GW-028

ANNUAL DP REPORT (1)

2014

HOLLYFRONTIER.

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

Mr. John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environmental Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505

March 13, 2015

RE: Submittal of the *2014 Annual Discharge Permit Report* for the Navajo Refining Company, Artesia Refinery
Discharge Permit GW-028
RCRA Permit No. NMD048918817

Dear Mr. Chavez and Mr. Kieling:

Enclosed are one paper copy and one electronic copy of the *2014 Annual Discharge Permit Report* for the Navajo Refining Company, LLC Artesia Refinery. This report is being submitted to fulfill the requirement of Section 2.F. of Discharge Permit GW-028.

If you have any questions or comments regarding this report, please feel free to contact me at 575-746-5294 or Robert Combs at 575-746-5382.

Sincerely,

Brian Stone, P.E.
Environmental Specialist
Navajo Refining Company, LLC

c: Robert Combs, NRC
Mike Holder, HFC
Pamela R. Krueger, ARCADIS

2014 ANNUAL DISCHARGE PERMIT REPORT
NAVAJO REFINING COMPANY-ARTESIA REFINERY
DISCHARGE PERMIT GW-028

EXECUTIVE SUMMARY

This report was prepared to fulfill the requirement in Section 2.F. of the Discharge Permit GW-028 for Navajo Refining Company L.L.C. The requirement specifies that an Annual Report be submitted by March 15 following the reporting year and should include:

A. Summary of major refinery activities and events.
B. Summary of discharge activities.
C. Summary of all leaks, spills, and releases and corrective actions taken.
D. Summary of discovery of new groundwater contamination.

A. MAJOR REFINERY ACTIVITIES

The refinery conducted normal operations for 2014. The refinery did not undergo any expansions in regards to production capacity, but did make several modifications to improve operability and reliability.

In August 2012, OCD issued a new discharge permit (GW-028) to the refinery. One of the major conditions of the permit is to discontinue the discharge of reverse osmosis (RO) reject water to the farm fields within 36 months. The required engineering and planning to achieve the requirement are underway. Section 6.D of Discharge Permit GW-028 required a site investigation of the fields, which was performed throughout 2013. The Final Report for the investigation was completed and submitted on February 21, 2014.

In November 2014, NRC requested that the Refinery's discharge permit be modified to allow for continued land application of the RO reject until the expiration of the permit or the installation and operation of the planned fourth injection well, whichever comes first. This extension was necessary due to decreased capacity of the current three injection wells and limitations on effluent discharged to the City's POTW. Studies are currently underway to allow for alternate disposal of effluent at the Refinery. As part of these efforts, NRC also began working with the OCD in 2014 on the permitting of a fourth injection well and the rulemaking required to allow for conversion of the well to use for hazardous effluent in the future.

In the fall of 2013, it was discovered that selenium concentrations in the refinery waste water effluent exceeded the toxicity characteristic limit of 1.0 mg/L. To address this problem, NRC met with OCD and NMED Hazardous Waste Bureau to discuss options. The refinery and OCD signed an Agreed Compliance Order and Amendment to outline the path forward

and a letter agreement with NMED. Selenium concentration in the waste water stream was reduced by addition of ferric chloride to facilitate co-precipitate with selenium. This was the initial action until a Selenium Reduction Technology (SeRT) unit could be put online. The SeRT unit became operational in January 2014 and is used in conjunction with ferric chloride co-precipitation to meet pretreatment concentration limits for discharge to both the POTW and to the injection wells.

In December 2011, construction of the light non-aqueous phase liquid (LNAPL) Recovery System Phase I upgrades began, and became operational in April 2012. The system upgrades replaced several of the existing pumps and segregated recovery of produced groundwater and recovered hydrocarbons in order to reduce the process load on the NRC WWTP. The Phase I wells addressed were RW-5R, RW-12R, RW-13R, RW-14R, RW-15, RW-19, RW-20, and RW-22. Implementation of Phase II of the recovery system upgrades began in late 2013 and operation of those upgrades was started in January of 2014. Phase II included minor retrofits to Phase I equipment, a controls and communications system, installation of two additional lift stations, and implemented recovery wells RW-1R, RW-2R, RW-4R, RW-6R, RW-7R, and RW-8R. In 2014, the system recovered 2,969,066 gallons (70,692 barrels) of groundwater and 104,272 gallons (2483 barrels) of PSH. Further details of the recovery system operation are discussed in Section 6 of the *2014 Annual Groundwater Report*, submitted to OCD and NMED on February 27, 2015.

In November 2014, NRC submitted a well abandonment plan (plugging plan) to the New Mexico Office of the State Engineer (OSE) requesting approval to abandon the three recovery wells located immediately west of Bolton Road (RW-12, RW-13, and RW-14) because these wells have been replaced and are no longer used for the recovery system. The OSE approved the plugging plan but raised questions on the diversion of groundwater from the shallow saturated zone. OSE verbally requested that NRC cease pumping of groundwater from the recovery system until a review of the operation and potential water rights issues could be completed. As a result, the groundwater pumps in all of the recovery wells were turned off on November 17, 2014, with the exception of the total fluids pump located in the french drain immediately east of Bolton Road (RW-20). The PSH skimming pumps continued to be operated throughout the remainder of 2014. A letter describing the situation and the concerns of OSE, along with the current status of the recovery system operation, was submitted to NMED and OCD on January 30, 2015. A copy of the letter is provided in Appendix A of this report.

In July of 2014, NRC began a background groundwater study to evaluate upgradient/crossgradient groundwater concentrations, and to potentially establish alternative standards for select COCs, as appropriate. NRC is utilizing existing wells in the monitoring network and also installed two additional monitoring wells to complete the evaluation. A report summarizing the activities associated with the background groundwater study will be submitted to OCD and NMED no later than July 31, 2015.

B. SUMMARY OF DISCHARGE ACTIVITIES

Navajo's primary discharges are treated waste water from the WWTP (WWTP effluent) and the RO Reject. The WWTP effluent is discharged to NRC's Injection Wells (WDW-1, WDW-2, and WDW-3) and to the City of Artesia's POTW. The details of each discharge are provided below:

1. Injection Wells

The injection rates, volume, and quality of treated waste water disposed of in the injection wells are reported quarterly in a report to OCD, in addition to monthly C-115 reports. Those reports are included in Appendix B, tab 1. The total injected water volume for 2014 was 4,515,886 barrels.

2. POTW

The flow rates, volume, and quality of water discharged to the POTW are reported semiannually to the City of Artesia; those letter reports are included in Appendix B, tab 2. The total transferred water volume for 2014 was 915,507 gallons, or 21,798 barrels.

Navajo continued to discharge the blow-down from the cooling tower to the POTW in 2014. The total volume discharged at a rate of 99 gpm is estimated to be 44,936,053 gallons, or 1,069,906 barrels.

3. Reverse Osmosis Reject

A secondary waste stream is the RO reject water. This RO process is fed by fresh ground water provided by either the refinery's agricultural supply wells or purchased water from the City of Artesia. The reject waste stream is comprised of water with concentrated salts, primarily chloride, fluoride, and sulfate, and is a high total dissolved solids (TDS) waste stream which is discharged to two farm fields. The stream is sampled semiannually as required by Section 4.B.1. of Discharge Permit GW-028 and the data is included in Appendix B, tab 3. The flow rate is continuously recorded with the Process History Database (PHD). Based on the data in the PHD, the total discharged RO reject water volume for 2014 was 128,930,388 gallons, or 3,069,771 barrels.

As noted in a March 13, 2015 telephone call from Mr. Mike Holder (HollyFrontier Corporate Environmental Specialist) to OCD Staff, it was determined during report preparation that the above figures do not take into account RO reject water discharged from a temporary RO unit installed in 2011 and that has been used to supplement the two permanent RO units. Considering this discharge, and subject to ongoing review and confirmation, NRC believes it has exceeded the permitted discharge volume of approximately 10,000 barrels per day. Discharge levels vary, and NRC is continuing to review this matter, including operation of the temporary RO unit since installation. NRC will further communicate with OCD when it has additional information and will work with OCD to resolve this issue.

C. SUMMARY OF ALL LEAKS, SPILLS, AND RELEASES

The Artesia refinery had 2 spills of reportable quantities in 2014. It should be mentioned here that this demonstrates the continued improvements compared to previous years (4 spills in 2013, 7 spills 2012; 9 spills in 2011). The refinery aspires to continue this trend for 2015. Appendix C contains information about the spills.

1. 7/15/2014 – Southwest Tank Farm Diesel Pipeline Leak

At approximately 0710 on 7/15/2014, it was reported that an above ground diesel suction line had developed a leak sometime during the previous night where it penetrated an earthen dike between two adjacent containment areas in the Southwest Tank Farm (AOC 4 – Tanks 111, 112, 113, 417, 418, 419 and 434). Because it had rained during the night, rainwater had pooled in the low spots within the diked containment areas. At the morning shift inspection it was determined that the rainwater contained diesel product. The leaking line was isolated and blocked off to prevent any additional release. Vapor suppressant foam was applied to the pooled liquid to prevent volatile organics from being released during the heat of the day. Three vacuum trucks were sent to the containment area and vacuumed the diesel/water/foam liquid mixture. The volume of water and diesel from each truckload was recorded separately to determine the amount of diesel that leaked and was returned to the crude process unit.

Following completion of the removal of liquids from the containment areas, the earthen berm was removed to allow access to the pipeline for repairs. A hand auger was used to inspect the soil within the containment areas to evaluate the depth of saturation. Soil samples were submitted to a laboratory for analysis of total petroleum hydrocarbons (TPH) diesel range organics (DRO). Limited soil excavation was performed to remove saturated soil from the floor of the containment areas around Tanks 434 and 113 and around Tanks 111 and 112. Excavation was not possible in the containment area surrounding Tanks 417, 418, and 419 due to the presence of above ground piping on all four sides of that containment area. Microbial agents were applied to the soil within all three of the containment areas to promote biodegradation of any remaining hydrocarbons in the soil.

Treatment of the soil within the containment areas is ongoing. A final report will be submitted summarizing the release response and remediation activities during the first half of 2015.

2. 10/17/2014 – Hydrocarbons in Clark Draw

At approximately 1100 on 10/17/2014, a small area of stained concrete was observed in the base of Clark Draw. Clark Draw is an east-west oriented drainage ditch that conveys stormwater from west of US Highway 285 through the northern portion of the refinery, just south of the North Colony Landfarm into Eagle Draw. There was no water flowing in the waterway at the time of discovery. It was determined that the hydrocarbons were seeping up from below the concrete in the bottom of the draw. The observed hydrocarbon material was removed using absorbent pads and absorbent booms were

placed to prevent residual hydrocarbons being released during flowing conditions in the waterway.

Inspection of nearby monitoring and recovery wells determined that the groundwater elevation had risen significantly, likely due to heavier than normal rainfall to the west and northwest of Artesia. On 10/17/2014, fluid levels in RW-17, located immediately north of Clark Draw on the west side of Eagle Draw, were measured as 9.12 feet (ft) to product and 9.35 ft to groundwater, relative to the top of casing. Between 2011 and March 2014, no hydrocarbon product was identified in this recovery well and the depth to groundwater measured ranged from 9.6 to 14 ft below top of casing. It is believed that the elevated groundwater resulting from heavy rainfall and recharge to the shallow groundwater bearing unit caused a small amount of hydrocarbon product to be mobilized and to enter Clark Draw.

A vacuum truck was used to remove the hydrocarbon product from RW-17 periodically between 10/17/2014 and 11/10/2014, as appropriate. During this time period, a total of 650 barrels of hydrocarbons and groundwater were removed from RW-17.

No further expression of hydrocarbons has been observed within Clark Draw since 10/17/2014. A final report will be submitted summarizing the remediation activities.

D. SUMMARY OF NEW GROUNDWATER CONTAMINATION

New groundwater contamination and changes in existing constituents are discussed in Section 7 of the *2014 Annual Groundwater Report* submitted to OCD and NMED on February 27, 2015. The conclusions of that report are listed below:

- Groundwater flow direction and gradient remains generally consistent with that measured during past years. Discharge of the RO reject water to the RO reject fields and operation of the recovery system groundwater pumps have localized influence of groundwater gradients, creating a slight mound beneath the RO reject fields. Localized groundwater sinks are observed around recovery wells when the total fluids pumps are operating.

- The PSH plume shapes were modified, as shown in Figures 8 and 9, based on the findings of the Contaminant Migration Evaluation (CME) Investigation performed in 2014. The findings included refinement of the lithologic model for the site through identification of gravel lenses. However, a general reduction in the PSH plume was observed during the second semiannual event, which is attributable to the rise in the groundwater potentiometric surface throughout the area.

- Concentrations of dissolved phase organic constituents have generally remained stable, although increasing trends were noted in specific areas. The overall shape of the dissolved phase constituent plumes remain similar to previous years, although slight changes were observed due to installation of additional wells.

- Upgrades to the PSH recovery system have been completed and the system operated more consistently throughout 2014.

- The OSE requested that pumping of groundwater be halted while a review of the water rights associated with the shallow saturated zone is completed. The recovery system is currently being operated using the PSH pumps only, with the exception of the total fluids pump placed in the french drain immediately to the east of Bolton Road (RW-20).

Appendices

Appendix A Recovery System Status Letter

Appendix B Refinery Discharges

B.1 Treated Wastewater to Injection Wells

B.2 Treated Wastewater to Artesia POTW

B.3 RO Reject Discharge Volumes

Appendix C Leaks, Spills, and Releases

C.1 7/15/2014 – Southwest Tank Farm Diesel Pipeline Leak

C.2 10/17/2014 – Hydrocarbons in Clark Draw

Appendix A

Recovery System Status Letter

HOLLYFRONTIER

Mr. Dave Cobrain
New Mexico Environmental Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

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

January 30, 2015

RE: Status of the Groundwater Recovery System
Navajo Refining Company, Artesia Refinery
RCRA Permit No. NMD048918817
Discharge Permit GW-028

Dear Mr. Cobrain and Mr. Chavez:

The Navajo Refining Company, LLC (NRC) has been operating a groundwater recovery system to capture phase separated hydrocarbons (PSH) present within the shallow water bearing zone beneath the Artesia Refinery (Refinery) and the field east of the Refinery owned by NRC. The operation of the system is conducted in accordance with the Post Closure Care Permit (PCC Permit) administered by the New Mexico Environment Department (NMED) and the Discharge Permit administered by the Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural Resources Department.

The recovery system consists of a series of trenches and recovery wells located throughout the Refinery and the field east of the Refinery owned by NRC. The typical recovery well contains two pumps: a groundwater pump typically placed near the bottom of the recovery well and a PSH-only "skimming" pump placed near the interface between the groundwater and PSH. The groundwater pumps are operated on an as-needed basis to depress the groundwater beneath the PSH, drawing additional PSH into each recovery well. The groundwater pumps are typically cycled in order to minimize the volume of groundwater produced. Recovered groundwater is piped to the process wastewater system for treatment and ultimate discharge to either the City of Artesia wastewater treatment system or a deep well injection site(s) located approximately 12 miles east of the Refinery. Recovered PSH is placed into the crude stream for processing. The volume of PSH and groundwater recovered is reported to both NMED and OCD annually in the required annual monitoring report.

In November 2014, NRC submitted a well abandonment plan (plugging plan) to the New Mexico Office of the State Engineer (OSE) requesting approval to abandon three recovery wells located adjacent to Bolton Road that are no longer used as collection points within the recovery system. The OSE approved the plugging plan but raised questions on the diversion of groundwater as part of the recovery system. OSE verbally requested that NRC cease pumping of groundwater from the recovery system until a review of the operation and potential water rights issues could be completed. As a result, the groundwater pumps associated with the recovery system were turned off on November 17, 2014, with the exception of the total fluids pump located in the french drain immediately east of Bolton Road. The PSH skimming pumps continue to be operated; thus, the recovery system is still operating but at slightly reduced efficiency. The change in operational mode (i.e. not operating the groundwater pumps) will be documented in the 2014 Groundwater Report and the 2014 Annual Report.

A meeting was conducted on December 29, 2014 to describe the recovery system to OSE personnel and to discuss any potential water rights requirements. The volume of groundwater "diverted" from the shallow water bearing zone by the recovery system (since 1995) was provided to OSE and compared to the volume of water discharged to the reverse osmosis (RO) reject discharge fields for the same period. Although not permitted by OSE for the purpose, the discharge to the RO reject fields provides return flow to the shallow water bearing zone, as demonstrated by the investigation of the RO reject fields conducted in 2013 at the request of OCD. Accordingly, any water diverted in connection with the recovery system from the shallow water bearing zone is "offset" by water returned to the same aquifer. NRC presented the volume information to OSE and requested whether the return flow through the RO reject fields could be considered as an offset to the volume of groundwater diverted for remediation purposes. As an initial matter, the OSE personnel with whom the meeting was held stated that this would likely not be allowable since the RO was currently associated with NRC's artesian groundwater rights and, as currently permitted, NRC may not apply any excess artesian water rights to the shallow water bearing zone diversion. OSE personnel stated that NRC would likely need to obtain shallow water rights through either a leasing agreement or purchase of existing water rights to continue operation of the system. Another alternative suggested by OSE was to inject the recovered/diverted groundwater phase into the shallow water bearing zone.

NRC is currently reviewing various options for addressing the OSE concerns for water rights for the shallow groundwater, including:

- Modifying the existing water rights permit for the artesian aquifer to apply the return flow credit from discharge to the RO reject fields allowed under this permit to the diversion of the shallow groundwater from the recovery system. This modification would be submitted along with a request for emergency approval under Section 72-5-25 New Mexico Statutes Amended 1978 (NMSA 1978).

- Identifying shallow groundwater rights nearby that may be obtainable under either a lease or purchase agreement. This approach may require a significant amount of time, resulting in a longer period in which the groundwater pumps are not operating.

- Evaluating the potential for re-injection of the groundwater into the shallow groundwater. This approach will require approval of both NMED and OCD and is expected to require a modification of the Discharge Permit. As part of this evaluation, the possibility of using the re-injection of groundwater for either gradient control (i.e., a hydraulic barrier) or for flushing of groundwater contaminants to the recovery system is being considered. This approach will require a significant amount of time for design and construction of treatment (if required) and injection infrastructure.

The groundwater pumps, as described above, will remain inactive until an agreement can be reached with the various agencies to allow the diversion of groundwater from the shallow water bearing zone for the remediation system. The PSH-only pumps will remain active; however, NRC believes that operation of the remediation system in this fashion is not the most efficient or effective method to control potential migration of the PSH plume. As we proceed with evaluation of the various options we will keep you informed and may request your assistance with regard to ensuring an effective resolution of this matter with the OSE.

NRC will continue to update both NMED and OCD regarding the status of the remediation system periodically. If you have any questions or comments regarding this request, please feel free to contact me at 575-746-5294 or Robert Combs at 575-746-5382.

Sincerely,

Brian Stone
Environmental Specialist
Navajo Refining Company, LLC

c: Robert Combs, NRC
Pamela R. Krueger, ARCADIS

Appendix B

Refinery Discharges

B.1 Treated Wastewater to Injection Wells

HOLLYFRONTIER.

May 22, 2014

Mr. Carl Chavez, CHMM
NM Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr.
Santa Fe, NM 87505-5472

Certified Mail/Return Receipt
7007 3020 0000 3028 8048

RE: 2014 1st Quarter Injection Report for Wells WDW-1, WDW-2 and WDW-3, Navajo Refining Company, L.L.C.

Dear Mr. Chavez,

Enclosed, please find the first quarter 2014 sampling results for fluids injected into WDW-1, WDW-2 and WDW-3 and a spread sheet showing various volumes and pressures as required under Permit Condition 2.I.1, Quarterly Reports.

This report covers the period from January 1, 2014 to March 31, 2014. We have disposed a total of 1,271,325 barrels of fluid into the three wells during the first quarter 2014. The volume per well is:

- 444,572 barrels into WDW-1
- 461,609 barrels into WDW-2
- 365,144 barrels into WDW-3

This report is signed and certified in accordance with WQCC section 5101.G. If there are any questions, please call me at 575-748-3311.

Respectfully,

Michael D. McKee

Michael McKee
Vice-President, Refinery Manager
Navajo Refining Company L.L.C.

Electronic cc (w/enc.): D Crawford, R Combs, M Schultz, A Strange
Environmental File: Injection Wells/Reports C-115 & Quarterly/2014/1st quarter/2014-05-22 1st QTR Inj Rpt for Wells WDW-1,2,3 Navajo: (ART: REF 14- 4.A.02.D)

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

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

April 09, 2014

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

RE: WDW-1, 2 & 3 Qtrly Inj Well OrderNo.: 1403871

Dear Mike Holder:

Hall Environmental Analysis Laboratory received 2 sample(s) on 3/20/2014 for the analyses presented in the following report.

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

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

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1403871**
Date Reported: **4/9/2014**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2 & 3 Qtrly Inj Well
Lab ID: 1403871-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2 & 3 Effluent
Collection Date: 3/20/2014 9:00:00 AM
Received Date: 3/20/2014 1:50:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JRR**	
Fluoride	5.5	1.0	*	mg/L	10	3/21/2014 12:08:26 AM	R17472
Chloride	410	50		mg/L	100	3/21/2014 12:20:50 AM	R17472
Nitrogen, Nitrite (As N)	ND	1.0		mg/L	10	3/21/2014 12:08:26 AM	R17472
Bromide	1.6	1.0		mg/L	10	3/21/2014 12:08:26 AM	R17472
Nitrogen, Nitrate (As N)	ND	1.0		mg/L	10	3/21/2014 12:08:26 AM	R17472
Phosphorus, Orthophosphate (As P)	ND	5.0		mg/L	10	3/21/2014 12:08:26 AM	R17472
Sulfate	3900	50		mg/L	100	3/21/2014 12:20:50 AM	R17472
EPA METHOD 7470: MERCURY						Analyst: **JML**	
Mercury	ND	0.00020		mg/L	1	3/24/2014 5:57:04 PM	12328
MERCURY, TCLP						Analyst: **JML**	
Mercury	ND	0.020		mg/L	1	3/21/2014 4:08:02 PM	12307
EPA METHOD 6010B: TCLP METALS						Analyst: **ELS**	
Arsenic	ND	0.10		mg/L	1	3/21/2014 10:39:40 AM	12293
Barium	ND	0.10		mg/L	1	3/21/2014 10:39:40 AM	12293
Cadmium	ND	0.10		mg/L	1	3/21/2014 10:39:40 AM	12293
Chromium	ND	0.10		mg/L	1	3/21/2014 10:39:40 AM	12293
Lead	ND	0.10		mg/L	1	3/21/2014 10:39:40 AM	12293
Selenium	ND	0.10		mg/L	1	3/21/2014 10:39:40 AM	12293
Silver	ND	0.10		mg/L	1	3/21/2014 10:39:40 AM	12293
EPA 6010B: TOTAL METALS						Analyst: **ELS**	
Aluminum	2.3	0.10		mg/L	5	3/21/2014 10:29:25 AM	12293
Antimony	ND	0.050		mg/L	1	3/21/2014 10:25:56 AM	12293
Arsenic	ND	0.020		mg/L	1	3/21/2014 10:25:56 AM	12293
Barium	0.049	0.020		mg/L	1	3/21/2014 10:25:56 AM	12293
Beryllium	ND	0.0030		mg/L	1	3/21/2014 10:25:56 AM	12293
Cadmium	ND	0.0020		mg/L	1	3/21/2014 10:25:56 AM	12293
Calcium	93	1.0		mg/L	1	3/21/2014 10:25:56 AM	12293
Chromium	ND	0.0060		mg/L	1	3/21/2014 10:25:56 AM	12293
Cobalt	ND	0.0060		mg/L	1	3/21/2014 10:25:56 AM	12293
Copper	0.0092	0.0060		mg/L	1	3/21/2014 10:25:56 AM	12293
Iron	3.3	0.25		mg/L	5	3/21/2014 10:29:25 AM	12293
Lead	ND	0.0050		mg/L	1	3/21/2014 10:25:56 AM	12293
Magnesium	30	1.0		mg/L	1	3/21/2014 10:25:56 AM	12293
Manganese	0.12	0.0020		mg/L	1	3/21/2014 10:25:56 AM	12293
Nickel	0.016	0.010		mg/L	1	3/21/2014 10:25:56 AM	12293
Potassium	37	1.0		mg/L	1	3/21/2014 10:25:56 AM	12293
Selenium	0.13	0.050		mg/L	1	3/21/2014 10:25:56 AM	12293

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2 & 3 Qtrly Inj Well
Lab ID: 1403871-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2 & 3 Effluent
Collection Date: 3/20/2014 9:00:00 AM
Received Date: 3/20/2014 1:50:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 6010B: TOTAL METALS						Analyst: **ELS**	
Silver	ND	0.0050		mg/L	1	3/21/2014 10:25:56 AM	12293
Sodium	1400	20		mg/L	20	3/21/2014 10:31:26 AM	12293
Thallium	ND	0.050		mg/L	1	3/21/2014 10:25:56 AM	12293
Vanadium	ND	0.050		mg/L	1	3/21/2014 10:25:56 AM	12293
Zinc	0.15	0.020		mg/L	1	3/21/2014 10:25:56 AM	12293
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
Acetonitrile	ND	10		µg/L	1	3/26/2014	R17842
Allyl chloride	ND	0.50		µg/L	1	3/26/2014	R17842
Chloroprene	ND	0.50		µg/L	1	3/26/2014	R17842
Cyclohexane	1.6	0.50		µg/L	1	3/26/2014	R17842
Diethyl ether	ND	0.50		µg/L	1	3/26/2014	R17842
Diisopropyl ether	ND	0.50		µg/L	1	3/26/2014	R17842
Epichlorohydrin	ND	5.0		µg/L	1	3/26/2014	R17842
Ethyl acetate	ND	0.50		µg/L	1	3/26/2014	R17842
Ethyl methacrylate	ND	0.50		µg/L	1	3/26/2014	R17842
Ethyl tert-butyl ether	ND	0.50		µg/L	1	3/26/2014	R17842
Freon-113	ND	0.50		µg/L	1	3/26/2014	R17842
Isobutanol	ND	20		µg/L	1	3/26/2014	R17842
Isopropyl acetate	ND	0.50		µg/L	1	3/26/2014	R17842
Methacrylonitrile	ND	0.50		µg/L	1	3/26/2014	R17842
Methyl acetate	ND	0.50		µg/L	1	3/26/2014	R17842
Methyl ethyl ketone	5.6	2.5		µg/L	1	3/26/2014	R17842
Methyl isobutyl ketone	ND	2.5		µg/L	1	3/26/2014	R17842
Methyl methacrylate	ND	0.50		µg/L	1	3/26/2014	R17842
Methylcyclohexane	1.2	1.0		µg/L	1	3/26/2014	R17842
n-Amyl acetate	ND	0.50		µg/L	1	3/26/2014	R17842
n-Hexane	ND	0.50		µg/L	1	3/26/2014	R17842
Nitrobenzene	ND	5.0		µg/L	1	3/26/2014	R17842
Pentachloroethane	ND	5.0		µg/L	1	3/26/2014	R17842
p-isopropyltoluene	ND	0.50		µg/L	1	3/26/2014	R17842
Propionitrile	ND	0.50		µg/L	1	3/26/2014	R17842
Tetrahydrofuran	ND	0.50		µg/L	1	3/26/2014	R17842
Benzene	0.63	0.50		µg/L	1	3/26/2014	R17842
Toluene	ND	0.50		µg/L	1	3/26/2014	R17842
Ethylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	1	3/26/2014	R17842
1,2,4-Trimethylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,3,5-Trimethylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,2-Dichloroethane (EDC)	ND	0.50		µg/L	1	3/26/2014	R17842

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2 & 3 Qtrly Inj Well
Lab ID: 1403871-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2 & 3 Effluent
Collection Date: 3/20/2014 9:00:00 AM
Received Date: 3/20/2014 1:50:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
1,2-Dibromoethane (EDB)	ND	0.50		µg/L	1	3/26/2014	R17842
Naphthalene	ND	0.50		µg/L	1	3/26/2014	R17842
Acetone	42	2.5		µg/L	1	3/26/2014	R17842
Bromobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
Bromodichloromethane	ND	0.50		µg/L	1	3/26/2014	R17842
Bromoform	ND	0.50		µg/L	1	3/26/2014	R17842
Bromomethane	ND	0.50		µg/L	1	3/26/2014	R17842
Carbon disulfide	5.6	0.50		µg/L	1	3/26/2014	R17842
Carbon Tetrachloride	ND	0.50		µg/L	1	3/26/2014	R17842
Chlorobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
Chloroethane	ND	0.50		µg/L	1	3/26/2014	R17842
Chloroform	0.64	0.50		µg/L	1	3/26/2014	R17842
Chloromethane	ND	0.50		µg/L	1	3/26/2014	R17842
2-Chlorotoluene	ND	0.50		µg/L	1	3/26/2014	R17842
4-Chlorotoluene	ND	0.50		µg/L	1	3/26/2014	R17842
cis-1,2-DCE	ND	0.50		µg/L	1	3/26/2014	R17842
cis-1,3-Dichloropropene	ND	0.50		µg/L	1	3/26/2014	R17842
1,2-Dibromo-3-chloropropane	ND	0.50		µg/L	1	3/26/2014	R17842
Dibromochloromethane	ND	0.50		µg/L	1	3/26/2014	R17842
Dibromomethane	ND	0.50		µg/L	1	3/26/2014	R17842
1,2-Dichlorobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,3-Dichlorobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,4-Dichlorobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
Dichlorodifluoromethane	ND	0.50		µg/L	1	3/26/2014	R17842
1,1-Dichloroethane	ND	0.50		µg/L	1	3/26/2014	R17842
1,1-Dichloroethene	ND	0.50		µg/L	1	3/26/2014	R17842
1,2-Dichloropropane	ND	0.50		µg/L	1	3/26/2014	R17842
1,3-Dichloropropane	ND	0.50		µg/L	1	3/26/2014	R17842
2,2-Dichloropropane	ND	0.50		µg/L	1	3/26/2014	R17842
1,1-Dichloropropene	ND	0.50		µg/L	1	3/26/2014	R17842
Hexachlorobutadiene	ND	0.50		µg/L	1	3/26/2014	R17842
2-Hexanone	ND	0.50		µg/L	1	3/26/2014	R17842
Isopropylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
4-Isopropyltoluene	ND	0.50		µg/L	1	3/26/2014	R17842
Methylene Chloride	ND	2.5		µg/L	1	3/26/2014	R17842
n-Butylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
n-Propylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
sec-Butylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
Styrene	ND	0.50		µg/L	1	3/26/2014	R17842

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2 & 3 Qtrly Inj Well
Lab ID: 1403871-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2 & 3 Effluent
Collection Date: 3/20/2014 9:00:00 AM
Received Date: 3/20/2014 1:50:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
tert-Butylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,1,1,2-Tetrachloroethane	ND	0.50		µg/L	1	3/26/2014	R17842
1,1,2,2-Tetrachloroethane	ND	0.50		µg/L	1	3/26/2014	R17842
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	3/26/2014	R17842
trans-1,2-DCE	ND	0.50		µg/L	1	3/26/2014	R17842
trans-1,3-Dichloropropene	ND	0.50		µg/L	1	3/26/2014	R17842
1,2,3-Trichlorobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,2,4-Trichlorobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,1,1-Trichloroethane	ND	0.50		µg/L	1	3/26/2014	R17842
1,1,2-Trichloroethane	ND	0.50		µg/L	1	3/26/2014	R17842
Trichloroethene (TCE)	ND	0.50		µg/L	1	3/26/2014	R17842
Trichlorofluoromethane	ND	0.50		µg/L	1	3/26/2014	R17842
1,2,3-Trichloropropane	ND	0.50		µg/L	1	3/26/2014	R17842
Vinyl chloride	ND	0.50		µg/L	1	3/26/2014	R17842
mp-Xylenes	ND	1.0		µg/L	1	3/26/2014	R17842
o-Xylene	ND	0.50		µg/L	1	3/26/2014	R17842
tert-Amyl methyl ether	ND	0.50		µg/L	1	3/26/2014	R17842
tert-Butyl alcohol	ND	20		µg/L	1	3/26/2014	R17842
Acrolein	ND	10		µg/L	1	3/26/2014	R17842
Acrylonitrile	ND	10		µg/L	1	3/26/2014	R17842
Bromochloromethane	ND	0.50		µg/L	1	3/26/2014	R17842
2-Chloroethyl vinyl ether	ND	1.0		µg/L	1	3/26/2014	R17842
Iodomethane	ND	0.50		µg/L	1	3/26/2014	R17842
trans-1,4-Dichloro-2-butene	ND	0.50		µg/L	1	3/26/2014	R17842
Vinyl acetate	ND	0.50		µg/L	1	3/26/2014	R17842
1,4-Dioxane	ND	20		µg/L	1	3/26/2014	R17842
Surr: 1,2-Dichloroethane-d4	116	70-130		%REC	1	3/26/2014	R17842
Surr: 4-Bromofluorobenzene	104	70-130		%REC	1	3/26/2014	R17842
Surr: Toluene-d8	101	70-130		%REC	1	3/26/2014	R17842
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**
1,1-Biphenyl	ND	1.0		µg/L	1	3/28/2014	R17842
Caprolactam	ND	0.10		µg/L	1	3/28/2014	R17842
N-Nitroso-di-n-butylamine	ND	1.0		µg/L	1	3/28/2014	R17842
Acetophenone	ND	10		µg/L	1	3/28/2014	R17842
1-Methylnaphthalene	ND	10		µg/L	1	3/28/2014	R17842
2,3,4,6-Tetrachlorophenol	ND	10		µg/L	1	3/28/2014	R17842
2,4,5-Trichlorophenol	ND	10		µg/L	1	3/28/2014	R17842
2,4,6-Trichlorophenol	ND	10		µg/L	1	3/28/2014	R17842
2,4-Dichlorophenol	ND	10		µg/L	1	3/28/2014	R17842

