A** Prep Date: **5/29/2013** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	DER Ref Value	DER	DER Limit	Qual
Ra-226	26.2 (+/- 6.7)	0.2	29.99		87.2	67-120	30.4	0.419	2.13	P
Carr: BARIUM	31570		33170		95.2	40-110	32650			

MB Sample ID: **RE130529-2** Units: **pCi/l** Analysis Date: **6/7/2013 13:29**

Client ID: Run ID: **RE130529-2A** Prep Date: **5/29/2013** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	DER Ref Value	DER	DER Limit	Qual
Ra-226	ND	0.28								U
Carr: BARIUM	31150		33170		93.9	40-110				

The following samples were analyzed in this batch:

1305319-1	1305319-2	1305319-3
1305319-4	1305319-5	1305319-6
1305319-7	1305319-8	1305319-9

Client: ALS Environmental
Work Order: 1305319
Project: 1305797

QC BATCH REPORT

Batch ID: **RA130528-1-1** Instrument ID: **LB4100-B** Method: **Radium-228 Analysis by GFPC**

LCS Sample ID: **RA130528-1** Units: **pCi/l** Analysis Date: **5/31/2013 10:31**
Client ID: Run ID: **RA130528-1A** Prep Date: **5/28/2013** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	DER Ref Value	DER	DER Limit	Qual
Ra-228	10.2 (+/- 2.5)	0.6	9.859		104	70-130				P
Carr: BARIUM	32650		33170		98.4	40-110				

LCSD Sample ID: **RA130528-1** Units: **pCi/l** Analysis Date: **5/31/2013 10:31**
Client ID: Run ID: **RA130528-1A** Prep Date: **5/28/2013** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	DER Ref Value	DER	DER Limit	Qual
Ra-228	11 (+/- 2.7)	0.6	9.859		112	70-130	10.2	0.223	2.13	P
Carr: BARIUM	31570		33170		95.2	40-110	32650			

MB Sample ID: **RA130528-1** Units: **pCi/l** Analysis Date: **5/31/2013 10:39**
Client ID: Run ID: **RA130528-1A** Prep Date: **5/28/2013** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	DER Ref Value	DER	DER Limit	Qual
Ra-228	ND	0.39								U
Carr: BARIUM	31150		33170		93.9	40-110				

The following samples were analyzed in this batch:

1305319-1	1305319-2	1305319-3
1305319-4	1305319-5	1305319-6
1305319-7	1305319-8	1305319-9