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2 & 3 Qtrly Inj Well
Lab ID: 1403871-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2 & 3 Effluent
Collection Date: 3/20/2014 9:00:00 AM
Received Date: 3/20/2014 1:50:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**
2,4-Dimethylphenol	ND	10		µg/L	1	3/28/2014	R17842
2,4-Dinitrophenol	ND	10		µg/L	1	3/28/2014	R17842
2,4-Dinitrotoluene	ND	10		µg/L	1	3/28/2014	R17842
2,6-Dinitrotoluene	ND	10		µg/L	1	3/28/2014	R17842
2-Chloronaphthalene	ND	10		µg/L	1	3/28/2014	R17842
2-Chlorophenol	ND	10		µg/L	1	3/28/2014	R17842
2-Methylnaphthalene	ND	10		µg/L	1	3/28/2014	R17842
2-Methylphenol	ND	10		µg/L	1	3/28/2014	R17842
2-Nitroaniline	ND	10		µg/L	1	3/28/2014	R17842
2-Nitrophenol	ND	10		µg/L	1	3/28/2014	R17842
3,3'-Dichlorobenzidine	ND	10		µg/L	1	3/28/2014	R17842
3-Nitroaniline	ND	10		µg/L	1	3/28/2014	R17842
4,6-Dinitro-2-methylphenol	ND	10		µg/L	1	3/28/2014	R17842
4-Bromophenyl phenyl ether	ND	10		µg/L	1	3/28/2014	R17842
4-Chloro-3-methylphenol	ND	5.0		µg/L	1	3/28/2014	R17842
4-Chloroaniline	ND	10		µg/L	1	3/28/2014	R17842
4-Chlorophenyl phenyl ether	ND	10		µg/L	1	3/28/2014	R17842
4-Nitroaniline	ND	10		µg/L	1	3/28/2014	R17842
4-Nitrophenol	ND	10		µg/L	1	3/28/2014	R17842
Acenaphthene	ND	10		µg/L	1	3/28/2014	R17842
Acenaphthylene	ND	10		µg/L	1	3/28/2014	R17842
Anthracene	ND	10		µg/L	1	3/28/2014	R17842
Benzo(g,h,i)perylene	ND	1.0		µg/L	1	3/28/2014	R17842
Benz(a)anthracene	ND	1.0		µg/L	1	3/28/2014	R17842
Benzo(a)pyrene	ND	1.0		µg/L	1	3/28/2014	R17842
Benzo(b)fluoranthene	ND	1.0		µg/L	1	3/28/2014	R17842
Benzo(k)fluoranthene	ND	1.0		µg/L	1	3/28/2014	R17842
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	3/28/2014	R17842
Bis(2-chloroethyl)ether	ND	10		µg/L	1	3/28/2014	R17842
Bis(2-chloroisopropyl)ether	ND	10		µg/L	1	3/28/2014	R17842
Bis(2-ethylhexyl)phthalate	ND	5.0		µg/L	1	3/28/2014	R17842
Butyl benzyl phthalate	ND	10		µg/L	1	3/28/2014	R17842
Carbazole	ND	10		µg/L	1	3/28/2014	R17842
Chrysene	ND	0.10		µg/L	1	3/28/2014	R17842
Dibenz(a,h)anthracene	ND	1.0		µg/L	1	3/28/2014	R17842
Dibenzofuran	ND	10		µg/L	1	3/28/2014	R17842
Diethyl phthalate	ND	10		µg/L	1	3/28/2014	R17842
Dimethyl phthalate	ND	10		µg/L	1	3/28/2014	R17842
Di-n-butyl phthalate	ND	10		µg/L	1	3/28/2014	R17842

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2 & 3 Qtrly Inj Well
Lab ID: 1403871-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2 & 3 Effluent
Collection Date: 3/20/2014 9:00:00 AM
Received Date: 3/20/2014 1:50:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**
Di-n-octyl phthalate	ND	10		µg/L	1	3/28/2014	R17842
Fluoranthene	ND	10		µg/L	1	3/28/2014	R17842
Fluorene	ND	10		µg/L	1	3/28/2014	R17842
Hexachlorobenzene	ND	1.0		µg/L	1	3/28/2014	R17842
Hexachlorobutadiene	ND	10		µg/L	1	3/28/2014	R17842
Hexachlorocyclopentadiene	ND	10		µg/L	1	3/28/2014	R17842
Hexachloroethane	ND	10		µg/L	1	3/28/2014	R17842
Indeno(1,2,3-cd)pyrene	ND	1.0		µg/L	1	3/28/2014	R17842
Isophorone	ND	10		µg/L	1	3/28/2014	R17842
Naphthalene	ND	10		µg/L	1	3/28/2014	R17842
Nitrobenzene	ND	10		µg/L	1	3/28/2014	R17842
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	3/28/2014	R17842
N-Nitrosodiphenylamine	ND	2.0		µg/L	1	3/28/2014	R17842
Pentachlorophenol	ND	10		µg/L	1	3/28/2014	R17842
Phenanthrene	ND	10		µg/L	1	3/28/2014	R17842
Phenol	ND	5.0		µg/L	1	3/28/2014	R17842
Pyrene	ND	10		µg/L	1	3/28/2014	R17842
o-Toluidine	ND	1.0		µg/L	1	3/28/2014	R17842
Pyridine	ND	1.0		µg/L	1	3/28/2014	R17842
1,2,4,5-Tetrachlorobenzene	ND	10		µg/L	1	3/28/2014	R17842
Surr: 2,4,6-Tribromophenol	90.5	10-123		%REC	1	3/28/2014	R17842
Surr: 2-Fluorobiphenyl	84.5	19-130		%REC	1	3/28/2014	R17842
Surr: 2-Fluorophenol	79.4	21-110		%REC	1	3/28/2014	R17842
Surr: Nitrobenzene-d5	84.7	25-130		%REC	1	3/28/2014	R17842
Surr: Phenol-d5	80.6	10-125		%REC	1	3/28/2014	R17842
Surr: Terphenyl-d14	101	33-141		%REC	1	3/28/2014	R17842
CORROSIVITY							Analyst: **SUB**
pH	7.45	0.100		pH Units	1	3/25/2014	R17842
IGNITABILITY METHOD 1010							Analyst: **SUB**
Ignitability	>200	0		°F	1	4/2/2014	R17842
CYANIDE, REACTIVE							Analyst: **SUB**
Reactive Cyanide	ND	1.00		mg/Kg	1	4/2/2014	R17842
SULFIDE, REACTIVE							Analyst: **SUB**
Reactive Sulfide	5.1	1.0		mg/Kg	1	3/25/2014	R17842
SM2510B: SPECIFIC CONDUCTANCE							Analyst: **JML**
Conductivity	7000	0.010		µmhos/cm	1	3/20/2014 3:57:42 PM	R17458

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2 & 3 Qtrly Inj Well
Lab ID: 1403871-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2 & 3 Effluent
Collection Date: 3/20/2014 9:00:00 AM
Received Date: 3/20/2014 1:50:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM4500-H+B: PH						Analyst: **JML**	
pH	7.45	1.68	H	pH units	1	3/20/2014 3:57:42 PM	R17458
SM2320B: ALKALINITY						Analyst: **JML**	
Bicarbonate (As CaCO3)	270	20		mg/L CaCO3	1	3/20/2014 3:57:42 PM	R17458
Carbonate (As CaCO3)	ND	2.0		mg/L CaCO3	1	3/20/2014 3:57:42 PM	R17458
Total Alkalinity (as CaCO3)	270	20		mg/L CaCO3	1	3/20/2014 3:57:42 PM	R17458
SPECIFIC GRAVITY						Analyst: **SRM**	
Specific Gravity	1.006	0			1	3/24/2014 11:49:00 AM	R17512
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	6180	100	*	mg/L	1	3/25/2014 5:22:00 PM	12342

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2 & 3 Qtrly Inj Well
Lab ID: 1403871-002

Client Sample ID: Trip Blank
Collection Date:
Matrix: TRIP BLANK **Received Date:** 3/20/2014 1:50:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
Acetonitrile	ND	10		µg/L	1	3/26/2014	R17842
Allyl chloride	ND	0.50		µg/L	1	3/26/2014	R17842
Chloroprene	ND	0.50		µg/L	1	3/26/2014	R17842
Cyclohexane	ND	0.50		µg/L	1	3/26/2014	R17842
Diethyl ether	ND	0.50		µg/L	1	3/26/2014	R17842
Diisopropyl ether	ND	0.50		µg/L	1	3/26/2014	R17842
Epichlorohydrin	ND	5.0		µg/L	1	3/26/2014	R17842
Ethyl acetate	ND	0.50		µg/L	1	3/26/2014	R17842
Ethyl methacrylate	ND	0.50		µg/L	1	3/26/2014	R17842
Ethyl tert-butyl ether	ND	0.50		µg/L	1	3/26/2014	R17842
Freon-113	ND	0.50		µg/L	1	3/26/2014	R17842
Isobutanol	ND	20		µg/L	1	3/26/2014	R17842
Isopropyl acetate	ND	0.50		µg/L	1	3/26/2014	R17842
Methacrylonitrile	ND	0.50		µg/L	1	3/26/2014	R17842
Methyl acetate	ND	0.50		µg/L	1	3/26/2014	R17842
Methyl ethyl ketone	ND	2.5		µg/L	1	3/26/2014	R17842
Methyl isobutyl ketone	ND	2.5		µg/L	1	3/26/2014	R17842
Methyl methacrylate	ND	0.50		µg/L	1	3/26/2014	R17842
Methylcyclohexane	ND	1.0		µg/L	1	3/26/2014	R17842
n-Amyl acetate	ND	0.50		µg/L	1	3/26/2014	R17842
n-Hexane	ND	0.50		µg/L	1	3/26/2014	R17842
Nitrobenzene	ND	5.0		µg/L	1	3/26/2014	R17842
Pentachloroethane	ND	5.0		µg/L	1	3/26/2014	R17842
p-isopropyltoluene	ND	0.50		µg/L	1	3/26/2014	R17842
Propionitrile	ND	0.50		µg/L	1	3/26/2014	R17842
Tetrahydrofuran	ND	0.50		µg/L	1	3/26/2014	R17842
Benzene	ND	0.50		µg/L	1	3/26/2014	R17842
Toluene	ND	0.50		µg/L	1	3/26/2014	R17842
Ethylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	1	3/26/2014	R17842
1,2,4-Trimethylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,3,5-Trimethylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,2-Dichloroethane (EDC)	ND	0.50		µg/L	1	3/26/2014	R17842
1,2-Dibromoethane (EDB)	ND	0.50		µg/L	1	3/26/2014	R17842
Naphthalene	ND	0.50		µg/L	1	3/26/2014	R17842
Acetone	ND	2.5		µg/L	1	3/26/2014	R17842
Bromobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
Bromodichloromethane	ND	0.50		µg/L	1	3/26/2014	R17842
Bromoform	ND	0.50		µg/L	1	3/26/2014	R17842

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2 & 3 Qtrly Inj Well
Lab ID: 1403871-002
Client Sample ID: Trip Blank
Collection Date:
Matrix: TRIP BLANK
Received Date: 3/20/2014 1:50:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
Bromomethane	ND	0.50		µg/L	1	3/26/2014	R17842
Carbon disulfide	ND	0.50		µg/L	1	3/26/2014	R17842
Carbon Tetrachloride	ND	0.50		µg/L	1	3/26/2014	R17842
Chlorobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
Chloroethane	ND	0.50		µg/L	1	3/26/2014	R17842
Chloroform	ND	0.50		µg/L	1	3/26/2014	R17842
Chloromethane	ND	0.50		µg/L	1	3/26/2014	R17842
2-Chlorotoluene	ND	0.50		µg/L	1	3/26/2014	R17842
4-Chlorotoluene	ND	0.50		µg/L	1	3/26/2014	R17842
cis-1,2-DCE	ND	0.50		µg/L	1	3/26/2014	R17842
cis-1,3-Dichloropropene	ND	0.50		µg/L	1	3/26/2014	R17842
1,2-Dibromo-3-chloropropane	ND	0.50		µg/L	1	3/26/2014	R17842
Dibromochloromethane	ND	0.50		µg/L	1	3/26/2014	R17842
Dibromomethane	ND	0.50		µg/L	1	3/26/2014	R17842
1,2-Dichlorobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,3-Dichlorobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,4-Dichlorobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
Dichlorodifluoromethane	ND	0.50		µg/L	1	3/26/2014	R17842
1,1-Dichloroethane	ND	0.50		µg/L	1	3/26/2014	R17842
1,1-Dichloroethene	ND	0.50		µg/L	1	3/26/2014	R17842
1,2-Dichloropropane	ND	0.50		µg/L	1	3/26/2014	R17842
1,3-Dichloropropane	ND	0.50		µg/L	1	3/26/2014	R17842
2,2-Dichloropropane	ND	0.50		µg/L	1	3/26/2014	R17842
1,1-Dichloropropene	ND	0.50		µg/L	1	3/26/2014	R17842
Hexachlorobutadiene	ND	0.50		µg/L	1	3/26/2014	R17842
2-Hexanone	ND	0.50		µg/L	1	3/26/2014	R17842
Isopropylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
4-Isopropyltoluene	ND	0.50		µg/L	1	3/26/2014	R17842
Methylene Chloride	ND	2.5		µg/L	1	3/26/2014	R17842
n-Butylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
n-Propylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
sec-Butylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
Styrene	ND	0.50		µg/L	1	3/26/2014	R17842
tert-Butylbenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,1,1,2-Tetrachloroethane	ND	0.50		µg/L	1	3/26/2014	R17842
1,1,2,2-Tetrachloroethane	ND	0.50		µg/L	1	3/26/2014	R17842
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	3/26/2014	R17842
trans-1,2-DCE	ND	0.50		µg/L	1	3/26/2014	R17842
trans-1,3-Dichloropropene	ND	0.50		µg/L	1	3/26/2014	R17842

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

Qualifiers:

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E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2 & 3 Qtrly Inj Well
Lab ID: 1403871-002

Client Sample ID: Trip Blank
Collection Date:
Matrix: TRIP BLANK **Received Date:** 3/20/2014 1:50:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
1,2,3-Trichlorobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,2,4-Trichlorobenzene	ND	0.50		µg/L	1	3/26/2014	R17842
1,1,1-Trichloroethane	ND	0.50		µg/L	1	3/26/2014	R17842
1,1,2-Trichloroethane	ND	0.50		µg/L	1	3/26/2014	R17842
Trichloroethene (TCE)	ND	0.50		µg/L	1	3/26/2014	R17842
Trichlorofluoromethane	ND	0.50		µg/L	1	3/26/2014	R17842
1,2,3-Trichloropropane	ND	0.50		µg/L	1	3/26/2014	R17842
Vinyl chloride	ND	0.50		µg/L	1	3/26/2014	R17842
mp-Xylenes	ND	1.0		µg/L	1	3/26/2014	R17842
o-Xylene	ND	0.50		µg/L	1	3/26/2014	R17842
tert-Amyl methyl ether	ND	0.50		µg/L	1	3/26/2014	R17842
tert-Butyl alcohol	ND	20		µg/L	1	3/26/2014	R17842
Acrolein	ND	10		µg/L	1	3/26/2014	R17842
Acrylonitrile	ND	10		µg/L	1	3/26/2014	R17842
Bromochloromethane	ND	0.50		µg/L	1	3/26/2014	R17842
2-Chloroethyl vinyl ether	ND	1.0		µg/L	1	3/26/2014	R17842
Iodomethane	ND	0.50		µg/L	1	3/26/2014	R17842
trans-1,4-Dichloro-2-butene	ND	0.50		µg/L	1	3/26/2014	R17842
Vinyl acetate	ND	0.50		µg/L	1	3/26/2014	R17842
1,4-Dioxane	ND	20		µg/L	1	3/26/2014	R17842
Surr: 1,2-Dichloroethane-d4	111	70-130		%REC	1	3/26/2014	R17842
Surr: 4-Bromofluorobenzene	103	70-130		%REC	1	3/26/2014	R17842
Surr: Toluene-d8	100	70-130		%REC	1	3/26/2014	R17842

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Qualifiers:

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E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1403871

09-Apr-14

Client: Navajo Refining Company

Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R17472**	RunNo: **17472**
Prep Date:	Analysis Date: **3/20/2014**	SeqNo: **503279** Units: **mg/L**

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

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R17472**	RunNo: **17472**
Prep Date:	Analysis Date: **3/20/2014**	SeqNo: **503281** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.51	0.10	0.5000	0	102	90	110			
Chloride	4.8	0.50	5.000	0	95.7	90	110			
Nitrogen, Nitrite (As N)	0.95	0.10	1.000	0	95.3	90	110			
Bromide	2.5	0.10	2.500	0	99.2	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	101	90	110			
Phosphorus, Orthophosphate (As P	4.9	0.50	5.000	0	97.9	90	110			
Sulfate	9.7	0.50	10.00	0	96.7	90	110			

Qualifiers:

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E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403871**

09-Apr-14

Client: Navajo Refining Company

Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID **MB-R17842**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R17842**	RunNo: **17842**
Prep Date:	Analysis Date: **3/26/2014**	SeqNo: **514551** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acetonitrile	ND	0.50								
Allyl chloride	ND	0.50								
Chloroprene	ND	0.50								
Ethyl methacrylate	ND	0.50								
Isobutanol	ND	0.50								
Methacrylonitrile	ND	0.50								
Methyl ethyl ketone	ND	2.5								
Methyl isobutyl ketone	ND	2.5								
Methyl methacrylate	ND	0.50								
Propionitrile	ND	0.50								
Benzene	ND	0.50								
Toluene	ND	0.50								
Ethylbenzene	ND	0.50								
1,2-Dichloroethane (EDC)	ND	0.50								
1,2-Dibromoethane (EDB)	ND	0.50								
Acetone	ND	2.5								
Bromodichloromethane	ND	0.50								
Bromoform	ND	0.50								
Bromomethane	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon Tetrachloride	ND	0.50								
Chlorobenzene	ND	0.50								
Chloroethane	ND	0.50								
Chloroform	ND	0.50								
Chloromethane	ND	0.50								
cis-1,2-DCE	ND	0.50								
cis-1,3-Dichloropropene	ND	0.50								
1,2-Dibromo-3-chloropropane	ND	0.50								
Dibromochloromethane	ND	0.50								
Dibromomethane	ND	0.50								
1,2-Dichlorobenzene	ND	0.50								
1,4-Dichlorobenzene	ND	0.50								
Dichlorodifluoromethane	ND	0.50								
1,1-Dichloroethane	ND	0.50								
1,1-Dichloroethene	ND	0.50								
1,2-Dichloropropane	ND	0.50								
1,3-Dichloropropane	ND	0.50								
2,2-Dichloropropane	ND	0.50								
1,1-Dichloropropene	ND	0.50								

Qualifiers:

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- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1403871

09-Apr-14

Client: Navajo Refining Company

Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID **MB-R17842**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R17842**	RunNo: **17842**
Prep Date:	Analysis Date: **3/26/2014**	SeqNo: **514551** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Hexanone	ND	0.50								
Methylene Chloride	ND	2.5								
Styrene	ND	0.50								
1,1,1,2-Tetrachloroethane	ND	0.50								
1,1,2,2-Tetrachloroethane	ND	0.50								
Tetrachloroethene (PCE)	ND	0.50								
trans-1,2-DCE	ND	0.50								
trans-1,3-Dichloropropene	ND	0.50								
1,1,1-Trichloroethane	ND	0.50								
1,1,2-Trichloroethane	ND	0.50								
Trichloroethene (TCE)	ND	0.50								
Trichlorofluoromethane	ND	0.50								
1,2,3-Trichloropropane	ND	0.50								
Vinyl chloride	ND	0.50								
mp-Xylenes	ND	1.0								
o-Xylene	ND	0.50								
Acrolein	ND	0.50								
Acrylonitrile	ND	0.50								
Bromochloromethane	ND	0.50								
Iodomethane	ND	0.50								
trans-1,4-Dichloro-2-butene	ND	0.50								
Vinyl acetate	ND	0.50								

Sample ID **LCS-R17842**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R17842**	RunNo: **17842**
Prep Date:	Analysis Date: **3/26/2014**	SeqNo: **514552** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	4.9	0.50	5.000	0	97.2	80	120			
Toluene	4.9	0.50	5.000	0	98.2	80	120			
Ethylbenzene	5.0	0.50	5.000	0	99.0	80	120			
Chlorobenzene	4.9	0.50	5.000	0	98.2	80	120			
1,1-Dichloroethene	4.5	0.50	5.000	0	89.4	80	120			
Tetrachloroethene (PCE)	4.4	0.50	5.000	0	87.8	80	120			
Trichloroethene (TCE)	4.6	0.50	5.000	0	93.0	80	120			
o-Xylene	5.2	0.50	5.000	0	105	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403871**

09-Apr-14

Client: Navajo Refining Company
Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID **MB-R17842**	SampType: **MBLK**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **PBW**	Batch ID: **R17842**	RunNo: **17842**
Prep Date:	Analysis Date: **3/28/2014**	SeqNo: **515354** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1-Methylnaphthalene	ND	0.50								
2,3,4,6-Tetrachlorophenol	ND	0.50								
2,4,5-Trichlorophenol	ND	0.50								
2,4,6-Trichlorophenol	ND	0.50								
2,4-Dichlorophenol	ND	0.50								
2,4-Dimethylphenol	ND	0.50								
2,4-Dinitrophenol	ND	0.50								
2,4-Dinitrotoluene	ND	0.50								
2,6-Dinitrotoluene	ND	0.50								
2-Chloronaphthalene	ND	0.50								
2-Chlorophenol	ND	0.50								
2-Methylnaphthalene	ND	0.50								
2-Methylphenol	ND	0.50								
2-Nitroaniline	ND	0.50								
2-Nitrophenol	ND	0.50								
3,3'-Dichlorobenzidine	ND	0.50								
3-Nitroaniline	ND	0.50								
4,6-Dinitro-2-methylphenol	ND	0.50								
4-Bromophenyl phenyl ether	ND	0.50								
4-Chloro-3-methylphenol	ND	0.50								
4-Chloroaniline	ND	0.50								
4-Chlorophenyl phenyl ether	ND	0.50								
4-Nitroaniline	ND	0.50								
4-Nitrophenol	ND	0.50								
Acenaphthene	ND	0.50								
Acenaphthylene	ND	0.50								
Anthracene	ND	0.50								
Benzo(g,h,i)perylene	ND	0.50								
Benz(a)anthracene	ND	0.50								
Benzo(a)pyrene	ND	0.50								
Benzo(b)fluoranthene	ND	0.50								
Benzo(k)fluoranthene	ND	0.50								
Bis(2-chloroethoxy)methane	ND	0.50								
Bis(2-chloroethyl)ether	ND	0.50								
Bis(2-chloroisopropyl)ether	ND	0.50								
Bis(2-ethylhexyl)phthalate	ND	0.50								
Butyl benzyl phthalate	ND	0.50								
Carbazole	ND	0.50								
Chrysene	ND	0.50								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403871**

09-Apr-14

Client: Navajo Refining Company

Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID **MB-R17842**	SampType: **MBLK**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **PBW**	Batch ID: **R17842**	RunNo: **17842**
Prep Date:	Analysis Date: **3/28/2014**	SeqNo: **515354** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Dibenz(a,h)anthracene	ND	0.50								
Dibenzofuran	ND	0.50								
Diethyl phthalate	ND	0.50								
Dimethyl phthalate	ND	0.50								
Di-n-butyl phthalate	ND	0.50								
Di-n-octyl phthalate	ND	0.50								
Fluoranthene	ND	0.50								
Fluorene	ND	0.50								
Hexachlorobenzene	ND	0.50								
Hexachlorobutadiene	ND	0.50								
Hexachlorocyclopentadiene	ND	0.50								
Hexachloroethane	ND	0.50								
Isophorone	ND	0.50								
Naphthalene	ND	0.50								
Nitrobenzene	ND	0.50								
N-Nitrosodi-n-propylamine	ND	0.50								
N-Nitrosodiphenylamine	ND	0.50								
Pentachlorophenol	ND	0.50								
Phenanthrene	ND	0.50								
Phenol	ND	0.50								
Pyrene	ND	0.50								

Sample ID **LCS-R17842**	SampType: **LCS**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **LCSW**	Batch ID: **R17842**	RunNo: **17842**
Prep Date:	Analysis Date: **3/28/2014**	SeqNo: **515355** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	6.6	1.0	5.000	0	131	42	143			
2-Chlorophenol	5.8	1.0	5.000	0	116	50	131			
4-Chloro-3-methylphenol	5.5	1.0	5.000	0	110	42	139			
4-Nitrophenol	4.7	1.0	5.000	0	94.6	19	137			
Acenaphthene	5.9	1.0	5.000	0	118	45	129			
Bis(2-ethylhexyl)phthalate	6.6	1.0	5.000	0	131	43	142			
N-Nitrosodi-n-propylamine	6.0	1.0	5.000	0	120	46	135			
Pentachlorophenol	5.2	1.0	5.000	0	104	22	138			
Phenol	5.3	1.0	5.000	0	106	45	134			
Pyrene	6.3	1.0	5.000	0	126	45	139			

Qualifiers:

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- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403871**

09-Apr-14

Client: Navajo Refining Company

Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID **MB-12328**	SampType: **MBLK**	TestCode: **EPA Method 7470: Mercury**
Client ID: **PBW**	Batch ID: **12328**	RunNo: **17527**
Prep Date: **3/24/2014**	Analysis Date: **3/24/2014**	SeqNo: **505323** Units: **mg/L**

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

Sample ID **LCS-12328**	SampType: **LCS**	TestCode: **EPA Method 7470: Mercury**
Client ID: **LCSW**	Batch ID: **12328**	RunNo: **17527**
Prep Date: **3/24/2014**	Analysis Date: **3/24/2014**	SeqNo: **505324** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0050	0.00020	0.005000	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1403871

09-Apr-14

Client: Navajo Refining Company

Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID	MB-12307	SampType:	MBLK	TestCode:	MERCURY, TCLP					
Client ID:	PBW	Batch ID:	12307	RunNo:	17489					
Prep Date:	3/21/2014	Analysis Date:	3/21/2014	SeqNo:	503698	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020								

Sample ID	LCS-12307	SampType:	LCS	TestCode:	MERCURY, TCLP					
Client ID:	LCSW	Batch ID:	12307	RunNo:	17489					
Prep Date:	3/21/2014	Analysis Date:	3/21/2014	SeqNo:	503699	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020	0.005000	0	101	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403871**

09-Apr-14

Client: Navajo Refining Company

Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID **MB-12293**	SampType: **MBLK**	TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **PBW**	Batch ID: **12293**	RunNo: **17477**
Prep Date: **3/20/2014**	Analysis Date: **3/21/2014**	SeqNo: **503513** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0								
Barium	ND	100								
Cadmium	ND	1.0								
Chromium	ND	5.0								
Lead	ND	5.0								
Selenium	ND	1.0								
Silver	ND	5.0								

Sample ID **LCS-12293**	SampType: **LCS**	TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **LCSW**	Batch ID: **12293**	RunNo: **17477**
Prep Date: **3/20/2014**	Analysis Date: **3/21/2014**	SeqNo: **503514** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0	0.5000	0	104	80	120			
Barium	ND	100	0.5000	0	102	80	120			
Cadmium	ND	1.0	0.5000	0	102	80	120			
Chromium	ND	5.0	0.5000	0	102	80	120			
Lead	ND	5.0	0.5000	0	100	80	120			
Selenium	ND	1.0	0.5000	0	101	80	120			
Silver	ND	5.0	0.1000	0	105	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403871**

09-Apr-14

Client: Navajo Refining Company
Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID **MB-12293**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Metals**
Client ID: **PBW**	Batch ID: **12293**	RunNo: **17477**
Prep Date: **3/20/2014**	Analysis Date: **3/21/2014**	SeqNo: **503563** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Antimony	ND	0.050								
Arsenic	ND	0.020								
Barium	ND	0.020								
Beryllium	ND	0.0030								
Cadmium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Copper	ND	0.0060								
Iron	ND	0.050								
Lead	ND	0.0050								
Magnesium	ND	1.0								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Potassium	ND	1.0								
Selenium	ND	0.050								
Silver	ND	0.0050								
Thallium	ND	0.050								
Vanadium	ND	0.050								
Zinc	ND	0.020								

Sample ID **LCS-12293**	SampType: **LCS**	TestCode: **EPA 6010B: Total Metals**
Client ID: **LCSW**	Batch ID: **12293**	RunNo: **17477**
Prep Date: **3/20/2014**	Analysis Date: **3/21/2014**	SeqNo: **503564** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.55	0.020	0.5000	0	111	80	120			
Antimony	0.50	0.050	0.5000	0	99.3	80	120			
Arsenic	0.52	0.020	0.5000	0	104	80	120			
Barium	0.51	0.020	0.5000	0	102	80	120			
Beryllium	0.54	0.0030	0.5000	0	107	80	120			
Cadmium	0.51	0.0020	0.5000	0	102	80	120			
Calcium	53	1.0	50.00	0	106	80	120			
Chromium	0.51	0.0060	0.5000	0	102	80	120			
Cobalt	0.50	0.0060	0.5000	0	100	80	120			
Copper	0.52	0.0060	0.5000	0	104	80	120			
Iron	0.52	0.050	0.5000	0	103	80	120			
Lead	0.50	0.0050	0.5000	0	100	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403871**

09-Apr-14

Client: Navajo Refining Company

Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID **LCS-12293**	SampType: **LCS**	TestCode: **EPA 6010B: Total Metals**
Client ID: **LCSW**	Batch ID: **12293**	RunNo: **17477**
Prep Date: **3/20/2014**	Analysis Date: **3/21/2014**	SeqNo: **503564** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	52	1.0	50.00	0	104	80	120			
Manganese	0.51	0.0020	0.5000	0	103	80	120			
Nickel	0.50	0.010	0.5000	0	99.5	80	120			
Potassium	50	1.0	50.00	0	101	80	120			
Selenium	0.50	0.050	0.5000	0	101	80	120			
Silver	0.11	0.0050	0.1000	0	105	80	120			
Thallium	0.51	0.050	0.5000	0	102	80	120			
Vanadium	0.53	0.050	0.5000	0	105	80	120			
Zinc	0.51	0.020	0.5000	0	102	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403871**

09-Apr-14

Client: Navajo Refining Company

Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID	**LCS-R17842**	SampType: **LCS**			TestCode: **CYANIDE, Reactive**					
Client ID:	**LCSS**	Batch ID: **R17842**			RunNo: **17842**					
Prep Date:		Analysis Date: **4/2/2014**			SeqNo: **515168**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Cyanide	0.533	0.100	0.5000	0	107	80	120			

Sample ID	**MB-R17842**	SampType: **MBLK**			TestCode: **CYANIDE, Reactive**					
Client ID:	**PBS**	Batch ID: **R17842**			RunNo: **17842**					
Prep Date:		Analysis Date: **4/2/2014**			SeqNo: **515169**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Cyanide	ND	1.00								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403871**

09-Apr-14

Client: Navajo Refining Company

Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID **MB-R17842**	SampType: **MBLK**	TestCode: **SULFIDE, Reactive**
Client ID: **PBS**	Batch ID: **R17842**	RunNo: **17842**
Prep Date:	Analysis Date: **3/25/2014**	SeqNo: **515170** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Sulfide	ND	1.0								

Sample ID **LCS-R17842**	SampType: **LCS**	TestCode: **SULFIDE, Reactive**
Client ID: **LCSS**	Batch ID: **R17842**	RunNo: **17842**
Prep Date:	Analysis Date: **3/25/2014**	SeqNo: **515171** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Sulfide	0.16	0.10	0.2000	0	80.0	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1403871

09-Apr-14

Client: Navajo Refining Company

Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID	mb-1	SampType:	mblk	TestCode:	SM2320B: Alkalinity					
Client ID:	PBW	Batch ID:	R17458	RunNo:	17458					
Prep Date:		Analysis Date:	3/20/2014	SeqNo:	502901	Units:	mg/L CaCO3			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID	lcs-1	SampType:	lcs	TestCode:	SM2320B: Alkalinity					
Client ID:	LCSW	Batch ID:	R17458	RunNo:	17458					
Prep Date:		Analysis Date:	3/20/2014	SeqNo:	502902	Units:	mg/L CaCO3			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	81	20	80.00	0	101	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403871**

09-Apr-14

Client: Navajo Refining Company

Project: WDW-1, 2 & 3 Qtrly Inj Well

Sample ID **MB-12342**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **12342**	RunNo: **17558**
Prep Date: **3/24/2014**	Analysis Date: **3/25/2014**	SeqNo: **505731** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID **LCS-12342**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **12342**	RunNo: **17558**
Prep Date: **3/24/2014**	Analysis Date: **3/25/2014**	SeqNo: **505732** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1030	20.0	1000	0	103	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: NAVAJO REFINING COM Work Order Number: 1403871 RcptNo: 1

Received by/date: AT 03/20/14

Logged By: Michelle Garcia 3/20/2014 1:50:00 PM Michelle Garcia

Completed By: Michelle Garcia 3/20/2014 2:03:05 PM Michelle Garcia

Reviewed By: 03/20/14

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: 2 2 (<2 or >12 unless noted)

Adjusted? No

Checked by: MJ SR

Special Handling (if applicable)

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

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.3	Good	Yes			

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Client: Navajo Refining Co.	☐ Standar ☐ Rush
	Project Name:
Mailing Address: P.O. Box 159 Artesia,	WDW-1, 2, & 3 Qtrly Inj Well
NM 88211-0159	Project #:
Phone #: 575-748-3311	
email or Fax#: 575-746-5451	Project Manager:
QA/QC Package:	
☐ Standard ☐ Level 4 (Full Validation)	Mike Holder
☐ Other	Sampler: Jerry Sosa
☐ EDD (Type)	On Ice: ☒ Yes ☐ No
	Sample Temperature: 2

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No 1403571	Specific Gravity,HCO3, CO3, Cl, SO4, TDS, pH, cond.,Fl, Cation/anion bal., Br, Eh/40	VOCs/SW-846 Method 8260C (see attached list 'VOCs')	SVOCs/SW-846 Method 8270D (see attached list 'SVOCs')	R,C,I/40 CFR part 261	Metals/SW-846 Mthd 6010, 7470 (see attached list 'Metals')	Ca, K, Mg, Na/40 CFR 136.3	TCLP Metals, only /40 CFR Part 261/ SW-846 Method 1311
3/20/14	9:00	Liquid	WDW-1, 2, & 3 Effluent	3	Neat/H2SO4	-001	X						X
3/20/14	9:00	Liquid	WDW-1, 2, & 3 Effluent	1	HNO3	-001					X	X	
3/20/14	9:00	Liquid	WDW-1, 2, & 3 Effluent	3	HCL	-001		X					
3/20/14	9:00	Liquid	WDW-1, 2, & 3 Effluent	2	Neat	-001			X				
3/20/14	9:00	Liquid	WDW-1, 2, & 3 Effluent	2	Neat	-001		X					
3/20/14	9:00	Liquid	Trip Blank	2	Neat	-002		X					
3/20/14	9:00	Liquid	Temperature Blank	1	Neat								

Date:	Time:	Relinquished by:	Received by:	Date	Time
3/20/14	10:00	Robert Pava			
Date:	Time:	Relinquished by:	Received by:	Date	Time
				03/21/14	1350

Remarks: Report these results separately from all other Chain of Custody kits provided.

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

Strange, Aaron

From: Strange, Aaron
Sent: Thursday, May 22, 2014 11:21 AM
To: Schultz, Michele
Subject: Injection Wells

Micki,

The temperature was 90.3F and the pH was 7.71 for the Injection well samples on 3-20-14.

Thank you,
Aaron

Aaron Strange
Environmental Specialist
Environmental Department
Navajo Refining Co, LLC
Artesia NM
Cell: (575) 703-5057
Off: (575) 746-5468

Navajo Refining Company, L.L.C.

2014 FIRST QUARTER MONTHLY INJECTION PRESSURES, RATES, AND VOLUMES

	Average Pressure (psig)	Maximum Pressure (psig)	Minimum Pressure (psig)	Average Flow (gpm)	Maximum Flow (gpm)	Minimum Flow (gpm)	Average Annular Pressure (psig)	Maximum Annular Pressure (psig)	Minimum Annular Pressure (psig)	Average Volume (bpd)	Maximum Volume (bpd)	Minimum Volume (bpd)	Volume (barrels)	TOTAL CUMULATIVE Volume (barrels)
WDW-1													**Previous Quarter**	34,369,800
Jan-14	1,161	1,197	1,093	142	152	122	272	422	182	4,869	5,211	4,183	151,696	34,521,496
Feb-14	1,200	1,225	1,131	147	154	135	443	610	211	5,040	5,280	4,629	141,482	34,662,978
Mar-14	1,206	1,247	1,077	142	150	129	576	843	218	4,869	5,143	4,423	151,394	34,814,372
WDW-2													**Previous Quarter**	21,592,917
Jan-14	1,166	1,208	1,105	152	161	141	394	685	105	5,211	5,520	4,834	162,143	21,755,060
Feb-14	1,202	1,225	1,134	152	160	128	385	599	132	5,211	5,486	4,389	145,969	21,901,029
Mar-14	1,205	1,248	1,081	144	157	125	539	824	219	4,937	5,383	4,286	153,497	22,054,526
WDW-3													**Previous Quarter**	11,583,990
Jan-14	1,120	1,193	938	106	130	23	499	686	306	3,634	4,457	789	112,425	11,696,415
Feb-14	1,199	1,225	1,143	128	138	99	737	920	444	4,389	4,731	3,394	122,680	11,819,095
Mar-14	1,183	1,248	983	122	145	40	622	983	231	4,183	4,971	1,371	130,039	11,949,135
													Total Injected fluids:	68,818,033

Navajo Refining Company, L.L.C.

2014 FIRST QUARTER WEEKLY WAMS LEVEL TABLE

	1/6/14	1/15/14	1/20/14	1/30/14	2/3/14	2/10/14	2/17/14	2/24/14	3/3/14	3/12/14	3/17/14	3/27/14	3/31/14
WDW -1[1]	145	145	160	155	155	150	150	150	150	150	150	150	150
WDW-2[1]	145	145	145	145	145	145	145	145	145	145	145	145	145
WDW-3[1]	100	100	155	150	150	150	150	150	150	150	150	150	150
Comments: 1/20/14 2 drums glycol added to WDW-1 and 1/21/14 1 drum glycol added to WDW-3 after surface tubing leaks repaired													

[1] Graduated tank gauged weekly in the field. Reading is in gallons.

HOLLYFRONTIER.

July 30, 2014

Mr. Carl Chavez, CHMM
NM Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr.
Santa Fe, NM 87505-5472

Certified Mail/Return Receipt
7007 3020 0000 3028 8413

RE: 2014 2nd Quarter Injection Report for Wells WDW-1, WDW-2 and WDW-3, Navajo Refining Company, L.L.C.

Dear Mr. Chavez,

Enclosed, please find the second quarter 2014 sampling results for fluids injected into WDW-1, WDW-2 and WDW-3 and a spread sheet showing various volumes and pressures as required under Permit Condition 2.I.1, Quarterly Reports.

Over the second quarter, the average injection pressure for all three wells was 1180 psig and the average flows were 134 gpm for WDW-1, 132 gpm for WDW-2 and 111 gpm for WDW-3. There were no significant losses from the glycol expansion tanks Well Annulus Monitoring System (WAMS) although minor above ground tubing leaks at two of the wells were identified and repaired. The quarterly effluent analyses indicated parameters are within limits.

This report covers the period from April 1, 2014 to June 30, 2014. We have disposed a total of 1,179,825 barrels of fluid into the three wells during the second quarter of 2014. The volume per well is:

- 421,136 barrels into WDW-1
- 412,743 barrels into WDW-2
- 345,946 barrels into WDW-3

This report is signed and certified in accordance with WQCC section 5101.G. If there are any questions, please call me at 575-748-3311.

Respectfully,

Michael D. McKee

Michael McKee
Vice-President & Refinery Manager
Navajo Refining Company, L.L.C.

Enc.

Electronic cc (w/enc.): D Crawford, R Combs, M Schultz, A Strange
Environmental File: Injection Wells/Reports C-115 & Quarterly/2014/2nd quarter/2014-07-31 2nd QTR Inj Rpt for Wells WDW-1,2,3

Navajo Refining Company, L.L.C.

2014 SECOND QUARTER MONTHLY INJECTION PRESSURES, RATES, AND VOLUMES

	Average Pressure (psig)	Maximum Pressure (psig)	Minimum Pressure (psig)	Average Flow (gpm)	Maximum Flow (gpm)	Minimum Flow (gpm)	Average Annular Pressure Av (psig)	Maximum Annular Pressure Mx (psig)	Minimum Annular Pressure Mn (psig)	Average Volume (bpd)	Maximum Volume (bpd)	Minimum Volume (bpd)	Volume (barrels)	TOTAL CUMULATIVE Volume (barrels)
WDW-1													**Previous Quarter**	34,814,372
Apr-14	1,198	1,226	1,138	136	140	129	335	483	202	4,663	4,800	4,423	140,351	34,954,723
May-14	1,173	1,250	947	133	147	115	508	874	189	4,560	5,040	3,943	141,827	35,096,550
Jun-14	1,194	1,261	972	135	144	121	746	993	232	4,629	4,937	4,149	138,958	35,235,507
WDW-2													**Previous Quarter**	22,054,526
Apr-14	1,192	1,226	1,109	211	347	109	477	630	241	7,234	11,897	3,737	216,878	22,271,404
May-14	1,163	1,248	958	98	121	34	662	1,251	198	3,360	4,149	1,166	103,840	22,375,244
Jun-14	1,206	1,265	1,155	89	116	32	537	1,018	146	3,051	3,977	1,097	92,025	22,467,269
WDW-3													**Previous Quarter**	11,949,135
Apr-14	1,176	1,225	1,100	119	133	96	462	698	268	4,080	4,560	3,291	122,621	12,071,756
May-14	1,139	1,250	961	100	140	11	519	999	226	3,429	4,800	377	106,412	12,178,167
Jun-14	1,184	1,248	989	114	133	27	572	876	267	3,909	4,560	926	116,913	12,295,081
													Total Injected fluids:	69,997,857

T:\Injection Wells\Reports C-115 and Quarterly\2014\2nd quarter\
2nd 2014 qtrly rpt data
Injection fluids

7/29/20144:16 PM

Navajo Refining Company, L.L.C.

2014 SECOND QUARTER WEEKLY WAMS LEVEL TABLE

	4/7/14	4/14/14	4/22/14	4/28/14	5/5/14	5/16/14	5/23/14	5/29/14	6/2/14	6/9/14	6/17/14	6/25/14		
WDW -1[1]	145	145	145	145	145	140	140	135	130	125	100	100		
WDW-2[1]	150	150	150	150	150	145	145	145	145	145	145	130		
WDW-3[1]	145	145	145	145	145	145	145	145	145	145	145	145		
Comments: 6/9/14 small tubing leak at WDW-1 reported and repaired. 6/17/14 a second tubing leak at WDW-1 was reported and repaired. 6/25/14 small tubing leak at WDW-2 reported and repaired.														

[1] Graduated tank gauged weekly in the field. Reading is in gallons.

WDW-1 is Mewbourne
WDW-2 is Chukka
WDW-3 is Gaines

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

Injection Well Quarterly Sample Details Attachment

HOLLYFRONTIER
The HollyFrontier Companies

Project Name	WDW-1,2, & 3 Qrtly Inj Well
Samplers Name	Aaron Strange
Samplers Affiliation	Navajo Refining Co. LLC
Start Date and Time	6/19/2014 @ 09:25
End Date and Time	6/19/2014 @ 09:35

Sample Type	
Grab	☑
Time Weighted Composite	☐
Flow Weighted Composite	☐

Parts / Sample Intervals	One

Physical Property	
Solid	☐
Liquid	☑
Sludge	☐

Type of Sampler	Directly to sample jars

Outfall / Sample Location: Waste water effluent pumps to injection wells.

☐ P-849 sample point (first from east)
☑ P-854 sample point (second from east)
☐ P-856 sample point (third from east)
☐ P-857 sample point (fourth from east)

				Preservatives							
Container	Size	Material	# of Containers	Neat (None)	HCL	HNO3	H2SO4	NaOH	Na2S2O3	NaHSO4	Other	Analysis and/or Method Requested
1			3	X			X					Specific Gravity,HCO3, CO3, Cl, SO4, TDS, pH, cond.,Fl, Cation/anion bal., Br, Eh/40 CFR 136.3
2			1			X						VOCs/SW-846 Method 8260C (see attached list 'VOCs')
3			3		X							SVOCs/SW-846 Method 8270D (see attached list 'SVOCs')
4			2	X								R,C,I/40 CFR part 261
5			2	X								Metals/SW-846 Mthd 6010, 7470 (see attached list 'Metals')
6			2	X								Ca, K, Mg, Na/40 CFR 136.3
7			1	X								TCLP Metals, only /40 CFR Part 261/ SW-846 Method 1311
8												
9												
10												

Field Data (Weather, Observations, Etc): 6/19/2014 09:35 Tmp. 77.0, Humidity 61%, Wind Dir. N, Wind Speed 10.4 mph, Conditions Clear
Date and Time:

Field Temp. 116.6°F Field pH 7.37

Storage Method	
Ice	☑
Refrigerated	☐
Other	☐

Shipping Media	
Ice	☑
Other	☐

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

July 17, 2014

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

RE: WDW-1, 2, & 3 Qtrly Inj Well OrderNo.: 1406935

Dear Dan Crawford:

Hall Environmental Analysis Laboratory received 2 sample(s) on 6/19/2014 for the analyses presented in the following report.

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

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

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Case Narrative

WO#: **1406935**
Date: **7/17/2014**

CLIENT: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well

The following compounds were also scanned for by NIST library search and not detected. The detection level for these compounds would be ~10ppb:

Allyl alcohol
t-amyl ethyl ether
Bis(2-chloroethyl)sulfide
Bromoacetone
Chloral hydrate
1-chlorobutane
1-chlorohexane
2-chloroethanol
Crotonaldehyde
Cis-1,4-Dichloro-2butene
1,3-Dichloro-2-propanol
1,2,3,4-Depoxybutane
Ethanol
Ethylene oxide
Malonitrile
Methanol
Methyl acrylate
2-Nitropropane
Paraldehyde
Pentafluorobenzene
2-Pentanone
2-picoline
1-propanol
2-propanol
Propargyl alcohol
Beta-propiolactone
n-propylamine

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well
Lab ID: 1406935-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2, & 3 Effluent
Collection Date: 6/19/2014 9:30:00 AM
Received Date: 6/19/2014 2:35:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JRR**	
Fluoride	28	2.0	*	mg/L	20	6/19/2014 5:43:17 PM	R19410
Chloride	290	10		mg/L	20	6/19/2014 5:43:17 PM	R19410
Nitrogen, Nitrite (As N)	1.5	0.50		mg/L	5	6/19/2014 5:30:53 PM	R19410
Bromide	0.72	0.50		mg/L	5	6/19/2014 5:30:53 PM	R19410
Nitrogen, Nitrate (As N)	ND	0.50		mg/L	5	6/19/2014 5:30:53 PM	R19410
Phosphorus, Orthophosphate (As P)	ND	2.5		mg/L	5	6/19/2014 5:30:53 PM	R19410
Sulfate	2600	50		mg/L	100	7/7/2014 4:18:15 PM	R19725
EPA METHOD 7470: MERCURY						Analyst: **MMD**	
Mercury	ND	0.00020		mg/L	1	6/26/2014 9:07:50 AM	13883
MERCURY, TCLP						Analyst: **MMD**	
Mercury	ND	0.020		mg/L	1	7/8/2014 12:50:03 PM	14082
EPA METHOD 6010B: TCLP METALS						Analyst: **ELS**	
Arsenic	ND	5.0		mg/L	1	7/8/2014 12:02:28 PM	14080
Barium	ND	100		mg/L	1	7/8/2014 12:02:28 PM	14080
Cadmium	ND	1.0		mg/L	1	7/8/2014 12:02:28 PM	14080
Chromium	ND	5.0		mg/L	1	7/8/2014 12:02:28 PM	14080
Lead	ND	5.0		mg/L	1	7/8/2014 12:02:28 PM	14080
Selenium	ND	1.0		mg/L	1	7/8/2014 12:02:28 PM	14080
Silver	ND	5.0		mg/L	1	7/8/2014 12:02:28 PM	14080
EPA 6010B: TOTAL METALS						Analyst: **ELS**	
Aluminum	1.2	0.020		mg/L	1	7/11/2014 10:29:51 AM	14172
Antimony	ND	0.050		mg/L	1	7/7/2014 12:25:17 PM	14075
Arsenic	0.027	0.020		mg/L	1	7/7/2014 12:25:17 PM	14075
Barium	ND	0.020		mg/L	1	7/7/2014 12:25:17 PM	14075
Beryllium	ND	0.0030		mg/L	1	7/7/2014 12:25:17 PM	14075
Cadmium	ND	0.0020		mg/L	1	7/7/2014 12:25:17 PM	14075
Calcium	27	1.0		mg/L	1	7/7/2014 12:25:17 PM	14075
Chromium	ND	0.0060		mg/L	1	7/7/2014 12:25:17 PM	14075
Cobalt	ND	0.0060		mg/L	1	7/7/2014 12:25:17 PM	14075
Copper	ND	0.0060		mg/L	1	7/7/2014 12:25:17 PM	14075
Iron	0.21	0.050		mg/L	1	7/7/2014 12:25:17 PM	14075
Lead	ND	0.0050		mg/L	1	7/7/2014 12:25:17 PM	14075
Magnesium	9.2	1.0		mg/L	1	7/7/2014 12:25:17 PM	14075
Manganese	0.032	0.0020		mg/L	1	7/7/2014 12:25:17 PM	14075
Nickel	ND	0.010		mg/L	1	7/7/2014 12:25:17 PM	14075
Potassium	69	1.0		mg/L	1	7/7/2014 12:25:17 PM	14075
Selenium	0.069	0.050		mg/L	1	7/7/2014 12:25:17 PM	14075

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well
Lab ID: 1406935-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2, & 3 Effluent
Collection Date: 6/19/2014 9:30:00 AM
Received Date: 6/19/2014 2:35:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 6010B: TOTAL METALS						Analyst: **ELS**	
Silver	ND	0.0050		mg/L	1	7/7/2014 12:25:17 PM	14075
Sodium	1200	20		mg/L	20	7/7/2014 12:31:46 PM	14075
Thallium	ND	0.050		mg/L	1	7/7/2014 12:25:17 PM	14075
Vanadium	ND	0.050		mg/L	1	7/7/2014 12:25:17 PM	14075
Zinc	ND	0.020		mg/L	1	7/7/2014 12:25:17 PM	14075
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
Ethyl tert-butyl ether	ND	0.50		µg/L	1	6/26/2014	R19890
Acetonitrile	ND	0.50		µg/L	1	6/26/2014	R19890
Allyl chloride	ND	0.50		µg/L	1	6/26/2014	R19890
Chloroprene	ND	0.50		µg/L	1	6/26/2014	R19890
Cyclohexane	ND	2.5		µg/L	1	6/26/2014	R19890
Diethyl ether	ND	0.50		µg/L	1	6/26/2014	R19890
Diisopropyl ether	ND	0.50		µg/L	1	6/26/2014	R19890
Epichlorohydrin	ND	5.0		µg/L	1	6/26/2014	R19890
Ethyl acetate	ND	0.50		µg/L	1	6/26/2014	R19890
Ethyl methacrylate	ND	2.5		µg/L	1	6/26/2014	R19890
Freon-113	ND	0.50		µg/L	1	6/26/2014	R19890
Isobutanol	ND	50		µg/L	1	6/26/2014	R19890
Isopropyl acetate	ND	0.50		µg/L	1	6/26/2014	R19890
Methacrylonitrile	ND	2.5		µg/L	1	6/26/2014	R19890
Methyl acetate	ND	0.50		µg/L	1	6/26/2014	R19890
Methyl ethyl ketone	ND	2.5		µg/L	1	6/26/2014	R19890
Methyl isobutyl ketone	ND	2.5		µg/L	1	6/26/2014	R19890
Methyl methacrylate	ND	2.5		µg/L	1	6/26/2014	R19890
Methylcyclohexane	ND	1.0		µg/L	1	6/26/2014	R19890
n-Amyl acetate	ND	0.50		µg/L	1	6/26/2014	R19890
n-Hexane	ND	0.50		µg/L	1	6/26/2014	R19890
Nitrobenzene	ND	5.0		µg/L	1	6/26/2014	R19890
Pentachloroethane	ND	5.0		µg/L	1	6/26/2014	R19890
p-isopropyltoluene	ND	0.50		µg/L	1	6/26/2014	R19890
Propionitrile	ND	2.5		µg/L	1	6/26/2014	R19890
Tetrahydrofuran	ND	0.50		µg/L	1	6/26/2014	R19890
Benzene	0.64	0.50		µg/L	1	6/26/2014	R19890
Toluene	ND	0.50		µg/L	1	6/26/2014	R19890
Ethylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	1	6/26/2014	R19890
1,2,4-Trimethylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
1,3,5-Trimethylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
1,2-Dichloroethane (EDC)	ND	0.50		µg/L	1	6/26/2014	R19890

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well
Lab ID: 1406935-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2, & 3 Effluent
Collection Date: 6/19/2014 9:30:00 AM
Received Date: 6/19/2014 2:35:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
1,2-Dibromoethane (EDB)	ND	0.50		µg/L	1	6/26/2014	R19890
Naphthalene	ND	0.50		µg/L	1	6/26/2014	R19890
Acetone	15	2.5		µg/L	1	6/26/2014	R19890
Bromobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
Bromodichloromethane	ND	0.50		µg/L	1	6/26/2014	R19890
Bromoform	ND	0.50		µg/L	1	6/26/2014	R19890
Bromomethane	ND	0.50		µg/L	1	6/26/2014	R19890
Carbon disulfide	ND	0.50		µg/L	1	6/26/2014	R19890
Carbon Tetrachloride	ND	0.50		µg/L	1	6/26/2014	R19890
Chlorobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
Chloroethane	ND	0.50		µg/L	1	6/26/2014	R19890
Chloroform	ND	0.50		µg/L	1	6/26/2014	R19890
Chloromethane	ND	0.50		µg/L	1	6/26/2014	R19890
2-Chlorotoluene	ND	0.50		µg/L	1	6/26/2014	R19890
4-Chlorotoluene	ND	0.50		µg/L	1	6/26/2014	R19890
cis-1,2-DCE	ND	0.50		µg/L	1	6/26/2014	R19890
cis-1,3-Dichloropropene	ND	0.50		µg/L	1	6/26/2014	R19890
1,2-Dibromo-3-chloropropane	ND	0.50		µg/L	1	6/26/2014	R19890
Dibromochloromethane	ND	0.50		µg/L	1	6/26/2014	R19890
Dibromomethane	ND	0.50		µg/L	1	6/26/2014	R19890
1,2-Dichlorobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
1,3-Dichlorobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
1,4-Dichlorobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
Dichlorodifluoromethane	ND	0.50		µg/L	1	6/26/2014	R19890
1,1-Dichloroethane	ND	0.50		µg/L	1	6/26/2014	R19890
1,1-Dichloroethene	ND	0.50		µg/L	1	6/26/2014	R19890
1,2-Dichloropropane	ND	0.50		µg/L	1	6/26/2014	R19890
1,3-Dichloropropane	ND	0.50		µg/L	1	6/26/2014	R19890
2,2-Dichloropropane	ND	0.50		µg/L	1	6/26/2014	R19890
1,1-Dichloropropene	ND	0.50		µg/L	1	6/26/2014	R19890
Hexachlorobutadiene	ND	0.50		µg/L	1	6/26/2014	R19890
2-Hexanone	ND	0.50		µg/L	1	6/26/2014	R19890
Isopropylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
Methylene Chloride	ND	2.5		µg/L	1	6/26/2014	R19890
n-Butylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
n-Propylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
sec-Butylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
Styrene	ND	0.50		µg/L	1	6/26/2014	R19890
tert-Butylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well
Lab ID: 1406935-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2, & 3 Effluent
Collection Date: 6/19/2014 9:30:00 AM
Received Date: 6/19/2014 2:35:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
1,1,1,2-Tetrachloroethane	ND	0.50		µg/L	1	6/26/2014	R19890
1,1,2,2-Tetrachloroethane	ND	0.50		µg/L	1	6/26/2014	R19890
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	6/26/2014	R19890
trans-1,2-DCE	ND	0.50		µg/L	1	6/26/2014	R19890
trans-1,3-Dichloropropene	ND	0.50		µg/L	1	6/26/2014	R19890
1,2,3-Trichlorobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
1,2,4-Trichlorobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
1,1,1-Trichloroethane	ND	0.50		µg/L	1	6/26/2014	R19890
1,1,2-Trichloroethane	ND	0.50		µg/L	1	6/26/2014	R19890
Trichloroethene (TCE)	ND	0.50		µg/L	1	6/26/2014	R19890
Trichlorofluoromethane	ND	0.50		µg/L	1	6/26/2014	R19890
1,2,3-Trichloropropane	ND	0.50		µg/L	1	6/26/2014	R19890
Vinyl chloride	ND	0.50		µg/L	1	6/26/2014	R19890
mp-Xylenes	ND	1.0		µg/L	1	6/26/2014	R19890
o-Xylene	ND	0.50		µg/L	1	6/26/2014	R19890
tert-Amyl methyl ether	ND	0.50		µg/L	1	6/26/2014	R19890
tert-Butyl alcohol	ND	10		µg/L	1	6/26/2014	R19890
Acrolein	ND	2.5		µg/L	1	6/26/2014	R19890
Acrylonitrile	ND	10		µg/L	1	6/26/2014	R19890
Bromochloromethane	ND	0.50		µg/L	1	6/26/2014	R19890
2-Chloroethyl vinyl ether	ND	2.5		µg/L	1	6/26/2014	R19890
Iodomethane	ND	0.50		µg/L	1	6/26/2014	R19890
trans-1,4-Dichloro-2-butene	ND	0.50		µg/L	1	6/26/2014	R19890
Vinyl acetate	ND	0.50		µg/L	1	6/26/2014	R19890
1,4-Dioxane	ND	20		µg/L	1	6/26/2014	R19890
Surr: 1,2-Dichloroethane-d4	104	70-130		%REC	1	6/26/2014	R19890
Surr: 4-Bromofluorobenzene	100	70-130		%REC	1	6/26/2014	R19890
Surr: Toluene-d8	101	70-130		%REC	1	6/26/2014	R19890
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**
1,1-Biphenyl	ND	0.10		µg/L	1	6/26/2014	R19935
Atrazine	ND	0.10		µg/L	1	6/26/2014	R19935
Benzaldehyde	ND	0.10		µg/L	1	6/26/2014	R19935
Caprolactam	ND	0.10		µg/L	1	6/26/2014	R19935
N-Nitroso-di-n-butylamine	ND	0.10		µg/L	1	6/26/2014	R19935
Acetophenone	ND	10		µg/L	1	6/26/2014	R19935
1-Methylnaphthalene	ND	10		µg/L	1	6/26/2014	R19935
2,3,4,6-Tetrachlorophenol	ND	10		µg/L	1	6/26/2014	R19935
2,4,5-Trichlorophenol	ND	10		µg/L	1	6/26/2014	R19935
2,4,6-Trichlorophenol	ND	10		µg/L	1	6/26/2014	R19935

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well
Lab ID: 1406935-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2, & 3 Effluent
Collection Date: 6/19/2014 9:30:00 AM
Received Date: 6/19/2014 2:35:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**
2,4-Dichlorophenol	ND	10		µg/L	1	6/26/2014	R19935
2,4-Dimethylphenol	ND	10		µg/L	1	6/26/2014	R19935
2,4-Dinitrophenol	ND	10		µg/L	1	6/26/2014	R19935
2,4-Dinitrotoluene	ND	10		µg/L	1	6/26/2014	R19935
2,6-Dinitrotoluene	ND	10		µg/L	1	6/26/2014	R19935
2-Chloronaphthalene	ND	10		µg/L	1	6/26/2014	R19935
2-Chlorophenol	ND	10		µg/L	1	6/26/2014	R19935
2-Methylnaphthalene	ND	10		µg/L	1	6/26/2014	R19935
2-Methylphenol	ND	10		µg/L	1	6/26/2014	R19935
2-Nitroaniline	ND	10		µg/L	1	6/26/2014	R19935
2-Nitrophenol	ND	10		µg/L	1	6/26/2014	R19935
3,3'-Dichlorobenzidine	ND	10		µg/L	1	6/26/2014	R19935
3-Nitroaniline	ND	10		µg/L	1	6/26/2014	R19935
4,6-Dinitro-2-methylphenol	ND	10		µg/L	1	6/26/2014	R19935
4-Bromophenyl phenyl ether	ND	10		µg/L	1	6/26/2014	R19935
4-Chloro-3-methylphenol	ND	5.0		µg/L	1	6/26/2014	R19935
4-Chloroaniline	ND	10		µg/L	1	6/26/2014	R19935
4-Chlorophenyl phenyl ether	ND	10		µg/L	1	6/26/2014	R19935
4-Nitroaniline	ND	10		µg/L	1	6/26/2014	R19935
4-Nitrophenol	ND	10		µg/L	1	6/26/2014	R19935
Acenaphthene	ND	10		µg/L	1	6/26/2014	R19935
Acenaphthylene	ND	10		µg/L	1	6/26/2014	R19935
Anthracene	ND	10		µg/L	1	6/26/2014	R19935
Benzo(g,h,i)perylene	ND	10		µg/L	1	6/26/2014	R19935
Benz(a)anthracene	ND	0.10		µg/L	1	6/26/2014	R19935
Benzo(a)pyrene	ND	0.10		µg/L	1	6/26/2014	R19935
Benzo(b)fluoranthene	ND	0.10		µg/L	1	6/26/2014	R19935
Benzo(k)fluoranthene	ND	0.10		µg/L	1	6/26/2014	R19935
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	6/26/2014	R19935
Bis(2-chloroethyl)ether	ND	10		µg/L	1	6/26/2014	R19935
Bis(2-chloroisopropyl)ether	ND	10		µg/L	1	6/26/2014	R19935
Bis(2-ethylhexyl)phthalate	ND	5.0		µg/L	1	6/26/2014	R19935
Butyl benzyl phthalate	ND	10		µg/L	1	6/26/2014	R19935
Carbazole	ND	10		µg/L	1	6/26/2014	R19935
Chrysene	ND	0.10		µg/L	1	6/26/2014	R19935
Dibenz(a,h)anthracene	ND	0.10		µg/L	1	6/26/2014	R19935
Dibenzofuran	ND	10		µg/L	1	6/26/2014	R19935
Diethyl phthalate	ND	10		µg/L	1	6/26/2014	R19935
Dimethyl phthalate	ND	10		µg/L	1	6/26/2014	R19935

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well
Lab ID: 1406935-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2, & 3 Effluent
Collection Date: 6/19/2014 9:30:00 AM
Received Date: 6/19/2014 2:35:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**
Di-n-butyl phthalate	ND	10		µg/L	1	6/26/2014	R19935
Di-n-octyl phthalate	ND	10		µg/L	1	6/26/2014	R19935
Fluoranthene	ND	10		µg/L	1	6/26/2014	R19935
Fluorene	ND	10		µg/L	1	6/26/2014	R19935
Hexachlorobenzene	ND	1.0		µg/L	1	6/26/2014	R19935
Hexachlorobutadiene	ND	10		µg/L	1	6/26/2014	R19935
Hexachlorocyclopentadiene	ND	10		µg/L	1	6/26/2014	R19935
Hexachloroethane	ND	10		µg/L	1	6/26/2014	R19935
Indeno(1,2,3-cd)pyrene	ND	0.10		µg/L	1	6/26/2014	R19935
Isophorone	ND	10		µg/L	1	6/26/2014	R19935
Naphthalene	ND	10		µg/L	1	6/26/2014	R19935
Nitrobenzene	ND	10		µg/L	1	6/26/2014	R19935
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	6/26/2014	R19935
N-Nitrosodiphenylamine	ND	2.0		µg/L	1	6/26/2014	R19935
Pentachlorophenol	ND	10		µg/L	1	6/26/2014	R19935
Phenanthrene	ND	10		µg/L	1	6/26/2014	R19935
Phenol	ND	5.0		µg/L	1	6/26/2014	R19935
Pyrene	ND	10		µg/L	1	6/26/2014	R19935
o-Toluidine	ND	0.10		µg/L	1	6/26/2014	R19935
Pyridine	ND	0.10		µg/L	1	6/26/2014	R19935
1,2,4,5-Tetrachlorobenzene	ND	10		µg/L	1	6/26/2014	R19935
Surr: 2,4,6-Tribromophenol	101	10-123		%REC	1	6/26/2014	R19935
Surr: 2-Fluorobiphenyl	102	19-130		%REC	1	6/26/2014	R19935
Surr: 2-Fluorophenol	76.2	21-110		%REC	1	6/26/2014	R19935
Surr: Nitrobenzene-d5	91.1	25-130		%REC	1	6/26/2014	R19935
Surr: Phenol-d5	79.3	10-125		%REC	1	6/26/2014	R19935
Surr: Terphenyl-d14	92.2	33-141		%REC	1	6/26/2014	R19935
CORROSIVITY							Analyst: **SUB**
pH	7.90		H	pH Units	1	7/2/2014	R19940
IGNITABILITY METHOD 1010							Analyst: **SUB**
Ignitability	>200	0		°F	1	7/7/2014	R19940
CYANIDE, REACTIVE							Analyst: **SUB**
Cyanide, Reactive	ND	1.00		mg/L	1	7/2/2014	R19940
SULFIDE, REACTIVE							Analyst: **SUB**
Reactive Sulfide	ND	1.0		mg/L	1	6/26/2014	R19940
SM2510B: SPECIFIC CONDUCTANCE							Analyst: **JRR**
Conductivity	6000	0.010		µmhos/cm	1	6/23/2014 3:26:39 PM	R19484

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

Qualifiers:

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E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well
Lab ID: 1406935-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1, 2, & 3 Effluent
Collection Date: 6/19/2014 9:30:00 AM
Received Date: 6/19/2014 2:35:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM4500-H+B: PH						Analyst: **JRR**	
pH	7.91	1.68	H	pH units	1	6/23/2014 3:26:39 PM	R19484
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	290	20		mg/L CaCO3	1	6/23/2014 3:26:39 PM	R19484
Carbonate (As CaCO3)	ND	2.0		mg/L CaCO3	1	6/23/2014 3:26:39 PM	R19484
Total Alkalinity (as CaCO3)	290	20		mg/L CaCO3	1	6/23/2014 3:26:39 PM	R19484
SPECIFIC GRAVITY						Analyst: **SRM**	
Specific Gravity	1.003	0			1	6/30/2014 10:37:00 AM	R19574
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	4440	40.0	*	mg/L	1	6/23/2014 11:26:00 AM	13798

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Qualifiers:

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J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well
Lab ID: 1406935-002

Client Sample ID: Trip Blank
Collection Date:
Matrix: TRIP BLANK
Received Date: 6/19/2014 2:35:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
Ethyl tert-butyl ether	ND	0.50		µg/L	1	6/26/2014	R19890
Acetonitrile	ND	2.5		µg/L	1	6/26/2014	R19890
Allyl chloride	ND	0.50		µg/L	1	6/26/2014	R19890
Chloroprene	ND	0.50		µg/L	1	6/26/2014	R19890
Cyclohexane	ND	0.50		µg/L	1	6/26/2014	R19890
Diethyl ether	ND	0.50		µg/L	1	6/26/2014	R19890
Diisopropyl ether	ND	0.50		µg/L	1	6/26/2014	R19890
Epichlorohydrin	ND	5.0		µg/L	1	6/26/2014	R19890
Ethyl acetate	ND	0.50		µg/L	1	6/26/2014	R19890
Ethyl methacrylate	ND	2.5		µg/L	1	6/26/2014	R19890
Freon-113	ND	0.50		µg/L	1	6/26/2014	R19890
Isobutanol	ND	50		µg/L	1	6/26/2014	R19890
Isopropyl acetate	ND	0.50		µg/L	1	6/26/2014	R19890
Methacrylonitrile	ND	2.5		µg/L	1	6/26/2014	R19890
Methyl acetate	ND	0.50		µg/L	1	6/26/2014	R19890
Methyl ethyl ketone	ND	2.5		µg/L	1	6/26/2014	R19890
Methyl isobutyl ketone	ND	2.5		µg/L	1	6/26/2014	R19890
Methyl methacrylate	ND	2.5		µg/L	1	6/26/2014	R19890
Methylcyclohexane	ND	1.0		µg/L	1	6/26/2014	R19890
n-Amyl acetate	ND	0.50		µg/L	1	6/26/2014	R19890
n-Hexane	ND	0.50		µg/L	1	6/26/2014	R19890
Nitrobenzene	ND	5.0		µg/L	1	6/26/2014	R19890
Pentachloroethane	ND	5.0		µg/L	1	6/26/2014	R19890
p-isopropyltoluene	ND	0.50		µg/L	1	6/26/2014	R19890
Propionitrile	ND	2.5		µg/L	1	6/26/2014	R19890
Tetrahydrofuran	ND	0.50		µg/L	1	6/26/2014	R19890
Benzene	ND	0.50		µg/L	1	6/26/2014	R19890
Toluene	ND	0.50		µg/L	1	6/26/2014	R19890
Ethylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	1	6/26/2014	R19890
1,2,4-Trimethylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
1,3,5-Trimethylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
1,2-Dichloroethane (EDC)	ND	0.50		µg/L	1	6/26/2014	R19890
1,2-Dibromoethane (EDB)	ND	0.50		µg/L	1	6/26/2014	R19890
Naphthalene	ND	0.50		µg/L	1	6/26/2014	R19890
Acetone	ND	2.5		µg/L	1	6/26/2014	R19890
Bromobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
Bromodichloromethane	ND	0.50		µg/L	1	6/26/2014	R19890
Bromoform	ND	0.50		µg/L	1	6/26/2014	R19890

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

Qualifiers:

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- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- O RSD is greater than RSDlimit
- P Sample pH greater than 2.
- R RPD outside accepted recovery limits
- RL Reporting Detection Limit
- S Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well
Lab ID: 1406935-002
Client Sample ID: Trip Blank
Collection Date:
Matrix: TRIP BLANK
Received Date: 6/19/2014 2:35:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
Bromomethane	ND	0.50		µg/L	1	6/26/2014	R19890
Carbon disulfide	ND	0.50		µg/L	1	6/26/2014	R19890
Carbon Tetrachloride	ND	0.50		µg/L	1	6/26/2014	R19890
Chlorobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
Chloroethane	ND	0.50		µg/L	1	6/26/2014	R19890
Chloroform	ND	0.50		µg/L	1	6/26/2014	R19890
Chloromethane	ND	0.50		µg/L	1	6/26/2014	R19890
2-Chlorotoluene	ND	0.50		µg/L	1	6/26/2014	R19890
4-Chlorotoluene	ND	0.50		µg/L	1	6/26/2014	R19890
cis-1,2-DCE	ND	0.50		µg/L	1	6/26/2014	R19890
cis-1,3-Dichloropropene	ND	0.50		µg/L	1	6/26/2014	R19890
1,2-Dibromo-3-chloropropane	ND	0.50		µg/L	1	6/26/2014	R19890
Dibromochloromethane	ND	0.50		µg/L	1	6/26/2014	R19890
Dibromomethane	ND	0.50		µg/L	1	6/26/2014	R19890
1,2-Dichlorobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
1,3-Dichlorobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
1,4-Dichlorobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
Dichlorodifluoromethane	ND	0.50		µg/L	1	6/26/2014	R19890
1,1-Dichloroethane	ND	0.50		µg/L	1	6/26/2014	R19890
1,1-Dichloroethene	ND	0.50		µg/L	1	6/26/2014	R19890
1,2-Dichloropropane	ND	0.50		µg/L	1	6/26/2014	R19890
1,3-Dichloropropane	ND	0.50		µg/L	1	6/26/2014	R19890
2,2-Dichloropropane	ND	0.50		µg/L	1	6/26/2014	R19890
1,1-Dichloropropene	ND	0.50		µg/L	1	6/26/2014	R19890
Hexachlorobutadiene	ND	0.50		µg/L	1	6/26/2014	R19890
2-Hexanone	ND	0.50		µg/L	1	6/26/2014	R19890
Isopropylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
Methylene Chloride	ND	2.5		µg/L	1	6/26/2014	R19890
n-Butylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
n-Propylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
sec-Butylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
Styrene	ND	0.50		µg/L	1	6/26/2014	R19890
tert-Butylbenzene	ND	0.50		µg/L	1	6/26/2014	R19890
1,1,1,2-Tetrachloroethane	ND	0.50		µg/L	1	6/26/2014	R19890
1,1,2,2-Tetrachloroethane	ND	0.50		µg/L	1	6/26/2014	R19890
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	6/26/2014	R19890
trans-1,2-DCE	ND	0.50		µg/L	1	6/26/2014	R19890
trans-1,3-Dichloropropene	ND	0.50		µg/L	1	6/26/2014	R19890
1,2,3-Trichlorobenzene	ND	0.50		µg/L	1	6/26/2014	R19890

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Qualifiers:

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- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well
Lab ID: 1406935-002 **Matrix:** TRIP BLANK

Client Sample ID: Trip Blank
Collection Date:
Received Date: 6/19/2014 2:35:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
1,2,4-Trichlorobenzene	ND	0.50		µg/L	1	6/26/2014	R19890
1,1,1-Trichloroethane	ND	0.50		µg/L	1	6/26/2014	R19890
1,1,2-Trichloroethane	ND	0.50		µg/L	1	6/26/2014	R19890
Trichloroethene (TCE)	ND	0.50		µg/L	1	6/26/2014	R19890
Trichlorofluoromethane	ND	0.50		µg/L	1	6/26/2014	R19890
1,2,3-Trichloropropane	ND	0.50		µg/L	1	6/26/2014	R19890
Vinyl chloride	ND	0.50		µg/L	1	6/26/2014	R19890
mp-Xylenes	ND	1.0		µg/L	1	6/26/2014	R19890
o-Xylene	ND	0.50		µg/L	1	6/26/2014	R19890
tert-Amyl methyl ether	ND	0.50		µg/L	1	6/26/2014	R19890
tert-Butyl alcohol	ND	0.50		µg/L	1	6/26/2014	R19890
Acrolein	ND	0.50		µg/L	1	6/26/2014	R19890
Acrylonitrile	ND	10		µg/L	1	6/26/2014	R19890
Bromochloromethane	ND	0.50		µg/L	1	6/26/2014	R19890
2-Chloroethyl vinyl ether	ND	0.50		µg/L	1	6/26/2014	R19890
Iodomethane	ND	0.50		µg/L	1	6/26/2014	R19890
trans-1,4-Dichloro-2-butene	ND	0.50		µg/L	1	6/26/2014	R19890
Vinyl acetate	ND	0.50		µg/L	1	6/26/2014	R19890
1,4-Dioxane	ND	20		µg/L	1	6/26/2014	R19890
Surr: 1,2-Dichloroethane-d4	100	70-130		%REC	1	6/26/2014	R19890
Surr: 4-Bromofluorobenzene	102	70-130		%REC	1	6/26/2014	R19890
Surr: Toluene-d8	99.6	70-130		%REC	1	6/26/2014	R19890

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

Qualifiers:

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- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **A5**	SampType: **ccv_5**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19410**	RunNo: **19410**							
Prep Date:	Analysis Date: **6/19/2014**	SeqNo: **561477**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.4	0.10	1.600	0	90.3	90	110			
Chloride	7.8	0.50	8.000	0	96.9	90	110			
Nitrogen, Nitrite (As N)	3.2	0.10	3.200	0	99.5	90	110			
Bromide	7.9	0.10	8.000	0	98.4	90	110			
Nitrogen, Nitrate (As N)	4.9	0.10	4.800	0	102	90	110			
Phosphorus, Orthophosphate (As P	7.8	0.50	8.000	0	97.4	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **R19410**	RunNo: **19410**							
Prep Date:	Analysis Date: **6/19/2014**	SeqNo: **561479**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Bromide	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSW**	Batch ID: **R19410**	RunNo: **19410**							
Prep Date:	Analysis Date: **6/19/2014**	SeqNo: **561480**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.47	0.10	0.5000	0	94.3	90	110			
Chloride	4.7	0.50	5.000	0	94.8	90	110			
Nitrogen, Nitrite (As N)	0.94	0.10	1.000	0	93.7	90	110			
Bromide	2.4	0.10	2.500	0	96.2	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	99.8	90	110			
Phosphorus, Orthophosphate (As P	4.9	0.50	5.000	0	97.6	90	110			

Sample ID **A6**	SampType: **ccv_6**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19410**	RunNo: **19410**							
Prep Date:	Analysis Date: **6/19/2014**	SeqNo: **561489**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2.3	0.10	2.400	0	95.4	90	110			
Chloride	12	0.50	12.00	0	102	90	110			
Nitrogen, Nitrite (As N)	4.9	0.10	4.800	0	102	90	110			
Bromide	12	0.10	12.00	0	100	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **A6**	SampType: **ccv_6**			TestCode: **EPA Method 300.0: Anions**					
Client ID: **BatchQC**	Batch ID: **R19410**			RunNo: **19410**					
Prep Date:	Analysis Date: **6/19/2014**			SeqNo: **561489**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	7.8	0.10	7.200	0	108	90	110			
Phosphorus, Orthophosphate (As P	12	0.50	12.00	0	101	90	110			

Sample ID **A4**	SampType: **ccv_4**			TestCode: **EPA Method 300.0: Anions**					
Client ID: **BatchQC**	Batch ID: **R19410**			RunNo: **19410**					
Prep Date:	Analysis Date: **6/19/2014**			SeqNo: **561501**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.94	0.10	1.000	0	93.7	90	110			
Chloride	4.6	0.50	5.000	0	92.9	90	110			
Nitrogen, Nitrite (As N)	2.0	0.10	2.000	0	97.9	90	110			
Bromide	4.8	0.10	5.000	0	96.0	90	110			
Nitrogen, Nitrate (As N)	3.0	0.10	3.000	0	98.7	90	110			
Phosphorus, Orthophosphate (As P	4.8	0.50	5.000	0	95.8	90	110			

Sample ID **A5**	SampType: **ccv_5**			TestCode: **EPA Method 300.0: Anions**					
Client ID: **BatchQC**	Batch ID: **R19410**			RunNo: **19410**					
Prep Date:	Analysis Date: **6/19/2014**			SeqNo: **561513**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.5	0.10	1.600	0	96.1	90	110			
Chloride	7.8	0.50	8.000	0	97.0	90	110			
Nitrogen, Nitrite (As N)	3.1	0.10	3.200	0	98.3	90	110			
Bromide	7.6	0.10	8.000	0	95.3	90	110			
Nitrogen, Nitrate (As N)	4.9	0.10	4.800	0	102	90	110			
Phosphorus, Orthophosphate (As P	7.7	0.50	8.000	0	96.6	90	110			

Sample ID **A6**	SampType: **ccv_6**			TestCode: **EPA Method 300.0: Anions**					
Client ID: **BatchQC**	Batch ID: **R19410**			RunNo: **19410**					
Prep Date:	Analysis Date: **6/19/2014**			SeqNo: **561525**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2.3	0.10	2.400	0	97.8	90	110			
Chloride	12	0.50	12.00	0	101	90	110			
Nitrogen, Nitrite (As N)	4.8	0.10	4.800	0	101	90	110			
Bromide	12	0.10	12.00	0	100	90	110			
Nitrogen, Nitrate (As N)	7.7	0.10	7.200	0	107	90	110			
Phosphorus, Orthophosphate (As P	12	0.50	12.00	0	101	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R19410**	RunNo: **19410**
Prep Date:	Analysis Date: **6/19/2014**	SeqNo: **561529** Units: **mg/L**

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

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R19410**	RunNo: **19410**
Prep Date:	Analysis Date: **6/19/2014**	SeqNo: **561530** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.51	0.10	0.5000	0	101	90	110			
Chloride	4.8	0.50	5.000	0	96.1	90	110			
Nitrogen, Nitrite (As N)	0.97	0.10	1.000	0	97.0	90	110			
Bromide	2.5	0.10	2.500	0	99.2	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	101	90	110			
Phosphorus, Orthophosphate (As P	5.0	0.50	5.000	0	99.0	90	110			

Sample ID **A4**	SampType: **ccv_4**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R19410**	RunNo: **19410**
Prep Date:	Analysis Date: **6/20/2014**	SeqNo: **561537** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.96	0.10	1.000	0	95.6	90	110			
Chloride	4.7	0.50	5.000	0	93.1	90	110			
Nitrogen, Nitrite (As N)	2.0	0.10	2.000	0	98.8	90	110			
Bromide	4.8	0.10	5.000	0	96.5	90	110			
Nitrogen, Nitrate (As N)	2.9	0.10	3.000	0	97.9	90	110			
Phosphorus, Orthophosphate (As P	4.8	0.50	5.000	0	96.0	90	110			

Sample ID **A5**	SampType: **ccv_5**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R19410**	RunNo: **19410**
Prep Date:	Analysis Date: **6/20/2014**	SeqNo: **561549** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.5	0.10	1.600	0	96.4	90	110			
Chloride	7.8	0.50	8.000	0	97.5	90	110			
Nitrogen, Nitrite (As N)	3.2	0.10	3.200	0	100	90	110			
Bromide	7.8	0.10	8.000	0	98.0	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **A5**	SampType: **ccv_5**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19410**	RunNo: **19410**							
Prep Date:	Analysis Date: **6/20/2014**	SeqNo: **561549**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	4.9	0.10	4.800	0	103	90	110			
Phosphorus, Orthophosphate (As P	7.9	0.50	8.000	0	98.2	90	110			

Sample ID **A6**	SampType: **ccv_6**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19410**	RunNo: **19410**							
Prep Date:	Analysis Date: **6/20/2014**	SeqNo: **561555**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2.3	0.10	2.400	0	97.5	90	110			
Chloride	12	0.50	12.00	0	101	90	110			
Nitrogen, Nitrite (As N)	4.9	0.10	4.800	0	102	90	110			
Bromide	12	0.10	12.00	0	99.7	90	110			
Nitrogen, Nitrate (As N)	7.7	0.10	7.200	0	107	90	110			
Phosphorus, Orthophosphate (As P	12	0.50	12.00	0	101	90	110			

Sample ID **A6**	SampType: **CCV_6**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/7/2014**	SeqNo: **572917**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	30	0.50	30.00	0	101	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/7/2014**	SeqNo: **572919**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSW**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/7/2014**	SeqNo: **572920**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.3	0.50	10.00	0	93.5	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **A4**	SampType: **CCV_4**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/7/2014**	SeqNo: **572929**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	12	0.50	12.50	0	94.3	90	110			

Sample ID **A5**	SampType: **CCV_5**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/7/2014**	SeqNo: **572941**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	20	0.50	20.00	0	98.2	90	110			

Sample ID **A6**	SampType: **CCV_6**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/7/2014**	SeqNo: **572953**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	31	0.50	30.00	0	102	90	110			

Sample ID **A4**	SampType: **CCV_4**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/7/2014**	SeqNo: **572968**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	12	0.50	12.50	0	95.2	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/7/2014**	SeqNo: **572970**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSW**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/7/2014**	SeqNo: **572971**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.5	0.50	10.00	0	95.0	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **A5**	SampType: **CCV_5**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/7/2014**	SeqNo: **572980**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	20	0.50	20.00	0	98.6	90	110			

Sample ID **A6**	SampType: **CCV_6**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/8/2014**	SeqNo: **572992**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	30	0.50	30.00	0	102	90	110			

Sample ID **A4**	SampType: **CCV_4**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/8/2014**	SeqNo: **573004**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	12	0.50	12.50	0	94.7	90	110			

Sample ID **A5**	SampType: **CCV_5**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **BatchQC**	Batch ID: **R19725**	RunNo: **19725**							
Prep Date:	Analysis Date: **7/8/2014**	SeqNo: **573016**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	20	0.50	20.00	0	98.9	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
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- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **MB-R19890**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R19890**	RunNo: **19890**
Prep Date:	Analysis Date: **6/26/2014**	SeqNo: **578052** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acetonitrile	ND	0.50								
Allyl chloride	ND	0.50								
Chloroprene	ND	0.50								
Ethyl methacrylate	ND	0.50								
Methacrylonitrile	ND	0.50								
Methyl ethyl ketone	ND	2.5								
Methyl isobutyl ketone	ND	2.5								
Methyl methacrylate	ND	0.50								
Propionitrile	ND	0.50								
Benzene	ND	0.50								
Toluene	ND	0.50								
Ethylbenzene	ND	0.50								
1,2-Dichloroethane (EDC)	ND	0.50								
1,2-Dibromoethane (EDB)	ND	0.50								
Acetone	ND	2.5								
Bromodichloromethane	ND	0.50								
Bromoform	ND	0.50								
Bromomethane	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon Tetrachloride	ND	0.50								
Chlorobenzene	ND	0.50								
Chloroethane	ND	0.50								
Chloroform	ND	0.50								
Chloromethane	ND	0.50								
cis-1,2-DCE	ND	0.50								
cis-1,3-Dichloropropene	ND	0.50								
1,2-Dibromo-3-chloropropane	ND	0.50								
Dibromochloromethane	ND	0.50								
Dibromomethane	ND	0.50								
1,2-Dichlorobenzene	ND	0.50								
1,4-Dichlorobenzene	ND	0.50								
Dichlorodifluoromethane	ND	0.50								
1,1-Dichloroethane	ND	0.50								
1,1-Dichloroethene	ND	0.50								
1,2-Dichloropropane	ND	0.50								
1,3-Dichloropropane	ND	0.50								
2,2-Dichloropropane	ND	0.50								
1,1-Dichloropropene	ND	0.50								
2-Hexanone	ND	0.50								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **MB-R19890**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R19890**	RunNo: **19890**
Prep Date:	Analysis Date: **6/26/2014**	SeqNo: **578052** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methylene Chloride	ND	0.50								
Styrene	ND	0.50								
1,1,1,2-Tetrachloroethane	ND	0.50								
1,1,2,2-Tetrachloroethane	ND	0.50								
Tetrachloroethene (PCE)	ND	0.50								
trans-1,2-DCE	ND	0.50								
trans-1,3-Dichloropropene	ND	0.50								
1,1,1-Trichloroethane	ND	0.50								
1,1,2-Trichloroethane	ND	0.50								
Trichloroethene (TCE)	ND	0.50								
Trichlorofluoromethane	ND	0.50								
1,2,3-Trichloropropane	ND	0.50								
Vinyl chloride	ND	0.50								
mp-Xylenes	ND	0.50								
o-Xylene	ND	0.50								
Acrolein	ND	10								
Bromochloromethane	ND	0.50								
Iodomethane	ND	0.50								
Vinyl acetate	ND	0.50								

Sample ID **LCS-R19890**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R19890**	RunNo: **19890**
Prep Date:	Analysis Date: **6/26/2014**	SeqNo: **578053** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	9.6	0.50	10.00	0	95.5	80	120			
Toluene	9.8	0.50	10.00	0	98.2	80	120			
Ethylbenzene	10	0.50	10.00	0	99.9	80	120			
Chlorobenzene	9.8	0.50	10.00	0	97.5	80	120			
1,1-Dichloroethene	9.5	0.50	10.00	0	94.9	80	120			
Tetrachloroethene (PCE)	9.9	0.50	10.00	0	98.9	80	120			
Trichloroethene (TCE)	9.9	0.50	10.00	0	98.8	80	120			
o-Xylene	10	0.50	10.00	0	102	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **MB-R19935**	SampType: **MBLK**	TestCode: **EPA 8270C: Semivolatiles/Mod**	
Client ID: **PBW**	Batch ID: **R19935**	RunNo: **19935**	
Prep Date:	Analysis Date: **6/26/2014**	SeqNo: **579511**	Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
N-Nitroso-di-n-butylamine	ND	1.0								
1-Methylnaphthalene	ND	10								
2,3,4,6-Tetrachlorophenol	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
2,4-Dichlorophenol	ND	10								
2,4-Dimethylphenol	ND	10								
2,4-Dinitrophenol	ND	10								
2,4-Dinitrotoluene	ND	10								
2,6-Dinitrotoluene	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
2-Methylnaphthalene	ND	10								
2-Methylphenol	ND	10								
2-Nitroaniline	ND	10								
2-Nitrophenol	ND	10								
3,3'-Dichlorobenzidine	ND	10								
3-Nitroaniline	ND	10								
4,6-Dinitro-2-methylphenol	ND	10								
4-Bromophenyl phenyl ether	ND	10								
4-Chloro-3-methylphenol	ND	5.0								
4-Chloroaniline	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
4-Nitroaniline	ND	10								
4-Nitrophenol	ND	10								
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Anthracene	ND	10								
Benzo(g,h,i)perylene	ND	1.0								
Benz(a)anthracene	ND	1.0								
Benzo(a)pyrene	ND	1.0								
Benzo(b)fluoranthene	ND	1.0								
Benzo(k)fluoranthene	ND	1.0								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	ND	5.0								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								

Qualifiers:

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- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **MB-R19935**	SampType: **MBLK**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **PBW**	Batch ID: **R19935**	RunNo: **19935**
Prep Date:	Analysis Date: **6/26/2014**	SeqNo: **579511** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chrysene	ND	0.10								
Dibenz(a,h)anthracene	ND	1.0								
Dibenzofuran	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Hexachlorobenzene	ND	1.0								
Hexachlorobutadiene	ND	10								
Hexachlorocyclopentadiene	ND	10								
Hexachloroethane	ND	10								
Isophorone	ND	10								
Naphthalene	ND	10								
Nitrobenzene	ND	10								
N-Nitrosodi-n-propylamine	ND	10								
Pentachlorophenol	ND	10								
Phenanthrene	ND	10								
Phenol	ND	5.0								
Pyrene	ND	10								

Sample ID **LCS-R19935**	SampType: **LCS**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **LCSW**	Batch ID: **R19935**	RunNo: **19935**
Prep Date:	Analysis Date: **6/26/2014**	SeqNo: **579512** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	5.3		5.000	0	106	49	134			
2-Chlorophenol	4.4		5.000	0	87.0	50	131			
4-Chloro-3-methylphenol	5.4		5.000	0	108	42	139			
4-Nitrophenol	4.6		5.000	0	92.8	19	137			
Acenaphthene	4.6		5.000	0	93.0	36	122			
Bis(2-ethylhexyl)phthalate	4.9		5.000	0	97.8	43	142			
N-Nitrosodi-n-propylamine	4.5		5.000	0	89.6	46	135			
Pentachlorophenol	4.1		5.000	0	82.6	22	138			
Phenol	6.3		5.000	0	126	45	134			
Pyrene	4.7		5.000	0	93.6	45	138			

Qualifiers:

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- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID	**MB-13883**	SampType: **MBLK**			TestCode: **EPA Method 7470: Mercury**					
Client ID:	**PBW**	Batch ID: **13883**			RunNo: **19515**					
Prep Date:	**6/25/2014**	Analysis Date: **6/26/2014**			SeqNo: **564933**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID	**LCS-13883**	SampType: **LCS**			TestCode: **EPA Method 7470: Mercury**					
Client ID:	**LCSW**	Batch ID: **13883**			RunNo: **19515**					
Prep Date:	**6/25/2014**	Analysis Date: **6/26/2014**			SeqNo: **564934**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0046	0.00020	0.005000	0	92.4	80	120			

Sample ID	**1406935-001BMS**	SampType: **MS**			TestCode: **EPA Method 7470: Mercury**					
Client ID:	**WDW-1, 2, & 3 Efflu**	Batch ID: **13883**			RunNo: **19515**					
Prep Date:	**6/25/2014**	Analysis Date: **6/26/2014**			SeqNo: **564941**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0048	0.00020	0.005000	0	95.9	75	125			

Sample ID	**1406935-001BMSD**	SampType: **MSD**			TestCode: **EPA Method 7470: Mercury**					
Client ID:	**WDW-1, 2, & 3 Efflu**	Batch ID: **13883**			RunNo: **19515**					
Prep Date:	**6/25/2014**	Analysis Date: **6/26/2014**			SeqNo: **564944**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0048	0.00020	0.005000	0	95.6	75	125	0.263	20	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **MB-14082**	SampType: **MBLK**	TestCode: **MERCURY, TCLP**							
Client ID: **PBW**	Batch ID: **14082**	RunNo: **19737**							
Prep Date: **7/7/2014**	Analysis Date: **7/8/2014**	SeqNo: **573374**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020								

Sample ID **LCS-14082**	SampType: **LCS**	TestCode: **MERCURY, TCLP**							
Client ID: **LCSW**	Batch ID: **14082**	RunNo: **19737**							
Prep Date: **7/7/2014**	Analysis Date: **7/8/2014**	SeqNo: **573375**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020	0.005000	0	100	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID	**MB-14080**	SampType: **MBLK**		TestCode: **EPA Method 6010B: TCLP Metals**					
Client ID:	**PBW**	Batch ID: **14080**		RunNo: **19736**					
Prep Date:	**7/7/2014**	Analysis Date: **7/8/2014**		SeqNo: **573325**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0								
Barium	ND	100								
Cadmium	ND	1.0								
Chromium	ND	5.0								
Lead	ND	5.0								
Selenium	ND	1.0								
Silver	ND	5.0								

Sample ID	**LCS-14080**	SampType: **LCS**		TestCode: **EPA Method 6010B: TCLP Metals**					
Client ID:	**LCSW**	Batch ID: **14080**		RunNo: **19736**					
Prep Date:	**7/7/2014**	Analysis Date: **7/8/2014**		SeqNo: **573326**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0	0.5000	0	99.9	80	120			
Barium	ND	100	0.5000	0	96.7	80	120			
Cadmium	ND	1.0	0.5000	0	97.9	80	120			
Chromium	ND	5.0	0.5000	0	96.1	80	120			
Lead	ND	5.0	0.5000	0	94.4	80	120			
Selenium	ND	1.0	0.5000	0	97.1	80	120			
Silver	ND	5.0	0.1000	0	101	80	120			

Sample ID	**1406935-001CMS**	SampType: **MS**		TestCode: **EPA Method 6010B: TCLP Metals**					
Client ID:	**WDW-1, 2, & 3 Efflu**	Batch ID: **14080**		RunNo: **19736**					
Prep Date:	**7/7/2014**	Analysis Date: **7/8/2014**		SeqNo: **573329**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0	0.5000	0.02968	108	75	125			
Barium	ND	100	0.5000	0.04484	98.2	75	125			
Cadmium	ND	1.0	0.5000	0	103	75	125			
Chromium	ND	5.0	0.5000	0.001840	98.1	75	125			
Lead	ND	5.0	0.5000	0	95.5	75	125			
Selenium	ND	1.0	0.5000	0.09485	103	75	125			
Silver	ND	5.0	0.1000	0	107	75	125			

Sample ID	**1406935-001CMSD**	SampType: **MSD**		TestCode: **EPA Method 6010B: TCLP Metals**					
Client ID:	**WDW-1, 2, & 3 Efflu**	Batch ID: **14080**		RunNo: **19736**					
Prep Date:	**7/7/2014**	Analysis Date: **7/8/2014**		SeqNo: **573330**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0	0.5000	0.02968	109	75	125	0	20	

Qualifiers:

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- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **1406935-001CMSD**	SampType: **MSD**	TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **WDW-1, 2, & 3 Efflu**	Batch ID: **14080**	RunNo: **19736**
Prep Date: **7/7/2014**	Analysis Date: **7/8/2014**	SeqNo: **573330** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	100	0.5000	0.04484	98.1	75	125	0	20	
Cadmium	ND	1.0	0.5000	0	102	75	125	0	20	
Chromium	ND	5.0	0.5000	0.001840	97.8	75	125	0	20	
Lead	ND	5.0	0.5000	0	95.1	75	125	0	20	
Selenium	ND	1.0	0.5000	0.09485	108	75	125	0	20	
Silver	ND	5.0	0.1000	0	107	75	125	0	20	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
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- B Analyte detected in the associated Method Blank
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **MB-14075**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Metals**
Client ID: **PBW**	Batch ID: **14075**	RunNo: **19704**
Prep Date: **7/5/2014**	Analysis Date: **7/7/2014**	SeqNo: **572184** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.050								
Arsenic	ND	0.020								
Barium	ND	0.020								
Beryllium	ND	0.0030								
Cadmium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Copper	ND	0.0060								
Iron	ND	0.050								
Lead	ND	0.0050								
Magnesium	ND	1.0								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Potassium	ND	1.0								
Selenium	ND	0.050								
Silver	ND	0.0050								
Thallium	ND	0.050								
Vanadium	ND	0.050								
Zinc	ND	0.020								

Sample ID **LCS-14075**	SampType: **LCS**	TestCode: **EPA 6010B: Total Metals**
Client ID: **LCSW**	Batch ID: **14075**	RunNo: **19704**
Prep Date: **7/5/2014**	Analysis Date: **7/7/2014**	SeqNo: **572185** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.55	0.050	0.5000	0	110	80	120			
Arsenic	0.55	0.020	0.5000	0	110	80	120			
Barium	0.54	0.020	0.5000	0	109	80	120			
Beryllium	0.57	0.0030	0.5000	0	115	80	120			
Cadmium	0.54	0.0020	0.5000	0	109	80	120			
Calcium	57	1.0	50.00	0	114	80	120			
Chromium	0.54	0.0060	0.5000	0	108	80	120			
Cobalt	0.52	0.0060	0.5000	0	104	80	120			
Copper	0.56	0.0060	0.5000	0	112	80	120			
Iron	0.55	0.050	0.5000	0	110	80	120			
Lead	0.53	0.0050	0.5000	0	107	80	120			
Magnesium	57	1.0	50.00	0	113	80	120			
Manganese	0.54	0.0020	0.5000	0	108	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
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- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **LCS-14075**	SampType: **LCS**	TestCode: **EPA 6010B: Total Metals**
Client ID: **LCSW**	Batch ID: **14075**	RunNo: **19704**
Prep Date: **7/5/2014**	Analysis Date: **7/7/2014**	SeqNo: **572185** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nickel	0.52	0.010	0.5000	0	105	80	120			
Potassium	54	1.0	50.00	0	109	80	120			
Selenium	0.53	0.050	0.5000	0	106	80	120			
Silver	0.11	0.0050	0.1000	0	112	80	120			
Thallium	0.53	0.050	0.5000	0	106	80	120			
Vanadium	0.57	0.050	0.5000	0	113	80	120			
Zinc	0.53	0.020	0.5000	0	106	80	120			

Sample ID **MB-14172**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Metals**
Client ID: **PBW**	Batch ID: **14172**	RunNo: **19829**
Prep Date: **7/10/2014**	Analysis Date: **7/11/2014**	SeqNo: **576105** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								

Sample ID **LCS-14172**	SampType: **LCS**	TestCode: **EPA 6010B: Total Metals**
Client ID: **LCSW**	Batch ID: **14172**	RunNo: **19829**
Prep Date: **7/10/2014**	Analysis Date: **7/11/2014**	SeqNo: **576106** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.48	0.020	0.5000	0	96.2	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **MB-R19940**	SampType: **MBLK**	TestCode: **CYANIDE, Reactive**							
Client ID: **PBW**	Batch ID: **R19940**	RunNo: **19940**							
Prep Date:	Analysis Date: **7/2/2014**	SeqNo: **579570**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide, Reactive	ND	1.00								

Sample ID **LCS-R19940**	SampType: **LCS**	TestCode: **CYANIDE, Reactive**							
Client ID: **LCSW**	Batch ID: **R19940**	RunNo: **19940**							
Prep Date:	Analysis Date: **7/2/2014**	SeqNo: **579571**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide, Reactive	0.512		0.5000	0	102	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **MB-R19940**	SampType: **MBLK**	TestCode: **SULFIDE, Reactive**
Client ID: **PBW**	Batch ID: **R19940**	RunNo: **19940**
Prep Date:	Analysis Date: **6/26/2014**	SeqNo: **579573** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Sulfide	ND	1.0								

Sample ID **LCS-R19940**	SampType: **LCS**	TestCode: **SULFIDE, Reactive**
Client ID: **LCSW**	Batch ID: **R19940**	RunNo: **19940**
Prep Date:	Analysis Date: **6/26/2014**	SeqNo: **579574** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Sulfide	0.20		0.2000	0	100	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company
Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **mb-1**	SampType: **MBLK**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R19484**	RunNo: **19484**							
Prep Date:	Analysis Date: **6/23/2014**	SeqNo: **563920**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID **lcs-1**	SampType: **LCS**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R19484**	RunNo: **19484**							
Prep Date:	Analysis Date: **6/23/2014**	SeqNo: **563921**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	79	20	80.00	0	98.7	90	110			

Sample ID **mb-2**	SampType: **MBLK**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R19484**	RunNo: **19484**							
Prep Date:	Analysis Date: **6/23/2014**	SeqNo: **563943**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID **lcs-2**	SampType: **LCS**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R19484**	RunNo: **19484**							
Prep Date:	Analysis Date: **6/23/2014**	SeqNo: **563944**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	80	20	80.00	0	100	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1406935**

18-Jul-14

Client: Navajo Refining Company

Project: WDW-1, 2, & 3 Qtrly Inj Well

Sample ID **MB-13798**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **13798**	RunNo: **19431**
Prep Date: **6/19/2014**	Analysis Date: **6/23/2014**	SeqNo: **561986** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID **LCS-13798**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **13798**	RunNo: **19431**
Prep Date: **6/19/2014**	Analysis Date: **6/23/2014**	SeqNo: **561987** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1010	20.0	1000	0	101	80	120			

Sample ID **1406935-001AMS**	SampType: **MS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **WDW-1, 2, & 3 Efflu**	Batch ID: **13798**	RunNo: **19431**
Prep Date: **6/19/2014**	Analysis Date: **6/23/2014**	SeqNo: **562008** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	6460	40.0	2000	4442	101	80	120			

Sample ID **1406935-001AMSD**	SampType: **MSD**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **WDW-1, 2, & 3 Efflu**	Batch ID: **13798**	RunNo: **19431**
Prep Date: **6/19/2014**	Analysis Date: **6/23/2014**	SeqNo: **562009** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	6460	40.0	2000	4442	101	80	120	0.124	5	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: NAVAJO REFINING CO Work Order Number: 1406935 RcptNo: 1

Received by/date: AT 06/19/14

Logged By: Anne Thorne 6/19/2014 2:35:00 PM Anne Thorne

Completed By: Anne Thorne 6/19/2014 Anne Thorne

Reviewed By: AT 06/19/14

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

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

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.6	Good	Yes			

Chain-of-Custody Record

Client: Navajo Refining Co.

Mailing Address: P.O. Box 159 Artesia, NM 88211-0159

Phone #: 575-748-3311

email or Fax#: 575-746-5451

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)
☐ Other
☐ EDD (Type)

Turn-Around Time:
☐ Standar ☐ **Rush**

Project Name: WDW-1, 2, & 3 Qtrly Inj Well

Project #: P.O. # 167796

Project Manager: Dan Crawford

Sampler: Jerry Sosa

On Ice: ☒ Yes ☐ No

Sample Temperature: 4/6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No 1406935	Specific Gravity,HCO3, CO3, Cl, SO4, TDS, pH, cond.,Fl, Cation/anion bal., Br, Eh/40	VOCs/SW-846 Method 8260C (see attached list 'VOCs')	SVOCs/SW-846 Method 8270D (see attached list 'SVOCs')	R,C,I/40 CFR part 261	Metals/SW-846 Mthd 6010, 7470 (see attached list 'Metals')	Ca, K, Mg, Na/40 CFR 136.3	TCLP Metals, only /40 CFR Part 261/ SW-846 Method 1311
6/19/14	9:00	Liquid	WDW-1, 2, & 3 Effluent	3	Neat/H2SO4	-001	X						X
6/19/14	9:00	Liquid	WDW-1, 2, & 3 Effluent	1	HNO3	-001					X	X	
6/19/14	9:00	Liquid	WDW-1, 2, & 3 Effluent	3	HCL	-001		X					
6/19/14	9:00	Liquid	WDW-1, 2, & 3 Effluent	2	Neat	-001			X				
6/19/14	9:00	Liquid	WDW-1, 2, & 3 Effluent	2	Neat	-001				X			
6/19/14	9:00	Liquid	Trip Blank	2	Neat	-002		X					
6/19/14	9:00	Liquid	Temperature Blank	1	Neat								

Date	Time	Relinquished by	Received by	Date	Time
6/19/14	10:00	Jerry Sosa		06/19/14	14:35

Remarks: Report these results separately from all other Chain of Custody kits provided.

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

Classification	Analyte name	Method	Units	RL
Volatile organics	Acetone	SW-846 Method 8260C	µg/L	10
Volatile organics	Acetonitrile	SW-846 Method 8260C	µg/L	
Volatile organics	Acrolein	SW-846 Method 8260C	µg/L	
Volatile organics	Allyl alcohol	SW-846 Method 8260C	µg/L	
Volatile organics	Allyl chloride	SW-846 Method 8260C	µg/L	
Volatile organics	t-Amyl ethyl ether (TAEE)	SW-846 Method 8260C	µg/L	
Volatile organics	t-Amyl methyl ether (TAME)	SW-846 Method 8260C	µg/L	
Volatile organics	Benzene	SW-846 Method 8260C	µg/L	1
Volatile organics	Benzyl chloride	SW-846 Method 8260C	µg/L	
Volatile organics	Bis(2-chloroethyl)sulfide	SW-846 Method 8260C	µg/L	
Volatile organics	Bromoacetone	SW-846 Method 8260C	µg/L	
Volatile organics	Bromobenzene	SW-846 Method 8260C	µg/L	
Volatile organics	Bromochloromethane	SW-846 Method 8260C	µg/L	5
Volatile organics	Bromodichloromethane	SW-846 Method 8260C	µg/L	1
Volatile organics	4-Bromofluorobenzene (surr)	SW-846 Method 8260C	µg/L	
Volatile organics	Bromoform	SW-846 Method 8260C	µg/L	4
Volatile organics	Bromomethane	SW-846 Method 8260C	µg/L	2
Volatile organics	n-Butanol	SW-846 Method 8260C	µg/L	
Volatile organics	2-Butanone (MEK)	SW-846 Method 8260C	µg/L	10
Volatile organics	n-Butylbenzene	SW-846 Method 8260C	µg/L	
Volatile organics	sec-Butylbenzene	SW-846 Method 8260C	µg/L	
Volatile organics	tert-Butylbenzene	SW-846 Method 8260C	µg/L	
Volatile organics	t-Butyl alcohol	SW-846 Method 8260C	µg/L	
Volatile organics	Carbon disulfide	SW-846 Method 8260C	µg/L	2
Volatile organics	Carbon tetrachloride	SW-846 Method 8260C	µg/L	1
Volatile organics	Chloral hydrate	SW-846 Method 8260C	µg/L	
Volatile organics	Chlorobenzene	SW-846 Method 8260C	µg/L	1
Volatile organics	Chlorobenzene-d5 (IS)	SW-846 Method 8260C	µg/L	
Volatile organics	1-Chlorobutane	SW-846 Method 8260C	µg/L	
Volatile organics	Chlorodibromomethane	SW-846 Method 8260C	µg/L	
Volatile organics	1-Chlorohexane	SW-846 Method 8260C	µg/L	
Volatile organics	Chloroethane	SW-846 Method 8260C	µg/L	1
Volatile organics	2-Chloroethanol	SW-846 Method 8260C	µg/L	
Volatile organics	2-Chloroethyl vinyl ether	SW-846 Method 8260C	µg/L	
Volatile organics	Chloroform	SW-846 Method 8260C	µg/L	1
Volatile organics	Chloromethane	SW-846 Method 8260C	µg/L	1
Volatile organics	Chloroprene	SW-846 Method 8260C	µg/L	
Volatile organics	4-Chlorotoluene	SW-846 Method 8260C	µg/L	
Volatile organics	Crotonaldehyde	SW-846 Method 8260C	µg/L	
Volatile organics	Cyclohexane	SW-846 Method 8260C	µg/L	5
Volatile organics	1,2-Dibromo-3-chloropropane	SW-846 Method 8260C	µg/L	10
Volatile organics	1,2-Dibromoethane	SW-846 Method 8260C	µg/L	2
Volatile organics	Dibromochloromethane	SW-846 Method 8260C	µg/L	1
Volatile organics	Dibromomethane	SW-846 Method 8260C	µg/L	
Volatile organics	1,2-Dichlorobenzene	SW-846 Method 8260C	µg/L	1
Volatile organics	1,3-Dichlorobenzene	SW-846 Method 8260C	µg/L	1

Volatile organics	1,4-Dichlorobenzene	SW-846 Method 8260C	µg/L	1
Volatile organics	1,4-Dichlorobenzene-d4 (IS)	SW-846 Method 8260C	µg/L	
Volatile organics	cis-1,4-Dichloro-2-butene	SW-846 Method 8260C	µg/L	
Volatile organics	trans-1,4-Dichloro-2-butene	SW-846 Method 8260C	µg/L	
Volatile organics	Dichlorodifluoromethane	SW-846 Method 8260C	µg/L	5
Volatile organics	1,1-Dichloroethane	SW-846 Method 8260C	µg/L	1
Volatile organics	1,2-Dichloroethane	SW-846 Method 8260C	µg/L	1
Volatile organics	1,2-Dichloroethane-d4 (surr)	SW-846 Method 8260C	µg/L	
Volatile organics	1,1-Dichloroethene	SW-846 Method 8260C	µg/L	1
Volatile organics	cis-1,2-Dichloroethene	SW-846 Method 8260C	µg/L	1
Volatile organics	trans-1,2-Dichloroethene	SW-846 Method 8260C	µg/L	1
Volatile organics	1,2-Dichloropropane	SW-846 Method 8260C	µg/L	1
Volatile organics	1,3-Dichloropropane	SW-846 Method 8260C	µg/L	
Volatile organics	2,2-Dichloropropane	SW-846 Method 8260C	µg/L	
Volatile organics	1,1-Dichloropropene	SW-846 Method 8260C	µg/L	
Volatile organics	1,3-Dichloro-2-propanol	SW-846 Method 8260C	µg/L	
Volatile organics	cis-1,3-Dichloropropene	SW-846 Method 8260C	µg/L	1
Volatile organics	trans-1,3-Dichloropropene	SW-846 Method 8260C	µg/L	1
Volatile organics	1,2,3,4-Depoxybutane	SW-846 Method 8260C	µg/L	
Volatile organics	Diethyl ether	SW-846 Method 8260C	µg/L	
Volatile organics	Diisopropyl either (DIPE)	SW-846 Method 8260C	µg/L	
Volatile organics	1,4-Difluorobenzene (IS)	SW-846 Method 8260C	µg/L	
Volatile organics	1,4-Dioxane	SW-846 Method 8260C	µg/L	130
Volatile organics	Epichlorohydrin	SW-846 Method 8260C	µg/L	
Volatile organics	Ethanol	SW-846 Method 8260C	µg/L	
Volatile organics	Ethyl acetate	SW-846 Method 8260C	µg/L	
Volatile organics	Ethylbenzene	SW-846 Method 8260C	µg/L	1
Volatile organics	Ethylene oxide	SW-846 Method 8260C	µg/L	
Volatile organics	Ethyl methacrylate	SW-846 Method 8260C	µg/L	
Volatile organics	Fluorobenzene (IS)	SW-846 Method 8260C	µg/L	
Volatile organics	Freon 113	SW-846 Method 8260C	µg/L	5
Volatile organics	Ethyl tert-butyl ether (ETBE)	SW-846 Method 8260C	µg/L	
Volatile organics	Hexachlorobutadiene	SW-846 Method 8260C	µg/L	
Volatile organics	Hexachloroethane	SW-846 Method 8260C	µg/L	
Volatile organics	2-Hexanone	SW-846 Method 8260C	µg/L	5
Volatile organics	Iodomethane	SW-846 Method 8260C	µg/L	
Volatile organics	Isobutyl alcohol	SW-846 Method 8260C	µg/L	
Volatile organics	Isopropylbenzene	SW-846 Method 8260C	µg/L	2
Volatile organics	p-Isopropyltoluene	SW-846 Method 8260C	µg/L	
Volatile organics	Malononitrile	SW-846 Method 8260C	µg/L	
Volatile organics	Methacrylonitrile	SW-846 Method 8260C	µg/L	
Volatile organics	Methanol	SW-846 Method 8260C	µg/L	
Volatile organics	Methyl acetate	SW-846 Method 8260C	µg/L	5
Volatile organics	Methylcyclohexane	SW-846 Method 8260C	µg/L	5
Volatile organics	Methyl acrylate	SW-846 Method 8260C	µg/L	
Volatile organics	Methylene chloride	SW-846 Method 8260C	µg/L	2
Volatile organics	Methyl methacrylate	SW-846 Method 8260C	µg/L	

Volatile organics	4-Methyl-2-pentanone (MIBK)	SW-846 Method 8260C	µg/L	5
Volatile organics	Methyl tert-butyl ether (MTBE)	SW-846 Method 8260C	µg/L	1
Volatile organics	Naphthalene	SW-846 Method 8260C	µg/L	
Volatile organics	Nitrobenzene	SW-846 Method 8260C	µg/L	
Volatile organics	2-Nitropropane	SW-846 Method 8260C	µg/L	
Volatile organics	N-Nitroso-di-n-butylamine	SW-846 Method 8260C	µg/L	
Volatile organics	Paraldehyde	SW-846 Method 8260C	µg/L	
Volatile organics	Pentachloroethane	SW-846 Method 8260C	µg/L	
Volatile organics	Pentafluorobenzene	SW-846 Method 8260C	µg/L	
Volatile organics	2-Pentanone	SW-846 Method 8260C	µg/L	
Volatile organics	2-Picoline	SW-846 Method 8260C	µg/L	
Volatile organics	1-Propanol	SW-846 Method 8260C	µg/L	
Volatile organics	2-Propanol	SW-846 Method 8260C	µg/L	
Volatile organics	Propargyl alcohol	SW-846 Method 8260C	µg/L	
Volatile organics	beta-Propiolactone	SW-846 Method 8260C	µg/L	
Volatile organics	Propionitrile	SW-846 Method 8260C	µg/L	
Volatile organics	n-Propylamine	SW-846 Method 8260C	µg/L	
Volatile organics	n-Propylbenzene	SW-846 Method 8260C	µg/L	
Volatile organics	Pyridine	SW-846 Method 8260C	µg/L	
Volatile organics	Styrene	SW-846 Method 8260C	µg/L	5
Volatile organics	1,1,1,2-Tetrachloroethane	SW-846 Method 8260C	µg/L	
Volatile organics	1,1,2,2-Tetrachloroethane	SW-846 Method 8260C	µg/L	1
Volatile organics	Tetrachloroethene (PCE)	SW-846 Method 8260C	µg/L	1
Volatile organics	Toluene	SW-846 Method 8260C	µg/L	1
Volatile organics	Toluene-d8 (surr)	SW-846 Method 8260C	µg/L	
Volatile organics	o-Toluidine	SW-846 Method 8260C	µg/L	
Volatile organics	1,2,3-Trichlorobenzene	SW-846 Method 8260C	µg/L	5
Volatile organics	1,2,4-Trichlorobenzene	SW-846 Method 8260C	µg/L	5
Volatile organics	1,1,1-Trichloroethane	SW-846 Method 8260C	µg/L	1
Volatile organics	1,1,2-Trichloroethane	SW-846 Method 8260C	µg/L	1
Volatile organics	Trichloroethene (TCE)	SW-846 Method 8260C	µg/L	1
Volatile organics	Trichlorofluoromethane	SW-846 Method 8260C	µg/L	5
Volatile organics	1,2,3-Trichloropropane	SW-846 Method 8260C	µg/L	
Volatile organics	1,2,4-Trimethylbenzene	SW-846 Method 8260C	µg/L	
Volatile organics	1,3,5-Trimethylbenzene	SW-846 Method 8260C	µg/L	
Volatile organics	Vinyl acetate	SW-846 Method 8260C	µg/L	
Volatile organics	Vinyl chloride	SW-846 Method 8260C	µg/L	1
Volatile organics	o-Xylene	SW-846 Method 8260C	µg/L	1
Volatile organics	m-Xylene	SW-846 Method 8260C	µg/L	1
Volatile organics	p-Xylene	SW-846 Method 8260C	µg/L	1
Volatile organics	Xylene, total	SW-846 Method 8260C	µg/L	1

(surr) - Surrogate
(IS) - Internal Standard
Method 8260C Volatile Organic Compounds by Gas Chromatograhy/Mass Spectrometry (GC/MS) (EPA, Revision 3, August 2006)
Constituents with RLs are on the VOC Target Compound List (TCL) (SOMO 1.1)

Classification	Analyte name	Method	Units	RL
Semivolatile organics	1,1'-Biphenyl	SW-864 Method 8270B	µg/L	1
Semivolatile organics	1,2,4,5-Tetrachlorobenzene	SW-864 Method 8270B	µg/L	2
Semivolatile organics	2-Chloronaphthalene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	2-Chlorophenol	SW-864 Method 8270B	µg/L	5
Semivolatile organics	2-Methylphenol	SW-864 Method 8270B	µg/L	5
Semivolatile organics	2-Nitroaniline	SW-864 Method 8270B	µg/L	10
Semivolatile organics	2-Nitrophenol	SW-864 Method 8270B	µg/L	5
Semivolatile organics	2,3,4,6-Tetrachlorophenol	SW-864 Method 8270B	µg/L	5
Semivolatile organics	2,4-Dichlorophenol	SW-864 Method 8270B	µg/L	5
Semivolatile organics	2,4-Dimethylphenol	SW-864 Method 8270B	µg/L	5
Semivolatile organics	2,4-Dinitrophenol	SW-864 Method 8270B	µg/L	10
Semivolatile organics	2,4-Dinitrotoluene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	2,4,5-Trichlorophenol	SW-864 Method 8270B	µg/L	10
Semivolatile organics	2,4,6-Trichlorophenol	SW-864 Method 8270B	µg/L	5
Semivolatile organics	2,6-Dinitrotoluene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	3-Nitroaniline	SW-864 Method 8270B	µg/L	10
Semivolatile organics	3,3'-Dichlrobenzidine	SW-864 Method 8270B	µg/L	5
Semivolatile organics	4-Bromophenyl-phenylether	SW-864 Method 8270B	µg/L	5
Semivolatile organics	4-Chloro-3-methylphenol	SW-864 Method 8270B	µg/L	5
Semivolatile organics	4-Chloroaniline	SW-864 Method 8270B	µg/L	5
Semivolatile organics	4-Chlorophenyl-phenyl ether	SW-864 Method 8270B	µg/L	5
Semivolatile organics	4-Nitroaniline	SW-864 Method 8270B	µg/L	10
Semivolatile organics	4-Nitrophenol	SW-864 Method 8270B	µg/L	10
Semivolatile organics	4,6-Dinitro-2-methylphenol	SW-864 Method 8270B	µg/L	10
Semivolatile organics	Acetophenone	SW-864 Method 8270B	µg/L	2
Semivolatile organics	Acenaphthene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Acenaphthylene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Anthracene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Atrazine	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Benzaldehyde	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Benzo(a)anthracene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Benzo(a)pyrene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Benzo(b)fluoranthene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Benzo(g,h,i)perylene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Benzo(k)fluoranthene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	bis(2-Chloroethoxy)-methane	SW-864 Method 8270B	µg/L	2
Semivolatile organics	bis(2-Chloroethyl) ether	SW-864 Method 8270B	µg/L	2
Semivolatile organics	bis(2-Chloroisopropyl) ether	SW-864 Method 8270B	µg/L	2
Semivolatile organics	bis(2-Ethylhexyl)phthalate	SW-864 Method 8270B	µg/L	2
Semivolatile organics	Butylbenzylphthalate	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Carbazole	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Caprolactam	SW-864 Method 8270B	µg/L	2
Semivolatile organics	Chrysene	SW-864 Method 8270B	µg/L	0.1
Semivolatile organics	Di-n-butylphthalate	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Di-n-octylphthalate	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Dibenz(a,h)anthracene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Dibenzofuran	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Diethylphthalate	SW-864 Method 8270B	µg/L	5

Semivolatile organics	Dimethylphthalate	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Fluroanthene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Fluorene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Hexachlorobenzene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Hexachlorobutadiene	SW-864 Method 8270B	µg/L	1
Semivolatile organics	Hexachlorocyclopentadiene	SW-864 Method 8270B	µg/L	10
Semivolatile organics	Hexachloroethane	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Indeno(1,2,3-cd)peryline	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Isophorone	SW-864 Method 8270B	µg/L	5
Semivolatile organics	1-Methylnaphthalene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	2-Methylnaphthalene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	N-Nitroso-di-n-propylamine	SW-864 Method 8270B	µg/L	5
Semivolatile organics	N-Nitrosodiphenylamine	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Napthtalene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Nitrobenzene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Pentachlorophenol	SW-864 Method 8270B	µg/L	10
Semivolatile organics	Phenanthrene	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Phenol	SW-864 Method 8270B	µg/L	5
Semivolatile organics	Pyrene	SW-864 Method 8270B	µg/L	5

Target Compound List 1.5 for SVOCs by SW-846 Method 8270

Classification	Analyte name[1]	Method	Units	RL
Inorganics	Mercury	SW-846 Method 7470		
Inorganics	Arsenic	SW-846 Method 6010		
Inorganics	Silver	SW-846 Method 6010		
Inorganics	Aluminum	SW-846 Method 6010		
Inorganics	Barium	SW-846 Method 6010		
Inorganics	Beryllium	SW-846 Method 6010		
Inorganics	Calcium	SW-846 Method 6010		
Inorganics	Cadmium	SW-846 Method 6010		
Inorganics	Cobalt	SW-846 Method 6010		
Inorganics	Chromium	SW-846 Method 6010		
Inorganics	Copper	SW-846 Method 6010		
Inorganics	Iron	SW-846 Method 6010		
Inorganics	Mercury	SW-846 Method 6010		
Inorganics	Potassium	SW-846 Method 6010		
Inorganics	Magnesium	SW-846 Method 6010		
Inorganics	Manganese	SW-846 Method 6010		
Inorganics	Sodium	SW-846 Method 6010		
Inorganics	Nickel	SW-846 Method 6010		
Inorganics	Lead	SW-846 Method 6010		
Inorganics	Antimony	SW-846 Method 6010		
Inorganics	Selenium	SW-846 Method 6010		
Inorganics	Thallium	SW-846 Method 6010		
Inorganics	Vanadium	SW-846 Method 6010		
Inorganics	Zinc	SW-846 Method 6010		

** dilute elements only if necessary

[1] 23 TAL Metals

HOLLYFRONTIER.

October 27, 2014

Mr. Carl Chavez, CHMM
NM Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr.
Santa Fe, NM 87505-5472

Certified Mail/Return Receipt
7007 3020 0000 3028 9359

RE: 2014 3rd Quarter Injection Report for Wells WDW-1, WDW-2 and WDW-3, Navajo Refining Company, L.L.C.

Dear Mr. Chavez,

Enclosed, please find the third quarter 2014 sampling results for fluids injected into WDW-1, WDW-2 and WDW-3 and a spread sheet showing various volumes and pressures as required under Permit Condition 2.I.1, Quarterly Reports.

Over the third quarter, the average injection pressure for all three wells was 1260 psig and the average flows were 105 gpm for WDW-1, 98 gpm for WDW-2 and 106 gpm for WDW-3. There were no significant losses from the glycol expansion tanks Well Annulus Monitoring System (WAMS). The quarterly effluent analyses indicated parameters are within permit limits.

This report covers the period from July 1, 2014 to September 30, 2014. We have disposed a total of 976,643 barrels of fluid into the three wells during the third quarter of 2014. The volume per well is:

- 423,882 barrels into WDW-1
- 143,954 barrels into WDW-2
- 408,807 barrels into WDW-3

This report is signed and certified in accordance with WQCC section 5101.G. If there are any questions, please call me at 575-748-3311.

Respectfully,

Michael McKee
Vice-President & Refinery Manager
Navajo Refining Company, L.L.C.

Enc.

Electronic cc (w/enc.): R Combs, M Schultz, A Strange
Environmental File: Injection Wells/Reports C-115 & Quarterly/2014/3rd quarter/2014-10-27 3rd QTR Inj Rpt for Wells WDW-1,2,3

Navajo Refining Company, L.L.C.

2014 THIRD QUARTER MONTHLY INJECTION PRESSURES, RATES, AND VOLUMES

	Average Pressure (psig)	Maximum Pressure (psig)	Minimum Pressure (psig)	Average Flow (gpm)	Maximum Flow (gpm)	Minimum Flow (gpm)	Average Annular Pressure Av (psig)	Maximum Annular Pressure Mx (psig)	Minimum Annular Pressure Mn (psig)	Average Volume (bpd)	Maximum Volume (bpd)	Minimum Volume (bpd)	Volume (barrels)	TOTAL CUMULATIVE Volume (barrels)
WDW-1													**Previous Quarter**	35,238,254
Jul-14	1,241	1,275	970	153	393	140	722	819	179	5,246	13,474	4,800	163,199	35,401,453
Aug-14	1,235	1,275	996	138	144	112	550	769	79	4,731	4,937	3,840	146,646	35,548,099
Sep-14	1,305	1,350	1,273	111	143	76	110	361	0	3,806	4,903	2,606	114,037	35,662,136
WDW-2													**Previous Quarter**	22,198,479
Jul-14	1,241	1,275	983	35	37	11	573	943	265	1,200	1,269	377	37,182	22,235,661
Aug-14	1,235	1,275	1,011	33	37	10	320	402	271	1,131	1,269	343	34,872	22,270,533
Sep-14	1,303	1,350	1,265	70	129	33	285	304	268	2,400	4,423	1,131	71,900	22,342,432
WDW-3													**Previous Quarter**	12,357,942
Jul-14	1,238	1,275	987	128	140	15	914	1,023	260	4,389	4,800	514	136,278	12,494,220
Aug-14	1,239	1,275	1,012	123	137	13	811	935	308	4,217	4,697	446	130,920	12,625,140
Sep-14	1,301	1,350	1,143	138	150	80	782	976	560	4,731	5,143	2,743	141,609	12,766,749
													Total Injected fluids:	70,771,318

Navajo Refining Company, L.L.C.

2014 THIRD QUARTER WEEKLY WAMS LEVEL TABLE

	7/1/14	7/7/14	7/14/14	7/22/14	7/28/14	8/4/14	8/11/14	8/18/14	8/26/14	9/3/14	9/8/14	9/15/14	9/22/14	9/29/14
WDW -1[1]	150	145	145	145	145	145	145	145	145	145	145	145	145	145
WDW-2[1]	130	100	100	100	100	100	100	100	100	100	100	100	100	100
WDW-3[1]	145	145	145	145	145	145	145	145	145	145	145	145	145	145

Comments: WDW-2 Minor surface tubing leak identified and repaired week of 7/7.

[1] Graduated tank gauged weekly in the field. Reading is in gallons.

WDW-1 is Mewbourne
WDW-2 is Chukka
WDW-3 is Gaines

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

October 09, 2014

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

RE: Quarterly WDW-1, 2, &3 Inj Well

OrderNo.: 1409594

Dear Dan Crawford:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/12/2014 for the analyses presented in the following report.

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

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

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Case Narrative

WO#: **1409594**
Date: **10/9/2014**

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

The following compounds were also scanned for by NIST library search and not detected. The detection level for these compounds would be ~10ppb:
Allyl alcohol
t-amyl ethyl ether
Bis(2-chloroethyl)sulfide
Bromoacetone
Chloral hydrate
1-chlorobutane
1-chlorohexane
2-chloroethanol
Crotonaldehyde
Cis-1,4-Dichloro-2butene
1,3-Dichloro-2-propanol
1,2,3,4-Depoxybutane
Ethanol
Ethylene oxide
Malonitrile
Methanol
Methyl acrylate
2-Nitropropane
Paraldehyde
Pentafluorobenzene
2-Pentanone
2-picoline
1-propanol
2-propanol
Propargyl alcohol
Beta-propiolactone
n-propylamine

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1409594-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 9/11/2014 9:30:00 AM
Received Date: 9/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGP**	
Fluoride	7.0	2.0	*	mg/L	20	9/13/2014 4:23:10 AM	R21201
Chloride	350	10		mg/L	20	9/13/2014 4:23:10 AM	R21201
Nitrogen, Nitrite (As N)	ND	0.50		mg/L	5	9/13/2014 4:10:46 AM	R21201
Bromide	ND	0.50		mg/L	5	9/13/2014 4:10:46 AM	R21201
Nitrogen, Nitrate (As N)	ND	0.50		mg/L	5	9/13/2014 4:10:46 AM	R21201
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	9/13/2014 4:23:10 AM	R21201
Sulfate	2500	50		mg/L	100	9/19/2014 12:23:58 AM	R21321
EPA METHOD 7470: MERCURY						Analyst: **MMD**	
Mercury	ND	0.00020		mg/L	1	9/18/2014 1:55:03 PM	15362
MERCURY, TCLP						Analyst: **JLF**	
Mercury	ND	0.020		mg/L	1	9/23/2014 11:17:20 AM	15428
EPA METHOD 6010B: TCLP METALS						Analyst: **ELS**	
Arsenic	ND	5.0		mg/L	1	9/20/2014 10:20:57 AM	15405
Barium	ND	100		mg/L	1	9/20/2014 10:20:57 AM	15405
Cadmium	ND	1.0		mg/L	1	9/20/2014 10:20:57 AM	15405
Chromium	ND	5.0		mg/L	1	9/20/2014 10:20:57 AM	15405
Lead	ND	5.0		mg/L	1	9/20/2014 10:20:57 AM	15405
Selenium	ND	1.0		mg/L	1	9/20/2014 10:20:57 AM	15405
Silver	ND	5.0		mg/L	1	9/25/2014 12:34:33 PM	15405
EPA 6010B: TOTAL METALS						Analyst: **ELS**	
Aluminum	0.18	0.020		mg/L	1	9/20/2014 9:40:32 AM	15405
Antimony	ND	0.050		mg/L	1	9/20/2014 9:40:32 AM	15405
Arsenic	0.061	0.020		mg/L	1	9/20/2014 9:40:32 AM	15405
Barium	0.022	0.020		mg/L	1	9/20/2014 9:40:32 AM	15405
Beryllium	ND	0.0030		mg/L	1	9/20/2014 9:40:32 AM	15405
Cadmium	ND	0.0020		mg/L	1	9/20/2014 9:40:32 AM	15405
Calcium	80	1.0		mg/L	1	9/20/2014 9:40:32 AM	15405
Chromium	ND	0.0060		mg/L	1	9/20/2014 9:40:32 AM	15405
Cobalt	ND	0.0060		mg/L	1	9/20/2014 9:40:32 AM	15405
Copper	ND	0.0060		mg/L	1	9/20/2014 9:40:32 AM	15405
Iron	0.50	0.050		mg/L	1	9/20/2014 9:40:32 AM	15405
Lead	ND	0.0050		mg/L	1	9/20/2014 9:40:32 AM	15405
Magnesium	28	1.0		mg/L	1	9/20/2014 9:40:32 AM	15405
Manganese	0.21	0.0020		mg/L	1	9/20/2014 9:40:32 AM	15405
Nickel	0.012	0.010		mg/L	1	9/20/2014 9:40:32 AM	15405
Potassium	58	1.0		mg/L	1	9/20/2014 9:40:32 AM	15405
Selenium	ND	0.050		mg/L	1	9/20/2014 9:40:32 AM	15405

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1409594-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 9/11/2014 9:30:00 AM
Received Date: 9/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 6010B: TOTAL METALS						Analyst: **ELS**	
Silver	ND	0.0050		mg/L	1	9/23/2014 1:35:48 PM	15405
Thallium	ND	0.050		mg/L	1	9/20/2014 9:40:32 AM	15405
Titanium	ND	0.0050		mg/L	1	9/20/2014 9:40:32 AM	15405
Silica	9.8	1.1		mg/L	1	9/20/2014 9:40:32 AM	15405
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
Acetonitrile	73	0.50		µg/L	1	9/24/2014	R21755
Allyl chloride	ND	0.50		µg/L	1	9/24/2014	R21755
Chloroprene	ND	0.50		µg/L	1	9/24/2014	R21755
Cyclohexane	ND	0.50		µg/L	1	9/24/2014	R21755
Diethyl ether	ND	0.50		µg/L	1	9/24/2014	R21755
Diisopropyl ether	ND	0.50		µg/L	1	9/24/2014	R21755
Epichlorohydrin	ND	5.0		µg/L	1	9/24/2014	R21755
Ethyl acetate	ND	0.50		µg/L	1	9/24/2014	R21755
Ethyl methacrylate	ND	0.50		µg/L	1	9/24/2014	R21755
Ethyl tert-butyl ether	ND	0.50		µg/L	1	9/24/2014	R21755
Freon-113	ND	0.50		µg/L	1	9/24/2014	R21755
Isobutanol	ND	50		µg/L	1	9/24/2014	R21755
Isopropyl acetate	ND	0.50		µg/L	1	9/24/2014	R21755
Methacrylonitrile	ND	0.50		µg/L	1	9/24/2014	R21755
Methyl acetate	ND	0.50		µg/L	1	9/24/2014	R21755
Methyl ethyl ketone	ND	2.5		µg/L	1	9/24/2014	R21755
Methyl isobutyl ketone	ND	2.5		µg/L	1	9/24/2014	R21755
Methyl methacrylate	ND	0.50		µg/L	1	9/24/2014	R21755
Methylcyclohexane	ND	1.0		µg/L	1	9/24/2014	R21755
n-Amyl acetate	ND	0.50		µg/L	1	9/24/2014	R21755
n-Hexane	ND	0.50		µg/L	1	9/24/2014	R21755
Nitrobenzene	ND	5.0		µg/L	1	9/24/2014	R21755
Pentachloroethane	ND	5.0		µg/L	1	9/24/2014	R21755
p-isopropyltoluene	ND	0.50		µg/L	1	9/24/2014	R21755
Propionitrile	0.97	0.50		µg/L	1	9/24/2014	R21755
Tetrahydrofuran	ND	0.50		µg/L	1	9/24/2014	R21755
Benzene	ND	0.50		µg/L	1	9/24/2014	R21755
Toluene	ND	0.50		µg/L	1	9/24/2014	R21755
Ethylbenzene	ND	0.50		µg/L	1	9/24/2014	R21755
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	1	9/24/2014	R21755
1,2,4-Trimethylbenzene	ND	0.50		µg/L	1	9/24/2014	R21755
1,3,5-Trimethylbenzene	ND	0.50		µg/L	1	9/24/2014	R21755
1,2-Dichloroethane (EDC)	ND	0.50		µg/L	1	9/24/2014	R21755
1,2-Dibromoethane (EDB)	ND	0.50		µg/L	1	9/24/2014	R21755

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- O RSD is greater than RSDlimit
- P Sample pH greater than 2.
- R RPD outside accepted recovery limits
- RL Reporting Detection Limit
- S Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1409594-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 9/11/2014 9:30:00 AM
Received Date: 9/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
Naphthalene	ND	0.50		µg/L	1	9/24/2014	R21755
Acetone	18	2.5		µg/L	1	9/24/2014	R21755
Bromobenzene	ND	0.50		µg/L	1	9/24/2014	R21755
Bromodichloromethane	ND	0.50		µg/L	1	9/24/2014	R21755
Bromoform	ND	0.50		µg/L	1	9/24/2014	R21755
Bromomethane	ND	0.50		µg/L	1	9/24/2014	R21755
Carbon disulfide	0.56	0.50		µg/L	1	9/24/2014	R21755
Carbon Tetrachloride	ND	0.50		µg/L	1	9/24/2014	R21755
Chlorobenzene	ND	0.50		µg/L	1	9/24/2014	R21755
Chloroethane	ND	0.50		µg/L	1	9/24/2014	R21755
Chloroform	ND	0.50		µg/L	1	9/24/2014	R21755
Chloromethane	ND	0.50		µg/L	1	9/24/2014	R21755
2-Chlorotoluene	ND	0.50		µg/L	1	9/24/2014	R21755
4-Chlorotoluene	ND	0.50		µg/L	1	9/24/2014	R21755
cis-1,2-DCE	ND	0.50		µg/L	1	9/24/2014	R21755
cis-1,3-Dichloropropene	ND	0.50		µg/L	1	9/24/2014	R21755
1,2-Dibromo-3-chloropropane	ND	0.50		µg/L	1	9/24/2014	R21755
Dibromochloromethane	ND	0.50		µg/L	1	9/24/2014	R21755
Dibromomethane	ND	0.50		µg/L	1	9/24/2014	R21755
1,2-Dichlorobenzene	ND	0.50		µg/L	1	9/24/2014	R21755
1,3-Dichlorobenzene	ND	0.50		µg/L	1	9/24/2014	R21755
1,4-Dichlorobenzene	ND	0.50		µg/L	1	9/24/2014	R21755
Dichlorodifluoromethane	ND	0.50		µg/L	1	9/24/2014	R21755
1,1-Dichloroethane	ND	0.50		µg/L	1	9/24/2014	R21755
1,1-Dichloroethene	ND	0.50		µg/L	1	9/24/2014	R21755
1,2-Dichloropropane	ND	0.50		µg/L	1	9/24/2014	R21755
1,3-Dichloropropane	ND	0.50		µg/L	1	9/24/2014	R21755
2,2-Dichloropropane	ND	0.50		µg/L	1	9/24/2014	R21755
1,1-Dichloropropene	ND	0.50		µg/L	1	9/24/2014	R21755
Hexachlorobutadiene	ND	0.50		µg/L	1	9/24/2014	R21755
2-Hexanone	ND	0.50		µg/L	1	9/24/2014	R21755
Isopropylbenzene	ND	0.50		µg/L	1	9/24/2014	R21755
4-Isopropyltoluene	ND	0.50		µg/L	1	9/24/2014	R21755
4-Methyl-2-pentanone	ND	0.50		µg/L	1	9/24/2014	R21755
Methylene Chloride	ND	2.5		µg/L	1	9/24/2014	R21755
n-Butylbenzene	ND	0.50		µg/L	1	9/24/2014	R21755
n-Propylbenzene	ND	0.50		µg/L	1	9/24/2014	R21755
sec-Butylbenzene	ND	0.50		µg/L	1	9/24/2014	R21755
Styrene	ND	0.50		µg/L	1	9/24/2014	R21755

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Qualifiers:

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- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1409594-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 9/11/2014 9:30:00 AM
Received Date: 9/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
tert-Butylbenzene	ND	0.50		µg/L	1	9/24/2014	R21755
1,1,1,2-Tetrachloroethane	ND	0.50		µg/L	1	9/24/2014	R21755
1,1,2,2-Tetrachloroethane	ND	0.50		µg/L	1	9/24/2014	R21755
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	9/24/2014	R21755
trans-1,2-DCE	ND	0.50		µg/L	1	9/24/2014	R21755
trans-1,3-Dichloropropene	ND	0.50		µg/L	1	9/24/2014	R21755
1,2,3-Trichlorobenzene	ND	0.50		µg/L	1	9/24/2014	R21755
1,2,4-Trichlorobenzene	ND	0.50		µg/L	1	9/24/2014	R21755
1,1,1-Trichloroethane	ND	0.50		µg/L	1	9/24/2014	R21755
1,1,2-Trichloroethane	ND	0.50		µg/L	1	9/24/2014	R21755
Trichloroethene (TCE)	ND	0.50		µg/L	1	9/24/2014	R21755
Trichlorofluoromethane	ND	0.50		µg/L	1	9/24/2014	R21755
1,2,3-Trichloropropane	ND	0.50		µg/L	1	9/24/2014	R21755
Vinyl chloride	ND	0.50		µg/L	1	9/24/2014	R21755
Xylenes, Total	ND	1.0		µg/L	1	9/24/2014	R21755
mp-Xylenes	ND	1.0		µg/L	1	9/24/2014	R21755
o-Xylene	ND	0.50		µg/L	1	9/24/2014	R21755
tert-Amyl methyl ether	ND	0.50		µg/L	1	9/24/2014	R21755
tert-Butyl alcohol	23	0.50		µg/L	1	9/24/2014	R21755
Acrolein	ND	0.50		µg/L	1	9/24/2014	R21755
Acrylonitrile	ND	10		µg/L	1	9/24/2014	R21755
Bromochloromethane	ND	0.50		µg/L	1	9/24/2014	R21755
2-Chloroethyl vinyl ether	ND	0.50		µg/L	1	9/24/2014	R21755
Iodomethane	ND	0.50		µg/L	1	9/24/2014	R21755
trans-1,4-Dichloro-2-butene	ND	0.50		µg/L	1	9/24/2014	R21755
Vinyl acetate	ND	0.50		µg/L	1	9/24/2014	R21755
1,4-Dioxane	ND	20		µg/L	1	9/24/2014	R21755
Surr: 1,2-Dichloroethane-d4	110	70-130		%REC	1	9/24/2014	R21755
Surr: 4-Bromofluorobenzene	99.6	70-130		%REC	1	9/24/2014	R21755
Surr: Toluene-d8	104	70-130		%REC	1	9/24/2014	R21755
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**
1,1-Biphenyl	ND	5.0		µg/L	1	9/23/2014	R21755
Atrazine	ND	5.0		µg/L	1	9/23/2014	R21755
Benzaldehyde	ND	5.0		µg/L	1	9/23/2014	R21755
Caprolactam	ND	5.0		µg/L	1	9/23/2014	R21755
N-Nitroso-di-n-butylamine	ND	5.0		µg/L	1	9/23/2014	R21755
Acetophenone	ND	10		µg/L	1	9/23/2014	R21755
1-Methylnaphthalene	ND	10		µg/L	1	9/23/2014	R21755
2,3,4,6-Tetrachlorophenol	ND	10		µg/L	1	9/23/2014	R21755

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Qualifiers:

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E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1409594-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 9/11/2014 9:30:00 AM
Received Date: 9/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**
2,4,5-Trichlorophenol	ND	10		µg/L	1	9/23/2014	R21755
2,4,6-Trichlorophenol	ND	10		µg/L	1	9/23/2014	R21755
2,4-Dichlorophenol	ND	10		µg/L	1	9/23/2014	R21755
2,4-Dimethylphenol	ND	10		µg/L	1	9/23/2014	R21755
2,4-Dinitrophenol	ND	10		µg/L	1	9/23/2014	R21755
2,4-Dinitrotoluene	ND	10		µg/L	1	9/23/2014	R21755
2,6-Dinitrotoluene	ND	10		µg/L	1	9/23/2014	R21755
2-Chloronaphthalene	ND	10		µg/L	1	9/23/2014	R21755
2-Chlorophenol	ND	10		µg/L	1	9/23/2014	R21755
2-Methylnaphthalene	ND	10		µg/L	1	9/23/2014	R21755
2-Methylphenol	ND	10		µg/L	1	9/23/2014	R21755
2-Nitroaniline	ND	10		µg/L	1	9/23/2014	R21755
2-Nitrophenol	ND	10		µg/L	1	9/23/2014	R21755
3,3'-Dichlorobenzidine	ND	10		µg/L	1	9/23/2014	R21755
3-Nitroaniline	ND	10		µg/L	1	9/23/2014	R21755
4,6-Dinitro-2-methylphenol	ND	10		µg/L	1	9/23/2014	R21755
4-Bromophenyl phenyl ether	ND	10		µg/L	1	9/23/2014	R21755
4-Chloro-3-methylphenol	ND	5.0		µg/L	1	9/23/2014	R21755
4-Chloroaniline	ND	10		µg/L	1	9/23/2014	R21755
4-Chlorophenyl phenyl ether	ND	10		µg/L	1	9/23/2014	R21755
4-Nitroaniline	ND	10		µg/L	1	9/23/2014	R21755
4-Nitrophenol	ND	10		µg/L	1	9/23/2014	R21755
Acenaphthene	ND	10		µg/L	1	9/23/2014	R21755
Acenaphthylene	ND	10		µg/L	1	9/23/2014	R21755
Anthracene	ND	10		µg/L	1	9/23/2014	R21755
Benzo(g,h,i)perylene	ND	10		µg/L	1	9/23/2014	R21755
Benz(a)anthracene	ND	0.10		µg/L	1	9/23/2014	R21755
Benzo(a)pyrene	ND	0.10		µg/L	1	9/23/2014	R21755
Benzo(b)fluoranthene	ND	0.10		µg/L	1	9/23/2014	R21755
Benzo(k)fluoranthene	ND	0.10		µg/L	1	9/23/2014	R21755
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	9/23/2014	R21755
Bis(2-chloroethyl)ether	ND	10		µg/L	1	9/23/2014	R21755
Bis(2-chloroisopropyl)ether	ND	10		µg/L	1	9/23/2014	R21755
Bis(2-ethylhexyl)phthalate	ND	5.0		µg/L	1	9/23/2014	R21755
Butyl benzyl phthalate	ND	10		µg/L	1	9/23/2014	R21755
Carbazole	ND	10		µg/L	1	9/23/2014	R21755
Chrysene	ND	0.10		µg/L	1	9/23/2014	R21755
Dibenz(a,h)anthracene	ND	0.10		µg/L	1	9/23/2014	R21755
Dibenzofuran	ND	10		µg/L	1	9/23/2014	R21755

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1409594-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 9/11/2014 9:30:00 AM
Received Date: 9/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**
Diethyl phthalate	ND	10		µg/L	1	9/23/2014	R21755
Dimethyl phthalate	ND	10		µg/L	1	9/23/2014	R21755
Di-n-butyl phthalate	ND	10		µg/L	1	9/23/2014	R21755
Di-n-octyl phthalate	ND	10		µg/L	1	9/23/2014	R21755
Fluoranthene	ND	10		µg/L	1	9/23/2014	R21755
Fluorene	ND	10		µg/L	1	9/23/2014	R21755
Hexachlorobenzene	ND	1.0		µg/L	1	9/23/2014	R21755
Hexachlorobutadiene	ND	10		µg/L	1	9/23/2014	R21755
Hexachlorocyclopentadiene	ND	10		µg/L	1	9/23/2014	R21755
Hexachloroethane	ND	10		µg/L	1	9/23/2014	R21755
Indeno(1,2,3-cd)pyrene	ND	5.0		µg/L	1	9/23/2014	R21755
Isophorone	ND	10		µg/L	1	9/23/2014	R21755
Naphthalene	ND	10		µg/L	1	9/23/2014	R21755
Nitrobenzene	ND	10		µg/L	1	9/23/2014	R21755
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	9/23/2014	R21755
N-Nitrosodiphenylamine	ND	2.0		µg/L	1	9/23/2014	R21755
Pentachlorophenol	ND	10		µg/L	1	9/23/2014	R21755
Phenanthrene	ND	10		µg/L	1	9/23/2014	R21755
Phenol	ND	5.0		µg/L	1	9/23/2014	R21755
Pyrene	ND	10		µg/L	1	9/23/2014	R21755
o-Toluidine	ND	5.0		µg/L	1	9/23/2014	R21755
Pyridine	ND	5.0		µg/L	1	9/23/2014	R21755
1,2,4,5-Tetrachlorobenzene	ND	10		µg/L	1	9/23/2014	R21755
Surr: 2,4,6-Tribromophenol	80.2	10-123		%REC	1	9/23/2014	R21755
Surr: 2-Fluorobiphenyl	100	19-130		%REC	1	9/23/2014	R21755
Surr: 2-Fluorophenol	77.0	21-110		%REC	1	9/23/2014	R21755
Surr: Nitrobenzene-d5	91.2	25-130		%REC	1	9/23/2014	R21755
Surr: Phenol-d5	94.4	10-125		%REC	1	9/23/2014	R21755
Surr: Terphenyl-d14	39.9	33-141		%REC	1	9/23/2014	R21755
CORROSIVITY							Analyst: **SUB**
pH	6.61			pH Units	1	9/18/2014	R21755
IGNITABILITY METHOD 1010							Analyst: **SUB**
Ignitability	>200	0		°F	1	9/24/2014	R21755
CYANIDE, REACTIVE							Analyst: **SUB**
Cyanide, Reactive	ND	1.00		mg/L	1	9/25/2014	R21755
SULFIDE, REACTIVE							Analyst: **SUB**
Reactive Sulfide	ND	1.0		mg/L	1	9/30/2014	R21755

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1409594-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 9/11/2014 9:30:00 AM
Received Date: 9/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	5400	0.010		µmhos/cm	1	9/19/2014 8:48:13 PM	R21338
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	120	20		mg/L CaCO3	1	9/19/2014 8:48:13 PM	R21338
Carbonate (As CaCO3)	ND	2.0		mg/L CaCO3	1	9/19/2014 8:48:13 PM	R21338
Total Alkalinity (as CaCO3)	120	20		mg/L CaCO3	1	9/19/2014 8:48:13 PM	R21338
SPECIFIC GRAVITY						Analyst: **SRM**	
Specific Gravity	1.001	0			1	9/23/2014 4:39:00 PM	R21384
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	4700	20.0	*	mg/L	1	9/17/2014 10:23:00 AM	15289

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R21201**	RunNo: **21201**
Prep Date:	Analysis Date: **9/12/2014**	SeqNo: **617354** Units: **mg/L**

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

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R21201**	RunNo: **21201**
Prep Date:	Analysis Date: **9/12/2014**	SeqNo: **617355** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.52	0.10	0.5000	0	104	90	110			
Chloride	4.9	0.50	5.000	0	97.9	90	110			
Nitrogen, Nitrite (As N)	0.97	0.10	1.000	0	97.0	90	110			
Bromide	2.4	0.10	2.500	0	96.4	90	110			
Nitrogen, Nitrate (As N)	2.6	0.10	2.500	0	103	90	110			
Phosphorus, Orthophosphate (As P	5.0	0.50	5.000	0	101	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R21201**	RunNo: **21201**
Prep Date:	Analysis Date: **9/12/2014**	SeqNo: **617410** Units: **mg/L**

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

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R21201**	RunNo: **21201**
Prep Date:	Analysis Date: **9/12/2014**	SeqNo: **617411** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.52	0.10	0.5000	0	103	90	110			
Chloride	4.7	0.50	5.000	0	94.7	90	110			
Nitrogen, Nitrite (As N)	0.94	0.10	1.000	0	93.9	90	110			
Bromide	2.4	0.10	2.500	0	96.7	90	110			

Qualifiers:

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- O RSD is greater than RSDlimit
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- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R21201**	RunNo: **21201**
Prep Date:	Analysis Date: **9/12/2014**	SeqNo: **617411** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	99.1	90	110			
Phosphorus, Orthophosphate (As P	5.0	0.50	5.000	0	99.5	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R21321**	RunNo: **21321**
Prep Date:	Analysis Date: **9/18/2014**	SeqNo: **622134** Units: **mg/L**

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

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R21321**	RunNo: **21321**
Prep Date:	Analysis Date: **9/18/2014**	SeqNo: **622135** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.6	0.50	10.00	0	96.2	90	110			

Qualifiers:

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- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R21755**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R21755**	RunNo: **21755**
Prep Date:	Analysis Date: **9/24/2014**	SeqNo: **638768** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acetonitrile	ND	0.50								
Allyl chloride	ND	0.50								
Chloroprene	ND	0.50								
Cyclohexane	ND	0.50								
Diethyl ether	ND	0.50								
Diisopropyl ether	ND	0.50								
Epichlorohydrin	ND	0.50								
Ethyl acetate	ND	0.50								
Ethyl methacrylate	ND	0.50								
Ethyl tert-butyl ether	ND	0.50								
Freon-113	ND	0.50								
Isobutanol	ND	50								
Isopropyl acetate	ND	0.50								
Methacrylonitrile	ND	0.50								
Methyl acetate	ND	0.50								
Methyl ethyl ketone	ND	2.5								
Methyl isobutyl ketone	ND	2.5								
Methyl methacrylate	ND	0.50								
Methylcyclohexane	ND	1.0								
n-Amyl acetate	ND	0.50								
n-Hexane	ND	0.50								
Nitrobenzene	ND	0.50								
Pentachloroethane	ND	5.0								
p-isopropyltoluene	ND	0.50								
Propionitrile	ND	0.50								
Tetrahydrofuran	ND	0.50								
Benzene	ND	0.50								
Toluene	ND	0.50								
Ethylbenzene	ND	0.50								
Methyl tert-butyl ether (MTBE)	ND	10								
1,2,4-Trimethylbenzene	ND	0.50								
1,3,5-Trimethylbenzene	ND	0.50								
1,2-Dichloroethane (EDC)	ND	0.50								
1,2-Dibromoethane (EDB)	ND	0.50								
Naphthalene	ND	0.50								
Acetone	ND	2.5								
Bromobenzene	ND	0.50								
Bromodichloromethane	ND	0.50								
Bromoform	ND	0.50								

Qualifiers:

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- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1409594**

Hall Environmental Analysis Laboratory, Inc.

09-Oct-14

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R21755**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R21755**	RunNo: **21755**
Prep Date:	Analysis Date: **9/24/2014**	SeqNo: **638768** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Bromomethane	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon Tetrachloride	ND	0.50								
Chlorobenzene	ND	0.50								
Chloroethane	ND	0.50								
Chloroform	ND	0.50								
Chloromethane	ND	0.50								
2-Chlorotoluene	ND	0.50								
4-Chlorotoluene	ND	0.50								
cis-1,2-DCE	ND	0.50								
cis-1,3-Dichloropropene	ND	0.50								
1,2-Dibromo-3-chloropropane	ND	0.50								
Dibromochloromethane	ND	0.50								
Dibromomethane	ND	0.50								
1,2-Dichlorobenzene	ND	0.50								
1,3-Dichlorobenzene	ND	0.50								
1,4-Dichlorobenzene	ND	0.50								
Dichlorodifluoromethane	ND	0.50								
1,1-Dichloroethane	ND	0.50								
1,1-Dichloroethene	ND	0.50								
1,2-Dichloropropane	ND	0.50								
1,3-Dichloropropane	ND	0.50								
2,2-Dichloropropane	ND	0.50								
1,1-Dichloropropene	ND	0.50								
Hexachlorobutadiene	ND	0.50								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.50								
4-Isopropyltoluene	ND	0.50								
4-Methyl-2-pentanone	ND	0.50								
Methylene Chloride	ND	2.5								
n-Butylbenzene	ND	0.50								
n-Propylbenzene	ND	0.50								
sec-Butylbenzene	ND	0.50								
Styrene	ND	0.50								
tert-Butylbenzene	ND	0.50								
1,1,1,2-Tetrachloroethane	ND	0.50								
1,1,2,2-Tetrachloroethane	ND	0.50								
Tetrachloroethene (PCE)	ND	0.50								
trans-1,2-DCE	ND	0.50								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R21755**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R21755**	RunNo: **21755**
Prep Date:	Analysis Date: **9/24/2014**	SeqNo: **638768** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
trans-1,3-Dichloropropene	ND	0.50								
1,2,3-Trichlorobenzene	ND	0.50								
1,2,4-Trichlorobenzene	ND	0.50								
1,1,1-Trichloroethane	ND	0.50								
1,1,2-Trichloroethane	ND	0.50								
Trichloroethene (TCE)	ND	0.50								
Trichlorofluoromethane	ND	0.50								
1,2,3-Trichloropropane	ND	0.50								
Vinyl chloride	ND	0.50								
Xylenes, Total	ND	1.0								
mp-Xylenes	ND	1.0								
o-Xylene	ND	0.50								
tert-Amyl methyl ether	ND	0.50								
tert-Butyl alcohol	ND	0.50								
Acrolein	ND	0.50								
Acrylonitrile	ND	10								
Bromochloromethane	ND	0.50								
2-Chloroethyl vinyl ether	ND	0.50								
Iodomethane	ND	0.50								
trans-1,4-Dichloro-2-butene	ND	0.50								
Vinyl acetate	ND	0.50								
1,4-Dioxane	ND	20								

Sample ID **LCS-R21755**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R21755**	RunNo: **21755**
Prep Date:	Analysis Date: **9/24/2014**	SeqNo: **638769** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	9.9		10.00	0	99.2	80	120			
Toluene	10		10.00	0	102	80	120			
Ethylbenzene	10		10.00	0	99.6	80	120			
Chlorobenzene	9.9		10.00	0	99.3	80	120			
1,1-Dichloroethene	9.2		10.00	0	91.9	80	120			
Tetrachloroethene (PCE)	9.8		10.00	0	98.4	80	120			
Trichloroethene (TCE)	9.5		10.00	0	95.2	80	120			
o-Xylene	10		10.00	0	102	80	120			

Qualifiers:

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- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R21755**	SampType: **MBLK**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **PBW**	Batch ID: **R21755**	RunNo: **21755**
Prep Date:	Analysis Date: **9/23/2014**	SeqNo: **638842** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Biphenyl	ND	10								
Atrazine	ND	10								
Caprolactam	ND	10								
N-Nitroso-di-n-butylamine	ND	10								
Acetophenone	ND	10								
1-Methylnaphthalene	ND	10								
2,3,4,6-Tetrachlorophenol	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
2,4-Dichlorophenol	ND	10								
2,4-Dimethylphenol	ND	10								
2,4-Dinitrophenol	ND	10								
2,4-Dinitrotoluene	ND	10								
2,6-Dinitrotoluene	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
2-Methylnaphthalene	ND	10								
2-Methylphenol	ND	10								
2-Nitroaniline	ND	10								
2-Nitrophenol	ND	10								
3,3'-Dichlorobenzidine	ND	10								
3-Nitroaniline	ND	10								
4,6-Dinitro-2-methylphenol	ND	10								
4-Bromophenyl phenyl ether	ND	10								
4-Chloro-3-methylphenol	ND	5.0								
4-Chloroaniline	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
4-Nitroaniline	ND	10								
4-Nitrophenol	ND	10								
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Anthracene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Benz(a)anthracene	ND	0.10								
Benzo(a)pyrene	ND	0.10								
Benzo(b)fluoranthene	ND	0.10								
Benzo(k)fluoranthene	ND	0.10								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								

Qualifiers:

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- E Value above quantitation range
- J Analyte detected below quantitation limits
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- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
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- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R21755**	SampType: **MBLK**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **PBW**	Batch ID: **R21755**	RunNo: **21755**
Prep Date:	Analysis Date: **9/23/2014**	SeqNo: **638842** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	ND	5.0								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								
Chrysene	ND	0.10								
Dibenz(a,h)anthracene	ND	0.10								
Dibenzofuran	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Hexachlorobenzene	ND	1.0								
Hexachlorobutadiene	ND	10								
Hexachlorocyclopentadiene	ND	10								
Hexachloroethane	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
Isophorone	ND	10								
Naphthalene	ND	10								
Nitrobenzene	ND	10								
N-Nitrosodi-n-propylamine	ND	10								
N-Nitrosodiphenylamine	ND	2.0								
Pentachlorophenol	ND	10								
Phenanthrene	ND	1.0								
Phenol	ND	5.0								
Pyrene	ND	10								
o-Toluidine	ND	10								
Pyridine	ND	10								
1,2,4,5-Tetrachlorobenzene	ND	10								

Sample ID **LCS-R21755**	SampType: **LCS**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **LCSW**	Batch ID: **R21755**	RunNo: **21755**
Prep Date:	Analysis Date: **9/23/2014**	SeqNo: **638843** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	3.1		5.000	0	61.2	49	134			
2-Chlorophenol	3.4		5.000	0	67.6	50	131			
4-Chloro-3-methylphenol	3.3		5.000	0	66.4	42	139			

Qualifiers:

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- E Value above quantitation range
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- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **LCS-R21755**	SampType: **LCS**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **LCSW**	Batch ID: **R21755**	RunNo: **21755**
Prep Date:	Analysis Date: **9/23/2014**	SeqNo: **638843** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Nitrophenol	2.6		5.000	0	53.0	19	137			
Acenaphthene	4.0		5.000	0	79.6	36	122			
Bis(2-ethylhexyl)phthalate	3.9		5.000	0	78.2	43	142			
N-Nitrosodi-n-propylamine	4.1		5.000	0	82.0	46	135			
Pentachlorophenol	2.5		5.000	0	49.6	22	138			
Phenol	3.7		5.000	0	73.4	45	134			
Pyrene	3.6		5.000	0	73.0	45	138			

Qualifiers:

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- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**MB-15362**	SampType: **MBLK**			TestCode: **EPA Method 7470: Mercury**					
Client ID:	**PBW**	Batch ID: **15362**			RunNo: **21286**					
Prep Date:	**9/18/2014**	Analysis Date: **9/18/2014**			SeqNo: **621116**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID	**LCS-15362**	SampType: **LCS**			TestCode: **EPA Method 7470: Mercury**					
Client ID:	**LCSW**	Batch ID: **15362**			RunNo: **21286**					
Prep Date:	**9/18/2014**	Analysis Date: **9/18/2014**			SeqNo: **621117**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0053	0.00020	0.005000	0	105	80	120			

Sample ID	**1409594-001BMS**	SampType: **MS**			TestCode: **EPA Method 7470: Mercury**					
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID: **15362**			RunNo: **21286**					
Prep Date:	**9/18/2014**	Analysis Date: **9/18/2014**			SeqNo: **621119**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0050	0.00020	0.005000	0	100	75	125			

Sample ID	**1409594-001BMSD**	SampType: **MSD**			TestCode: **EPA Method 7470: Mercury**					
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID: **15362**			RunNo: **21286**					
Prep Date:	**9/18/2014**	Analysis Date: **9/18/2014**			SeqNo: **621120**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0050	0.00020	0.005000	0	101	75	125	0.392	20	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-15428**	SampType: **MBLK**	TestCode: **MERCURY, TCLP**
Client ID: **PBW**	Batch ID: **15428**	RunNo: **21367**
Prep Date: **9/22/2014**	Analysis Date: **9/23/2014**	SeqNo: **623963** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020								

Sample ID **LCS-15428**	SampType: **LCS**	TestCode: **MERCURY, TCLP**
Client ID: **LCSW**	Batch ID: **15428**	RunNo: **21367**
Prep Date: **9/22/2014**	Analysis Date: **9/23/2014**	SeqNo: **623964** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020	0.005000	0	98.4	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-15405**	SampType: **MBLK**	TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **PBW**	Batch ID: **15405**	RunNo: **21324**
Prep Date: **9/19/2014**	Analysis Date: **9/20/2014**	SeqNo: **626611** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0								
Barium	ND	100								
Cadmium	ND	1.0								
Chromium	ND	5.0								
Lead	ND	5.0								
Selenium	ND	1.0								

Sample ID **LCS-15405**	SampType: **LCS**	TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **LCSW**	Batch ID: **15405**	RunNo: **21324**
Prep Date: **9/19/2014**	Analysis Date: **9/20/2014**	SeqNo: **626612** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0	0.5000	0	106	80	120			
Barium	ND	100	0.5000	0	101	80	120			
Cadmium	ND	1.0	0.5000	0	102	80	120			
Chromium	ND	5.0	0.5000	0	100	80	120			
Lead	ND	5.0	0.5000	0	98.6	80	120			
Selenium	ND	1.0	0.5000	0	104	80	120			

Sample ID **MB-15405**	SampType: **MBLK**	TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **PBW**	Batch ID: **15405**	RunNo: **21385**
Prep Date: **9/19/2014**	Analysis Date: **9/23/2014**	SeqNo: **626633** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Silver	ND	5.0								

Sample ID **LCS-15405**	SampType: **LCS**	TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **LCSW**	Batch ID: **15405**	RunNo: **21385**
Prep Date: **9/19/2014**	Analysis Date: **9/23/2014**	SeqNo: **626634** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Silver	ND	5.0	0.1000	0	104	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-15405**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Metals**
Client ID: **PBW**	Batch ID: **15405**	RunNo: **21324**
Prep Date: **9/19/2014**	Analysis Date: **9/20/2014**	SeqNo: **622303** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Antimony	ND	0.050								
Arsenic	ND	0.020								
Barium	ND	0.020								
Beryllium	ND	0.0030								
Cadmium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Copper	ND	0.0060								
Iron	ND	0.050								
Lead	ND	0.0050								
Magnesium	ND	1.0								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Potassium	ND	1.0								
Selenium	ND	0.050								
Thallium	ND	0.050								
Titanium	ND	0.0050								
Silica	ND	1.1								

Sample ID **LCS-15405**	SampType: **LCS**	TestCode: **EPA 6010B: Total Metals**
Client ID: **LCSW**	Batch ID: **15405**	RunNo: **21324**
Prep Date: **9/19/2014**	Analysis Date: **9/20/2014**	SeqNo: **622304** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.57	0.020	0.5000	0	114	80	120			
Antimony	0.50	0.050	0.5000	0	100	80	120			
Arsenic	0.53	0.020	0.5000	0	106	80	120			
Barium	0.50	0.020	0.5000	0	101	80	120			
Beryllium	0.53	0.0030	0.5000	0	106	80	120			
Cadmium	0.51	0.0020	0.5000	0	102	80	120			
Calcium	52	1.0	50.00	0	105	80	120			
Chromium	0.50	0.0060	0.5000	0	100	80	120			
Cobalt	0.49	0.0060	0.5000	0	97.9	80	120			
Copper	0.51	0.0060	0.5000	0	102	80	120			
Iron	0.51	0.050	0.5000	0	101	80	120			
Lead	0.49	0.0050	0.5000	0	98.6	80	120			
Magnesium	52	1.0	50.00	0	103	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **LCS-15405**	SampType: **LCS**	TestCode: **EPA 6010B: Total Metals**
Client ID: **LCSW**	Batch ID: **15405**	RunNo: **21324**
Prep Date: **9/19/2014**	Analysis Date: **9/20/2014**	SeqNo: **622304** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.50	0.0020	0.5000	0	100	80	120			
Nickel	0.49	0.010	0.5000	0	98.7	80	120			
Potassium	49	1.0	50.00	0	98.1	80	120			
Selenium	0.52	0.050	0.5000	0	104	80	120			
Thallium	0.49	0.050	0.5000	0	97.7	80	120			
Titanium	0.52	0.0050	0.5000	0	104	80	120			
Silica	5.6	1.1	5.350	0	104	80	120			

Sample ID **MB-15405**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Metals**
Client ID: **PBW**	Batch ID: **15405**	RunNo: **21385**
Prep Date: **9/19/2014**	Analysis Date: **9/23/2014**	SeqNo: **624518** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Silver	ND	0.0050								

Sample ID **LCS-15405**	SampType: **LCS**	TestCode: **EPA 6010B: Total Metals**
Client ID: **LCSW**	Batch ID: **15405**	RunNo: **21385**
Prep Date: **9/19/2014**	Analysis Date: **9/23/2014**	SeqNo: **624519** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Silver	0.10	0.0050	0.1000	0	104	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R21755**	SampType: **MBLK**	TestCode: **CYANIDE, Reactive**
Client ID: **PBW**	Batch ID: **R21755**	RunNo: **21755**
Prep Date:	Analysis Date: **9/25/2014**	SeqNo: **639462** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide, Reactive	ND	1.00								

Sample ID **LCS-R21755**	SampType: **LCS**	TestCode: **CYANIDE, Reactive**
Client ID: **LCSW**	Batch ID: **R21755**	RunNo: **21755**
Prep Date:	Analysis Date: **9/25/2014**	SeqNo: **639463** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide, Reactive	0.487		0.5000	0	97.4	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R21755**	SampType: **MBLK**	TestCode: **SULFIDE, Reactive**
Client ID: **PBW**	Batch ID: **R21755**	RunNo: **21755**
Prep Date:	Analysis Date: **9/30/2014**	SeqNo: **639465** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Sulfide	ND	1.0								

Sample ID **LCS-R21755**	SampType: **LCS**	TestCode: **SULFIDE, Reactive**
Client ID: **LCSW**	Batch ID: **R21755**	RunNo: **21755**
Prep Date:	Analysis Date: **9/30/2014**	SeqNo: **639466** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Sulfide	0.16		0.2000	0	80.0	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **mb-1**	SampType: **MBLK**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R21338**	RunNo: **21338**							
Prep Date:	Analysis Date: **9/19/2014**	SeqNo: **622910**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID **lcs-1**	SampType: **LCS**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R21338**	RunNo: **21338**							
Prep Date:	Analysis Date: **9/19/2014**	SeqNo: **622911**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	80	20	80.00	0	99.6	90	110			

Sample ID **mb-2**	SampType: **MBLK**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R21338**	RunNo: **21338**							
Prep Date:	Analysis Date: **9/19/2014**	SeqNo: **622914**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID **lcs-2**	SampType: **LCS**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R21338**	RunNo: **21338**							
Prep Date:	Analysis Date: **9/19/2014**	SeqNo: **622915**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	81	20	80.00	0	102	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**1409594-001ADUP**	SampType:	**DUP**	TestCode:	**Specific Gravity**					
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID:	**R21384**	RunNo:	**21384**					
Prep Date:		Analysis Date:	**9/23/2014**	SeqNo:	**624495**	Units:				

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Specific Gravity	1.000	0						0.110	20	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1409594**

09-Oct-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-15289**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **15289**	RunNo: **21253**
Prep Date: **9/15/2014**	Analysis Date: **9/17/2014**	SeqNo: **619558** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID **LCS-15289**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **15289**	RunNo: **21253**
Prep Date: **9/15/2014**	Analysis Date: **9/17/2014**	SeqNo: **619559** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1020	20.0	1000	0	102	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: NAVAJO REFINING COM Work Order Number: 1409594 RcptNo: 1

Received by/date: 09/12/14

Logged By: **Lindsay Mangin** 9/12/2014 9:45:00 AM

Completed By: **Lindsay Mangin** 9/12/2014 10:09:46 AM

Reviewed By: 09/12/14

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: 2 (2) 2 (<2 or >12 unless noted)

Adjusted? no

Checked by: CS

Special Handling (if applicable)

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

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.3	Good	Yes			

Chain of Custody Record

Client: Navajo Refining Co.	☐ Standar ☐ Rush
	Project Name:
Mailing Address: P.O. Box 159 Artesia,	Quarterly WDW-1, 2, & 3 Inj Well
NM 88211-0159	Project #: P.O. # 167796
Phone #: 575-748-3311	
email or Fax#: 575-746-5451	Project Manager:
QA/QC Package: ☐ Standard ☐ Level 4 (Full Validation)	Dan Crawford
☐ Other ☐ EDD (Type)	Sampler: Steven URBAN
	On Ice: ☑ Yes ☐ No
	Sample Temperature: 5.3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1409526	Specific Gravity,HCO3, CO3, Cl, SO4, TDS, pH, cond.,Fl, Cation/anion bal., Br, Eh/40	VOCs/SW-846 Method 8260C (see attached list 'VOCs')	SVOCs/SW-846 Method 8270D (see attached list 'SVOCs')	R,C,I/40 CFR part 261	Metals/SW-846 Mthd 6010, 7470 (see attached list 'Metals')	Ca, K, Mg, Na/40 CFR 136.3	TCLP Metals, only /40 CFR Part 261/ SW-846 Method 1311
9/11/14	9:30	Liquid	WDW-1, 2, & 3 Effluent	3	Neat/H2SO4	-001	X						X
9/11/14	9:30	Liquid	WDW-1, 2, & 3 Effluent	1	HNO3	-001					X	X	
9/11/14	9:30	Liquid	WDW-1, 2, & 3 Effluent	3	HCL	-001		X					
9/11/14	9:30	Liquid	WDW-1, 2, & 3 Effluent	2	Neat	-001			X				
9/11/14	9:30	Liquid	WDW-1, 2, & 3 Effluent	2	Neat	-001				X			
~~9/11/14~~	~~9:30~~	Liquid	Trip Blank	2	Neat	-002	CS 09/12/14	X					
9/11/14	9:30	Liquid	Temperature Blank	1	Neat	-							

Date: 9-11-14	Time: 10:08	Relinquished by: Steven URBAN	Received by:	Date: 09/12/14	Time: 0945
Date:	Time:	Relinquished by:	Received by:	Date:	Time:

Remarks: Report these results separately from all other Chain of Custody kits provided.

The trip blank sample was not recieved.
-CS 09/12/14

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

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

Injection Well Quarterly Sample Details Attachment

HOLLYFRONTIER
The HollyFrontier Companies

Project Name	WDW-1,2, & 3 Qrtly Inj Well
Samplers Name	Steven Urban
Samplers Affiliation	Navajo Refining Co. LLC
Start Date and Time	9/11/2014 @ 9:15P
End Date and Time	9/11/2014 @ 10:08

Sample Type	
Grab	☑
Time Weighted Composite	☐
Flow Weighted Composite	☐

Parts / Sample Intervals	One

Physical Property	
Solid	☐
Liquid	☑
Sludge	☐

Type of Sampler	Directly to sample jars

Outfall / Sample Location: Waste water effluent pumps to injection wells.

☐ P-849 sample point (first from east)
☐ P-854 sample point (second from east)
☐ P-856 sample point (third from east)
☐ P-857 sample point (fourth from east)

Container	Size	Material	# of Containers	Preservatives: Neat (None)	HCL	HNO3	H2SO4	NaOH	Na2S2O3	NaHSO4	Other	Analysis and/or Method Requested
1			3	X			X					Specific Gravity,HCO3, CO3, Cl, SO4, TDS, pH, cond.,Fl, Cation/anion bal., Br, Eh/40 CFR 136.3
2			1			X						VOCs/SW-846 Method 8260C (see attached list 'VOCs')
3			3		X							SVOCs/SW-846 Method 8270D (see attached list 'SVOCs')
4			2	X								R,C,I/40 CFR part 261
5			2	X								Metals/SW-846 Mthd 6010, 7470 (see attached list 'Metals')
6			2	X								Ca, K, Mg, Na/40 CFR 136.3
7			1	X								TCLP Metals, only /40 CFR Part 261/ SW-846 Method 1311
8												
9												
10												

Field Data (Weather, Observations, Etc): 6/11/2014 08:51 Tmp. 72.0, Humidity 68%, Wind Dir. SE, Wind Speed 8.1 mph, Conditions Overcast

Date and Time:

Field Temp. 113°F Field pH 6.48

Storage Method	
Ice	☑
Refrigerated	☐
Other	☐

Shipping Media	
Ice	☑
Other	☐

HOLLYFRONTIER.

January 22, 2015

Mr. Carl Chavez, CHMM
NM Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr.
Santa Fe, NM 87505-5472

Certified Mail/Return Receipt
7014 1200 0000 1832 3280

RE: 2014 4th Quarter Injection Report for Wells WDW-1, WDW-2 and WDW-3, Navajo Refining Company, L.L.C.

Dear Mr. Chavez,

Enclosed, please find the fourth quarter 2014 sampling results for fluids injected into WDW-1, WDW-2 and WDW-3 and a spread sheet showing various volumes and pressures as required under Permit Condition 2.I.1, Quarterly Reports.

Over the fourth quarter, the average injection pressure for all three wells was 1345 psig and the average flows were 111 gpm for WDW-1, 113 gpm for WDW-2 and 128 gpm for WDW-3. There were no significant losses from the glycol expansion tanks Well Annulus Monitoring System (WAMS). The quarterly effluent analyses indicated parameters are within permit limits.

This report covers the period from October 1, 2014 to December 31, 2014. We have disposed a total of 1,088,093 barrels of fluid into the three wells during the fourth quarter of 2014. The volume per well is:

- 350,826 barrels into WDW-1
- 360,020 barrels into WDW-2
- 377,247 barrels into WDW-3

This report is signed and certified in accordance with WQCC section 5101.G. If there are any questions, please call me at 575-748-3311.

Respectfully,

Robert O'Brien
Vice-President & Refinery Manager
Navajo Refining Company, L.L.C.

Enc.

Electronic cc (w/enc.): R Combs, M Schultz, A Strange
Environmental File: Injection Wells/Reports C-115 & Quarterly/2014/4th quarter/2015-1-22 4th QTR Inj Rpt for Wells WDW-1,2,3

Navajo Refining Company, L.L.C.

2014 FOURTH QUARTER MONTHLY INJECTION PRESSURES, RATES, AND VOLUMES

	Average Pressure (psig)	Maximum Pressure (psig)	Minimum Pressure (psig)	Average Flow (gpm)	Maximum Flow (gpm)	Minimum Flow (gpm)	Average Annular Pressure Av (psig)	Maximum Annular Pressure Mx (psig)	Minimum Annular Pressure Mn (psig)	Average Volume (bpd)	Maximum Volume (bpd)	Minimum Volume (bpd)	Volume (barrels)	TOTAL CUMULATIVE Volume (barrels)
WDW-1													**Previous Quarter**	35,589,080
Oct-14	1,341	1,350	1,310	93	125	67	360	569	203	3,189	4,286	2,297	99,503	35,688,583
Nov-14	1,356	1,375	1,300	122	128	112	305	380	193	4,183	4,389	3,840	125,348	35,813,931
Dec-14	1,346	1,380	1,244	118	269	94	285	402	156	4,046	9,223	3,223	125,975	35,939,906
WDW-2													**Previous Quarter**	22,558,499
Oct-14	1,341	1,350	1,306	119	126	110	298	366	256	4,080	4,320	3,771	127,175	22,685,674
Nov-14	1,353	1,375	1,300	115	123	105	515	1,617	253	3,943	4,217	3,600	118,739	22,804,413
Dec-14	1,347	1,380	1,255	107	117	83	808	1,492	256	3,669	4,011	2,846	114,106	22,918,519
WDW-3													**Previous Quarter**	12,735,189
Oct-14	1,341	1,350	1,063	122	144	0	784	938	331	4,183	4,937	0	129,877	12,865,066
Nov-14	1,342	1,375	1,205	124	139	54	847	1,002	676	4,251	4,766	1,851	127,146	12,992,212
Dec-14	1,340	1,373	1,258	138	127	82	706	799	616	4,731	4,354	2,811	120,224	13,112,436
													Total Injected fluids:	71,970,861

T:\Injection Wells\Reports C-115 and Quarterly\2014\4th quarter\
4th 2014 qtrly rpt data
Injection fluids

1/15/20159:33 AM

Navajo Refining Company, L.L.C.

2014 FOURTH QUARTER WEEKLY WAMS LEVEL TABLE

	10/8/14	10/13/14	10/21/14	10/27/02	11/4/14	11/10/14	11/17/14	11/24/14	12/1/14	12/9/14	12/15/14	12/22/14	12/29/14	
WDW -1[1]	145	145	145	145	145	145	145	145	145	145	145	145	145	
WDW-2[1]	100	100	100	100	100	100	100	100	100	100	100	100	100	
WDW-3[1]	145	145	145	145	145	145	145	200	200	200	200	200	200	
				Comments:										

[1] Graduated tank gauged weekly in the field. Reading is in gallons.

WDW-1 is Mewbourne
WDW-2 is Chukka
WDW-3 is Gaines

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

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

December 09, 2014

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

RE: Quarterly WDW-1, 2, &3 Inj Well OrderNo.: 1411288

Dear Dan Crawford:

Hall Environmental Analysis Laboratory received 2 sample(s) on 11/7/2014 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued December 08, 2014

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

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

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Case Narrative

WO#: **1411288**
Date: **12/9/2014**

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

The following compounds were also scanned for by NIST library search and not detected. The detection level for these compounds would be ~10ppb:
Allyl alcohol
t-amyl ethyl ether
Bis(2-chloroethyl)sulfide
Bromoacetone
Chloral hydrate
1-chlorobutane
1-chlorohexane
2-chloroethanol
Crotonaldehyde
Cis-1,4-Dichloro-2butene
1,3-Dichloro-2-propanol
1,2,3,4-Depoxybutane
Ethanol
Ethylene oxide
Malonitrile
Methanol
Methyl acrylate
2-Nitropropane
Paraldehyde
Pentafluorobenzene
2-Pentanone
2-picoline
1-propanol
2-propanol
Propargyl alcohol
Beta-propiolactone
n-propylamine

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1411288-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 11/6/2014 10:30:00 AM
Received Date: 11/7/2014 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGP**	
Fluoride	5.3	0.50	*	mg/L	5	11/7/2014 11:52:12 PM	R22427
Chloride	330	25		mg/L	50	11/19/2014 12:14:33 AM	R22629
Nitrogen, Nitrite (As N)	ND	0.50		mg/L	5	11/7/2014 11:52:12 PM	R22427
Bromide	0.68	0.50		mg/L	5	11/7/2014 11:52:12 PM	R22427
Nitrogen, Nitrate (As N)	1.3	0.50		mg/L	5	11/7/2014 11:52:12 PM	R22427
Phosphorus, Orthophosphate (As P)	ND	2.5		mg/L	5	11/7/2014 11:52:12 PM	R22427
Sulfate	1300	25		mg/L	50	11/19/2014 12:14:33 AM	R22629
EPA METHOD 7470: MERCURY						Analyst: **MMD**	
Mercury	ND	0.00020		mg/L	1	11/13/2014 11:05:18 AM	16357
MERCURY, TCLP						Analyst: **MMD**	
Mercury	ND	0.020		mg/L	1	11/13/2014 2:54:22 PM	16358
EPA METHOD 6010B: TCLP METALS						Analyst: **ELS**	
Arsenic	ND	0.20		mg/L	1	11/12/2014 11:08:39 AM	16345
Barium	ND	0.10		mg/L	1	11/12/2014 11:08:39 AM	16345
Cadmium	ND	0.10		mg/L	1	11/12/2014 11:08:39 AM	16345
Chromium	ND	0.10		mg/L	1	11/12/2014 11:08:39 AM	16345
Lead	ND	0.10		mg/L	1	11/12/2014 11:08:39 AM	16345
Selenium	ND	0.20		mg/L	1	11/12/2014 11:08:39 AM	16345
Silver	ND	0.10		mg/L	1	11/12/2014 11:08:39 AM	16345
EPA 6010B: TOTAL METALS						Analyst: **ELS**	
Aluminum	0.48	0.020		mg/L	1	11/12/2014 11:06:42 AM	16345
Antimony	ND	0.050		mg/L	1	11/12/2014 11:06:42 AM	16345
Arsenic	0.050	0.020		mg/L	1	11/12/2014 11:06:42 AM	16345
Barium	ND	0.020		mg/L	1	11/12/2014 11:06:42 AM	16345
Beryllium	ND	0.0030		mg/L	1	11/12/2014 11:06:42 AM	16345
Cadmium	ND	0.0020		mg/L	1	11/12/2014 11:06:42 AM	16345
Calcium	50	1.0		mg/L	1	11/12/2014 11:06:42 AM	16345
Chromium	ND	0.0060		mg/L	1	11/12/2014 11:06:42 AM	16345
Cobalt	ND	0.0060		mg/L	1	11/12/2014 11:06:42 AM	16345
Copper	0.0092	0.0060		mg/L	1	11/12/2014 11:06:42 AM	16345
Iron	0.86	0.050		mg/L	1	11/12/2014 11:06:42 AM	16345
Lead	ND	0.0050		mg/L	1	11/12/2014 11:06:42 AM	16345
Magnesium	17	1.0		mg/L	1	11/12/2014 11:06:42 AM	16345
Manganese	0.10	0.0020		mg/L	1	11/12/2014 11:06:42 AM	16345
Nickel	0.010	0.010		mg/L	1	11/12/2014 11:06:42 AM	16345
Potassium	22	1.0		mg/L	1	11/12/2014 11:06:42 AM	16345
Selenium	0.058	0.050		mg/L	1	11/12/2014 11:06:42 AM	16345

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1411288-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 11/6/2014 10:30:00 AM
Received Date: 11/7/2014 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 6010B: TOTAL METALS						Analyst: **ELS**	
Silver	ND	0.0050		mg/L	1	11/12/2014 11:06:42 AM	16345
Sodium	ND	1.0		mg/L	1	11/12/2014 11:06:42 AM	16345
Thallium	ND	0.050		mg/L	1	11/12/2014 11:06:42 AM	16345
Vanadium	ND	0.050		mg/L	1	11/12/2014 11:06:42 AM	16345
Zinc	0.049	0.020		mg/L	1	11/12/2014 11:06:42 AM	16345
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
Acetonitrile	ND	0.500		µg/L	1	11/13/2014	R22819
Allyl chloride	ND	0.500		µg/L	1	11/13/2014	R22819
Chloroprene	ND	0.500		µg/L	1	11/13/2014	R22819
Cyclohexane	ND	0.500		µg/L	1	11/13/2014	R22819
Diethyl ether	ND	0.500		µg/L	1	11/13/2014	R22819
Diisopropyl ether	ND	0.500		µg/L	1	11/13/2014	R22819
Epichlorohydrin	ND	5.00		µg/L	1	11/13/2014	R22819
Ethyl acetate	ND	0.500		µg/L	1	11/13/2014	R22819
Ethyl methacrylate	ND	0.500		µg/L	1	11/13/2014	R22819
Ethyl tert-butyl ether	ND	0.500		µg/L	1	11/13/2014	R22819
Freon-113	ND	0.500		µg/L	1	11/13/2014	R22819
Isobutanol	ND	50.0		µg/L	1	11/13/2014	R22819
Isopropyl acetate	ND	0.500		µg/L	1	11/13/2014	R22819
Methacrylonitrile	ND	0.500		µg/L	1	11/13/2014	R22819
Methyl acetate	ND	0.500		µg/L	1	11/13/2014	R22819
Methyl ethyl ketone	2.82	2.50		µg/L	1	11/13/2014	R22819
Methyl isobutyl ketone	ND	2.50		µg/L	1	11/13/2014	R22819
Methyl methacrylate	ND	0.500		µg/L	1	11/13/2014	R22819
Methylcyclohexane	ND	1.00		µg/L	1	11/13/2014	R22819
n-Amyl acetate	ND	0.500		µg/L	1	11/13/2014	R22819
n-Hexane	ND	0.500		µg/L	1	11/13/2014	R22819
Nitrobenzene	ND	5.00		µg/L	1	11/13/2014	R22819
Pentachloroethane	ND	5.00		µg/L	1	11/13/2014	R22819
p-isopropyltoluene	ND	0.500		µg/L	1	11/13/2014	R22819
Propionitrile	ND	0.500		µg/L	1	11/13/2014	R22819
Tetrahydrofuran	ND	0.500		µg/L	1	11/13/2014	R22819
Benzene	ND	0.500		µg/L	1	11/13/2014	R22819
Toluene	ND	0.500		µg/L	1	11/13/2014	R22819
Ethylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
Methyl tert-butyl ether (MTBE)	ND	10.0		µg/L	1	11/13/2014	R22819
1,2,4-Trimethylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
1,3,5-Trimethylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
1,2-Dichloroethane (EDC)	ND	0.500		µg/L	1	11/13/2014	R22819

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1411288-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 11/6/2014 10:30:00 AM
Received Date: 11/7/2014 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
1,2-Dibromoethane (EDB)	ND	0.500		µg/L	1	11/13/2014	R22819
Naphthalene	ND	0.500		µg/L	1	11/13/2014	R22819
Acetone	47.2	2.50		µg/L	1	11/13/2014	R22819
Bromobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
Bromodichloromethane	ND	0.500		µg/L	1	11/13/2014	R22819
Bromoform	ND	0.500		µg/L	1	11/13/2014	R22819
Bromomethane	ND	0.500		µg/L	1	11/13/2014	R22819
Carbon disulfide	0.930	0.500		µg/L	1	11/13/2014	R22819
Carbon Tetrachloride	ND	0.500		µg/L	1	11/13/2014	R22819
Chlorobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
Chloroethane	ND	0.500		µg/L	1	11/13/2014	R22819
Chloroform	ND	0.500		µg/L	1	11/13/2014	R22819
Chloromethane	ND	0.500		µg/L	1	11/13/2014	R22819
2-Chlorotoluene	ND	0.500		µg/L	1	11/13/2014	R22819
4-Chlorotoluene	ND	0.500		µg/L	1	11/13/2014	R22819
cis-1,2-DCE	ND	0.500		µg/L	1	11/13/2014	R22819
cis-1,3-Dichloropropene	ND	0.500		µg/L	1	11/13/2014	R22819
1,2-Dibromo-3-chloropropane	ND	0.500		µg/L	1	11/13/2014	R22819
Dibromochloromethane	ND	0.500		µg/L	1	11/13/2014	R22819
Dibromomethane	ND	0.500		µg/L	1	11/13/2014	R22819
1,2-Dichlorobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
1,3-Dichlorobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
1,4-Dichlorobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
Dichlorodifluoromethane	ND	0.500		µg/L	1	11/13/2014	R22819
1,1-Dichloroethane	ND	0.500		µg/L	1	11/13/2014	R22819
1,1-Dichloroethene	ND	0.500		µg/L	1	11/13/2014	R22819
1,2-Dichloropropane	ND	0.500		µg/L	1	11/13/2014	R22819
1,3-Dichloropropane	ND	0.500		µg/L	1	11/13/2014	R22819
2,2-Dichloropropane	ND	0.500		µg/L	1	11/13/2014	R22819
1,1-Dichloropropene	ND	0.500		µg/L	1	11/13/2014	R22819
Hexachlorobutadiene	ND	0.500		µg/L	1	11/13/2014	R22819
2-Hexanone	ND	0.500		µg/L	1	11/13/2014	R22819
Isopropylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
Methylene Chloride	ND	2.50		µg/L	1	11/13/2014	R22819
n-Butylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
n-Propylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
sec-Butylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
Styrene	ND	0.500		µg/L	1	11/13/2014	R22819
tert-Butylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819

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Qualifiers:

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- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1411288-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 11/6/2014 10:30:00 AM
Received Date: 11/7/2014 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **SUB**
1,1,1,2-Tetrachloroethane	ND	0.500		µg/L	1	11/13/2014	R22819
1,1,2,2-Tetrachloroethane	ND	0.500		µg/L	1	11/13/2014	R22819
Tetrachloroethene (PCE)	ND	0.500		µg/L	1	11/13/2014	R22819
trans-1,2-DCE	ND	0.500		µg/L	1	11/13/2014	R22819
trans-1,3-Dichloropropene	ND	0.500		µg/L	1	11/13/2014	R22819
1,2,3-Trichlorobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
1,2,4-Trichlorobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
1,1,1-Trichloroethane	ND	0.500		µg/L	1	11/13/2014	R22819
1,1,2-Trichloroethane	ND	0.500		µg/L	1	11/13/2014	R22819
Trichloroethene (TCE)	ND	0.500		µg/L	1	11/13/2014	R22819
Trichlorofluoromethane	ND	0.500		µg/L	1	11/13/2014	R22819
1,2,3-Trichloropropane	ND	0.500		µg/L	1	11/13/2014	R22819
Vinyl chloride	ND	0.500		µg/L	1	11/13/2014	R22819
Xylenes, Total	ND	1.00		µg/L	1	11/13/2014	R22819
mp-Xylenes	ND	1.00		µg/L	1	11/13/2014	R22819
o-Xylene	ND	0.500		µg/L	1	11/13/2014	R22819
tert-Amyl methyl ether	ND	0.500		µg/L	1	11/13/2014	R22819
tert-Butyl alcohol	46.8	0.500		µg/L	1	11/13/2014	R22819
Acrolein	ND	0.500		µg/L	1	11/13/2014	R22819
Acrylonitrile	ND	10.0		µg/L	1	11/13/2014	R22819
Bromochloromethane	ND	0.500		µg/L	1	11/13/2014	R22819
2-Chloroethyl vinyl ether	ND	0.500		µg/L	1	11/13/2014	R22819
Iodomethane	ND	0.500		µg/L	1	11/13/2014	R22819
trans-1,4-Dichloro-2-butene	ND	0.500		µg/L	1	11/13/2014	R22819
Vinyl acetate	ND	0.500		µg/L	1	11/13/2014	R22819
1,4-Dioxane	ND	20.0		µg/L	1	11/13/2014	R22819
Surr: 1,2-Dichlorobenzene-d4	108	70-130		%REC	1	11/13/2014	R22819
Surr: 4-Bromofluorobenzene	101	70-130		%REC	1	11/13/2014	R22819
Surr: Toluene-d8	99.2	70-130		%REC	1	11/13/2014	R22819
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**
1,1-Biphenyl	ND	5.0		µg/L	1	11/14/2014	R22918
Atrazine	ND	5.0		µg/L	1	11/14/2014	R22918
Benzaldehyde	ND	5.0		µg/L	1	11/14/2014	R22918
Caprolactam	ND	5.0		µg/L	1	11/14/2014	R22918
N-Nitroso-di-n-butylamine	ND	5.0		µg/L	1	11/14/2014	R22918
Acetophenone	ND	10		µg/L	1	11/14/2014	R22918
1-Methylnaphthalene	ND	10		µg/L	1	11/14/2014	R22918
2,3,4,6-Tetrachlorophenol	ND	10		µg/L	1	11/14/2014	R22918
2,4,5-Trichlorophenol	ND	10		µg/L	1	11/14/2014	R22918

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Qualifiers:

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J	Analyte detected below quantitation limits
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R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
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ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2.
RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1411288-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 11/6/2014 10:30:00 AM
Received Date: 11/7/2014 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**
2,4,6-Trichlorophenol	ND	10		µg/L	1	11/14/2014	R22918
2,4-Dichlorophenol	ND	10		µg/L	1	11/14/2014	R22918
2,4-Dimethylphenol	ND	10		µg/L	1	11/14/2014	R22918
2,4-Dinitrophenol	ND	10		µg/L	1	11/14/2014	R22918
2,4-Dinitrotoluene	ND	10		µg/L	1	11/14/2014	R22918
2,6-Dinitrotoluene	ND	10		µg/L	1	11/14/2014	R22918
2-Chloronaphthalene	ND	10		µg/L	1	11/14/2014	R22918
2-Chlorophenol	ND	10		µg/L	1	11/14/2014	R22918
2-Methylnaphthalene	ND	10		µg/L	1	11/14/2014	R22918
2-Methylphenol	ND	10		µg/L	1	11/14/2014	R22918
2-Nitroaniline	ND	10		µg/L	1	11/14/2014	R22918
2-Nitrophenol	ND	10		µg/L	1	11/14/2014	R22918
3,3'-Dichlorobenzidine	ND	10		µg/L	1	11/14/2014	R22918
3-Nitroaniline	ND	10		µg/L	1	11/14/2014	R22918
4,6-Dinitro-2-methylphenol	ND	10		µg/L	1	11/14/2014	R22918
4-Bromophenyl phenyl ether	ND	10		µg/L	1	11/14/2014	R22918
4-Chloro-3-methylphenol	ND	5.0		µg/L	1	11/14/2014	R22918
4-Chloroaniline	ND	10		µg/L	1	11/14/2014	R22918
4-Chlorophenyl phenyl ether	ND	10		µg/L	1	11/14/2014	R22918
4-Nitroaniline	ND	10		µg/L	1	11/14/2014	R22918
4-Nitrophenol	ND	10		µg/L	1	11/14/2014	R22918
Acenaphthene	ND	10		µg/L	1	11/14/2014	R22918
Acenaphthylene	ND	10		µg/L	1	11/14/2014	R22918
Anthracene	ND	10		µg/L	1	11/14/2014	R22918
Benzo(g,h,i)perylene	ND	10		µg/L	1	11/14/2014	R22918
Benz(a)anthracene	ND	0.10		µg/L	1	11/14/2014	R22918
Benzo(a)pyrene	ND	0.10		µg/L	1	11/14/2014	R22918
Benzo(b)fluoranthene	ND	0.10		µg/L	1	11/14/2014	R22918
Benzo(k)fluoranthene	ND	0.10		µg/L	1	11/14/2014	R22918
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	11/14/2014	R22918
Bis(2-chloroethyl)ether	ND	10		µg/L	1	11/14/2014	R22918
Bis(2-chloroisopropyl)ether	ND	10		µg/L	1	11/14/2014	R22918
Bis(2-ethylhexyl)phthalate	ND	5.0		µg/L	1	11/14/2014	R22918
Butyl benzyl phthalate	ND	10		µg/L	1	11/14/2014	R22918
Carbazole	ND	10		µg/L	1	11/14/2014	R22918
Chrysene	ND	0.10		µg/L	1	11/14/2014	R22918
Dibenz(a,h)anthracene	ND	0.10		µg/L	1	11/14/2014	R22918
Dibenzofuran	ND	10		µg/L	1	11/14/2014	R22918
Diethyl phthalate	ND	10		µg/L	1	11/14/2014	R22918

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Qualifiers:

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E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1411288-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 11/6/2014 10:30:00 AM
Received Date: 11/7/2014 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**
Dimethyl phthalate	ND	10		µg/L	1	11/14/2014	R22918
Di-n-butyl phthalate	ND	10		µg/L	1	11/14/2014	R22918
Di-n-octyl phthalate	ND	10		µg/L	1	11/14/2014	R22918
Fluoranthene	ND	10		µg/L	1	11/14/2014	R22918
Fluorene	ND	10		µg/L	1	11/14/2014	R22918
Hexachlorobenzene	ND	1.0		µg/L	1	11/14/2014	R22918
Hexachlorobutadiene	ND	10		µg/L	1	11/14/2014	R22918
Hexachlorocyclopentadiene	ND	10		µg/L	1	11/14/2014	R22918
Hexachloroethane	ND	10		µg/L	1	11/14/2014	R22918
Indeno(1,2,3-cd)pyrene	ND	5.0		µg/L	1	11/14/2014	R22918
Isophorone	ND	10		µg/L	1	11/14/2014	R22918
Naphthalene	ND	10		µg/L	1	11/14/2014	R22918
Nitrobenzene	ND	10		µg/L	1	11/14/2014	R22918
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	11/14/2014	R22918
N-Nitrosodiphenylamine	ND	2.0		µg/L	1	11/14/2014	R22918
Pentachlorophenol	ND	10		µg/L	1	11/14/2014	R22918
Phenanthrene	ND	10		µg/L	1	11/14/2014	R22918
Phenol	ND	5.0		µg/L	1	11/14/2014	R22918
Pyrene	ND	10		µg/L	1	11/14/2014	R22918
o-Toluidine	ND	5.0		µg/L	1	11/14/2014	R22918
Pyridine	ND	5.0		µg/L	1	11/14/2014	R22918
1,2,4,5-Tetrachlorobenzene	ND	10		µg/L	1	11/14/2014	R22918
Surr: 2,4,6-Tribromophenol	131	10-123	S	%REC	1	11/14/2014	R22918
Surr: 2-Fluorobiphenyl	88.8	19-130		%REC	1	11/14/2014	R22918
Surr: 2-Fluorophenol	82.4	21-110		%REC	1	11/14/2014	R22918
Surr: Nitrobenzene-d5	86.4	25-130		%REC	1	11/14/2014	R22918
Surr: Phenol-d5	90.8	10-125		%REC	1	11/14/2014	R22918
Surr: Terphenyl-d14	35.6	33-141		%REC	1	11/14/2014	R22918
CORROSIVITY							Analyst: **SUB**
pH	7.51			pH Units	1	11/13/2014	R22918
IGNITABILITY METHOD 1010							Analyst: **SUB**
Ignitability	>200	0		°F	1	11/18/2014	R22918
CYANIDE, REACTIVE							Analyst: **SUB**
Cyanide, Reactive	ND	1.00		mg/L	1	11/18/2014	R22918
SULFIDE, REACTIVE							Analyst: **SUB**
Reactive Sulfide	ND	1.0		mg/L	1	11/21/2014	R22918
SM2510B: SPECIFIC CONDUCTANCE							Analyst: **JRR**

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Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well
Lab ID: 1411288-001 **Matrix:** AQUEOUS

Client Sample ID: WDW-1,2,&3 Effluent
Collection Date: 11/6/2014 10:30:00 AM
Received Date: 11/7/2014 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	3500	0.010		µmhos/cm	1	11/11/2014 1:35:05 PM	R22485
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	320	20		mg/L CaCO3	1	11/11/2014 1:35:05 PM	R22485
Carbonate (As CaCO3)	ND	2.0		mg/L CaCO3	1	11/11/2014 1:35:05 PM	R22485
Total Alkalinity (as CaCO3)	320	20		mg/L CaCO3	1	11/11/2014 1:35:05 PM	R22485
SPECIFIC GRAVITY						Analyst: **JRR**	
Specific Gravity	1.001	0			1	11/20/2014 2:11:00 PM	R22669
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	2380	100	*	mg/L	1	11/12/2014 1:18:00 PM	16340

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
E	Value above quantitation range
J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2.
RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Client Sample ID: TRIP BLANK
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date:
Lab ID: 1411288-002
Matrix: TRIP BLANK
Received Date: 11/7/2014 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
Acetonitrile	ND	0.500		µg/L	1	11/13/2014	R22819
Allyl chloride	ND	0.500		µg/L	1	11/13/2014	R22819
Chloroprene	ND	0.500		µg/L	1	11/13/2014	R22819
Cyclohexane	ND	0.500		µg/L	1	11/13/2014	R22819
Diethyl ether	ND	0.500		µg/L	1	11/13/2014	R22819
Diisopropyl ether	ND	0.500		µg/L	1	11/13/2014	R22819
Epichlorohydrin	ND	5.00		µg/L	1	11/13/2014	R22819
Ethyl acetate	ND	0.500		µg/L	1	11/13/2014	R22819
Ethyl methacrylate	ND	0.500		µg/L	1	11/13/2014	R22819
Ethyl tert-butyl ether	ND	0.500		µg/L	1	11/13/2014	R22819
Freon-113	ND	0.500		µg/L	1	11/13/2014	R22819
Isobutanol	ND	50.0		µg/L	1	11/13/2014	R22819
Isopropyl acetate	ND	0.500		µg/L	1	11/13/2014	R22819
Methacrylonitrile	ND	0.500		µg/L	1	11/13/2014	R22819
Methyl acetate	ND	0.500		µg/L	1	11/13/2014	R22819
Methyl ethyl ketone	ND	2.50		µg/L	1	11/13/2014	R22819
Methyl isobutyl ketone	ND	2.50		µg/L	1	11/13/2014	R22819
Methyl methacrylate	ND	0.500		µg/L	1	11/13/2014	R22819
Methylcyclohexane	ND	1.00		µg/L	1	11/13/2014	R22819
n-Amyl acetate	ND	0.500		µg/L	1	11/13/2014	R22819
n-Hexane	ND	0.500		µg/L	1	11/13/2014	R22819
Nitrobenzene	ND	5.00		µg/L	1	11/13/2014	R22819
Pentachloroethane	ND	5.00		µg/L	1	11/13/2014	R22819
p-isopropyltoluene	ND	0.500		µg/L	1	11/13/2014	R22819
Propionitrile	ND	0.500		µg/L	1	11/13/2014	R22819
Tetrahydrofuran	ND	0.500		µg/L	1	11/13/2014	R22819
Benzene	ND	0.500		µg/L	1	11/13/2014	R22819
Toluene	ND	0.500		µg/L	1	11/13/2014	R22819
Ethylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
Methyl tert-butyl ether (MTBE)	ND	10.0		µg/L	1	11/13/2014	R22819
1,2,4-Trimethylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
1,3,5-Trimethylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
1,2-Dichloroethane (EDC)	ND	0.500		µg/L	1	11/13/2014	R22819
1,2-Dibromoethane (EDB)	ND	0.500		µg/L	1	11/13/2014	R22819
Naphthalene	ND	0.500		µg/L	1	11/13/2014	R22819
Acetone	5.30	2.50		µg/L	1	11/13/2014	R22819
Bromobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
Bromodichloromethane	ND	0.500		µg/L	1	11/13/2014	R22819
Bromoform	ND	0.500		µg/L	1	11/13/2014	R22819

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Client Sample ID: TRIP BLANK
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date:
Lab ID: 1411288-002
Matrix: TRIP BLANK
Received Date: 11/7/2014 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
Bromomethane	ND	0.500		µg/L	1	11/13/2014	R22819
Carbon disulfide	ND	0.500		µg/L	1	11/13/2014	R22819
Carbon Tetrachloride	ND	0.500		µg/L	1	11/13/2014	R22819
Chlorobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
Chloroethane	ND	0.500		µg/L	1	11/13/2014	R22819
Chloroform	ND	0.500		µg/L	1	11/13/2014	R22819
Chloromethane	ND	0.500		µg/L	1	11/13/2014	R22819
2-Chlorotoluene	ND	0.500		µg/L	1	11/13/2014	R22819
4-Chlorotoluene	ND	0.500		µg/L	1	11/13/2014	R22819
cis-1,2-DCE	ND	0.500		µg/L	1	11/13/2014	R22819
cis-1,3-Dichloropropene	ND	0.500		µg/L	1	11/13/2014	R22819
1,2-Dibromo-3-chloropropane	ND	0.500		µg/L	1	11/13/2014	R22819
Dibromochloromethane	ND	0.500		µg/L	1	11/13/2014	R22819
Dibromomethane	ND	0.500		µg/L	1	11/13/2014	R22819
1,2-Dichlorobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
1,3-Dichlorobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
1,4-Dichlorobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
Dichlorodifluoromethane	ND	0.500		µg/L	1	11/13/2014	R22819
1,1-Dichloroethane	ND	0.500		µg/L	1	11/13/2014	R22819
1,1-Dichloroethene	ND	0.500		µg/L	1	11/13/2014	R22819
1,2-Dichloropropane	ND	0.500		µg/L	1	11/13/2014	R22819
1,3-Dichloropropane	ND	0.500		µg/L	1	11/13/2014	R22819
2,2-Dichloropropane	ND	0.500		µg/L	1	11/13/2014	R22819
1,1-Dichloropropene	ND	0.500		µg/L	1	11/13/2014	R22819
Hexachlorobutadiene	ND	0.500		µg/L	1	11/13/2014	R22819
2-Hexanone	ND	0.500		µg/L	1	11/13/2014	R22819
Isopropylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
Methylene Chloride	ND	2.50		µg/L	1	11/13/2014	R22819
n-Butylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
n-Propylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
sec-Butylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
Styrene	ND	0.500		µg/L	1	11/13/2014	R22819
tert-Butylbenzene	ND	0.500		µg/L	1	11/13/2014	R22819
1,1,1,2-Tetrachloroethane	ND	0.500		µg/L	1	11/13/2014	R22819
1,1,2,2-Tetrachloroethane	ND	0.500		µg/L	1	11/13/2014	R22819
Tetrachloroethene (PCE)	ND	0.500		µg/L	1	11/13/2014	R22819
trans-1,2-DCE	ND	0.500		µg/L	1	11/13/2014	R22819
trans-1,3-Dichloropropene	ND	0.500		µg/L	1	11/13/2014	R22819
1,2,3-Trichlorobenzene	ND	0.500		µg/L	1	11/13/2014	R22819

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

Qualifiers:

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- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Client Sample ID: TRIP BLANK
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date:
Lab ID: 1411288-002
Matrix: TRIP BLANK
Received Date: 11/7/2014 9:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
1,2,4-Trichlorobenzene	ND	0.500		µg/L	1	11/13/2014	R22819
1,1,1-Trichloroethane	ND	0.500		µg/L	1	11/13/2014	R22819
1,1,2-Trichloroethane	ND	0.500		µg/L	1	11/13/2014	R22819
Trichloroethene (TCE)	ND	0.500		µg/L	1	11/13/2014	R22819
Trichlorofluoromethane	ND	0.500		µg/L	1	11/13/2014	R22819
1,2,3-Trichloropropane	ND	0.500		µg/L	1	11/13/2014	R22819
Vinyl chloride	ND	0.500		µg/L	1	11/13/2014	R22819
Xylenes, Total	ND	1.00		µg/L	1	11/13/2014	R22819
mp-Xylenes	ND	1.00		µg/L	1	11/13/2014	R22819
o-Xylene	ND	0.500		µg/L	1	11/13/2014	R22819
tert-Amyl methyl ether	ND	0.500		µg/L	1	11/13/2014	R22819
tert-Butyl alcohol	ND	0.500		µg/L	1	11/13/2014	R22819
Acrolein	ND	0.500		µg/L	1	11/13/2014	R22819
Acrylonitrile	ND	10.0		µg/L	1	11/13/2014	R22819
Bromochloromethane	ND	0.500		µg/L	1	11/13/2014	R22819
2-Chloroethyl vinyl ether	ND	0.500		µg/L	1	11/13/2014	R22819
Iodomethane	ND	0.500		µg/L	1	11/13/2014	R22819
trans-1,4-Dichloro-2-butene	ND	0.500		µg/L	1	11/13/2014	R22819
Vinyl acetate	ND	0.500		µg/L	1	11/13/2014	R22819
1,4-Dioxane	ND	20.0		µg/L	1	11/13/2014	R22819
Surr: 1,2-Dichlorobenzene-d4	102	70-130		%REC	1	11/13/2014	R22819
Surr: 4-Bromofluorobenzene	94.4	70-130		%REC	1	11/13/2014	R22819
Surr: Toluene-d8	96.4	70-130		%REC	1	11/13/2014	R22819

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Qualifiers:

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E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R22427**	RunNo: **22427**
Prep Date:	Analysis Date: **11/7/2014**	SeqNo: **661019** Units: **mg/L**

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

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R22427**	RunNo: **22427**
Prep Date:	Analysis Date: **11/7/2014**	SeqNo: **661020** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.47	0.10	0.5000	0	93.8	66.6	112			
Nitrogen, Nitrite (As N)	0.90	0.10	1.000	0	90.2	67.5	109			
Bromide	2.3	0.10	2.500	0	92.8	82.8	103			
Nitrogen, Nitrate (As N)	2.3	0.10	2.500	0	93.3	84	109			
Phosphorus, Orthophosphate (As P	4.6	0.50	5.000	0	91.7	68.8	109			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R22427**	RunNo: **22427**
Prep Date:	Analysis Date: **11/7/2014**	SeqNo: **661041** Units: **mg/L**

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

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R22427**	RunNo: **22427**
Prep Date:	Analysis Date: **11/7/2014**	SeqNo: **661042** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.48	0.10	0.5000	0	96.6	66.6	112			
Nitrogen, Nitrite (As N)	0.94	0.10	1.000	0	94.0	67.5	109			
Bromide	2.4	0.10	2.500	0	96.4	82.8	103			
Nitrogen, Nitrate (As N)	2.4	0.10	2.500	0	97.1	84	109			
Phosphorus, Orthophosphate (As P	4.7	0.50	5.000	0	94.8	68.8	109			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R22629**	RunNo: **22629**
Prep Date:	Analysis Date: **11/18/2014**	SeqNo: **667493** Units: **mg/L**

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

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R22629**	RunNo: **22629**
Prep Date:	Analysis Date: **11/18/2014**	SeqNo: **667494** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.6	0.50	5.000	0	91.7	90	110			
Sulfate	9.5	0.50	10.00	0	95.2	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R22819**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R22819**	RunNo: **22819**
Prep Date:	Analysis Date: **11/13/2014**	SeqNo: **673562** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acetonitrile	ND	0.500								
Allyl chloride	ND	0.500								
Chloroprene	ND	0.500								
Cyclohexane	ND	0.500								
Diethyl ether	ND	0.500								
Diisopropyl ether	ND	0.500								
Epichlorohydrin	ND	0.500								
Ethyl acetate	ND	0.500								
Ethyl methacrylate	ND	0.500								
Ethyl tert-butyl ether	ND	0.500								
Freon-113	ND	0.500								
Isobutanol	ND	0.500								
Isopropyl acetate	ND	0.500								
Methacrylonitrile	ND	0.500								
Methyl acetate	ND	0.500								
Methyl ethyl ketone	ND	2.50								
Methyl isobutyl ketone	ND	2.50								
Methyl methacrylate	ND	0.500								
Methylcyclohexane	ND	0.500								
n-Amyl acetate	ND	0.500								
n-Hexane	ND	0.500								
Nitrobenzene	ND	0.500								
Pentachloroethane	ND	0.500								
p-isopropyltoluene	ND	0.500								
Propionitrile	ND	0.500								
Tetrahydrofuran	ND	0.500								
Benzene	ND	0.500								
Toluene	ND	0.500								
Ethylbenzene	ND	0.500								
Methyl tert-butyl ether (MTBE)	ND	0.500								
1,2,4-Trimethylbenzene	ND	0.500								
1,3,5-Trimethylbenzene	ND	0.500								
1,2-Dichloroethane (EDC)	ND	0.500								
1,2-Dibromoethane (EDB)	ND	0.500								
Naphthalene	ND	0.500								
Acetone	ND	2.50								
Bromobenzene	ND	0.500								
Bromodichloromethane	ND	0.500								
Bromoform	ND	0.500								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R22819**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R22819**	RunNo: **22819**
Prep Date:	Analysis Date: **11/13/2014**	SeqNo: **673562** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Bromomethane	ND	0.500								
Carbon disulfide	ND	0.500								
Carbon Tetrachloride	ND	0.500								
Chlorobenzene	ND	0.500								
Chloroethane	ND	0.500								
Chloroform	ND	0.500								
Chloromethane	ND	0.500								
2-Chlorotoluene	ND	0.500								
4-Chlorotoluene	ND	0.500								
cis-1,2-DCE	ND	0.500								
cis-1,3-Dichloropropene	ND	0.500								
1,2-Dibromo-3-chloropropane	ND	0.500								
Dibromochloromethane	ND	0.500								
Dibromomethane	ND	0.500								
1,2-Dichlorobenzene	ND	0.500								
1,3-Dichlorobenzene	ND	0.500								
1,4-Dichlorobenzene	ND	0.500								
Dichlorodifluoromethane	ND	0.500								
1,1-Dichloroethane	ND	0.500								
1,1-Dichloroethene	ND	0.500								
1,2-Dichloropropane	ND	0.500								
1,3-Dichloropropane	ND	0.500								
2,2-Dichloropropane	ND	0.500								
1,1-Dichloropropene	ND	0.500								
Hexachlorobutadiene	ND	0.500								
2-Hexanone	ND	0.500								
Isopropylbenzene	ND	0.500								
Methylene Chloride	ND	2.50								
n-Butylbenzene	ND	0.500								
n-Propylbenzene	ND	0.500								
sec-Butylbenzene	ND	0.500								
Styrene	ND	0.500								
tert-Butylbenzene	ND	0.500								
1,1,1,2-Tetrachloroethane	ND	0.500								
1,1,2,2-Tetrachloroethane	ND	0.500								
Tetrachloroethene (PCE)	ND	0.500								
trans-1,2-DCE	ND	0.500								
trans-1,3-Dichloropropene	ND	0.500								
1,2,3-Trichlorobenzene	ND	0.500								

Qualifiers:

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- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R22819**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R22819**	RunNo: **22819**
Prep Date:	Analysis Date: **11/13/2014**	SeqNo: **673562** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	ND	0.500								
1,1,1-Trichloroethane	ND	0.500								
1,1,2-Trichloroethane	ND	0.500								
Trichloroethene (TCE)	ND	0.500								
Trichlorofluoromethane	ND	0.500								
1,2,3-Trichloropropane	ND	0.500								
Vinyl chloride	ND	0.500								
Xylenes, Total	ND	1.00								
mp-Xylenes	ND	1.00								
o-Xylene	ND	0.500								
tert-Amyl methyl ether	ND	0.500								
tert-Butyl alcohol	ND	0.500								
Acrolein	ND	0.500								
Acrylonitrile	ND	0.500								
Bromochloromethane	ND	0.500								
2-Chloroethyl vinyl ether	ND	0.500								
Iodomethane	ND	0.500								
trans-1,4-Dichloro-2-butene	ND	0.500								
Vinyl acetate	ND	0.500								
1,4-Dioxane	ND	0.500								
Surr: 1,2-Dichloroethane-d4	0		10.00		0	70	130			S
Surr: 4-Bromofluorobenzene	0		10.00		0	70	130			S
Surr: Toluene-d8	0		10.00		0	70	130			S

Sample ID **LCS-R22819**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R22819**	RunNo: **22819**
Prep Date:	Analysis Date: **11/13/2014**	SeqNo: **673563** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	9.77		10.00	0	97.7	80	120			
Toluene	10.0		10.00	0	100	80	120			
Ethylbenzene	10.0		10.00	0	100	80	120			
Chlorobenzene	9.99		10.00	0	99.9	80	120			
1,1-Dichloroethene	9.57		10.00	0	95.7	80	120			
Trichloroethene (TCE)	9.91		10.00	0	99.1	80	120			
o-Xylene	10.6		10.00	0	106	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R22918**	SampType: **MBLK**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **PBW**	Batch ID: **R22918**	RunNo: **22918**
Prep Date:	Analysis Date: **11/14/2014**	SeqNo: **676667** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acetophenone	ND	10								
1-Methylnaphthalene	ND	10								
2,3,4,6-Tetrachlorophenol	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
2,4-Dichlorophenol	ND	10								
2,4-Dimethylphenol	ND	10								
2,4-Dinitrophenol	ND	10								
2,4-Dinitrotoluene	ND	10								
2,6-Dinitrotoluene	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
2-Methylnaphthalene	ND	10								
2-Methylphenol	ND	10								
2-Nitroaniline	ND	10								
2-Nitrophenol	ND	10								
3,3'-Dichlorobenzidine	ND	10								
3-Nitroaniline	ND	10								
4,6-Dinitro-2-methylphenol	ND	10								
4-Bromophenyl phenyl ether	ND	10								
4-Chloro-3-methylphenol	ND	5.0								
4-Chloroaniline	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
4-Nitroaniline	ND	10								
4-Nitrophenol	ND	10								
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Anthracene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Benz(a)anthracene	ND	0.10								
Benzo(a)pyrene	ND	0.10								
Benzo(b)fluoranthene	ND	0.10								
Benzo(k)fluoranthene	ND	0.10								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	ND	5.0								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								

Qualifiers:

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- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R22918**	SampType: **MBLK**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **PBW**	Batch ID: **R22918**	RunNo: **22918**
Prep Date:	Analysis Date: **11/14/2014**	SeqNo: **676667** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chrysene	ND	0.10								
Dibenz(a,h)anthracene	ND	0.10								
Dibenzofuran	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Hexachlorobenzene	ND	1.0								
Hexachlorobutadiene	ND	10								
Hexachlorocyclopentadiene	ND	10								
Hexachloroethane	ND	10								
Isophorone	ND	10								
Naphthalene	ND	10								
Nitrobenzene	ND	10								
N-Nitrosodi-n-propylamine	ND	10								
N-Nitrosodiphenylamine	ND	2.0								
Pentachlorophenol	ND	10								
Phenanthrene	ND	1.0								
Phenol	ND	5.0								
Pyrene	ND	10								
1,2,4,5-Tetrachlorobenzene	ND	10								

Sample ID **LCS-R22918**	SampType: **LCS**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **LCSW**	Batch ID: **R22918**	RunNo: **22918**
Prep Date:	Analysis Date: **11/14/2014**	SeqNo: **676668** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	5.4		5.000	0	108	49	134			
2-Chlorophenol	4.8		5.000	0	96.4	50	131			
4-Chloro-3-methylphenol	5.8		5.000	0	115	42	139			
4-Nitrophenol	3.9		5.000	0	78.4	19	137			
Acenaphthene	5.3		5.000	0	105	36	122			
Bis(2-ethylhexyl)phthalate	6.0		5.000	0	120	43	142			
N-Nitrosodi-n-propylamine	5.1		5.000	0	102	46	135			
Pentachlorophenol	4.8		5.000	0	95.2	22	138			
Phenol	4.4		5.000	0	88.0	45	134			
Pyrene	5.9		5.000	0	117	45	138			

Qualifiers:

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- E Value above quantitation range
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- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-16357**	SampType: **MBLK**	TestCode: **EPA Method 7470: Mercury**
Client ID: **PBW**	Batch ID: **16357**	RunNo: **22512**
Prep Date: **11/12/2014**	Analysis Date: **11/13/2014**	SeqNo: **664165** Units: **mg/L**

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

Sample ID **LCS-16357**	SampType: **LCS**	TestCode: **EPA Method 7470: Mercury**
Client ID: **LCSW**	Batch ID: **16357**	RunNo: **22512**
Prep Date: **11/12/2014**	Analysis Date: **11/13/2014**	SeqNo: **664166** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.5	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
E	Value above quantitation range
J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2.
RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-16358**	SampType: **MBLK**	TestCode: **MERCURY, TCLP**
Client ID: **PBW**	Batch ID: **16358**	RunNo: **22521**
Prep Date: **11/12/2014**	Analysis Date: **11/13/2014**	SeqNo: **664178** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020								

Sample ID **LCS-16358**	SampType: **LCS**	TestCode: **MERCURY, TCLP**
Client ID: **LCSW**	Batch ID: **16358**	RunNo: **22521**
Prep Date: **11/12/2014**	Analysis Date: **11/13/2014**	SeqNo: **664179** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020	0.005000	0	97.5	80	120			

Qualifiers:

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- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-16345**	SampType: **MBLK**	TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **PBW**	Batch ID: **16345**	RunNo: **22489**
Prep Date: **11/11/2014**	Analysis Date: **11/12/2014**	SeqNo: **663247** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0								
Barium	ND	100								
Cadmium	ND	1.0								
Chromium	ND	5.0								
Lead	ND	5.0								
Selenium	ND	1.0								
Silver	ND	5.0								

Sample ID **LCS-16345**	SampType: **LCS**	TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **LCSW**	Batch ID: **16345**	RunNo: **22489**
Prep Date: **11/11/2014**	Analysis Date: **11/12/2014**	SeqNo: **663248** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0	0.5000	0	103	80	120			
Barium	ND	100	0.5000	0	98.9	80	120			
Cadmium	ND	1.0	0.5000	0	99.2	80	120			
Chromium	ND	5.0	0.5000	0	98.1	80	120			
Lead	ND	5.0	0.5000	0	95.2	80	120			
Selenium	ND	1.0	0.5000	0	97.9	80	120			
Silver	ND	5.0	0.1000	0	99.9	80	120			

Qualifiers:

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- E Value above quantitation range
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- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-16345**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Metals**
Client ID: **PBW**	Batch ID: **16345**	RunNo: **22489**
Prep Date: **11/11/2014**	Analysis Date: **11/12/2014**	SeqNo: **663203** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Antimony	ND	0.050								
Arsenic	ND	0.020								
Barium	ND	0.020								
Beryllium	ND	0.0030								
Cadmium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Copper	ND	0.0060								
Iron	ND	0.050								
Lead	ND	0.0050								
Magnesium	ND	1.0								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Potassium	ND	1.0								
Selenium	ND	0.050								
Silver	ND	0.0050								
Thallium	ND	0.050								
Vanadium	ND	0.050								
Zinc	ND	0.020								

Sample ID **LCS-16345**	SampType: **LCS**	TestCode: **EPA 6010B: Total Metals**
Client ID: **LCSW**	Batch ID: **16345**	RunNo: **22489**
Prep Date: **11/11/2014**	Analysis Date: **11/12/2014**	SeqNo: **663204** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.51	0.020	0.5000	0	103	80	120			
Antimony	0.50	0.050	0.5000	0	99.3	80	120			
Arsenic	0.52	0.020	0.5000	0	103	80	120			
Barium	0.49	0.020	0.5000	0	98.9	80	120			
Beryllium	0.52	0.0030	0.5000	0	104	80	120			
Cadmium	0.50	0.0020	0.5000	0	99.2	80	120			
Calcium	51	1.0	50.00	0	102	80	120			
Chromium	0.49	0.0060	0.5000	0	98.1	80	120			
Cobalt	0.48	0.0060	0.5000	0	95.9	80	120			
Copper	0.50	0.0060	0.5000	0	100	80	120			
Iron	0.49	0.050	0.5000	0	98.8	80	120			
Lead	0.48	0.0050	0.5000	0	95.2	80	120			

Qualifiers:

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- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **LCS-16345**	SampType: **LCS**	TestCode: **EPA 6010B: Total Metals**
Client ID: **LCSW**	Batch ID: **16345**	RunNo: **22489**
Prep Date: **11/11/2014**	Analysis Date: **11/12/2014**	SeqNo: **663204** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	50	1.0	50.00	0	100	80	120			
Manganese	0.49	0.0020	0.5000	0	97.2	80	120			
Nickel	0.48	0.010	0.5000	0	95.5	80	120			
Potassium	47	1.0	50.00	0	94.6	80	120			
Selenium	0.49	0.050	0.5000	0	97.9	80	120			
Silver	0.10	0.0050	0.1000	0	99.9	80	120			
Thallium	0.48	0.050	0.5000	0	96.1	80	120			
Vanadium	0.52	0.050	0.5000	0	104	80	120			
Zinc	0.49	0.020	0.5000	0	98.0	80	120			

Qualifiers:

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- E Value above quantitation range
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- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R22918**	SampType: **MBLK**	TestCode: **CYANIDE, Reactive**
Client ID: **PBW**	Batch ID: **R22918**	RunNo: **22918**
Prep Date:	Analysis Date: **11/18/2014**	SeqNo: **677093** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide, Reactive	ND	1.00								

Sample ID **LCS-R22918**	SampType: **LCS**	TestCode: **CYANIDE, Reactive**
Client ID: **LCSW**	Batch ID: **R22918**	RunNo: **22918**
Prep Date:	Analysis Date: **11/18/2014**	SeqNo: **677094** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide, Reactive	0.532		0.5000	0	106	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R22918**	SampType: **MBLK**	TestCode: **SULFIDE, Reactive**
Client ID: **PBW**	Batch ID: **R22918**	RunNo: **22918**
Prep Date:	Analysis Date: **11/21/2014**	SeqNo: **677096** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Sulfide	ND	1.0								

Sample ID **LCS-R22918**	SampType: **LCS**	TestCode: **SULFIDE, Reactive**
Client ID: **LCSW**	Batch ID: **R22918**	RunNo: **22918**
Prep Date:	Analysis Date: **11/21/2014**	SeqNo: **677097** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Sulfide	0.18		0.2000	0	90.0	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1411288**

09-Dec-14

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **mb-1**	SampType: **MBLK**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R22485**	RunNo: **22485**							
Prep Date:	Analysis Date: **11/11/2014**	SeqNo: **663098**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID **lcs-1**	SampType: **LCS**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R22485**	RunNo: **22485**							
Prep Date:	Analysis Date: **11/11/2014**	SeqNo: **663099**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	79	20	80.00	0	99.3	90	110			

Sample ID **mb-2**	SampType: **MBLK**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R22485**	RunNo: **22485**							
Prep Date:	Analysis Date: **11/11/2014**	SeqNo: **663121**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID **lcs-2**	SampType: **LCS**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R22485**	RunNo: **22485**							
Prep Date:	Analysis Date: **11/11/2014**	SeqNo: **663122**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	80	20	80.00	0	99.5	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit