AP - 111

SMW-2 AREA BOUNDARY WELL INSTALLATION REPORT

Marathon Petroleum Company LP

September 25, 2019

Mr. John E. Kieling, Chief
New Mexico Environmental Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 87505-6303

RE: Response to Disapproval
SMW-2 Area and Boundary Well Installation Report
Marathon Petroleum Company LP, Gallup Refinery
(dba Western Refining Southwest, Inc.)
EPA ID# NMD000333211
HWB-WRG-19-008

Dear Mr. Kieling:

Marathon Petroleum Company LP (dba Western Refining Southwest, Inc.) Gallup Refinery is submitting the enclosed responses to your comments dated May 21, 2019 on the referenced Report. The Report has been revised per your comments and enclosed for your review. If there are any questions, please call Brian Moore at 505-726-9745.

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,
Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks

Robert S. Hanks
Refinery General Manager

Enclosure

cc K. Van Horn NMED
C. Chavez NMOCD
B. Moore Marathon Gallup Refinery

RESPONSE TO COMMENTS
May 21, 2019 Disapproval – SMW-2 Area and Boundary Well Installation Report
(April 2019)

NMED Comment 1:
The cover letter states, " [t]his report was prepared in response to New Mexico Environmental Department (NMED) comments in the 2013 and 2014 Annual Facility-Wide Ground Water Monitoring Reports." More accurately, the Report was submitted based on the Permittee's Investigation Work Plan and NMED's comments. No response is necessary.

MPC Response 1:
Acknowledged.

NMED Comment 2:
The Executive Summary, page E-i, states, "[t]he sample was very turbid and dissolved metals analyses were not performed." A turbid groundwater sample should have been filtered to remove excessive suspended solids. Turbidity in groundwater should not prevent collection of groundwater samples for dissolved metals analysis. Provide a more detailed explanation in a response letter.

MPC Response 2:
Well BW-4B was developed on June 27, 2017 at approximately 1330. The predevelopment depth to water was 30.92 ft btoc. Approximately 12 gallons of turbid water were removed from the well before the well dried up. The depth to water post-development was 63.88 ftbtoc. On June, 28, 2017 the sampler mobbed back to BW-4B at 1000. The depth to water was 51.65 ft btoc. The well had not fully recovered. The sampler collected a water sample for water quality parameters. The sampler then collected enough water to fill up 5 voa vials (VOCs), one 250-ml amber (TPH), and one 1-liter amber (SVOCs) per the sampling order required during groundwater sampling. At that point, the groundwater had become too turbid to collect a filtered sample. The water was so turbid that when the syringe was filled and evacuated thru the filter into the sample container only about 5 drops of water were yielded into the sample container before the filter became unusable. The water that was yielded into the container was not clear and was obviously not being filtered properly due to the turbidity. It would take a minimum of forty filters to collect that one sample of questionable quality. The sampler chose not to collect that sample and collected the remainder of the required analytical suite.

NMED Comment 3:
The Executive Summary, page E-i, states, "[c]hloride was detected at a concentration (1,400 Mg/L) above the screening level (250 mg/L) in one sample collected from well BW-5C. Diesel range organics (DRO) were detected at low concentrations of 0.47 mg/L and 0.74 mg/L in groundwater samples collected at wells BW-4B and BW-5B, respectively, in comparison to the screening level of 0.086 mg/L." There are currently no other groundwater monitoring wells west of these boundary wells. The extent of groundwater contamination west of pond EP-9 is not delineated. Comment 1 in NMED's *Disapproval Annual Groundwater Monitoring Report: Gallup Refinery - 2017,* dated March 21, 2019, requires installation of more wells west of these boundary wells. These new wells are intended to delineate the contaminant plumes west of Pond EP-9. In addition, other organic constituents (e.g., MTBE, EDC) were detected in the groundwater sample collected from well BW-5C according to Appendix E (Groundwater Analytical Reports). Revise the Report for accuracy.

MPC Response 3:
NMED references the following statement from the Executive Summary "[c]hloride was detected at a concentration (1,400 Mg/L) above the screening level (250 mg/L) in one sample collected from well BW-5C. Diesel range organics (DRO) were detected at low concentrations of 0.47 mg/L and 0.74 mg/L in groundwater samples collected at wells BW-4B and BW-5B, respectively, in comparison to the screening level of 0.086 mg/L." and then directs that the Report be revised for accuracy. We checked this statement and find it to be accurate. Also, the detection of MTBE and EDC are shown in Table 3 and discussed on page 6-5 of the report. We do not attempt to discuss every detection in the Executive Summary of the investigation reports. No change is made to the Report.

NMED Comment 4:
In Section 2.1 (SMW-2 Area), page 2-1, the Permittee states, "MTBE has been detected in groundwater samples collected at SMW-2, but has remained below the screening level." According to the *2017 Annual Groundwater Monitoring Report,* the MTBE concentration in the groundwater sample collected from well SMW-2 exceeded the screening level in August 2015. Revise the Report for accuracy.

MPC Response 4:
The quoted discussion in Section 2.1 is referring to the historical analyses that were presented in Table 1 of the referenced Work Plan. We reviewed Table 1 and have confirmed that MTBE was not detected above the screening level in the referenced Table 1. The text is revised in Section 2.1 (page 2-1) to note the detection of MTBE above the screening level in August 2015.

NMED Comment 5:
In Section 2.2 (OW-1 Area), page 2-2, the Permittee states, "[o]ther organic constituents that have been detected at very low concentrations below screening levels in water samples collected at OW-1 include benzene, toluene, and total xylenes." According to the *2017 Annual Groundwater Monitoring Report,* the MTBE, ethylbenzene, and EDC concentrations in groundwater samples collected from well OW-1 were also detected (below the screening levels). The detection of MTBE in the groundwater samples collected from well OW-1 prompted further groundwater investigation west of well OW-1 (see Comment 3). Revise the Report for accuracy.

MPC Response 5:
The text in Section 2.2 has been revised to reference additional detections of constituents included in the 2017 Annual Report.

NMED Comment 6:
In Section 2.2 (OW-1 Area), page 2-2, the Permittee states, "[o]rganic constituents that have been detected at very low concentrations below screening levels in water samples collected at OW-10 include 1, 1-dichloroethane, 1,2-dichloroethane, 1, 1-dichloroethene." According to the *2017 Annual Groundwater Monitoring Report,* the cis-1, 2-DCE, 1, 2, 4-trimethylbenzene, toluene, ethylbenzene, and xylenes were also detected at concentrations below the screening levels in groundwater samples collected from well OW-10. Revise the Report for accuracy.

MPC Response 6:
The text in Section 2.2 has been revised to reference additional detections of constituents included in the 2017 Annual Report.

NMED Comment 7:
Section 3.1.1 (Boundary Wells), page 3-1, states, "[n]o discrete soil samples were retained for laboratory analysis since the field screening methods did not indicate any potential contamination." As stated numerous times in previous NMED's comments, it is necessary to collect soil samples for laboratory analysis even though field screening did not indicate any potential contamination. At a minimum of three soil samples should have been collected from each boring (e.g., from the bottom of boring, at the water table, and from vadose zone at the depth with the highest PID readings). Include the provision for all future work plans. No revision required.

MPC Response 7:
The comment is acknowledged.

NMED Comment 8:
Section 3.1.2 (SMW-2 Area), page 3-2, states, "[o]ne discrete soil sample was collected from each soil boring. The samples were from the interval exhibiting the highest soil vapor reading." Soil samples should have been collected from each boring to delineate the extent of chloride exceedance. In addition, one discrete sample per boring is not adequate (see Comment 7). NMED's *Approval, Response to Comments NMED Approval with Modifications Letter dated March 17, 2017 [Chloride Exceedance Excavation Report}*, dated May 16, 2019 requires the Permittee to submit a work plan to install soil borings to investigate the extent of chloride exceedances. If soil data had been collected from the borings, it could be used to guide the investigation. It is important to collect soil data to provide characterization data for the site.

MPC Response 8:
NMED refers to defining the "extent of chloride exceedances." We do not find any screening levels for chloride in NMED's *Risk Assessment Guidance for Investigations and Remediation* (March 2019), nor is chloride a hazardous constituent, so possibly this comment is coming from the Oil Conservation Division (OCD). The OCD Permitted Landfarm is being evaluated for closure separately and we have not attempted to pursue that action during the installation of OW-59 and OW-60.

NMED Comment 9:
Section 4.3.1 (Well Installation and Groundwater Sample Collection) includes two subsections titled as "Boundary Wells" and "SMW-2 Areas". The section numbers of "Boundary Wells" and "SMW-2 Areas" are presented incorrectly. The sections regarding "Boundary Wells" and "SMW-2 Areas" are numbered as Section 3.3.1.1 and 3.3.1.2, respectively. These sections should be numbered as Section 4.3.1.1 and 4.3.1.2. Correct the typographical errors in the revised Report.

MPC Response 9:
The subsection numbers have been corrected to 4.3.1.1 and 4.3.1.2, as correctly identified by NMED.

NMED Comment 10:
Section 3.3.1.1 (sic) (Boundary Wells), page 4-7, states, "[t]he well [BW-5A] was installed with the screened interval ranging from 10 feet bgl to 20 feet bgl. The screen was set to intercept possible groundwater that may exist in the gravel and sand encountered from 12 feet bgl to 14 feet bgl and the very fine grain sands encountered within the silty clay from 14 feet bgl to 20.50 feet bgl." The screened interval of well BW-5A should have been set deeper with longer screen. The lithology description for the boring (page 4-6) indicates that the targeted sandy layers were

dry. Potential water presence is first recorded at the depth of 30 feet bgs in nearby boring BW-5B. Therefore, groundwater production is unlikely at the depth shallower than 30 feet bgs at the location. In addition, the depth-to-water (DTW) measurements in the closest upgradient groundwater monitoring well MKTF-44 ranged from 22.85 to 31.16 feet bgs in 2017. Since the upper sandy layer and Chinle/Alluvial Interface are unlikely to be different water bearing zones, the groundwater elevation at the location of BW-5A is expected to be comparable to that of well MKTF-44. The DTW data in MKTF-44 should have been used to guide the decision regarding the placement of the well screen. In the future, in order to make appropriate decisions regarding the placement of screened intervals in unconfined or semi-confined aquifers, review the boring logs for nearby wells for the depths where water is potentially present and historic groundwater elevation data in nearby wells. Also, a longer screen (e.g., 20 feet) is acceptable to intercept the water table and to accommodate the trend of decreasing groundwater levels in recent years. Include the measure to appropriately select screened intervals in future work plans. No revision is required.

MPC Response 10:
MPC acknowledges NMED's comment and welcomes the flexibility to use 20 feet long screens were appropriate. We'll not attempt to revisit or explain here the past reasons and requirements from NMED and OCD regarding the installation of the boundary monitoring wells dating back to 2003. However, we note that BW-1A and BW-3A are also dry, but do serve to help detect any potential releases from the nearby evaporation ponds.

NMED Comment 11:
Section 3.3.1.1 (sic) (Boundary Wells), page 4-8, states, "[t]he sampling was terminated at 58.5 feet bgl." The statement is misleading. No soil samples were collected from the boring. The statement "[t]he sampling was terminated at ... " appears multiple times in the Report. Revise this statement as well as all similar statements that appear in the Report for clarity.

MPC Response 11:
The term "sampling" is replaced with "drilling" on pages 4-3, 4-5, 4-7, 4-8, 4-9, 4-10, 4-12, and 4-13.

NMED Comment 12:
Section 3.3.1.1 (sic) (Boundary Wells), page 4-8, states, "[n]o apparent saturated sediments were encountered [at boring BW-5B]." Although no apparent saturated sediments are encountered, groundwater is produced from well BW-5B. Indications of saturation are not always obvious in tight clay characteristic of the Chinle formation. A 24-hour delay prior to well construction to allow water to enter the boring could aid in appropriate screened interval selection. No response required.

MPC Response 12:
We acknowledge the comment.

NMED Comment 13:
Section 3.3.1.1 (sic) (Boundary Wells), page 4-8, states, "[t]he screen [for well BW-5B) was set to intercept possible groundwater that may exist in the sandstone encountered within the silty clays from 48 feet bgl to 54 feet bgl." Well BW-5B is screened across the Chinle/Alluvial Interface according to Table 7 (Fluid Levels). However, since the sandstone describes the Sonsela formation, well BW-5B is likely screened across Sonsela/Chinle rather than Chinle/Alluvial Interface. Additionally, the DTW measurements for well BW-5B ranged from

8.65 to 10.57 feet bgs according to Table 7. The higher groundwater elevation in well BW-5B in comparison to that of up gradient well MKTF-44 is indicative of confined conditions, typically seen in the Sonsela formation. Revise the Report accordingly or provide explanation for why the Permittee believes well BW-5B is screened to Chinle/Alluvial Interface.

MPC Response 13:
First, we do not agree that the "sandstone describes the Sonsela Formation." The sandstone encountered in well BW-5B is first noted in the 48 to 50 foot below ground level (bgl) interval and is described as "trace pink sandstone at base." Sandstone is then noting as being present within a silty clay from 50 to 54 feet bgl. This is in contrast to the massive dense sandstone layer logged in nearby well BW-5C starting at a depth of 64 feet bgl and extending to the termination depth of the boring at 76 feet with an intervening layer of sand and siltstone from 68 to 69.5 feet bgl. The sandstone logged in well BW-5B is only a minor fraction in a predominantly silty clay matrix, which is clearly unlike the deeper sandstone layers observed in BW-5C, which is consistent with other logs that have drilled into the Sonsela Sandstone. We also note that "thin sandstone interbeds" were logged in the Petrified Forest Formation, which lies above the Sonsela Sandstone in well OW-1. Last, the lithology of the Petrified Forest Formation, while commonly observed to be a claystone/siltstone has also been logged as a sandstone at the site in other locations. The Petrified Forest Formation has been described in published research papers for the Four Corners Area as a "mostly bentonitic mudstone with variegated hues of purple, blue, gray, and red. They contain lenses of trough-crossbedded, biotite rich sandstones and numerous calcrete nodules indicate of extensive pedogenesis."[1]

NMED Comment 14:
In Section 5 (Regulatory Criteria), page 5-2, the Permittee states, "[o]nly one constituent (di-n-octyl-phthalate) was detected in groundwater that does not have a screening level." Table 8.2.3 (OW-59 and OW-60 Semi-Volatile and Volatile Organic Compounds, Analytical Results Summary) does not present the detection of di-n-octyl-phthalate. Include all detections of SVOCs and VOCs regardless of presence or absence of screening levels in the table. Revise the Report accordingly.

MPC Response 14:
The text is revised on page 5-2 to reference Table 3 for this discussion. The subject detection of di-n-octyl-phthalate is provided in Table 3.

NMED Comment 15:
In Section 6.2 (Groundwater Analytical Results), page 6-3, the Permittee states, "[g]roundwater samples were also analyzed for the following total metals using the indicated analytical methods." Cyanide and mercury are listed following the statement. However, cyanide is not a RCRA metal. Revise the Report accordingly.

MPC Response 15:
The reference to "total metals" has been revised on page 6-3.

NMED Comment 16:
In Section 6.2 (Groundwater Analytical Results), page 6-5, the Permittee states, "[d]etectable concentrations of acetone and benzoic acid were reported in the sample collected from BW-4B.

---

[1] Lucas and Others, 1997, "Stratigraphy of the Upper Triassic Chinle Group." New Mexico Geological Society Guidebook, 48th Field Conference, Mesozoic Geology and Paleontology of the Four Corners Region.

The concentrations were below the screening levels." The tables presenting the analytical results for groundwater samples collected from well BW-4B are not included in the Report. Provide these tables in the revised Report.

MPC Response 16:
The groundwater samples were collected on June 28, 2017 after the new wells were developed. The analytical results are included in Table 3. We checked on NMED's website and confirmed that Table 3 is included in the copy of the Report that NMED has posted.

NMED Comment 17:
In Section 6.2 (Groundwater Analytical Results), page 6-5, the Permittee states, "[i]n the sample collected from BW-5B acetone, toluene and benzoic acid were reported at concentrations below the screening levels. Detectable concentrations of 1,1-dichloroethane, 1,2-dichloroethane, acetone, MTBE, benzoic acid, di-n-octyl phthalate, and GRO were reported in the sample collected from BW-5C." According to Table 8.1 (BW-5B and BW-5C BTEX and MTBE Analytical Result Summary) and Table 8.1.1 (BW-5B and BW-5C General Chemistry and DRO/GRO/MRO Analytical Result Summary), MTBE and GRO are detected below the screening level in the groundwater sample collected from well BW-5B; however, these detections are not included in the statement. In addition, the detections of acetone and benzoic acid in the groundwater samples collected from well BW-5B are not presented in any tables included in the Report. Similarly, the detections of 1,1-dichloroethane, 1,2-dichloroethane, acetone, benzoic acid, and di-n-octyl phthalate are not presented in any tables included in the Report. Revise the Report for accuracy and include the analytical data tables pertinent to the discussion in the revised Report.

MPC Response 17:
The detections of acetone and benzoic acid in the groundwater samples collected from well BW-5B and the detections of 1,1-dichloroethane, 1,2-dichloroethane, acetone, benzoic acid, and di-n-octyl phthalate are presented in Table 3. The text on page 6-5 is revised to note the detections of MTBE and GRO presented in Table 8.1, which occurred in a later sampling effort that was not part of the initial well installation effort that is the focus of the *SMW-2 Area and Boundary Well Installation Report*. Additional discussion has been added to Section 6.5 (page 6-8) noting the additional detections of MTBE and GRO in a later sampling event.

NMED Comment 18:
In Section 6.2 (Groundwater Analytical Results), page 6-5, the Permittee states, "[d]etectable concentrations of 1,2,4-trimethybenzene, acetone, MTBE, and benzoic acid, were reported in the groundwater sample collected from OW-59." The tables presenting the detection of 1,2,4-trimethybenzene and benzoic acid are not included in the Report. Include the analytical data tables pertinent to the discussion in the revised Report.

MPC Response 18:
The referenced detections are included in Table 3.

NMED Comment 19:
In Section 6.2 (Groundwater Analytical Results), page 6-6, the Permittee states, "[d]etectable concentrations of 4-isopropyltoluene, acetone, MTBE, toluene, benzoic acid, and bis(2-ethylhexyl) phthalate were reported in the groundwater sample collected from OW-60." The

tables presenting the detection of 4-isopropyltoluene and benzoic acid are not included in the Report. Include the analytical data tables pertinent to the discussion in the revised Report. In addition, toluene is not detected from well OW-60 according to Table 8.2 (OW-59 and OW-60 BTEX, MTBE, General Chemistry and DRO/GRO/MRO Analytical Result Summary). Revise the Report for accuracy.

MPC Response 19:
Table 3 presents the detections of 4-isopropyltoluene, acetone, MTBE, toluene, benzoic acid, and bis(2-ethyhexyl)phthalate in the groundwater sample collected at OW-60.

NMED Comment 20:
In Section 6.3 (SMW-2 Area - Additional Sampling), page 6-7, the Permittee states, "[b)ased on the flow direction of groundwater and the reported concentrations, the elevated chloride concentrations in SMW-2 maybe originating from a source located in the area of the OCD Central landfarm, or further up-gradient." The laboratory reports included in the *Response to Comments NMED Approval with Modifications Letter dated March 17, 2017 [Chloride Exceedance Excavation Report}* indicate that the chloride concentrations in the soil samples collected from the OCD Central Landfarm range from 170 mg/kg to 570 mg/kg. With exception of one sample, the chloride concentrations in soil samples collected from the landfarm did not exceed the screening level of 500 mg/kg. Although the chloride concentrations in the excavation confirmation samples, collected from depths of approximately six feet bgs, exceed the screening level in multiple locations, these soil samples were likely collected within the footprint of Evaporation Pond (EP)-10 or native soils below the pond, rather than shallow soils within the OCD Landfarm. Therefore, the landfarm is not the likely source of chloride in groundwater. Since the landfarm overlies former Pond EP-10 and Pond EP-10 may be the source of the chloride contamination in groundwater, the depth of Pond EP-10 must be identified and the soils below the landfarm must be investigated (see Comment 8). Note that the OCD has regulatory authority regarding the chloride and sulfate exceedances in groundwater. Ensure that OCD is included on all correspondence related to this issue.

MPC Response 20:
MPC is currently working with the OCD to close the OCD Landfarm and any related releases will be addressed with OCD. We acknowledge that chloride is not a hazardous constituent and therefore not regulated by NMED Hazardous Waste Bureau, but rather the OCD.

NMED Comment 21:
In Section 6.3 (SMW-2 Area - Additional Sampling), page 6-7, the Permittee states, "[t]he sulfate concentrations increase across the OCD Central landfarm moving down-gradient, with the highest reported concentrations in the area in the groundwater sample collected in OW-59. This could suggest the OCD Central landfarm is a source of the sulfate." The laboratory reports included in the *Response to Comments NMED Approval with Modifications Letter dated March 17, 2017 [Chloride Exceedance Excavation Report}* indicate that the sulfate concentrations in the soil samples collected from the OCD Central Landfarm range from 400 mg/kg to 770 mg/kg. Since the sulfate concentration in groundwater sample collected from well OW-59 is recorded as 3,000 mg/L, the landfarm is not the likely source of sulfate in groundwater. Pond EP-10 that underlies the landfarm may be the source of the sulfate contamination in groundwater; thus, the soils below the landfarm also must be investigated for sulfate contamination (see Comment 20).

MPC Response 21:
Similarly, to the response to Comment 20, as sulfate is not a hazardous constituent and not regulated by NMED Hazardous Waste Bureau, MPC will work with OCD to address sulfate.

NMED Comment 22:
In Section 7 (Conclusions and Recommendations), page 7-1, the Permittee states, "[i]t is recommended to install additional monitoring wells to better determine if a local source of chloride and/or sulfate is present. An Investigation Work Plan for additional monitoring wells was submitted in August, 2018 pursuant to NMED's request." NMED issued a disapproval for the work plan on February 20, 2019 and required a revised work plan by August 9, 2019. This comment serves as a reminder. No response is required.

MPC Response 22:
The comment is acknowledged.

NMED Comment 23:
The groundwater elevation data collected from well SMW-2 is not included in Figure 5 (Chinle/Alluvium Interface Potentiometric Map September 2017). Although well SMW-2 is screened to the Chinle/Alluvial Interface, the groundwater elevation in well SMW-2 is significantly higher compared to the rest of the wells screened within the same formation in the area. Provide an explanation for the higher groundwater elevation in well SMW-2 in the revised Report.

MPC Response 23:
We note that the groundwater elevation data for SMW-2 is included on Figure 5, but as noted on the Figure, neither SWM-2 nor MW-4 were used to prepare the contours, as they not believed to be screened at the contact of the Alluvium / Chinle Formation as are the other wells on Figure 5. MW-4 is screened in the deeper in the Sonsela aquifer and SMW-2 is screened in upper sands as described in the LTA Subsurface Conditions evaluation completed by Precision Engineering, Inc. in 1996. A copy of this document has been added as Appendix G.

SMW-2 Area and Boundary Well Installation Report

Marathon Petroleum Company LP

Gallup Refinery
Marathon Petroleum Company
Gallup, New Mexico

EPA ID# NMD000333211

APRIL 2019

(Revised September 2019)

Scott Crouch, P.G
DiSorbo Consulting, LLC

DiSorbo
Environmental Consulting Firm

8501 North Mopac Expy | Suite 300 | Austin, TX 78759
512.693.4190 (P) | 512.279.3118 (F) | www.disorboconsult.com

Table of Contents

List of Acronyms i

Executive Summary i

Section 1 Introduction 1-1

Section 2 Background 2-1

2.1 SMW-2 Area 2-1

2.2 OW-1 Area 2-2

Section 3 Scope of Activities 3-1

3.1 Monitor Well Installation and Sample Collection 3-1

3.1.1 Boundary Wells 3-1

3.1.2 SMW-2 Area 3-2

3.2 Collection and Management of Investigation Derived Waste 3-3

3.3 Surveys 3-3

Section 4 Field Investigation Results 4-1

4.1 Surface Conditions 4-1

4.2 Subsurface Conditions 4-1

4.3 Subsurface Investigations 4-2

4.3.1 Well Installation and Groundwater Sample Collection 4-3

4.4 SMW-2 Area – Additional Sampling 4-14

Section 5 Regulatory Criteria 5-1

Section 6 Site Impacts 6-1

6.1 Soil Analytical Results 6-1

6.2 Groundwater Analytical Results 6-2

6.3 SMW-2 Area – Additional Sampling 6-6

6.4 General Groundwater Chemistry 6-8

6.5 Subsequent Data 6-8

Section 7 Conclusions and Recommendations 7-1

Section 8 References 8-1

List of Tables

Table 1 Soil Vapor Screening Results

Table 2 Soil Analytical Data

Table of Contents (Continued)

Table 3 Groundwater Analytical Data

Table 4 SMW-2 Area Additional Sampling

Table 5 Groundwater and Surface Water Field Measurements

Table 6 Groundwater Gauging Results

Table 7 Fluid Levels

Table 8 Fourth Quarter 2017 Groundwater Analytical Data

List of Figures

Figure 1 Site Location Map

Figure 2 Well Location Map – Boundary Wells

Figure 3 Well Location Map – SMW-2 Area

Figure 4 Geologic Map of New Mexico

Figure 5 Chinle/Alluvium Interface Potentiometric Map - September 2017

Figure 6 Sulfate and Chloride Concentrations

Appendices

Appendix A Well Logs

Appendix B Waste Analyses and Waste Manifests

Appendix C Field Methods

Appendix D Soil Analytical Reports

Appendix E Groundwater Analytical Reports

Appendix F SMW-2 Area – Analytical Reports

Appendix G LTA Subsurface Conditions

List of Acronyms

API	American Petroleum Institute
bgl	below ground level (bgl)
btoc	below top of casing
DRO	diesel range organics
EPA	Environmental Protection Agency
HSA	hollow-stem auger
IDW	investigation derived waste
MCL	maximum contaminant level
msl	mean sea level
MW	monitor well
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
RCRA	Resource Conservation and Recovery Act
PID	photoionization detector
PPM	parts per million
PVC	polyvinyl chloride
SPH	separate phase hydrocarbon
SVOC	semi volatile organic compound
SWMUs	Solid Waste Management Units
TPH	total petroleum hydrocarbon
TCLP	toxicity characteristic leaching procedure
USCS	unified soil classification system
VOC	volatile organic compound
WQCC	Water Quality Control Commission

Executive Summary

The Gallup Refinery, which is located 17 miles east of Gallup, New Mexico, has been in operation since the 1950s. Pursuant to the terms and conditions of the facility Resource Conservation and Recovery Act (RCRA) Post-Closure Care Permit and 20.4.1.500 New Mexico Administrative Code, this report documents installation of boundary wells west of the on-site evaporation ponds and installation of wells in the area of well SMW-2. This area was identified by the New Mexico Environment Department (NMED) in comment letters regarding the 2013 and 2014 Annual Facility-Wide Ground Water Monitoring Reports as requiring additional groundwater monitoring wells.

The activities completed include the installation of five permanent monitoring wells (BW-4A, BW-4B, BW-5A, BW-5B, and BW-5C) and groundwater sampling along the western property boundary in an area approximately 500 feet west of Pond 9 and 780 feet south of existing monitor well OW-1. The activities also included the installation of two permanent monitoring wells (OW-59 and OW-60) in the area of SMW-2. Water samples were also collected at monitoring wells SMW-2 and SMW-4 and evaporation ponds EP-2 and EP-3. The field activities began on June 6, 2017 and continued through June 29, 2017.

Boundary Wells

Five permanent well completions were installed, although two of the wells were dry. Three groundwater samples (excluding additional quality assurance samples) were collected for analysis of potential site-related constituents (e.g., volatile and semi-volatile organics, total petroleum hydrocarbons (TPH), metals, and inorganic/general water quality parameters) at wells BW-4B, BW-5B and BW-5C.

Total metals concentrations exceeded the respective screening levels for arsenic, barium, beryllium, chromium, cobalt, iron, lead, manganese, nickel, and vanadium in one groundwater sample collected from well BW-4B. The sample was very turbid and dissolved metals analyses were not performed. Chloride was detected at a concentration (1,400 mg/L) above the screening level (250 mg/L) in one sample collected from well BW-5C. Diesel range organics (DRO) were detected at low concentrations of 0.47 mg/L and 0.74 mg/L in groundwater samples collected at wells BW-4B and BW-5B, respectively, in comparison to the screening level of 0.086 mg/L.

Detectable concentrations of acetone and benzoic acid were reported in the sample collected from BW-4B. The concentrations were below the screening levels. In the sample collected from BW-5B acetone, toluene and benzoic acid were reported at concentrations below the screening levels.

SMW-2 Area Wells

Two permanent well completions were installed. Two soil samples (excluding additional quality assurance samples) were collected during the advancement of the soil borings for analysis of potential site-related constituents (e.g., volatile and semi-volatile organics, TPH, and metals).

In the soil sample collected from OW-59 the lead concentration exceeded the screening level for the leachate DAF of 20. In the soil sample collected from OW-60 the iron and lead concentrations exceeded the screening level for the leachate DAF of 20. The manganese concentration exceeded non-residential soil screening level. Detectable concentrations of volatile and semi-volatile organics were reported in both soil samples but did not exceed the screening levels.

Two groundwater samples (excluding additional quality assurance samples) were collected for analysis of potential site-related constituents (e.g., volatile and semi-volatile organics, TPH, metals, inorganic/general water quality parameters and major cations/anions) at wells OW-59 and OW-60.

Total metals concentrations exceeded the respective screening levels for iron and manganese in both wells. Arsenic exceeded the screening level in OW-59. Beryllium exceeded the screening level in OW-60. Chloride and sulfate exceeded the respective screening levels in both wells. Dissolved metals concentrations exceeded the screening level for manganese in both wells. GRO and DRO concentrations exceeded the screening levels in the sample collected from OW-59. Detectable concentrations of volatile and semi-volatile organics were reported in both groundwater samples but did not exceed the screening levels.

SMW-2 Area – Additional Sampling

Water samples collected from Monitoring wells SMW-2 and SMW-4 and evaporation ponds EP-2 and EP-3 were analyzed for major cations/anions. The chloride concentrations reported from the surface water samples collected from evaporation ponds EP-2 and EP-3 were the highest concentrations reported during the sampling event. The chloride concentrations decreased moving up-gradient from SMW-2 to OW-59 and OW-60. The highest sulfate concentrations were observed in the groundwater

sample collected from OW-59, located on the down-gradient end of the OCD Central landfarm. The sulfate concentrations decreased down-gradient at SMW-2 and were significantly lower up-gradient in the groundwater sample collected from OW-60. Based on the existing information, the source(s) of the elevated concentrations of chloride and sulfate observed in SWMU-2 are not conclusive. It is possible that there may be separate sources for sulfate and chloride.

Section 1
Introduction

The Gallup Refinery is located approximately 17 miles east of Gallup, New Mexico along the north side of Interstate Highway I-40 in McKinley County. The physical address is I-40, Exit #39 Jamestown, New Mexico 87347. The Gallup Refinery property covers approximately 810 acres. Figure 1 presents the refinery location and the regional vicinity, which is characterized as high desert plain comprised primarily of public lands used for grazing by cattle and sheep.

The Gallup Refinery generally processes crude oil from the Four Corners area transported to the facility by pipeline or tanker truck. Various process units are operated at the facility, including crude distillation, reforming, fluidized catalytic cracking, alkylation, isomerization, sulfur recovery, merox treater, and hydrotreating. Current and past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, and residual fuel.

The location of the new boundary wells is shown on Figure 2. The purpose of these wells is to provide additional groundwater monitoring down-gradient of Evaporation Ponds 6 and 9. To accomplish this objective, two additional shallower monitoring wells (BW-4A and BW-4B) were installed near existing monitor well OW-1 to create three clustered wells similar to what was installed earlier at the boundary well locations (BW-1, BW-2, and BW-3). Three additional clustered wells (BW-5A, BW-5B and BW-5C) were installed approximately 500 feet west of Pond 9.

The location of the new wells in the area of SMW-2 is shown on Figure 3. The purposed of these wells (OW-59 and OW-60) is to determine the source of the elevated chloride and sulfated detected at monitoring well SMW-2. Groundwater samples were also collected from SMW-2 and SMW-4. Surface water samples were collected from Evaporation Ponds EP-2 and EP-3.

Section 2 describes the scope of work completed, including completion of soil borings, installation of permanent monitoring wells, soil sample collection, groundwater sample collection and surface water sample collection. Section 3 explains the results of the field investigation, including the general surface and subsurface conditions and detailed site-specific information acquired during subsurface investigations. Section 4 presents the analytical results of soil samples, groundwater samples, and surface water samples. The results of these analyses are compared to applicable State or federal screening levels.

Section 2
Background

This section presents background information for the area of the refinery property near monitoring wells SMW-2 and OW-1, including a review of historical waste management activities to identity the following:

Type and characteristics of all waste and all contaminants handled in the subject areas;
Known and possible sources of contamination;
History of operations; and
Prior investigations.

2.1 SMW-2 Area

Monitoring well SMW-2 is located immediately south of the closed Land Treatment Unit (LTU). This well is not included in the RCRA Permit as part of the detection or shallow monitoring well networks, but groundwater samples are routinely collected and analyzed per the Facility-Wide Ground Water Monitoring Plan. Well SMW-2 is located on the up-gradient end of the LTU. Historical analytical results for groundwater samples collected since 2010 are included in Table 1 of the *Work Plan SWM-2 Area Investigation and Boundary Wells Installation*s (DiSorbo, 2016). Also included in Table 1 of the work plan are the analytical results for groundwater samples collected in SMW-4, which is located on the north (down-gradient) end of the LTU. These historical analyses indicate the detection of chloride, sulfate, manganese, and uranium at concentrations above the applicable screening levels per the RCRA Permit. Uranium was also detected in groundwater samples collected from SMW-4 at concentrations above the screening level. MTBE has been detected in groundwater samples collected at SMW-2, but had remained below the screening level throughout the time period presented in Table 1 of the Work Plan. MTBE was reported above the screening level in August 2015 (Western, 2017)

Well SMW-2 is located down-gradient of the Central Landfarm, which is permitted by the New Mexico Oil Conservation Division (NMOCD) and also potentially down-gradient of the evaporation ponds (Figure 3). It is noted that the area where the NMOCD Central Landfarm is currently located may overlie former Evaporation Pond #10. According to information provided in the *Inventory of Solid Waste Management Units,* cell or Evaporation Pond #10 was used for wastewater from the boiler

house and water softener regeneration wastes, but did not receive process wastewater discharges through the API Separator. The process of discharging directly to Evaporation Pond #10 was replaced with the addition of a neutralization tank in 1980 (Geoscience Consultants, Ltd., 1985a). Evaporation Pond #10 was no longer in service in 1985 based on information provided in the 1985 *Discharge Plan Application* (Geoscience Consultants, Ltd., 1985b).

2.2 OW-1 Area

Monitoring well OW-1 was installed in November 1980 as part of the initial site investigations conducted pursuant to RCRA (Figure 2). The well was drilled to depth of 100 feet and is screened in the Sonsela Sandstone aquifer. Well OW-10, which is also screened in the Sonsela Sandstone aquifer, is located to the east and up-gradient of OW-1. The only site operations known to have been conducted in the area are the evaporation ponds located to the east and hydraulically up-gradient of OW-1.

Analytical results for groundwater samples collected from OW-1 and OW-10 are included in Table 2 in the *Work Plan SWM-2 Area Investigation and Boundary Wells Installations* (DiSorbo, 2016.) MTBE was detected in groundwater samples collected at OW-10 in 2012 and 2013 at concentrations above the screening level, but has since shown concentrations below the screening level. There have been a few detections of nitrate above screening levels in OW-1 and OW-10. Chloride has consistently been detected above the screening level in groundwater samples collected at OW-10. Total metals analyses of water samples collected at OW-1 have shown sporadic occurrences of arsenic, chromium, iron, lead, and manganese above screening levels. Total analyses of uranium have consistently exceeded screening levels in samples collected at both OW-1 and OW-10. Dissolved metals analyses of water samples collected at OW-1 have shown sporadic occurrences of iron, lead, and manganese above screening levels. Dissolved analyses of uranium have consistently exceeded screening levels in samples collected at both OW-1 and OW-10. Other organic constituents that have been detected at very low concentrations below screening levels in water samples collected at OW-1 include benzene, ethylbenzene, toluene, 1,2-dichloroethane, MTBE, and total xylenes (Western, 2017). Organic constituents that have been detected at very low concentrations below screening levels in water samples collected at OW-10 include 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, and cis-1,2-dichloroethene. 1, 2, 4-trimethylbenzene, toluene, ethylbenzene, and xylenes (Western, 2017).

Section 3
Scope of Activities

3.1 Monitor Well Installation and Sample Collection

Pursuant to the approved SWMU-2 Area Investigation and Boundary Well Installations Work Plan, five permanent monitoring wells were installed west of Evaporation Ponds 6 and 9 (Figure 2). Two permanent monitoring wells were installed in the area of the OCD Landfarm (Figure 3).

3.1.1 Boundary Wells

Two new wells were installed near OW-1. Well BW-4A was installed with the screen interval set in the zone designated as the Upper Sand. Well BW-4B was installed with the screen interval set just above the Chinle bedrock in the Chinle/Alluvial Interface zone. Copies of the well logs are included in Appendix A.

Three clustered wells were drilled approximately 500 feet west of Pond 9 and 780 feet south of existing monitor well OW-1. Monitor well BW-5A was installed with screened interval set in the zone designated as the Upper Sand. Monitor well BW-5B was installed with screened interval set just above the Chinle bedrock in the Chinle/Alluvial Interface zone. Monitor well BW-5C was installed with the screened interval set in the Sonsela Sandstone aquifer. Copies of the well logs are included in Appendix A.

Soil samples obtained from the soil borings were screened in the field on 2.0 foot intervals for evidence of contaminants. The screening methods included, (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds. No discrete soil samples were retained for laboratory analysis since the field screening methods did not indicate any potential contamination.

The following list provides a summary of the five permanent wells advanced using hollow stem augers:

- BW-4A; screened from 21 feet below ground level (bgl) to 36 feet bgl;
- BW-4B; screened from 41 feet bgl to 61 feet bgl;
- BW-5A; screened from 10 feet bgl to 20 feet bgl;

- BW-5B; screened from 48 feet bgl to 58 feet bgl; and
- BW-5C; screened from 64.3 feet bgl to 74.3 feet bgl.

Groundwater samples were collected from three of the five permanent monitoring wells. The groundwater samples were analyzed for volatile and semi-volatile organics, TPH (GRO, DRO, and MRO), Skinner List metals, cyanide, iron, manganese, chloride, fluoride, and sulfate. The following list provides a brief summary of the groundwater sample collection:

- BW-4A; dry; well did not yield enough water to sample;
- BW-4B; developed and sampled; yielded enough water for a full analytical suite, the groundwater was too turbid to collect a filtered sample for dissolved metals analyses;
- BW-5A; dry; well did not yield enough water to sample;
- BW-5B; developed and sampled; yielded enough water for a full analytical suite; and
- BW-5C; developed and sampled; yielded enough water for a full analytical suite.

3.1.2 SMW-2 Area

Two new wells were installed adjacent to the OCD Landfarm, which is located north of evaporation ponds EP-2 and EP-3 and up-gradient of SMW-2. Well OW-59 was installed adjacent to the northwest (down-gradient) corner of the OCD Landfarm. Well OW-60 was installed adjacent to the southeast (up-gradient) corner of the OCD Landfarm. OW-59 and OW-60 are located outside of the bermed area for the OCD Landfarm. The wells are screened in the Chinle/Alluvial Interface zone. Copies of the well logs are included in Appendix A.

Soil samples obtained from the soil borings were screened in the field on 2.0 foot intervals for evidence of contaminants. The screening methods included, (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds. One discrete soil sample was collected from each soil boring. The samples were from the interval exhibiting the highest soil vapor reading.

The following list provides a summary of the two permanent wells advanced using hollow stem augers:

- OW-59; screened from 20 feet bgl to 35 feet bgl; and
- OW-60; screened from 25 feet bgl to 45 feet bgl.

3.2 Collection and Management of Investigation Derived Waste

Drill cuttings, excess sample material and decontamination fluids, and all other investigation derived waste (IDW) associated with the installation of the permanent wells were contained and characterized using methods based on the boring locations and type of contaminants suspected or encountered. All drill cuttings generated during the boundary well installations were collected and placed into 55-gallon drums. A composite sample of the drums generated during the June 2017 well installation event was collected using a decontaminated stainless steel spoon and sent to Hall Environmental Laboratory for waste characterization analysis. The sample was analyzed for the following:

- Reactivity – Cyanide (SW846 CH7);
- Reactivity – Sulfide (SW846 CH7);
- Ignitability (Method 1030);
- Corrosivity – pH (Method 9045);
- RCRA 8 (TCLP) Metals (Method 6010B);
- Diesel Range Organics (Method 8015B);
- Motor Oil Range Organics (Method 8015B);
- Gasoline Range Organics (Method 8015B); and
- TCLP Volatiles (Method 1311/8260B).

The Hall analytical report (#1708D66) is included in Appendix B. Based on the analyses, 28 non-hazardous/non-DOT regulated drums (16,380 pounds) were shipped off-site to Advanced Chemical Treatment in Albuquerque, NM for disposal on 8/30/2017.

Copies of the waste manifests are included in Appendix B. All purge water and decontamination water was disposed in the refinery wastewater system upstream of the API Separator.

3.3 Surveys

A global positioning system receiver was used to record the coordinates of each permanent monitor well. These coordinates were recorded on the field boring logs. Surveys were completed by a registered land surveyor for the seven permanent wells to include geographic position and land surface elevation.

Section 4
Field Investigation Results

This section provides a summary of the surface and subsurface conditions at the refinery, including the area west of Evaporation Ponds 6 and 9 and the SMW-2 area. A discussion is included on the installation of soil borings and field screening of soils. This is followed by a description of the installation of permanent monitoring wells and the collection of groundwater samples.

4.1 Surface Conditions

Site topographic features include high ground in the southeast gradually decreasing to a lowland fluvial plain to the northwest. Elevations on the refinery property range from 6,860 feet to 7,040 feet above mean sea level (msl). The area near monitor well OW-1 is at an approximate elevation of 6,866 feet msl. The elevation in the area of SMW-2 is approximately 6,887 feet msl.

Surface soils within most of the area of investigation are primarily Rehobeth silty clay loam. Rehobeth soil properties include a pH ranging from 8 to 9 standard units and salinity (naturally occurring and typically measuring up to approximately 8 mmhos/cm).

Regional surface water features include the refinery evaporation ponds and a number of small ponds (one cattle water pond and two small unnamed spring fed ponds). The site is located in the Puerco River Valley, north of the Zuni Uplift with overland flows directed northward to the tributaries of the Puerco River. The Puerco River continues to the west to the confluence with the Little Colorado River. The South Fork of the Puerco River is intermittent and retains flow only during and immediately following precipitation events.

4.2 Subsurface Conditions

The shallow subsurface soils consist of fluvial and alluvial deposits comprised of clay and silt with minor inter-bedded sand layers. The diverse properties and complex, irregular stratigraphy of the surface soils across the site cause a wide range of hydraulic conductivity ranging from less than 10^{-2} cm/sec for gravelly sands immediately overlying the Petrified Forest Formation to 10^{-8} cm/sec in the clay soils located near the surface (Western Refining, 2009). Generally, shallow groundwater at the refinery follows the upper contact of the Chinle Group (i.e., Chinle/Alluvial Interface zone) with prevailing flow from the southeast to the northwest, with some flow potentially to the northeast on

the northeastern portion of the refinery property. In the northwestern portion of the facility there are thin intermittent sand layers above the Chinle/Alluvial Interface zone, which may be saturated. These intervals are referred to as the Upper Sands with groundwater flow directions downdip to the northwest.

The Quaternary alluvium, which occurs at the land surface in the area of the refinery is mapped regionally as a narrow band trending west-northwest and running just north of I-40 (Figure 4). The Quaternary alluvium is thought to be the parent material of the Rehobeth soils, which are present at the facility.

Subcropping beneath the Quaternary alluvium is the Triassic Chinle Group (Figure 4). The stratigraphy of the Chinle Group was described in detail for the nearby Fort Wingate quadrangle by Lucas et al, 1997. The Painted Desert Member of the Petrified Forest Formation is the uppermost member of the Chinle Group present in the area of the refinery. The Painted Desert Member is described as reddish-brown and greyish red mudstone with minor beds of resistant, laminated or crossbedded, litharenite. This is consistent with the bedrock encountered at the refinery. Beneath the Painted Desert Member is the Sonsela Member, which is described by Lucas et al (1997) as grey to yellowish-brown, fine-grained to conglomeratic, crossbedded sandstone. The Sonsela Member forms an artesian aquifer across most of the facility. The base of the Sonsela Member is recognized as a basin wide unconformity, which was termed the Tr-4 unconformity (Heckert and Lucas, 1996). The Blue Mesa Member, which underlies the Sonsela Member, is the lowest member of the Petrified Forest Formation. The Blue Mesa Member is described as mostly purple and greenish-grey mudstone.

4.3 Subsurface Investigations

No underground pipelines were detected during clearance of utilities in the area of the well installations. This subsection provides a detailed description of subsurface soil and groundwater investigations conducted during the installation of the seven permanent monitoring wells.

A description of the field screening procedures are presented in Appendix C – Field Methods. Copies of the boring logs/well construction logs are provided in Appendix A. In addition to being included on the soil boring logs, the soil vapor (i.e., headspace) screening results are summarized in Table 1. The locations of the soil borings/monitor wells appear on Figure 2 and Figure 3.

4.3.1 Well Installation and Groundwater Sample Collection

Seven soil borings were advanced using the hollow-stem auger (HSA) method. The drilling equipment was decontaminated between each borehole, as described in Appendix C. The well development and purging is also discussed in Appendix C. Detailed soil boring logs are included in Appendix A. The soil boring logs describe the subsurface lithology, the presence of saturation, the field screening results, and permanent well construction details. The drilling of the soil borings, well installation, and groundwater sampling is discussed below in numerical order.

4.3.1.1 Boundary Wells

BW-4A

On June 14, 2017 the drilling rig was set up on location BW-4A. Well BW-4A is located approximately 10 feet north of monitor well OW-1. Sample collection was accomplished using the HSA drilling method and split spoon samplers. No discrete soil samples were retained for laboratory analysis since the field screening results did not indicate potential contamination. The lithology encountered consisted of the following:

- Silty Clay: 0 – 2 feet below ground level (bgl) (low plasticity, firm, dry to damp, brown, no odor);
- Clay: 2 feet bgl – 18 feet bgl (high plasticity, stiff to very stiff, damp, brown, no odor);
- Clayey Silt/Silty Clay: 18 feet bgl – 26 feet bgl (low plasticity, firm/crumbly, damp, light brown/tan, no odor, interbedded);
- Clay: 26 feet bgl – 32 feet bgl (high plasticity, very stiff, damp, brown to darker brown, no odor); and
- Silty Clay: 32 feet bgl – 34 feet bgl (low plasticity, very stiff, damp, light reddish brown, trace very fine grain sand, no odor).
- Clayey Silt/Silty Clay: 34 feet bgl – 36 feet bgl (low plasticity, firm to stiff, damp, reddish brown and grey, alternating silt/clay, no odor)
- Silty Clay: 36 feet bgl – 44 feet bgl (low plasticity, stiff, damp, reddish brown and grey, no odor).

The drilling was terminated at 44 feet bgl. Activities at this location were then shut down for the day. The augers were left in the borehole. On June 15, 2017 an interface probe was lowered inside the augers. No groundwater was detected. A permanent monitor well was installed at this location with

2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 21 feet bgl to 36 feet bgl. The screen was set to intercept possible groundwater bearing sediments in the clayey silt (22 feet bgl to 24 feet bgl) and the silty clay (32 feet bgl to 34 feet bgl) that exhibited traces of very fine grain sands. A sand filter pack was installed to approximately 18 feet bgl. A bentonite seal was installed to approximately 14.5 feet bgl. The top of the well casing is approximately 3 feet above ground level.

On June 15, 2017, June 16, 2017, June 19, 2017, and June 26, 2017 the well was gauged. No groundwater was detected during the gauging events, thus no water sample was collected.

The annular seal (bentonite grout) was installed on June 27, 2017. The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

BW-4B

On June 15, 2017 the drilling rig was set up on location BW-4B. Well BW-4B is located approximately 10 feet south of monitor well OW-1. Sample collection was accomplished using the HSA drilling method and split spoon samplers. No discrete soil samples were retained for laboratory analysis since the field screening results did not indicate potential contamination. The lithology encountered consisted of the following:

- Silty Clay: 0 – 2 feet bgl (low plasticity, firm, dry to damp, brown, no odor);
- Clay: 2 feet bgl – 18 feet bgl (high plasticity, stiff to very stiff, damp, brown, no odor);
- Clayey Silt/Silty Clay: 18 feet bgl – 25 feet bgl (low plasticity, firm/crumbly, damp, light brown/tan, no odor, interbedded);
- Clay: 25 feet bgl – 28 feet bgl (high plasticity, very stiff, damp, brown to darker brown, no odor);
- Silty Clay: 28 feet bgl – 31 feet bgl (moderate to low plasticity, very stiff, damp, dark brown grading to light reddish brown, trace fine grain sand at base, no odor);
- Sandy Gravelly Clay: 31 feet bgl – 31.75 feet bgl (low plasticity, stiff, dry to damp, light grey and brown, no odor);
- Silty Clay: 31.75 feet bgl – 32 feet bgl (low plasticity, stiff, damp, reddish brown, no odor);

- Clayey Silt/Silty Clay: 32 feet bgl - 34 feet bgl (low plasticity, firm/crumbly, damp, reddish brown and grey);
- Silty Clay: 34 feet bgl – 44.75 feet bgl (low plasticity, firm/crumbly, damp, reddish brown and grey, no odor);
- Gravelly Silty Clay: 44.75 feet bgl – 45.50 feet bgl (low plasticity, firm/crumbly, dry, grey and reddish brown, no odor, calcium carbonate nodules present);
- Sandy Clay: 45.50 feet bgl – 46 feet bgl (low plasticity, firm/crumbly, dry, grey and reddish brown, very fine grain sand present, no odor);
- Silty Clay: 46 feet bgl – 54 feet bgl (low plasticity, very stiff, dry to damp, reddish brown, no odor, trace grey clay at base with occasional gravel);
- Silty Clay: 54 feet bgl – 60 feet bgl (low plasticity, very stiff, dry to damp, reddish brown, no odor, trace grey clay); and
- Silty Clay: 60 feet bgl – 68 feet bgl (low plasticity, very stiff, dry to damp, reddish brown and grey, no odor).

The drilling was terminated at 68 feet bgl. Activities at this location were then shut down for the day. The augers were left in the borehole. On July 16, 2017 the drilling resumed. The lithology encountered consisted of the following:

- Silty Clay: 68 feet bgl – 70 feet bgl (low plasticity, very stiff, dry to damp, reddish brown and bluish grey, no odor, calcareous);
- Silty Clay: 70 feet bgl – 84 feet bgl (low plasticity, firm/crumbly, damp, reddish brown, no odor);
- Silty Clay: 84 feet bgl – 88 feet bgl (low plasticity, very stiff, damp, reddish brown and trace of grey clay, no odor); and
- Silty Clay: 88 feet bgl – 90 feet bgl (low plasticity, very stiff, damp, reddish brown and trace of grey clay, no odor, interbedded with fine grain sandstone – white, hard/dense).

The drilling was terminated at 90 feet bgl. Activities at this location were then shut down for the day. The augers were left in the borehole. At 0926 on June 19, 2017 an interface probe was lowered inside the augers. The depth to groundwater was approximately 71 feet bgl. Activities at this location were then shut down for the day. The augers were left in the borehole and the rig was mobilized to a different location. At 1730 an interface probe was lowered inside the augers. The depth to groundwater was approximately 69.50 feet bgl.

On June 20, 2017 the rig was mobilized to the location for BW-4B. Bentonite pellets were installed in the bottom of the borehole from a depth of 64.5 feet bgl to 90 feet bgl. The pellets were allowed to hydrate. A permanent monitoring well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 41 feet bgl to 61 feet bgl. The screen was set to intercept possible groundwater bearing sediments in the gravelly silty clay encountered from 44.75 to 45.50 feet bgl. A sand filter pack was installed to approximately 39 feet bgl. A bentonite seal was installed to approximately 36 feet bgl. The top of the well casing is approximately 3 feet above ground level. The annular seal (bentonite grout) was installed on June 26, 2017.

On June 27, 2017 the well was gauged. The depth to groundwater was 30.92 feet btoc (27.92 feet bgl). The well was developed on June 27, 2017. The depth to groundwater after well development was 63.88 feet btoc. The water sample was collected on June 28, 2017. The depth to groundwater prior to sampling was 51.65 feet btoc (48.65 feet bgl).

The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

BW-5A

On June 23, 2017 the drilling rig was set up on location BW-5A. Well BW-5A is the southernmost well in the BW-5A, 5B, and 5C well cluster. Sample collection was accomplished using the HSA drilling method and split spoon samplers. No discrete soil samples were retained for laboratory analysis since the field screening results did not indicate potential contamination. The lithology encountered consisted of the following:

- Silty Clay: 0 – 6 feet bgl (low plasticity, firm, dry, brown, no odor);
- Clay: 6 feet bgl – 10 feet bgl (high plasticity, very stiff, dry, brown, no odor);
- Clay: 10 feet bgl – 12 feet bgl (moderate plasticity, very stiff, dry, brown, no odor, gravel at base);
- Gravelly Silt/Sand: 12 feet bgl – 14 feet bgl (very fine grain sand, dry, tan, no odor, 5-10 mm sized gravel was present, a stiff clay was at the base of this interval);
- Silty Clay: 14 feet bgl – 18 feet bgl (low plasticity, stiff, dry, light reddish brown, tan and grey, trace very fine grain sand, no odor); and

- Sandy Silty Clay: 18 feet bgl – 20.50 feet bgl (low plasticity, very stiff, dry, light reddish brown with occasional grey, no odor, very fine grain sand present).

The drilling was terminated at 20.50 feet bgl. No apparent saturated sediments were encountered. A permanent monitoring well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 10 feet bgl to 20 feet bgl. The screen was set to intercept possible groundwater that may exist in the gravel and sand encountered from 12 feet bgl to 14 feet bgl and the very fine grain sands encountered within the silty clay from 14 feet bgl to 20.50 feet bgl. A sand filter pack was installed to approximately 8 feet bgl. A bentonite seal was installed to approximately 4 feet bgl. The top of the well casing is approximately 3 feet above ground level. The annular seal (bentonite grout) was installed on June 26, 2017.

On June 26, 2017 the well was gauged. The depth to groundwater was 22.80 feet btoc (19.80 feet bgl) and the total depth was gauged at 23.28 feet btoc (20.28 feet bgl). The well was developed on June 26, 2017. BW-5A was bailed dry with the depth to groundwater at 23.20 feet after bailing was completed.

On June 27, 2017 the well was gauged. The depth to groundwater was 23.21 feet btoc. A water sample was not collected since there was an insufficient amount of groundwater in the well for a water sample.

The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

<u>BW-5B</u>

On June 23, 2017 the drilling rig was set up on location BW-5B. Well BW-5B is the middle well in the BW-5A, 5B, and 5C well cluster. The well is located approximately 10 feet from BW-5A and 10 feet from BW-5C. Sample collection was accomplished using the HSA drilling method and split spoon samplers. No discrete soil samples were retained for laboratory analysis since the field screening methods did not indicate potential contamination. The lithology encountered consisted of the following:

- Silty Clay: 0 – 6 feet bgl (low plasticity, firm, dry, brown, no odor);

- Clay: 6 feet bgl – 11 feet bgl (high plasticity, very stiff, dry, brown, no odor);
- Silty Clay: 11 feet bgl – 12 feet bgl (low plasticity, very stiff, dry, tan to light brown, no odor, calcareous);
- Gravelly Silt/Sand: 12 feet bgl – 14 feet bgl (very fine grain sand, very dense, dry, tan, no odor, sandstone and chert gravel);
- Silty Clay: 14 feet bgl – 16 feet bgl (low plasticity, firm to stiff/crumbly, dry to damp, reddish brown and grey, trace gravel and very fine grain sand, no odor);
- Clayey Silt/Sand: 16 feet bgl – 20 feet bgl (very fine grain sand, firm/crumbly, dry, light brown and grey to light reddish brown, no odor);
- Sandy Silty Clay: 20 feet bgl – 30 feet bgl (low plasticity, very stiff, dry, light reddish brown and light grey, no odor, very fine grain sand present);
- Silty Clay: 30 feet bgl – 48 feet bgl (low plasticity, firm to stiff, damp, reddish brown, no odor, softer than above, trace grey clay);
- Silty Clay: 48 feet bgl – 54 feet bgl (low plasticity, very stiff, damp, light reddish brown, no odor, pink sandstone present); and
- Silty Clay: 54 feet bgl – 58.5 feet bgl (low plasticity, very stiff, damp/dry, reddish brown, and grey, bluish grey from 56 feet bgl to 58 feet bgl, no odor).

The drilling was terminated at 58.5 feet bgl. No apparent saturated sediments were encountered. A permanent monitoring well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 48 feet bgl to 58 feet bgl. The screen was set to intercept possible groundwater that may exist in the sandstone encountered within the silty clays from 48 feet bgl to 54 feet bgl. A sand filter pack was installed to approximately 46 feet bgl. A bentonite seal was installed to approximately 44 feet bgl. The top of the well casing is approximately 3 feet above ground level. The annular seal (bentonite grout) was installed on June 26, 2017.

On June 26, 2017 the well was gauged. The depth to groundwater was 29.80 feet btoc (26.80 feet bgl). On June 27, 2017 the well was gauged. The depth to groundwater was 13.50 feet btoc (10.50 feet bgl). The well was developed on June 26, 2017. BW-5B was bailed down with the depth to groundwater at 61.10 feet btoc after bailing was completed. A water sample was collected on June 28, 2017. The depth to water prior to sampling was 20.60 feet btoc (17.60 feet bgl).

The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

BW-5C

On June 19, 2017 the drilling rig was set up on location BW-5C. Well BW-5C is the northernmost well in the BW-5A, 5B, and 5C well cluster. Sample collection was accomplished using the HSA drilling method and split spoon samplers. No discrete soil samples were retained for laboratory analysis since the field screening results did not indicate potential contamination. The lithology encountered consisted of the following:

- Silty Clay: 0 – 6 feet bgl (low plasticity, firm, dry, brown, no odor);
- Clay: 6 feet bgl – 11 feet bgl (high plasticity, very stiff, dry, brown, no odor);
- Silty Clay: 11 feet bgl – 12 feet bgl (low plasticity, very stiff, dry, tan to light brown, no odor, calcareous);
- Gravelly Silt/Sand: 12 feet bgl – 14 feet bgl (very fine grain sand, very dense, dry, tan, no odor, sandstone and chert gravel);
- Silty Clay: 14 feet bgl – 16 feet bgl (low plasticity, firm to stiff/crumbly, dry to damp, reddish brown and grey, trace gravel and very fine grain sand, no odor);
- Clayey Silt/Sand: 16 feet bgl – 20 feet bgl (very fine grain sand, firm/crumbly, dry, light brown and grey to light reddish brown, no odor);
- Sandy Silty Clay: 20 feet bgl - 30 feet bgl (low plasticity, very stiff, dry, light reddish brown and light grey, no odor, very fine grain sand present);
- Silty Clay: 30 feet bgl – 38 feet bgl (low plasticity, firm to stiff, damp, reddish brown, no odor, softer than above, trace grey clay); and
- Silty Clay: 38 feet bgl – 50 feet bgl (low plasticity, stiff to very stiff, damp, reddish brown, no odor, calcareous, pink sandstone at base – very dense, dry, no odor).

The drilling was terminated at 50 feet bgl. Activities at this location were then shut down for the day. The augers were left in the borehole. At 0840 on June 20, 2017 an interface probe was lowered inside the augers. No groundwater was detected. Activities at this location were then shut down for the day. The augers were left in the borehole and the rig was mobilized to a different location.

On June 21, 2017 the rig was mobilized back to the location for BW-5C and drilling continued. The lithology encountered consisted of the following:

- Silty Clay: 50 feet bgl – 54 feet bgl (low plasticity, stiff, dry, reddish brown and grey, calcareous, no odor, sandstone present – white and very dense);
- Silty Clay: 54 feet bgl – 58 feet bgl (low plasticity, very stiff, dry, reddish brown, occasional grey clay that increases with depth, no odor);
- Shale: 58 feet bgl – 64 feet bgl (very dense, light brown and grey, damp to saturated in cracks, no odor, fissile, becomes dry from 60 feet bgl to 64 feet bgl, very fine grain sand present and increases with interbedded clays present, no odor);
- Sandstone: 64 feet bgl – 66 feet bgl (very dense, fine grain sand, dry, brown, interbedded with clay lenses, no odor);
- Sandstone: 66 feet bgl – 68 feet bgl (very dense, fine grain sand, damp in fractures, light purplish brown, interbedded with clay lenses, weathered, soft, micaceous, no odor);
- Sand: 68 feet bgl – 69 feet bgl (fine to medium grain, loose, saturated, brown, no odor)
- Siltstone: 69 feet bgl – 69.5 feet bgl (dense, dry to damp, brown, no odor); and
- Sandstone: 69.5 feet bgl – 76 feet bgl (firm to dense, damp to moist, grey, no odor – dark grey to black shale at base, damp, stiff).

The drilling was terminated at 76 feet bgl. Activities at this location were then shut down for the day. The augers were left in the borehole. At 0950 on June 22, 2017 an interface probe was lowered inside the augers. The depth to groundwater was approximately 11.40 feet bgl.

A permanent monitoring well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 64.30 feet bgl to 74.30 feet bgl. The top of the screen was set approximately 4 foot above the occurrence of saturated sand (68 feet bgl to 69 feet bgl). The screen was extended to a depth of 74.3 feet bgl which allowed for the screening across additional moist intervals encountered within a sandstone (69.5 feet bgl to 74 feet bgl). A sand filter pack was installed to approximately 60 feet bgl. A bentonite seal was installed to approximately 56.90 feet bgl. The top of the well casing is approximately 3 feet above ground level. The annular seal (bentonite grout) was installed on June 22, 2017.

On June 23 and 26, 2017 the well was gauged. The depth to groundwater readings were 2.30 ft btoc and 2.42 ft btoc, respectively.

On June 27, 2017 the well was gauged. The depth to groundwater was 2.44 feet btoc. The well was developed on June 27, 2017. The depth to water after development was 47.90 feet btoc. A water sample was collected on June 28, 2017. The depth to water prior to sampling was 2.70 feet btoc.

The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

4.3.1.2 SMW-2 Area

Monitoring wells OW-59 and OW-60 were installed, developed and groundwater samples collected during the June 2017 field activities. The wells yielded enough water for a full analytical suite. The soil borings and subsequent wells are located adjacent to the OCD Landfarm.

OW-59

On June 12, 2017 the drilling rig was set up on location OW-59. Well OW-59 is located adjacent to the northwest (down-gradient) corner of the OCD Landfarm. Sample collection was accomplished using the HSA drilling method and split spoon samplers. One discrete soil sample was retained for laboratory analysis. The lithology encountered consisted of the following:

- Silty Clay: 0 – 6 feet bgl (low plasticity, firm, damp, brown, no odor);
- Clay: 6 feet bgl – 8 feet bgl (high plasticity, stiff, damp, brown, no odor);
- Silty Clay: 8 feet bgl – 10 feet bgl (low plasticity, stiff, damp, light brown, no odor, sandy at the base);
- Silt: 10 feet bgl – 12 feet bgl (low plasticity, compact, damp, brown, no odor);
- Silty Clay: 12 feet bgl – 14 feet bgl (low plasticity, very stiff, damp, brown, no odor, trace sand);
- Silty Clay: 14 feet bgl – 18 feet bgl (high plasticity, very stiff, damp, brown, no odor);
- Silty Clay: 18 feet bgl – 20 feet bgl (low to moderate plasticity, stiff, damp, brown, no odor);
- Sandy Silty Clay: 20 feet bgl – 22 feet bgl (low plasticity, firm to soft, damp, brown, no odor);
- Sandy Clay: 22 feet bgl – 24 feet bgl (low plasticity, soft, damp, brown, no odor);
- Silty Clay: 24 feet bgl – 26 feet bgl (low plasticity, soft, damp, brown, no odor);
- Sandy Silt: 26 feet bgl – 30 feet bgl (very fine grain, very moist, brown, no odor);
- Silty Clay: 30 feet bgl – 33 feet bgl (low plasticity, firm, damp, brown, no odor);

- Silty Sand: 33 feet bgl – 34 feet bgl (very fine grain, compact, saturated, brown, no odor);
- Silty Clay: 34 feet bgl – 38 feet bgl (low plasticity, firm, damp, brown, no odor);
- Clay: 38 feet bgl – 39 feet bgl (high plasticity, firm, damp, brown, no odor); and
- Silty Clay: 39 feet bgl – 40 feet bgl (low plasticity, firm to soft, damp, grey and white, no odor, trace sand and white nodules).

The drilling was terminated at 40 feet bgl. One soil sample was collected for laboratory analysis from the soil boring for OW-59. The sample was collected from the interval 33 to 34 feet bgl, which exhibited the highest soil vapor reading of 16.3 ppm.

Activities at this location were then shut down for the day. The augers were left in the borehole. On June 13, 2017 an interface probe was lowered inside the augers. The depth to groundwater was 24 feet bgl. A permanent monitor well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 20 feet bgl to 35 feet bgl. The screen was set to intercept possible groundwater bearing sediments in the sandy silt (26 feet bgl to 30 feet bgl) and the silty sand (33 feet bgl to 34 feet bgl). A sand filter pack was installed to approximately 18 feet bgl. A bentonite seal was installed to approximately 15.75 feet bgl. The top of the well casing is approximately 2.67 feet above ground level. The annular seal (bentonite grout) was installed on June 26, 2017.

On June 14, 2017 the well was gauged and the depth to groundwater was 24.44 feet btoc. On June 19, 2017 the well was gauged and the depth to groundwater was 24.75 feet btoc. On June 27, 2017 the well was gauged and the depth to groundwater was 25.00 feet btoc. The well was developed on June 27, 2017 using a disposable bailer. The well was bailed dry after approximately 8 gallons of groundwater was removed. On June 28, 2017 the well was gauged and the depth to groundwater was 26.15 feet btoc. The well was sampled and yielded enough groundwater for a full analytical suite.

The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

OW-60

On June 13, 2017 the drilling rig was set up on location OW-60. Well OW-60 is located adjacent to the southeast (up-gradient) corner of the OCD Landfarm. Sample collection was accomplished using the HSA drilling method and split spoon samplers. One discrete soil sample was retained for laboratory analysis. The lithology encountered consisted of the following:

- Silty Clay: 0 – 2 feet bgl (low plasticity, firm, damp, brown, no odor);
- Clay: 2 feet bgl – 10 feet bgl (high plasticity, firm to stiff, damp, brown, no odor);
- Silty Clay: 10 feet bgl – 28 feet bgl (moderate plasticity, firm to soft, damp, brown, no odor, traces of gravel from 24 to 26 feet and pockets of tan silt from 26 to 28 feet);
- Clayey Silt: 28 feet bgl – 30 feet bgl (low plasticity, soft/crumbly, damp, light brown and grey, no odor);
- Silty Clay: 30 feet bgl – 36 feet bgl (low plasticity, firm to crumbly, damp, light reddish brown with a trace of grey);
- Silty Clay: 36 feet bgl – 38 feet bgl (low plasticity, very stiff, crumbly, damp, light reddish brown and grey, no odor); and
- Silt: 38 feet bgl – 48 feet bgl (low plasticity, compact to dense/stiff, crumbly, damp, light grey, no odor, trace reddish brown clay from 46 to 48 feet).

The drilling was terminated at 48 feet bgl. One soil sample was collected for laboratory analysis from the soil boring for OW-60. The sample was collected from the interval 20 to 22 feet bgl, which exhibited the highest soil vapor reading of 15.3 ppm.

Activities at this location were then shut down for the day. The augers were left in the borehole. On June 14, 2017 an interface probe was lowered inside the augers. No groundwater was detected. A monitor well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 25 feet bgl to 45 feet bgl. The screen was set to intercept possible groundwater bearing sediments in the silt (38 feet bgl to 48 feet bgl). A sand filter pack was installed to approximately 22.5 feet bgl. A bentonite seal was not installed in order to adjust the well setting if necessary. The top of the well casing was approximately 3.00 feet above ground level. Water was present with the soil cuttings that were removed from the augers as they were removed from the wellbore. The well was gauged after the installation of the well materials. No groundwater was encountered. Additional gauging was conducted on OW-60 with the following results:

- June 15, 2017 - 24.68 feet below top of casing (btoc);
- June 16, 2017 – 17.74 feet btoc; and
- June 19, 2017 – 17.45 feet btoc.

It was determined that the sidewalls of the wellbore had caved off into the wellbore onto the top of the sand filter pack. On June 26, 2017 the well materials were removed from the wellbore and the borehole was reamed. New well materials were installed in the borehole. A permanent monitor well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 25 feet bgl to 45 feet bgl. The screen was set to intercept possible groundwater bearing sediments in the silt (38 feet bgl to 48 feet bgl). A sand filter pack was installed to approximately 21.70 feet bgl. A bentonite seal was installed to approximately 19.40 feet bgl. The annular seal (bentonite grout) was installed on June 27, 2017.

On June 27, 2017 the well was gauged and the depth to groundwater was 10.25 feet btoc. The well was developed on June 27, 2017 using a disposable bailer. The well was bailed down after approximately 12 gallons of groundwater was removed. The depth to water was 44.65 feet btoc. On June 28, 2017 the well was gauged and the depth to groundwater was 33.15 feet btoc. The well was sampled and yielded enough groundwater for a full analytical suite.

The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

4.4 SMW-2 Area – Additional Sampling

On June 27, 2017 monitoring well SMW-2 was purged. On June 28, 2017 SMW-2 was sampled. Monitoring well SWM-4 was purged and groundwater samples collected on June 28, 2017. SMW-2 and SMW-4 yielded enough water for a full analytical suite. The measurement of field purging parameters included measurement of groundwater pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature. The groundwater field parameters collected during the sampling event are included in Table 5. Groundwater gauging measurements collected during the field activities are presented in Table 6.

In addition to collecting groundwater samples at SMW-2 and SMW-4, surface water samples were collected from Evaporation Ponds EP-2 and EP-3. The field parameters collected during the collection of the samples are included in Table 5.

Section 5
Regulatory Criteria

The applicable screening and potential cleanup levels are specified in NMED's *Risk Assessment Guidance for Site Investigations and Remediation* dated March 2019 and in the Environmental Protection Agency's (EPA) Regional Screening Levels dated November 2018.

For non-residential properties (e.g., the Gallup Refinery), the soil screening levels must be protective of commercial/industrial workers throughout the upper one foot of surface soils and construction workers throughout the upper ten feet based on NMED criteria. NMED residential soil screening levels are applied to the upper ten feet and soil screening levels for protection of groundwater apply throughout the vadose zone. EPA soil screening levels for direct contact exposure apply to the upper two feet of the vadose zone. The soil screening levels are included in Table 2 for comparison to concentrations of constituents reported for soil samples. The sample results are not segregated based on the aforementioned depths for this initial comparison.

The groundwater cleanup levels are based on New Mexico Water Quality Control Commission (WQCC) standards (20.6.2.7 WW NMAC, 20.6.2.3103, and 20.6.2.4103) unless there is a federal maximum contaminant level (MCL), in which case the lower of the two values is selected as the cleanup level. If neither a WCQQ standard nor an MCL is available, then the cleanup level is based on a NMED Tap Water Screening Level. If a NMED Tap Water Screening Level is not available for a constituent, then an EPA Regional Screening Level is used. If an EPA Regional Screening Level is for a carcinogenic compound, then the screening level is multiplied by 10 to bring the risk level to 1E-05 to be consistent with the NMED screening levels. Table 3 presents the groundwater cleanup levels used for comparison to reported groundwater concentrations. The same screening levels are also used in Tables 4 and 8.

The aforementioned Table 2 has soil screening levels for the soil-to-groundwater pathway that are based on a dilution/attenuation factor (DAF) of 20. Pursuant the discussion in Section 4.9 of NMED's most recent Risk Assessment Guidance, the highest soil leachate-based soil screening level based on a DAF of 20 has been provided in Table A-1 of the guidance and is to be applied for initial screening. If an MCL based value is available, then it is used, if not, then NMED's Cw soil screening

level from Table A-1 is used. If neither of these screening levels is available for a particular constituent, then an EPA screening level is used.

The applicable TPH screening levels for comparison to the individual soil samples are selected from Tables 6-2 and 6-4 of the NMED guidance (NMED, 2019). The groundwater screening levels for TPH are taken from Table 6-4. Both soil and groundwater TPH screening levels for "unknown oil" are used for comparison to site concentrations.

As shown in Table 3, only one constituent (di-n-octyl-phthalate) was detected in groundwater that does not have a screening level. It is not classified as a known carcinogen.

Section 6
Site Impacts

This section discusses the chemical analyses performed and presents the analytical results that were obtained through the analysis of soil, groundwater and surface water samples.

6.1 Soil Analytical Results

One soil sample was collected from each of the soil borings for OW-59 and OW-60. The samples were collected from the interval with the highest soil vapor reading. In the boring for OW-59 a sample was collected from the interval 33 to 34 feet bgl, which exhibited the highest soil vapor reading of 16.3 ppm. In the boring for OW-60 a sample was collected from the interval 20 to 22 feet bgl, which exhibited the highest soil vapor reading of 15.3 ppm.

The soil samples were analyzed for organic constituents by the following methods:

- SW-846 Method 8260 volatile organic compounds;
- SW-846 Method 8270 semi-volatile organic compounds;
- SW-846 Method 8015D gasoline range organics; and
- SW-846 Method 8015M/D diesel and motor oil range organics.

Soil samples were analyzed for the following metals using the indicated analytical methods:

- SW-846 Method 6010B
    - Antimony
    - Arsenic
    - Barium
    - Beryllium
    - Cadmium
    - Chromium
    - Cobalt
    - Iron
    - Manganese
    - Nickel
    - Selenium
    - Silver
    - Vanadium
    - Zinc

- SW-846 Method 7471
  - Mercury
- SW-846 Method 9012
  - Cyanide

The analytical results and the applicable screening levels are presented in Table 2. The laboratory analytical reports are included in Appendix D. The individual results that exceed the applicable cleanup levels are highlighted. The constituents with reported concentrations that exceed screening levels are discussed below.

The following soil samples exceeded the screening levels for the listed constituents. The screening level is included in the parenthesis:

OW-59 (33-34')

- Lead (0.052 mg/kg – Leachate DAF of 20) – 0.72 mg/kg

OW-60 (20-22')

- Iron (6,958.86 mg/kg – Leachate DAF of 20) – 10,000 mg/kg
- Lead (0.052 mg/kg – Leachate DAF of 20) – 1.6 mg/kg
- Manganese (463.84 mg/kg – Non-Residential Soil Screening Level) – 470 mg/kg

Detectable concentrations of 1-methylnaphthalene, 2-methylnaphthalene, acetone, benzene, ethylbenzene, toluene, xylenes, bis(2-ethylhexyl)phthalate, diethyl phthalate, and di-n-butyl phthalate were detected in the soil samples from OW-59 and OW-60. MTBE and naphthalene were also detected in the soil sample from OW-59. None of the volatile or semi-volatile constituents detected in the soil samples from OW-59 and OW-60 exceeded the screening levels.

6.2 Groundwater Analytical Results

The groundwater samples collected from the boundary wells (BW-4B, BW-5B and BW-5C) and the SMW-2 area wells (OW-59 and OW-60) were analyzed for organic constituents by the following methods:

- SW-846 Method 8260 volatile organic compounds;

- SW-846 Method 8270 semi-volatile organic compounds;
- SW-846 Method 8015D gasoline range organics; and
- SW-846 Method 8015M/D diesel and motor oil range organics.

Groundwater samples were analyzed for the following total and dissolved metals using the indicated analytical methods.

Analyte	Analytical Method
Antimony	SW-846 Method 200.8
Arsenic	SW-846 Method 200.8
Barium	SW-846 Method 200.7
Beryllium	SW-846 Method 200.7
Cadmium	SW-846 Method 200.7
Chromium	SW-846 Method 200.7
Cobalt	SW-846 Method 200.7
Iron	SW-846 Method 200.7
Lead	SW-846 Method 200.8
Manganese	SW-846 Method 200.7
Nickel	SW-846 Method 200.7
Selenium	SW-846 Method 200.8
Silver	SW-846 Method 200.7
Vanadium	SW-846 Method 200.7
Zinc	SW-846 Method 200.7

Groundwater samples were also analyzed for the following constituents using the indicated analytical methods.

Analyte	Analytical Method
Cyanide	SW-846 Method 9012B

Analyte	Analytical Method
Mercury	SW-846 Method 245.1

In addition, groundwater samples were analyzed for chloride, fluoride, bromide, phosphorus, sulfate and nitrate+nitrite as N using EPA method 300.

The analytical results and the applicable screening levels are presented in Table 3. The laboratory analytical reports are included in Appendix E. The individual results that exceed the applicable cleanup levels are highlighted. The constituents with reported concentrations that exceed screening levels are discussed below.

The following boundary wells exceeded the screening levels for the listed constituents. The screening level is included in the parenthesis:

BW-4B

- Arsenic (10 ug/L) – 12 ug/L;
- Barium (2,000 ug/L) – 4,700 ug/L;
- Beryllium (4 ug/L) – 48 ug/L;
- Chromium (50 ug/L) – 170 ug/L;
- Cobalt (50 ug/L) – 79 ug/L;
- Iron (1,000 ug/L) – 82,000 ug/L;
- Lead (15 ug/L) – 200 ug/L;
- Manganese (200 ug/L) – 5,600 ug/L;
- Nickel (372 ug/L) – 540 ug/L;
- Vanadium (63.1 ug/L) – 140 ug/L; and
- DRO (0.04 mg/L) – 0.47 mg/L.

BW-5B

- DRO (0.04 mg/L) – 0.74 mg/L.

BW-5C

- Chloride (250,000 ug/L) – 1,400,000 ug/L.

Detectable concentrations of acetone and benzoic acid were reported in the sample collected from BW-4B. The concentrations were below the screening levels. In the sample collected from BW-5B acetone, toluene and benzoic acid were reported at concentrations below the screening levels. Detectable concentrations of 1,1-dichloroethane, 1,2-dichloroethane, acetone, MTBE, benzoic acid, di-n-octyl phthalate, and GRO were reported in the sample collected from BW-5C. The concentrations were below the screening levels.

The following groundwater results from the SMW-2 area exceeded the screening levels for the listed constituents. The screening level is included in the parenthesis.

OW-59

- Arsenic (10 ug/L) – 11 ug/L;
- Iron (1,000 ug/L) – 9,700 ug/L;
- Manganese (200 ug/L) – 1,200 ug/L;
- Manganese – Dissolved (200 ug/L) – 670 ug/L;
- Chloride (250,000 ug/L) – 2,000,000 ug/L;
- Sulfate (600,000 ug/L) – 3,000,000 ug/L;
- GRO (0.04 mg/L) – 0.23 mg/L; and
- DRO (0.04 mg/L) – 0.56 mg/L.

Detectable concentrations of 1,2,4-trimethybenzene, acetone, MTBE, and benzoic acid, were reported in the groundwater sample collected from OW-59. None of the constituents exceeded the screening levels.

OW-60

- Beryllium (4 ug/L) – 4.6 ug/L;
- Iron (1,000 ug/L) – 28,000 ug/L;
- Manganese (200 ug/L) – 2,200 ug/L;
- Manganese – Dissolved (200 ug/L) – 550 ug/L;
- Chloride (250,000 ug/L) – 1,600,000 ug/L; and

- Sulfate (600,000 ug/L) – 740,000 ug/L.

Detectable concentrations of 4-Isopropyltoluene, acetone, MTBE, toluene, benzoic acid, and bis(2-ethyhexyl)phthalate were reported in the groundwater sample collected from OW-60. None of the concentrations exceeded the screening levels.

6.3 SMW-2 Area – Additional Sampling

Groundwater samples from SMW-2 and SWM-4 and surface water samples collected from Evaporation Ponds EP-2 and EP-3 were analyzed for chloride, fluoride, bromide, phosphorus, sulfate and nitrate+nitrite as N using EPA method 300. The samples were also analyzed for calcium, magnesium, potassium, and sodium using EPA method 200.7.

The analytical results and the applicable screening levels are presented in Table 4. The laboratory analytical reports are included in Appendix F. The analytical results for the aforementioned constituents reported for OW-59 and OW-60 are also included in Table 4 for a direct comparison to the nearby sampling locations. The individual results that exceed the applicable cleanup levels are bolded. The constituents with reported concentrations that exceed screening levels are discussed below. The screening level is included in the parenthesis:

<u>OW-59</u>

- Chloride (250 mg/L) – 2,000 mg/L; and
- Sulfate (600 mg/L) – 3,000 mg/L.

<u>OW-60</u>

- Chloride (250 mg/L) – 1,600 mg/L; and
- Sulfate (600 mg/L) – 740 mg/L.

<u>SMW-2</u>

- Chloride (250 mg/L) – 2,600 mg/L; and
- Sulfate (600 mg/L) – 1,500 mg/L.

<u>Evaporation Pond #2 (Surface Water Sample)</u>

- Chloride (250 mg/L) – 5,000 mg/L;

- Sulfate (600 mg/L) – 1,400 mg/L; and
- Fluoride (1.6 mg/L) – 18 mg/L.

Evaporation Pond #3 (Surface Water Sample)

- Chloride (250 mg/L) – 7,100 mg/L;
- Sulfate (600 mg/L) – 1,800 mg/L; and
- Fluoride (1.6 mg/L) – 16 mg/L.

Included as Figure 5 is a potentiometric map developed from groundwater elevations collected in September 2017 in the SMW-2 area. As shown on Figure 5 the groundwater flow direction is from the east-southeast to the west-northwest. OW-60 is an up-gradient well located near the southeast corner of the OCD Central Landfarm. OW-59 is located approximately 440 feet downgradient to OW-60 and 230 feet upgradient to SMW-2. Monitoring well SMW-4 is located approximately 780 feet downgradient of SMW-2. Neither SWM-2 nor MW-4 are used to prepare the contours, as they not believed to be screened at the contact of the Alluvium/Chinle Formation as are the other wells on Figure 5. MW-4 is screened deeper in the Sonsela aquifer and SMW-2 is screened in upper sands as described in the LTA Subsurface Conditions evaluation completed by Precision Engineering, Inc. in 1996 (Appendix G).

Figure 6 presents sulfate and chloride concentrations reported from groundwater and surface water samples collected in the SWM-2 area. The chloride concentrations reported from the surface water samples collected from EP-2 and EP-3 were the highest concentrations reported during the sampling event, 5,000 mg/l and 7,100 mg/l, respectively. The chloride concentrations increased downgradient from OW-60 (1,600 mg/L) to OW-59 (2,000 mg/L) and increase in SMW-2 (2,600 mg/L). The chloride concentrations decreased from 2,600 mg/L in SMW-2 to 63 mg/L in the sample from SMW-4.

The sulfate concentrations in samples collected from EP-2 and EP-3 were elevated, but were not the highest concentrations reported in the sampling area. The highest reported concentration reported was from OW-59 (3,000 mg/L). Figure 6 indicates that the sulfate concentration increased from OW-60 (740 mg/L) to OW-59 (3,000 mg/L) and then decreased in SMW-2 (1,500 mg/L). The sulfate concentration in the sample from SMW-4 (downgradient well) was the lowest reported at 180 mg/L.

Based on the flow direction of groundwater and the reported concentrations, the elevated chloride concentrations in SMW-2 may be originating from a source located in the area of the OCD Central

landfarm, or further up-gradient. The sulfate concentrations increase across the OCD Central landfarm moving down-gradient, with the highest reported concentrations in the area in the groundwater sample collected in OW-59. This could suggest the OCD Central landfarm is a source of the sulfate.

6.4 General Groundwater Chemistry

The measurement of field purging parameters included measurement of groundwater pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature. The groundwater field parameters collected during the sampling event are included in Table 5. Groundwater gauging measurements collected during the field activities are presented in Table 6.

6.5 Subsequent Data

Additional groundwater data has been collected from the five monitoring wells installed and sampled in June 2017. Included as Table 7 are the fluid level measurements of the five wells through the 2018 fourth quarter gauging event. Table 8 presents the analytical data collected during the 2017 fourth quarter sampling event.

In addition to the detections discussed above in Section 6.2, MTBE and GRO were detected at concentrations below the screening levels in a groundwater sample collected at BW-5B.

Section 7
Conclusions and Recommendations

The analytical results from groundwater samples collected at new wells OW-59 and OW-60, along with groundwater samples collected at existing well SMW-2 and surface water samples collected from Evaporation Ponds EP-2 and EP-3 provide a better understanding of the distribution of chloride and sulfate in the immediate vicinity. However, the data is not conclusive as to a particular source of either constituent. The highest sulfate concentrations appear at the down-gradient end of the OCD Central landfarm, which could be the primary source of sulfate affecting groundwater at SMW-2. An obvious source of the chloride was not identified in the immediate area.

It is recommended to install additional monitoring wells to better determine if a local source of chloride and/or sulfate is present. An Investigation Work Plan for additional monitoring wells was submitted in August, 2018 pursuant to NMED's request.

Section 8
References

DiSorbo, 2016, Work Plan SMW-2 Area Investigation and Boundary Well Installations, Gallup Refinery.

Geoscience Consultants, Ltd, 1985a, Inventory of Solid Waste Management Units, June 14, 1985, p. 22.

Geoscience Consultants, Ltd, 1985b, Discharge Plan Application for Giant Refining Company Ciniza Refinery, Gallup New Mexico, November 21, 1985, p, 59.

Heckert, A.B. and Lucas, S.G., 1996, *Stratigraphic description of the Tr-4 unconformity in west-central New Mexico and eastern Arizona*: New Mexico Geology, Vol. 18, No. 3, pp. 61-70.

Lucas, S. G., Heckert, A.B., and Anderson, O. J., 1997, *Triassic Stratigraphy and Paleontology on the Fort Wingate quadrangle, west-central New Mexico*, New Mexico Geology, Vol. 19, No. 2. pp 33 - 42.

NMED, 2019, *Risk Assessment Guidance for Site Investigations and Remediation*, New Mexico Environment Department, p.105.

Western Refining, 2009, *Facility Wide Groundwater Monitoring Work Plan*, Western Refining Company Southwest, Inc., p. 78.

Western Refining Southwest, Inc., 2017, *Facility Wide Ground Water Monitoring Report*.

Figures

Figure 1 Site Location Map

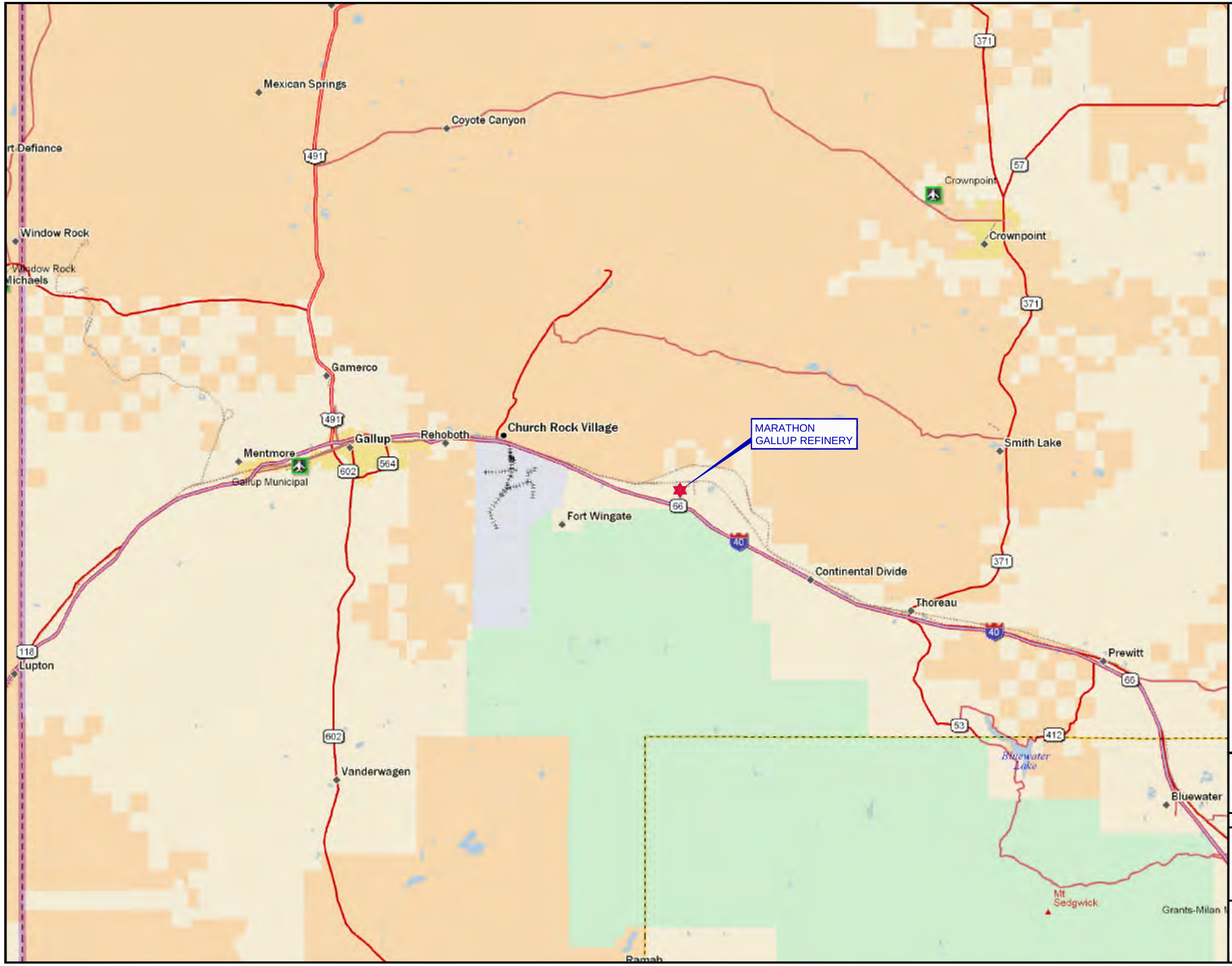
Figure 2 Well Location Map – Boundary Wells

Figure 3 Well Location Map – SMW-2 Area

Figure 4 Geologic Map of New Mexico

Figure 5 Chinle/Alluvium Interface Potentiometric Map – September 2017

Figure 6 Sulfate and Chloride Concentrations



Map Source: DeLorme Street Atlas USA 2007 Plus.

N

0 5
SCALE IN MILES

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 03/24/19 | FILE: Mathon-dB206

FIGURE 1
SITE LOCATION MAP
GALLUP REFINERY

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



Aerial Map Source: Google Map, 03/18/2016.

N

0 300

SCALE IN FEET

LEGEND

MKTF-43 MONITORING WELL LOCATION (CHINLE / ALLUVIAL) AND IDENTIFICATION NUMBER

OW-01 MONITORING WELL LOCATION (SONSELA) AND IDENTIFICATION NUMBER

PW-2 RAW WATER PRODUCTION WELL LOCATION AND IDENTIFICATION NUMBER

NEW MEXICO

SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 03/24/19 | FILE: Mathon-dA128

FIGURE 2
WELL LOCATION MAP
BOUNDARY WELLS

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



Aerial Map Source: Google Map, 03/18/2016.

N

0 300

SCALE IN FEET

NEW MEXICO

SITE LOCATION

LEGEND

MKTF-43 ● MONITORING WELL LOCATION (CHINLE / ALLUVIAL) AND IDENTIFICATION NUMBER

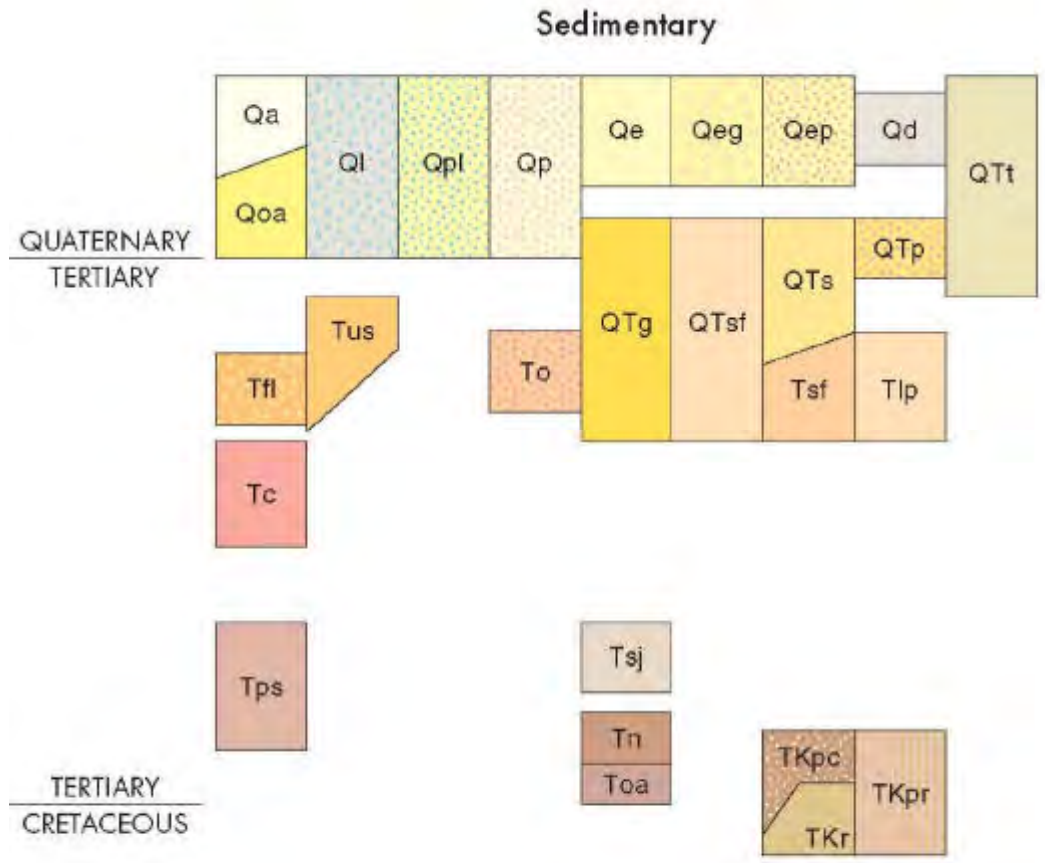
OW-01 ● MONITORING WELL LOCATION (SONSELA) AND IDENTIFICATION NUMBER

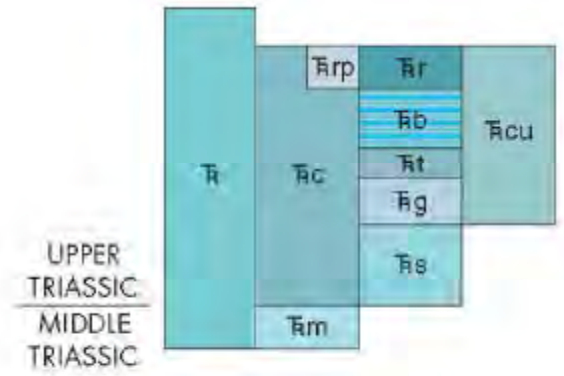
MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon	DATE: 03/24/19	FILE: Mathon-dA76

FIGURE 3
WELL LOCATION MAP
SMW-2 AREA

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759







DESCRIPTION OF MAP UNITS

QUATERNARY

Qa Alluvium (Holocene to upper Pleistocene)

Ql Landslide deposits and colluvium (Holocene to Pleistocene)—Landslide deposits on western flanks of Socorro Mountains not shown for clarity

Qpl Lacustrine and playa deposits (Holocene)—Includes associated alluvial and eolian deposits of major lake basins

Qp Piedmont alluvial deposits (Holocene to lower Pleistocene)—Includes deposits of higher gradient tributaries bordering major stream valleys, alluvial veneers of the piedmont slope, and alluvial fans. May locally include uppermost Pliocene deposits

TRIASSIC

Chinle Formation of previous workers (e.g., Stewart et al., 1972) is used here as Chinle Group, following Lucas (1993)

Tr Triassic rocks, undivided—Continental red beds

Trp Rock Point Formation of Chinle Group (Upper Triassic)—May locally include Wingate Sandstone (Triassic)

Trc Chinle Group (Upper Triassic)—Map unit includes Moenkopi Formation (Middle Triassic) at base in many areas; in eastern part of state the following five formations are mapped:

Trr Redonda Formation (Upper Triassic)

Trb Bull Canyon Formation (Norian)

Trt Trujillo Formation (Norian)

Trg Garita Creek Formation (Carnian)

Trs Santa Rosa Formation (Carnian)—Includes Moenkopi Formation (Middle Triassic) at base in most areas

Trcu Upper Chinle Group, Garita Creek through Redonda Formations, undivided

Trm Moenkopi Formation (Middle Triassic)

JURASSIC

To compare this map nomenclature to the USGS nomenclature, see the diagram included on this sheet (at right)

J Upper and Middle Jurassic rocks, undivided. In southwest includes the basalt-bearing Broken Jug Formation

Jm Morrison Formation—Upper Jurassic nonmarine rocks

Jmsu Morrison Formation and upper San Rafael Group (lowermost Cretaceous?–upper Jurassic)

Jz Zuni Sandstone (Callovian)—Consists of undivided equivalents of the Summerville Formation and Bluff Sandstone; restricted to Zuni Basin area

Jze Zuni and Entrada Sandstones, undivided

Je Entrada Sandstone (Middle Jurassic)

Jsr San Rafael Group (Middle Jurassic)—Consists of Entrada Sandstone, Todilto and Summerville Formations, Bluff Sandstone, and locally Zuni Sandstone (or only Acoma Tongue of Zuni)

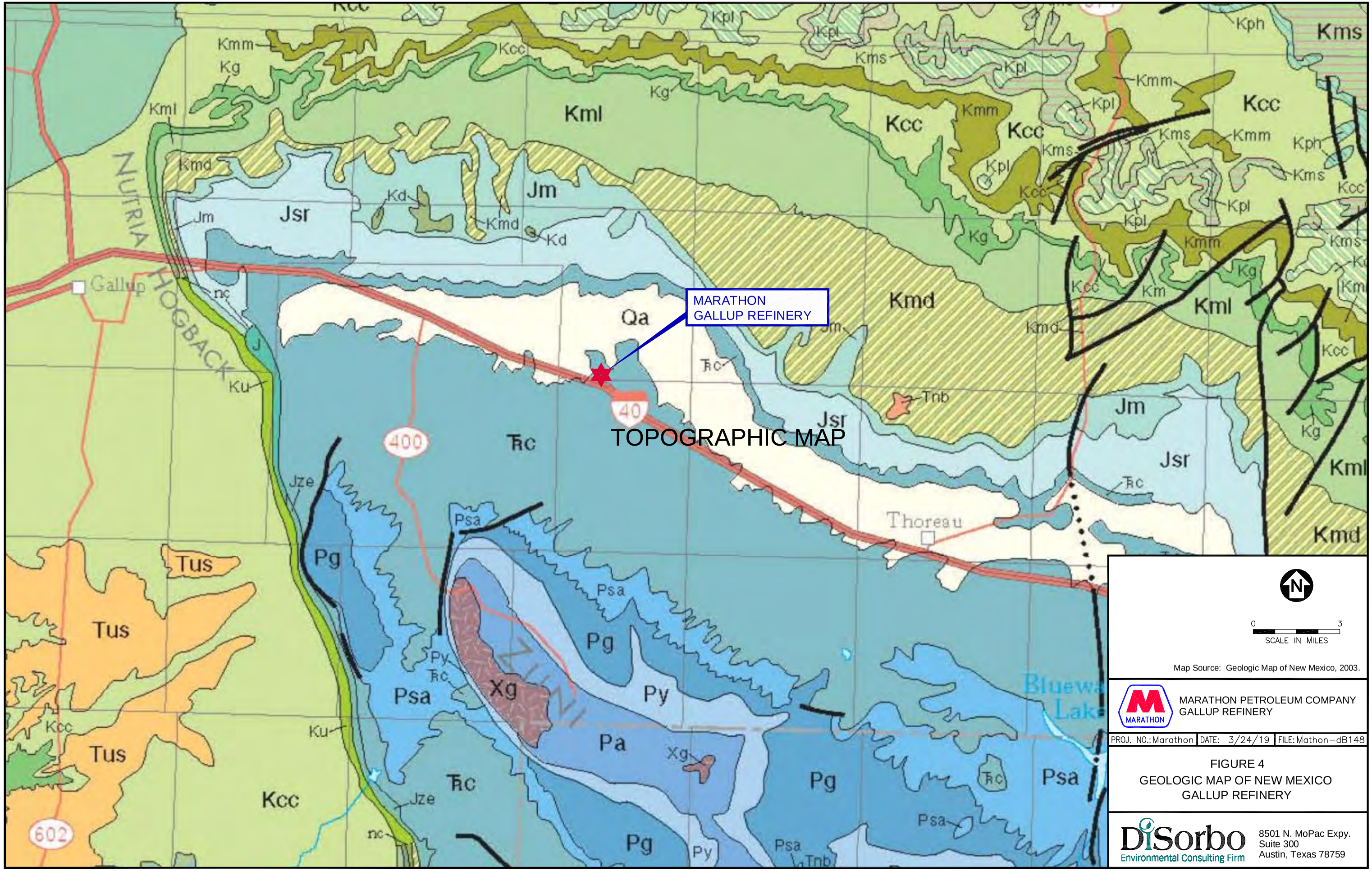
Map Source: Geologic Map of New Mexico, 2003.

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 3/24/19 | FILE: Mathon–dB148

FIGURE 4
GEOLOGIC MAP OF NEW MEXICO
GALLUP REFINERY

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



TOPOGRAPHIC MAP

0 3
SCALE IN MILES

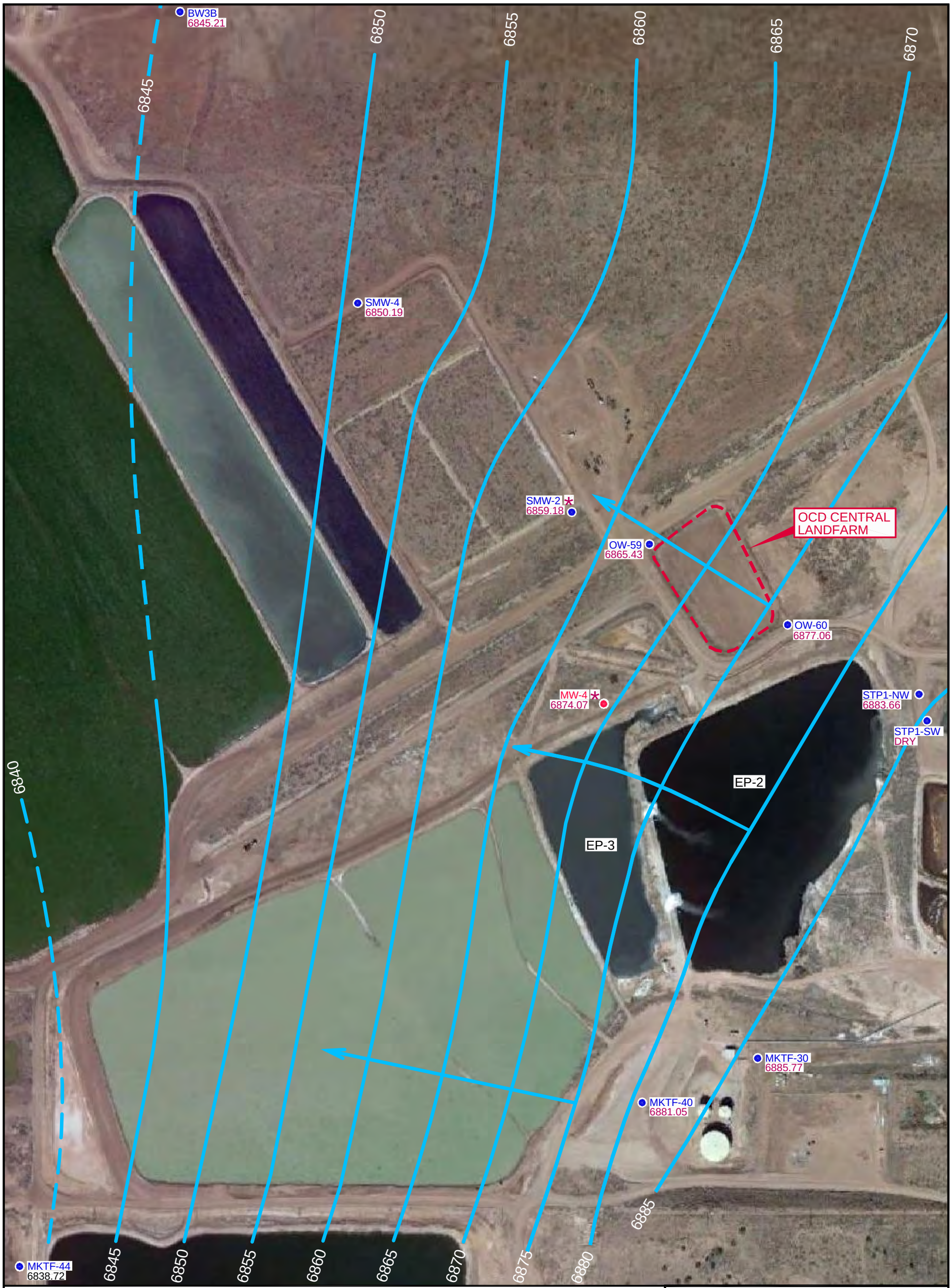
Map Source: Geologic Map of New Mexico, 2003.

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 3/24/19 | FILE: Mathon-dB148

FIGURE 4
GEOLOGIC MAP OF NEW MEXICO
GALLUP REFINERY

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



Aerial Map Source: Google Map, 03/18/2016.

LEGEND

- MKTF-40 — MONITORING WELL LOCATION (CHINLE / ALLUVIAL) AND IDENTIFICATION NUMBER
- MW-04 — MONITORING WELL LOCATION (SONSELA) AND IDENTIFICATION NUMBER
- 6860 — POTENTIOMETRIC CONTOUR (FT) (5 FT INTERVAL)
- GROUNDWATER FLOW DIRECTION
- 6881.05 — WATER LEVEL ELEVATION MEASURED SEPT. 2017 (ABOVE MSL)
- * — DATA NOT USED IN CONTOURS

N

0 250
SCALE IN FEET

NEW MEXICO
SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 03/24/19 | FILE: Mathon–dB178

FIGURE 5
CHINLE / ALLUVIUM INTERFACE POTENTIOMETRIC MAP SEPTEMBER 2017

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



Aerial Map Source: Google Map, 03/18/2016.

0 300
SCALE IN FEET

LEGEND

SMW-2 MONITORING WELL LOCATION (CHINLE / ALLUVIAL) AND IDENTIFICATION NUMBER

MW-4 MONITORING WELL LOCATION (SONSELA) AND IDENTIFICATION NUMBER

2,000 CHLORIDE CONCENTRATION (mg/L)
3,000 SULFATE CONCENTRATION (mg/L)

NA NOT ANALYZED

ANALYSIS FROM JUNE 2017
EXCEPT GWM-1 (AUGUST 2017)

NEW MEXICO

SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 03/24/19 | FILE: Mathon-dA146

FIGURE 6

SULFATE AND CHLORIDE CONCENTRATIONS

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Tables

Table 1 Soil Vapor Screening Results

Table 2 Soil Analytical Data

Table 3 Groundwater Analytical Data

Table 4 SMW-2 Area Additional Sampling

Table 5 Groundwater and Surface Water Field Measurements

Table 6 Groundwater Gauging Results

Table 7 Fluid Levels

Table 8 Fourth Quarter 2017 Groundwater Analytical Data

Table 1
Soil Vapor Screening Results
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Sample Interval Depth (ftbgl)	BW-4A (ppm)	BW-4B (ppm)	BW-5A (ppm)	BW-5B (ppm)	BW-5C (ppm)	OW-59 (ppm)	OW-60 (ppm)
0 - 2	7.7	1.3	NR	NR	0.0	0.0	6.5
2 - 4	9.5	1.2	NR	NR	0.1	0.0	5.8
4 - 6	9.0	1.3	NR	NR	0.0	0.0	6.3
6 - 8	6.8	1.7	NR	NR	0.0	2.0	8.1
8 - 10	5.4	2.0	NR	NR	0.1	1.0	9.6
10 - 12	3.3	2.1	0.0	NR	0.0	0.3	9.1
12 - 14	5.8	3.1	0.0	NR	0.1	0.5	8.2
14 - 16	4.0	3.4	0.0	NR	0.0	1.3	7.9
16 - 18	2.0	5.1	0.0	NR	0.0	1.7	8.3
18 - 20	6.9	3.2	0.0	NR	0.0	1.1	10.1
20 - 22	5.0	3.9	TD 20 ftbgl	NR	0.0	1.2	15.3
22 - 24	3.6	3.5		NR	0.0	0.2	12.1
24 - 26	3.7	3.9		NR	0.0	3.3	11.6
26 - 28	6.2	1.8		NR	0.0	10.9	10.9
28 - 30	3.5	1.8		NR	0.0	11.6	10.5
30 - 32	6.1	2.0		NR	0.0	11.4	11.1
32 - 34	6.1	2.2		NR	0.0	14.9/16.3	15.0
34 - 36	3.8	5.6		NR	0.0	10.5	12.8
36 - 38	6.1	3.6		NR	0.0	7.3	12.7
38 - 40	5.2	2.3		NR	0.0	10.0	10.4
40 - 42	4.2	6.2		NR	0.0	TD 40 ftbgl	9.9
42 - 44	3.9	5.0		NR	0.0		10.7
44 - 46	TD 44 ftbgl	2.6		NR	0.0		10.1
46 - 48		3.5		NR	0.1		9.6
48 - 50		1.9		0.0	0.0		TD 48 ftbgl
50 - 52		5.1		0.0	0.0		
52 - 54		5.6		0.0	0.0		
54 - 56		3.8		0.0	0.0		
56 - 58		3.4		0.0	0.0		
58 - 60		2.4		TD 58 ftbgl	0.0		
60 - 62		4.9			0.0		
62 - 64		1.7			0.0		
64 - 66		5.8			0.0		
66 - 68		2.7			0.0		
68 - 70		3.9			0.0		
70 - 72		1.6			NR		
72 - 74		1.7			NR		
74 - 76		1.0			NR		
76 - 78		0.1			TD 76 ftbgl		
78 - 80		0.4					
80 - 82		0.1					
82 - 84		0.2					
84 - 86		0.0					
86 - 88		0.1					
88 - 90		0.2					
		TD 90 ftbgl					

ftbgl - feet below ground level ppm - parts per million NR - No reading was collected.

Table 2
Soil Analytical Data
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Residential Soil Screening Level	Source	Non-Residential Soil Screening Level	Source	Leachate DAF (20) (mg/kg) SoilGW	Source	OW-59 (33-34')		OW-60 (20-22')	
					Lab ID		1706910-003		1706910-004	
					Sample Date		6/12/2017		6/13/2017	
Metals (mg/kg)										
Antimony	3.13E+01	(1)	1.42E+02	(5)	5.42E+00	(10)	< 0.996	u	< 1.0017	u
Arsenic	7.07E+00	(1)	3.59E+01	(4)	5.83E+00	(8)	< 0.8796	u	1.3	J
Barium	1.56E+04	(1)	4.39E+03	(5)	1.65E+03	(10)	130	v	160	v
Beryllium	1.56E+02	(1)	1.48E+02	(5)	6.32E+01	(10)	0.34	v	0.52	v
Cadmium	7.05E+01	(1)	7.21E+01	(5)	7.52E+00	(10)	< 0.0628	u	< 0.0631	u
Chromium (Total)	9.66E+01	(1)	1.34E+02	(5)	3.60E+06	(10)	4.6	v	6.4	v
Cobalt	2.34E+01	(1)	3.67E+01	(5)	5.40E+00	(8)	2.1	v	3.1	v
Cyanide	1.12E+01	(1)	1.21E+01	(5)	7.13E-01	(8)	< 0.25	u	< 0.25	u
Iron	5.48E+04	(1)	2.48E+05	(5)	6.96E+03	(8)	6,400	v	10,000	v
Lead	4.00E+02	(2)	8.00E+02	(6)	5.20E-02	(10)	0.72	v	1.6	v
Manganese	1.05E+04	(1)	4.64E+02	(5)	2.63E+03	(8)	180	v	**470**	v
Mercury (elemental)	2.38E+01	(1)	2.07E+01	(5)	2.09E+00	(8)	< 0.0063	u	< 0.0063	u
Nickel	1.56E+03	(1)	7.53E+02	(5)	4.85E+02	(8)	3.5	v	4.9	v
Selenium	3.91E+02	(1)	1.75E+03	(5)	5.17E+00	(10)	< 1.8009	u	< 1.8111	u
Silver	3.91E+02	(1)	1.77E+03	(5)	1.38E+01	(8)	< 0.062	u	< 0.0623	u
Vanadium	3.94E+02	(1)	6.14E+02	(5)	1.26E+03	(8)	11	v	14	v
Zinc	2.35E+04	(1)	1.06E+05	(5)	7.41E+03	(8)	7.5	v	10	v
Volatiles (mg/kg)										
1,1,1,2-Tetrachloroethane	2.81E+01	(1)	1.37E+02	(4)	3.60E-02	(8)	<0.0001	u	<0.0001	u
1,1,1-Trichloroethane	1.44E+04	(1)	1.36E+04	(5)	1.28E+00	(10)	<0.0001	u	<0.0001	u
1,1,2,2-Tetrachloroethane	7.98E+00	(1)	3.94E+01	(4)	4.81E-03	(8)	<0.0002	u	<0.0001	u
1,1,2-Trichloroethane	2.61E+00	(1)	2.30E+00	(5)	2.68E-02	(8)	<0.0001	u	<0.0001	u
1,1-Dichloroethane	7.86E+01	(1)	3.83E+02	(4)	1.36E-01	(8)	<0.0001	u	<0.0001	u
1,1-Dichloroethene	4.40E+02	(1)	4.24E+02	(5)	4.79E-02	(10)	<0.0001	u	<0.0001	u
1,1-Dichloropropene	-	-	-	-	-	-	<0.0002	u	<0.0001	u
Trichlorobenzene, 1,2,3-	6.30E+01	(2)	9.30E+02	(6)	4.20E-01	(9)	<0.0001	u	<0.0001	u
1,2,3-Trichloropropane	5.10E-02	(1)	1.21E+00	(4)	5.82E-05	(8)	<0.0003	u	<0.0003	u
1,2,4-Trichlorobenzene	8.29E+01	(1)	7.91E+01	(5)	3.10E+00	(8)	<0.0002	u	<0.0001	u
Trimethylbenzene, 1,2,4-	3.00E+02	(2)	1.80E+03	(6)	1.62E+00	(9)	<0.0002	u	<0.0002	u
1,2-Dibromo-3-chloropropane	8.58E-02	(1)	1.18E+00	(4)	1.39E-03	(8)	<0.0002	u	<0.0002	u
1,2-Dibromoethane (Ethylene dibromide)	6.72E-01	(1)	3.31E+00	(4)	2.36E-04	(10)	<0.0002	u	<0.0001	u
1,2-Dichlorobenzene	2.15E+03	(1)	2.50E+03	(5)	9.08E+00	(8)	<0.0002	u	<0.0001	u
1,2-Dichloroethane	8.32E+00	(1)	4.07E+01	(4)	2.38E-02	(8)	<0.0002	u	<0.0001	u
1,2-Dichloropropane	1.78E+01	(1)	2.54E+01	(5)	2.77E-02	(8)	<0.0002	u	<0.0001	u
Trimethylbenzene, 1,3,5-	2.70E+02	(2)	1.50E+03	(6)	1.74E+00	(9)	<0.0002	u	<0.0002	u
1,3-Dichlorobenzene	-	-	-	-	-	-	<0.0002	u	<0.0001	u
Dichloropropane, 1,3-	1.60E+03	(2)	2.30E+04	(6)	2.60E+00	(9)	<0.0001	u	<0.0001	u
1,4-Dichlorobenzene	1.29E+03	(1)	6.73E+03	(4)	1.12E+00	(8)	<0.0002	u	<0.0001	u
1-Methylnaphthalene	1.72E+02	(1)	8.13E+02	(4)	8.93E-01	(8)	0.0003	J	0.0003	J
2,2-Dichloropropane	-	-	-	-	-	-	<0.0001	u	<0.0001	u
2-Butanone (Methyl ethyl ketone, MEK)	3.74E+04	(1)	9.17E+04	(5)	2.01E+01	(8)	<0.0006	u	<0.0005	u
o-Chlorotoluene	1.56E+03	(1)	7.08E+03	(5)	3.56E+00	(8)	<0.0002	u	<0.0001	u
Hexanone, 2-	2.00E+02	(2)	1.30E+03	(6)	1.76E-01	(9)	<0.0003	u	<0.0002	u
2-Methylnaphthalene	2.32E+02	(1)	1.00E+03	(5)	2.76E+00	(8)	0.0004	J	0.0003	J
Chlorotoluene, p-	1.60E+03	(2)	2.30E+04	(6)	4.80E+00	(9)	<0.0002	u	<0.0002	u
4-Isopropyltoluene	-	-	-	-	-	-	<0.0002	u	<0.0002	u
Methyl isobutyl ketone	5.81E+03	(1)	2.02E+04	(5)	4.80E+00	(8)	<0.0005	u	<0.0004	u

Table 2
Soil Analytical Data
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Residential Soil Screening Level	Source	Non-Residential Soil Screening Level	Source	Leachate DAF (20) (mg/kg) SoilGW	Source	OW-59 (33-34')		OW-60 (20-22')	
					Lab ID		1706910-003		1706910-004	
					Sample Date		6/12/2017		6/13/2017	
Acetone	6.63E+04	(1)	2.42E+05	(5)	4.98E+01	(8)	0.0119	v	0.011	v
Benzene	1.78E+01	(1)	8.72E+01	(4)	4.18E-02	(8)	0.0019	v	0.0007	v
Bromobenzene	2.90E+02	(2)	1.80E+03	(6)	8.40E-01	(9)	<0.0002	u	<0.0002	u
Bromodichloromethane	6.19E+00	(1)	3.02E+01	(4)	6.21E-03	(8)	<0.0002	u	<0.0002	u
Tribromomethane (Bromoform)	6.74E+02	(1)	1.76E+03	(4)	1.47E-01	(8)	<0.0002	u	<0.0001	u
Bromomethane	1.77E+01	(1)	1.79E+01	(5)	3.43E-02	(8)	<0.0004	u	<0.0003	u
Carbon disulfide	1.55E+03	(1)	1.62E+03	(5)	4.42E+00	(8)	<0.0003	u	<0.0003	u
Carbon tetrachloride	1.07E+01	(1)	5.25E+01	(4)	3.67E-02	(8)	<0.0001	u	<0.0001	u
Chlorobenzene (Monochlorobenzene	3.78E+02	(1)	4.12E+02	(5)	1.08E+00	(8)	<0.0001	u	<0.0001	u
Ethyl chloride	1.90E+04	(1)	1.66E+04	(5)	1.07E+02	(8)	<0.0002	u	<0.0001	u
Chloroform	5.90E+00	(1)	2.87E+01	(4)	1.09E-02	(8)	<0.0002	u	<0.0001	u
Chloromethane	4.11E+01	(1)	2.01E+02	(4)	9.52E-02	(8)	<0.0002	u	<0.0002	u
cis-1,2-Dichloroethene	1.56E+02	(1)	7.08E+02	(5)	3.52E-01	(8)	<0.0002	u	<0.0001	u
cis-1,3-Dichloropropene	-	-	-	-	-	-	<0.0001	u	<0.0001	u
Dibromochloromethane	1.39E+01	(1)	6.74E+01	(4)	7.55E-03	(8)	<0.0001	u	<0.0001	u
Dibromomethane (Methylene Bromide)	2.40E+01	(2)	9.90E+01	(6)	4.20E-02	(9)	<0.0001	u	<0.0001	u
Dichlorodifluoromethane	1.82E+02	(1)	1.61E+02	(5)	7.23E+00	(8)	<0.0002	u	<0.0001	u
Ethylbenzene	7.51E+01	(1)	3.68E+02	(4)	1.23E+01	(8)	0.0003	J	0.0002	J
Hexachloro-1,3-butadiene	6.16E+01	(1)	5.21E+01	(4)	4.13E-02	(8)	<0.0002	u	<0.0002	u
Cumene (isopropylbenzene)	2.36E+03	(1)	2.74E+03	(5)	1.14E+01	(8)	<0.0002	u	<0.0002	u
tert-Butyl methyl ether (MTBE)	9.75E+02	(1)	4.82E+03	(4)	5.53E-01	(8)	0.0007	J	<0.0003	u
Methylene chloride (Dichloromethan	4.09E+02	(1)	1.21E+03	(5)	2.21E-02	(10)	<0.0003	u	<0.0003	u
Naphthalene	1.16E+03	(1)	5.02E+03	(5)	8.23E-02	(8)	0.0003	J	<0.0001	u
Butylbenzene, n-	3.90E+03	(2)	5.80E+04	(6)	6.40E+01	(9)	<0.0002	u	<0.0002	u
Propyl benzene	3.80E+03	(2)	2.40E+04	(6)	2.40E+01	(9)	<0.0002	u	<0.0002	u
Butylbenzene, sec-	7.80E+03	(2)	1.20E+05	(6)	1.18E+02	(9)	<0.0002	u	<0.0002	u
Styrene	7.26E+03	(1)	1.02E+04	(5)	1.71E+00	(10)	<0.0001	u	<0.0001	u
Butylbenzene, tert-	7.80E+03	(2)	1.20E+05	(6)	3.20E+01	(9)	<0.0002	u	<0.0002	u
Tetrachloroethene	1.11E+02	(1)	1.20E+02	(5)	3.98E-02	(10)	<0.0001	u	<0.0001	u
Toluene	5.23E+03	(1)	1.40E+04	(5)	1.11E+01	(10)	0.0008	v	0.0004	J
trans-1,2-Dichloroethene	2.95E+02	(1)	3.05E+02	(5)	5.03E-01	(8)	<0.0002	u	<0.0001	u
trans-1,3-Dichloropropene	-	-	-	-	-	-	<0.0001	u	<0.0001	u
Trichloroethylene	6.77E+00	(1)	6.90E+00	(5)	3.10E-02	(8)	<0.0001	u	<0.0001	u
Trichlorofluoromethane	1.23E+03	(1)	1.13E+03	(5)	1.57E+01	(8)	<0.0001	u	<0.0001	u
Vinyl chloride	7.42E-01	(1)	2.84E+01	(4)	1.34E-02	(8)	<0.0001	u	<0.0001	u
Xylenes	8.71E+02	(1)	7.98E+02	(5)	1.54E+02	(8)	0.001	J	0.0007	J
Semi-volatiles (mg/kg)										
1,2,4-Trichlorobenzene	8.29E+01	(1)	7.91E+01	(5)	3.10E+00	(8)	< 0.183	u	< 0.1838	u
1,2-Dichlorobenzene	2.15E+03	(1)	2.50E+03	(5)	9.08E+00	(8)	< 0.1492	u	< 0.1499	u
1,3-Dichlorobenzene	-	-	-	-	-	-	< 0.1377	u	< 0.1384	u
1,4-Dichlorobenzene	1.29E+03	(1)	6.73E+03	(4)	1.12E+00	(8)	< 0.1615	u	< 0.1622	u
1-Methylnaphthalene	1.72E+02	(1)	8.13E+02	(7)	8.93E-01	(8)	< 0.192	u	< 0.1929	u
2,4,5-Trichlorophenol	6.16E+03	(1)	2.69E+04	(5)	6.62E+01	(8)	< 0.1472	u	< 0.1479	u
2,4,6-Trichlorophenol	6.16E+01	(1)	2.69E+02	(5)	6.74E-01	(8)	< 0.1565	u	< 0.1572	u
2,4-Dichlorophenol	1.85E+02	(1)	8.07E+02	(5)	8.25E-01	(8)	< 0.1567	u	< 0.1575	u
2,4-Dimethylphenol	1.23E+03	(1)	5.38E+03	(5)	6.45E+00	(8)	< 0.0883	u	< 0.0887	u
2,4-Dinitrophenol	1.23E+02	(1)	5.38E+02	(5)	6.69E-01	(8)	< 0.1179	u	< 0.1184	u
2,4-Dinitrotoluene	1.71E+01	(1)	8.23E+01	(4)	4.92E-02	(8)	< 0.1855	u	< 0.1863	u
2,6-Dintitrotoluene	3.56E+00	(1)	1.72E+01	(4)	1.02E-02	(8)	< 0.1746	u	< 0.1754	u
b-Chloronaphthalene	6.26E+03	(1)	2.83E+04	(5)	5.70E+01	(8)	< 0.178	u	< 0.1788	u

Table 2
Soil Analytical Data
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Residential Soil Screening Level	Source	Non-Residential Soil Screening Level	Source	Leachate DAF (20) (mg/kg) SoilGW	Source	OW-59 (33-34')		OW-60 (20-22')	
					Lab ID		1706910-003		1706910-004	
					Sample Date		6/12/2017		6/13/2017	
2-Chlorophenol	3.91E+02	(1)	1.77E+03	(5)	1.15E+00	(8)	< 0.1437	u	< 0.1444	u
2-Methylnaphthalene	2.32E+02	(1)	1.00E+03	(5)	2.76E+00	(8)	< 0.1668	u	< 0.1676	u
Cresol, o-	3.20E+03	(2)	4.10E+04	(6)	1.50E+01	(9)	< 0.1469	u	< 0.1476	u
Nitroaniline, 2-	6.30E+02	(2)	8.00E+03	(6)	1.60E+00	(9)	< 0.1824	u	< 0.1832	u
2-Nitrophenol	-	-	-	-	-	-	< 0.1869	u	< 0.1878	u
3,3-Dichlorobenzidine	1.18E+01	(1)	5.70E+01	(4)	1.24E-01	(8)	< 0.1462	u	< 0.1469	u
3+4-Methylphenol	-	-	-	-	-	-	< 0.1338	u	< 0.1344	u
3-Nitroaniline	-	-	-	-	-	-	< 0.1774	u	< 0.1782	u
4,6-Dinitro-o-cresol	4.93E+00	(1)	2.15E+01	(5)	3.98E-02	(8)	< 0.1504	u	< 0.1511	u
4-Bromophenyl phenyl ether	-	-	-	-	-	-	< 0.162	u	< 0.1628	u
4-Chloro-3-methylphenol	-	-	-	-	-	-	< 0.1803	u	< 0.1812	u
Chloroaniline, p-	2.70E+01	(3)	1.10E+02	(7)	3.20E-03	(9)	< 0.1541	u	< 0.1549	u
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	< 0.1548	u	< 0.1555	u
Nitroaniline, 4-	2.70E+02	(3)	1.10E+03	(7)	3.20E-02	(9)	< 0.1687	u	< 0.1695	u
4-Nitrophenol	-	-	-	-	-	-	< 0.1542	u	< 0.1549	u
Acenaphthene	3.48E+03	(1)	1.51E+04	(5)	8.25E+01	(8)	< 0.163	u	< 0.1637	u
Acenaphthylene	-	-	-	-	-	-	< 0.1829	u	< 0.1837	u
Aniline	9.50E+02	(3)	4.00E+03	(7)	9.20E-02	(9)	< 0.1121	u	< 0.1127	u
Anthracene	1.74E+04	(1)	7.53E+04	(5)	8.51E+02	(8)	< 0.1813	u	< 0.1822	u
Azobenzene	5.60E+01	(3)	2.60E+02	(7)	1.86E+06	(9)	< 0.183	u	< 0.1839	u
Benzo(a)anthracene	1.53E+00	(1)	3.23E+01	(4)	6.37E-01	(8)	< 0.1704	u	< 0.1712	u
Benzo(a)pyrene	1.12E+00	(1)	2.36E+01	(4)	3.53E+00	(10)	< 0.1568	u	< 0.1575	u
Benzo(b)fluoranthene	1.53E+00	(1)	3.23E+01	(4)	6.17E+00	(8)	< 0.1892	u	< 0.1901	u
Benzo(g,h,i)perylene	-	-	-	-	-	-	< 0.1618	u	< 0.1626	u
Benzo(k)fluoranthene	1.53E+01	(1)	3.23E+02	(4)	6.05E+01	(8)	< 0.1494	u	< 0.1501	u
Benzoic acid	2.50E+05	(2)	3.30E+06	(6)	3.00E+02	(9)	< 0.1502	u	< 0.1509	u
Benzyl alcohol	6.30E+03	(2)	8.20E+04	(6)	9.60E+00	(9)	< 0.1665	u	< 0.1673	u
Bis(2-chloroethoxy)methane	1.90E+02	(2)	2.50E+03	(6)	2.60E-01	(9)	< 0.1795	u	< 0.1803	u
Bis(2-chloroethyl) ether	3.11E+00	(1)	1.95E+00	(5)	6.05E-04	(8)	< 0.1276	u	< 0.1281	u
Bis(2-chloroisopropyl) ether	9.93E+01	(1)	5.19E+02	(4)	4.75E-02	(8)	< 0.1981	u	< 0.199	u
Bis(2-ethylhexyl)phthalate [Di(2-ethylhexyl)phthalate, DEHP]	3.80E+02	(1)	1.83E+03	(4)	2.15E+01	(10)	0.21	J	0.25	J
Butyl Benzyl Phthalate	2.90E+03	(3)	1.20E+04	(7)	4.60E+00	(9)	< 0.1648	u	< 0.1656	u
Carbazole	-	-	-	-	-	-	< 0.1576	u	< 0.1584	u
Chrysene	1.53E+02	(1)	3.23E+03	(4)	1.86E+02	(8)	< 0.1496	u	< 0.1503	u
Dibenz(a,h)anthracene	1.53E-01	(1)	3.23E+00	(4)	1.97E+00	(8)	< 0.1596	u	< 0.1603	u
Dibenzofuran	-	-	-	-	-	-	< 0.1714	u	< 0.1722	u
Diethyl phthalate	4.93E+04	(1)	2.15E+05	(5)	9.79E+01	(8)	0.19	J	0.26	b
Dimethyl phthalate (DMP, Phthalic Acid)	6.16E+04	(1)	2.69E+05	(5)	3.57E+00	(8)	< 0.1858	u	< 0.1867	u
Di-n-butyl phthalate (Dibutyl phthalate)	6.16E+03	(1)	2.69E+04	(5)	3.38E+01	(8)	0.17	J	0.34	J
Di-n-octyl phthalate	-		-		-	-	< 0.1491	u	< 0.1498	u
Fluoranthene	2.32E+03	(1)	1.00E+04	(5)	1.34E+03	(8)	< 0.1655	u	< 0.1663	u
Fluorene	2.32E+03	(1)	1.00E+04	(5)	8.00E+01	(8)	< 0.152	u	< 0.1527	u
Hexachlorobenzene	3.33E+00	(1)	1.17E+02	(5)	1.89E-01	(8)	< 0.1831	u	< 0.184	u
Hexachloro-1,3-butadiene	6.16E+01	(1)	5.21E+01	(4)	4.13E-02	(8)	< 0.1694	u	< 0.1702	u
Hexachlorocyclopentadiene	2.30E+00	(1)	8.67E+02	(5)	2.40E+00	(8)	< 0.1584	u	< 0.1592	u
Hexachloroethane	1.33E+02	(1)	1.88E+02	(5)	3.20E-02	(8)	< 0.1434	u	< 0.144	u
Indeno(1,2,3-c,d)pyrene	1.53E+00	(1)	3.23E+01	(4)	2.01E+01	(8)	< 0.164	u	< 0.1648	u
Isophorone	5.61E+03	(1)	2.70E+04	(4)	0.00E+00	(9)	< 0.1902	u	< 0.1911	u

Table 2
Soil Analytical Data
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Residential Soil Screening Level	Source	Non-Residential Soil Screening Level	Source	Leachate DAF (20) (mg/kg) SoilGW	Source	OW-59 (33-34')		OW-60 (20-22')	
					Lab ID		1706910-003		1706910-004	
					Sample Date		6/12/2017		6/13/2017	
Naphthalene	1.16E+03	(1)	5.02E+03	(5)	8.23E-02	(8)	< 0.1845	u	< 0.1854	u
Nitrobenzene	6.04E+01	(1)	2.93E+02	(4)	1.44E-02	(8)	< 0.1654	u	< 0.1661	u
Nitroso-di-N-propylamine, N-	7.80E-01	(3)	3.30E+00	(7)	1.62E-04	(9)	< 0.1759	u	< 0.1767	u
N-Nitrosodiphenylamine	1.09E+03	(1)	5.24E+03	(4)	1.00E+01	(8)	< 0.1908	u	< 0.1917	u
Pentachlorophenol	9.85E+00	(1)	4.45E+01	(4)	1.52E-01	(8)	< 0.1705	u	< 0.1713	u
Phenanthrene	1.74E+03	(1)	7.53E+03	(5)	8.59E+01	(8)	< 0.1756	u	< 0.1764	u
Phenol	1.85E+04	(1)	7.74E+04	(5)	5.23E+01	(8)	< 0.1375	u	< 0.1381	u
Pyrene	1.74E+03	(1)	7.53E+03	(5)	1.92E+02	(8)	< 0.1493	u	< 0.15	u
Pyridine	7.80E+01	(2)	1.20E+03	(6)	1.36E-01	(9)	< 0.1322	u	< 0.1328	u
Total Petroleum Hydrocarbons (mg/kg)										
Gasoline Range Organics (GRO)	1.00E+03	(11)	3.80E+03	(11)	4.61E+03	(11)	< 1.1271	u	< 1.1271	u
Diesel Range Organics (DRO)	1.00E+03	(11)	3.80E+03	(11)	4.61E+03	(11)	< 1.529	u	< 1.5232	u
Motor Oil Range Organics (MRO)	1.00E+03	(11)	3.80E+03	(11)	4.61E+03	(11)	< 47.4834	u	< 47.3037	u

- No screening level or analytical result available
NMED - Risk Assessment Guidance for Site Investigations and Remediation (March 2019)
EPA - Regional Screening Levels (Nov. 2018)
(1) NMED Residential Screening Level
(2) EPA Residential Screening Level
(3) EPA Residential - Screening Levels multiplied by 10 pursuant to Section IV.D.2 of the Oct. 31, 2013 RCRA Post-Closure Permit because the constituent is listed as carcinogenic
(4) NMED Industrial Occupational Screening Level
(5) NMED Construction Worker Screening Level
(6) EPA Industrial - Screening Levels
(7) EPA Industrial - Screening Levels multiplied by 10 pursuant to Section IV.D.2 of the Oct. 31, 2013 RCRA Post-Closure Permit because the constituent is listed as carcinogenic
(8) SoilGW NMED Cw Dilution Attenuation Factor (DAF) = 20
(9) SoilGW Risk-based EPA DAF = 20
(10) SoilGW MCL-based NMED DAF = 20
(11) NMED Tables 6-2 and 6-4 TPH Soil Screening Levels "unknown oil" - see report Section 5 for use of screening levels

Bold represents value above Non-Residential Screening Level
yellow highlight represents value above Leachate (DAF) Screening Level
Bold with yellow highlight value exceeds Residential Screening Level and DAF

v = reportable detection above the Practical quantitation limit (PQL)
u - result is not detected at method detection limit (MDL)
J - estimated result at concentration above MDL but less than PQL

Table 3
Groundwater Analytical Results Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	BW-4B		BW-5B		BW-5C		OW-59		OW-60	
Lab ID			1706G62-003		1706G62-005		1706G62-004		1706G62-007		1706G62-001	
Sample Date			6/28/2017		6/28/2017		6/28/2017		6/28/2017		6/28/2017	
Metals (ug/l) TOTAL												
Antimony	6	(3)	<1.86	u	<1.86	u	<1.86	u	<1.86	u	<1.86	u
Arsenic	10	(3)	**12**	Z	2.8	J	<1.49	u	**11**	Z	8.1	v
Barium	2000	(3)	**4700**	Z	73	v	210	v	350	v	1600	v
Beryllium	4	(3)	**48**	Z	<0.26	u	<0.26	u	1.5	J	**4.6**	Z
Cadmium	5	(3)	<2.91	u	<0.58	u	<0.58	u	<0.58	u	<0.58	u
Chromium	50	(3)	**170**	Z	3	J	<1.09	u	14	v	48	v
Cobalt	50	(3)	**79**	v	1	J	1.2	J	8	v	21	v
Cyanide	200	(3)	<5	u	<5	u	<5	u	26.8	v	<5	u
Iron	1000	(3)	**82000**	Z	**1500**	Z	740	Z	**9700**	Z	**28000**	Z
Lead	15	(3)	**200**	Z	0.93	J	<0.48	u	9.4	v	**31**	Z
Manganese	200	(3)	**5600**	Z	26	v	130	Z	**1200**	Z	**2200**	Z
Mercury	2	(3)	0.24	v	0.07	J	0.18	J	0.08	J	0.1	J
Nickel	372	(4)	**540**	Z	<3.61	u	<3.61	u	20	v	47	v
Selenium	50	(3)	<7.11	u	4.4	J	4.9	J	15	v	13	v
Silver	50	(3)	<2.09	u	<0.42	u	<0.42	u	<0.42	u	<0.42	u
Vanadium	63.1	(4)	**140**	J	22	J	2.9	J	26	J	**70**	v
Zinc	10000	(3)	3400	v	3.8	J	3.6	J	32	v	71	v
Chloride	250000	(3)	73000	v	50000	v	**1400000**	Z	**2000000**	Z	**1600000**	Z
Fluoride	1600	(3)	1300	v	280	J	<218.5	u	<218.5	u	<218.5	u
Sulfate	600000	(3)	230000	v	100000	v	220000	v	**3000000**	Z	**740000**	Z
Metals (ug/l) DISSOLVED												
Antimony (D)	6	(3)	**NS**		<0.17	u	<0.17	u	1	J	0.28	J
Arsenic (D)	10	(3)	**NS**		2.4	v	1.9	J	9.4	J	4.4	J
Barium (D)	2000	(3)	**NS**		52	v	210	v	14	v	44	v
Beryllium (D)	4	(3)	**NS**		<0.29	u	<0.29	u	0.39	J	0.45	J
Cadmium (D)	5	(3)	**NS**		<1	u	<1	u	<1	u	<0.58	u
Calcium (D)	-	-	**NS**		2800	v	64000	v	210000	v	170000	v
Chromium (D)	50	(3)	**NS**		1.8	J	1.6	J	<1.01	u	<1.09	u
Cobalt (D)	50	(3)	**NS**		<1.59	u	<1.59	u	3.5	J	1.9	J
Cyanide (D)	200	(3)	**NS**		-		-		-		-	
Iron (D)	1000	(3)	**NS**		110	v	<16.45	u	30	v	<10.21	u
Lead (D)	15	(3)	**NS**		<0.00013	J	<0.00013	u	<0.84	u	<0.84	u
Magnesium (D)	-	-	**NS**		350	J	8300	v	65000	v	33000	v
Manganese (D)	200	(3)	**NS**		8.2	v	120	Z	**670**	Z	**550**	Z
Nickel (D)	372	(4)	**NS**		<1.07	u	4.9	J	10	v	6.1	J
Potassium (D)	-	-	**NS**		850	J	3500	v	1700	v	5000	v
Selenium (D)	50	(3)	**NS**		5.3	v	6.8	v	23	v	14	v
Sodium (D)	-	-	**NS**		260000	v	950000	v	2400000	v	1100000	v
Silver (D)	50	(3)	**NS**		<0.88	u	<0.88	u	<0.88	u	<0.42	u
Vanadium (D)	63.1	(4)	**NS**		18	J	<1.94	u	4.2	J	6.6	J
Zinc (D)	10000	(3)	**NS**		12	v	11	v	13	v	11	v
Volatiles (ug/l)												
1,1,1,2-Tetrachloroethane	5.74	(4)	<0.21	u	<0.1	u	<0.1	u	<0.1	u	<0.1	u
1,1,1-Trichloroethane	200	(3)	<0.15	u	<0.07	u	<0.07	u	<0.07	u	<0.07	u
1,1,2,2-Tetrachloroethane	10	(3)	<0.27	u	<0.14	u	<0.14	u	<0.14	u	<0.14	u
1,1,2-Trichloroethane	5	(3)	<0.28	u	<0.14	u	<0.14	u	<0.14	u	<0.14	u
1,1-Dichloroethane	25	(3)	<0.8	u	<0.4	u	0.61	J	<0.4	u	<0.4	u
1,1-Dichloroethene	7	(3)	<0.16	u	<0.08	u	<0.08	u	<0.08	u	<0.08	u
1,1-Dichloropropene	-	-	<0.19	u	<0.09	u	<0.09	u	<0.09	u	<0.09	u
1,2,3-Trichlorobenzene	7	(1)	<0.23	u	<0.12	u	<0.12	u	<0.12	u	<0.12	u
1,2,3-Trichloropropane	0.00835	(4)	<0.78	u	<0.39	u	<0.39	u	<0.39	u	<0.39	u

Table 3
Groundwater Analytical Results Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	BW-4B		BW-5B		BW-5C		OW-59		OW-60	
Lab ID			1706G62-003		1706G62-005		1706G62-004		1706G62-007		1706G62-001	
Sample Date			6/28/2017		6/28/2017		6/28/2017		6/28/2017		6/28/2017	
1,2,4-Trichlorobenzene (V)	70	(3)	<0.28	u	<0.14	u	<0.14	u	<0.14	u	<0.14	u
1,2,4-Trimethylbenzene	56	(1)	<0.23	u	<0.11	u	<0.11	u	0.13	J	<0.11	u
1,2-Dibromo-3-chloropropane	0.2	(2)	<2.77	u	<1.39	u	<1.39	u	<1.39	u	<1.39	u
1,2-Dibromoethane (EDB)	0.05	(3)	<0.26	u	<0.13	u	<0.13	u	<0.13	u	<0.13	u
1,2-Dichlorobenzene (V)	600	(3)	<0.18	u	<0.09	u	<0.09	u	<0.09	u	<0.09	u
1,2-Dichloroethane (EDC)	5	(3)	<0.8	u	<0.4	u	0.57	J	<0.4	u	<0.4	u
1,2-Dichloropropane	5	(3)	<0.2	u	<0.1	u	<0.1	u	<0.1	u	<0.1	u
1,3,5-Trimethylbenzene	60	(1)	<0.17	u	<0.09	u	<0.09	u	<0.09	u	<0.09	u
1,3-Dichlorobenzene (V)	-	-	<0.3	u	<0.15	u	<0.15	u	<0.15	u	<0.15	u
1,3-Dichloropropane	370	(1)	<0.33	u	<0.17	u	<0.17	u	<0.17	u	<0.17	u
1,4-Dichlorobenzene (V)	75	(2)	<0.8	u	<0.4	u	<0.4	u	<0.4	u	<0.4	u
1-Methylnaphthalene (V)	11.37	(4)	<0.32	u	<0.16	u	<0.16	u	<0.16	u	<0.16	u
2,2-Dichloropropane	-	-	<0.31	u	<0.16	u	<0.16	u	<0.16	u	<0.16	u
2-Butanone	5564	(4)	<2.26	u	<1.13	u	<1.13	u	<1.13	u	<1.13	u
2-Chlorotoluene	233	(4)	<0.8	u	<0.4	u	<0.4	u	<0.4	u	<0.4	u
2-Hexanone	38	(1)	<1.31	u	<0.66	u	<0.66	u	<0.66	u	<0.66	u
2-Methylnaphthalene (V)	35.11	(4)	<0.3	u	<0.15	u	<0.15	u	<0.15	u	<0.15	u
4-Chlorotoluene	250	(1)	<0.8	u	<0.4	u	<0.4	u	<0.4	u	<0.4	u
4-Isopropyltoluene	-	-	<0.19	u	<0.1	u	<0.1	u	<0.1	u	0.21	J
4-Methyl-2-pentanone	1243	(4)	<1.41	u	<0.71	u	<0.71	u	<0.71	u	<0.71	u
Acetone	14063	(4)	10	J	3.1	J	5.4	J	6	J	13	v
Benzene	5	(3)	<0.12	u	<0.06	u	<0.06	u	<0.06	u	<0.06	u
Bromobenzene	62	(1)	<0.28	u	<0.14	u	<0.14	u	<0.14	u	<0.14	u
Bromodichloromethane	1.34	(4)	<0.35	u	<0.18	u	<0.18	u	<0.18	u	<0.18	u
Bromoform	32.85	(4)	<0.42	u	<0.21	u	<0.21	u	<0.21	u	<0.21	u
Bromomethane	7.54	(4)	<0.51	u	<0.26	u	<0.26	u	<0.26	u	<0.26	u
Carbon disulfide	810	(4)	<0.8	u	<0.4	u	<0.4	u	<0.4	u	<0.4	u
Carbon Tetrachloride	5	(3)	<0.22	u	<0.11	u	<0.11	u	<0.11	u	<0.11	u
Chlorobenzene	100	(2)	<0.21	u	<0.11	u	<0.11	u	<0.11	u	<0.11	u
Chloroethane	20900	(4)	<0.47	u	<0.23	u	<0.23	u	<0.23	u	<0.23	u
Chloroform	100	(3)	<0.8	u	<0.4	u	<0.4	u	<0.4	u	<0.4	u
Chloromethane	20.3	(4)	<0.59	u	<0.29	u	<0.29	u	<0.29	u	<0.29	u
cis-1,2-DCE	70	(3)	<0.41	u	<0.2	u	<0.2	u	<0.2	u	<0.2	u
cis-1,3-Dichloropropene	4.71	(4)	<0.16	u	<0.08	u	<0.08	u	<0.08	u	<0.08	u
Dibromochloromethane	1.68	(4)	<0.14	u	<0.07	u	<0.07	u	<0.07	u	<0.07	u
Dibromomethane	8.3	(1)	<0.18	u	<0.09	u	<0.09	u	<0.09	u	<0.09	u
Dichlorodifluoromethane	197	(4)	<2	u	<1	u	<1	u	<1	u	<1	u
Ethylbenzene	700	(3)	<0.19	u	<0.09	u	<0.09	u	<0.09	u	<0.09	u
Hexachlorobutadiene (V)	1.39	(4)	<1.6	u	<0.8	u	<0.8	u	<0.8	u	<0.8	u
Isopropylbenzene	447	(4)	<0.1	u	<0.05	u	<0.05	u	<0.05	u	<0.05	u
Methyl tert-butyl ether (MTBE)	100	(4)	<0.48	u	<0.24	u	38	v	6.8	v	0.86	J
Methylene Chloride	5	(3)	<0.22	u	<0.11	u	<0.11	u	<0.11	u	<0.11	u
Naphthalene (V)	30	(3)	<0.23	u	<0.11	u	<0.11	u	<0.11	u	<0.11	u
n-Butylbenzene	-	-	<0.26	u	<0.13	u	<0.13	u	<0.13	u	<0.13	u
n-Propylbenzene	-	-	<0.15	u	<0.07	u	<0.07	u	<0.07	u	<0.07	u
sec-Butylbenzene	-	-	<0.22	u	<0.11	u	<0.11	u	<0.11	u	<0.11	u
Styrene	100	(3)	<0.31	u	<0.16	u	<0.16	u	<0.16	u	<0.16	u
tert-Butylbenzene	-	-	<0.21	u	<0.1	u	<0.1	u	<0.1	u	<0.1	u
Tetrachloroethene (PCE)	5	(3)	<0.26	u	<0.13	u	<0.13	u	<0.13	u	<0.13	u
Toluene	1000	(3)	<0.13	u	0.23	J	<0.06	u	<0.06	u	0.24	J
trans-1,2-DCE	100	(3)	<0.37	u	<0.18	u	<0.18	u	<0.18	u	<0.18	u
trans-1,3-Dichloropropene	4.71	(4)	<0.44	u	<0.22	u	<0.22	u	<0.22	u	<0.22	u

Table 3
Groundwater Analytical Results Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	BW-4B		BW-5B		BW-5C		OW-59		OW-60	
Lab ID			1706G62-003		1706G62-005		1706G62-004		1706G62-007		1706G62-001	
Sample Date			6/28/2017		6/28/2017		6/28/2017		6/28/2017		6/28/2017	
Trichloroethene (TCE)	5	(3)	<0.22	u	<0.11	u	<0.11	u	<0.11	u	<0.11	u
Trichlorofluoromethane	1140	(4)	<0.37	u	<0.18	u	<0.18	u	<0.18	u	<0.18	u
Vinyl chloride	2	(3)	<0.36	u	<0.18	u	<0.18	u	<0.18	u	<0.18	u
Xylenes, Total	620	(3)	<0.64	u	<0.32	u	<0.32	u	<0.32	u	<0.32	u
Semivolatiles (ug/l)												
1,2,4-Trichlorobenzene	70	(2)	<21.28	u	<2.13	u	<2.13	u	<2.13	u	<2.13	u
1,2-Dichlorobenzene	600	(3)	<20.1	u	<2.01	u	<2.01	u	<2.01	u	<2.01	u
1,3-Dichlorobenzene	-	-	<18.27	u	<1.83	u	<1.83	u	<1.83	u	<1.83	u
1,4-Dichlorobenzene	75	(3)	<21.37	u	<2.14	u	<2.14	u	<2.14	u	<2.14	u
1-Methylnaphthalene	11.38	(4)	<33.08	u	<3.31	u	<3.31	u	<3.31	u	<3.31	u
2,4,5-Trichlorophenol	1166	(4)	<51	u	<5.1	u	<5.1	u	<5.1	u	<5.1	u
2,4,6-Trichlorophenol	11.9	(4)	<55	u	<5.5	u	<5.5	u	<5.5	u	<5.5	u
2,4-Dichlorophenol	45.3	(4)	<56.81	u	<5.68	u	<5.68	u	<5.68	u	<5.68	u
2,4-Dimethylphenol	354	(4)	<28.29	u	<2.83	u	<2.83	u	<2.83	u	<2.83	u
2,4-Dinitrophenol	38.7	(4)	<25.79	u	<2.58	u	<2.58	u	<2.58	u	<2.58	u
2,4-Dinitrotoluene	2.37	(4)	<39.66	u	<3.97	u	<3.97	u	<3.97	u	<3.97	u
2,6-Dinitrotoluene	0.485	(4)	<44.92	u	<4.49	u	<4.49	u	<4.49	u	<4.49	u
2-Chloronaphthalene	733	(4)	<36.96	u	<3.7	u	<3.7	u	<3.7	u	<3.7	u
2-Chlorophenol	91	(4)	<75.34	u	<7.53	u	<7.53	u	<7.53	u	<7.53	u
2-Methylnaphthalene	35.1	(4)	<32.65	u	<3.27	u	<3.27	u	<3.27	u	<3.27	u
2-Methylphenol	930	(1)	<33.03	u	<3.3	u	<3.3	u	<3.3	u	<3.3	u
2-Nitroaniline	190	(1)	<49.46	u	<4.95	u	<4.95	u	<4.95	u	<4.95	u
2-Nitrophenol	-	-	<51.95	u	<5.19	u	<5.19	u	<5.19	u	<5.19	u
3,3´-Dichlorobenzidine	1.25	(4)	<39.18	u	<3.92	u	<3.92	u	<3.92	u	<3.92	u
3+4-Methylphenol	930	(1)	<32.07	u	<3.21	u	<3.21	u	<3.21	u	<3.21	u
3-Nitroaniline	-	-	<43.42	u	<4.34	u	<4.34	u	<4.34	u	<4.34	u
4,6-Dinitro-2-methylphenol	1.52	(4)	<38.67	u	<3.87	u	<3.87	u	<3.87	u	<3.87	u
4-Bromophenyl phenyl ether	-	-	<46.2	u	<4.62	u	<4.62	u	<4.62	u	<4.62	u
4-Chloro-3-methylphenol	-	-	<63.41	u	<6.34	u	<6.34	u	<6.34	u	<6.34	u
4-Chloroaniline	3.7	(5)	<35.17	u	<3.52	u	<3.52	u	<3.52	u	<3.52	u
4-Chlorophenyl phenyl ether	-	-	<36.15	u	<3.61	u	<3.61	u	<3.61	u	<3.61	u
4-Nitroaniline	38	(5)	<40.33	u	<4.03	u	<4.03	u	<4.03	u	<4.03	u
4-Nitrophenol	-	-	<54.78	u	<5.48	u	<5.48	u	<5.48	u	<5.48	u
Acenaphthene	535	(4)	<36.15	u	<3.61	u	<3.61	u	<3.61	u	<3.61	u
Acenaphthylene	-	-	<35.31	u	<3.53	u	<3.53	u	<3.53	u	<3.53	u
Aniline	130	(5)	<30.59	u	<3.06	u	<3.06	u	<3.06	u	<3.06	u
Anthracene	1721	(4)	<35.37	u	<3.54	u	<3.54	u	<3.54	u	<3.54	u
Azobenzene	1.2	(5)	<45.33	u	<4.53	u	<4.53	u	<4.53	u	<4.53	u
Benz(a)anthracene	0.12	(4)	<38.66	u	<3.87	u	<3.87	u	<3.87	u	<3.87	u
Benzo(a)pyrene	0.2	(3)	<39.92	u	<3.99	u	<3.99	u	<3.99	u	<3.99	u
Benzo(b)fluoranthene	0.343	(4)	<39.52	u	<3.95	u	<3.95	u	<3.95	u	<3.95	u
Benzo(g,h,i)perylene	-	-	<40.38	u	<4.04	u	<4.04	u	<4.04	u	<4.04	u
Benzo(k)fluoranthene	3.43	(4)	<43.87	u	<4.39	u	<4.39	u	<4.39	u	<4.39	u
Benzoic acid	75000	(1)	93	J	8.2	J	7.9	J	8.3	J	7.8	J
Benzyl alcohol	2000	(1)	<45.91	u	<4.59	u	<4.59	u	<4.59	u	<4.59	u
Bis(2-chloroethoxy)methane	59	(1)	<43.22	u	<4.32	u	<4.32	u	<4.32	u	<4.32	u
Bis(2-chloroethyl)ether	0.1365	(4)	<43.28	u	<4.33	u	<4.33	u	<4.33	u	<4.33	u
Bis(2-chloroisopropyl)ether	9.81	(4)	<38.74	u	<3.87	u	<3.87	u	<3.87	u	<3.87	u
Bis(2-ethylhexyl)phthalate	6	(2)	<48.24	u	<4.82	u	<4.82	u	<4.82	u	5.1	J
Butyl benzyl phthalate	160	(5)	<46.27	u	<4.63	u	<4.63	u	<4.63	u	<4.63	u
Carbazole	-	-	<45.82	u	<4.58	u	<4.58	u	<4.58	u	<4.58	u
Chrysene	34.3	(4)	<38.19	u	<3.82	u	<3.82	u	<3.82	u	<3.82	u

Table 3
Groundwater Analytical Results Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	BW-4B		BW-5B		BW-5C		OW-59		OW-60	
Lab ID			1706G62-003		1706G62-005		1706G62-004		1706G62-007		1706G62-001	
Sample Date			6/28/2017		6/28/2017		6/28/2017		6/28/2017		6/28/2017	
Dibenz(a,h)anthracene	0.0343	(4)	<46.4	u	<4.64	u	<4.64	u	<4.64	u	<4.64	u
Dibenzofuran	7.9	(1)	<40.75	u	<4.08	u	<4.08	u	<4.08	u	<4.08	u
Diethyl phthalate	14800	(4)	<40.49	u	<4.05	u	<4.05	u	<4.05	u	<4.05	u
Dimethyl phthalate	611.56	(4)	<35.78	u	<3.58	u	<3.58	u	<3.58	u	<3.58	u
Di-n-butyl phthalate	885	(4)	<50.34	u	<5.03	u	<5.03	u	<5.03	u	<5.03	u
Di-n-octyl phthalate	-	-	<46.77	u	<4.68	u	5	J	<4.68	u	<4.68	u
Fluoranthene	802	(4)	<42.64	u	<4.26	u	<4.26	u	<4.26	u	<4.26	u
Fluorene	288	(4)	<40.08	u	<4.01	u	<4.01	u	<4.01	u	<4.01	u
Hexachlorobenzene	1	(2)	<38.49	u	<3.85	u	<3.85	u	<3.85	u	<3.85	u
Hexachlorobutadiene	1.39	(4)	<13.49	u	<1.35	u	<1.35	u	<1.35	u	<1.35	u
Hexachlorocyclopentadiene	50	(2)	<12.74	u	<1.27	u	<1.27	u	<1.27	u	<1.27	u
Hexachloroethane	3.28	(4)	<11.99	u	<1.2	u	<1.2	u	<1.2	u	<1.2	u
Indeno(1,2,3-cd)pyrene	0.343	(4)	<41.62	u	<4.16	u	<4.16	u	<4.16	u	<4.16	u
Isophorone	780.63	(4)	<43.58	u	<4.36	u	<4.36	u	<4.36	u	<4.36	u
Naphthalene	1.65	(4)	<28.73	u	<2.87	u	<2.87	u	<2.87	u	<2.87	u
Nitrobenzene	1.4	(4)	<35.87	u	<3.59	u	<3.59	u	<3.59	u	<3.59	u
N-Nitrosodimethylamine	0.00167	(4)	<35.01	u	<3.5	u	<3.5	u	<3.5	u	<3.5	u
N-Nitrosodi-n-propylamine	0.11	(5)	<45.68	u	<4.57	u	<4.57	u	<4.57	u	<4.57	u
N-Nitrosodiphenylamine	121.92	(4)	<38.86	u	<3.89	u	<3.89	u	<3.89	u	<3.89	u
Phenanthrene	170	(4)	<43.44	u	<4.34	u	<4.34	u	<4.34	u	<4.34	u
Pentachlorophenol	1	(3)	<49.21	u	<4.92	u	<4.92	u	<4.92	u	<4.92	u
Phenol	5760	(4)	<31.14	u	<3.11	u	<3.11	u	<3.11	u	<3.11	u
Pyrene	117	(4)	<44.33	u	<4.43	u	<4.43	u	<4.43	u	<4.43	u
Pyridine	20	(1)	<22.96	u	<2.3	u	<2.3	u	<2.3	u	<2.3	u
TPH (mg/l)												
Gasoline Range Organics (GRO	0.0858	(6)	< 0.05	v	< 0.025	u	0.039	J	**0.23**	v	< 0.025	v
Diesel Range Organics (DRO)	0.0858	(6)	**0.47**	J	**0.74**	J	< 0.36	u	**0.56**	J	< 0.36	u
Motor Oil Range Organics (MR	0.0858	(6)	< 5	u	< 5	u	< 5	u	< 5	u	< 5	u

- No screening level or analytical result available

450 - bolded value exceeds screening level

(1) EPA - Regional Screening Levels (November 2018) -Tap Water

(2) EPA - Regional Screening Levels (November 2018) - MCL

(3) NMED WQCC standards - Title 20 Chapter 6, Part 2, - 20.6.2.3101 Standards for Ground Water of 10,000 mg/l TDS Concentration or less (December 2018)

(4) NMED Tap Water Screening Level - Risk Assessment Guidance for Site Investigations and Remediation (February 2019)

(5) EPA Screening Level - Tap Water x 10 for carcinogenic compounds

(6) NMED SSG (March 2019)

v = reportable detection above the Practical quantitation limit (PQL)

u - result is not detected at method detection limit (MDL)

j - estimated result at concentration above MDL but less than PQL

z - concentration exceeds MCL

Table 4
SMW-2 Area Additional Sampling
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Sample Location			OW-59		OW-60		SMW-2		SMW-4		Evaporation Pond #2		Evaporation Pond #3	
Lab Sample ID			1706G62-007		1706G62-001		1706G37-001		1706G37-002		1706G37-003		1706G37-002	
Sample Date			6/28/2017		6/28/2017		6/28/2017		6/28/2017		6/28/2017		6/28/2017	
Parameter	Screening Level	Source												
Method E300 (mg/L) Total														
Bromide	NE	-	3.6	v	2.4	v	2.8	v	0.26	J	1.9	v	2.3	v
Chloride	250	4	**2000**	Z	**1600**	Z	**2600**	v	63	v	**5000**	v	**7100**	v
Fluoride	1.6	4	<0.2185	u	<0.2185	u	<0.2185	u	1.1	v	**18**	Z	**16**	Z
Nitrate+Nitrite as N	10	6	<0.26	u	3	v	<0.26	u	0.21	J	1.1	J	1.1	J
Phosphorus, Orthophosphate (As P)	NE	-	<5	u	<1.25	u	<5	u	<1.25	u	<2.5	u	<2.5	u
Sulfate	600	4	**3000**	Z	**740**	Z	**1500**	v	180	v	**1400**	v	**1800**	v
Method E200.7 (mg/L) Dissolved														
Calcium - E200.7	NE	-	210	v	170	v	300	v	4.5	v	410	v	540	v
Magnesium	NE	-	65	v	33	v	90	v	1.2	v	100	v	150	v
Potassium	NE	-	1.7	v	5	v	0.75	J	0.52	J	140	v	230	v
Sodium	NE	-	2400	v	1100	v	2300	v	310	v	3100	v	4300	v

NE - Not Established

450 - bolded value exceeds screening level

(1) EPA - Regional Screening Levels (November 2018) - Tap Water

(2) EPA - Regional Screening Levels (November 2018) - MCL

(3) NMED WQCC standards - Title 20 Chapter 6, Part 2, - 20.6.2.3101 Standards for Ground Water of 10,000 mg/l TDS Concentration or less (December 2018)

(4) NMED Tap Water Screening Level - Risk Assessment Guidance for Site Investigations and Remediation (February 2019)

(5) EPA Screening Level - Tap Water x 10 for carcinogenic compounds

(6) 40 CFR 141.61 MCL (November 2015)

v = reportable detection above the Practical quantitation limit (PQL)

u - result is not detected at method detection limit (MDL)

J - estimated result at concentration above MDL but less than PQL

Z - concentration exceeds MCL

Table 5
Groundwater and Surface Water Field Measurements
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

WELL	DATE	DEPTH TO GROUNDWATER (ft BTOC)	TEMPERATURE °C	SPECIFIC CONDUCTIVITY (uS/cm)	DISSOLVED OXYGEN (mg/L)	pH	OXYGEN REDUCTION POTENTIAL
BW-4A	06/28/17	ND	Well was not sampled due to insufficient groundwater volume.				
BW-4B	06/28/17	51.65	16.3	1458	3.66	8.87	11.2
BW-5A	06/28/17	23.21	Well was not sampled due to insufficient groundwater volume.				
BW-5B	06/28/17	20.60	18.0	1155	6.04	8.80	48
BW-5C	06/28/17	2.70	20.2	5274	1.83	7.65	-28.0
OW-59	06/28/17	26.15	15.4	11067	9.61	7.40	111.1
OW-60	06/28/17	33.15	16.3	6189	8.12	7.43	98.1
SMW-2	06/28/17	24.80	16.3	11232	5.24	7.08	117.7
SMW-4	06/28/17	32.13	16.2	1384	4.37	8.44	86.7
EP-2	06/28/17	NA	22.9	16175	1.31	8.17	-212.7
EP-3	06/28/17	NA	23.6	22127	1.33	8.17	-56.7

ND - not detected
NA - not applicable
ft BTOC - feet below top of casing

Table 6
Groundwater Gauging Results
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

WELL	STICKUP (ft ABGL)	DATE	DATUM	DEPTH TO GROUNDWATER (ft BGL)	DEPTH TO GROUNDWATER (ft BTOC)	COMMENTS
BW-4A	-	06/15/17	BGL	ND	NA	COLLECTED FROM INSIDE THE AUGERS
	3.00	06/16/17	BTOC	ND	ND	
	3.00	06/19/17	BTOC	ND	ND	
	3.00	06/26/17	BTOC	ND	ND	
	3.00	06/28/17	BTOC	ND	ND	
BW-4B	-	06/19/17	BGL	71.00	NA	COLLECTED FROM INSIDE THE AUGERS
	-	06/19/17	BGL	69.50	NA	COLLECTED FROM INSIDE THE AUGERS
	3.00	06/27/17	BTOC	27.92	30.92	PRIOR TO DEVELOPMENT
	3.00	06/27/17	BTOC	60.88	63.88	IMMEDIATELY AFTER WELL DEVELOPMENT
	3.00	06/28/17	BTOC	48.65	51.65	PRIOR TO SAMPLING
BW-5A	3.00	06/26/17	BTOC	19.80	22.80	PRIOR TO DEVELOPMENT
	3.00	06/26/17	BTOC	20.20	23.20	IMMEDIATELY AFTER WELL DEVELOPMENT
	3.00	06/27/17	BTOC	20.21	23.21	
BW-5B	3.00	06/26/17	BTOC	26.80	29.80	
	3.00	06/27/17	BTOC	10.50	13.50	PRIOR TO DEVELOPMENT
	3.00	06/27/17	BTOC	58.10	61.10	IMMEDIATELY AFTER WELL DEVELOPMENT
	3.00	06/28/17	BTOC	17.60	20.60	PRIOR TO SAMPLING
BW-5C	-	06/20/17	BGL	ND	ND	COLLECTED FROM INSIDE THE AUGERS-TD@47.80'
	-	06/22/17	BGL	11.40	NA	COLLECTED FROM INSIDE THE AUGERS
	3.00	06/23/17	BTOC	0.70 ft ABGL	2.30	
	3.00	06/26/17	BTOC	0.58 ft ABGL	2.42	
	3.00	06/27/17	BTOC	0.56 ft ABGL	2.44	PRIOR TO DEVELOPMENT
	3.00	06/27/17	BTOC	44.90	47.90	IMMEDIATELY AFTER WELL DEVELOPMENT
	3.00	06/27/17	BTOC	0.30 ft ABGL	2.70	PRIOR TO SAMPLING

Table 6
Groundwater Gauging Results
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

WELL	STICKUP (ft ABGL)	DATE	DATUM	DEPTH TO GROUNDWATER (ft BGL)	DEPTH TO GROUNDWATER (ft BTOC)	COMMENTS
OW-59	-	06/13/17	BGL	24 ft BGL	NA	COLLECTED FROM INSIDE THE AUGERS
	2.67	06/14/17	BTOC	21.77	24.44	
	2.67	06/19/17	BTOC	22.08	24.75	
	2.67	06/27/17	BTOC	22.33	25.00	PRIOR TO DEVELOPMENT
	2.67	06/28/17	BTOC	23.48	26.15	PRIOR TO SAMPLING
OW-60	3.00	06/14/17	BGL	ND	ND	COLLECTED FROM INSIDE THE AUGERS
	3.00	06/14/17	BGL	ND	ND	IMMEDIATELY AFTER WELL INSTALLATION
	3.00	06/15/17	BTOC	21.68	24.68	
	3.00	06/16/17	BTOC	14.74	17.74	
	3.00	06/19/17	BTOC	14.45	17.45	
	2.50	06/27/17	-	-	-	WELL WAS REINSTALLED
	2.50	06/27/17	BTOC	7.75	10.25	PRIOR TO DEVELOPMENT
	2.50	06/27/17	BTOC	42.15	44.65	IMMEDIATELY AFTER WELL DEVELOPMENT
	2.50	06/28/17	BTOC	30.65	33.15	PRIOR TO SAMPLING

BGL - below ground level
BTOC - below top of casing
ABGL - above ground level
ND - not detected
NA - not available

Table 7
Fluid Levels
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevation (ft)	Well Casing Rim Elevation (ft)	Stick-up length (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation (ft)	Corrected Water Table Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
06/29/17	BW-4A	09/21/17	2.00	6,870.67	6,873.18	2.51	38.80	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
		12/08/17	2.00	6,870.67	6,873.18	2.51	38.30	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
		02/26/18	2.00	6,870.67	6,873.18	2.51	38.80	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
		04/25/18	2.00	6,870.67	6,873.18	2.51	38.80	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
		08/15/18	2.00	6,870.67	6,873.18	2.51	38.80	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
		11/07/18	2.00	6,870.67	6,873.18	2.51	38.30	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
06/29/17	BW-4B	09/21/17	2.00	6,870.62	6,873.23	2.61	63.50	ND	NA	31.58	6,841.65	NA	41 - 61	Chinle/Alluvial Interface
		12/08/17	2.00	6,870.62	6,873.23	2.61	63.50	ND	NA	37.95	6,835.28	NA	41 - 61	Chinle/Alluvial Interface
		02/26/18	2.00	6,870.62	6,873.23	2.61	63.50	ND	NA	38.43	6,834.80	NA	41 - 61	Chinle/Alluvial Interface
		04/25/18	2.00	6,870.62	6,873.23	2.61	63.50	ND	NA	43.60	6,829.63	NA	41 - 61	Chinle/Alluvial Interface
		08/15/18	2.00	6,870.62	6,873.23	2.61	63.50	ND	NA	39.05	6,834.18	NA	41 - 61	Chinle/Alluvial Interface
		11/13/18	2.00	6,870.62	6,873.23	2.61	63.50	ND	NA	44.87	6,828.36	NA	41 - 61	Chinle/Alluvial Interface
06/29/17	BW-5A	09/21/17	2.00	6,874.39	6,877.00	2.61	23.00	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
		12/08/17	2.00	6,874.39	6,877.00	2.61	23.02	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
		02/26/18	2.00	6,874.39	6,877.00	2.61	23.02	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
		04/25/18	2.00	6,874.39	6,877.00	2.61	23.02	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
		08/15/18	2.00	6,874.39	6,877.00	2.61	23.02	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
		11/13/18	2.00	6,874.39	6,877.00	2.61	23.02	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
06/29/17	BW-5B	09/21/17	2.00	6,874.32	6,876.82	2.50	61.45	ND	NA	8.65	6,868.17	NA	48 - 58	Chinle/Alluvial Interface
		12/08/17	2.00	6,874.32	6,876.82	2.50	61.45	ND	NA	9.00	6,867.82	NA	48 - 58	Chinle/Alluvial Interface
		02/26/18	2.00	6,874.32	6,876.82	2.50	61.45	ND	NA	10.28	6,866.54	NA	48 - 58	Chinle/Alluvial Interface
		04/25/18	2.00	6,874.32	6,876.82	2.50	61.45	ND	NA	9.75	6,867.07	NA	48 - 58	Chinle/Alluvial Interface
		08/15/18	2.00	6,874.32	6,876.82	2.50	61.45	ND	NA	10.04	6,866.78	NA	48 - 58	Chinle/Alluvial Interface
		11/13/18	2.00	6,874.32	6,876.82	2.50	61.45	ND	NA	10.57	6,866.25	NA	48 - 58	Chinle/Alluvial Interface
06/29/17	BW-5C	09/21/17	2.00	6,874.22	6,876.85	2.63	76.35	ND	NA	2.99	6,873.86	NA	64.3-74.30	Sonsela Sandstone
		12/08/17	2.00	6,874.22	6,876.85	2.63	76.35	ND	NA	2.80	6,874.05	NA	64.3-74.30	Sonsela Sandstone
		02/26/18	2.00	6,874.22	6,876.85	2.63	76.35	ND	NA	2.63	6,874.22	NA	64.3-74.30	Sonsela Sandstone
		04/25/18	2.00	6,874.22	6,876.85	2.63	76.35	ND	NA	2.55	6,874.30	NA	64.3-74.30	Sonsela Sandstone
		08/15/18	2.00	6,874.22	6,876.85	2.63	76.35	ND	NA	3.32	6,873.53	NA	64.3-74.30	Sonsela Sandstone
		11/13/18	2.00	6,874.22	6,876.85	2.63	76.35	ND	NA	3.49	6,873.36	NA	64.3-74.30	Sonsela Sandstone

Table 7
Fluid Levels
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevation (ft)	Well Casing Rim Elevation (ft)	Stick-up length (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation (ft)	Corrected Water Table Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
06/29/17	OW-59	09/21/17	2.00	6,887.63	6,889.73	2.10	38.30	ND	NA	24.30	6,865.43	NA	20 - 35	Chinle/Alluvial Interface
		12/05/17	2.00	6,887.63	6,889.73	2.10	38.50	ND	NA	24.30	6,865.43	NA	20 - 35	Chinle/Alluvial Interface
		02/21/18	2.00	6,887.63	6,889.73	2.10	38.55	ND	NA	24.00	6,865.73	NA	20 - 35	Chinle/Alluvial Interface
		04/26/18	2.00	6,887.63	6,889.73	2.10	38.48	ND	NA	24.05	6,865.68	NA	20 - 35	Chinle/Alluvial Interface
		08/14/18	2.00	6,887.63	6,889.73	2.10	38.52	ND	NA	24.13	6,865.60	NA	20 - 35	Chinle/Alluvial Interface
		11/06/18	2.00	6,887.63	6,889.73	2.10	38.50	ND	NA	23.90	6,865.83	NA	20 - 35	Chinle/Alluvial Interface
06/29/17	OW-60	09/21/17	2.00	6,891.06	6,893.51	2.45	45.55	ND	NA	16.45	6,877.06	NA	25 - 45	Chinle/Alluvial Interface
		12/05/17	2.00	6,891.06	6,893.51	2.45	45.70	ND	NA	16.40	6,877.11	NA	25 - 45	Chinle/Alluvial Interface
		02/21/18	2.00	6,891.06	6,893.51	2.45	46.06	ND	NA	16.26	6,877.25	NA	25 - 45	Chinle/Alluvial Interface
		04/26/18	2.00	6,891.06	6,893.51	2.45	46.15	ND	NA	16.52	6,876.99	NA	25 - 45	Chinle/Alluvial Interface
		08/14/18	2.00	6,891.06	6,893.51	2.45	46.42	ND	NA	16.52	6,876.99	NA	25 - 45	Chinle/Alluvial Interface
		11/06/18	2.00	6,891.06	6,893.51	2.45	45.70	ND	NA	16.25	6,877.26	NA	25 - 45	Chinle/Alluvial Interface

DEFINITIONS:

DTB - Depth to Bottom
DTW - Depth to Water
SPH = Separate Phase Hydrocarbons

NA = Not Applicable
Dry indicates no water was detected.

NM = Not Measured

Table 8.1
BW-5B and BW-5C BTEX and MTBE Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

STANDARDS			PARAMETERS				
			Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	MTBE (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**0.005**	**1**	**0.7**	**0.62**	**0.1**
40 CFR 141.61 MCL (NOVEMBER 2015)			0.005	1	0.7	10	NE
NMED TAP WATER (FEBRUARY 2019)			0.00455	1.09	0.0149	0.193	0.143
EPA RSL TAP WATER (NOVEMBER 2018)			0.00046	1.1	0.0015	0.19	0.014
WELL ID	**DATE SAMPLED**	**METHOD**					
BW-5B	12/08/17	8260B	<0.001	0.0018	<0.001	<0.0015	0.00064
BW-5C	12/08/17	8260B	<0.001	<0.001	<0.001	<0.0015	0.039

DEFINITIONS
NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.61 Detection Limits for Organic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1

NOTES

Table 8.1.1
BW-5B and BW-5C General Chemistry and DRO/GRO/MRO Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

			PARAMETERS									
STANDARDS			**Fluoride (mg/L)**	**Chloride (mg/L)**	**Bromide (mg/L)**	**Nitrite (mg/L)**	**Nitrate (mg/L)**	**Phosphorus (mg/L)**	**Sulfate (mg/L)**	**DRO (mg/L)**	**GRO (mg/L)**	**MRO (mg/L)**
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**1.6**	**250.0**	NE	**1**	**10**	NE	**600.0**	NE	NE	NE
40 CFR 141.62 MCL			4.0	NE	NE	1	10	NE	NE	NE	NE	NE
NMED TAP WATER (FEBRUARY 2019)			1.18	NE	NE	1.97	31.59	NE	NE	NE	NE	NE
EPA RSL TAP WATER (NOVEMBER 2018)			0.8	NE	NE	2	32	NE	NE	NE	NE	NE
NMED SSG (March 2019)			NE	NE	NE	NE	NE	NE	NE	**0.0858**	**0.0858**	**0.0858**
Well ID	**DATE SAMPLED**	**METHOD**										
BW-5B	12/08/17	E300	0.27	110	0.47	0.15	0.15	<2.5	110	<1	0.014	<5
BW-5C	12/08/17	E300	<0.5	**1400**	1.2	0.23	0.23	<2.5	210	<1	0.035	<5

DEFINITIONS
NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.62 Detection Limits for Inorganic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1
NMED Soil Screening Guidance Volume 1, Table 6-4 (groundwater), (March 2017)

NOTES

Table 8.1.2
BW-5B and BW-5C Total Metals Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

STANDARDS			PARAMETERS										
			Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)	Selenium (mg/L)	Mercury (mg/L)	Uranium (mg/L)	Zinc (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**0.01**	**2**	**0.005**	**0.05**	**1.0**	**1.0**	**0.015**	**0.2**	**0.05**	**0.002**	**0.03**	**10.0**
40 CFR 141.62 MCL (NOVEMBER 2015)			0.01	2.0	0.005	0.1	1.3	NE	0.015	NE	0.05	0.002	0.03	NE
NMED TAP WATER (FEBRUARY 2019)			0.000855	3.28	0.00624	0.0057	0.7898	13.8	NE	2.02	0.0987	0.000626	0.0592	5.96
EPA RSL TAP WATER (NOVEMBER 2018)			0.000052	3.8	0.0092	NE	0.8	14	0.015	0.43	0.1	0.00063	0.004	6
Well ID	**DATE SAMPLED**	**METHOD**												
BW-5B	12/08/17	200.7/200.8	0.003	0.085	<0.002	0.012	<0.006	**1.7**	0.00097	0.042	<0.005	0.00015	**0.042**	0.0086
BW-5C	12/08/17	200.7/200.8	0.0022	0.12	<0.002	<0.006	<0.006	0.54	<0.0025	0.058	<0.005	0.000081	**0.038**	<0.01

DEFINITIONS

NE = Not established

NA = Not analyzed

Bold and highlighted values represent values above the applicable standards

STANDARDS

WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.

a) Human Health Standards; b) Other Standards for Domestic Water

40 CFR 141.62 Detection Limits for Inorganic Contaminants

EPA Regional Screening Level (RSL) Summary Table

NMED Risk Assessment Guidance for Investigations and Remediations Table A-1 (Dec 2014)

NOTES

Table 8.1.3
BW-5B and BW-5C Dissolved Metals Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

STANDARDS			PARAMETERS									
			Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)	Selenium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**0.01**	**2**	**0.005**	**0.05**	**1.0**	**1.0**	**0.015**	**0.2**	**0.05**	**0.03**	**10.0**
40 CFR 141.62 MCL (NOVEMBER 2015)			0.01	2.0	0.005	0.1	1.3	NE	0.015	NE	0.05	0.03	NE
NMED TAP WATER (FEBRUARY 2019)			0.000855	3.28	0.00624	0.0057	0.7898	13.8	NE	2.02	0.0987	0.0592	5.96
EPA RSL TAP WATER (NOVEMBER 2018)			0.000052	3.8	0.0092	NE	0.8	14	0.015	0.43	0.1	0.004	6
Well ID	**DATE SAMPLED**	**METHOD**											
BW-5B	12/08/17	200.7/200.14	0.0032	0.05	<0.002	<0.006	<0.006	0.024	<0.0005	0.0064	0.0039	**0.04**	0.007
BW-5C	12/08/17	200.7/200.15	<0.02	0.11	<0.002	<0.006	<0.006	0.29	<0.0005	0.043	<0.01	**0.041**	0.0074

DEFINITIONS
NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.62 Detection Limits for Inorganic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1

Table 8.1.4
BW-5A and BW-5B Semi-Volatile Organic Compound Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

			PARAMETERS
STANDARDS			Bis(2-ethylhexyl)phthalate (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			NE
40 CFR 141.61 MCL (NOVEMBER 2015)			**0.006**
NMED TAP WATER (FEBRUARY 2019)			0.0556
EPA RSL TAP WATER (NOVEMBER 2018)			0.0056
Well ID	**DATE SAMPLED**	**METHOD**	
BW-5B	12/08/17	8270C	<0.01
BW-5C	12/08/17	8270C	<0.01

DEFINITIONS
NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.62 Detection Limits for Inorganic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1 (Dec 2014)

NOTES
1) Detected for the first time. Possible lab contaminant.

2) Request to remove 8270C Analysis in 2015 approved per NMED Comment 7(b), Approval with Modification, FWGWMWP - 2012 Updates; 2013 Updates; 2014 Updates for 2015.

Table 8.2
OW-59 and OW-60 BTEX, MTBE, General Chemistry and DRO/GRO/MRO Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

			PARAMETERS											
STANDARDS			**Benzene (mg/L)**	**Toluene (mg/L)**	**Ethyl Benzene (mg/L)**	**Total Xylenes (mg/L)**	**MTBE (mg/L)**	**Fluoride (mg/L)**	**Chloride (mg/L)**	**Nitrite (mg/L)**	**Nitrate (mg/L)**	**Sulfate (mg/L)**	**DRO (mg/L)**	**GRO (mg/L)**	**MRO (mg/L)**
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**0.005**	**1**	**0.7**	**0.62**	**0.1**	**1.6**	**250**	**1**	**10**	**600**	NE	NE	NE
40 CFR 141.61 MCL (NOVEMBER 2015)			0.005	1	0.7	10	NE	4.0	NE	1	10	NE	NE	NE	NE
NMED TAP WATER (FEBRUARY 2019)			0.00455	1.09	0.0149	0.193	0.143	1.18	NE	1.97	31.59	NE	NE	NE	NE
EPA RSL TAP WATER (NOVEMBER 2018)			0.00046	1.1	0.0015	0.19	0.014	0.8	NE	2	32	NE	NE	NE	NE
NMED SSG (MARCH 2019)			NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	**0.0858**	**0.0858**	**0.0858**
Well ID	**DATE SAMPLED**	**METHOD**													
OW-59	12/06/17	8260B	<0.001	<0.001	<0.001	<0.0015	0.0094	<0.5	**1700**	<2	<2	**2600**	**0.55**	**3.1**	<5
OW-60	12/06/17	8260B	<0.001	<0.001	<0.001	<0.0015	0.00028	1.1	**1700**	**14**	**14**	**780**	<1	0.031	<5

DEFINITIONS

NE = Not established

NA = Not analyzed

Bold and highlighted values represent values above the applicable standards

STANDARDS

WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.

a) Human Health Standards; b) Other Standards for Domestic Water

40 CFR 141.62 Detection Limits for Inorganic Contaminants

EPA Regional Screening Level (RSL) Summary Table

NMED Risk Assessment Guidance for Investigations and Remediations Table A-1

NMED Soil Screening Guidance Volume 1, Table 6-4 (groundwater), (March 2017)

NOTES

Table 8.2.1
OW-59 and OW-60 Total Metals Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

STANDARDS			PARAMETERS											
			Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)	Selenium (mg/L)	Silver	Mercury (mg/L)	Uranium (mg/L)	Zinc (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**0.01**	**2**	**0.005**	**0.05**	**1.0**	**1.0**	**0.015**	**0.2**	**0.05**	**0.05**	**0.002**	**0.03**	**10.0**
40 CFR 141.62 MCL (NOVEMBER 2015)			0.01	2.0	0.005	0.1	1.3	NE	0.015	NE	0.05	**NE**	0.002	0.03	NE
NMED TAP WATER (FEBRUARY 2019)			0.000855	3.28	0.00624	0.0057	0.7898	13.8	NE	2.02	0.0987	0.0812	0.000626	0.0592	5.96
EPA RSL TAP WATER (NOVEMBER 2018)			0.000052	3.8	0.0092	NE	0.8	14	0.015	0.43	0.1	0.094	0.00063	0.004	6
Well ID	**DATE SAMPLED**	**METHOD**													
OW-59	12/06/17	200.7/200.8	0.0095	0.064	<0.002	<0.006	0.0042	**2.1**	0.0014	0.17	<0.02	0.0037	<0.0002	**0.17**	0.0041
OW-60	12/06/17	200.7/200.8	<0.02	0.12	<0.002	0.0033	<0.006	**3.1**	0.002	0.13	0.021	0.0024	<0.0002	**0.048**	0.0097

DEFINITIONS

NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS

WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.62 Detection Limits for Inorganic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1

NOTES

Table 8.2.2
OW-59 and OW-60 Dissolved Metals Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

STANDARDS			PARAMETERS										
			Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)	Selenium (mg/L)	Silver	Uranium (mg/L)	Zinc (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**0.01**	**2**	**0.005**	**0.05**	**1.0**	**1.0**	**0.015**	**0.2**	**0.05**	**0.05**	**0.03**	**10.0**
40 CFR 141.62 MCL (NOVEMBER 2015)			0.01	2.0	0.005	0.1	1.3	NE	0.015	NE	0.05	**NE**	0.03	NE
NMED TAP WATER (FEBRUARY 2019)			0.000855	3.28	0.00624	0.0057	0.7898	13.8	NE	2.02	0.0987	0.0812	0.0592	5.96
EPA RSL TAP WATER (NOVEMBER 2018)			0.000052	3.8	0.0092	NE	0.8	14	0.015	0.43	0.1	0.094	0.004	6
Well ID	**DATE SAMPLED**	**METHOD**												
OW-59	12/06/17	200.7/200.8	**0.012**	0.013	<0.002	<0.006	<0.006	0.024	<0.0025	0.13	0.023	0.0047	**0.14**	0.011
OW-60	12/06/17	200.7/200.8	**0.013**	0.029	<0.002	<0.006	<0.006	0.02	<0.0005	0.042	0.031	0.0029	**0.047**	0.01

DEFINITIONS
NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.62 Detection Limits for Inorganic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1

NOTES

Table 8.2.3
OW-59 and OW-60 Semi-Volatile and Volatile Organic Compounds, Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

STANDARDS			PARAMETERS		
			1-Methyl naphthalene (mg/L)	Acetone (mg/L)	Bis(2-ethylhexyl)phthalate (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			NE	NE	NE
40 CFR 141.61 MCL (NOVEMBER 2015)			NE	NE	**0.006**
NMED TAP WATER (FEBRUARY 2019)			**0.0114**	**14.06**	0.0556
EPA RSL TAP WATER (NOVEMBER 2018)			0.0011	14	0.0056
Well ID	**DATE SAMPLED**	**METHOD**			
OW-59	12/06/17	8260B	<0.004	0.0028	<0.01
OW-60	12/06/17	8260B	<0.004	0.0025	**0.045**

DEFINITIONS
NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.62 Detection Limits for Inorganic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1

NOTES

Appendix A

Well Logs

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon/
Comments	: Hand Auger to 5' BGL
Total Depth	: 44'
Ground Water	: Not Encountered
Start Date	: 6/14/2017
Finish Date	: 6/14/2017

WELL NO. BW-4A

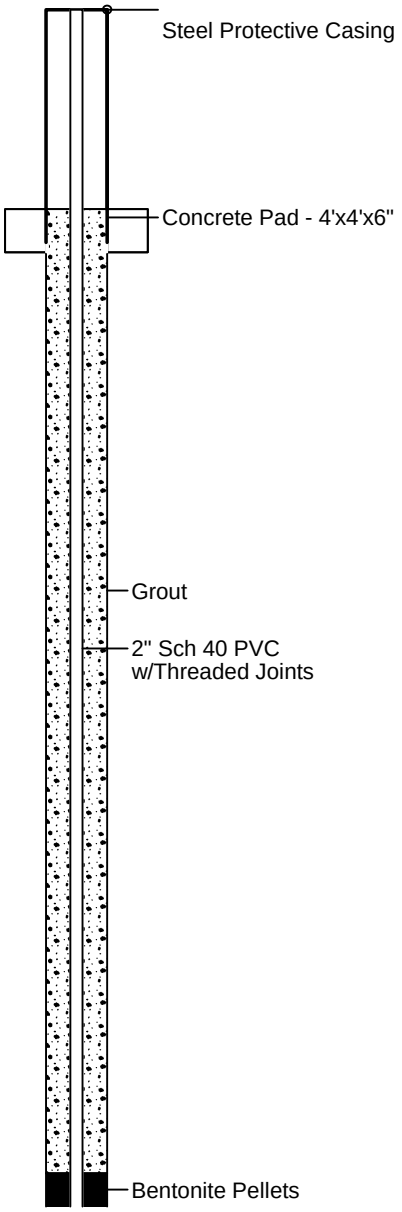
(Sheet 1 of 3)

Elev., TOC (ft.msl)	: 6873.18
Elev., PAD (ft. msl)	: 6870.67
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634063.05
E	: W2542465.22

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							
1	7.7			CL	100		SILTY CLAY, low, firm, dry to damp, brown, no odor,
2							
3	9.5			CH	100		CLAY, high, stiff, damp, brown, no odor,
4							
5	9.0			CH	100		CLAY, SIMILAR TO ABOVE (STA), very stiff, no odor,
6							
7	6.8			CH	90		CLAY, STA, no odor,
8							
9	5.4			CH	80		CLAY, STA, no odor,
10							
11	3.3			CH	80		CLAY, STA, no odor,
12							
13	5.8			CH	50		CLAY, STA, no odor,
14							
15	4.0			CH			CLAY, STA, no odor,

Completion Results

Well No. BW-4A



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4A.boı

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon/
Comments	: Hand Auger to 5' BGL
Total Depth	: 44'
Ground Water	: Not Encountered
Start Date	: 6/14/2017
Finish Date	: 6/14/2017

WELL NO. BW-4A

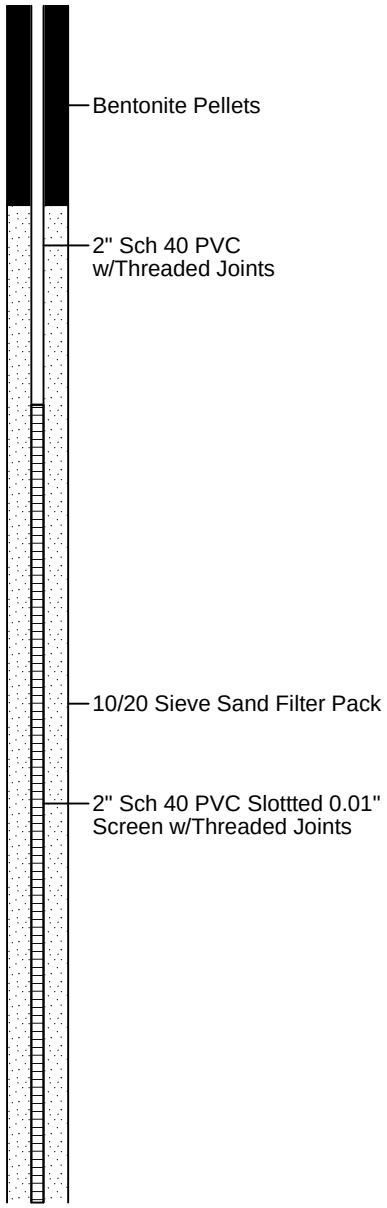
(Sheet 2 of 3)

Elev., TOC (ft.msl)	: 6873.18
Elev., PAD (ft. msl)	: 6870.67
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634063.05
E	: W2542465.22

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
15	4.0			CH	60		
16							CLAY, STA, no odor,
17	2.0			CH	80		
18							CLAYEY SILT, low, firm/crumbly, damp, light brown/tan, no odor,
19	6.9			ML	40		
20							CLAYEY SILT/SILTY CLAY, STA, interbedded, no odor,
21	5.0			ML/CL	70		
22							CLAYEY SILT, low, firm/crumbly,damp, tan, no odor,
23	3.6			ML	50		
24							CLAYEY SILT/SILTY CLAY, STA, interbedded, no odor,
25	3.7			ML/CL	60		
26							CLAY, high, very stiff, damp, brown, no odor,
27	6.2			CH	60		
28							CLAY, STA, darker brown, no odor,
29	3.5			CH	70		
30							CLAY, STA, no odor,
31	6.1			CH	80		
32	6.1			CL			SILTY CLAY, low, very stiff, damp, no odor, light brown (reddish), trace very fine grain sand,
33							

Completion Results

Well No. BW-4A



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4A.boı

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon/
Comments	: Hand Auger to 5' BGL
Total Depth	: 44'
Ground Water	: Not Encountered
Start Date	: 6/14/2017
Finish Date	: 6/14/2017

WELL NO. BW-4A

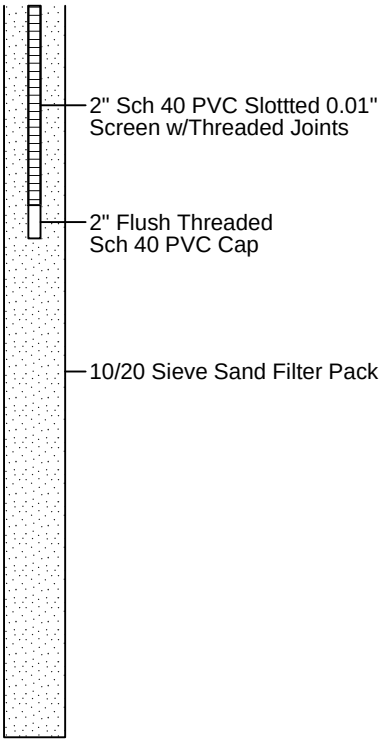
(Sheet 3 of 3)

Elev., TOC (ft.msl)	: 6873.18
Elev., PAD (ft. msl)	: 6870.67
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634063.05
E	: W2542465.22

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
33	6.1			CL	60		
34							CLAYEY SILT/SILTY CLAY, low, firm to stiff, damp, reddish brown and grey, alternating silt/clay, no odor,
35	3.8			ML/CL	80		
36							SILTY CLAY, low, stiff, damp, reddish brown and grey (less grey than above), no odor,
37	6.1			CL	60		
38							SILTY CLAY, STA, no odor,
39	5.2			CL	60		
40							SILTY CLAY, STA, reddish brown and grey, no odor,
41	4.2			CL	70		
42							SILTY CLAY, STA, no odor.
43	3.9			CL	60		
44							
45							
46							
47							
48							
49							
50							
51							

Completion Results

Well No. BW-4A



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4A.boı

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon -
Comments	: Hand Auger to 5' BGL
Total Depth	: 90'
Ground Water	: Not Encountered
Start Date	: 6/15/2017
Finish Date	: 6/16/2017

WELL NO. BW-4B

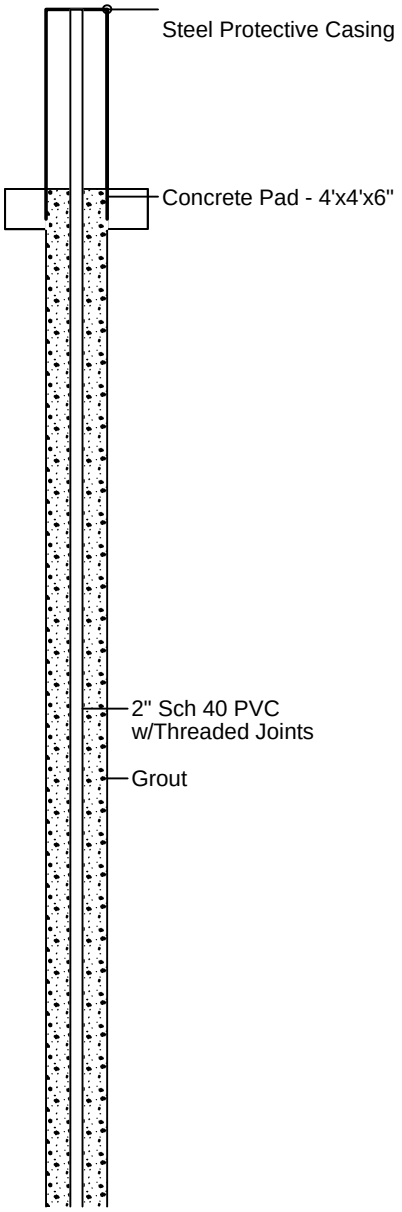
(Sheet 1 of 5)

Elev., TOC (ft.msl)	: 6873.23
Elev., PAD (ft. msl)	: 6870.62
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634043.22
E	: W2542462.98

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, dry to damp, brown, no odor,
1	1.3			CL	100		
2							CLAY, high, stiff, damp, brown, no odor,
3	1.2			CH	100		
4							CLAY, SIMILAR TO ABOVE (STA), very stiff, no odor,
5	1.3			CH	100		
6							CLAY, STA, no odor,
7	1.7			CH	90		
8							CLAY, STA, no odor,
9	2.0			CH	80		
10							CLAY, STA, no odor,
11	2.1			CH	80		
12							CLAY, STA, no odor,
13	3.1			CH	80		
14							CLAY, STA, no odor,
15	3.4			CH	80		
16							CLAY, STA, no odor,
17	5.1			CH			

Completion Results

Well No. BW-4B



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4B.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon -
Comments	: Hand Auger to 5' BGL
Total Depth	: 90'
Ground Water	: Not Encountered
Start Date	: 6/15/2017
Finish Date	: 6/16/2017

WELL NO. BW-4B

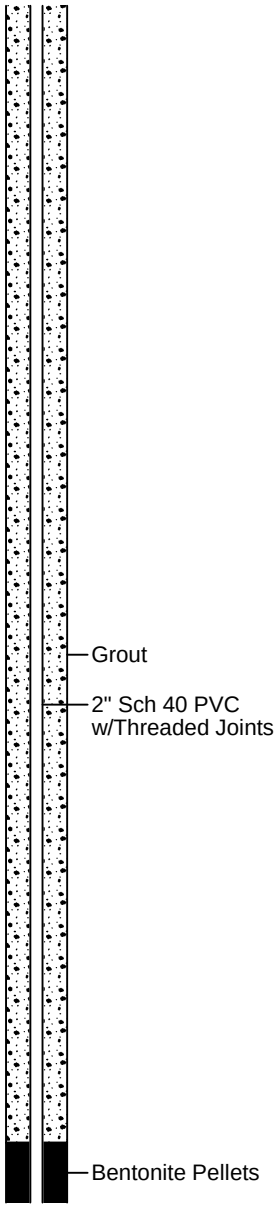
(Sheet 2 of 5)

Elev., TOC (ft.msl)	: 6873.23
Elev., PAD (ft. msl)	: 6870.62
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634043.22
E	: W2542462.98

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
17							
	5.1			CH	70		
18							CLAYEY SILT, low, firm/crumbly, damp, light brown/tan, no odor,
19	3.2			ML	60		
20							CLAYEY SILT/SILTY CLAY, STA, no odor, interbedded,
21	3.9			ML/CL	70		
22							CLAYEY SILT, low, firm/crumbly, damp, brown and tan, no odor,
23	3.5			ML	60		
24				ML/CL	60		CLAYEY SILT/SILTY CLAY, STA, no odor,
25	3.9			CH	60		CLAY, high, very stiff, damp, brown, no odor,
26							CLAY, STA, darker brown, no odor,
27	1.8			CH	70		
28							SILTY CLAY, moderate to low, very stiff, damp, dark brown grading to light reddish brown, trace fine grain sand at base, no odor,
29	1.8			CL	80		
30				CL	80		SILTY CLAY, STA,
31	2.0			CL	80		SANDY GRAVELLY CLAY, low, stiff, dry to damp, light grey and brown, no odor,
32				CL	80		SILTY CLAY, low, stiff, damp, reddish brown, no odor,
33	2.2			ML/CL	80		CLAYEY SILT/SILTY CLAY, low, firm/crumbly, damp, reddish brown and grey,
34							SILTY CLAY, STA, no odor,
35	5.6			CL	80		
36							SILTY CLAY, STA, no odor,
	3.6			CL			
37							

Completion Results

Well No. BW-4B



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4B.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon -
Comments	: Hand Auger to 5' BGL
Total Depth	: 90'
Ground Water	: Not Encountered
Start Date	: 6/15/2017
Finish Date	: 6/16/2017

WELL NO. BW-4B

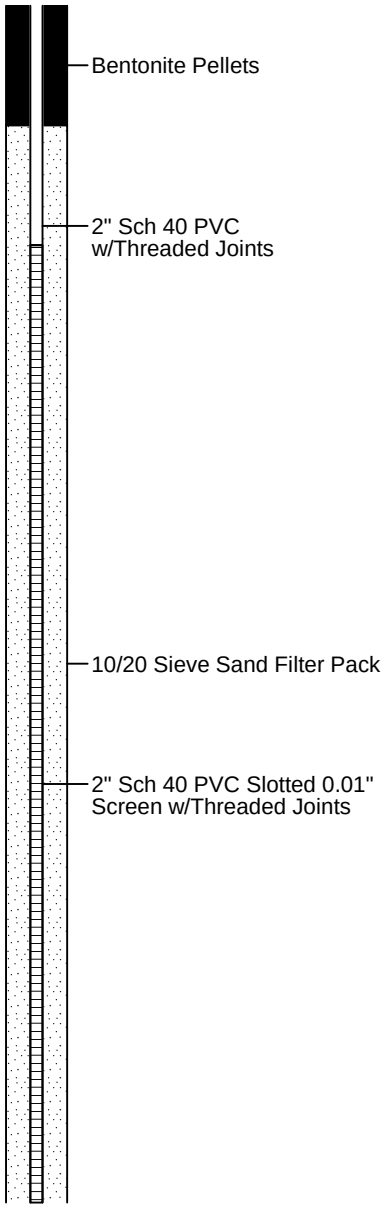
(Sheet 3 of 5)

Elev., TOC (ft.msl)	: 6873.23
Elev., PAD (ft. msl)	: 6870.62
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634043.22
E	: W2542462.98

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
37							
	3.6			CL	80		
38							SILTY CLAY, STA, no odor,
39	2.3			CL	80		
40							SILTY CLAY, STA, no odor,
41	6.2			CL	80		
42							SILTY CLAY, STA, no odor,
43	5.0			CL	70		
44				CL	80		SILTY CLAY, STA, no odor,
45	2.6			CL	80		GRAVELLY SILTY CLAY, low, firm/crumbly, dry-calcium carbonate nodules, grey and reddish brown, no odor,
46				CL	80		SANDY CLAY, low, firm/crumbly, dry, grey and reddish brown, very fine grain sand, no odor,
47	3.5			CL	80		SILTY CLAY, low, very stiff, dry to damp, reddish brown, no odor,
48							SILTY CLAY, STA, no odor,
49	1.9			CL	80		
50							SILTY CLAY, STA, no odor,
51	5.1			CL	80		
52							SILTY CLAY, STA, trace grey clay, occasional gravel, no odor,
53	5.6			CL	70		
54							SILTY CLAY, low, very stiff, dry to damp, reddish brown, no odor,
55	3.8			CL	70		
56							SILTY CLAY, STA, trace grey clay, no odor,
	3.4			CL			
57							

Completion Results

Well No. BW-4B



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4B.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon -
Comments	: Hand Auger to 5' BGL
Total Depth	: 90'
Ground Water	: Not Encountered
Start Date	: 6/15/2017
Finish Date	: 6/16/2017

WELL NO. BW-4B

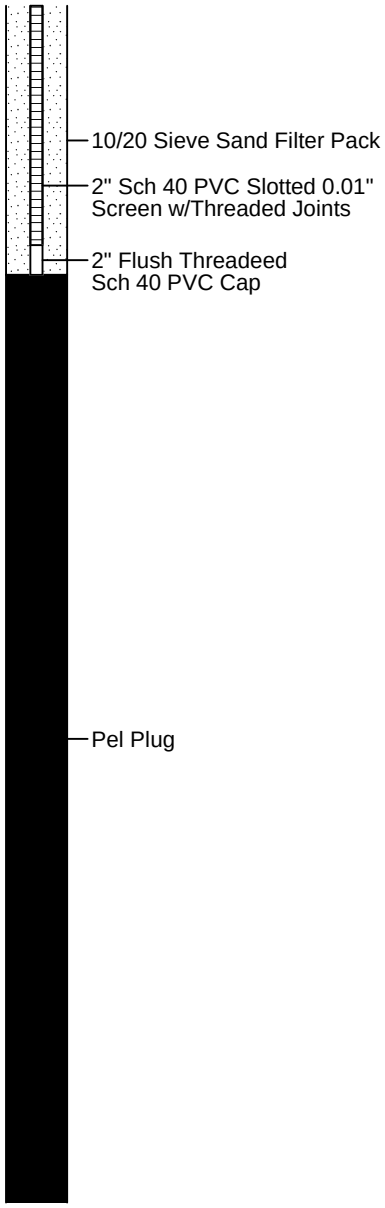
(Sheet 4 of 5)

Elev., TOC (ft.msl)	: 6873.23
Elev., PAD (ft. msl)	: 6870.62
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634043.22
E	: W2542462.98

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
57							
	3.4			CL	60		
58							SILTY CLAY, STA, no odor,
59	2.4			CL	80		
60							SILTY CLAY, low, very stiff, dry to damp, reddish brown grey clay, no odor,
61	4.9			CL	80		
62							SILTY CLAY, STA, no odor,
63	1.7			CL	80		
64							SILTY CLAY, STA, no odor,
65	5.8			CL	80		
66							SILTY CLAY, STA,
67	2.7			CL	80		
68							SILTY CLAY, low, very stiff, calcareous, dry to damp, brown and blueish grey, no odor,
69	3.9			CL	80		
70							SILTY CLAY, low, firm/crumbly, damp, reddish brown, no odor,
71	1.6			CL	80		
72							SILTY CLAY, STA, no odor,
73	1.7			CL	60		
74							SILTY CLAY, STA, no odor,
75	1.0			CL	60		
76							SILTY CLAY, STA, no odor,
	0.1			CL			
77							

Completion Results

Well No. BW-4B



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4B.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon -
Comments	: Hand Auger to 5' BGL
Total Depth	: 90'
Ground Water	: Not Encountered
Start Date	: 6/15/2017
Finish Date	: 6/16/2017

WELL NO. BW-4B

(Sheet 5 of 5)

Elev., TOC (ft.msl)	: 6873.23
Elev., PAD (ft. msl)	: 6870.62
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634043.22
E	: W2542462.98

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
77							
	0.1			CL	70		
78							SILTY CLAY, STA, no odor,
79	0.4			CL	60		
80							SILTY CLAY, STA, no odor,
81	0.1			CL	70		
82							SILTY CLAY, STA, no odor,
83	0.2			CL	60		
84							SILTY CLAY, STA, very stiff, trace grey clay, no odor,
85	0.0			CL	70		
86							SILTY CLAY, STA, no odor,
87	0.1			CL	40		
88							SILTY CLAY, STA, imbedded with fine grain sandstone, hard/dense, white.
89	0.2			CL/SS	40		
90							
91							
92							
93							
94							
95							
96							
97							

Completion Results

Well No. BW-4B



03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4B.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	:
Total Depth	: 20.5'
Ground Water	: Not Encountered
Start Date	: 06/23/2017
Finish Date	: 06/23/2017

WELL NO. BW-5A

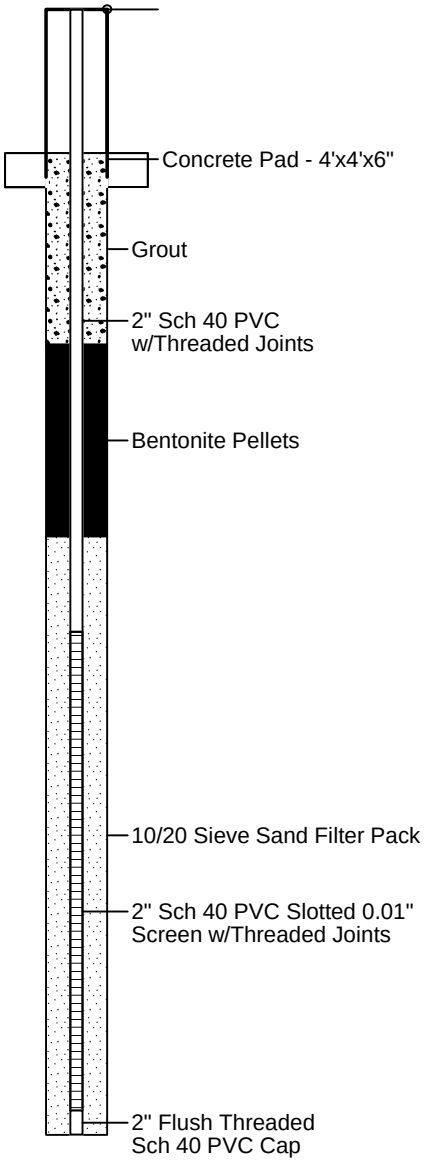
(Sheet 1 of 1)

Elev., TOC (ft.msl)	: 6877.00
Elev., PAD (ft. msl)	: 6874.39
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633259.56
E	: W2542551.45

Depth (ft.)	PID (ppm)	USCS	Recovery	DESCRIPTION
0-1	0.0	CL	100	SILTY CLAY, low, firm, dry, brown, no odor,
1-2				
2-3	0.1	CL	100	SILTY CLAY, SIMILAR TO ABOVE (STA), no odor,
3-4				
4-5	0.0	CL	100	SILTY CLAY, STA, no odor,
5-6				
6-7	0.0	CH	40	CLAY, high, very stiff, dry, brown, no odor,
7-8				
8-9	0.1	CH	80	CLAY, STA, no odor,
9-10				
10-11	0.0	CL	60	CLAY, moderate, very stiff, gravel at base, dry, brown, no odor,
11-12				
12-13	0.0	SP	80	GRAVELLY SILT/SAND, very fine, 5-10 mm gravel-clay at base - stiff, dry, tan, no odor,
13-14				
14-15	0.0	CL	70	SILTY CLAY, low, stiff, dry, light reddish brown, tan and grey, trace very fine grain sand,
15-16				
16-17	0.0	CL	60	SILTY CLAY, STA,
17-18				
18-19	0.0	CL	80	SANDY SILTY CLAY, low, very stiff, very fine sand, light reddish brown, occasional grey, no odor.
19-20				
20-21				
21-22				

Completion Results

Well No. BW-5A



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5A.boı

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to .5'
Total Depth	: 58'
Ground Water	: Not Encountered
Start Date	: 06/23/2017
Finish Date	: 06/23/2017

WELL NO. BW-5B

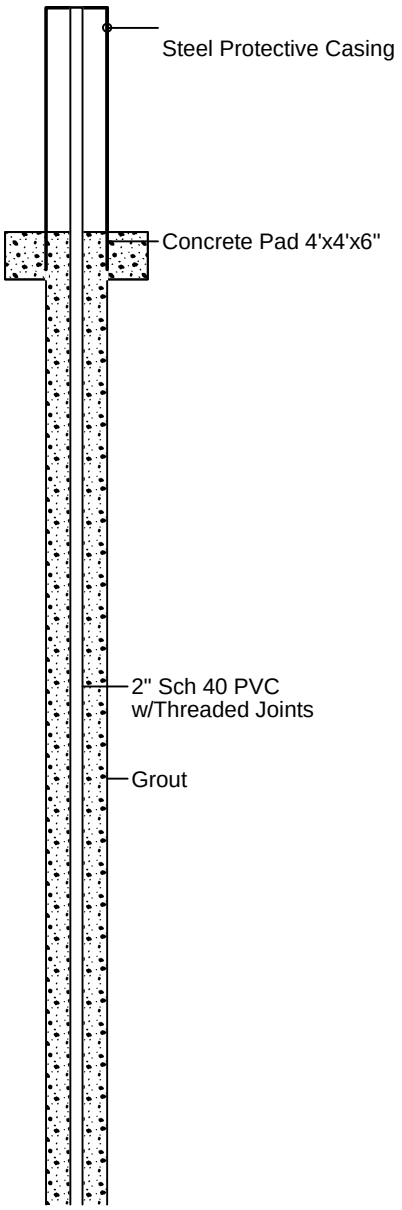
(Sheet 1 of 4)

Elev., TOC (ft.msl)	: 6876.82
Elev., PAD (ft. msl)	: 6874.32
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633269.31
E	: W2542551.84

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, dry, brown, no odor,
1	0.0			CL	100		
2							SILTY CLAY, SIMILAR TO ABOVE (STA), no odor,
3	0.1			CL	100		
4							SILTY CLAY, STA, no odor,
5	0.0			CL	100		
6							CLAY, high, very stiff, dry, brown, no odor,
7	0.0			CH	40		
8							CLAY, STA, no odor,
9	0.1			CH	80		
10				CH	60		CLAY, STA, no odor,
11	0.0			CL	60		SILTY CLAY, low, very stiff, dry, calcareous, tan to light brown, no odor,
12							GRAVELLY SILT/SAND, very fine, very
13	0.1			SP			dense, dry, tan, no odor, sandstone and chert gravel,

Completion Results

Well No. BW-5B



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5B.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to .5'
Total Depth	: 58'
Ground Water	: Not Encountered
Start Date	: 06/23/2017
Finish Date	: 06/23/2017

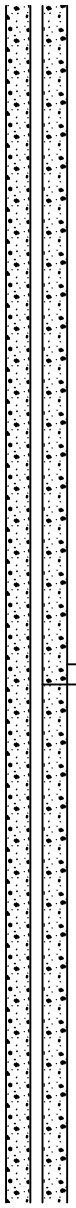
WELL NO. BW-5B

Elev., TOC (ft.msl)	: 6876.82
Elev., PAD (ft. msl)	: 6874.32
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633269.31
E	: W2542551.84

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
13	0.1			SP	90		
14							SILTY CLAY, low, firm to stiff/crumbly, dry to damp, reddish brown and grey, trace gravel and very fine grain sand, no odor,
15	0.0			CL	90		
16							CLAYEY SILT/SAND, very fine grain, firm/crumbly, dry, light brown and grey, no odor,
17	0.0			SP	50		
18							CLAYEY SILT/SAND, STA, dry, light reddish brown, no odor,
19	0.0			SP	50		
20							SANDY SILTY CLAY, low, very stiff, dry, light reddish brown and light grey, no odor, very fine grain sand,
21	0.0			CL	60		
22							SANDY SILTY CLAY, STA, no odor,
23	0.0			CL	90		
24							SANDY SILTY CLAY, STA, no odor,
25	0.0			CL	60		
26							SANDY SILTY CLAY, STA, no odor,
27	0.0			CL	70		
28							SANDY SILTY CLAY, STA, no odor,
29	0.0			CL			

Completion Results

Well No. BW-5B



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5B.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to .5'
Total Depth	: 58'
Ground Water	: Not Encountered
Start Date	: 06/23/2017
Finish Date	: 06/23/2017

WELL NO. BW-5B

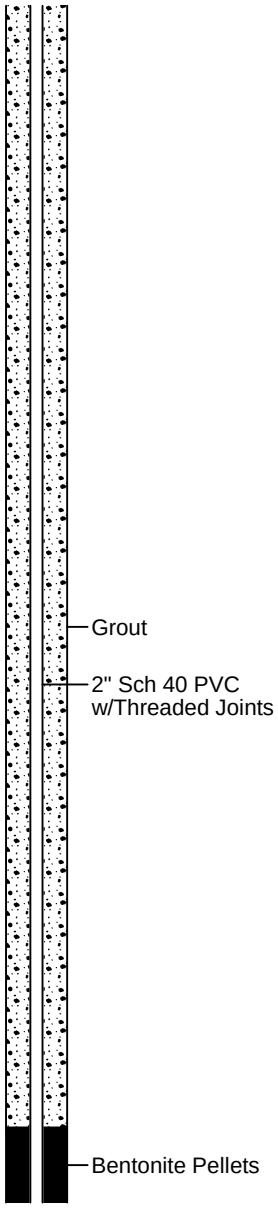
(Sheet 3 of 4)

Elev., TOC (ft.msl)	: 6876.82
Elev., PAD (ft. msl)	: 6874.32
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633269.31
E	: W2542551.84

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
29	0.0			CL	60		
30							SILTY CLAY, low, firm to stiff, damp, reddish brown, no odor, softer than above,
31	0.0			CL	60		
32							SILTY CLAY, STA, no odor, trace grey clay,
33	0.0			CL	70		
34							SILTY CLAY, STA, no odor, trace grey clay,
35	0.0			CL	70		
36							SILTY CLAY, STA, no odor,
37	0.0			CL	60		
38							SILTY CLAY, low, stiff to very stiff, damp, reddish brown, no odor,
39	0.0			CL	70		
40							SILTY CLAY, STA, stiff, damp, no odor,
41	0.0			CL	70		
42							SILTY CLAY, STA,
43	0.0			CL	60		
44							SILTY CLAY, STA, calcareous,
45	0.0			CL			

Completion Results

Well No. BW-5B



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5B.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to .5'
Total Depth	: 58'
Ground Water	: Not Encountered
Start Date	: 06/23/2017
Finish Date	: 06/23/2017

WELL NO. BW-5B

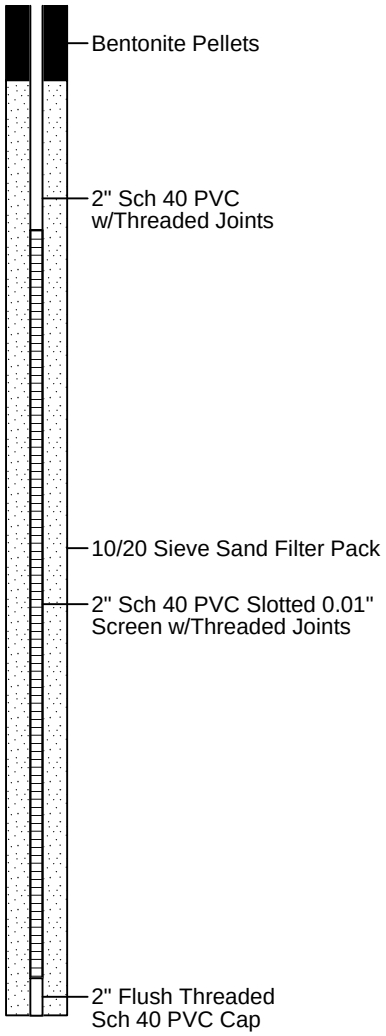
(Sheet 4 of 4)

Elev., TOC (ft.msl)	: 6876.82
Elev., PAD (ft. msl)	: 6874.32
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633269.31
E	: W2542551.84

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
45	0.0			CL	60		
46							SILTY CLAY, STA,
47	0.1			CL	60		
48							SILTY CLAY, low, very stiff, damp, light reddish brown, no odor, trace pink sandstone at base,
49	0.0			CL	80		
50							SILTY CLAY, STA, trace grey clay and sandstone present,
51	0.0			CL	70		
52							SILTY CLAY, STA, sandstone present,
53	0.0			CL	20		
54							SILTY CLAY, low, very stiff, damp/dry, reddish brown and grey, bluish grey at base, no odor,
55	0.0			CL	80		
56							SILTY CLAY, STA, increase in bluish grey clay, damp.
57	0.0			CL	90		
58							
59							
60							
61							

Completion Results

Well No. BW-5B



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5B.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	:
Total Depth	: 76'
Ground Water	: 68'
Start Date	: 06/19/2017
Finish Date	: 06/21/2017

WELL NO. BW-5C

(Sheet 1 of 4)

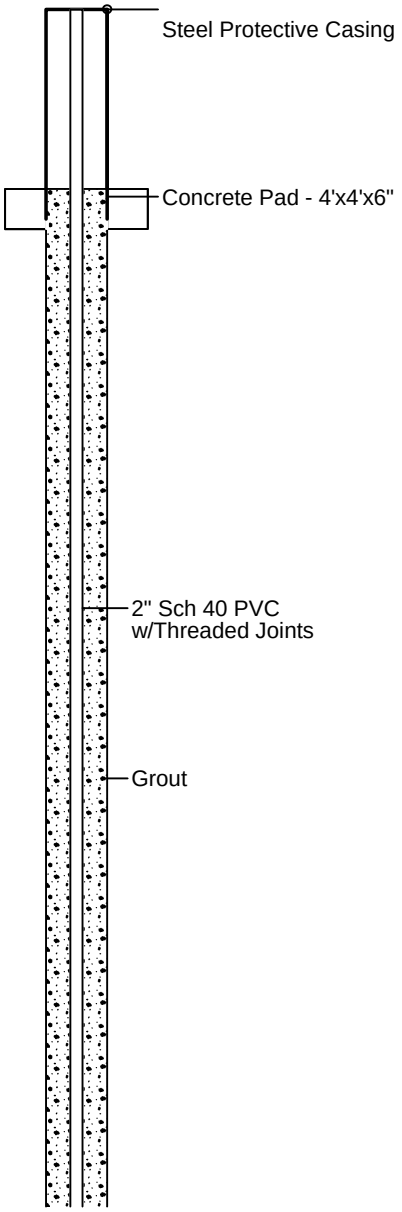
Elev., TOC (ft.msl)	: 6876.85
Elev., PAD (ft. msl)	: 6874.22
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633279.54
E	: W2542553.04

Saturation
▼ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, dry, brown, no odor,
1	0.0			CL	100		
2							SILTY CLAY, SIMILAR TO ABOVE (STA), no odor,
3	0.1			CL	100		
4							SILTY CLAY, STA, no odor,
5	0.0			CL	100		
6							CLAY, high, very stiff, dry, brown, no odor,
7	0.0			CH	40		
8							CLAY, STA, no odor,
9	0.1			CH	80		
10				CH	60		CLAY, STA, no odor,
11	0.0			CL	60		SILTY CLAY, low, very stiff, dry, calcareous, tan to light brown, no odor,
12							GRAVELLY SILT/SAND, very fine, very dense, dry, tan, no odor, sandstone and chert gravel,
13	0.1			SP	90		
14							SILTY CLAY, low, firm to stiff/crumbly, dry to damp, reddish brown and grey, trace gravel and very fine grain sand, no odor,
15	0.0			CL	90		
16							CLAYEY SILT/SAND, very fine grain, firm/crumbly, dry, light brown and grey, no odor,
17	0.0			SP			

Completion Results

Well No. BW-5C



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5C.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	:
Total Depth	: 76'
Ground Water	: 68'
Start Date	: 06/19/2017
Finish Date	: 06/21/2017

WELL NO. BW-5C

(Sheet 2 of 4)

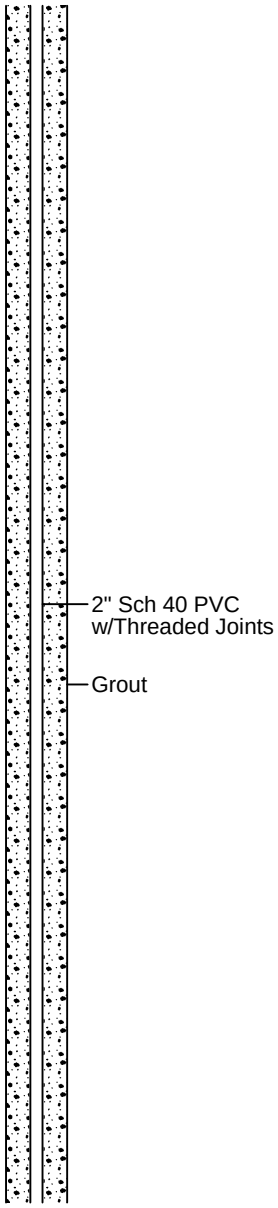
Elev., TOC (ft.msl)	: 6876.85
Elev., PAD (ft. msl)	: 6874.22
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633279.54
E	: W2542553.04

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
17							
	0.0			SP	50		
18							CLAYEY SILT/SAND, STA, dry, light reddish brown, no odor,
19	0.0			SP	50		
20							SANDY SILTY CLAY, low, very stiff, dry, light reddish brown and light grey, no odor, very fine grain sand,
21	0.0			CL	60		
22							SANDY SILTY CLAY, STA, no odor,
23	0.0			CL	90		
24							SANDY SILTY CLAY, STA, no odor,
25	0.0			CL	60		
26							SANDY SILTY CLAY, STA, no odor,
27	0.0			CL	70		
28							SANDY SILTY CLAY, STA, no odor,
29	0.0			CL	60		
30							SILTY CLAY, low, firm to stiff, damp, reddish brown, no odor, softer than above,
31	0.0			CL	60		
32							SILTY CLAY, STA, no odor, trace grey clay,
33	0.0			CL	70		
34							SILTY CLAY, STA, no odor, trace grey clay,
35	0.0			CL	70		
36							SILTY CLAY, STA, no odor,
	0.0			CL			
37							

Saturation
▼ Saturation

Completion Results

Well No. BW-5C



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5C.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	:
Total Depth	: 76'
Ground Water	: 68'
Start Date	: 06/19/2017
Finish Date	: 06/21/2017

WELL NO. BW-5C

(Sheet 3 of 4)

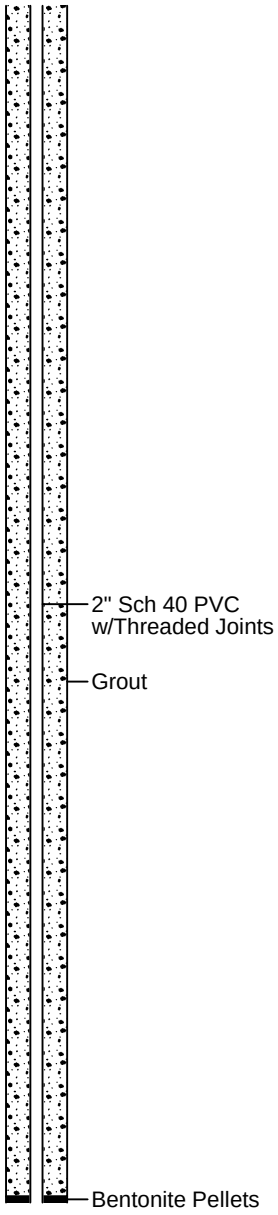
Elev., TOC (ft.msl)	: 6876.85
Elev., PAD (ft. msl)	: 6874.22
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633279.54
E	: W2542553.04

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
37	0.0			CL	60		
38							SILTY CLAY, low, stiff to very stiff, damp, reddish brown, no odor,
39	0.0			CL	70		
40							SILTY CLAY, STA, stiff, damp, no odor,
41	0.0			CL	70		
42							SILTY CLAY, STA,
43	0.0			CL	60		
44							SILTY CLAY, STA, calcareous,
45	0.0			CL	60		
46							SILTY CLAY, STA,
47	0.1			CL	60		
48							SILTY CLAY, STA, pink sandstone at base, very dense, dry, no odor,
49	0.0			CL	60		
50							SILTY CLAY, low, stiff, calcareous, dry, reddish brown and grey, no odor,
51	0.0			CL	90		
52							SILTY CLAY, STA, sandstone lense present near base, very dense, white,
53	0.0			CL	60		
54							SILTY CLAY, low, very stiff, dry, reddish brown, occasional grey, no odor,
55	0.0			CL	80		
56							SILTY CLAY, STA, increase in grey clay, no odor,
57	0.0			CL			

Saturation
▼ Saturation

Completion Results

Well No. BW-5C



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5C.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	:
Total Depth	: 76'
Ground Water	: 68'
Start Date	: 06/19/2017
Finish Date	: 06/21/2017

WELL NO. BW-5C

(Sheet 4 of 4)

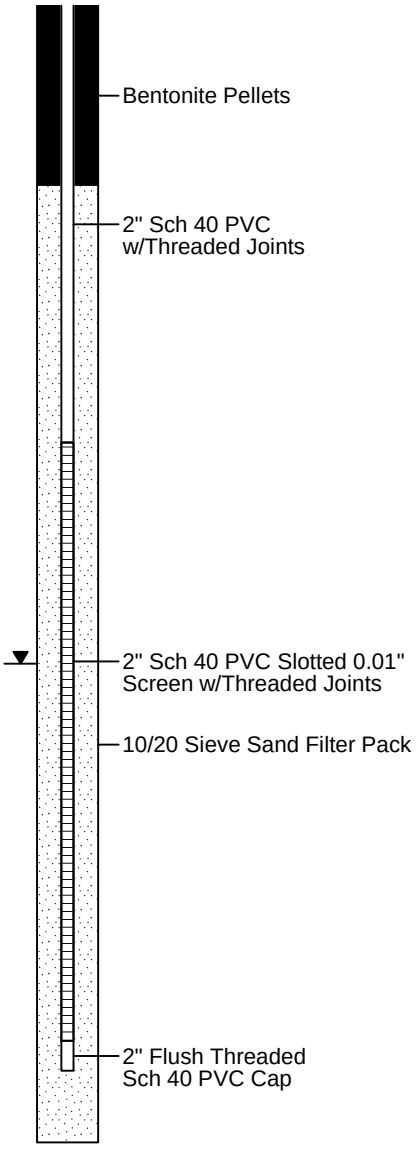
Elev., TOC (ft.msl)	: 6876.85
Elev., PAD (ft. msl)	: 6874.22
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633279.54
E	: W2542553.04

Depth (ft.)	PID (ppm)	USCS	Recovery	DESCRIPTION
57				
58	0.0	CL	60	
59	0.0		60	SHALE, very dense, damp to saturated in cracks, fissle, light brown and grey, no odor,
60				
61	0.0		50	SHALE, STA, very fine grain sand, dry, brown, no odor,
62				
63	0.0		40	SHALE, STA, sand increases with interbedded clays, dry,
64				
65	0.0	SST	40	SANDSTONE, very dense, fine grain, interbedded with clay lenses, dry, brown,
66				
67	0.0	SST	40	SANDSTONE, STA, interbedded with clay, damp in fractures, weathered, soft, micaceous, light purple brown,
68		SP	80	SAND, fine to medium, loose, saturated, brown,
69	0.0	SP	80	SILTSTONE, dense, dry/damp, brown,
70		SST	80	SANDSTONE, firm/dense, damp to moist, grey, no odor,
71		SST	20	SANDSTONE, STA, moist,
72				
73		SST	10	SANDSTONE, STA, moist,
74				
75		SST	10	SANDSTONE, STA, moist, shale at base, stiff, damp, dark grey to black.
76				
77				

Saturation
▼ Saturation

Completion Results

Well No. BW-5C



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5C.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to 5 BGL
Total Depth	: 40'
Ground Water	: 26'
Start Date	: 06/12/2017
Finish Date	: 06/12/2017

WELL NO. OW-59

(Sheet 1 of 3)

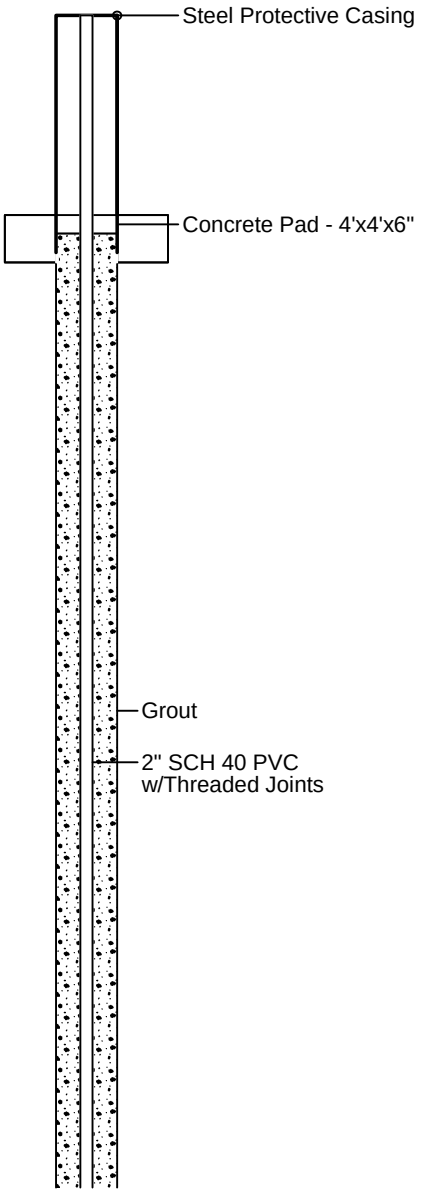
Elev., TOC (ft.msl)	: 6889.73
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6887.63
Site Coordinates	:
N	: N1635547.14
E	: W2544633.00

Saturation
▼ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, damp, brown, no odor,
1	0.0			CL	100		
2							SILTY CLAY, SIMILAR TO ABOVE (STA),
3	0.0			CL	100		
4							SILTY CLAY, STA,
5	0.0			CL	100		
6							CLAY, high, stiff, damp, brown, no odor,
7	2.0			CH	70		
8							SILTY CLAY, low, stiff, damp, light brown, no odor, sandy at base,
9	1.0			CL	80		
10							SILT, low, compact, damp, brown, no odor,
11	0.3			ML	70		
12							SILTY CLAY, low, very stiff, damp, brown, no odor, trace sand,
13	0.5			CL			

Completion Results

Well No. OW-59



03-20-2019 C:\Users\cholmes\Desktop\WEST\OW-59.bor

DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to 5 BGL
Total Depth	: 40'
Ground Water	: 26'
Start Date	: 06/12/2017
Finish Date	: 06/12/2017

WELL NO. OW-59

(Sheet 2 of 3)

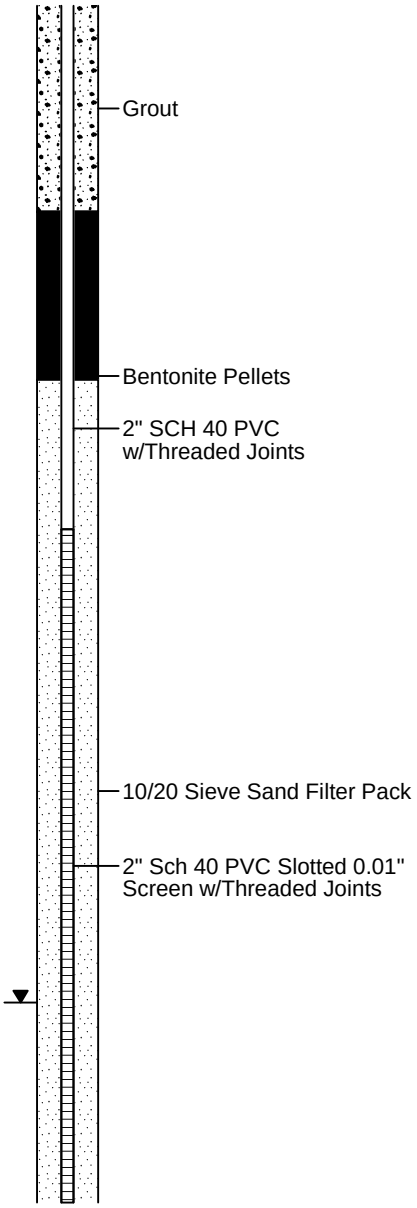
Elev., TOC (ft.msl)	: 6889.73
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6887.63
Site Coordinates	:
N	: N1635547.14
E	: W2544633.00

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
13	0.5			CL	50		
14							SILTY CLAY, high, very stiff, damp, brown, no odor,
15	1.3			CH	50		
16							SILTY CLAY, STA, no odor,
17	1.7			CH	60		
18							SILTY CLAY, low to moderate, stiff, damp, brown, no odor,
19	1.1			CL	50		
20							SANDY SILTY CLAY, low, firm to soft, damp, brown, no odor,
21	1.2			CL	50		
22							SANDY CLAY, low, soft, damp, brown, no odor,
23	0.2			CL	60		
24							SILTY CLAY, low, soft, damp, brown, no odor,
25	3.3			CL	70		
26		▼					SANDY SILT, very fine, very moist, brown, no odor,
27	10.9			ML	80		
28							SANDY SILT, STA, very moist, no odor,
29	11.6			ML			

Saturation
▼ Saturation

Completion Results

Well No. OW-59



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-20-2019 C:\Users\cholmes\Desktop\WEST\OW-59.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to 5 BGL
Total Depth	: 40'
Ground Water	: 26'
Start Date	: 06/12/2017
Finish Date	: 06/12/2017

WELL NO. OW-59

(Sheet 3 of 3)

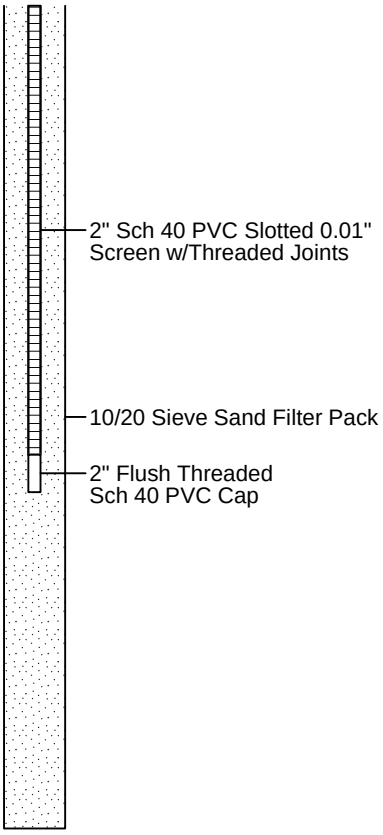
Elev., TOC (ft.msl)	: 6889.73
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6887.63
Site Coordinates	:
N	: N1635547.14
E	: W2544633.00

Saturation
▼ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
29	11.6			ML	80		
30							SILTY CLAY, low, firm, damp, brown, no odor,
31	11.4			CL	90		
32	14.9			CL	90		SILTY CLAY, STA, no odor,
33	16.3			SM	90	X	SILTY SAND, very fine, compact, saturated, brown, no odor,
34							SILTY CLAY, low, firm, damp, brown, no odor,
35	10.5			CL	60		
36							SILTY CLAY, STA, no odor,
37	7.3			CL	70		
38				CH	70		CLAY, high, firm, damp, brown, no odor,
39	10.0			CL	70		SILTY CLAY, low, firm to soft, grey and white, no odor, trace sand and white nodules.
40							
41							
42							
43							
44							
45							

Completion Results

Well No. OW-59



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-20-2019 C:\Users\cholmes\Desktop\WEST\OW-59.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to 5' BGL
Total Depth	: 48'
Ground Water	: Not Encountered
Start Date	: 6/13/2017
Finish Date	: 6/13/2017

WELL NO. OW-60

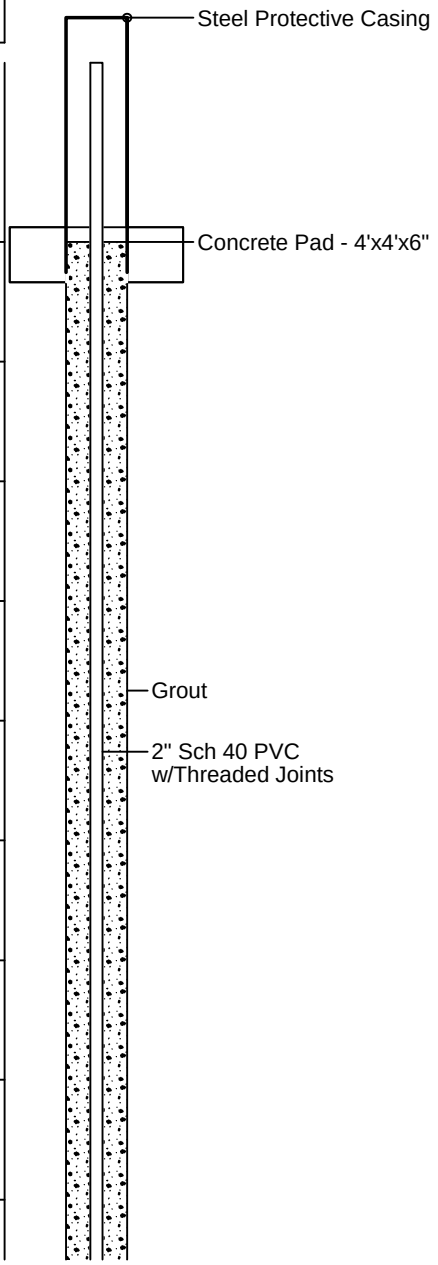
(Sheet 1 of 3)

Elev., TOC (ft.msl)	: 6893.51
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6891.06
Site Coordinates	:
N	: N1635335.02
E	: W2545018.21

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
1	6.5			CL	100		SILTY CLAY, low, firm, damp, brown, no odor,
3	5.8			CH	100		CLAY, high, firm to stiff, damp, brown, no odor,
5	6.3			CH	100		CLAY, SIMILAR TO ABOVE (STA), no odor,
7	8.1			CH	90		CLAY, STA, no odor,
9	9.6			CH	100		CLAY, STA, no odor,
11	9.1			CL	50		SILTY CLAY, moderate, firm, damp, brown, no odor,
13	8.2			CL	50		SILTY CLAY, STA, soft, no odor,
15	7.9			CL	70		SILTY CLAY, STA, firm, no odor,
16	8.3			CL			SILTY CLAY, STA, no odor,

Completion Results

Well No. OW-60



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-20-2019 C:\Users\cholmes\Desktop\WEST\OW-60.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to 5' BGL
Total Depth	: 48'
Ground Water	: Not Encountered
Start Date	: 6/13/2017
Finish Date	: 6/13/2017

WELL NO. OW-60

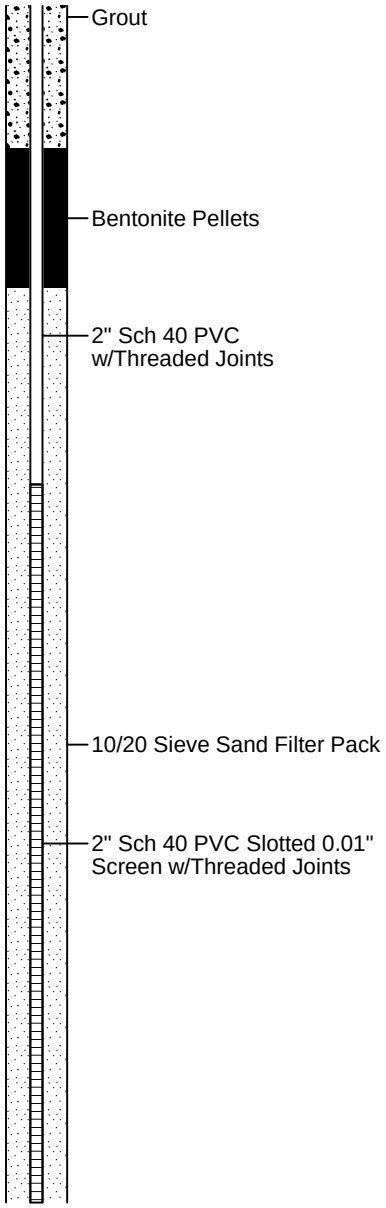
(Sheet 2 of 3)

Elev., TOC (ft.msl)	: 6893.51
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6891.06
Site Coordinates	:
N	: N1635335.02
E	: W2545018.21

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
17	8.3			CL	70		
18							SILTY CLAY, STA, no odor,
19	10.1			CL	50		
20							SILTY CLAY, moderate, soft, damp, brown, no odor,
21	15.3			CL	60		
22							SILTY CLAY, STA, firm, no odor,
23	12.1			CL	70		
24							SILTY CLAY, STA,calcareous nodules (white) present, trace gravel, no odor,
25	11.6			CL	80		
26							SILTY CLAY, STA, tan-silt pockets throughout, no odor,
27	10.9			CL	80		
28							CLAYEY SILT, low, soft/crumbly, damp, light brown and grey, no odor,
29	10.5			ML	80		
30							SILTY CLAY, low, firm to crumbly, damp, light reddish brown with trace grey, no odor,
31	11.1			CL	70		
32							SILTY CLAY, STA, no odor,
33	15.0			CL	70		
34							SILTY CLAY, STA, no odor,
35	12.8			CL	80		
36	12.7			CL			SILTY CLAY, low, very stiff, crumbly, damp, light reddish brown, grey, no odor,
37							

Completion Results

Well No. OW-60



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-20-2019 C:\Users\cholmes\Desktop\WEST\OW-60.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to 5' BGL
Total Depth	: 48'
Ground Water	: Not Encountered
Start Date	: 6/13/2017
Finish Date	: 6/13/2017

WELL NO. OW-60

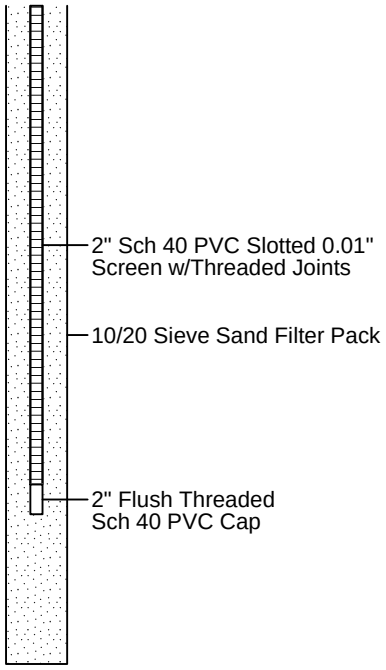
(Sheet 3 of 3)

Elev., TOC (ft.msl)	: 6893.51
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6891.06
Site Coordinates	:
N	: N1635335.02
E	: W2545018.21

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
37	12.7			CL	70		
38							SILT, low, compact to dense/stiff crumbly, damp, light grey, no odor,
39	10.4			ML	50		
40							SILT, STA, no odor,
41	9.9			ML	60		
42							SILT, STA, trace very fine sand, no odor,
43	10.7			ML	60		
44							SILT, STA, no odor,
45	10.1			ML	50		
46							SILT, STA, trace reddish brown clay with grey, no odor.
47	9.6			ML	50		
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							

Completion Results

Well No. OW-60



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-20-2019 C:\Users\cholmes\Desktop\WEST\OW-60.bor

Appendix B

Waste Analyses and Waste Manifests

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

August 30, 2017

Cheryl Johnson

Western Refining Southwest, Gallup
Rt. 3 Box 7
Gallup, NM 87301
TEL:
FAX

RE: Soil T-35 Drill Cuttings OrderNo.: 1708D66

Dear Cheryl Johnson:

Hall Environmental Analysis Laboratory received 2 sample(s) on 8/23/2017 for the analyses presented in the following report.

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

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

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

Sincerely,



Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: T-35 Soil Clean Up
Project: Soil T-35 Drill Cuttings
Collection Date: 8/23/2017 9:50:00 AM
Lab ID: 1708D66-001
Matrix: SLUDGE
Received Date: 8/23/2017 3:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	10000	31	190		mg/Kg	20	8/28/2017 2:56:47 PM	33552
Motor Oil Range Organics (MRO)	4400	960	960		mg/Kg	20	8/28/2017 2:56:47 PM	33552
Surr: DNOP	0	0	70-130	S	%Rec	20	8/28/2017 2:56:47 PM	33552
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.1	5.0		mg/Kg	1	8/25/2017 11:01:22 AM	33543
Surr: BFB	77.3	0	54-150		%Rec	1	8/25/2017 11:01:22 AM	33543
MERCURY, TCLP							Analyst: **pmf**	
Mercury	ND	0.00075	0.020		mg/L	1	8/28/2017 1:59:07 PM	33583
EPA METHOD 6010B: TCLP METALS							Analyst: **MED**	
Arsenic	0.040	0.013	5.0	J	mg/L	1	8/28/2017 1:57:50 PM	33562
Barium	0.68	0.00062	100	J	mg/L	1	8/28/2017 1:57:50 PM	33562
Cadmium	ND	0.00063	1.0		mg/L	1	8/28/2017 1:57:50 PM	33562
Chromium	ND	0.0017	5.0		mg/L	1	8/28/2017 1:57:50 PM	33562
Lead	ND	0.0053	5.0		mg/L	1	8/28/2017 1:57:50 PM	33562
Selenium	ND	0.032	1.0		mg/L	1	8/28/2017 1:57:50 PM	33562
Silver	ND	0.0018	5.0		mg/L	1	8/28/2017 1:57:50 PM	33562
EPA METHOD 8260B: TCLP COMPOUNDS							Analyst: **DJF**	
Benzene	ND	0.049	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
Toluene	ND	0.040	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
Ethylbenzene	ND	0.035	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
1,2-Dichloroethane (EDC)	ND	0.052	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
2-Butanone	ND	0.30	200		ppm	10	8/25/2017 11:59:53 AM	33543
Carbon tetrachloride	ND	0.049	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
Chlorobenzene	ND	0.030	100		ppm	10	8/25/2017 11:59:53 AM	33543
Chloroform	ND	0.030	6.0		ppm	10	8/25/2017 11:59:53 AM	33543
1,4-Dichlorobenzene	ND	0.056	7.5		ppm	10	8/25/2017 11:59:53 AM	33543
1,1-Dichloroethene	ND	0.20	0.70		ppm	10	8/25/2017 11:59:53 AM	33543
Tetrachloroethene (PCE)	ND	0.040	0.70		ppm	10	8/25/2017 11:59:53 AM	33543
Trichloroethene (TCE)	ND	0.061	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
Vinyl chloride	ND	0.042	0.20		ppm	10	8/25/2017 11:59:53 AM	33543
Xylenes, Total	ND	0.16	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
Surr: 1,2-Dichloroethane-d4	106		70-130		%Rec	10	8/25/2017 11:59:53 AM	33543
Surr: 4-Bromofluorobenzene	94.6		70-130		%Rec	10	8/25/2017 11:59:53 AM	33543
Surr: Dibromofluoromethane	104		70-130		%Rec	10	8/25/2017 11:59:53 AM	33543
Surr: Toluene-d8	96.0		70-130		%Rec	10	8/25/2017 11:59:53 AM	33543

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: Drill Cuttings
Project: Soil T-35 Drill Cuttings
Collection Date: 8/23/2017 10:32:00 AM
Lab ID: 1708D66-002
Matrix: SLUDGE
Received Date: 8/23/2017 3:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	2.3	1.6	10	J	mg/Kg	1	8/28/2017 3:41:24 PM	33552
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	8/28/2017 3:41:24 PM	33552
Surr: DNOP	93.6	0	70-130		%Rec	1	8/28/2017 3:41:24 PM	33552
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.1	5.0		mg/Kg	1	8/25/2017 10:37:23 AM	33543
Surr: BFB	77.5	0	54-150		%Rec	1	8/25/2017 10:37:23 AM	33543
MERCURY, TCLP							Analyst: **pmf**	
Mercury	ND	0.00075	0.020		mg/L	1	8/28/2017 2:00:51 PM	33583
EPA METHOD 6010B: TCLP METALS							Analyst: **MED**	
Arsenic	0.031	0.013	5.0	J	mg/L	1	8/28/2017 1:59:04 PM	33562
Barium	1.9	0.00062	100	J	mg/L	1	8/28/2017 1:59:04 PM	33562
Cadmium	ND	0.00063	1.0		mg/L	1	8/28/2017 1:59:04 PM	33562
Chromium	ND	0.0017	5.0		mg/L	1	8/28/2017 1:59:04 PM	33562
Lead	ND	0.0053	5.0		mg/L	1	8/28/2017 1:59:04 PM	33562
Selenium	ND	0.032	1.0		mg/L	1	8/28/2017 1:59:04 PM	33562
Silver	ND	0.0018	5.0		mg/L	1	8/28/2017 1:59:04 PM	33562
EPA METHOD 8260B: TCLP COMPOUNDS							Analyst: **DJF**	
Benzene	ND	0.049	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
Toluene	ND	0.040	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
Ethylbenzene	ND	0.035	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
1,2-Dichloroethane (EDC)	ND	0.052	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
2-Butanone	ND	0.30	200		ppm	10	8/25/2017 12:28:45 PM	33543
Carbon tetrachloride	ND	0.049	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
Chlorobenzene	ND	0.030	100		ppm	10	8/25/2017 12:28:45 PM	33543
Chloroform	ND	0.030	6.0		ppm	10	8/25/2017 12:28:45 PM	33543
1,4-Dichlorobenzene	ND	0.055	7.5		ppm	10	8/25/2017 12:28:45 PM	33543
1,1-Dichloroethene	ND	0.20	0.70		ppm	10	8/25/2017 12:28:45 PM	33543
Tetrachloroethene (PCE)	ND	0.040	0.70		ppm	10	8/25/2017 12:28:45 PM	33543
Trichloroethene (TCE)	ND	0.060	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
Vinyl chloride	ND	0.042	0.20		ppm	10	8/25/2017 12:28:45 PM	33543
Xylenes, Total	ND	0.16	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
Surr: 1,2-Dichloroethane-d4	106		70-130		%Rec	10	8/25/2017 12:28:45 PM	33543
Surr: 4-Bromofluorobenzene	91.1		70-130		%Rec	10	8/25/2017 12:28:45 PM	33543
Surr: Dibromofluoromethane	104		70-130		%Rec	10	8/25/2017 12:28:45 PM	33543
Surr: Toluene-d8	97.5		70-130		%Rec	10	8/25/2017 12:28:45 PM	33543

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Wet Chemistry by Method 9012 B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Reactive Cyanide	ND		0.250	1	08/25/2017 22:23	WG1013530

Wet Chemistry by Method 9034-9030B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Reactive Sulfide	ND		25.0	1	08/25/2017 16:05	WG1013568

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
Corrosivity by pH	8.51	T8	1	08/29/2017 10:37	WG1014298

Sample Narrative:

L931847-01 WG1014298: 8.51 at 20.5c

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	Deg. F			date / time	
Ignitability	DNI at 170		1	08/28/2017 13:00	WG1014260

Wet Chemistry by Method 9012 B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Reactive Cyanide	ND		0.250	1	08/25/2017 22:26	WG1013530

Wet Chemistry by Method 9034-9030B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Reactive Sulfide	ND		25.0	1	08/25/2017 16:05	WG1013568

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
Corrosivity by pH	10.0	T8	1	08/29/2017 10:37	WG1014298

Sample Narrative:

L931847-02 WG1014298: 10.03 at 20.1c

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	Deg. F			date / time	
Ignitability	DNI at 170		1	08/28/2017 13:00	WG1014260

Method Blank (MB)

(MB) R3244658-1 08/25/17 22:01

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Reactive Cyanide	U		0.039	0.250

L931815-01 Original Sample (OS) • Duplicate (DUP)

(OS) L931815-01 08/25/17 22:20 • (DUP) R3244658-6 08/25/17 22:21

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/kg	mg/kg		%		%
Reactive Cyanide	ND	0.0532	1	0		20

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

(LCS) R3244658-2 08/25/17 22:02 • (LCSD) R3244658-3 08/25/17 22:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Reactive Cyanide	2.50	2.57	2.47	103	99	50-150			4	20

L931767-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L931767-05 08/25/17 22:16 • (MS) R3244658-4 08/25/17 22:17 • (MSD) R3244658-5 08/25/17 22:18

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Reactive Cyanide	1.67	ND	1.55	1.57	89	90	1	75-125			1	20

Method Blank (MB)

(MB) WG1013568-1 08/25/17 16:05

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Reactive Sulfide	U		7.63	25.0

L931847-01 Original Sample (OS) • Duplicate (DUP)

(OS) L931847-01 08/25/17 16:05 • (DUP) WG1013568-4 08/25/17 16:05

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

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

(LCS) WG1013568-2 08/25/17 16:05 • (LCSD) WG1013568-3 08/25/17 16:05

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Reactive Sulfide	100	73.1	73.1	73.1	73.1	70.0-130			0.000	20

Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

L931847-02 Original Sample (OS) • Duplicate (DUP)

(OS) L931847-02 08/29/17 10:37 • (DUP) WG1014298-3 08/29/17 10:37

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
Corrosivity by pH	10.0	10.0	1	0.399	T8	1

Sample Narrative:

OS: 10.03 at 20.1c

DUP: 10.04 at 20.2c

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

(LCS) WG1014298-1 08/29/17 10:37 • (LCSD) WG1014298-2 08/29/17 10:37

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
Corrosivity by pH	10.0	10.1	10.1	101	101	98.4-102			0.000	1

Sample Narrative:

LCS: 10.06 at 20.0c

LCSD: 10.06 at 20.1c

L931842-01 Original Sample (OS) • Duplicate (DUP)

(OS) L931842-01 08/28/17 13:00 • (DUP) R3244961-3 08/28/17 13:00

Analyte	Original Result Deg. F	DUP Result Deg. F	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ignitability	131	135	1	3.00		10

L931859-01 Original Sample (OS) • Duplicate (DUP)

(OS) L931859-01 08/28/17 13:00 • (DUP) R3244961-4 08/28/17 13:00

Analyte	Original Result Deg. F	DUP Result Deg. F	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ignitability	148	142	1	4.00		10

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

(LCS) R3244961-1 08/28/17 13:00 • (LCSD) R3244961-2 08/28/17 13:00

Analyte	Spike Amount Deg. F	LCS Result Deg. F	LCSD Result Deg. F	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ignitability	82.0	79.9	80.3	97.0	98.0	96.0-104			0.000	10

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Rec.	Recovery.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1708D66**

30-Aug-17

Client: Western Refining Southwest, Gallup

Project: Soil T-35 Drill Cuttings

Sample ID	**LCS-33552**	SampType:	**LCS**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**LCSS**	Batch ID:	**33552**		RunNo:	**45247**				
Prep Date:	**8/25/2017**	Analysis Date:	**8/28/2017**		SeqNo:	**1432934**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	10	50.00	0	96.0	73.2	114			
Surr: DNOP	4.8		5.000		95.7	70	130			

Sample ID	**MB-33552**	SampType:	**MBLK**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**PBS**	Batch ID:	**33552**		RunNo:	**45247**				
Prep Date:	**8/25/2017**	Analysis Date:	**8/28/2017**		SeqNo:	**1432935**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.4	10								J
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.8		10.00		97.7	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1708D66**

30-Aug-17

Client: Western Refining Southwest, Gallup

Project: Soil T-35 Drill Cuttings

Sample ID	**MB-33543**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**PBS**	Batch ID:	**33543**	RunNo:	**45235**					
Prep Date:	**8/24/2017**	Analysis Date:	**8/25/2017**	SeqNo:	**1432593**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	790		1000		78.6	54	150			

Sample ID	**LCS-33543**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**LCSS**	Batch ID:	**33543**	RunNo:	**45235**					
Prep Date:	**8/24/2017**	Analysis Date:	**8/25/2017**	SeqNo:	**1432594**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	95.0	76.4	125			
Surr: BFB	880		1000		88.1	54	150			

Sample ID	**1708D66-001AMS**	SampType:	**MS**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**T-35 Soil Clean Up**	Batch ID:	**33543**	RunNo:	**45235**					
Prep Date:	**8/24/2017**	Analysis Date:	**8/25/2017**	SeqNo:	**1432598**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	24.95	0	95.0	77.8	128			
Surr: BFB	930		998.0		92.9	54	150			

Sample ID	**1708D66-001AMSD**	SampType:	**MSD**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**T-35 Soil Clean Up**	Batch ID:	**33543**	RunNo:	**45235**					
Prep Date:	**8/24/2017**	Analysis Date:	**8/25/2017**	SeqNo:	**1432599**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	24.90	0	94.9	77.8	128	0.326	20	
Surr: BFB	940		996.0		94.7	54	150	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1708D66**

30-Aug-17

Client: Western Refining Southwest, Gallup

Project: Soil T-35 Drill Cuttings

Sample ID **mb-33543**	SampType: **MBLK**	TestCode: **EPA Method 8260B: TCLP Compounds**
Client ID: **PBS**	Batch ID: **33543**	RunNo: **45237**
Prep Date: **8/24/2017**	Analysis Date: **8/25/2017**	SeqNo: **1432746** Units: **ppm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
1,2-Dichloroethane (EDC)	ND	0.050								
2-Butanone	ND	20								
Carbon tetrachloride	ND	0.050								
Chlorobenzene	ND	10								
Chloroform	ND	0.60								
1,4-Dichlorobenzene	ND	0.75								
1,1-Dichloroethene	ND	0.070								
Tetrachloroethene (PCE)	ND	0.070								
Trichloroethene (TCE)	ND	0.050								
Vinyl chloride	ND	0.020								
Surr: 1,2-Dichloroethane-d4	0.52		0.5000		104	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.5000		92.8	70	130			
Surr: Dibromofluoromethane	0.50		0.5000		101	70	130			
Surr: Toluene-d8	0.48		0.5000		96.3	70	130			

Sample ID **lcs-33543**	SampType: **LCS**	TestCode: **EPA Method 8260B: TCLP Compounds**
Client ID: **LCSS**	Batch ID: **33543**	RunNo: **45237**
Prep Date: **8/24/2017**	Analysis Date: **8/25/2017**	SeqNo: **1432747** Units: **ppm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.050	1.000	0	111	70	130			
Chlorobenzene	0.94	0.050	1.000	0	93.9	70	130			
1,1-Dichloroethene	1.2	0.050	1.000	0	120	68.8	161			
Trichloroethene (TCE)	1.0	0.050	1.000	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	0.55		0.5000		109	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		95.2	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		104	70	130			
Surr: Toluene-d8	0.49		0.5000		98.3	70	130			

Sample ID **1708d66-002ams**	SampType: **MS**	TestCode: **EPA Method 8260B: TCLP Compounds**
Client ID: **Drill Cuttings**	Batch ID: **33543**	RunNo: **45237**
Prep Date: **8/24/2017**	Analysis Date: **8/25/2017**	SeqNo: **1432750** Units: **ppm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.3	0.50	0.9990	0	127	61.9	146			
Chlorobenzene	1.0	0.50	0.9990	0	103	70	130			
1,1-Dichloroethene	1.3	0.50	0.9990	0	125	37.1	170			
Trichloroethene (TCE)	1.2	0.50	0.9990	0	116	49.8	150			
Surr: 1,2-Dichloroethane-d4	5.5		4.995		109	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1708D66**

30-Aug-17

Client: Western Refining Southwest, Gallup

Project: Soil T-35 Drill Cuttings

Sample ID	**1708d66-002ams**	SampType:	**MS**		TestCode:	**EPA Method 8260B: TCLP Compounds**				
Client ID:	**Drill Cuttings**	Batch ID:	**33543**		RunNo:	**45237**				
Prep Date:	**8/24/2017**	Analysis Date:	**8/25/2017**		SeqNo:	**1432750**	Units:	**ppm**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	4.8		4.995		95.8	70	130			
Surr: Dibromofluoromethane	5.3		4.995		106	70	130			
Surr: Toluene-d8	4.9		4.995		98.0	70	130			

Sample ID	**1708d66-002amsd**	SampType:	**MSD**		TestCode:	**EPA Method 8260B: TCLP Compounds**				
Client ID:	**Drill Cuttings**	Batch ID:	**33543**		RunNo:	**45237**				
Prep Date:	**8/24/2017**	Analysis Date:	**8/25/2017**		SeqNo:	**1432751**	Units:	**ppm**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.50	0.9980	0	115	61.9	146	10.2	20	
Chlorobenzene	0.95	0.50	0.9980	0	94.8	70	130	8.41	20	
1,1-Dichloroethene	1.2	0.50	0.9980	0	119	37.1	170	5.29	20	
Trichloroethene (TCE)	1.1	0.50	0.9980	0	106	49.8	150	8.97	20	
Surr: 1,2-Dichloroethane-d4	5.6		4.990		111	70	130	0	0	
Surr: 4-Bromofluorobenzene	4.7		4.990		95.1	70	130	0	0	
Surr: Dibromofluoromethane	5.3		4.990		105	70	130	0	0	
Surr: Toluene-d8	4.9		4.990		98.4	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1708D66**

30-Aug-17

Client: Western Refining Southwest, Gallup

Project: Soil T-35 Drill Cuttings

Sample ID	**MB-33583**	SampType:	**MBLK**	TestCode:	**MERCURY, TCLP**					
Client ID:	**PBW**	Batch ID:	**33583**	RunNo:	**45252**					
Prep Date:	**8/28/2017**	Analysis Date:	**8/28/2017**	SeqNo:	**1433185**	Units:	**mg/L**			

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

Sample ID	**LCS-33583**	SampType:	**LCS**	TestCode:	**MERCURY, TCLP**					
Client ID:	**LCSW**	Batch ID:	**33583**	RunNo:	**45252**					
Prep Date:	**8/28/2017**	Analysis Date:	**8/28/2017**	SeqNo:	**1433186**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0050	0.020	0.005000	0	101	80	120			J

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1708D66**

30-Aug-17

Client: Western Refining Southwest, Gallup

Project: Soil T-35 Drill Cuttings

Sample ID	**MB-33562**	SampType:	**MBLK**	TestCode:	**EPA Method 6010B: TCLP Metals**
Client ID:	**PBW**	Batch ID:	**33562**	RunNo:	**45251**
Prep Date:	**8/25/2017**	Analysis Date:	**8/28/2017**	SeqNo:	**1433165** 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-33562**	SampType:	**LCS**	TestCode:	**EPA Method 6010B: TCLP Metals**
Client ID:	**LCSW**	Batch ID:	**33562**	RunNo:	**45251**
Prep Date:	**8/25/2017**	Analysis Date:	**8/28/2017**	SeqNo:	**1433166** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.56	5.0	0.5000	0	112	80	120			J
Barium	0.49	100	0.5000	0	97.6	80	120			J
Cadmium	0.50	1.0	0.5000	0	100	80	120			J
Chromium	0.50	5.0	0.5000	0	99.4	80	120			J
Lead	0.48	5.0	0.5000	0	95.1	80	120			J
Selenium	0.55	1.0	0.5000	0	111	80	120			J
Silver	0.10	5.0	0.1000	0	103	80	120			J

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **Western Refining Gallup** Work Order Number: **1708D66** RcptNo: **1**

Received By: **Isaiah Ortiz** **8/23/2017 3:55:00 PM** IO

Completed By: **Ashley Gallegos** **8/23/2017 4:40:39 PM** AG

Reviewed By: SRC 08/24/17

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	4.4	Good	Yes			

Chain-of-Custody Record

Client:	WESTERN REFINING
	GALLUP REFINERY
Mailing Address:	92 Giant Crossing Road
	Gallup, NM 87301
Phone #:	505-722-3833
Email or Fax#:	505-863-0830
QA/QC Package:	
X Standard	☐ Level 4 (Full Validation)
Accreditation:	
☐ NELAP	☐ Other:
☐ EDD (Type)	

Turn-Around Time: Standard / Rush x

Project Name: Soil - T-35/Drill Cuttings

Project #:

Project Manager: CherylJohnson@wnr.com

Sampler: C JOHNSON

On Ice: X Yes ☐ No

Sample Temperature: 4.4 °C

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. 1708D066	8015D (GRO/DRO/MRO)		8260B - (BTEX) TCLP		RCRA 8 METALS - TCLP	RCI									Air Bubbles (Y or N)
8-23-17	9:50	SOLID	T-35 soil clean up	2-9oz jar	None	-001	X		X		X	X									
8-23-17	10:32	SOLID	DRILL CUTINGS -	2-9oz jar	None	-002	X		X		X	X									

Date	Time	Relinquished by	Received by	Date	Time
8-23-17	~~1450~~ 1555			8-23-17	1555

Remarks:

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.

ase print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	NMD000333211	2	800-424-9300	009001800 FLE

GENERATOR

5. Generator's Name and Mailing Address
WESTERN REFINING SOUTHWEST GALLUP REFINING
92 GIANT CROSSING ROAD
GALLUP, NM 87301
Generator's Phone: 505 722 0654

Generator's Site Address (if different than mailing address)

6. Transporter 1 Company Name
Advanced Chemical Transport Inc. (GV)

U.S. EPA ID Number
CAR000070540

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address
Advanced Chemical Treatment
6133 Edith Blvd NE
Albuquerque, NM 87107

U.S. EPA ID Number
NMD982208527

Facility's Phone: 505-345-5220

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ, UN3475, Waste Solids containing flammable liquid n.o.s. (acetone, methanol) 4.1, PGII	01	MEDBA CF	312	P	D001
X	2. ~~HAZARDS Hazardous waste, solid, n.o.s., (D001, D035), UN3077, BENZENE, 9, PGIII~~ MIL		~~DM~~ MT		~~M~~ P	~~D001~~ D035
X	3. UN2809, Waste Mercury, 8, PGIII	01	DF	184	P	D009
X	4. NA1993, Combustible liquid, n.o.s., Contains PCB (DIESEL IN VIALS)	01	DF	131	P	NONE

14. Special Handling Instructions and Additional Information
1) LHGM33, AC15180 WEA (1)CYB
~~2) LHGM44, AC15750 WEA~~ MIL
Project Number 12751 Document # D165090
3) LHGM172, AC15750 WEA (1)55DM
4) LHGM28, AC15480 WEA (1)55DM
24 hour emergency contact CHEMTREC 800-424-9300

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: ALVIN DORSEY — Signature — Month 08 Day 30 Year 17

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Mike Ramirez — Signature — Month 8 Day 30 Year 17

Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name — Signature — Month Day Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

. HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number	22. Page	23. Manifest Tracking Number
	NMD988553211	2 of 2	00560 UKAFLE

24. Generator's Name

WESTERN REFINING SOUTHWEST GALLUP REFINING
92 GIANT CROSSING ROAD
GALLUP, NM 87301

25. Transporter _____ Company Name — U.S. EPA ID Number

26. Transporter _____ Company Name — U.S. EPA ID Number

GENERATOR

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		
	5) Non-RCRA/Non-DOT Regulated Material Solid (SOIL - DRILL CUTTINGS)	28	DM	16,380	P	NONE		
X	6) UN3077, Environmentally hazardous substances, solid, n.o.s. (refractory solids), 9, PGIII	01	DM	407	P			
	7) Non-RCRA/Non-DOT Regulated Material Solid (USED FILTERS)	03	CF and DM	510	P			
	8) Non-DOT Regulated Material Solid (TPH SOIL)	04	DM	1,000	P	NONE		
	9) Non-DOT Regulated Material Solid (OIL, PPE, RAGS, DEBRIS)	17	DM	5,404	P	NONE		
	10) Non-DOT Regulated Material Solid (OIL CONTAMINATED CERAMIC SUPPORT MEDIA)	01	DM	186	P	NONE		
	11) Non-RCRA/Non-DOT Regulated Material Solid (spent carbon)	32	DM	11,564	P	NONE		
X	12) RQ UN1325, Waste Flammable solids, organic, n.o.s. (cans and rags contaminated with paint), 4.1, PGII (D001)	01	DM	53	P	D001	D035	F003
	13) Non-DOT Regulated Material Solid (RESIN BEADS)	01	DM	213	P	F005 NONE		

32. Special Handling Instructions and Additional Information

5) ERG#; ACT14825 WEA (28) 55 DM 6) ERG#171; ACT58435 WEA (1) 55 DM 7) ERG#; ACT59624 WEA (3) CYB 8) ERG#; RC7145 WEA (4) 55 DM 9) ERG#; RC7334 WEA (17) 55 DM 10) ERG#; RC8009 WEA (1) 55 DM 11) ERG#; RC8751 WEA (2) 55 DM 12) ERG#133; RC8365 WEA (1) 55 DM 13) ERG#; RC8783 WEA (1) 55 DM

TRANSPORTER

33. Transporter _____ Acknowledgment of Receipt of Materials
Printed/Typed Name | Signature | Month | Day | Year

34. Transporter _____ Acknowledgment of Receipt of Materials
Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

Appendix C
Field Methods

Field Methods

Pursuant to the Work Plan for the SMW-2 Area Investigation and Boundary Well Installations, additional groundwater monitoring wells were installed downgradient of evaporation ponds EP-6 and EP-9 and in the SMW-2 area. The field methods are described below and individual discussions are presented for the following activities:

- Drilling procedures;
- Soil screening;
- Decontamination procedures;
- Monitor well development;
- Fluid level measurements;
- Purging of wells/groundwater sample collection;
- Sample collection and handling procedures;
- Equipment calibration; and
- Management of investigation derived waste.

Drilling Procedures

The soil borings were drilled using the hollow-stem auger (HSA) method. Soil samples were collected continuously and logged by a qualified geologist in accordance with the Unified Soil Classification System (USCS) nomenclature. As shown on the boring logs, the data recorded included the lithologic interval, symbol, percent recovery, field screening results, and a sample description of the cuttings and core samples.

Soil Screening

Samples obtained from the borings were screened in the field on 2-foot intervals for evidence of contaminants. Field screening results were recorded on the soil boring logs. Field screening results were used to aid in the selection of soil samples for laboratory analysis. The primary screening methods include: (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds.

Visual screening included examining the soil samples for evidence of staining caused by petroleum-related compounds or other substances that may have caused staining of soils such as elemental sulfur or cyanide compounds. Headspace vapor screening was conducted and involved placing a soil sample in a plastic sealable bag allowing space for ambient air. The bag was sealed, labeled and then shaken gently to expose the soil to the air trapped in the container. The sealed bag was allowed to rest for a minimum of 5 minutes while the vapors equilibrated. Vapors present within the

sample bag's headspace were then measured by inserting the probe of a MiniRae 3000 portable volatile organic constituent (VOC) monitor in a small opening in the bag. The maximum value and the ambient air temperature were recorded on the field boring log for each sample. Field screening results and any conditions that were considered to be capable of influencing the results of the field screening were recorded on the field logs.

Decontamination Procedures

The drilling equipment (e.g., hollow-stem augers) was decontaminated between each borehole using a high pressure potable water wash. The sampling equipment coming in direct contact with the samples (e.g., hand augers and split-spoon samplers) were decontaminated using a brush, as necessary, to remove larger particulate matter followed by a rinse with potable water, wash with non-phosphate detergent, rinse with potable water, and double rinse with deionized water.

Fluid Level Measurements

The depth to separate phase hydrocarbon, if present, and groundwater was measured prior to purging the wells of potentially stagnant groundwater. A Geotech Interface Probe was used to measure fluid levels to 0.01 foot. Fluid level measurements collected during the field activities are presented in Table 6.

Well Development/Purging

All wells were developed/purged using a new disposable bailer attached to the end of the clean rope. The groundwater and sediment removed from the wells were transported to the bundle cleaning pad in sealed 5-gallon buckets or in a plastic tote.

The purge volumes are calculated as follows:

Volume (gallons) = water column thickness (ft) x 3.14 x radius of well casing^2 (ft) x 7.48 (gals/ft). The calculated purge volumes and actual volumes removed from each well are presented below.

Well (Date)	Water Column Thickness (ft)	Calculated Purge Volume (gallons) – 3 well volumes	Actual Purge Volume (gallons)
BW-4A	Dry	NA	NA
BW-4B	33.43	16	Bailed down at 12

BW-5A	0.07	NA	NA
BW-5B	48.18	24	Bailed down at 16
BW-5C	75.36	37	45
OW-59	13.50	7	Bailed down at 8
OW-60	34.65	18	Bailed down at 12

NA – not applicable

Field measurements of groundwater stabilization parameters included pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature and the readings are presented in Table 5.

Sample Collection and Handling Procedures

Soil samples were collected using split-spoon samplers. The selected portion of the sample interval was placed in pre-cleaned, laboratory-prepared sample containers for laboratory chemical analysis. Three soil samples were collected for VOC analysis in the following manner:

- Two sample aliquots were collected using a syringe for low-level VOC analysis pursuant to EPA method 5035. For the sodium bisulfate preserved kits, 4- 5 grams (4cc) of soil was injected into each vial using the syringe. The syringes were disposed after soil collection.
- Two sample aliquots were collected using a syringe for preservation with methanol. For the methanol preserved kits, 10 grams (10 cc) of soil was injected into each methanol vial using the syringe. The syringes were disposed after soil collection.
- The third sample aliquot was placed in an 8-ounce glass jar, which was filled to the top to minimize any head space.

Two additional soil samples were collected in 8-ounce glass jars for semivolatile and metals analyses.

Groundwater samples were collected using clean disposable bailers and clean rope. Surface water samples were collected using a decontaminated polypropylene dipper attached to an extendable handle. The water was immediately poured directly into clean laboratory supplied sample containers with the exception of samples collected for dissolved metals analyses. Samples specified for dissolved metals analyses were filtered in the field using a disposable 0.45 micron filter. A new filter and syringe were used for each sample. All samples were immediately placed into an ice chest with

ice. The samples were maintained in the custody of the sampler until the chain-of-custody form was completed and the ice chest was sealed for delivery to the laboratory.

Equipment Calibration

Soil vapor screening was conducted using a MiniRae 3000 portable VOC monitor. The instrument was calibrated at the beginning of each work day to a concentration of 100 ppm isobutylene.

The instruments used to measure groundwater stabilization parameters included an YSI Professional Series Data Logger and YSI Quatro Sonde. The calibration solutions used at the beginning of each day are as follows:

- 4.0 pH solution;
- 7.0 pH solution;
- 10.0 pH solution; and
- 1.413 mS/cm conductivity solution.

Management of Investigation Derived Waste

The drilling rig and drilling equipment were decontaminated on the bundle cleaning pad. The water is diverted to the Refinery's wastewater treatment system up-stream of the API Separator. The decontamination water generated from sampling equipment was collected in buckets and disposed at the bundle cleaning pad at the end of each day of sampling. All development/purge water was collected in five gallon buckets and disposed at the bundle cleaning pad.

Soil cuttings were placed into open top 55-gallon drums and were sealed when not in use. Each drum of soils was labeled and temporarily stored in a concrete curbed area pending waste characterization and disposal.

Appendix D

Soil Analytical Reports

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 11, 2017

Cheryl Johnson

Western Refining Company
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-0231
FAX

RE: SMW-2 AND BOUNDARY WELLS OrderNo.: 1706910

Dear Cheryl Johnson:

Hall Environmental Analysis Laboratory received 4 sample(s) on 6/15/2017 for the analyses presented in the following report.

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

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

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

Sincerely,



Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB01
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 6:10:00 PM
Lab ID: 1706910-001
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.36	1.0		mg/L	1	6/20/2017 4:35:45 PM	32351
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	6/20/2017 4:35:45 PM	32351
Surr: DNOP	121	0	72.4-157		%Rec	1	6/20/2017 4:35:45 PM	32351
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	6/19/2017 4:33:28 PM	G43605
Surr: BFB	114	0	52.3-138		%Rec	1	6/19/2017 4:33:28 PM	G43605
EPA METHOD 200.7: METALS							Analyst: **pmf**	
Barium	ND	0.00093	0.0020		mg/L	1	6/20/2017 3:40:02 PM	A43653
Beryllium	ND	0.00029	0.0020		mg/L	1	6/20/2017 3:40:02 PM	A43653
Cadmium	ND	0.0010	0.0020		mg/L	1	6/20/2017 3:40:02 PM	A43653
Chromium	ND	0.0011	0.0060		mg/L	1	6/20/2017 3:40:02 PM	A43653
Cobalt	ND	0.0016	0.0060		mg/L	1	6/20/2017 3:40:02 PM	A43653
Iron	ND	0.016	0.020		mg/L	1	6/20/2017 3:40:02 PM	A43653
Manganese	ND	0.0011	0.0020		mg/L	1	6/20/2017 3:40:02 PM	A43653
Nickel	ND	0.0036	0.010		mg/L	1	6/20/2017 3:40:02 PM	A43653
Silver	ND	0.00088	0.0050		mg/L	1	6/20/2017 3:40:02 PM	A43653
Vanadium	ND	0.0019	0.050		mg/L	1	6/20/2017 3:40:02 PM	A43653
Zinc	ND	0.0028	0.010		mg/L	1	6/20/2017 3:40:02 PM	A43653
EPA 200.8: METALS							Analyst: **JLF**	
Antimony	ND	0.00037	0.0010		mg/L	1	6/26/2017 4:37:29 PM	B43799
Arsenic	ND	0.00030	0.0010		mg/L	1	6/26/2017 4:37:29 PM	B43799
Lead	ND	0.00017	0.00050		mg/L	1	6/26/2017 4:37:29 PM	B43799
Selenium	ND	0.00071	0.0010		mg/L	1	6/26/2017 4:37:29 PM	B43799
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	ND	0.000037	0.00020		mg/L	1	6/27/2017 1:47:23 PM	32504
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Acenaphthylene	ND	3.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Aniline	ND	3.1	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Anthracene	ND	3.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Azobenzene	ND	4.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Benz(a)anthracene	ND	3.9	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Benzo(a)pyrene	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Benzoic acid	7.2	3.9	20	J	µg/L	1	6/21/2017 4:02:29 PM	32356

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB01
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 6:10:00 PM
Lab ID: 1706910-001
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Benzyl alcohol	ND	4.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Bis(2-ethylhexyl)phthalate	ND	4.8	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Carbazole	ND	4.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4-Chloroaniline	ND	3.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2-Chloronaphthalene	ND	3.7	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2-Chlorophenol	ND	7.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Chrysene	ND	3.8	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Di-n-octyl phthalate	ND	4.7	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Dibenzofuran	ND	4.1	10		µg/L	1	6/21/2017 4:02:29 PM	32356
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	6/21/2017 4:02:29 PM	32356
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	6/21/2017 4:02:29 PM	32356
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Diethyl phthalate	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Dimethyl phthalate	ND	3.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	6/21/2017 4:02:29 PM	32356
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	6/21/2017 4:02:29 PM	32356
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	6/21/2017 4:02:29 PM	32356
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Fluoranthene	ND	4.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Fluorene	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Hexachlorobenzene	ND	3.8	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Hexachlorobutadiene	ND	1.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Hexachloroethane	ND	1.2	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Isophorone	ND	4.4	10		µg/L	1	6/21/2017 4:02:29 PM	32356
1-Methylnaphthalene	ND	3.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB01
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 6:10:00 PM
Lab ID: 1706910-001
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
2-Methylnaphthalene	ND	3.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2-Methylphenol	ND	3.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
3+4-Methylphenol	ND	3.2	10		µg/L	1	6/21/2017 4:02:29 PM	32356
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Naphthalene	ND	2.9	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2-Nitroaniline	ND	4.9	10		µg/L	1	6/21/2017 4:02:29 PM	32356
3-Nitroaniline	ND	4.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4-Nitroaniline	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Nitrobenzene	ND	3.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2-Nitrophenol	ND	5.2	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4-Nitrophenol	ND	5.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Pentachlorophenol	ND	4.9	20		µg/L	1	6/21/2017 4:02:29 PM	32356
Phenanthrene	ND	4.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Phenol	ND	3.1	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Pyrene	ND	4.4	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Pyridine	ND	2.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Surr: 2-Fluorophenol	46.0	0	15-98.1		%Rec	1	6/21/2017 4:02:29 PM	32356
Surr: Phenol-d5	36.5	0	15-80.7		%Rec	1	6/21/2017 4:02:29 PM	32356
Surr: 2,4,6-Tribromophenol	74.5	0	15-112		%Rec	1	6/21/2017 4:02:29 PM	32356
Surr: Nitrobenzene-d5	82.4	0	27.2-90.7		%Rec	1	6/21/2017 4:02:29 PM	32356
Surr: 2-Fluorobiphenyl	69.5	0	23.3-85.6		%Rec	1	6/21/2017 4:02:29 PM	32356
Surr: 4-Terphenyl-d14	65.7	0	27.6-107		%Rec	1	6/21/2017 4:02:29 PM	32356
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.062	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Toluene	0.072	0.064	1.0	J	µg/L	1	6/16/2017 11:04:36 PM	B43587
Ethylbenzene	ND	0.093	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Methyl tert-butyl ether (MTBE)	ND	0.24	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Naphthalene	ND	0.11	2.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	6/16/2017 11:04:36 PM	B43587

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB01
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 6:10:00 PM
Lab ID: 1706910-001
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Acetone	ND	0.82	10		µg/L	1	6/16/2017 11:04:36 PM	B43587
Bromobenzene	ND	0.14	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Bromodichloromethane	ND	0.18	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Bromoform	ND	0.21	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Bromomethane	ND	0.26	3.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
2-Butanone	ND	1.1	10		µg/L	1	6/16/2017 11:04:36 PM	B43587
Carbon disulfide	ND	0.40	10		µg/L	1	6/16/2017 11:04:36 PM	B43587
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Chlorobenzene	ND	0.11	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Chloroethane	ND	0.23	2.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Chloroform	ND	0.40	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Chloromethane	ND	0.29	3.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Dibromochloromethane	ND	0.072	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Dibromomethane	ND	0.091	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
2-Hexanone	ND	0.66	10		µg/L	1	6/16/2017 11:04:36 PM	B43587
Isopropylbenzene	ND	0.051	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	6/16/2017 11:04:36 PM	B43587
Methylene Chloride	ND	0.11	3.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
n-Butylbenzene	ND	0.13	3.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
n-Propylbenzene	ND	0.074	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Styrene	ND	0.16	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB01
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 6:10:00 PM
Lab ID: 1706910-001
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Vinyl chloride	ND	0.18	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Xylenes, Total	ND	0.32	1.5		µg/L	1	6/16/2017 11:04:36 PM	B43587
Surr: 1,2-Dichloroethane-d4	100	0	70-130		%Rec	1	6/16/2017 11:04:36 PM	B43587
Surr: 4-Bromofluorobenzene	96.7	0	70-130		%Rec	1	6/16/2017 11:04:36 PM	B43587
Surr: Dibromofluoromethane	102	0	70-130		%Rec	1	6/16/2017 11:04:36 PM	B43587
Surr: Toluene-d8	98.6	0	70-130		%Rec	1	6/16/2017 11:04:36 PM	B43587

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB02
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 5:15:00 PM
Lab ID: 1706910-002
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.36	1.0		mg/L	1	6/20/2017 5:43:20 PM	32351
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	6/20/2017 5:43:20 PM	32351
Surr: DNOP	122	0	72.4-157		%Rec	1	6/20/2017 5:43:20 PM	32351
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	6/19/2017 4:57:21 PM	G43605
Surr: BFB	116	0	52.3-138		%Rec	1	6/19/2017 4:57:21 PM	G43605
EPA METHOD 200.7: METALS							Analyst: **pmf**	
Barium	ND	0.00093	0.0020		mg/L	1	6/20/2017 3:44:25 PM	A43653
Beryllium	ND	0.00029	0.0020		mg/L	1	6/20/2017 3:44:25 PM	A43653
Cadmium	ND	0.0010	0.0020		mg/L	1	6/20/2017 3:44:25 PM	A43653
Chromium	ND	0.0011	0.0060		mg/L	1	6/20/2017 3:44:25 PM	A43653
Cobalt	ND	0.0016	0.0060		mg/L	1	6/20/2017 3:44:25 PM	A43653
Iron	ND	0.016	0.020		mg/L	1	6/20/2017 3:44:25 PM	A43653
Manganese	ND	0.0011	0.0020		mg/L	1	6/20/2017 3:44:25 PM	A43653
Nickel	ND	0.0036	0.010		mg/L	1	6/20/2017 3:44:25 PM	A43653
Silver	ND	0.00088	0.0050		mg/L	1	6/20/2017 3:44:25 PM	A43653
Vanadium	ND	0.0019	0.050		mg/L	1	6/20/2017 3:44:25 PM	A43653
Zinc	ND	0.0028	0.010		mg/L	1	6/20/2017 3:44:25 PM	A43653
EPA 200.8: METALS							Analyst: **JLF**	
Antimony	ND	0.00037	0.0010		mg/L	1	6/26/2017 4:42:37 PM	B43799
Arsenic	ND	0.00030	0.0010		mg/L	1	6/26/2017 4:42:37 PM	B43799
Lead	ND	0.00017	0.00050		mg/L	1	6/26/2017 4:42:37 PM	B43799
Selenium	ND	0.00071	0.0010		mg/L	1	6/26/2017 4:42:37 PM	B43799
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	ND	0.000037	0.00020		mg/L	1	6/27/2017 1:49:21 PM	32504
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Acenaphthylene	ND	3.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Aniline	ND	3.1	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Anthracene	ND	3.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Azobenzene	ND	4.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Benz(a)anthracene	ND	3.9	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Benzo(a)pyrene	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Benzoic acid	7.1	3.9	20	J	µg/L	1	6/21/2017 4:30:48 PM	32356

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB02
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 5:15:00 PM
Lab ID: 1706910-002
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Benzyl alcohol	ND	4.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Bis(2-ethylhexyl)phthalate	5.0	4.8	10	J	µg/L	1	6/21/2017 4:30:48 PM	32356
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Carbazole	ND	4.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
4-Chloroaniline	ND	3.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2-Chloronaphthalene	ND	3.7	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2-Chlorophenol	ND	7.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Chrysene	ND	3.8	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Di-n-octyl phthalate	ND	4.7	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Dibenzofuran	ND	4.1	10		µg/L	1	6/21/2017 4:30:48 PM	32356
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	6/21/2017 4:30:48 PM	32356
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	6/21/2017 4:30:48 PM	32356
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Diethyl phthalate	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Dimethyl phthalate	ND	3.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	6/21/2017 4:30:48 PM	32356
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	6/21/2017 4:30:48 PM	32356
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	6/21/2017 4:30:48 PM	32356
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	6/21/2017 4:30:48 PM	32356
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Fluoranthene	ND	4.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Fluorene	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Hexachlorobenzene	ND	3.8	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Hexachlorobutadiene	ND	1.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Hexachloroethane	ND	1.2	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Isophorone	ND	4.4	10		µg/L	1	6/21/2017 4:30:48 PM	32356
1-Methylnaphthalene	ND	3.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB02
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 5:15:00 PM
Lab ID: 1706910-002
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
2-Methylnaphthalene	ND	3.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2-Methylphenol	ND	3.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
3+4-Methylphenol	ND	3.2	10		µg/L	1	6/21/2017 4:30:48 PM	32356
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Naphthalene	ND	2.9	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2-Nitroaniline	ND	4.9	10		µg/L	1	6/21/2017 4:30:48 PM	32356
3-Nitroaniline	ND	4.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
4-Nitroaniline	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Nitrobenzene	ND	3.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2-Nitrophenol	ND	5.2	10		µg/L	1	6/21/2017 4:30:48 PM	32356
4-Nitrophenol	ND	5.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Pentachlorophenol	ND	4.9	20		µg/L	1	6/21/2017 4:30:48 PM	32356
Phenanthrene	ND	4.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Phenol	ND	3.1	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Pyrene	ND	4.4	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Pyridine	ND	2.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Surr: 2-Fluorophenol	45.9	0	15-98.1		%Rec	1	6/21/2017 4:30:48 PM	32356
Surr: Phenol-d5	34.4	0	15-80.7		%Rec	1	6/21/2017 4:30:48 PM	32356
Surr: 2,4,6-Tribromophenol	76.8	0	15-112		%Rec	1	6/21/2017 4:30:48 PM	32356
Surr: Nitrobenzene-d5	80.1	0	27.2-90.7		%Rec	1	6/21/2017 4:30:48 PM	32356
Surr: 2-Fluorobiphenyl	68.9	0	23.3-85.6		%Rec	1	6/21/2017 4:30:48 PM	32356
Surr: 4-Terphenyl-d14	67.6	0	27.6-107		%Rec	1	6/21/2017 4:30:48 PM	32356
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.062	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Toluene	0.085	0.064	1.0	J	µg/L	1	6/16/2017 11:32:59 PM	B43587
Ethylbenzene	ND	0.093	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Methyl tert-butyl ether (MTBE)	ND	0.24	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Naphthalene	ND	0.11	2.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	6/16/2017 11:32:59 PM	B43587

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB02
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 5:15:00 PM
Lab ID: 1706910-002
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Acetone	ND	0.82	10		µg/L	1	6/16/2017 11:32:59 PM	B43587
Bromobenzene	ND	0.14	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Bromodichloromethane	ND	0.18	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Bromoform	ND	0.21	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Bromomethane	ND	0.26	3.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
2-Butanone	ND	1.1	10		µg/L	1	6/16/2017 11:32:59 PM	B43587
Carbon disulfide	ND	0.40	10		µg/L	1	6/16/2017 11:32:59 PM	B43587
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Chlorobenzene	ND	0.11	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Chloroethane	ND	0.23	2.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Chloroform	ND	0.40	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Chloromethane	ND	0.29	3.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Dibromochloromethane	ND	0.072	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Dibromomethane	ND	0.091	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
2-Hexanone	ND	0.66	10		µg/L	1	6/16/2017 11:32:59 PM	B43587
Isopropylbenzene	ND	0.051	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	6/16/2017 11:32:59 PM	B43587
Methylene Chloride	ND	0.11	3.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
n-Butylbenzene	ND	0.13	3.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
n-Propylbenzene	ND	0.074	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Styrene	ND	0.16	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB02
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 5:15:00 PM
Lab ID: 1706910-002
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Vinyl chloride	ND	0.18	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Xylenes, Total	ND	0.32	1.5		µg/L	1	6/16/2017 11:32:59 PM	B43587
Surr: 1,2-Dichloroethane-d4	103	0	70-130		%Rec	1	6/16/2017 11:32:59 PM	B43587
Surr: 4-Bromofluorobenzene	98.0	0	70-130		%Rec	1	6/16/2017 11:32:59 PM	B43587
Surr: Dibromofluoromethane	102	0	70-130		%Rec	1	6/16/2017 11:32:59 PM	B43587
Surr: Toluene-d8	102	0	70-130		%Rec	1	6/16/2017 11:32:59 PM	B43587

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-59 (33-34')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 5:00:00 PM
Lab ID: 1706910-003 **Matrix:** SOIL **Received Date:** 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	1.5	9.5		mg/Kg	1	6/20/2017 11:00:19 AM	32362
Motor Oil Range Organics (MRO)	ND	47	47		mg/Kg	1	6/20/2017 11:00:19 AM	32362
Surr: DNOP	89.5	0	70-130		%Rec	1	6/20/2017 11:00:19 AM	32362
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.1	5.0		mg/Kg	1	6/19/2017 4:40:03 PM	32325
Surr: BFB	102	0	54-150		%Rec	1	6/19/2017 4:40:03 PM	32325
EPA METHOD 7471: MERCURY							Analyst: **ELS**	
Mercury	ND	0.0063	0.031		mg/Kg	1	6/20/2017 11:30:58 AM	32380
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Antimony	ND	1.0	2.5		mg/Kg	1	6/26/2017 8:40:45 AM	32349
Arsenic	ND	0.88	2.5		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Barium	130	0.070	0.099		mg/Kg	1	6/26/2017 8:40:45 AM	32349
Beryllium	0.34	0.034	0.15		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Cadmium	ND	0.063	0.099		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Chromium	4.6	0.093	0.30		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Cobalt	2.1	0.11	0.30		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Iron	6400	37	120		mg/Kg	50	6/26/2017 8:58:04 AM	32349
Lead	0.72	0.17	0.25		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Manganese	180	0.053	0.099		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Nickel	3.5	0.15	0.49		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Selenium	ND	1.8	2.5		mg/Kg	1	6/26/2017 8:40:45 AM	32349
Silver	ND	0.062	0.25		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Vanadium	11	0.17	2.5		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Zinc	7.5	0.34	2.5		mg/Kg	1	6/20/2017 12:32:04 PM	32349
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Acenaphthene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Acenaphthylene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Aniline	ND	0.11	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Anthracene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Azobenzene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benz(a)anthracene	ND	0.17	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benzo(a)pyrene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benzo(b)fluoranthene	ND	0.19	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benzo(g,h,i)perylene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benzo(k)fluoranthene	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benzoic acid	ND	0.15	0.50		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benzyl alcohol	ND	0.17	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-59 (33-34')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 5:00:00 PM
Lab ID: 1706910-003
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Bis(2-chloroethoxy)methane	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Bis(2-chloroethyl)ether	ND	0.13	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Bis(2-chloroisopropyl)ether	ND	0.20	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Bis(2-ethylhexyl)phthalate	0.21	0.19	0.50	J	mg/Kg	1	6/28/2017 11:41:38 AM	32411
4-Bromophenyl phenyl ether	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Butyl benzyl phthalate	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Carbazole	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
4-Chloro-3-methylphenol	ND	0.18	0.50		mg/Kg	1	6/28/2017 11:41:38 AM	32411
4-Chloroaniline	ND	0.15	0.50		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2-Chloronaphthalene	ND	0.18	0.25		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2-Chlorophenol	ND	0.14	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
4-Chlorophenyl phenyl ether	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Chrysene	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Di-n-butyl phthalate	0.17	0.11	0.40	J	mg/Kg	1	6/28/2017 11:41:38 AM	32411
Di-n-octyl phthalate	ND	0.15	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Dibenz(a,h)anthracene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Dibenzofuran	ND	0.17	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
1,2-Dichlorobenzene	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
1,3-Dichlorobenzene	ND	0.14	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
1,4-Dichlorobenzene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
3,3´-Dichlorobenzidine	ND	0.15	0.25		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Diethyl phthalate	0.19	0.17	0.20	J	mg/Kg	1	6/28/2017 11:41:38 AM	32411
Dimethyl phthalate	ND	0.19	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,4-Dichlorophenol	ND	0.16	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,4-Dimethylphenol	ND	0.088	0.30		mg/Kg	1	6/28/2017 11:41:38 AM	32411
4,6-Dinitro-2-methylphenol	ND	0.15	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,4-Dinitrophenol	ND	0.12	0.50		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,4-Dinitrotoluene	ND	0.19	0.50		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,6-Dinitrotoluene	ND	0.17	0.50		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Fluoranthene	ND	0.17	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Fluorene	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Hexachlorobenzene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Hexachlorobutadiene	ND	0.17	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Hexachlorocyclopentadiene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Hexachloroethane	ND	0.14	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Indeno(1,2,3-cd)pyrene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Isophorone	ND	0.19	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
1-Methylnaphthalene	ND	0.19	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2-Methylnaphthalene	ND	0.17	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-59 (33-34')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 5:00:00 PM
Lab ID: 1706910-003
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
2-Methylphenol	ND	0.15	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
3+4-Methylphenol	ND	0.13	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
N-Nitrosodi-n-propylamine	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
N-Nitrosodiphenylamine	ND	0.19	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Naphthalene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2-Nitroaniline	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
3-Nitroaniline	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
4-Nitroaniline	ND	0.17	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Nitrobenzene	ND	0.17	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2-Nitrophenol	ND	0.19	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
4-Nitrophenol	ND	0.15	0.25		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Pentachlorophenol	ND	0.17	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Phenanthrene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Phenol	ND	0.14	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Pyrene	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Pyridine	ND	0.13	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
1,2,4-Trichlorobenzene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,4,5-Trichlorophenol	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,4,6-Trichlorophenol	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Surr: 2-Fluorophenol	52.0	0	21.4-101		%Rec	1	6/28/2017 11:41:38 AM	32411
Surr: Phenol-d5	55.4	0	32-110		%Rec	1	6/28/2017 11:41:38 AM	32411
Surr: 2,4,6-Tribromophenol	64.4	0	38.7-115		%Rec	1	6/28/2017 11:41:38 AM	32411
Surr: Nitrobenzene-d5	63.6		26.2-120		%Rec	1	6/28/2017 11:41:38 AM	32411
Surr: 2-Fluorobiphenyl	61.0		36.2-124		%Rec	1	6/28/2017 11:41:38 AM	32411
Surr: 4-Terphenyl-d14	45.0		15-114		%Rec	1	6/28/2017 11:41:38 AM	32411
METHOD 8260B/5035LOW: VOLATILES							Analyst: **RAA**	
Benzene	1.86	0.113	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Toluene	0.833	0.116	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Ethylbenzene	0.264	0.132	0.801	J	µg/Kg	1	6/19/2017 3:57:00 PM	32370
Methyl tert-butyl ether (MTBE)	0.657	0.340	0.801	J	µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2,4-Trimethylbenzene	ND	0.241	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,3,5-Trimethylbenzene	ND	0.219	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2-Dichloroethane (EDC)	ND	0.162	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2-Dibromoethane (EDB)	ND	0.151	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Naphthalene	0.336	0.167	1.60	J	µg/Kg	1	6/19/2017 3:57:00 PM	32370
1-Methylnaphthalene	0.336	0.206	3.20	J	µg/Kg	1	6/19/2017 3:57:00 PM	32370
2-Methylnaphthalene	0.368	0.168	3.20	J	µg/Kg	1	6/19/2017 3:57:00 PM	32370
Acetone	11.9	0.485	8.01		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Bromobenzene	ND	0.195	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-59 (33-34')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 5:00:00 PM
Lab ID: 1706910-003
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: **RAA**	
Bromodichloromethane	ND	0.184	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Bromoform	ND	0.170	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Bromomethane	ND	0.386	2.40		µg/Kg	1	6/19/2017 3:57:00 PM	32370
2-Butanone	ND	0.600	8.01		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Carbon disulfide	ND	0.321	8.01		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Carbon tetrachloride	ND	0.148	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Chlorobenzene	ND	0.122	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Chloroethane	ND	0.158	1.60		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Chloroform	ND	0.172	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Chloromethane	ND	0.202	2.40		µg/Kg	1	6/19/2017 3:57:00 PM	32370
2-Chlorotoluene	ND	0.170	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
4-Chlorotoluene	ND	0.175	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
cis-1,2-DCE	ND	0.165	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
cis-1,3-Dichloropropene	ND	0.128	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2-Dibromo-3-chloropropane	ND	0.214	1.60		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Dibromochloromethane	ND	0.113	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Dibromomethane	ND	0.129	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2-Dichlorobenzene	ND	0.172	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,3-Dichlorobenzene	ND	0.164	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,4-Dichlorobenzene	ND	0.169	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Dichlorodifluoromethane	ND	0.164	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,1-Dichloroethane	ND	0.138	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,1-Dichloroethene	ND	0.133	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2-Dichloropropane	ND	0.160	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,3-Dichloropropane	ND	0.143	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
2,2-Dichloropropane	ND	0.129	1.60		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,1-Dichloropropene	ND	0.159	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Hexachlorobutadiene	ND	0.227	1.60		µg/Kg	1	6/19/2017 3:57:00 PM	32370
2-Hexanone	ND	0.281	8.01		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Isopropylbenzene	ND	0.195	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
4-Isopropyltoluene	ND	0.234	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
4-Methyl-2-pentanone	ND	0.474	8.01		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Methylene chloride	ND	0.319	2.40		µg/Kg	1	6/19/2017 3:57:00 PM	32370
n-Butylbenzene	ND	0.186	2.40		µg/Kg	1	6/19/2017 3:57:00 PM	32370
n-Propylbenzene	ND	0.228	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
sec-Butylbenzene	ND	0.234	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Styrene	ND	0.147	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
tert-Butylbenzene	ND	0.250	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,1,1,2-Tetrachloroethane	ND	0.133	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-59 (33-34')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 5:00:00 PM
Lab ID: 1706910-003
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: **RAA**	
1,1,2,2-Tetrachloroethane	ND	0.164	1.60		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Tetrachloroethene (PCE)	ND	0.102	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
trans-1,2-DCE	ND	0.164	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
trans-1,3-Dichloropropene	ND	0.117	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2,3-Trichlorobenzene	ND	0.141	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2,4-Trichlorobenzene	ND	0.165	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,1,1-Trichloroethane	ND	0.139	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,1,2-Trichloroethane	ND	0.113	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Trichloroethene (TCE)	ND	0.130	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Trichlorofluoromethane	ND	0.114	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2,3-Trichloropropane	ND	0.326	1.60		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Vinyl chloride	ND	0.146	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Xylenes, Total	1.00	0.439	1.60	J	µg/Kg	1	6/19/2017 3:57:00 PM	32370
Surr: 1,2-Dichloroethane-d4	147	0	70-130	S	%Rec	1	6/19/2017 3:57:00 PM	32370
Surr: 4-Bromofluorobenzene	105	0	70-130		%Rec	1	6/19/2017 3:57:00 PM	32370
Surr: Dibromofluoromethane	129	0	70-130		%Rec	1	6/19/2017 3:57:00 PM	32370
Surr: Toluene-d8	96.5	0	70-130		%Rec	1	6/19/2017 3:57:00 PM	32370

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-60 (20-22')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 4:05:00 PM
Lab ID: 1706910-004 **Matrix:** SOIL **Received Date:** 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	1.5	9.5		mg/Kg	1	6/20/2017 11:28:46 AM	32362
Motor Oil Range Organics (MRO)	ND	47	47		mg/Kg	1	6/20/2017 11:28:46 AM	32362
Surr: DNOP	90.7	0	70-130		%Rec	1	6/20/2017 11:28:46 AM	32362
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.1	5.0		mg/Kg	1	6/19/2017 5:04:24 PM	32325
Surr: BFB	95.7	0	54-150		%Rec	1	6/19/2017 5:04:24 PM	32325
EPA METHOD 7471: MERCURY							Analyst: **ELS**	
Mercury	ND	0.0063	0.031		mg/Kg	1	6/20/2017 11:32:38 AM	32380
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Antimony	ND	1.0	2.5		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Arsenic	1.3	0.88	2.5	J	mg/Kg	1	6/20/2017 12:36:26 PM	32349
Barium	160	0.071	0.099		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Beryllium	0.52	0.034	0.15		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Cadmium	ND	0.063	0.099		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Chromium	6.4	0.094	0.30		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Cobalt	3.1	0.11	0.30		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Iron	10000	38	120		mg/Kg	50	6/26/2017 9:01:24 AM	32349
Lead	1.6	0.17	0.25		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Manganese	470	0.27	0.50		mg/Kg	5	6/26/2017 8:59:45 AM	32349
Nickel	4.9	0.15	0.50		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Selenium	ND	1.8	2.5		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Silver	ND	0.062	0.25		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Vanadium	14	0.17	2.5		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Zinc	10	0.35	2.5		mg/Kg	1	6/20/2017 12:36:26 PM	32349
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Acenaphthene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Acenaphthylene	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Aniline	ND	0.11	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Anthracene	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Azobenzene	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benz(a)anthracene	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benzo(a)pyrene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benzo(b)fluoranthene	ND	0.19	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benzo(g,h,i)perylene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benzo(k)fluoranthene	ND	0.15	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benzoic acid	ND	0.15	0.50		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benzyl alcohol	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-60 (20-22')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 4:05:00 PM
Lab ID: 1706910-004
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Bis(2-chloroethoxy)methane	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Bis(2-chloroethyl)ether	ND	0.13	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Bis(2-chloroisopropyl)ether	ND	0.20	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Bis(2-ethylhexyl)phthalate	0.25	0.19	0.50	J	mg/Kg	1	6/28/2017 1:04:56 PM	32411
4-Bromophenyl phenyl ether	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Butyl benzyl phthalate	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Carbazole	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
4-Chloro-3-methylphenol	ND	0.18	0.50		mg/Kg	1	6/28/2017 1:04:56 PM	32411
4-Chloroaniline	ND	0.15	0.50		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2-Chloronaphthalene	ND	0.18	0.25		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2-Chlorophenol	ND	0.14	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
4-Chlorophenyl phenyl ether	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Chrysene	ND	0.15	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Di-n-butyl phthalate	0.34	0.11	0.40	J	mg/Kg	1	6/28/2017 1:04:56 PM	32411
Di-n-octyl phthalate	ND	0.15	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Dibenz(a,h)anthracene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Dibenzofuran	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
1,2-Dichlorobenzene	ND	0.15	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
1,3-Dichlorobenzene	ND	0.14	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
1,4-Dichlorobenzene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
3,3´-Dichlorobenzidine	ND	0.15	0.25		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Diethyl phthalate	0.26	0.17	0.20	B	mg/Kg	1	6/28/2017 1:04:56 PM	32411
Dimethyl phthalate	ND	0.19	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,4-Dichlorophenol	ND	0.16	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,4-Dimethylphenol	ND	0.089	0.30		mg/Kg	1	6/28/2017 1:04:56 PM	32411
4,6-Dinitro-2-methylphenol	ND	0.15	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,4-Dinitrophenol	ND	0.12	0.50		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,4-Dinitrotoluene	ND	0.19	0.50		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,6-Dinitrotoluene	ND	0.18	0.50		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Fluoranthene	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Fluorene	ND	0.15	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Hexachlorobenzene	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Hexachlorobutadiene	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Hexachlorocyclopentadiene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Hexachloroethane	ND	0.14	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Indeno(1,2,3-cd)pyrene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Isophorone	ND	0.19	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
1-Methylnaphthalene	ND	0.19	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2-Methylnaphthalene	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-60 (20-22')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 4:05:00 PM
Lab ID: 1706910-004
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
2-Methylphenol	ND	0.15	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
3+4-Methylphenol	ND	0.13	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
N-Nitrosodi-n-propylamine	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
N-Nitrosodiphenylamine	ND	0.19	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Naphthalene	ND	0.19	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2-Nitroaniline	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
3-Nitroaniline	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
4-Nitroaniline	ND	0.17	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Nitrobenzene	ND	0.17	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2-Nitrophenol	ND	0.19	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
4-Nitrophenol	ND	0.15	0.25		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Pentachlorophenol	ND	0.17	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Phenanthrene	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Phenol	ND	0.14	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Pyrene	ND	0.15	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Pyridine	ND	0.13	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
1,2,4-Trichlorobenzene	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,4,5-Trichlorophenol	ND	0.15	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,4,6-Trichlorophenol	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Surr: 2-Fluorophenol	61.6	0	21.4-101		%Rec	1	6/28/2017 1:04:56 PM	32411
Surr: Phenol-d5	66.8	0	32-110		%Rec	1	6/28/2017 1:04:56 PM	32411
Surr: 2,4,6-Tribromophenol	76.3	0	38.7-115		%Rec	1	6/28/2017 1:04:56 PM	32411
Surr: Nitrobenzene-d5	70.3		26.2-120		%Rec	1	6/28/2017 1:04:56 PM	32411
Surr: 2-Fluorobiphenyl	73.0		36.2-124		%Rec	1	6/28/2017 1:04:56 PM	32411
Surr: 4-Terphenyl-d14	66.5		15-114		%Rec	1	6/28/2017 1:04:56 PM	32411
METHOD 8260B/5035LOW: VOLATILES							Analyst: **RAA**	
Benzene	0.728	0.0973	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Toluene	0.440	0.0997	0.687	J	µg/Kg	1	6/19/2017 4:23:00 PM	32370
Ethylbenzene	0.151	0.113	0.687	J	µg/Kg	1	6/19/2017 4:23:00 PM	32370
Methyl tert-butyl ether (MTBE)	ND	0.292	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2,4-Trimethylbenzene	ND	0.207	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,3,5-Trimethylbenzene	ND	0.188	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2-Dichloroethane (EDC)	ND	0.139	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2-Dibromoethane (EDB)	ND	0.129	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Naphthalene	ND	0.144	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1-Methylnaphthalene	0.261	0.177	2.75	J	µg/Kg	1	6/19/2017 4:23:00 PM	32370
2-Methylnaphthalene	0.295	0.144	2.75	J	µg/Kg	1	6/19/2017 4:23:00 PM	32370
Acetone	11.0	0.416	6.87		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Bromobenzene	ND	0.167	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-60 (20-22')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 4:05:00 PM
Lab ID: 1706910-004
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: **RAA**	
Bromodichloromethane	ND	0.158	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Bromoform	ND	0.146	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Bromomethane	ND	0.331	2.06		µg/Kg	1	6/19/2017 4:23:00 PM	32370
2-Butanone	ND	0.515	6.87		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Carbon disulfide	ND	0.275	6.87		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Carbon tetrachloride	ND	0.127	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Chlorobenzene	ND	0.105	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Chloroethane	ND	0.135	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Chloroform	ND	0.147	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Chloromethane	ND	0.173	2.06		µg/Kg	1	6/19/2017 4:23:00 PM	32370
2-Chlorotoluene	ND	0.146	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
4-Chlorotoluene	ND	0.150	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
cis-1,2-DCE	ND	0.142	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
cis-1,3-Dichloropropene	ND	0.110	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2-Dibromo-3-chloropropane	ND	0.184	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Dibromochloromethane	ND	0.0974	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Dibromomethane	ND	0.111	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2-Dichlorobenzene	ND	0.147	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,3-Dichlorobenzene	ND	0.141	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,4-Dichlorobenzene	ND	0.145	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Dichlorodifluoromethane	ND	0.141	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,1-Dichloroethane	ND	0.118	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,1-Dichloroethene	ND	0.114	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2-Dichloropropane	ND	0.137	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,3-Dichloropropane	ND	0.123	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
2,2-Dichloropropane	ND	0.111	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,1-Dichloropropene	ND	0.136	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Hexachlorobutadiene	ND	0.195	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
2-Hexanone	ND	0.241	6.87		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Isopropylbenzene	ND	0.167	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
4-Isopropyltoluene	ND	0.201	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
4-Methyl-2-pentanone	ND	0.406	6.87		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Methylene chloride	ND	0.273	2.06		µg/Kg	1	6/19/2017 4:23:00 PM	32370
n-Butylbenzene	ND	0.160	2.06		µg/Kg	1	6/19/2017 4:23:00 PM	32370
n-Propylbenzene	ND	0.196	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
sec-Butylbenzene	ND	0.201	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Styrene	ND	0.126	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
tert-Butylbenzene	ND	0.214	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,1,1,2-Tetrachloroethane	ND	0.114	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-60 (20-22')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 4:05:00 PM
Lab ID: 1706910-004
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: **RAA**	
1,1,2,2-Tetrachloroethane	ND	0.141	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Tetrachloroethene (PCE)	ND	0.0879	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
trans-1,2-DCE	ND	0.141	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
trans-1,3-Dichloropropene	ND	0.101	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2,3-Trichlorobenzene	ND	0.121	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2,4-Trichlorobenzene	ND	0.141	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,1,1-Trichloroethane	ND	0.119	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,1,2-Trichloroethane	ND	0.0971	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Trichloroethene (TCE)	ND	0.111	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Trichlorofluoromethane	ND	0.0981	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2,3-Trichloropropane	ND	0.280	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Vinyl chloride	ND	0.125	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Xylenes, Total	0.708	0.376	1.37	J	µg/Kg	1	6/19/2017 4:23:00 PM	32370
Surr: 1,2-Dichloroethane-d4	153	0	70-130	S	%Rec	1	6/19/2017 4:23:00 PM	32370
Surr: 4-Bromofluorobenzene	105	0	70-130		%Rec	1	6/19/2017 4:23:00 PM	32370
Surr: Dibromofluoromethane	137	0	70-130	S	%Rec	1	6/19/2017 4:23:00 PM	32370
Surr: Toluene-d8	98.8	0	70-130		%Rec	1	6/19/2017 4:23:00 PM	32370

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Wet Chemistry by Method 4500CN E-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Cyanide	ND		0.00500	1	06/22/2017 17:26	WG991209

Wet Chemistry by Method 4500CN E-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Cyanide	ND		0.00500	1	06/22/2017 17:27	WG991209

Wet Chemistry by Method 9012B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Cyanide	ND		0.250	1	06/23/2017 20:37	WG991279

Wet Chemistry by Method 9012B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Cyanide	ND		0.250	1	06/23/2017 20:39	WG991279

Tc
Ss
Cn
Sr
Qc
Gl
Al
Sc

Method Blank (MB)

(MB) R3227997-1 06/22/17 17:07

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Cyanide	U		0.0018	0.00500

L917084-01 Original Sample (OS) • Duplicate (DUP)

(OS) L917084-01 06/22/17 17:20 • (DUP) R3227997-4 06/22/17 17:21

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Cyanide	0.00197	0.00245	1	22	J P1	20

L917108-01 Original Sample (OS) • Duplicate (DUP)

(OS) L917108-01 06/22/17 17:33 • (DUP) R3227997-7 06/22/17 17:34

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Cyanide	ND	0.000	1	0		20

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

(LCS) R3227997-2 06/22/17 17:08 • (LCSD) R3227997-3 06/22/17 17:09

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Cyanide	0.100	0.0985	0.105	99	105	85-115			6	20

L917102-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L917102-04 06/22/17 17:23 • (MS) R3227997-5 06/22/17 17:24 • (MSD) R3227997-6 06/22/17 17:25

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Cyanide	0.100	ND	0.0435	0.0896	44	90	1	75-125	J6	J3	69	20

Method Blank (MB)

(MB) R3228415-1 06/23/17 20:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cyanide	U		0.039	0.250

L917105-03 Original Sample (OS) • Duplicate (DUP)

(OS) L917105-03 06/23/17 20:37 • (DUP) R3228415-4 06/23/17 20:38

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Cyanide	ND	0.0472	1	0		20

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

(LCS) R3228415-2 06/23/17 20:23 • (LCSD) R3228415-3 06/23/17 20:24

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cyanide	2.50	2.52	2.62	101	105	50-150			4	20

L917238-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L917238-03 06/23/17 20:48 • (MS) R3228415-6 06/23/17 20:49 • (MSD) R3228415-7 06/23/17 20:50

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Cyanide	3.33	ND	1.47	1.68	42	49	1	75-125	J6	J6	14	20

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Rec.	Recovery.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **MB-A**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Metals**
Client ID: **PBW**	Batch ID: **A43653**	RunNo: **43653**
Prep Date:	Analysis Date: **6/20/2017**	SeqNo: **1375201** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Iron	ND	0.020								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Sample ID **LCSLL-A**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Metals**
Client ID: **BatchQC**	Batch ID: **A43653**	RunNo: **43653**
Prep Date:	Analysis Date: **6/20/2017**	SeqNo: **1375202** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0018	0.0020	0.002000	0	90.0	50	150			J
Beryllium	0.0019	0.0020	0.002000	0	96.0	50	150			J
Cadmium	0.0019	0.0020	0.002000	0	96.0	50	150			J
Chromium	0.0059	0.0060	0.006000	0	97.7	50	150			J
Cobalt	0.0064	0.0060	0.006000	0	107	50	150			
Iron	0.024	0.020	0.02000	0	121	50	150			
Manganese	0.0020	0.0020	0.002000	0	102	50	150			
Nickel	0.0056	0.010	0.005000	0	113	50	150			J
Silver	0.0052	0.0050	0.005000	0	105	50	150			
Vanadium	0.0098	0.050	0.01000	0	98.2	50	150			J
Zinc	0.0055	0.010	0.005000	0	109	50	150			J

Sample ID **LCS-A**	SampType: **LCS**	TestCode: **EPA Method 200.7: Metals**
Client ID: **LCSW**	Batch ID: **A43653**	RunNo: **43653**
Prep Date:	Analysis Date: **6/20/2017**	SeqNo: **1375203** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	97.0	85	115			
Beryllium	0.50	0.0020	0.5000	0	100	85	115			
Cadmium	0.49	0.0020	0.5000	0	97.7	85	115			
Chromium	0.49	0.0060	0.5000	0	97.0	85	115			
Cobalt	0.46	0.0060	0.5000	0	91.7	85	115			
Iron	0.47	0.020	0.5000	0	95.0	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **LCS-A**	SampType: **LCS**	TestCode: **EPA Method 200.7: Metals**
Client ID: **LCSW**	Batch ID: **A43653**	RunNo: **43653**
Prep Date:	Analysis Date: **6/20/2017**	SeqNo: **1375203** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.47	0.0020	0.5000	0	93.6	85	115			
Nickel	0.46	0.010	0.5000	0	91.8	85	115			
Silver	0.099	0.0050	0.1000	0	99.3	85	115			
Vanadium	0.51	0.050	0.5000	0	102	85	115			
Zinc	0.48	0.010	0.5000	0	95.5	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**LCS**	SampType:	**LCS**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**LCSW**	Batch ID:	**B43799**	RunNo:	**43799**					
Prep Date:		Analysis Date:	**6/26/2017**	SeqNo:	**1379729**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.023	0.0010	0.02500	0	91.1	85	115			
Arsenic	0.024	0.0010	0.02500	0	94.4	85	115			
Lead	0.011	0.00050	0.01250	0	90.6	85	115			
Selenium	0.023	0.0010	0.02500	0	93.4	85	115			

Sample ID	**LLLCS**	SampType:	**LCSLL**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**BatchQC**	Batch ID:	**B43799**	RunNo:	**43799**					
Prep Date:		Analysis Date:	**6/26/2017**	SeqNo:	**1379730**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00094	0.0010	0.001000	0	94.4	50	150			J
Arsenic	0.0011	0.0010	0.001000	0	107	50	150			
Lead	0.00047	0.00050	0.0005000	0	94.9	50	150			J
Selenium	0.0013	0.0010	0.001000	0	134	50	150			

Sample ID	**MB**	SampType:	**MBLK**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**PBW**	Batch ID:	**B43799**	RunNo:	**43799**					
Prep Date:		Analysis Date:	**6/26/2017**	SeqNo:	**1379732**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**MB-32504**	SampType:	**MBLK**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**PBW**	Batch ID:	**32504**	RunNo:	**43819**					
Prep Date:	**6/27/2017**	Analysis Date:	**6/27/2017**	SeqNo:	**1380679**	Units:	**mg/L**			

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

Sample ID	**LCS-32504**	SampType:	**LCS**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**LCSW**	Batch ID:	**32504**	RunNo:	**43819**					
Prep Date:	**6/27/2017**	Analysis Date:	**6/27/2017**	SeqNo:	**1380680**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0047	0.00020	0.005000	0	93.8	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **LCS-32362**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32362**	RunNo: **43629**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1374617** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	91.4	73.2	114			
Surr: DNOP	4.9		5.000		97.7	70	130			

Sample ID **MB-32362**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32362**	RunNo: **43629**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1374618** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		100	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **1706910-001CMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **EB01**	Batch ID: **32351**	RunNo: **43629**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1375391** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.9	1.0	5.000	0	119	87.2	145			
Surr: DNOP	0.60		0.5000		121	72.4	157			

Sample ID **1706910-001CMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **EB01**	Batch ID: **32351**	RunNo: **43629**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1375392** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.8	1.0	5.000	0	116	87.2	145	2.61	20	
Surr: DNOP	0.60		0.5000		121	72.4	157	0	0	

Sample ID **LCS-32351**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **LCSW**	Batch ID: **32351**	RunNo: **43629**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1375408** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.7	1.0	5.000	0	114	82.8	146			
Surr: DNOP	0.59		0.5000		118	72.4	157			

Sample ID **MB-32351**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **PBW**	Batch ID: **32351**	RunNo: **43629**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1375409** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	1.2		1.000		121	72.4	157			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**MB-32325**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**PBS**	Batch ID:	**32325**	RunNo:	**43604**
Prep Date:	**6/16/2017**	Analysis Date:	**6/19/2017**	SeqNo:	**1374087** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	950		1000		94.9	54	150			

Sample ID	**LCS-32325**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**LCSS**	Batch ID:	**32325**	RunNo:	**43604**
Prep Date:	**6/16/2017**	Analysis Date:	**6/19/2017**	SeqNo:	**1374088** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	95.6	76.4	125			
Surr: BFB	1100		1000		108	54	150			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G43605**	RunNo: **43605**
Prep Date:	Analysis Date: **6/19/2017**	SeqNo: **1374131** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	24		20.00		118	52.3	138			

Sample ID **2.5UG GRO LCSB**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G43605**	RunNo: **43605**
Prep Date:	Analysis Date: **6/19/2017**	SeqNo: **1374132** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.42	0.050	0.5000	0	84.4	79.1	123			
Surr: BFB	26		20.00		128	52.3	138			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **lcs-32370**	SampType: **LCS4**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **BatchQC**	Batch ID: **32370**	RunNo: **43615**
Prep Date: **6/19/2017**	Analysis Date: **6/19/2017**	SeqNo: **1373913** Units: **µg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	10.8	1.00	10.00	0	108	70	130			
Toluene	9.91	1.00	10.00	0	99.1	70	130			
Ethylbenzene	9.83	1.00	10.00	0	98.3	70	130			
Methyl tert-butyl ether (MTBE)	21.6	1.00	20.00	0	108	70	130			
1,2,4-Trimethylbenzene	10.1	1.00	10.00	0	101	70	130			
1,3,5-Trimethylbenzene	9.91	1.00	10.00	0	99.1	70	130			
1,2-Dichloroethane (EDC)	11.5	1.00	10.00	0	115	70	130			
1,2-Dibromoethane (EDB)	10.1	1.00	10.00	0	101	70	130			
Naphthalene	10.1	2.00	10.00	0	101	73.3	147			
1-Methylnaphthalene	11.2	4.00	10.00	0	112	69.6	154			
2-Methylnaphthalene	9.00	4.00	10.00	0	90.0	67.7	155			
Acetone	22.9	10.0	20.00	0	115	60	140			
Bromobenzene	10.2	1.00	10.00	0	102	70	130			
Bromodichloromethane	11.5	1.00	10.00	0	115	70	130			
Bromoform	9.88	1.00	10.00	0	98.8	70	130			
Bromomethane	8.35	3.00	10.00	0	83.5	70	130			
2-Butanone	24.3	10.0	20.00	0	121	60	140			
Carbon disulfide	21.2	10.0	20.00	0	106	60	140			
Carbon tetrachloride	10.8	1.00	10.00	0	108	70	130			
Chlorobenzene	9.97	1.00	10.00	0	99.7	70	130			
Chloroethane	10.9	2.00	10.00	0	109	70	130			
Chloroform	11.2	1.00	10.00	0	112	70	130			
Chloromethane	9.34	3.00	10.00	0	93.4	66.4	132			
2-Chlorotoluene	10.0	1.00	10.00	0	100	70	130			
4-Chlorotoluene	10.2	1.00	10.00	0	102	70	130			
cis-1,2-DCE	11.3	1.00	10.00	0	113	70	130			
cis-1,3-Dichloropropene	10.1	1.00	10.00	0	101	70	130			
1,2-Dibromo-3-chloropropane	8.90	2.00	10.00	0	89.0	70	130			
Dibromochloromethane	9.57	1.00	10.00	0	95.7	70	130			
Dibromomethane	11.5	1.00	10.00	0	115	70	130			
1,2-Dichlorobenzene	10.1	1.00	10.00	0	101	70	130			
1,3-Dichlorobenzene	10.2	1.00	10.00	0	102	70	130			
1,4-Dichlorobenzene	10.3	1.00	10.00	0	103	70	130			
Dichlorodifluoromethane	11.8	1.00	10.00	0	118	35.6	131			
1,1-Dichloroethane	10.7	1.00	10.00	0	107	63.7	129			
1,1-Dichloroethene	10.6	1.00	10.00	0	106	70	130			
1,2-Dichloropropane	10.6	1.00	10.00	0	106	70	130			
1,3-Dichloropropane	10.1	1.00	10.00	0	101	70	130			
2,2-Dichloropropane	10.4	2.00	10.00	0	104	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **lcs-32370**	SampType: **LCS4**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **BatchQC**	Batch ID: **32370**	RunNo: **43615**
Prep Date: **6/19/2017**	Analysis Date: **6/19/2017**	SeqNo: **1373913** Units: **µg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	11.0	1.00	10.00	0	110	70	130			
Hexachlorobutadiene	9.23	2.00	10.00	0	92.3	70	130			
2-Hexanone	19.4	10.0	20.00	0	96.8	60	140			
Isopropylbenzene	9.68	1.00	10.00	0	96.8	70	130			
4-Isopropyltoluene	10.2	1.00	10.00	0	102	70	130			
4-Methyl-2-pentanone	21.6	10.0	20.00	0	108	60	140			
Methylene chloride	10.6	3.00	10.00	0	106	70	130			
n-Butylbenzene	9.98	3.00	10.00	0	99.8	70	130			
n-Propylbenzene	9.98	1.00	10.00	0	99.8	70	130			
sec-Butylbenzene	9.62	1.00	10.00	0	96.2	70	130			
Styrene	10.0	1.00	10.00	0	101	70	130			
tert-Butylbenzene	9.54	1.00	10.00	0	95.4	70	130			
1,1,1,2-Tetrachloroethane	9.54	1.00	10.00	0	95.4	70	130			
1,1,2,2-Tetrachloroethane	10.4	2.00	10.00	0	104	70	130			
Tetrachloroethene (PCE)	9.91	1.00	10.00	0	99.1	70	130			
trans-1,2-DCE	10.6	1.00	10.00	0	106	70	130			
trans-1,3-Dichloropropene	8.98	1.00	10.00	0	89.8	70	130			
1,2,3-Trichlorobenzene	10.3	1.00	10.00	0	103	70	130			
1,2,4-Trichlorobenzene	10.4	1.00	10.00	0	104	70	130			
1,1,1-Trichloroethane	10.7	1.00	10.00	0	107	70	130			
1,1,2-Trichloroethane	10.2	1.00	10.00	0	103	70	130			
Trichloroethene (TCE)	10.9	1.00	10.00	0	109	70	130			
Trichlorofluoromethane	11.1	1.00	10.00	0	111	70	130			
1,2,3-Trichloropropane	10.9	2.00	10.00	0	109	70	130			
Vinyl chloride	10.1	1.00	10.00	0	101	70	130			
Xylenes, Total	30.0	2.00	30.00	0	99.9	70	130			
Surr: 1,2-Dichloroethane-d4	11.9		10.00		119	70	130			
Surr: 4-Bromofluorobenzene	10.4		10.00		104	70	130			
Surr: Dibromofluoromethane	11.8		10.00		118	70	130			
Surr: Toluene-d8	10.2		10.00		103	70	130			

Sample ID **mb-32370**	SampType: **MBLK**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **PBS**	Batch ID: **32370**	RunNo: **43615**
Prep Date: **6/19/2017**	Analysis Date: **6/19/2017**	SeqNo: **1373982** Units: **µg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.00								
Toluene	ND	1.00								
Ethylbenzene	ND	1.00								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**
11-Jul-17

Client: Western Refining Company
Project: SMW-2 AND BOUNDARY WELLS

Sample ID **mb-32370**	SampType: **MBLK**	TestCode: **Method 8260B/5035LOW: VOLATILES**	
Client ID: **PBS**	Batch ID: **32370**	RunNo: **43615**	
Prep Date: **6/19/2017**	Analysis Date: **6/19/2017**	SeqNo: **1373982**	Units: **µg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	1.00								
1,2,4-Trimethylbenzene	ND	1.00								
1,3,5-Trimethylbenzene	ND	1.00								
1,2-Dichloroethane (EDC)	ND	1.00								
1,2-Dibromoethane (EDB)	ND	1.00								
Naphthalene	0.420	2.00								J
1-Methylnaphthalene	0.630	4.00								J
2-Methylnaphthalene	0.620	4.00								J
Acetone	0.980	10.0								J
Bromobenzene	ND	1.00								
Bromodichloromethane	ND	1.00								
Bromoform	ND	1.00								
Bromomethane	ND	3.00								
2-Butanone	ND	10.0								
Carbon disulfide	ND	10.0								
Carbon tetrachloride	ND	1.00								
Chlorobenzene	ND	1.00								
Chloroethane	ND	2.00								
Chloroform	ND	1.00								
Chloromethane	ND	3.00								
2-Chlorotoluene	ND	1.00								
4-Chlorotoluene	ND	1.00								
cis-1,2-DCE	ND	1.00								
cis-1,3-Dichloropropene	ND	1.00								
1,2-Dibromo-3-chloropropane	ND	2.00								
Dibromochloromethane	ND	1.00								
Dibromomethane	ND	1.00								
1,2-Dichlorobenzene	ND	1.00								
1,3-Dichlorobenzene	ND	1.00								
1,4-Dichlorobenzene	ND	1.00								
Dichlorodifluoromethane	ND	1.00								
1,1-Dichloroethane	ND	1.00								
1,1-Dichloroethene	ND	1.00								
1,2-Dichloropropane	ND	1.00								
1,3-Dichloropropane	ND	1.00								
2,2-Dichloropropane	ND	2.00								
1,1-Dichloropropene	ND	1.00								
Hexachlorobutadiene	ND	2.00								
2-Hexanone	ND	10.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **mb-32370**	SampType: **MBLK**	TestCode: **Method 8260B/5035LOW: VOLATILES**	
Client ID: **PBS**	Batch ID: **32370**	RunNo: **43615**	
Prep Date: **6/19/2017**	Analysis Date: **6/19/2017**	SeqNo: **1373982**	Units: **µg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Isopropylbenzene	ND	1.00								
4-Isopropyltoluene	ND	1.00								
4-Methyl-2-pentanone	ND	10.0								
Methylene chloride	ND	3.00								
n-Butylbenzene	ND	3.00								
n-Propylbenzene	ND	1.00								
sec-Butylbenzene	ND	1.00								
Styrene	ND	1.00								
tert-Butylbenzene	ND	1.00								
1,1,1,2-Tetrachloroethane	ND	1.00								
1,1,2,2-Tetrachloroethane	ND	2.00								
Tetrachloroethene (PCE)	ND	1.00								
trans-1,2-DCE	ND	1.00								
trans-1,3-Dichloropropene	ND	1.00								
1,2,3-Trichlorobenzene	ND	1.00								
1,2,4-Trichlorobenzene	ND	1.00								
1,1,1-Trichloroethane	ND	1.00								
1,1,2-Trichloroethane	ND	1.00								
Trichloroethene (TCE)	ND	1.00								
Trichlorofluoromethane	ND	1.00								
1,2,3-Trichloropropane	ND	2.00								
Vinyl chloride	ND	1.00								
Xylenes, Total	ND	2.00								
Surr: 1,2-Dichloroethane-d4	13.1		10.00		131	70	130			S
Surr: 4-Bromofluorobenzene	10.2		10.00		102	70	130			
Surr: Dibromofluoromethane	12.6		10.00		126	70	130			
Surr: Toluene-d8	9.94		10.00		99.4	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **rb1**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B43587**	RunNo: **43587**
Prep Date:	Analysis Date: **6/16/2017**	SeqNo: **1373146** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **rb1**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B43587**	RunNo: **43587**
Prep Date:	Analysis Date: **6/16/2017**	SeqNo: **1373146** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		107	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	11		10.00		105	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **B43587**	RunNo: **43587**
Prep Date:	Analysis Date: **6/16/2017**	SeqNo: **1373147** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	104	70	130			
Toluene	19	1.0	20.00	0	95.1	70	130			
Chlorobenzene	20	1.0	20.00	0	101	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **B43587**	RunNo: **43587**
Prep Date:	Analysis Date: **6/16/2017**	SeqNo: **1373147** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	21	1.0	20.00	0	103	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	91.9	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		96.7	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID **1706910-001a ms2**	SampType: **MS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **EB01**	Batch ID: **B43587**	RunNo: **43587**
Prep Date:	Analysis Date: **6/17/2017**	SeqNo: **1373151** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	102	70	130			
Toluene	19	1.0	20.00	0.07200	96.4	70	130			
Chlorobenzene	20	1.0	20.00	0	101	70	130			
1,1-Dichloroethene	20	1.0	20.00	0	102	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	90.1	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	9.4		10.00		94.1	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID **1706910-001a msd2**	SampType: **MSD**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **EB01**	Batch ID: **B43587**	RunNo: **43587**
Prep Date:	Analysis Date: **6/17/2017**	SeqNo: **1373152** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	100	70	130	2.31	20	
Toluene	18	1.0	20.00	0.07200	91.7	70	130	5.02	20	
Chlorobenzene	19	1.0	20.00	0	96.4	70	130	4.50	20	
1,1-Dichloroethene	19	1.0	20.00	0	96.9	70	130	4.98	20	
Trichloroethene (TCE)	18	1.0	20.00	0	88.5	70	130	1.74	20	
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130	0	0	
Surr: 4-Bromofluorobenzene	9.4		10.00		94.3	70	130	0	0	
Surr: Dibromofluoromethane	10		10.00		104	70	130	0	0	
Surr: Toluene-d8	10		10.00		102	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **W43599**	RunNo: **43599**
Prep Date:	Analysis Date: **6/19/2017**	SeqNo: **1374263** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.3		10.00		93.0	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.1	70	130			
Surr: Dibromofluoromethane	9.7		10.00		96.8	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **W43599**	RunNo: **43599**
Prep Date:	Analysis Date: **6/19/2017**	SeqNo: **1374264** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		100	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		93.1	70	130			
Surr: Dibromofluoromethane	9.8		10.00		97.6	70	130			
Surr: Toluene-d8	9.9		10.00		99.0	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **1706910-003ams**	SampType: **MS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **OW-59 (33-34')**	Batch ID: **32411**	RunNo: **43869**
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382769** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.1	0.20	1.667	0	64.3	24.7	111			
4-Chloro-3-methylphenol	2.3	0.50	3.323	0	70.3	21.7	108			
2-Chlorophenol	1.9	0.20	3.323	0	58.5	21.9	103			
1,4-Dichlorobenzene	0.99	0.20	1.667	0	59.5	15.8	93.9			
2,4-Dinitrotoluene	0.91	0.50	1.667	0	54.5	19.9	101			
N-Nitrosodi-n-propylamine	1.0	0.20	1.667	0	62.4	17.7	100			
4-Nitrophenol	2.1	0.25	3.323	0	61.7	19.3	112			
Pentachlorophenol	2.0	0.40	3.323	0	60.5	20.5	105			
Phenol	2.2	0.20	3.323	0	65.1	23.1	101			
Pyrene	1.2	0.20	1.667	0	70.8	18.3	113			
1,2,4-Trichlorobenzene	1.2	0.20	1.667	0	70.0	21.8	108			
Surr: 2-Fluorophenol	1.9		3.323		57.9	21.4	101			
Surr: Phenol-d5	2.3		3.323		68.6	32	110			
Surr: 2,4,6-Tribromophenol	2.4		3.323		72.8	38.7	115			
Surr: Nitrobenzene-d5	1.2		1.667		74.2	26.2	120			
Surr: 2-Fluorobiphenyl	1.2		1.667		72.9	36.2	124			
Surr: 4-Terphenyl-d14	0.98		1.667		58.9	15	114			

Sample ID **1706910-003amsd**	SampType: **MSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **OW-59 (33-34')**	Batch ID: **32411**	RunNo: **43869**
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382770** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.0	0.20	1.664	0	61.7	24.7	111	4.25	30.2	
4-Chloro-3-methylphenol	2.0	0.50	3.319	0	61.3	21.7	108	13.8	37.2	
2-Chlorophenol	1.9	0.20	3.319	0	57.4	21.9	103	2.14	48	
1,4-Dichlorobenzene	1.0	0.20	1.664	0	60.0	15.8	93.9	0.736	40.6	
2,4-Dinitrotoluene	0.86	0.50	1.664	0	51.5	19.9	101	5.90	47.7	
N-Nitrosodi-n-propylamine	0.95	0.20	1.664	0	57.0	17.7	100	9.26	52.5	
4-Nitrophenol	2.0	0.25	3.319	0	61.7	19.3	112	0.0843	36.6	
Pentachlorophenol	1.9	0.40	3.319	0	57.6	20.5	105	4.98	65.5	
Phenol	2.0	0.20	3.319	0	60.7	23.1	101	7.15	44	
Pyrene	1.2	0.20	1.664	0	73.1	18.3	113	2.97	42.1	
1,2,4-Trichlorobenzene	1.2	0.20	1.664	0	73.5	21.8	108	4.68	31.5	
Surr: 2-Fluorophenol	1.8		3.319		54.3	21.4	101	0	0	
Surr: Phenol-d5	2.1		3.319		62.2	32	110	0	0	
Surr: 2,4,6-Tribromophenol	2.3		3.319		67.9	38.7	115	0	0	
Surr: Nitrobenzene-d5	1.2		1.664		72.9	26.2	120	0	0	
Surr: 2-Fluorobiphenyl	1.1		1.664		67.9	36.2	124	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **1706910-003amsd**	SampType: **MSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **OW-59 (33-34')**	Batch ID: **32411**	RunNo: **43869**
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382770** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	0.97		1.664		58.3	15	114	0	0	

Sample ID **lcs-32411**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS**	Batch ID: **32411**	RunNo: **43869**
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382773** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.0	0.20	1.670	0	61.7	39.4	110			
4-Chloro-3-methylphenol	1.9	0.50	3.330	0	56.2	41.6	108			
2-Chlorophenol	1.8	0.20	3.330	0	55.1	35	107			
1,4-Dichlorobenzene	0.96	0.20	1.670	0	57.7	31	105			
2,4-Dinitrotoluene	0.86	0.50	1.670	0	51.7	35.6	101			
N-Nitrosodi-n-propylamine	0.86	0.20	1.670	0	51.2	26	100			
4-Nitrophenol	1.6	0.25	3.330	0	48.6	34.1	106			
Pentachlorophenol	1.7	0.40	3.330	0	51.9	35.3	95.4			
Phenol	1.9	0.20	3.330	0	55.6	39.3	96.5			
Pyrene	1.2	0.20	1.670	0	70.3	47.8	95.7			
1,2,4-Trichlorobenzene	1.2	0.20	1.670	0	69.5	36.6	117			
Surr: 2-Fluorophenol	1.7		3.330		49.8	21.4	101			
Surr: Phenol-d5	1.9		3.330		58.1	32	110			
Surr: 2,4,6-Tribromophenol	2.1		3.330		64.4	38.7	115			
Surr: Nitrobenzene-d5	1.1		1.670		67.2	26.2	120			
Surr: 2-Fluorobiphenyl	1.2		1.670		70.9	36.2	124			
Surr: 4-Terphenyl-d14	0.96		1.670		57.3	15	114			

Sample ID **mb-32411**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBS**	Batch ID: **32411**	RunNo: **43869**
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382774** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	0.20								
Acenaphthylene	ND	0.20								
Aniline	ND	0.20								
Anthracene	ND	0.20								
Azobenzene	ND	0.20								
Benz(a)anthracene	ND	0.20								
Benzo(a)pyrene	ND	0.20								
Benzo(b)fluoranthene	ND	0.20								
Benzo(g,h,i)perylene	ND	0.20								
Benzo(k)fluoranthene	ND	0.20								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**
11-Jul-17

Client: Western Refining Company
Project: SMW-2 AND BOUNDARY WELLS

Sample ID **mb-32411**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**	
Client ID: **PBS**	Batch ID: **32411**	RunNo: **43869**	
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382774**	Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzoic acid	ND	0.50								
Benzyl alcohol	ND	0.20								
Bis(2-chloroethoxy)methane	ND	0.20								
Bis(2-chloroethyl)ether	ND	0.20								
Bis(2-chloroisopropyl)ether	ND	0.20								
Bis(2-ethylhexyl)phthalate	0.27	0.50								J
4-Bromophenyl phenyl ether	ND	0.20								
Butyl benzyl phthalate	ND	0.20								
Carbazole	ND	0.20								
4-Chloro-3-methylphenol	ND	0.50								
4-Chloroaniline	ND	0.50								
2-Chloronaphthalene	ND	0.25								
2-Chlorophenol	ND	0.20								
4-Chlorophenyl phenyl ether	ND	0.20								
Chrysene	ND	0.20								
Di-n-butyl phthalate	0.32	0.40								J
Di-n-octyl phthalate	ND	0.40								
Dibenz(a,h)anthracene	ND	0.20								
Dibenzofuran	ND	0.20								
1,2-Dichlorobenzene	ND	0.20								
1,3-Dichlorobenzene	ND	0.20								
1,4-Dichlorobenzene	ND	0.20								
3,3´-Dichlorobenzidine	ND	0.25								
Diethyl phthalate	0.23	0.20								
Dimethyl phthalate	ND	0.20								
2,4-Dichlorophenol	ND	0.40								
2,4-Dimethylphenol	ND	0.30								
4,6-Dinitro-2-methylphenol	ND	0.40								
2,4-Dinitrophenol	ND	0.50								
2,4-Dinitrotoluene	ND	0.50								
2,6-Dinitrotoluene	ND	0.50								
Fluoranthene	ND	0.20								
Fluorene	ND	0.20								
Hexachlorobenzene	ND	0.20								
Hexachlorobutadiene	ND	0.20								
Hexachlorocyclopentadiene	ND	0.20								
Hexachloroethane	ND	0.20								
Indeno(1,2,3-cd)pyrene	ND	0.20								
Isophorone	ND	0.40								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **mb-32411**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**	
Client ID: **PBS**	Batch ID: **32411**	RunNo: **43869**	
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382774**	Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
2-Methylphenol	ND	0.40								
3+4-Methylphenol	ND	0.20								
N-Nitrosodi-n-propylamine	ND	0.20								
N-Nitrosodiphenylamine	ND	0.20								
Naphthalene	ND	0.20								
2-Nitroaniline	ND	0.20								
3-Nitroaniline	ND	0.20								
4-Nitroaniline	ND	0.40								
Nitrobenzene	ND	0.40								
2-Nitrophenol	ND	0.20								
4-Nitrophenol	ND	0.25								
Pentachlorophenol	ND	0.40								
Phenanthrene	ND	0.20								
Phenol	ND	0.20								
Pyrene	ND	0.20								
Pyridine	ND	0.40								
1,2,4-Trichlorobenzene	ND	0.20								
2,4,5-Trichlorophenol	ND	0.20								
2,4,6-Trichlorophenol	ND	0.20								
Surr: 2-Fluorophenol	2.0		3.330		59.6	21.4	101			
Surr: Phenol-d5	2.1		3.330		64.2	32	110			
Surr: 2,4,6-Tribromophenol	2.3		3.330		68.5	38.7	115			
Surr: Nitrobenzene-d5	1.3		1.670		77.5	26.2	120			
Surr: 2-Fluorobiphenyl	1.3		1.670		77.5	36.2	124			
Surr: 4-Terphenyl-d14	1.0		1.670		60.9	15	114			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **mb-32356**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBW**	Batch ID: **32356**	RunNo: **43713**
Prep Date: **6/19/2017**	Analysis Date: **6/21/2017**	SeqNo: **1376917** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Aniline	ND	10								
Anthracene	ND	10								
Azobenzene	ND	10								
Benz(a)anthracene	ND	10								
Benzo(a)pyrene	ND	10								
Benzo(b)fluoranthene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Benzo(k)fluoranthene	ND	10								
Benzoic acid	12	20								J
Benzyl alcohol	ND	10								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	5.2	10								J
4-Bromophenyl phenyl ether	ND	10								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								
4-Chloro-3-methylphenol	ND	10								
4-Chloroaniline	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
Chrysene	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	10								
Dibenz(a,h)anthracene	ND	10								
Dibenzofuran	ND	10								
1,2-Dichlorobenzene	ND	10								
1,3-Dichlorobenzene	ND	10								
1,4-Dichlorobenzene	ND	10								
3,3´-Dichlorobenzidine	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
2,4-Dichlorophenol	ND	20								
2,4-Dimethylphenol	ND	10								
4,6-Dinitro-2-methylphenol	ND	20								
2,4-Dinitrophenol	ND	20								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **mb-32356**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**	
Client ID: **PBW**	Batch ID: **32356**	RunNo: **43713**	
Prep Date: **6/19/2017**	Analysis Date: **6/21/2017**	SeqNo: **1376917**	Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	10								
2,6-Dinitrotoluene	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Hexachlorobenzene	ND	10								
Hexachlorobutadiene	ND	10								
Hexachlorocyclopentadiene	ND	10								
Hexachloroethane	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
Isophorone	ND	10								
1-Methylnaphthalene	ND	10								
2-Methylnaphthalene	ND	10								
2-Methylphenol	ND	10								
3+4-Methylphenol	ND	10								
N-Nitrosodi-n-propylamine	ND	10								
N-Nitrosodimethylamine	ND	10								
N-Nitrosodiphenylamine	ND	10								
Naphthalene	ND	10								
2-Nitroaniline	ND	10								
3-Nitroaniline	ND	10								
4-Nitroaniline	ND	10								
Nitrobenzene	ND	10								
2-Nitrophenol	ND	10								
4-Nitrophenol	ND	10								
Pentachlorophenol	ND	20								
Phenanthrene	ND	10								
Phenol	ND	10								
Pyrene	ND	10								
Pyridine	ND	10								
1,2,4-Trichlorobenzene	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
Surr: 2-Fluorophenol	110		200.0		53.6	15	98.1			
Surr: Phenol-d5	80		200.0		39.9	15	80.7			
Surr: 2,4,6-Tribromophenol	170		200.0		84.0	15	112			
Surr: Nitrobenzene-d5	87		100.0		87.3	27.2	90.7			
Surr: 2-Fluorobiphenyl	71		100.0		70.6	23.3	85.6			
Surr: 4-Terphenyl-d14	71		100.0		70.8	27.6	107			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **lcs-32356**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSW**	Batch ID: **32356**	RunNo: **43713**
Prep Date: **6/19/2017**	Analysis Date: **6/21/2017**	SeqNo: **1376918** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	70	10	100.0	0	70.2	41.2	98.9			
4-Chloro-3-methylphenol	150	10	200.0	0	75.0	29.1	111			
2-Chlorophenol	150	10	200.0	0	73.2	23.3	108			
1,4-Dichlorobenzene	49	10	100.0	0	48.6	29.4	84.5			
2,4-Dinitrotoluene	71	10	100.0	0	70.9	36.6	88.7			
N-Nitrosodi-n-propylamine	79	10	100.0	0	79.1	46.9	106			
4-Nitrophenol	90	10	200.0	0	44.8	15	74.7			
Pentachlorophenol	150	20	200.0	0	72.8	28.1	85.4			
Phenol	91	10	200.0	0	45.4	15	78.2			
Pyrene	80	10	100.0	0	80.1	44.4	96.8			
1,2,4-Trichlorobenzene	63	10	100.0	0	63.2	34.3	89			
Surr: 2-Fluorophenol	94		200.0		47.2	15	98.1			
Surr: Phenol-d5	72		200.0		35.8	15	80.7			
Surr: 2,4,6-Tribromophenol	160		200.0		77.8	15	112			
Surr: Nitrobenzene-d5	80		100.0		80.1	27.2	90.7			
Surr: 2-Fluorobiphenyl	67		100.0		67.2	23.3	85.6			
Surr: 4-Terphenyl-d14	65		100.0		64.7	27.6	107			

Sample ID **lcsd-32356**	SampType: **LCSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS02**	Batch ID: **32356**	RunNo: **43713**
Prep Date: **6/19/2017**	Analysis Date: **6/21/2017**	SeqNo: **1376919** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	56	10	100.0	0	56.1	41.2	98.9	22.2	37.4	
4-Chloro-3-methylphenol	120	10	200.0	0	59.2	29.1	111	23.5	26.8	
2-Chlorophenol	110	10	200.0	0	55.9	23.3	108	26.8	30.3	
1,4-Dichlorobenzene	35	10	100.0	0	35.1	29.4	84.5	32.2	32	R
2,4-Dinitrotoluene	54	10	100.0	0	53.5	36.6	88.7	27.9	36.7	
N-Nitrosodi-n-propylamine	63	10	100.0	0	62.7	46.9	106	23.1	29.9	
4-Nitrophenol	70	10	200.0	0	34.9	15	74.7	24.7	28.8	
Pentachlorophenol	110	20	200.0	0	54.0	28.1	85.4	29.7	38.2	
Phenol	62	10	200.0	0	31.2	15	78.2	36.9	39.8	
Pyrene	64	10	100.0	0	64.0	44.4	96.8	22.3	28.3	
1,2,4-Trichlorobenzene	44	10	100.0	0	44.2	34.3	89	35.4	39.8	
Surr: 2-Fluorophenol	81		200.0		40.6	15	98.1	0	0	
Surr: Phenol-d5	63		200.0		31.5	15	80.7	0	0	
Surr: 2,4,6-Tribromophenol	130		200.0		65.0	15	112	0	0	
Surr: Nitrobenzene-d5	70		100.0		70.2	27.2	90.7	0	0	
Surr: 2-Fluorobiphenyl	56		100.0		56.4	23.3	85.6	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**
11-Jul-17

Client: Western Refining Company
Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**lcsd-32356**	SampType: **LCSD**		TestCode: **EPA Method 8270C: Semivolatiles**					
Client ID:	**LCSS02**	Batch ID: **32356**		RunNo: **43713**					
Prep Date:	**6/19/2017**	Analysis Date: **6/21/2017**		SeqNo: **1376919**	Units: **µg/L**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	56		100.0		56.3	27.6	107	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**MB-32380**	SampType:	**MBLK**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**PBS**	Batch ID:	**32380**	RunNo:	**43637**					
Prep Date:	**6/20/2017**	Analysis Date:	**6/20/2017**	SeqNo:	**1374889**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.033								

Sample ID	**LCS-32380**	SampType:	**LCS**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**LCSS**	Batch ID:	**32380**	RunNo:	**43637**					
Prep Date:	**6/20/2017**	Analysis Date:	**6/20/2017**	SeqNo:	**1374890**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.17	0.033	0.1667	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **MB-32349**	SampType: **MBLK**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **PBS**	Batch ID: **32349**	RunNo: **43643**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1374994** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	2.5								
Arsenic	ND	2.5								
Barium	ND	0.10								
Beryllium	ND	0.15								
Cadmium	ND	0.10								
Chromium	ND	0.30								
Cobalt	ND	0.30								
Iron	0.91	2.5								J
Lead	ND	0.25								
Manganese	0.065	0.10								J
Nickel	ND	0.50								
Selenium	ND	2.5								
Silver	ND	0.25								
Vanadium	ND	2.5								
Zinc	0.51	2.5								J

Sample ID **LCS-32349**	SampType: **LCS**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS**	Batch ID: **32349**	RunNo: **43643**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1374995** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	24	2.5	25.00	0	97.7	80	120			
Arsenic	25	2.5	25.00	0	102	80	120			
Barium	25	0.10	25.00	0	99.7	80	120			
Beryllium	26	0.15	25.00	0	103	80	120			
Cadmium	25	0.10	25.00	0	99.2	80	120			
Chromium	25	0.30	25.00	0	98.5	80	120			
Cobalt	23	0.30	25.00	0	93.9	80	120			
Iron	29	2.5	25.00	0	117	80	120			
Lead	23	0.25	25.00	0	93.7	80	120			
Manganese	24	0.10	25.00	0	97.8	80	120			
Nickel	24	0.50	25.00	0	94.3	80	120			
Selenium	24	2.5	25.00	0	96.6	80	120			
Silver	5.0	0.25	5.000	0	101	80	120			
Vanadium	26	2.5	25.00	0	103	80	120			
Zinc	24	2.5	25.00	0	95.6	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**1706910-003BMS**	SampType: **MS**		TestCode: **EPA Method 6010B: Soil Metals**						
Client ID:	**OW-59 (33-34')**	Batch ID: **32349**		RunNo: **43643**						
Prep Date:	**6/19/2017**	Analysis Date: **6/20/2017**		SeqNo: **1375007**		Units: **mg/Kg**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	22	2.4	24.39	0	90.9	75	125			
Beryllium	22	0.15	24.39	0.3383	90.7	75	125			
Cadmium	21	0.098	24.39	0	87.0	75	125			
Chromium	26	0.29	24.39	4.643	85.5	75	125			
Cobalt	21	0.29	24.39	2.130	78.1	75	125			
Lead	19	0.24	24.39	0.7202	76.2	75	125			
Manganese	200	0.098	24.39	180.8	94.5	75	125			
Nickel	22	0.49	24.39	3.504	77.1	75	125			
Silver	4.3	0.24	4.878	0	88.1	75	125			
Vanadium	33	2.4	24.39	10.95	92.4	75	125			
Zinc	27	2.4	24.39	7.461	79.0	75	125			

Sample ID	**1706910-003BMSD**	SampType: **MSD**		TestCode: **EPA Method 6010B: Soil Metals**						
Client ID:	**OW-59 (33-34')**	Batch ID: **32349**		RunNo: **43643**						
Prep Date:	**6/19/2017**	Analysis Date: **6/20/2017**		SeqNo: **1375008**		Units: **mg/Kg**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	23	2.5	24.89	0	90.7	75	125	1.74	20	
Beryllium	23	0.15	24.89	0.3383	89.5	75	125	0.681	20	
Cadmium	21	0.10	24.89	0	86.3	75	125	1.17	20	
Chromium	26	0.30	24.89	4.643	86.9	75	125	2.93	20	
Cobalt	21	0.30	24.89	2.130	77.6	75	125	1.21	20	
Lead	19	0.25	24.89	0.7202	75.1	75	125	0.552	20	
Manganese	200	0.10	24.89	180.8	93.0	75	125	0.0506	20	
Nickel	23	0.50	24.89	3.504	77.0	75	125	1.60	20	
Silver	4.3	0.25	4.977	0	86.9	75	125	0.614	20	
Vanadium	33	2.5	24.89	10.95	89.5	75	125	0.802	20	
Zinc	27	2.5	24.89	7.461	79.2	75	125	1.62	20	

Sample ID	**1706910-003BMS**	SampType: **MS**		TestCode: **EPA Method 6010B: Soil Metals**						
Client ID:	**OW-59 (33-34')**	Batch ID: **32349**		RunNo: **43774**						
Prep Date:	**6/19/2017**	Analysis Date: **6/26/2017**		SeqNo: **1378919**		Units: **mg/Kg**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	8.4	2.4	24.39	0	34.6	75	125			S
Barium	180	0.098	24.39	132.5	178	75	125			S
Selenium	12	2.4	24.39	0	49.9	75	125			S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**1706910-003BMSD**	SampType: **MSD**		TestCode: **EPA Method 6010B: Soil Metals**	
Client ID:	**OW-59 (33-34')**	Batch ID: **32349**		RunNo: **43774**	
Prep Date:	**6/19/2017**	Analysis Date: **6/26/2017**		SeqNo: **1378920**	Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	7.8	2.5	24.89	0	31.5	75	125	7.50	20	S
Barium	180	0.10	24.89	132.5	185	75	125	1.56	20	S
Selenium	14	2.5	24.89	0	56.1	75	125	13.6	20	S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **Western Refining Gallup** Work Order Number: **1706910** RcptNo: 1

Received By: **Anne Thorne** 6/15/2017 11:15:00 AM Anne Thorne

Completed By: **Anne Thorne** 6/16/2017 12:41:46 PM Anne Thorne

Reviewed By: ENM 06/16/17

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?	Client		

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: Re

Special Handling (if applicable)

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

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

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1706910	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL ~~& DISSOLVED~~)	CYANIDE			Air Bubbles (Y or N)
6/12/17	1810	WATER	EB01	40 ML VOA-5	HCL	001			✓							✓						
				250 ML AMBER-1	NEAT	001			✓													
				1 LITER AMBER-1	NEAT	001											✓		✓			
				~~125 ML PLASTIC-1~~	~~HNO3~~	001												~~✓~~	~~✓~~			
				500 ML PLASTIC-1	HNO_3	001												✓				
				500 ML PLASTIC-1	NaOH	001													✓			
6/13/17	1715	WATER	EB02	40 ML VOA-5	HCL	002			✓							✓						
				250 ML AMBER-1	NEAT	002			✓													
				1 LITER AMBER-1	NEAT	002											✓					
				500 ML PLASTIC-1	HNO_3	002												✓				
				500 ML PLASTIC-1	NaOH	002													✓			

Date:	Time:	Relinquished by:	Received by:	Date	Time
6/15/17	0800			6/15/17	0800
6/15/17	1115			6/15/17	1115

Remarks:

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.

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0

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. 1706910	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS AND CYANIDE				Air Bubbles (Y or N)
6/12/17	1700	SOIL	OW-59 (33-34')	JARS-3	NEAT	-003			X							X	X	X				
				VIALS-2	MEOH	-003										X						
				VIALS-2	SOBI	-003										X						
6/13/17	1605	SOIL	OW-60 (20-22')	JARS-3	NEAT	-004			X							X	X	X				
				VIALS-2	MEOH	-004										X						
				VIALS-2	SOBI	-004										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time	Remarks:
6/15/17	0800			6/15/17	0805	
6/15/17	1115			6/15/17	1115	

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.

WESTERN REFINING SOUTHWEST, INC.

GALLUP REFINERY - GALLUP, NEW MEXICO

SMW-2 AND BOUNDARY WELLS - JUNE 2016

METALS AND CYANIDE ANALYSES FOR GROUNDWATER SAMPLES

AND WATER QA/QC SAMPLES

TOTAL METALS ANALYSIS ~~AND DISSOLVED METALS ANALYSIS~~

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

GENERAL CHEMISTRY PARAMETERS FOR GROUNDWATER SAMPLES

AND WATER QA/QC SAMPLES

Analyte	Analytical Method
Chloride	EPA method 300.0
Fluoride	EPA method 300.0
Sulfate	EPA method 300.0

WESTERN REFINING SOUTHWEST, INC.

GALLUP REFINERY - GALLUP, NEW MEXICO

SMW-2 AND BOUNDARY WELLS - JUNE 2016

METALS AND CYANIDE ANALYSES FOR SOIL SAMPLES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

Appendix E

Groundwater Analytical Reports

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

August 03, 2017

Cheryl Johnson

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-3833
FAX (505) 722-0210

RE: SMW 2 and Boundary Wells OrderNo.: 1706G62

Dear Cheryl Johnson:

Hall Environmental Analysis Laboratory received 8 sample(s) on 6/30/2017 for the analyses presented in the following report.

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

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

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

Sincerely,



Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-60
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 11:10:00 AM
Lab ID: 1706G62-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.36	1.0		mg/L	1	7/5/2017 10:10:22 AM	32608
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	7/5/2017 10:10:22 AM	32608
Surr: DNOP	115	0	72.4-157		%Rec	1	7/5/2017 10:10:22 AM	32608
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	7/6/2017 1:51:07 PM	G44019
Surr: BFB	295	0	52.3-138	S	%Rec	1	7/6/2017 1:51:07 PM	G44019
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	ND	0.22	0.50		mg/L	5	7/3/2017 6:30:12 PM	R43973
Chloride	1600	50	100	*	mg/L	200	7/19/2017 1:32:26 PM	R44381
Bromide	2.4	0.072	0.50		mg/L	5	7/3/2017 6:30:12 PM	R43973
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/3/2017 6:30:12 PM	R43973
Sulfate	740	1.9	10	*	mg/L	20	7/3/2017 6:42:37 PM	R43973
Nitrate+Nitrite as N	3.0	0.13	1.0		mg/L	5	7/3/2017 9:23:59 PM	R43973
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Barium	0.044	0.00093	0.0020		mg/L	1	7/18/2017 1:13:37 PM	A44298
Beryllium	0.00045	0.00026	0.0020	J	mg/L	1	7/18/2017 1:13:37 PM	A44298
Cadmium	ND	0.00058	0.0020		mg/L	1	7/18/2017 1:13:37 PM	A44298
Calcium	170	0.45	10		mg/L	10	7/18/2017 1:21:54 PM	A44298
Chromium	ND	0.0011	0.0060		mg/L	1	7/18/2017 1:13:37 PM	A44298
Cobalt	0.0019	0.00076	0.0060	J	mg/L	1	7/18/2017 1:13:37 PM	A44298
Iron	ND	0.010	0.020		mg/L	1	7/18/2017 1:13:37 PM	A44298
Magnesium	33	0.12	1.0		mg/L	1	7/18/2017 1:13:37 PM	A44298
Manganese	0.55	0.0011	0.0020	*	mg/L	1	7/18/2017 1:13:37 PM	A44298
Nickel	0.0061	0.0036	0.010	J	mg/L	1	7/18/2017 1:13:37 PM	A44298
Potassium	5.0	0.071	1.0		mg/L	1	7/18/2017 1:13:37 PM	A44298
Silver	ND	0.00042	0.0050		mg/L	1	7/18/2017 1:13:37 PM	A44298
Sodium	1100	3.2	20		mg/L	20	7/18/2017 1:39:26 PM	A44298
Vanadium	0.0066	0.00076	0.050	J	mg/L	1	7/18/2017 1:13:37 PM	A44298
Zinc	0.011	0.0028	0.010		mg/L	1	7/18/2017 1:13:37 PM	A44298
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Barium	1.6	0.0093	0.020		mg/L	10	7/6/2017 5:42:54 PM	32644
Beryllium	0.0046	0.00026	0.0020	*	mg/L	1	7/6/2017 5:41:00 PM	32644
Cadmium	ND	0.00058	0.0020		mg/L	1	7/6/2017 5:41:00 PM	32644
Chromium	0.048	0.0011	0.0060		mg/L	1	7/6/2017 5:41:00 PM	32644
Cobalt	0.021	0.00076	0.0060		mg/L	1	7/6/2017 5:41:00 PM	32644
Iron	28	0.51	1.0	*	mg/L	50	7/7/2017 1:25:13 PM	32644
Manganese	2.2	0.011	0.020	*	mg/L	10	7/6/2017 5:42:54 PM	32644

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-60
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 11:10:00 AM
Lab ID: 1706G62-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Nickel	0.047	0.0036	0.010		mg/L	1	7/6/2017 5:41:00 PM	32644
Silver	ND	0.00042	0.0050		mg/L	1	7/6/2017 5:41:00 PM	32644
Vanadium	0.070	0.00076	0.050		mg/L	1	7/6/2017 5:41:00 PM	32644
Zinc	0.071	0.0028	0.010		mg/L	1	7/6/2017 5:41:00 PM	32644
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Antimony	0.00028	0.00017	0.0010	J	mg/L	1	7/19/2017 7:14:45 PM	C44340
Arsenic	0.0044	0.00089	0.0050	J	mg/L	5	7/21/2017 7:52:57 PM	A44430
Lead	ND	0.00084	0.0025		mg/L	5	7/21/2017 7:52:57 PM	A44430
Selenium	0.014	0.0019	0.0050		mg/L	5	7/21/2017 7:52:57 PM	A44430
200.8 ICPMS METALS:TOTAL							Analyst: **JLF**	
Antimony	ND	0.0019	0.0050		mg/L	5	7/14/2017 1:06:08 PM	32644
Arsenic	0.0081	0.0015	0.0050		mg/L	5	7/14/2017 1:06:08 PM	32644
Lead	0.031	0.00048	0.0025	*	mg/L	5	7/14/2017 1:06:08 PM	32644
Selenium	0.013	0.0036	0.0050		mg/L	5	7/14/2017 1:06:08 PM	32644
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	0.000099	0.000037	0.00020	J	mg/L	1	7/14/2017 4:10:26 PM	32802
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Acenaphthylene	ND	3.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Aniline	ND	3.1	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Anthracene	ND	3.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Azobenzene	ND	4.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Benz(a)anthracene	ND	3.9	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Benzo(a)pyrene	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Benzoic acid	7.8	3.9	20	J	µg/L	1	7/6/2017 8:24:22 PM	32619
Benzyl alcohol	ND	4.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Bis(2-ethylhexyl)phthalate	5.1	4.8	10	J	µg/L	1	7/6/2017 8:24:22 PM	32619
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Carbazole	ND	4.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-60
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 11:10:00 AM
Lab ID: 1706G62-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Chloroaniline	ND	3.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2-Chloronaphthalene	ND	3.7	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2-Chlorophenol	ND	7.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Chrysene	ND	3.8	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Di-n-octyl phthalate	ND	4.7	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Dibenzofuran	ND	4.1	10		µg/L	1	7/6/2017 8:24:22 PM	32619
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	7/6/2017 8:24:22 PM	32619
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	7/6/2017 8:24:22 PM	32619
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Diethyl phthalate	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Dimethyl phthalate	ND	3.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	7/6/2017 8:24:22 PM	32619
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	7/6/2017 8:24:22 PM	32619
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	7/6/2017 8:24:22 PM	32619
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	7/6/2017 8:24:22 PM	32619
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Fluoranthene	ND	4.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Fluorene	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Hexachlorobenzene	ND	3.8	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Hexachlorobutadiene	ND	1.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Hexachloroethane	ND	1.2	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Isophorone	ND	4.4	10		µg/L	1	7/6/2017 8:24:22 PM	32619
1-Methylnaphthalene	ND	3.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2-Methylnaphthalene	ND	3.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2-Methylphenol	ND	3.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
3+4-Methylphenol	ND	3.2	10		µg/L	1	7/6/2017 8:24:22 PM	32619
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Naphthalene	ND	2.9	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2-Nitroaniline	ND	4.9	10		µg/L	1	7/6/2017 8:24:22 PM	32619
3-Nitroaniline	ND	4.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-60
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 11:10:00 AM
Lab ID: 1706G62-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Nitrobenzene	ND	3.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2-Nitrophenol	ND	5.2	10		µg/L	1	7/6/2017 8:24:22 PM	32619
4-Nitrophenol	ND	5.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Pentachlorophenol	ND	4.9	20		µg/L	1	7/6/2017 8:24:22 PM	32619
Phenanthrene	ND	4.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Phenol	ND	3.1	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Pyrene	ND	4.4	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Pyridine	ND	2.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Surr: 2-Fluorophenol	19.2	0	15-98.1		%Rec	1	7/6/2017 8:24:22 PM	32619
Surr: Phenol-d5	34.8	0	15-80.7		%Rec	1	7/6/2017 8:24:22 PM	32619
Surr: 2,4,6-Tribromophenol	23.3	0	15-112		%Rec	1	7/6/2017 8:24:22 PM	32619
Surr: Nitrobenzene-d5	79.1	0	27.2-90.7		%Rec	1	7/6/2017 8:24:22 PM	32619
Surr: 2-Fluorobiphenyl	68.5	0	23.3-85.6		%Rec	1	7/6/2017 8:24:22 PM	32619
Surr: 4-Terphenyl-d14	64.8	0	27.6-107		%Rec	1	7/6/2017 8:24:22 PM	32619
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Toluene	0.24	0.064	1.0	J	µg/L	1	7/5/2017 6:12:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Methyl tert-butyl ether (MTBE)	0.86	0.24	1.0	J	µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Acetone	13	0.82	10		µg/L	1	7/5/2017 6:12:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 6:12:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 6:12:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-60
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 11:10:00 AM
Lab ID: 1706G62-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 6:12:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
4-Isopropyltoluene	0.21	0.096	1.0	J	µg/L	1	7/5/2017 6:12:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 6:12:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-60
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 11:10:00 AM
Lab ID: 1706G62-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 6:12:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	112	0	70-130		%Rec	1	7/5/2017 6:12:00 PM	R44015
Surr: 4-Bromofluorobenzene	112	0	70-130		%Rec	1	7/5/2017 6:12:00 PM	R44015
Surr: Dibromofluoromethane	112	0	70-130		%Rec	1	7/5/2017 6:12:00 PM	R44015
Surr: Toluene-d8	103	0	70-130		%Rec	1	7/5/2017 6:12:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GW DUP01
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017
Lab ID: 1706G62-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.36	1.0		mg/L	1	7/5/2017 11:34:25 AM	32608
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	7/5/2017 11:34:25 AM	32608
Surr: DNOP	111	0	72.4-157		%Rec	1	7/5/2017 11:34:25 AM	32608
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	0.035	0.025	0.050	J	mg/L	1	7/6/2017 2:16:13 PM	G44019
Surr: BFB	105	0	52.3-138		%Rec	1	7/6/2017 2:16:13 PM	G44019
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	ND	0.22	0.50		mg/L	5	7/3/2017 6:55:02 PM	R43973
Chloride	1300	25	50	*	mg/L	100	7/19/2017 1:44:51 PM	R44381
Bromide	1.2	0.072	0.50		mg/L	5	7/3/2017 6:55:02 PM	R43973
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/3/2017 6:55:02 PM	R43973
Sulfate	230	0.48	2.5		mg/L	5	7/3/2017 6:55:02 PM	R43973
Nitrate+Nitrite as N	ND	0.13	1.0		mg/L	5	7/3/2017 9:36:24 PM	R43973
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Barium	0.21	0.00085	0.0020		mg/L	1	7/18/2017 1:23:49 PM	A44298
Beryllium	0.00033	0.00029	0.0020	J	mg/L	1	7/18/2017 1:23:49 PM	A44298
Cadmium	ND	0.0010	0.0020		mg/L	1	7/18/2017 1:23:49 PM	A44298
Calcium	64	0.078	1.0		mg/L	1	7/18/2017 1:23:49 PM	A44298
Chromium	ND	0.0010	0.0060		mg/L	1	7/18/2017 1:23:49 PM	A44298
Cobalt	ND	0.0016	0.0060		mg/L	1	7/18/2017 1:23:49 PM	A44298
Iron	ND	0.016	0.020		mg/L	1	7/18/2017 1:23:49 PM	A44298
Magnesium	8.5	0.25	1.0		mg/L	1	7/18/2017 1:23:49 PM	A44298
Manganese	0.12	0.00038	0.0020	*	mg/L	1	7/18/2017 1:23:49 PM	A44298
Nickel	0.0028	0.0011	0.010	J	mg/L	1	7/18/2017 1:23:49 PM	A44298
Potassium	3.6	0.11	1.0		mg/L	1	7/18/2017 1:23:49 PM	A44298
Silver	ND	0.00088	0.0050		mg/L	1	7/18/2017 1:23:49 PM	A44298
Sodium	980	1.6	10		mg/L	10	7/18/2017 1:25:45 PM	A44298
Vanadium	ND	0.0019	0.050		mg/L	1	7/18/2017 1:23:49 PM	A44298
Zinc	0.012	0.0011	0.010		mg/L	1	7/18/2017 1:23:49 PM	A44298
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Barium	0.21	0.00093	0.0020		mg/L	1	7/6/2017 5:44:41 PM	32644
Beryllium	ND	0.00026	0.0020		mg/L	1	7/6/2017 5:44:41 PM	32644
Cadmium	ND	0.00058	0.0020		mg/L	1	7/6/2017 5:44:41 PM	32644
Chromium	ND	0.0011	0.0060		mg/L	1	7/6/2017 5:44:41 PM	32644
Cobalt	0.0010	0.00076	0.0060	J	mg/L	1	7/6/2017 5:44:41 PM	32644
Iron	0.81	0.010	0.020	*	mg/L	1	7/6/2017 5:44:41 PM	32644
Manganese	0.13	0.0011	0.0020	*	mg/L	1	7/6/2017 5:44:41 PM	32644

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GW DUP01
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017
Lab ID: 1706G62-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Nickel	ND	0.0036	0.010		mg/L	1	7/6/2017 5:44:41 PM	32644
Silver	ND	0.00042	0.0050		mg/L	1	7/6/2017 5:44:41 PM	32644
Vanadium	0.0025	0.00076	0.050	J	mg/L	1	7/6/2017 5:44:41 PM	32644
Zinc	ND	0.0028	0.010		mg/L	1	7/6/2017 5:44:41 PM	32644
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Antimony	ND	0.00017	0.0010		mg/L	1	7/19/2017 7:19:54 PM	C44340
Arsenic	0.0019	0.00089	0.0050	J	mg/L	5	7/21/2017 8:13:34 PM	A44430
Lead	ND	0.00084	0.0025		mg/L	5	7/21/2017 8:13:34 PM	A44430
Selenium	0.0067	0.0019	0.0050		mg/L	5	7/21/2017 8:13:34 PM	A44430
200.8 ICPMS METALS:TOTAL							Analyst: **JLF**	
Antimony	ND	0.0019	0.0050		mg/L	5	7/14/2017 1:11:16 PM	32644
Arsenic	0.0017	0.0015	0.0050	J	mg/L	5	7/14/2017 1:11:16 PM	32644
Lead	ND	0.00048	0.0025		mg/L	5	7/14/2017 1:11:16 PM	32644
Selenium	0.0065	0.0036	0.0050		mg/L	5	7/14/2017 1:11:16 PM	32644
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	0.00018	0.000037	0.00020	J	mg/L	1	7/14/2017 4:12:25 PM	32802
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Acenaphthylene	ND	3.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Aniline	ND	3.1	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Anthracene	ND	3.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Azobenzene	ND	4.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Benz(a)anthracene	ND	3.9	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Benzo(a)pyrene	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Benzoic acid	22	3.9	20		µg/L	1	7/6/2017 8:52:57 PM	32619
Benzyl alcohol	ND	4.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Bis(2-ethylhexyl)phthalate	ND	4.8	10		µg/L	1	7/6/2017 8:52:57 PM	32619
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Carbazole	ND	4.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GW DUP01
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017
Lab ID: 1706G62-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Chloroaniline	ND	3.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2-Chloronaphthalene	ND	3.7	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2-Chlorophenol	ND	7.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Chrysene	ND	3.8	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Di-n-octyl phthalate	5.0	4.7	10	J	µg/L	1	7/6/2017 8:52:57 PM	32619
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Dibenzofuran	ND	4.1	10		µg/L	1	7/6/2017 8:52:57 PM	32619
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	7/6/2017 8:52:57 PM	32619
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	7/6/2017 8:52:57 PM	32619
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Diethyl phthalate	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Dimethyl phthalate	ND	3.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	7/6/2017 8:52:57 PM	32619
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	7/6/2017 8:52:57 PM	32619
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	7/6/2017 8:52:57 PM	32619
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	7/6/2017 8:52:57 PM	32619
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Fluoranthene	ND	4.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Fluorene	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Hexachlorobenzene	ND	3.8	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Hexachlorobutadiene	ND	1.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Hexachloroethane	ND	1.2	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Isophorone	ND	4.4	10		µg/L	1	7/6/2017 8:52:57 PM	32619
1-Methylnaphthalene	ND	3.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2-Methylnaphthalene	ND	3.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2-Methylphenol	ND	3.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
3+4-Methylphenol	ND	3.2	10		µg/L	1	7/6/2017 8:52:57 PM	32619
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Naphthalene	ND	2.9	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2-Nitroaniline	ND	4.9	10		µg/L	1	7/6/2017 8:52:57 PM	32619
3-Nitroaniline	ND	4.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GW DUP01
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017
Lab ID: 1706G62-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Nitrobenzene	ND	3.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2-Nitrophenol	ND	5.2	10		µg/L	1	7/6/2017 8:52:57 PM	32619
4-Nitrophenol	ND	5.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Pentachlorophenol	ND	4.9	20		µg/L	1	7/6/2017 8:52:57 PM	32619
Phenanthrene	ND	4.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Phenol	ND	3.1	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Pyrene	ND	4.4	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Pyridine	ND	2.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Surr: 2-Fluorophenol	53.9	0	15-98.1		%Rec	1	7/6/2017 8:52:57 PM	32619
Surr: Phenol-d5	56.5	0	15-80.7		%Rec	1	7/6/2017 8:52:57 PM	32619
Surr: 2,4,6-Tribromophenol	71.7	0	15-112		%Rec	1	7/6/2017 8:52:57 PM	32619
Surr: Nitrobenzene-d5	83.9	0	27.2-90.7		%Rec	1	7/6/2017 8:52:57 PM	32619
Surr: 2-Fluorobiphenyl	75.2	0	23.3-85.6		%Rec	1	7/6/2017 8:52:57 PM	32619
Surr: 4-Terphenyl-d14	65.2	0	27.6-107		%Rec	1	7/6/2017 8:52:57 PM	32619
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Toluene	ND	0.064	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Methyl tert-butyl ether (MTBE)	37	0.24	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2-Dichloroethane (EDC)	0.54	0.40	1.0	J	µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Acetone	15	0.82	10		µg/L	1	7/5/2017 6:36:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 6:36:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 6:36:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GW DUP01
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017
Lab ID: 1706G62-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,1-Dichloroethane	0.61	0.40	1.0	J	µg/L	1	7/5/2017 6:36:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 6:36:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 6:36:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GW DUP01
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017
Lab ID: 1706G62-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 6:36:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	110	0	70-130		%Rec	1	7/5/2017 6:36:00 PM	R44015
Surr: 4-Bromofluorobenzene	107	0	70-130		%Rec	1	7/5/2017 6:36:00 PM	R44015
Surr: Dibromofluoromethane	115	0	70-130		%Rec	1	7/5/2017 6:36:00 PM	R44015
Surr: Toluene-d8	104	0	70-130		%Rec	1	7/5/2017 6:36:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-4B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 10:30:00 AM
Lab ID: 1706G62-003
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	0.47	0.36	1.0	J	mg/L	1	7/5/2017 12:02:35 PM	32608
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	7/5/2017 12:02:35 PM	32608
Surr: DNOP	113	0	72.4-157		%Rec	1	7/5/2017 12:02:35 PM	32608
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050	0.10	D	mg/L	2	7/6/2017 2:41:39 PM	G44019
Surr: BFB	114	0	52.3-138	D	%Rec	2	7/6/2017 2:41:39 PM	G44019
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	1.3	0.22	0.50		mg/L	5	7/3/2017 7:19:51 PM	R43973
Chloride	73	1.2	2.5		mg/L	5	7/3/2017 7:19:51 PM	R43973
Bromide	0.33	0.072	0.50	J	mg/L	5	7/3/2017 7:19:51 PM	R43973
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/3/2017 7:19:51 PM	R43973
Sulfate	230	0.48	2.5		mg/L	5	7/3/2017 7:19:51 PM	R43973
Nitrate+Nitrite as N	ND	0.13	1.0		mg/L	5	7/3/2017 9:48:48 PM	R43973
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Barium	4.7	0.0047	0.010	*	mg/L	5	7/18/2017 3:30:19 PM	32644
Beryllium	0.048	0.0013	0.010	*	mg/L	5	7/18/2017 3:30:19 PM	32644
Cadmium	ND	0.0029	0.010		mg/L	5	7/18/2017 3:30:19 PM	32644
Chromium	0.17	0.0055	0.030	*	mg/L	5	7/18/2017 3:30:19 PM	32644
Cobalt	0.079	0.0038	0.030		mg/L	5	7/18/2017 3:30:19 PM	32644
Iron	82	1.0	2.0	*	mg/L	100	7/7/2017 1:33:40 PM	32644
Manganese	5.6	0.055	0.10	*	mg/L	50	7/18/2017 3:32:08 PM	32644
Nickel	0.54	0.018	0.050	*	mg/L	5	7/18/2017 3:30:19 PM	32644
Silver	ND	0.0021	0.025		mg/L	5	7/18/2017 3:30:19 PM	32644
Vanadium	0.14	0.0038	0.25	J	mg/L	5	7/18/2017 3:30:19 PM	32644
Zinc	3.4	0.014	0.050		mg/L	5	7/18/2017 3:30:19 PM	32644
200.8 ICPMS METALS:TOTAL							Analyst: **JLF**	
Antimony	ND	0.0019	0.0050		mg/L	5	7/14/2017 1:26:41 PM	32644
Arsenic	0.012	0.0030	0.010	*	mg/L	10	7/14/2017 1:31:50 PM	32644
Lead	0.20	0.00095	0.0050	*	mg/L	10	7/14/2017 1:31:50 PM	32644
Selenium	ND	0.0071	0.010		mg/L	10	7/14/2017 1:31:50 PM	32644
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	0.00024	0.000037	0.00020		mg/L	1	7/14/2017 4:14:24 PM	32802
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	36	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Acenaphthylene	ND	35	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Aniline	ND	31	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix
W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-4B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 10:30:00 AM
Lab ID: 1706G62-003
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Anthracene	ND	35	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Azobenzene	ND	45	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Benz(a)anthracene	ND	39	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Benzo(a)pyrene	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Benzo(b)fluoranthene	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Benzo(g,h,i)perylene	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Benzo(k)fluoranthene	ND	44	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Benzoic acid	93	39	200	JD	µg/L	1	7/7/2017 1:52:19 PM	32619
Benzyl alcohol	ND	46	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Bis(2-chloroethoxy)methane	ND	43	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Bis(2-chloroethyl)ether	ND	43	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Bis(2-chloroisopropyl)ether	ND	39	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Bis(2-ethylhexyl)phthalate	ND	48	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4-Bromophenyl phenyl ether	ND	46	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Butyl benzyl phthalate	ND	46	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Carbazole	ND	46	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4-Chloro-3-methylphenol	ND	63	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4-Chloroaniline	ND	35	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2-Chloronaphthalene	ND	37	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2-Chlorophenol	ND	75	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4-Chlorophenyl phenyl ether	ND	36	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Chrysene	ND	38	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Di-n-butyl phthalate	ND	50	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Di-n-octyl phthalate	ND	47	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Dibenz(a,h)anthracene	ND	46	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Dibenzofuran	ND	41	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
1,2-Dichlorobenzene	ND	20	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
1,3-Dichlorobenzene	ND	18	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
1,4-Dichlorobenzene	ND	21	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
3,3´-Dichlorobenzidine	ND	39	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Diethyl phthalate	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Dimethyl phthalate	ND	36	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,4-Dichlorophenol	ND	57	200	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,4-Dimethylphenol	ND	28	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4,6-Dinitro-2-methylphenol	ND	39	200	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,4-Dinitrophenol	ND	26	200	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,4-Dinitrotoluene	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,6-Dinitrotoluene	ND	45	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Fluoranthene	ND	43	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-4B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 10:30:00 AM
Lab ID: 1706G62-003
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Fluorene	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Hexachlorobenzene	ND	38	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Hexachlorobutadiene	ND	13	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Hexachlorocyclopentadiene	ND	13	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Hexachloroethane	ND	12	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Indeno(1,2,3-cd)pyrene	ND	42	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Isophorone	ND	44	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
1-Methylnaphthalene	ND	33	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2-Methylnaphthalene	ND	33	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2-Methylphenol	ND	33	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
3+4-Methylphenol	ND	32	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
N-Nitrosodi-n-propylamine	ND	46	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
N-Nitrosodimethylamine	ND	35	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
N-Nitrosodiphenylamine	ND	39	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Naphthalene	ND	29	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2-Nitroaniline	ND	49	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
3-Nitroaniline	ND	43	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4-Nitroaniline	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Nitrobenzene	ND	36	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2-Nitrophenol	ND	52	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4-Nitrophenol	ND	55	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Pentachlorophenol	ND	49	200	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Phenanthrene	ND	43	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Phenol	ND	31	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Pyrene	ND	44	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Pyridine	ND	23	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
1,2,4-Trichlorobenzene	ND	21	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,4,5-Trichlorophenol	ND	51	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,4,6-Trichlorophenol	ND	55	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Surr: 2-Fluorophenol	57.6	0	15-98.1	D	%Rec	1	7/7/2017 1:52:19 PM	32619
Surr: Phenol-d5	47.6	0	15-80.7	D	%Rec	1	7/7/2017 1:52:19 PM	32619
Surr: 2,4,6-Tribromophenol	76.5	0	15-112	D	%Rec	1	7/7/2017 1:52:19 PM	32619
Surr: Nitrobenzene-d5	87.2	0	27.2-90.7	D	%Rec	1	7/7/2017 1:52:19 PM	32619
Surr: 2-Fluorobiphenyl	76.1	0	23.3-85.6	D	%Rec	1	7/7/2017 1:52:19 PM	32619
Surr: 4-Terphenyl-d14	75.7	0	27.6-107	D	%Rec	1	7/7/2017 1:52:19 PM	32619
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.12	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Toluene	ND	0.13	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Ethylbenzene	ND	0.19	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-4B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 10:30:00 AM
Lab ID: 1706G62-003
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Methyl tert-butyl ether (MTBE)	ND	0.48	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.23	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.17	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2-Dichloroethane (EDC)	ND	0.80	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.26	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Naphthalene	ND	0.23	4.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1-Methylnaphthalene	ND	0.32	8.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
2-Methylnaphthalene	ND	0.30	8.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Acetone	10	1.6	20	JD	µg/L	2	7/5/2017 7:00:00 PM	R44015
Bromobenzene	ND	0.28	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Bromodichloromethane	ND	0.35	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Bromoform	ND	0.42	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Bromomethane	ND	0.51	6.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
2-Butanone	ND	2.3	20	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Carbon disulfide	ND	0.80	20	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Carbon Tetrachloride	ND	0.22	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Chlorobenzene	ND	0.21	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Chloroethane	ND	0.47	4.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Chloroform	ND	0.80	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Chloromethane	ND	0.59	6.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
2-Chlorotoluene	ND	0.80	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
4-Chlorotoluene	ND	0.80	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
cis-1,2-DCE	ND	0.41	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.16	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	2.8	4.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Dibromochloromethane	ND	0.14	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Dibromomethane	ND	0.18	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2-Dichlorobenzene	ND	0.18	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,3-Dichlorobenzene	ND	0.30	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,4-Dichlorobenzene	ND	0.80	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Dichlorodifluoromethane	ND	2.0	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1-Dichloroethane	ND	0.80	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1-Dichloroethene	ND	0.16	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2-Dichloropropane	ND	0.20	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,3-Dichloropropane	ND	0.33	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
2,2-Dichloropropane	ND	0.31	4.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1-Dichloropropene	ND	0.19	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Hexachlorobutadiene	ND	1.6	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
2-Hexanone	ND	1.3	20	D	µg/L	2	7/5/2017 7:00:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-4B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 10:30:00 AM
Lab ID: 1706G62-003
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Isopropylbenzene	ND	0.10	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
4-Isopropyltoluene	ND	0.19	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
4-Methyl-2-pentanone	ND	1.4	20	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Methylene Chloride	ND	0.22	6.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
n-Butylbenzene	ND	0.26	6.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
n-Propylbenzene	ND	0.15	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
sec-Butylbenzene	ND	0.22	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Styrene	ND	0.31	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
tert-Butylbenzene	ND	0.21	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.21	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.27	4.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.26	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
trans-1,2-DCE	ND	0.37	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.44	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.23	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.28	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1,1-Trichloroethane	ND	0.15	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1,2-Trichloroethane	ND	0.28	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Trichloroethene (TCE)	ND	0.22	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Trichlorofluoromethane	ND	0.37	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2,3-Trichloropropane	ND	0.78	4.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Vinyl chloride	ND	0.36	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Xylenes, Total	ND	0.64	3.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	108	0	70-130	D	%Rec	2	7/5/2017 7:00:00 PM	R44015
Surr: 4-Bromofluorobenzene	109	0	70-130	D	%Rec	2	7/5/2017 7:00:00 PM	R44015
Surr: Dibromofluoromethane	110	0	70-130	D	%Rec	2	7/5/2017 7:00:00 PM	R44015
Surr: Toluene-d8	104	0	70-130	D	%Rec	2	7/5/2017 7:00:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5C
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:10:00 AM
Lab ID: 1706G62-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.36	1.0		mg/L	1	7/5/2017 12:30:40 PM	32608
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	7/5/2017 12:30:40 PM	32608
Surr: DNOP	114	0	72.4-157		%Rec	1	7/5/2017 12:30:40 PM	32608
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	0.039	0.025	0.050	J	mg/L	1	7/6/2017 3:07:27 PM	G44019
Surr: BFB	115	0	52.3-138		%Rec	1	7/6/2017 3:07:27 PM	G44019
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	ND	0.22	0.50		mg/L	5	7/3/2017 7:44:41 PM	R43973
Chloride	1400	25	50	*	mg/L	100	7/19/2017 1:57:16 PM	R44381
Bromide	1.7	0.072	0.50		mg/L	5	7/3/2017 7:44:41 PM	R43973
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/3/2017 7:44:41 PM	R43973
Sulfate	220	0.48	2.5		mg/L	5	7/3/2017 7:44:41 PM	R43973
Nitrate+Nitrite as N	ND	0.13	1.0		mg/L	5	7/3/2017 10:01:12 PM	R43973
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Barium	0.21	0.00085	0.0020		mg/L	1	7/18/2017 1:27:39 PM	A44298
Beryllium	ND	0.00029	0.0020		mg/L	1	7/18/2017 1:27:39 PM	A44298
Cadmium	ND	0.0010	0.0020		mg/L	1	7/18/2017 1:27:39 PM	A44298
Calcium	64	0.078	1.0		mg/L	1	7/18/2017 1:27:39 PM	A44298
Chromium	0.0016	0.0010	0.0060	J	mg/L	1	7/18/2017 1:27:39 PM	A44298
Cobalt	ND	0.0016	0.0060		mg/L	1	7/18/2017 1:27:39 PM	A44298
Iron	ND	0.016	0.020		mg/L	1	7/18/2017 1:27:39 PM	A44298
Magnesium	8.3	0.25	1.0		mg/L	1	7/18/2017 1:27:39 PM	A44298
Manganese	0.12	0.00038	0.0020	*	mg/L	1	7/18/2017 1:27:39 PM	A44298
Nickel	0.0049	0.0011	0.010	J	mg/L	1	7/18/2017 1:27:39 PM	A44298
Potassium	3.5	0.11	1.0		mg/L	1	7/18/2017 1:27:39 PM	A44298
Silver	ND	0.00088	0.0050		mg/L	1	7/18/2017 1:27:39 PM	A44298
Sodium	950	1.6	10		mg/L	10	7/18/2017 1:29:36 PM	A44298
Vanadium	ND	0.0019	0.050		mg/L	1	7/18/2017 1:27:39 PM	A44298
Zinc	0.011	0.0011	0.010		mg/L	1	7/18/2017 1:27:39 PM	A44298
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Barium	0.21	0.00093	0.0020		mg/L	1	7/6/2017 6:04:03 PM	32644
Beryllium	ND	0.00026	0.0020		mg/L	1	7/6/2017 6:04:03 PM	32644
Cadmium	ND	0.00058	0.0020		mg/L	1	7/6/2017 6:04:03 PM	32644
Chromium	ND	0.0011	0.0060		mg/L	1	7/6/2017 6:04:03 PM	32644
Cobalt	0.0012	0.00076	0.0060	J	mg/L	1	7/6/2017 6:04:03 PM	32644
Iron	0.74	0.010	0.020	*	mg/L	1	7/6/2017 6:04:03 PM	32644
Manganese	0.13	0.0011	0.0020	*	mg/L	1	7/6/2017 6:04:03 PM	32644

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5C
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:10:00 AM
Lab ID: 1706G62-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Nickel	ND	0.0036	0.010		mg/L	1	7/6/2017 6:04:03 PM	32644
Silver	ND	0.00042	0.0050		mg/L	1	7/6/2017 6:04:03 PM	32644
Vanadium	0.0029	0.00076	0.050	J	mg/L	1	7/6/2017 6:04:03 PM	32644
Zinc	0.0036	0.0028	0.010	J	mg/L	1	7/6/2017 6:04:03 PM	32644
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Antimony	ND	0.00017	0.0010		mg/L	1	7/19/2017 7:25:02 PM	C44340
Arsenic	0.0019	0.00089	0.0050	J	mg/L	5	7/21/2017 8:18:42 PM	A44430
Lead	ND	0.00084	0.0025		mg/L	5	7/21/2017 8:18:42 PM	A44430
Selenium	0.0068	0.0019	0.0050		mg/L	5	7/21/2017 8:18:42 PM	A44430
200.8 ICPMS METALS:TOTAL							Analyst: **JLF**	
Antimony	ND	0.0019	0.0050		mg/L	5	7/14/2017 1:47:18 PM	32644
Arsenic	ND	0.0015	0.0050		mg/L	5	7/14/2017 1:47:18 PM	32644
Lead	ND	0.00048	0.0025		mg/L	5	7/14/2017 1:47:18 PM	32644
Selenium	0.0049	0.0036	0.0050	J	mg/L	5	7/14/2017 1:47:18 PM	32644
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	0.00018	0.000037	0.00020	J	mg/L	1	7/14/2017 4:16:25 PM	32802
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Acenaphthylene	ND	3.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Aniline	ND	3.1	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Anthracene	ND	3.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Azobenzene	ND	4.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Benz(a)anthracene	ND	3.9	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Benzo(a)pyrene	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Benzoic acid	7.9	3.9	20	J	µg/L	1	7/7/2017 2:20:13 PM	32619
Benzyl alcohol	ND	4.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Bis(2-ethylhexyl)phthalate	ND	4.8	10		µg/L	1	7/7/2017 2:20:13 PM	32619
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Carbazole	ND	4.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5C
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:10:00 AM
Lab ID: 1706G62-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Chloroaniline	ND	3.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2-Chloronaphthalene	ND	3.7	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2-Chlorophenol	ND	7.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Chrysene	ND	3.8	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Di-n-octyl phthalate	5.0	4.7	10	J	µg/L	1	7/7/2017 2:20:13 PM	32619
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Dibenzofuran	ND	4.1	10		µg/L	1	7/7/2017 2:20:13 PM	32619
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	7/7/2017 2:20:13 PM	32619
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	7/7/2017 2:20:13 PM	32619
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Diethyl phthalate	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Dimethyl phthalate	ND	3.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	7/7/2017 2:20:13 PM	32619
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	7/7/2017 2:20:13 PM	32619
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	7/7/2017 2:20:13 PM	32619
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	7/7/2017 2:20:13 PM	32619
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Fluoranthene	ND	4.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Fluorene	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Hexachlorobenzene	ND	3.8	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Hexachlorobutadiene	ND	1.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Hexachloroethane	ND	1.2	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Isophorone	ND	4.4	10		µg/L	1	7/7/2017 2:20:13 PM	32619
1-Methylnaphthalene	ND	3.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2-Methylnaphthalene	ND	3.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2-Methylphenol	ND	3.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
3+4-Methylphenol	ND	3.2	10		µg/L	1	7/7/2017 2:20:13 PM	32619
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Naphthalene	ND	2.9	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2-Nitroaniline	ND	4.9	10		µg/L	1	7/7/2017 2:20:13 PM	32619
3-Nitroaniline	ND	4.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5C
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:10:00 AM
Lab ID: 1706G62-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Nitrobenzene	ND	3.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2-Nitrophenol	ND	5.2	10		µg/L	1	7/7/2017 2:20:13 PM	32619
4-Nitrophenol	ND	5.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Pentachlorophenol	ND	4.9	20		µg/L	1	7/7/2017 2:20:13 PM	32619
Phenanthrene	ND	4.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Phenol	ND	3.1	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Pyrene	ND	4.4	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Pyridine	ND	2.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Surr: 2-Fluorophenol	66.2	0	15-98.1		%Rec	1	7/7/2017 2:20:13 PM	32619
Surr: Phenol-d5	51.2	0	15-80.7		%Rec	1	7/7/2017 2:20:13 PM	32619
Surr: 2,4,6-Tribromophenol	84.6	0	15-112		%Rec	1	7/7/2017 2:20:13 PM	32619
Surr: Nitrobenzene-d5	97.0	0	27.2-90.7	S	%Rec	1	7/7/2017 2:20:13 PM	32619
Surr: 2-Fluorobiphenyl	88.8	0	23.3-85.6	S	%Rec	1	7/7/2017 2:20:13 PM	32619
Surr: 4-Terphenyl-d14	78.7	0	27.6-107		%Rec	1	7/7/2017 2:20:13 PM	32619
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Toluene	ND	0.064	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Methyl tert-butyl ether (MTBE)	38	0.24	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2-Dichloroethane (EDC)	0.57	0.40	1.0	J	µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Acetone	5.4	0.82	10	J	µg/L	1	7/5/2017 7:24:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 7:24:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 7:24:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5C
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:10:00 AM
Lab ID: 1706G62-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,1-Dichloroethane	0.61	0.40	1.0	J	µg/L	1	7/5/2017 7:24:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 7:24:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 7:24:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5C
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:10:00 AM
Lab ID: 1706G62-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 7:24:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	113	0	70-130		%Rec	1	7/5/2017 7:24:00 PM	R44015
Surr: 4-Bromofluorobenzene	107	0	70-130		%Rec	1	7/5/2017 7:24:00 PM	R44015
Surr: Dibromofluoromethane	113	0	70-130		%Rec	1	7/5/2017 7:24:00 PM	R44015
Surr: Toluene-d8	103	0	70-130		%Rec	1	7/5/2017 7:24:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:40:00 AM
Lab ID: 1706G62-005
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	0.74	0.36	1.0	J	mg/L	1	7/5/2017 12:58:49 PM	32608
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	7/5/2017 12:58:49 PM	32608
Surr: DNOP	112	0	72.4-157		%Rec	1	7/5/2017 12:58:49 PM	32608
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	7/6/2017 3:33:25 PM	G44019
Surr: BFB	117	0	52.3-138		%Rec	1	7/6/2017 3:33:25 PM	G44019
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	0.28	0.22	0.50	J	mg/L	5	7/3/2017 8:09:30 PM	R43973
Chloride	50	1.2	2.5		mg/L	5	7/3/2017 8:09:30 PM	R43973
Bromide	0.43	0.072	0.50	J	mg/L	5	7/3/2017 8:09:30 PM	R43973
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/3/2017 8:09:30 PM	R43973
Sulfate	100	0.48	2.5		mg/L	5	7/3/2017 8:09:30 PM	R43973
Nitrate+Nitrite as N	0.20	0.13	1.0	J	mg/L	5	7/3/2017 10:13:37 PM	R43973
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Barium	0.052	0.00085	0.0020		mg/L	1	7/18/2017 1:31:31 PM	A44298
Beryllium	ND	0.00029	0.0020		mg/L	1	7/18/2017 1:31:31 PM	A44298
Cadmium	ND	0.0010	0.0020		mg/L	1	7/18/2017 1:31:31 PM	A44298
Calcium	2.8	0.078	1.0		mg/L	1	7/18/2017 1:31:31 PM	A44298
Chromium	0.0018	0.0010	0.0060	J	mg/L	1	7/18/2017 1:31:31 PM	A44298
Cobalt	ND	0.0016	0.0060		mg/L	1	7/18/2017 1:31:31 PM	A44298
Iron	0.11	0.016	0.020		mg/L	1	7/18/2017 1:31:31 PM	A44298
Magnesium	0.35	0.25	1.0	J	mg/L	1	7/18/2017 1:31:31 PM	A44298
Manganese	0.0082	0.00038	0.0020		mg/L	1	7/18/2017 1:31:31 PM	A44298
Nickel	ND	0.0011	0.010		mg/L	1	7/18/2017 1:31:31 PM	A44298
Potassium	0.85	0.11	1.0	J	mg/L	1	7/18/2017 1:31:31 PM	A44298
Silver	ND	0.00088	0.0050		mg/L	1	7/18/2017 1:31:31 PM	A44298
Sodium	260	1.6	10		mg/L	10	7/18/2017 1:33:34 PM	A44298
Vanadium	0.018	0.0019	0.050	J	mg/L	1	7/18/2017 1:31:31 PM	A44298
Zinc	0.012	0.0011	0.010		mg/L	1	7/18/2017 1:31:31 PM	A44298
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Barium	0.073	0.00093	0.0020		mg/L	1	7/6/2017 6:07:46 PM	32644
Beryllium	ND	0.00026	0.0020		mg/L	1	7/6/2017 6:07:46 PM	32644
Cadmium	ND	0.00058	0.0020		mg/L	1	7/6/2017 6:07:46 PM	32644
Chromium	0.0030	0.0011	0.0060	J	mg/L	1	7/6/2017 6:07:46 PM	32644
Cobalt	0.0010	0.00076	0.0060	J	mg/L	1	7/6/2017 6:07:46 PM	32644
Iron	1.5	0.10	0.20	*	mg/L	10	7/6/2017 6:09:43 PM	32644
Manganese	0.026	0.0011	0.0020		mg/L	1	7/6/2017 6:07:46 PM	32644

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:40:00 AM
Lab ID: 1706G62-005
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Nickel	ND	0.0036	0.010		mg/L	1	7/6/2017 6:07:46 PM	32644
Silver	ND	0.00042	0.0050		mg/L	1	7/6/2017 6:07:46 PM	32644
Vanadium	0.022	0.00076	0.050	J	mg/L	1	7/6/2017 6:07:46 PM	32644
Zinc	0.0038	0.0028	0.010	J	mg/L	1	7/6/2017 6:07:46 PM	32644
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Antimony	ND	0.00017	0.0010		mg/L	1	7/19/2017 7:30:11 PM	C44340
Arsenic	0.0024	0.00018	0.0010		mg/L	1	7/19/2017 7:30:11 PM	C44340
Lead	0.00023	0.00017	0.00050	J	mg/L	1	7/19/2017 7:30:11 PM	C44340
Selenium	0.0053	0.00039	0.0010		mg/L	1	7/19/2017 7:30:11 PM	C44340
200.8 ICPMS METALS:TOTAL							Analyst: **JLF**	
Antimony	ND	0.0019	0.0050		mg/L	5	7/14/2017 1:52:27 PM	32644
Arsenic	0.0028	0.0015	0.0050	J	mg/L	5	7/14/2017 1:52:27 PM	32644
Lead	0.00093	0.00048	0.0025	J	mg/L	5	7/14/2017 1:52:27 PM	32644
Selenium	0.0044	0.0036	0.0050	J	mg/L	5	7/14/2017 1:52:27 PM	32644
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	0.000074	0.000037	0.00020	J	mg/L	1	7/14/2017 4:22:28 PM	32802
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Acenaphthylene	ND	3.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Aniline	ND	3.1	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Anthracene	ND	3.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Azobenzene	ND	4.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Benz(a)anthracene	ND	3.9	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Benzo(a)pyrene	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Benzoic acid	8.2	3.9	20	J	µg/L	1	7/7/2017 2:48:15 PM	32619
Benzyl alcohol	ND	4.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Bis(2-ethylhexyl)phthalate	ND	4.8	10		µg/L	1	7/7/2017 2:48:15 PM	32619
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Carbazole	ND	4.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:40:00 AM
Lab ID: 1706G62-005
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Chloroaniline	ND	3.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2-Chloronaphthalene	ND	3.7	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2-Chlorophenol	ND	7.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Chrysene	ND	3.8	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Di-n-octyl phthalate	ND	4.7	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Dibenzofuran	ND	4.1	10		µg/L	1	7/7/2017 2:48:15 PM	32619
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	7/7/2017 2:48:15 PM	32619
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	7/7/2017 2:48:15 PM	32619
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Diethyl phthalate	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Dimethyl phthalate	ND	3.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	7/7/2017 2:48:15 PM	32619
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	7/7/2017 2:48:15 PM	32619
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	7/7/2017 2:48:15 PM	32619
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	7/7/2017 2:48:15 PM	32619
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Fluoranthene	ND	4.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Fluorene	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Hexachlorobenzene	ND	3.8	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Hexachlorobutadiene	ND	1.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Hexachloroethane	ND	1.2	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Isophorone	ND	4.4	10		µg/L	1	7/7/2017 2:48:15 PM	32619
1-Methylnaphthalene	ND	3.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2-Methylnaphthalene	ND	3.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2-Methylphenol	ND	3.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
3+4-Methylphenol	ND	3.2	10		µg/L	1	7/7/2017 2:48:15 PM	32619
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Naphthalene	ND	2.9	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2-Nitroaniline	ND	4.9	10		µg/L	1	7/7/2017 2:48:15 PM	32619
3-Nitroaniline	ND	4.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:40:00 AM
Lab ID: 1706G62-005
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Nitrobenzene	ND	3.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2-Nitrophenol	ND	5.2	10		µg/L	1	7/7/2017 2:48:15 PM	32619
4-Nitrophenol	ND	5.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Pentachlorophenol	ND	4.9	20		µg/L	1	7/7/2017 2:48:15 PM	32619
Phenanthrene	ND	4.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Phenol	ND	3.1	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Pyrene	ND	4.4	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Pyridine	ND	2.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Surr: 2-Fluorophenol	56.7	0	15-98.1		%Rec	1	7/7/2017 2:48:15 PM	32619
Surr: Phenol-d5	43.8	0	15-80.7		%Rec	1	7/7/2017 2:48:15 PM	32619
Surr: 2,4,6-Tribromophenol	77.5	0	15-112		%Rec	1	7/7/2017 2:48:15 PM	32619
Surr: Nitrobenzene-d5	95.0	0	27.2-90.7	S	%Rec	1	7/7/2017 2:48:15 PM	32619
Surr: 2-Fluorobiphenyl	82.5	0	23.3-85.6		%Rec	1	7/7/2017 2:48:15 PM	32619
Surr: 4-Terphenyl-d14	64.3	0	27.6-107		%Rec	1	7/7/2017 2:48:15 PM	32619
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Toluene	0.23	0.064	1.0	J	µg/L	1	7/5/2017 7:48:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Methyl tert-butyl ether (MTBE)	ND	0.24	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Acetone	3.1	0.82	10	J	µg/L	1	7/5/2017 7:48:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 7:48:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 7:48:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:40:00 AM
Lab ID: 1706G62-005
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 7:48:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 7:48:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:40:00 AM
Lab ID: 1706G62-005
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 7:48:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	109	0	70-130		%Rec	1	7/5/2017 7:48:00 PM	R44015
Surr: 4-Bromofluorobenzene	105	0	70-130		%Rec	1	7/5/2017 7:48:00 PM	R44015
Surr: Dibromofluoromethane	113	0	70-130		%Rec	1	7/5/2017 7:48:00 PM	R44015
Surr: Toluene-d8	102	0	70-130		%Rec	1	7/5/2017 7:48:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: TRIP BLANK
Project: SMW 2 and Boundary Wells
Collection Date:
Lab ID: 1706G62-006
Matrix: TRIP BLANK
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	7/6/2017 3:59:34 PM	G44019
Surr: BFB	118	0	52.3-138		%Rec	1	7/6/2017 3:59:34 PM	G44019
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Toluene	ND	0.064	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Methyl tert-butyl ether (MTBE)	ND	0.24	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Acetone	2.7	0.82	10	J	µg/L	1	7/5/2017 8:12:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 8:12:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 8:12:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: TRIP BLANK
Project: SMW 2 and Boundary Wells
Collection Date:
Lab ID: 1706G62-006
Matrix: TRIP BLANK
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 8:12:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 8:12:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 8:12:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	111	0	70-130		%Rec	1	7/5/2017 8:12:00 PM	R44015
Surr: 4-Bromofluorobenzene	108	0	70-130		%Rec	1	7/5/2017 8:12:00 PM	R44015
Surr: Dibromofluoromethane	115	0	70-130		%Rec	1	7/5/2017 8:12:00 PM	R44015
Surr: Toluene-d8	103	0	70-130		%Rec	1	7/5/2017 8:12:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-59
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 12:40:00 PM
Lab ID: 1706G62-007
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	0.56	0.36	1.0	J	mg/L	1	7/5/2017 1:27:11 PM	32608
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	7/5/2017 1:27:11 PM	32608
Surr: DNOP	115	0	72.4-157		%Rec	1	7/5/2017 1:27:11 PM	32608
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	0.23	0.025	0.050		mg/L	1	7/6/2017 4:26:01 PM	G44019
Surr: BFB	3950	0	52.3-138	S	%Rec	1	7/6/2017 4:26:01 PM	G44019
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	ND	0.22	0.50		mg/L	5	7/3/2017 8:59:09 PM	R43973
Chloride	2000	50	100	*	mg/L	200	7/19/2017 2:09:41 PM	R44381
Bromide	3.6	0.072	0.50		mg/L	5	7/3/2017 8:59:09 PM	R43973
Phosphorus, Orthophosphate (As P)	ND	5.0	10	H	mg/L	20	7/3/2017 9:11:34 PM	R43973
Sulfate	3000	19	100	*	mg/L	200	7/19/2017 2:09:41 PM	R44381
Nitrate+Nitrite as N	ND	0.26	2.0		mg/L	10	7/26/2017 3:44:57 PM	R44528
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Barium	0.014	0.00085	0.0020		mg/L	1	7/18/2017 1:35:22 PM	A44298
Beryllium	0.00039	0.00029	0.0020	J	mg/L	1	7/18/2017 1:35:22 PM	A44298
Cadmium	ND	0.0010	0.0020		mg/L	1	7/18/2017 1:35:22 PM	A44298
Calcium	210	0.78	10		mg/L	10	7/18/2017 1:37:23 PM	A44298
Chromium	ND	0.0010	0.0060		mg/L	1	7/18/2017 1:35:22 PM	A44298
Cobalt	0.0035	0.0016	0.0060	J	mg/L	1	7/18/2017 1:35:22 PM	A44298
Iron	0.030	0.016	0.020		mg/L	1	7/18/2017 1:35:22 PM	A44298
Magnesium	65	0.25	1.0		mg/L	1	7/18/2017 1:35:22 PM	A44298
Manganese	0.67	0.00038	0.0020	*	mg/L	1	7/18/2017 1:35:22 PM	A44298
Nickel	0.010	0.0011	0.010		mg/L	1	7/18/2017 1:35:22 PM	A44298
Potassium	1.7	0.11	1.0		mg/L	1	7/18/2017 1:35:22 PM	A44298
Silver	ND	0.00088	0.0050		mg/L	1	7/18/2017 1:35:22 PM	A44298
Sodium	2400	8.2	50		mg/L	50	7/18/2017 1:47:36 PM	A44298
Vanadium	0.0042	0.0019	0.050	J	mg/L	1	7/18/2017 1:35:22 PM	A44298
Zinc	0.013	0.0011	0.010		mg/L	1	7/18/2017 1:35:22 PM	A44298
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Barium	0.35	0.00093	0.0020		mg/L	1	7/6/2017 6:11:30 PM	32644
Beryllium	0.0015	0.00026	0.0020	J	mg/L	1	7/6/2017 6:11:30 PM	32644
Cadmium	ND	0.00058	0.0020		mg/L	1	7/6/2017 6:11:30 PM	32644
Chromium	0.014	0.0011	0.0060		mg/L	1	7/6/2017 6:11:30 PM	32644
Cobalt	0.0080	0.00076	0.0060		mg/L	1	7/6/2017 6:11:30 PM	32644
Iron	9.7	0.20	0.40	*	mg/L	20	7/7/2017 1:35:46 PM	32644
Manganese	1.2	0.011	0.020	*	mg/L	10	7/6/2017 6:13:16 PM	32644

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-59
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 12:40:00 PM
Lab ID: 1706G62-007
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Nickel	0.020	0.0036	0.010		mg/L	1	7/6/2017 6:11:30 PM	32644
Silver	ND	0.00042	0.0050		mg/L	1	7/6/2017 6:11:30 PM	32644
Vanadium	0.026	0.00076	0.050	J	mg/L	1	7/6/2017 6:11:30 PM	32644
Zinc	0.032	0.0028	0.010		mg/L	1	7/6/2017 6:11:30 PM	32644
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Antimony	0.0010	0.00084	0.0050	J	mg/L	5	7/21/2017 4:42:33 PM	A44430
Arsenic	0.0094	0.0018	0.010	J	mg/L	10	7/21/2017 4:47:42 PM	A44430
Lead	ND	0.00084	0.0025		mg/L	5	7/21/2017 4:42:33 PM	A44430
Selenium	0.023	0.0019	0.0050		mg/L	5	7/21/2017 4:42:33 PM	A44430
200.8 ICPMS METALS:TOTAL							Analyst: **JLF**	
Antimony	ND	0.0019	0.0050		mg/L	5	7/14/2017 1:57:35 PM	32644
Arsenic	0.011	0.0015	0.0050	*	mg/L	5	7/14/2017 1:57:35 PM	32644
Lead	0.0094	0.00095	0.0050		mg/L	10	7/14/2017 3:08:09 PM	32644
Selenium	0.015	0.0036	0.0050		mg/L	5	7/14/2017 1:57:35 PM	32644
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	0.000082	0.000037	0.00020	J	mg/L	1	7/14/2017 4:24:22 PM	32802
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Acenaphthylene	ND	3.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Aniline	ND	3.1	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Anthracene	ND	3.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Azobenzene	ND	4.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Benz(a)anthracene	ND	3.9	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Benzo(a)pyrene	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Benzoic acid	8.3	3.9	20	J	µg/L	1	7/7/2017 3:16:16 PM	32619
Benzyl alcohol	ND	4.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Bis(2-ethylhexyl)phthalate	ND	4.8	10		µg/L	1	7/7/2017 3:16:16 PM	32619
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Carbazole	ND	4.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-59
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 12:40:00 PM
Lab ID: 1706G62-007
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Chloroaniline	ND	3.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2-Chloronaphthalene	ND	3.7	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2-Chlorophenol	ND	7.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Chrysene	ND	3.8	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Di-n-octyl phthalate	ND	4.7	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Dibenzofuran	ND	4.1	10		µg/L	1	7/7/2017 3:16:16 PM	32619
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	7/7/2017 3:16:16 PM	32619
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	7/7/2017 3:16:16 PM	32619
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Diethyl phthalate	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Dimethyl phthalate	ND	3.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	7/7/2017 3:16:16 PM	32619
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	7/7/2017 3:16:16 PM	32619
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	7/7/2017 3:16:16 PM	32619
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	7/7/2017 3:16:16 PM	32619
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Fluoranthene	ND	4.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Fluorene	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Hexachlorobenzene	ND	3.8	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Hexachlorobutadiene	ND	1.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Hexachloroethane	ND	1.2	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Isophorone	ND	4.4	10		µg/L	1	7/7/2017 3:16:16 PM	32619
1-Methylnaphthalene	ND	3.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2-Methylnaphthalene	ND	3.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2-Methylphenol	ND	3.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
3+4-Methylphenol	ND	3.2	10		µg/L	1	7/7/2017 3:16:16 PM	32619
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Naphthalene	ND	2.9	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2-Nitroaniline	ND	4.9	10		µg/L	1	7/7/2017 3:16:16 PM	32619
3-Nitroaniline	ND	4.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-59
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 12:40:00 PM
Lab ID: 1706G62-007
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Nitrobenzene	ND	3.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2-Nitrophenol	ND	5.2	10		µg/L	1	7/7/2017 3:16:16 PM	32619
4-Nitrophenol	ND	5.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Pentachlorophenol	ND	4.9	20		µg/L	1	7/7/2017 3:16:16 PM	32619
Phenanthrene	ND	4.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Phenol	ND	3.1	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Pyrene	ND	4.4	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Pyridine	ND	2.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Surr: 2-Fluorophenol	55.0	0	15-98.1		%Rec	1	7/7/2017 3:16:16 PM	32619
Surr: Phenol-d5	44.8	0	15-80.7		%Rec	1	7/7/2017 3:16:16 PM	32619
Surr: 2,4,6-Tribromophenol	70.3	0	15-112		%Rec	1	7/7/2017 3:16:16 PM	32619
Surr: Nitrobenzene-d5	90.7	0	27.2-90.7	S	%Rec	1	7/7/2017 3:16:16 PM	32619
Surr: 2-Fluorobiphenyl	85.7	0	23.3-85.6	S	%Rec	1	7/7/2017 3:16:16 PM	32619
Surr: 4-Terphenyl-d14	69.0	0	27.6-107		%Rec	1	7/7/2017 3:16:16 PM	32619
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Toluene	ND	0.064	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Methyl tert-butyl ether (MTBE)	6.8	0.24	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2,4-Trimethylbenzene	0.13	0.11	1.0	J	µg/L	1	7/5/2017 8:36:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Acetone	6.0	0.82	10	J	µg/L	1	7/5/2017 8:36:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 8:36:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 8:36:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-59
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 12:40:00 PM
Lab ID: 1706G62-007
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 8:36:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 8:36:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-59
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 12:40:00 PM
Lab ID: 1706G62-007
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 8:36:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	109	0	70-130		%Rec	1	7/5/2017 8:36:00 PM	R44015
Surr: 4-Bromofluorobenzene	110	0	70-130		%Rec	1	7/5/2017 8:36:00 PM	R44015
Surr: Dibromofluoromethane	110	0	70-130		%Rec	1	7/5/2017 8:36:00 PM	R44015
Surr: Toluene-d8	101	0	70-130		%Rec	1	7/5/2017 8:36:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: TRIP BLANK
Project: SMW 2 and Boundary Wells
Collection Date:
Lab ID: 1706G62-008
Matrix: TRIP BLANK
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	7/10/2017 2:53:57 PM	WG440
Surr: BFB	116	0	52.3-138		%Rec	1	7/10/2017 2:53:57 PM	WG440
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Toluene	ND	0.064	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Methyl tert-butyl ether (MTBE)	ND	0.24	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Acetone	4.5	0.82	10	J	µg/L	1	7/5/2017 9:00:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 9:00:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 9:00:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: TRIP BLANK
Project: SMW 2 and Boundary Wells
Collection Date:
Lab ID: 1706G62-008
Matrix: TRIP BLANK
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 9:00:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 9:00:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 9:00:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	109	0	70-130		%Rec	1	7/5/2017 9:00:00 PM	R44015
Surr: 4-Bromofluorobenzene	109	0	70-130		%Rec	1	7/5/2017 9:00:00 PM	R44015
Surr: Dibromofluoromethane	114	0	70-130		%Rec	1	7/5/2017 9:00:00 PM	R44015
Surr: Toluene-d8	102	0	70-130		%Rec	1	7/5/2017 9:00:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Wet Chemistry by Method 4500CN E-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Cyanide	ND		0.00500	1	07/11/2017 16:23	WG996538

Wet Chemistry by Method 4500CN E-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Cyanide	ND		0.00500	1	07/11/2017 16:25	WG996538

Wet Chemistry by Method 4500CN E-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Cyanide	ND		0.00500	1	07/11/2017 16:26	WG996538

Wet Chemistry by Method 4500CN E-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Cyanide	ND		0.00500	1	07/11/2017 16:27	WG996538

Wet Chemistry by Method 4500CN E-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Cyanide	ND		0.00500	1	07/11/2017 16:32	WG996538

Wet Chemistry by Method 4500CN E-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Cyanide	0.0268		0.00500	1	07/11/2017 16:33	WG996538

Method Blank (MB)

(MB) R3232467-1 07/11/17 16:06

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Cyanide	U		0.0018	0.00500

L920655-02 Original Sample (OS) • Duplicate (DUP)

(OS) L920655-02 07/11/17 16:23 • (DUP) R3232467-4 07/11/17 16:24

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Cyanide	ND	0.00343	1	0		20

L920655-07 Original Sample (OS) • Duplicate (DUP)

(OS) L920655-07 07/11/17 16:33 • (DUP) R3232467-7 07/11/17 16:34

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Cyanide	0.0268	0.0283	1	5		20

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

(LCS) R3232467-2 07/11/17 16:07 • (LCSD) R3232467-3 07/11/17 16:08

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cyanide	0.100	0.102	0.0969	102	97	85-115			5	20

L920655-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L920655-05 07/11/17 16:27 • (MS) R3232467-5 07/11/17 16:28 • (MSD) R3232467-6 07/11/17 16:31

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Cyanide	0.100	ND	0.0931	0.0959	93	96	1	75-125			3	20

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Rec.	Recovery.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID **MB-A**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **PBW**	Batch ID: **A44298**	RunNo: **44298**
Prep Date:	Analysis Date: **7/18/2017**	SeqNo: **1400233** Units: **mg/L**

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

Sample ID **LCSLL-A**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **A44298**	RunNo: **44298**
Prep Date:	Analysis Date: **7/18/2017**	SeqNo: **1400234** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0018	0.0020	0.002000	0	89.0	50	150			J
Beryllium	0.0021	0.0020	0.002000	0	106	50	150			
Cadmium	0.0020	0.0020	0.002000	0	98.5	50	150			J
Calcium	0.53	1.0	0.5000	0	106	50	150			J
Chromium	0.0063	0.0060	0.006000	0	105	50	150			
Cobalt	0.0060	0.0060	0.006000	0	99.7	50	150			J
Iron	0.020	0.020	0.02000	0	102	50	150			
Magnesium	0.53	1.0	0.5000	0	106	50	150			J
Manganese	0.0020	0.0020	0.002000	0	102	50	150			
Nickel	0.0051	0.010	0.005000	0	103	50	150			J
Potassium	0.53	1.0	0.5000	0	107	50	150			J
Silver	0.0049	0.0050	0.005000	0	97.4	50	150			J
Sodium	0.51	1.0	0.5000	0	102	50	150			J
Vanadium	0.010	0.050	0.01000	0	105	50	150			J
Zinc	0.0056	0.010	0.005000	0	113	50	150			J

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **LCS-A**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **A44298**	RunNo: **44298**
Prep Date:	Analysis Date: **7/18/2017**	SeqNo: **1400235** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	97.2	85	115			
Beryllium	0.49	0.0020	0.5000	0	98.0	85	115			
Cadmium	0.49	0.0020	0.5000	0	97.1	85	115			
Calcium	49	1.0	50.00	0	97.6	85	115			
Chromium	0.49	0.0060	0.5000	0	97.3	85	115			
Cobalt	0.47	0.0060	0.5000	0	93.6	85	115			
Iron	0.48	0.020	0.5000	0	95.1	85	115			
Magnesium	49	1.0	50.00	0	98.7	85	115			
Manganese	0.48	0.0020	0.5000	0	95.0	85	115			
Nickel	0.48	0.010	0.5000	0	95.0	85	115			
Potassium	47	1.0	50.00	0	94.7	85	115			
Silver	0.10	0.0050	0.1000	0	100	85	115			
Sodium	48	1.0	50.00	0	96.6	85	115			
Vanadium	0.50	0.050	0.5000	0	99.7	85	115			
Zinc	0.47	0.010	0.5000	0	94.2	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID **MB-32644**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Total Metals**
Client ID: **PBW**	Batch ID: **32644**	RunNo: **44032**
Prep Date: **7/5/2017**	Analysis Date: **7/6/2017**	SeqNo: **1388501** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Iron	ND	0.020								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Sample ID **LCSLL-32644**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Total Metals**
Client ID: **BatchQC**	Batch ID: **32644**	RunNo: **44032**
Prep Date:	Analysis Date: **7/6/2017**	SeqNo: **1388502** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0020	0.0020	0.002000	0	102	50	150			
Beryllium	0.0020	0.0020	0.002000	0	100	50	150			
Cadmium	0.0021	0.0020	0.002000	0	106	50	150			
Chromium	0.0062	0.0060	0.006000	0	104	50	150			
Cobalt	0.0061	0.0060	0.006000	0	101	50	150			
Iron	0.020	0.020	0.02000	0	99.8	50	150			J
Manganese	0.0020	0.0020	0.002000	0	100	50	150			
Nickel	0.0044	0.010	0.005000	0	88.0	50	150			J
Silver	0.0045	0.0050	0.005000	0	90.6	50	150			J
Vanadium	0.0097	0.050	0.01000	0	96.7	50	150			J
Zinc	0.0056	0.010	0.005000	0	112	50	150			J

Sample ID **LCS-32644**	SampType: **LCS**	TestCode: **EPA Method 200.7: Total Metals**
Client ID: **LCSW**	Batch ID: **32644**	RunNo: **44032**
Prep Date: **7/5/2017**	Analysis Date: **7/6/2017**	SeqNo: **1389083** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	97.9	85	115			
Beryllium	0.50	0.0020	0.5000	0	100	85	115			
Cadmium	0.49	0.0020	0.5000	0	98.6	85	115			
Chromium	0.49	0.0060	0.5000	0	98.4	85	115			
Cobalt	0.48	0.0060	0.5000	0	95.4	85	115			
Iron	0.48	0.020	0.5000	0	96.4	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID	**LCS-32644**	SampType:	**LCS**	TestCode:	**EPA Method 200.7: Total Metals**
Client ID:	**LCSW**	Batch ID:	**32644**	RunNo:	**44032**
Prep Date:	**7/5/2017**	Analysis Date:	**7/6/2017**	SeqNo:	**1389083** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.48	0.0020	0.5000	0	95.7	85	115			
Nickel	0.48	0.010	0.5000	0	95.7	85	115			
Silver	0.094	0.0050	0.1000	0	94.0	85	115			
Vanadium	0.50	0.050	0.5000	0	99.8	85	115			
Zinc	0.48	0.010	0.5000	0	95.3	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **C44340**	RunNo: **44340**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1401304** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.023	0.0010	0.02500	0	90.8	85	115			
Arsenic	0.024	0.0010	0.02500	0	94.1	85	115			
Lead	0.012	0.00050	0.01250	0	95.1	85	115			
Selenium	0.023	0.0010	0.02500	0	93.8	85	115			
Uranium	0.012	0.00050	0.01250	0	94.1	85	115			

Sample ID **LLLCS**	SampType: **LCSLL**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **C44340**	RunNo: **44340**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1401305** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00053	0.0010	0.001000	0	52.7	50	150			J
Arsenic	0.00096	0.0010	0.001000	0	96.0	50	150			J
Lead	0.00047	0.00050	0.0005001	0	94.2	50	150			J
Selenium	0.0011	0.0010	0.001000	0	106	50	150			
Uranium	0.00047	0.00050	0.0005001	0	93.2	50	150			J

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW**	Batch ID: **C44340**	RunNo: **44340**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1401306** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								
Uranium	ND	0.00050								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **A44430**	RunNo: **44430**
Prep Date:	Analysis Date: **7/21/2017**	SeqNo: **1404397** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.024	0.0010	0.02500	0	94.5	85	115			
Arsenic	0.023	0.0010	0.02500	0	91.5	85	115			
Lead	0.012	0.00050	0.01250	0	95.3	85	115			
Selenium	0.023	0.0010	0.02500	0	91.7	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID	**LLLCS**	SampType: **LCSLL**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID:	**BatchQC**	Batch ID: **A44430**	RunNo: **44430**
Prep Date:		Analysis Date: **7/21/2017**	SeqNo: **1404398** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00097	0.0010	0.001000	0	96.6	50	150			J
Arsenic	0.00090	0.0010	0.001000	0	89.8	50	150			J
Lead	0.00048	0.00050	0.0005001	0	96.9	50	150			J
Selenium	0.00088	0.0010	0.001000	0	87.8	50	150			J

Sample ID	**MB**	SampType: **MBLK**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID:	**PBW**	Batch ID: **A44430**	RunNo: **44430**
Prep Date:		Analysis Date: **7/21/2017**	SeqNo: **1404399** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID	**MB-32644**	SampType:	**MBLK**	TestCode:	**200.8 ICPMS Metals:Total**					
Client ID:	**PBW**	Batch ID:	**32644**	RunNo:	**44075**					
Prep Date:	**7/5/2017**	Analysis Date:	**7/8/2017**	SeqNo:	**1390839**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								

Sample ID	**MSLCS-32644**	SampType:	**LCS**	TestCode:	**200.8 ICPMS Metals:Total**					
Client ID:	**LCSW**	Batch ID:	**32644**	RunNo:	**44075**					
Prep Date:	**7/5/2017**	Analysis Date:	**7/8/2017**	SeqNo:	**1390841**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.025	0.0010	0.02500	0	102	85	115			
Arsenic	0.023	0.0010	0.02500	0	92.5	85	115			
Lead	0.012	0.00050	0.01250	0	96.0	85	115			
Selenium	0.022	0.0010	0.02500	0	89.1	85	115			

Sample ID	**MSLLLCS-32644**	SampType:	**LCSLL**	TestCode:	**200.8 ICPMS Metals:Total**					
Client ID:	**BatchQC**	Batch ID:	**32644**	RunNo:	**44075**					
Prep Date:	**7/5/2017**	Analysis Date:	**7/8/2017**	SeqNo:	**1390843**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00095	0.0010	0.001000	0	94.9	50	150			J
Arsenic	0.0011	0.0010	0.001000	0	113	50	150			
Lead	0.00048	0.00050	0.0005001	0	96.1	50	150			J
Selenium	0.00085	0.0010	0.001000	0	84.9	50	150			J

Sample ID	**1706G62-002ELLMS**	SampType:	**MSDLL**	TestCode:	**200.8 ICPMS Metals:Total**					
Client ID:	**GW DUP01**	Batch ID:	**32644**	RunNo:	**44225**					
Prep Date:	**7/5/2017**	Analysis Date:	**7/14/2017**	SeqNo:	**1396853**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.027	0.0050	0.02500	0	108	70	130	0.216	20	
Arsenic	0.026	0.0050	0.02500	0.001656	99.1	70	130	1.76	20	
Lead	0.014	0.0025	0.01250	0	111	70	130	0.949	20	
Selenium	0.029	0.0050	0.02500	0.006456	92.1	70	130	7.46	20	

Sample ID	**1706G62-002ELLMS**	SampType:	**MSLL**	TestCode:	**200.8 ICPMS Metals:Total**					
Client ID:	**GW DUP01**	Batch ID:	**32644**	RunNo:	**44225**					
Prep Date:	**7/5/2017**	Analysis Date:	**7/14/2017**	SeqNo:	**1396854**	Units:	**mg/L**			

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID	**1706G62-002ELLMS**	SampType:	**MSLL**	TestCode:	**200.8 ICPMS Metals:Total**					
Client ID:	**GW DUP01**	Batch ID:	**32644**	RunNo:	**44225**					
Prep Date:	**7/5/2017**	Analysis Date:	**7/14/2017**	SeqNo:	**1396854**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.027	0.0050	0.02500	0	108	70	130			
Arsenic	0.027	0.0050	0.02500	0.001656	101	70	130			
Lead	0.014	0.0025	0.01250	0	110	70	130			
Selenium	0.027	0.0050	0.02500	0.006456	83.6	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID	**MB-32802**	SampType:	**MBLK**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**PBW**	Batch ID:	**32802**	RunNo:	**44238**					
Prep Date:	**7/14/2017**	Analysis Date:	**7/14/2017**	SeqNo:	**1396754**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.000079	0.00020								J

Sample ID	**LCS-32802**	SampType:	**LCS**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**LCSW**	Batch ID:	**32802**	RunNo:	**44238**					
Prep Date:	**7/14/2017**	Analysis Date:	**7/14/2017**	SeqNo:	**1396755**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0052	0.00020	0.005000	0	104	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R43973**	RunNo: **43973**
Prep Date:	Analysis Date: **7/3/2017**	SeqNo: **1387126** 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								
Bromide	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								
Sulfate	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R43973**	RunNo: **43973**
Prep Date:	Analysis Date: **7/3/2017**	SeqNo: **1387127** 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	4.8	0.50	5.000	0	96.6	90	110			
Bromide	2.4	0.10	2.500	0	97.7	90	110			
Phosphorus, Orthophosphate (As P	4.8	0.50	5.000	0	96.4	90	110			
Sulfate	9.8	0.50	10.00	0	98.1	90	110			
Nitrate+Nitrite as N	3.4	0.20	3.500	0	97.6	90	110			

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402926** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Sulfate	0.15	0.50								J

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402927** 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	92.7	90	110			
Sulfate	9.4	0.50	10.00	0	93.7	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R44528**	RunNo: **44528**
Prep Date:	Analysis Date: **7/26/2017**	SeqNo: **1408053** Units: **mg/L**

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R44528**	RunNo: **44528**
Prep Date:	Analysis Date: **7/26/2017**	SeqNo: **1408053** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	ND	0.20								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R44528**	RunNo: **44528**
Prep Date:	Analysis Date: **7/26/2017**	SeqNo: **1408054** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	3.4	0.20	3.500	0	97.0	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID **MB-32608**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **PBW**	Batch ID: **32608**	RunNo: **43984**
Prep Date: **7/3/2017**	Analysis Date: **7/5/2017**	SeqNo: **1386515** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	1.1		1.000		112	72.4	157			

Sample ID **LCS-32608**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **LCSW**	Batch ID: **32608**	RunNo: **43984**
Prep Date: **7/3/2017**	Analysis Date: **7/5/2017**	SeqNo: **1386736** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.0	1.0	5.000	0	121	82.8	146			
Surr: DNOP	0.54		0.5000		109	72.4	157			

Sample ID **1706G62-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **OW-60**	Batch ID: **32608**	RunNo: **43984**
Prep Date: **7/3/2017**	Analysis Date: **7/5/2017**	SeqNo: **1386854** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.5	1.0	5.000	0	129	87.2	145			
Surr: DNOP	0.56		0.5000		112	72.4	157			

Sample ID **1706G62-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **OW-60**	Batch ID: **32608**	RunNo: **43984**
Prep Date: **7/3/2017**	Analysis Date: **7/5/2017**	SeqNo: **1386861** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.6	1.0	5.000	0	131	87.2	145	1.51	20	
Surr: DNOP	0.56		0.5000		112	72.4	157	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G44019**	RunNo: **44019**
Prep Date:	Analysis Date: **7/6/2017**	SeqNo: **1388622** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	21		20.00		106	52.3	138			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G44019**	RunNo: **44019**
Prep Date:	Analysis Date: **7/6/2017**	SeqNo: **1388623** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.50	0.050	0.5000	0	99.7	75.8	123			
Surr: BFB	24		20.00		118	52.3	138			

Sample ID **1706G62-002AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GW DUP01**	Batch ID: **G44019**	RunNo: **44019**
Prep Date:	Analysis Date: **7/6/2017**	SeqNo: **1388626** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.49	0.050	0.5000	0.03520	90.7	53.2	134			
Surr: BFB	26		20.00		131	52.3	138			

Sample ID **1706G62-002AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GW DUP01**	Batch ID: **G44019**	RunNo: **44019**
Prep Date:	Analysis Date: **7/6/2017**	SeqNo: **1388627** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.48	0.050	0.5000	0.03520	90.0	53.2	134	0.740	20	
Surr: BFB	26		20.00		129	52.3	138	0	0	

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **WG44091**	RunNo: **44091**
Prep Date:	Analysis Date: **7/10/2017**	SeqNo: **1391577** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	23		20.00		114	52.3	138			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **WG44091**	RunNo: **44091**
Prep Date:	Analysis Date: **7/10/2017**	SeqNo: **1391578** Units: **mg/L**

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID	**2.5UG GRO LCS**	SampType: **LCS**		TestCode: **EPA Method 8015D: Gasoline Range**						
Client ID:	**LCSW**	Batch ID: **WG44091**		RunNo: **44091**						
Prep Date:		Analysis Date: **7/10/2017**		SeqNo: **1391578**		Units: **mg/L**				
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)		0.48	0.050	0.5000	0	95.7	75.8	123			
Surr: BFB		25		20.00		125	52.3	138			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **100ng lcs**	SampType: **LCS4**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **BatchQC**	Batch ID: **R44015**	RunNo: **44015**
Prep Date:	Analysis Date: **7/5/2017**	SeqNo: **1387911** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	103	70	130			
Toluene	20	1.0	20.00	0	100	70	130			
Ethylbenzene	20	1.0	20.00	0	99.5	70	130			
Methyl tert-butyl ether (MTBE)	42	1.0	40.00	0	104	70	130			
1,2,4-Trimethylbenzene	21	1.0	20.00	0	103	70	130			
1,3,5-Trimethylbenzene	20	1.0	20.00	0	101	70	130			
1,2-Dichloroethane (EDC)	21	1.0	20.00	0	103	62.2	143			
1,2-Dibromoethane (EDB)	20	1.0	20.00	0	99.1	70	130			
Naphthalene	19	2.0	20.00	0	92.6	70	130			
1-Methylnaphthalene	19	4.0	20.00	0	95.0	60	140			
2-Methylnaphthalene	14	4.0	20.00	0	71.6	60	140			
Acetone	43	10	40.00	0	107	60	140			
Bromobenzene	21	1.0	20.00	0	104	70	130			
Bromodichloromethane	21	1.0	20.00	0	107	70	130			
Bromoform	20	1.0	20.00	0	99.3	70	130			
Bromomethane	17	3.0	20.00	0	87.2	60	140			
2-Butanone	47	10	40.00	0	117	60	140			
Carbon disulfide	38	10	40.00	0	94.3	60	140			
Carbon Tetrachloride	21	1.0	20.00	0	104	70	130			
Chlorobenzene	20	1.0	20.00	0	102	70	130			
Chloroethane	20	2.0	20.00	0	99.2	60	140			
Chloroform	21	1.0	20.00	0	107	70	130			
Chloromethane	17	3.0	20.00	0	87.0	60	140			
2-Chlorotoluene	20	1.0	20.00	0	102	70	130			
4-Chlorotoluene	20	1.0	20.00	0	102	70	130			
cis-1,2-DCE	21	1.0	20.00	0	107	70	130			
cis-1,3-Dichloropropene	19	1.0	20.00	0	96.8	70	130			
1,2-Dibromo-3-chloropropane	20	2.0	20.00	0	102	70	130			
Dibromochloromethane	19	1.0	20.00	0	95.4	70	130			
Dibromomethane	22	1.0	20.00	0	108	70	130			
1,2-Dichlorobenzene	20	1.0	20.00	0	101	70	130			
1,3-Dichlorobenzene	21	1.0	20.00	0	103	70	130			
1,4-Dichlorobenzene	21	1.0	20.00	0	103	67.2	141			
Dichlorodifluoromethane	17	1.0	20.00	0	85.6	60	140			
1,1-Dichloroethane	21	1.0	20.00	0	103	52.6	157			
1,1-Dichloroethene	20	1.0	20.00	0	101	70	130			
1,2-Dichloropropane	21	1.0	20.00	0	103	63.7	138			
1,3-Dichloropropane	20	1.0	20.00	0	98.1	70	130			
2,2-Dichloropropane	21	2.0	20.00	0	107	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **100ng lcs**	SampType: **LCS4**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **BatchQC**	Batch ID: **R44015**	RunNo: **44015**
Prep Date:	Analysis Date: **7/5/2017**	SeqNo: **1387911** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	20	1.0	20.00	0	102	70	130			
Hexachlorobutadiene	18	1.0	20.00	0	87.6	70	130			
2-Hexanone	38	10	40.00	0	95.4	60	140			
Isopropylbenzene	20	1.0	20.00	0	100	70	130			
4-Isopropyltoluene	21	1.0	20.00	0	104	70	130			
4-Methyl-2-pentanone	41	10	40.00	0	102	60	140			
Methylene Chloride	21	3.0	20.00	0	103	70	130			
n-Butylbenzene	19	3.0	20.00	0	97.4	70	130			
n-Propylbenzene	20	1.0	20.00	0	100	70	130			
sec-Butylbenzene	20	1.0	20.00	0	98.3	70	130			
Styrene	20	1.0	20.00	0	101	70	130			
tert-Butylbenzene	20	1.0	20.00	0	101	70	130			
1,1,1,2-Tetrachloroethane	20	1.0	20.00	0	98.5	70	130			
1,1,2,2-Tetrachloroethane	21	2.0	20.00	0	105	65.9	133			
Tetrachloroethene (PCE)	21	1.0	20.00	0	103	70	130			
trans-1,2-DCE	20	1.0	20.00	0	99.9	70	130			
trans-1,3-Dichloropropene	19	1.0	20.00	0	92.8	70	130			
1,2,3-Trichlorobenzene	19	1.0	20.00	0	92.9	70	130			
1,2,4-Trichlorobenzene	18	1.0	20.00	0	92.3	70	130			
1,1,1-Trichloroethane	21	1.0	20.00	0	104	70	130			
1,1,2-Trichloroethane	20	1.0	20.00	0	99.1	70	130			
Trichloroethene (TCE)	20	1.0	20.00	0	102	70	130			
Trichlorofluoromethane	20	1.0	20.00	0	102	70	130			
1,2,3-Trichloropropane	21	2.0	20.00	0	103	69.7	129			
Vinyl chloride	19	1.0	20.00	0	93.5	70	130			
Xylenes, Total	61	1.5	60.00	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		106	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	11		10.00		113	70	130			
Surr: Toluene-d8	11		10.00		107	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R44015**	RunNo: **44015**
Prep Date:	Analysis Date: **7/5/2017**	SeqNo: **1387914** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**	
Client ID: **PBW**	Batch ID: **R44015**	RunNo: **44015**	
Prep Date:	Analysis Date: **7/5/2017**	SeqNo: **1387914**	Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R44015**	RunNo: **44015**
Prep Date:	Analysis Date: **7/5/2017**	SeqNo: **1387914** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		108	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		108	70	130			
Surr: Dibromofluoromethane	11		10.00		114	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **mb-32619**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBW**	Batch ID: **32619**	RunNo: **44051**
Prep Date: **7/3/2017**	Analysis Date: **7/6/2017**	SeqNo: **1389536** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Aniline	ND	10								
Anthracene	ND	10								
Azobenzene	ND	10								
Benz(a)anthracene	ND	10								
Benzo(a)pyrene	ND	10								
Benzo(b)fluoranthene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Benzo(k)fluoranthene	ND	10								
Benzoic acid	8.5	20								J
Benzyl alcohol	ND	10								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	ND	10								
4-Bromophenyl phenyl ether	ND	10								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								
4-Chloro-3-methylphenol	ND	10								
4-Chloroaniline	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
Chrysene	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	10								
Dibenz(a,h)anthracene	ND	10								
Dibenzofuran	ND	10								
1,2-Dichlorobenzene	ND	10								
1,3-Dichlorobenzene	ND	10								
1,4-Dichlorobenzene	ND	10								
3,3´-Dichlorobenzidine	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
2,4-Dichlorophenol	ND	20								
2,4-Dimethylphenol	ND	10								
4,6-Dinitro-2-methylphenol	ND	20								
2,4-Dinitrophenol	ND	20								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **mb-32619**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBW**	Batch ID: **32619**	RunNo: **44051**
Prep Date: **7/3/2017**	Analysis Date: **7/6/2017**	SeqNo: **1389536** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	10								
2,6-Dinitrotoluene	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Hexachlorobenzene	ND	10								
Hexachlorobutadiene	ND	10								
Hexachlorocyclopentadiene	ND	10								
Hexachloroethane	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
Isophorone	ND	10								
1-Methylnaphthalene	ND	10								
2-Methylnaphthalene	ND	10								
2-Methylphenol	ND	10								
3+4-Methylphenol	ND	10								
N-Nitrosodi-n-propylamine	ND	10								
N-Nitrosodimethylamine	ND	10								
N-Nitrosodiphenylamine	ND	10								
Naphthalene	ND	10								
2-Nitroaniline	ND	10								
3-Nitroaniline	ND	10								
4-Nitroaniline	ND	10								
Nitrobenzene	ND	10								
2-Nitrophenol	ND	10								
4-Nitrophenol	ND	10								
Pentachlorophenol	ND	20								
Phenanthrene	ND	10								
Phenol	ND	10								
Pyrene	ND	10								
Pyridine	ND	10								
1,2,4-Trichlorobenzene	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
Surr: 2-Fluorophenol	120		200.0		60.8	15	98.1			
Surr: Phenol-d5	100		200.0		51.7	15	80.7			
Surr: 2,4,6-Tribromophenol	160		200.0		78.6	15	112			
Surr: Nitrobenzene-d5	90		100.0		90.2	27.2	90.7			
Surr: 2-Fluorobiphenyl	86		100.0		85.7	23.3	85.6			S
Surr: 4-Terphenyl-d14	72		100.0		71.6	27.6	107			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID **lcs-32619**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSW**	Batch ID: **32619**	RunNo: **44051**
Prep Date: **7/3/2017**	Analysis Date: **7/6/2017**	SeqNo: **1389537** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	85	10	100.0	0	85.2	41.2	98.9			
4-Chloro-3-methylphenol	170	10	200.0	0	84.8	29.1	111			
2-Chlorophenol	150	10	200.0	0	77.3	23.3	108			
1,4-Dichlorobenzene	63	10	100.0	0	62.6	29.4	84.5			
2,4-Dinitrotoluene	75	10	100.0	0	74.7	36.6	88.7			
N-Nitrosodi-n-propylamine	90	10	100.0	0	89.5	46.9	106			
4-Nitrophenol	99	10	200.0	0	49.4	15	74.7			
Pentachlorophenol	140	20	200.0	0	68.0	28.1	85.4			
Phenol	100	10	200.0	0	50.4	15	78.2			
Pyrene	97	10	100.0	0	97.0	44.4	96.8			S
1,2,4-Trichlorobenzene	75	10	100.0	0	74.9	34.3	89			
Surr: 2-Fluorophenol	120		200.0		58.5	15	98.1			
Surr: Phenol-d5	110		200.0		52.8	15	80.7			
Surr: 2,4,6-Tribromophenol	160		200.0		80.4	15	112			
Surr: Nitrobenzene-d5	95		100.0		94.6	27.2	90.7			S
Surr: 2-Fluorobiphenyl	86		100.0		85.6	23.3	85.6			
Surr: 4-Terphenyl-d14	68		100.0		68.0	27.6	107			

Sample ID **LCSD-32619**	SampType: **LCSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS02**	Batch ID: **32619**	RunNo: **44051**
Prep Date: **7/3/2017**	Analysis Date: **7/6/2017**	SeqNo: **1389538** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	69	10	100.0	0	68.6	41.2	98.9	21.6	37.4	
4-Chloro-3-methylphenol	140	10	200.0	0	70.4	29.1	111	18.5	26.8	
2-Chlorophenol	140	10	200.0	0	69.0	23.3	108	11.4	30.3	
1,4-Dichlorobenzene	58	10	100.0	0	57.6	29.4	84.5	8.32	32	
2,4-Dinitrotoluene	63	10	100.0	0	63.1	36.6	88.7	16.7	36.7	
N-Nitrosodi-n-propylamine	75	10	100.0	0	74.9	46.9	106	17.7	29.9	
4-Nitrophenol	88	10	200.0	0	43.9	15	74.7	11.7	28.8	
Pentachlorophenol	110	20	200.0	0	54.7	28.1	85.4	21.6	38.2	
Phenol	89	10	200.0	0	44.7	15	78.2	12.0	39.8	
Pyrene	89	10	100.0	0	89.2	44.4	96.8	8.42	28.3	
1,2,4-Trichlorobenzene	69	10	100.0	0	69.3	34.3	89	7.71	39.8	
Surr: 2-Fluorophenol	110		200.0		54.0	15	98.1	0	0	
Surr: Phenol-d5	96		200.0		48.0	15	80.7	0	0	
Surr: 2,4,6-Tribromophenol	140		200.0		71.3	15	112	0	0	
Surr: Nitrobenzene-d5	84		100.0		83.9	27.2	90.7	0	0	
Surr: 2-Fluorobiphenyl	74		100.0		74.3	23.3	85.6	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID	**LCSD-32619**	SampType:	**LCSD**	TestCode:	**EPA Method 8270C: Semivolatiles**
Client ID:	**LCSS02**	Batch ID:	**32619**	RunNo:	**44051**
Prep Date:	**7/3/2017**	Analysis Date:	**7/6/2017**	SeqNo:	**1389538** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	60		100.0		60.5	27.6	107	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **Western Refining Gallup** Work Order Number: **1706G62** RcptNo: **1**

Received By: **Richie Eriacho** **6/30/2017 10:30:00 AM**

Completed By: **Ashley Gallegos** **6/30/2017 4:02:10 PM**

Reviewed By: 6 7/3/17

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 ☑ aj
9. Was preservative added to bottles? Yes ☑ ~~No~~ ☑ aj 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: 17 6 (<2 or >12 unless noted)
Adjusted? yes
Checked by: aj

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: For metals analysis: added 1mL HNO3 to ~0.05E for acceptable pH. Held 24 hours prior to analysis.
18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.2	Good	Not Present			

7/3@1032
aj

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.2°C

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. 1706G62	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL AND DISSOLVED)	GENERAL CHEMISTRY	CYANIDE	MAJOR CATIONS / ANIONS	Air Bubbles (Y or N)
6/28/17	1110	WATER	OW-60	40 ML VOA-5	HCL	-001			✓							✓						
				250 ML AMBER-1	NEAT				✓													
				1 LITER AMBER-1	NEAT												✓					
				125 ML PLASTIC-1	HNO_3													✓			✓	
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓		✓	
				500 ML PLASTIC-1	NEAT														✓		✓	
				500 ML PLASTIC-1	NaOH															✓		

Date	Time	Relinquished by	Received by	Date	Time
6/29/17	8:00			6/29/17	8:00
6-29-17	11:00			6/30/17	1030

Remarks:

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.

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL-JOHNSON@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.2°C

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. 1706G62	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL AND DISSOLVED)	GENERAL CHEMISTRY	CYANIDE		Air Bubbles (Y or N)
6/28/17	—	WATER	GW DUP01	40 ML VOA-5	HCL	-002			✓							✓						
				250 ML AMBER-1	NEAT				✓													
				1 LITER AMBER-1	NEAT												✓					
				125 ML PLASTIC-1	HNO_3													✓				
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓			
				500 ML PLASTIC-1	NEAT														✓			
				500 ML PLASTIC-1	NAOH															✓		

Date	Time	Relinquished by:	Received by:	Date	Time
6/29/17	8:00			6-29-17	8:00
6-29-17	11:00			6/30/17	1030

Remarks:

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.

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.2

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. 1701G62	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL AND DISSOLVED)	GENERAL CHEMISTRY	CYANIDE		Air Bubbles (Y or N)
6/28/17	1030	WATER	BW-4B	40 ML VOA-5	HCL	-003			✓							✓						
				250 ML AMBER-1	NEAT				✓													
				1 LITER AMBER-1	NEAT												✓					
				~~125 ML~~ PLASTIC-1	~~HNO3~~													X				
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓			
				500 ML PLASTIC-1	NEAT														✓			
↓	↓	↓	↓	500 ML PLASTIC-1	NAOH															✓		

Date	Time	Relinquished by	Received by	Date	Time
6/29/17	8:00			6/29/17	8:00
6/29/17	11:00			6/30/17	1030

Remarks:

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.

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.2°C

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.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL AND DISSOLVED)	GENERAL CHEMISTRY	CYANIDE		Air Bubbles (Y or N)
6/28/17	0910	WATER	BW-[illegible]5C	40 ML VOA-5	HCL	1706G62-004			✓							✓						
				250 ML AMBER-1	NEAT				✓													
				1 LITER AMBER-1	NEAT												✓					
				125 ML PLASTIC-1	HNO_3													✓				
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓			
				500 ML PLASTIC-1	NEAT														✓			
				500 ML PLASTIC-1	NAOH															✓		

Date	Time	Relinquished by:	Received by:	Date	Time
6/29/17	8:00	[signature]	[signature]	6-29-17	8:00
6-29-17	11:00	[signature]	[signature]	6/30/17	1030

Remarks:

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.

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.2°C

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.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL AND DISSOLVED)	GENERAL CHEMISTRY	CYANIDE		Air Bubbles (Y or N)
6/29/17	0940	WATER	BW-5B	40 ML VOA-5	HCL	1706G62-005			✓							✓						
				250 ML AMBER-1	NEAT				✓													
				1 LITER AMBER-1	NEAT												✓					
				125 ML PLASTIC-1	HNO_3													✓				
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓			
				500 ML PLASTIC-1	NEAT														✓			
				500 ML PLASTIC-1	NAOH															✓		
↓	↓																					
6/28/17	—	WATER	TRIP BLANK	40 ML VOA-3	HCL	1706G62-006										✓						

Date: 6/29/17 Time: 8:00 Relinquished by: [signature]
Received by: [signature] Date: 6-29-17 Time: 8:00

Date: 6-29-17 Time: 11:00 Relinquished by: [signature]
Received by: [signature] Date: 6/30/17 Time: 1030

Remarks:

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.

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2-2°C

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. 1706662	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL AND DISSOLVED)	GENERAL CHEMISTRY	CYANIDE	MAJOR CATIONS / ANIONS	Air Bubbles (Y or N)
6/28/17	1240	WATER	OW-59	40 ML VOA-5	HCL	-005			✓							✓						
				250 ML AMBER-1	NEAT				✓													
				1 LITER AMBER-1	NEAT												✓					
				125 ML PLASTIC-1	HNO_3													✓			✓	
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓		✓	
				500 ML PLASTIC-1	NEAT														✓		✓	
↓	↓	↓	↓	500 ML PLASTIC-1	NAOH															✓		
6/28/17	—	WATER	TRIP BLANK	40 ML VOA-3	HCL	-008										✓						

Date	Time	Relinquished by	Received by	Date	Time
6/29/17	8:00			6-29-17	8:00
6/29/17	11:00			6/30/17	1030

Remarks:

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.

WESTERN REFINING SOUTHWEST, INC.

GALLUP REFINERY - GALLUP, NEW MEXICO

SMW-2 AND BOUNDARY WELLS - JUNE 2016

METALS AND CYANIDE ANALYSES FOR GROUNDWATER SAMPLES

AND WATER QA/QC SAMPLES

TOTAL METALS ANALYSIS AND DISSOLVED METALS ANALYSIS

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

GENERAL CHEMISTRY PARAMETERS FOR GROUNDWATER SAMPLES
AND WATER QA/QC SAMPLES

Analyte	Analytical Method
Chloride	EPA method 300.0
Fluoride	EPA method 300.0
Sulfate	EPA method 300.0

Appendix F

SMW-2 Area – Analytical Reports

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

August 01, 2017

Cheryl Johnson

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-0231
FAX

RE: SMW 2 OrderNo.: 1706G37

Dear Cheryl Johnson:

Hall Environmental Analysis Laboratory received 4 sample(s) on 6/30/2017 for the analyses presented in the following report.

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

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

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

Sincerely,



Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1706G37**
Date Reported: **8/1/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: SMW-2
Project: SMW 2
Collection Date: 6/28/2017 1:10:00 PM
Lab ID: 1706G37-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	ND	0.22	0.50		mg/L	5	7/3/2017 8:26:31 PM	R43998
Chloride	2600	120	250		mg/L	500	7/21/2017 4:18:01 PM	R44455
Bromide	2.8	0.073	0.50		mg/L	5	7/3/2017 8:26:31 PM	R43998
Phosphorus, Orthophosphate (As P)	ND	5.0	10	H	mg/L	20	7/19/2017 6:05:29 PM	R44381
Sulfate	1500	4.8	25		mg/L	50	7/19/2017 6:17:53 PM	R44381
Nitrate+Nitrite as N	ND	0.26	2.0		mg/L	10	7/19/2017 8:22:00 PM	A44381
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Calcium	300	1.6	20		mg/L	20	7/12/2017 8:09:43 PM	C44171
Magnesium	90	0.25	1.0		mg/L	1	7/12/2017 8:07:46 PM	C44171
Potassium	0.75	0.11	1.0	J	mg/L	1	7/12/2017 8:07:46 PM	C44171
Sodium	2300	8.2	50		mg/L	50	7/13/2017 5:56:50 PM	B44206

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: SMW-4
Project: SMW 2
Collection Date: 6/28/2017 2:25:00 PM
Lab ID: 1706G37-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	1.1	0.22	0.50		mg/L	5	7/3/2017 8:51:20 PM	R43998
Chloride	63	1.2	2.5		mg/L	5	7/3/2017 8:51:20 PM	R43998
Bromide	0.26	0.073	0.50	J	mg/L	5	7/3/2017 8:51:20 PM	R43998
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/19/2017 6:30:17 PM	R44381
Sulfate	180	0.48	2.5		mg/L	5	7/3/2017 8:51:20 PM	R43998
Nitrate+Nitrite as N	0.21	0.13	1.0	J	mg/L	5	7/3/2017 10:55:27 PM	R43998
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Calcium	4.5	0.078	1.0		mg/L	1	7/12/2017 8:11:40 PM	C44171
Magnesium	1.2	0.25	1.0		mg/L	1	7/12/2017 8:11:40 PM	C44171
Potassium	0.52	0.11	1.0	J	mg/L	1	7/12/2017 8:11:40 PM	C44171
Sodium	310	3.3	20		mg/L	20	7/12/2017 8:13:39 PM	C44171

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: Evaporation Pond #2
Project: SMW 2
Collection Date: 6/28/2017 2:45:00 PM
Lab ID: 1706G37-003
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	18	0.44	1.0	*	mg/L	10	7/3/2017 9:16:10 PM	R43998
Chloride	5000	120	250		mg/L	500	7/19/2017 7:19:55 PM	A44381
Bromide	1.9	0.15	1.0		mg/L	10	7/3/2017 9:16:10 PM	R43998
Phosphorus, Orthophosphate (As P)	ND	2.5	5.0	H	mg/L	10	7/19/2017 7:07:31 PM	A44381
Sulfate	1400	9.6	50		mg/L	100	7/3/2017 9:28:34 PM	R43998
Nitrate+Nitrite as N	1.1	0.52	4.0	J	mg/L	20	7/19/2017 8:34:25 PM	A44381
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Calcium	410	1.6	20		mg/L	20	7/12/2017 8:23:47 PM	C44171
Magnesium	100	5.0	20		mg/L	20	7/12/2017 8:23:47 PM	C44171
Potassium	140	2.3	20		mg/L	20	7/12/2017 8:23:47 PM	C44171
Sodium	3100	8.2	50		mg/L	50	7/13/2017 5:58:45 PM	B44206

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: Evaporation Pond #3
Project: SMW 2
Collection Date: 6/28/2017 3:05:00 PM
Lab ID: 1706G37-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	16	0.44	1.0	*	mg/L	10	7/3/2017 9:41:00 PM	R43998
Chloride	7100	120	250		mg/L	500	7/19/2017 7:44:45 PM	A44381
Bromide	2.3	0.15	1.0		mg/L	10	7/3/2017 9:41:00 PM	R43998
Phosphorus, Orthophosphate (As P)	ND	2.5	5.0	H	mg/L	10	7/19/2017 7:32:20 PM	A44381
Sulfate	1800	9.6	50		mg/L	100	7/3/2017 9:53:25 PM	R43998
Nitrate+Nitrite as N	1.1	0.52	4.0	J	mg/L	20	7/19/2017 8:46:49 PM	A44381
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Calcium	540	1.6	20		mg/L	20	7/12/2017 8:27:42 PM	C44171
Magnesium	150	5.0	20		mg/L	20	7/12/2017 8:27:42 PM	C44171
Potassium	230	2.3	20		mg/L	20	7/12/2017 8:27:42 PM	C44171
Sodium	4300	8.2	50		mg/L	50	7/13/2017 6:00:52 PM	B44206

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G37**

01-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2

Sample ID	**MB-C**	SampType:	**MBLK**	TestCode:	**EPA Method 200.7: Dissolved Metals**					
Client ID:	**PBW**	Batch ID:	**C44171**	RunNo:	**44171**					
Prep Date:		Analysis Date:	**7/12/2017**	SeqNo:	**1394698**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID	**LCSLL-C**	SampType:	**LCSLL**	TestCode:	**EPA Method 200.7: Dissolved Metals**					
Client ID:	**BatchQC**	Batch ID:	**C44171**	RunNo:	**44171**					
Prep Date:		Analysis Date:	**7/12/2017**	SeqNo:	**1394700**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.59	1.0	0.5000	0	119	50	150			J
Magnesium	0.53	1.0	0.5000	0	106	50	150			J
Potassium	0.50	1.0	0.5000	0	99.3	50	150			J
Sodium	0.51	1.0	0.5000	0	101	50	150			J

Sample ID	**LCS-C**	SampType:	**LCS**	TestCode:	**EPA Method 200.7: Dissolved Metals**					
Client ID:	**LCSW**	Batch ID:	**C44171**	RunNo:	**44171**					
Prep Date:		Analysis Date:	**7/12/2017**	SeqNo:	**1394702**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	52	1.0	50.00	0	103	85	115			
Magnesium	52	1.0	50.00	0	104	85	115			
Potassium	50	1.0	50.00	0	100	85	115			
Sodium	51	1.0	50.00	0	102	85	115			

Sample ID	**MB-B**	SampType:	**MBLK**	TestCode:	**EPA Method 200.7: Dissolved Metals**					
Client ID:	**PBW**	Batch ID:	**B44206**	RunNo:	**44206**					
Prep Date:		Analysis Date:	**7/13/2017**	SeqNo:	**1395435**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0								

Sample ID	**LCSLL-B**	SampType:	**LCSLL**	TestCode:	**EPA Method 200.7: Dissolved Metals**					
Client ID:	**BatchQC**	Batch ID:	**B44206**	RunNo:	**44206**					
Prep Date:		Analysis Date:	**7/13/2017**	SeqNo:	**1395438**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	0.54	1.0	0.5000	0	109	50	150			J

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G37**
01-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2

Sample ID	**LCS-B**	SampType: **LCS**		TestCode: **EPA Method 200.7: Dissolved Metals**						
Client ID:	**LCSW**	Batch ID: **B44206**		RunNo: **44206**						
Prep Date:		Analysis Date: **7/13/2017**		SeqNo: **1395441**		Units: **mg/L**				
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium		50	1.0	50.00	0	101	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G37**

01-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R43998**	RunNo: **43998**
Prep Date:	Analysis Date: **7/3/2017**	SeqNo: **1387038** 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								
Bromide	ND	0.10								
Sulfate	0.13	0.50								J
Nitrate+Nitrite as N	ND	0.20								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R43998**	RunNo: **43998**
Prep Date:	Analysis Date: **7/3/2017**	SeqNo: **1387039** 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	95.7	90	110			
Chloride	4.8	0.50	5.000	0	95.8	90	110			
Bromide	2.4	0.10	2.500	0	94.6	90	110			
Sulfate	9.7	0.50	10.00	0	96.6	90	110			
Nitrate+Nitrite as N	3.4	0.20	3.500	0	98.2	90	110			

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402926** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Orthophosphate (As P	0.30	0.50								J
Sulfate	0.15	0.50								J

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402927** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Orthophosphate (As P	4.6	0.50	5.000	0	92.7	90	110			
Sulfate	9.4	0.50	10.00	0	93.7	90	110			

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **A44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402953** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Phosphorus, Orthophosphate (As P	0.32	0.50								J

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G37**

01-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **A44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402953** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	ND	0.20								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **A44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402954** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.8	0.50	5.000	0	95.2	90	110			
Phosphorus, Orthophosphate (As P	4.8	0.50	5.000	0	96.4	90	110			
Nitrate+Nitrite as N	3.4	0.20	3.500	0	97.9	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R44455**	RunNo: **44455**
Prep Date:	Analysis Date: **7/21/2017**	SeqNo: **1405140** Units: **mg/L**

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

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R44455**	RunNo: **44455**
Prep Date:	Analysis Date: **7/21/2017**	SeqNo: **1405141** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	94.1	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **Western Refining Gallup** Work Order Number: **1706G37** RcptNo: **1**

Received By: **Richie Eriacho** **6/30/2017 10:30:00 AM**

Completed By: **Ashley Gallegos** **6/30/2017 1:43:58 PM**

Reviewed By: 6 7/3/17

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 ☐	# of preserved bottles checked for pH: 8 (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted? 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 ☐	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	2.2	Good	Yes			

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: SMW-2
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.2°C

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. 1706G37	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F^-,Cl^-,NO_3^-,NO_2^-,PO_4^{3-},SO_4^{2-})	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Major Cations/Anions				Air Bubbles (Y or N)
6/28/17	1310	WATER	SMW-2	125 mL Plastic-1	HNO_3	-001												✓				
				125 mL Plastic-1	H_2SO_4													✓				
				500 mL Plastic-1	NEAT													✓				
	1425	WATER	SMW-4	125 mL Plastic-1	HNO_3	-002												✓				
				125 mL Plastic-1	H_2SO_4													✓				
				500 mL Plastic-1	NEAT													✓				
	1445	WATER	EVAPORATION POND #2	Plastic-1 125 mL	HNO_3	-003												✓				
				125 mL Plastic-1	H_2SO_4													✓				
				500 mL Plastic-1	NEAT													✓				
	1505	WATER	EVAPORATION POND #3	125 mL Plastic-1	HNO_3	-004												✓				
				125 mL Plastic-1	H_2SO_4													✓				
				500 mL Plastic-1	NEAT													✓				

Date:	Time:	Relinquished by:	Received by:	Date	Time
6/29/17	8:00			6-29-17	8:00
6-29-17	11:00			6/30/17	1030

Remarks:

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.

Appendix G

LTA Subsurface Conditions

PRECISION ENGINEERING, INC.
P.O. BOX 422 • LAS CRUCES, NM 88004
Ph: (505) 523-7674
FAX: (505) 523-7248 • E-mail: werpei@aol.com

June 8, 1996

Mr. Ed Horst
Giant Refining Company
Ciniza Refinery
Route 3, Box 7
Gallup, New Mexico 87301

Re: LTA Subsurface Conditions

Dear Ed,

Attached is our summary of the geologic conditions at the Land Treatment Area. As you are aware our interpretation of the conditions was derived from all previous drilling that has been performed at the site as well as our work over the course of the past six years.

We would like to express our thanks to you and the rest of the Giant environmental staff. Without your assistance and professional cooperation in accumulating past data, our interpretations of the ground conditions would not have been possible.

If you have any questions or comments concerning our interpretations plese do not hesitate calling. We will be happy to discuss the matter with any project related personnel.

Sincerely,
Precision Engineering, Inc.

William H. Kingsley, P.E.

Introduction

The intent of this report is to provide a summary of stratigraphic conditions at the Land Treatment Area located in the northwest portion of the Ciniza Refinery property. The interpretations made are derived from the data of past investigations in the area as well as logs from borings and well installations performed by Precision Engineering, Inc. in the area of the refinery as well surface studies we have made on surrounding properties. All subsurface data in the area has been digitized and modeled as surfaces based on general environments of deposition.

Historical Interpretations

Past reports indicate the entire site is, in essence, a part of a highly weathered section of the Chinle Formation. An unconsolidated sandy stringer within this highly weathered shale formation was known to be water bearing. This unconsolidated sand was named the Ciniza Sand and is consistently referred to in reports after 1985. The nomenclature is local only and is not a documented bed name within the Chinle Formation. Some reports refer to the "Ciniza Sand" as a sandstone, however, it has never been shown to have any degree of cementation. Below the "Ciniza Sand" is a sandstone bed that lies within unweathered shale. This sandstone bed is known as the Sonsela Sandstone which is a documented unit name within the Chinle Formation. The bed is water bearing and represents a potential aquifer in the Ciniza area and is being used as an aquifer in the Bluewater area.

The Ciniza Sand was interpreted to vary in thickness below the Land Treatment Area. The zone was also thought to pinch out completely to the west and reach a maximum thickness of approximately five (5) feet in the south central portion of the Treatment Area.

The SMW well series was placed to monitor water quality in the "Ciniza Sand" since some water was encountered in the sands. The wells vary substantially in depth ranging from approximately forty six (46) feet at SMW-1 to seventy four (74) feet at SMW-5. Formation dip was used to explain the differences in depth initially, although it was later thought there may be two beds comprising the "Ciniza Sand".

The MW well series monitors the water from the Sonsela Sandstone. These wells range in depth from approximately one hundred twenty (120) to one hundred twenty seven (127) feet in depth.

Current Stratigraphic Interpretation

During the course of various subsurface investigations at the refinery site, including the Land Treatment Unit, inconsistencies were noted in the logs of early investigations and the

findings of more recent studies. One major inconsistency noted was that the depth to unweathered shale greatly varied from the OW series wells to all other findings. It was also noted that the upper fifty (50) to sixty (60) feet of sediments in the Land Treatment Unit did not match what should have been encountered in a weathered shale section of the Chinle Formation. As a result of the inconsistencies, the Land Treatment Area was modeled based on all borings that have been drilled in the area in an effort to accurately define the stratigraphy.

The results of the modeling show a much more complex subsurface environment than had originally been assumed. The upper fifty (50) to sixty (60) feet of sediments are not weathered in place sediments of the Chinle Formation. Although the sediments have a Chinle Formation parent material, the time of deposition is believed to be much later. Although not dated, the structure of the soils suggests a relatively recent fluvial environment of deposition. Charcoal is abundant in sandy sediments and occasionally encountered in the clay sediments. Some carbonate accumulation can be noted in the soils. No evidence of cementation of the sediments has been observed. It is believed dating would place the age of the sediments in the range of a few thousand years to a few tens of thousands of years - much younger than the Chinle Formation.

To a depth of approximately ten (10) feet the entire Land Treatment Area is comprised of a high density, high plasticity clay. Below the ten (10) foot depth and within the fluvial materials comprising the upper fifty (50) to sixty (60) feet of the valley floor below the Land Treatment Area is a sandy zone that extends roughly from the ten (10) foot depth to approximately the thirty to forty (40) foot depth. Grossly speaking the sandy unit can be subdivided in to two smaller units. The upper unit is about ten (10) feet thick and the lower unit is about ten (10) to fifteen (15) feet thick. On the south end of the Land Treatment Area the units are separated by a clay zone on the order of five (5) to ten (10) feet in thickness. On the north end of the treatment area the two zones become indistinguishable and appear as a single unit. Whether or not the upper or lower unit pinches out is not fully understood, however, it is suspected the upper unit thins and blends with the lower unit. It should be noted that the sandy zone is best described as interbedded very fine sands, silts and clays that should be expected to hydraulically interconnect. On the south end of the Treatment Area the lower sandy zone is water bearing below approximately the thirty (30) foot depth. To the north no water is encountered in this zone. The approximate extent of water in this zone may be represented by a line extending from the southwest corner of the Area to the northeast corner. Wells SMW-1, 2, and 3 derive their water from this zone. This zone is the original "Ciniza Sand" referred to in earlier work. This sandy zone represents channel deposition believed to be the result of infilling from the ancestral Rio Puerco or, more likely, derived from the Four Mile Canyon drainage system to the east of the Ciniza Refinery property. The channels of this zone trend roughly from northeast to southwest.

Below the sandy zone is a thick clay bed. The bed represents a very low energy environment likely as a result of flood plain deposits of the ancestral Rio Puerco. The clays are hard, high plasticity, moist to wet (but not water bearing) and brown to reddish

brown. Occasionally sample specimens show evidence of mud cracks indicating a wetted then dry environment after the initial deposition. No free water has ever been detected in this zone.

Immediately below the clay zone is another sand bed. The sand may or may not contain gravel made up of subrounded sandstone fragments, petrified wood, and rounded to subrounded multi-colored chert fragments one to two inches in greatest dimension. In some areas this bed is composed only of fine sand. The sands are red to brown. The bed thickness ranges from three (3) inches to one foot or more. Some logs indicate this zone up to three (3) feet in thickness, although records at Precision Engineering, Inc. only show these thicknesses apparent south and east of the Land Treatment Area. The significance of this bed is two fold. First, in all locations where this zone has been penetrated it has been water bearing. Secondly, it always lies immediately above shale or sandy shale of the upper portion of the Petrified Forest Member of the Chinle Formation. Water from this zone has never been shown to penetrate more than a few inches into the Chinle Formation. The shales below the zone are typically damp to dry; more often than not they are dry. This bed most likely represents alluvial deposition on the ancient exposed Chinle surface. It is felt this bed, at least in the refinery property area, may be used as a marker to represent the boundary between younger valley infilling and true Chinle Formation shales below.

Significantly, the thin sand bed described above is derived from a different environment of deposition. Hydraulic connection to the upper fluvial sands has, as yet, not been demonstrated and the two zones may not connect. Shallow Monitoring Wells (SMW) 4, 5, and 6 produce out of this zone. This bed has also been referred to as "Ciniza Sand" in earlier reports.

Shales and sandy shales of the Chinle formation lie below the valley fill materials. Approximately, thirty (30) to fifty (50) feet of shale lies between the valley fill and the Sonsela Sandstone bed that lies within the Chinle Formation. The sandstone is on the order of ten (10) to thirty (30) feet in thickness. The Sonsela Sandstone is water bearing at the refinery site and as stated earlier meets the definition of a potential aquifer.

The lower boundary of the Sonsela Sandstone is the extent of the modeling on this site. It is known from deep well logs that the Chinle Formation is on the order of seven hundred fifty (750) feet in thickness where deeper, established aquifers are encountered.

Summary

To summarize the current model of the stratigraphic section below the Land Treatment Area, a typical section through the area would be as follows:

The upper ten (10) feet of the site would be comprised of a dense dry to damp clay of high plasticity overlying two sequences of channel sands and silts separated by a clay zone on the order of five (5) to ten (10) feet in thickness. The channel sands would be expected

to be on the order of ten (10) to fifteen (15) feet in thickness each. The channel sands are actually interbedded sands, silts, and clays. Below the thirty (30) foot depth in the southern part of the LTA the sandy zone is water bearing. In the northern part the zones are not water bearing. A fifteen (15) to twenty (20) foot thick section of clay is encountered next. The clay is hard, highly plastic, not water bearing, and may show shrinkage cracking structure. Below this, a thin water bearing sand, gravel, or, sandy gravel composed of aggregates of mixed sources is encountered next and represents alluviation from the higher areas to the south into the valley. Below is generally unweathered shale for thirty (30) feet. The top of the shale should be encountered at an average of sixty (60) feet below the surface but may be as shallow as fifty (50) feet to the south and as deep as seventy (70) feet to the north. The water bearing Sonsela Sandstone is then encountered and should be from ten (10) to thirty (30) feet in thickness.

GRCC

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

Proposed Fire Water Storage

Rigid Wall Hydraulic Conductivity
Falling Head

ATTN: James Romero
Giant Refining Company
Route 3, Box 7
Gallup, NM 87301

Project: Ciniza Fire Water Lagoon — File No.: 05-100
Soil Type: Silty Clay — Date: October 13, 2005 — Lab No.: 47872
Sampled From: Boring 05-100-1(2.5'-3.0') — Performed By: GG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 120.8 pcf
Dry Unit Weight: 109.0 pcf

% Moisture: 10.8
% Compaction: n/a
% Compaction Requested: n/a

PROCTOR INFORMATION:

Maximum Dry Density: n/a pcf
Optimum Moisture Content: n/a %

Coefficient of Permeability, k_{20}: 1.1×10^{-7} cm/sec. avg

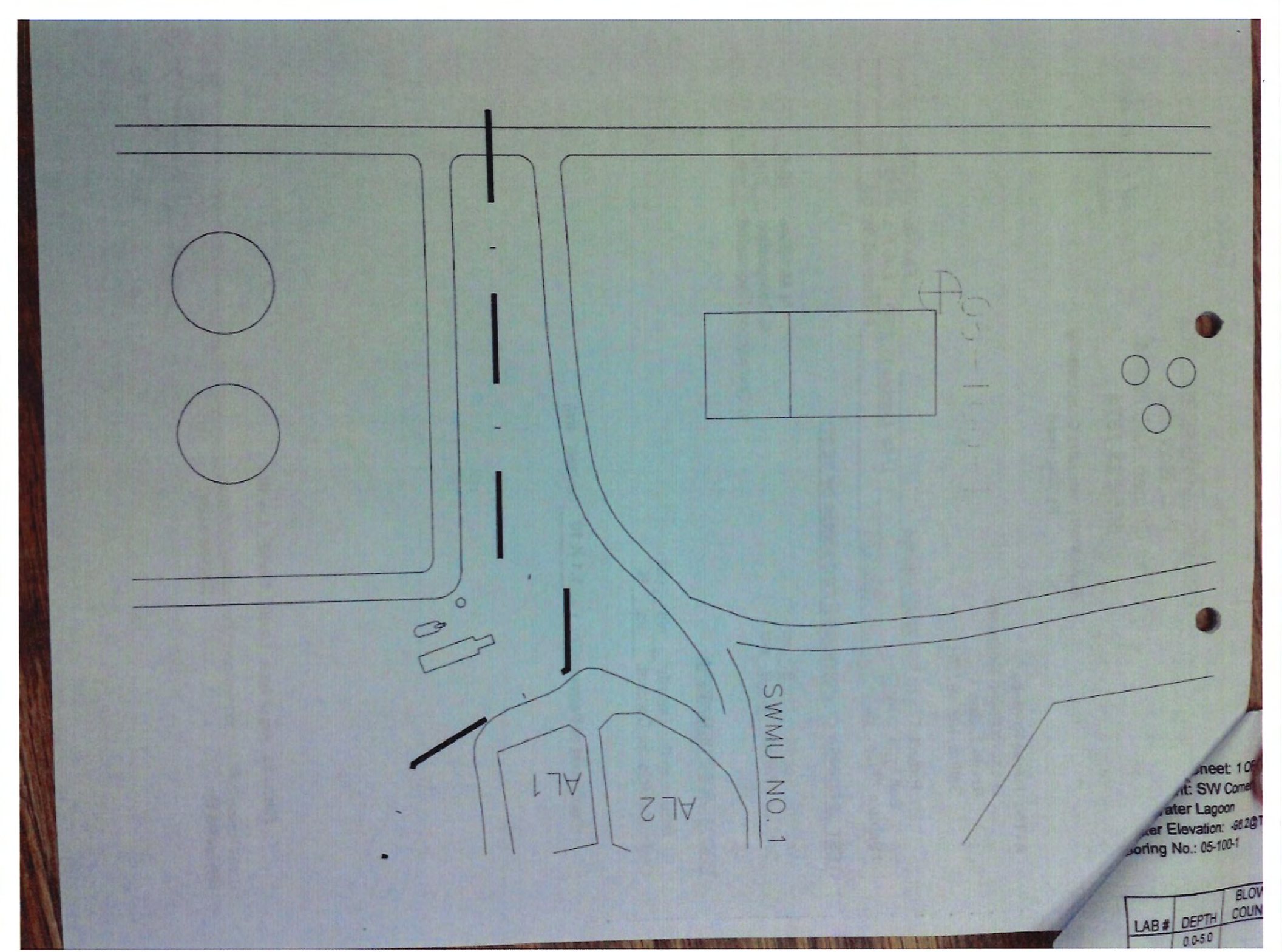
Remarks: Avg of three: 1.1×10^{-7}, 1.1×10^{-7}, 1.1×10^{-7}

C:\bill\Projects\2005\05100cinizafirewtr\[Permeability.xls]Report

Reviewed By:

Reviewed By:

Certified By:


SWMU NO. 1
AL1
AL2

SW Corner of Proposed
Lagoon
Elevation: -98.2@TD,-27@1 hr
Boring No.: 05-100-1

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #: 05-100
Site: Giant-Ciniza

Elevation: EXISTING
Date: 9/24/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
	0.0-5.0				Clay, Very Silty, Sandy, Very Fine, Dark Red, Wet, Firm				
47872				2.5	[2.5-3.0 hydraulic conductivity sample]				
	5.0-10.0			5.0	Same As Above, Wet, Soft				
				7.5					
	10.0-15.0			10.0	Same As Above				
	15.0-16.0			15.0	Same As Above				
	16.0-17.5				Sand, Very Fine, Very Clayey, Very Silty, Weak Water Bearing, Moderately Dense, Dark Red/Brown				
	17.5-21.5			20.0	Clay, Dark Red, Wet, Soft				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER LOGGED BY: WHK

C:\bill\Projects\2005\05100cinizafirewtr\[Boring 1.xls]Sheet1

Sheet: 2 OF 5
Bore Point: SW Corner of Proposed Fire Water Lagoon
Water Elevation:
Boring No.: 05-100-1

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #:
Site: Gi
Elevation: EXISTIN
Date: 9/24/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
	21.5-22.1				Clay, Sandy, Dark Brown, Wet, Stiff				
	22.1-23.5				Clay, Hard, Red/Brown (Brighter than Above), Wet/Moist				
	23.5-25.1				**Pertrified Forest Formation**				
					Mudstone/Claystone, Weathered, Some Grey/Green Reduction Spots, Generally Red/				
				25.0	Brown, Fissile to Crumbly, Damp/Moist				
	25.0-30.0				Mudstone, As Above, Few Reduction Spots, Damp/Dry				
				30.0					
	30.0-35.0				Same As Above dry				
				35.0					
	35.0-40.0				Same As Above dry				
				40.0					
	40.0-45.0				Same As Above, Brighter Red @ 44.5'-45.0', dry				
	41.5				siltstone/mudstone, dry, very dense,bright red brown				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER LOGGED BY: WHK

C:\bill\Projects\2005\05100c\nizafirewtr\[Boring 1.xls]Sheet1A

Sheet: 2 OF 5
Bore Point: SW Corner of Proposed Fire Water Lagoon
Water Elevation:
Boring No.: 05-100-1

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #:
Site: Gi
Elevation: EXISTIN
Date: 9/24/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
	21.5-22.1				**Clay**, Sandy, Dark Brown, Wet, Stiff				
	22.1-23.5				**Clay**, Hard, Red/Brown (Brighter than Above), Wet/Moist				
	23.5-25.1				**Pertrified Forest Formation** **Mudstone/Claystone**, Weathered, Some Grey/Green Reduction Spots, Generally Red/				
				25.0	Brown, Fissile to Crumbly, Damp/Moist				
	25.0-30.0				**Mudstone**, As Above, Few Reduction Spots, Damp/Dry				
				30.0					
	30.0-35.0				**Same As Above dry**				
				35.0					
	35.0-40.0				**Same As Above** dry				
				40.0					
	40.0-45.0				**Same As Above**, Brighter Red @ 44.5'-45.0', dry				
	41.5				siltstone/mudstone, dry, very dense,bright red brown				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER LOGGED BY: WHK

C:\bill\Projects\2005\05100cinizafirewtr\[Boring 1.xls]Sheet1A

Start: SW Corner of Proposed Lagoon

Elevation:

No.: 05-100-1

Date: 9/24/2005

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-623-7674

File #: 05-100
Site: Giant-Ciniza

Elevation: EXISTING
Date: 9/24/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
	45.0-50.0			45.0	**Mudstone/Siltstone**, Bright Red/Brown, Dry Very Dense				
	50.0-55.0			50.0	**Same As Above**				
	55.0-60.0			55.0	**Same As Above**				
	60.0-65.0			60.0	**Same As Above**				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER LOGGED BY: WHK

C:\bill\Projects\2005\05100cinizafirewtr\[Boring 1.xls]Sheet1B

Sheet: 4 OF 5
Bore Point: SW Corner of Proposed
Fire Water Lagoon
Water Elevation:
Boring No.: 05-100-1

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #
Site:
Elevation: EXIST
Date: 9/24/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
				65.0					
	65.0-66.2				**Same As Above**				
	66.2-67.4				**Sandstone**, Fine, Red/Brown, Hard, Fissile, Grey/Green Orbicular Reduction Spots Abundant, Dry				
	67.4-78.0				**Sandstone/Siltstone Interbeds**, Some Mudstone, Dark Red/Brown, Hard, Dry				
				70.0					
				75.0					
	78.0-79.1				**Mudstone**, Fissile, Dry, Red/Brown, Some Grey/Green Reduction Spots				
	79.1-97.7			80.0	**Sandstone**, Fine, Red/Brown, Fissile, Hard, Feldspathic, Bedded 6" to 1.0', White Mottled Upper Sonsela Member				
				85.0					

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER LOGGED BY: WHK

C:\bill\Projects\2005\05100cinizafirewtr\[Boring 1.xls]Sheet1C

Page 5 of 5

File #: 05-100-1
Site: SW Corner of Proposed Lagoon
Elevation:
Date: 9/24/2005

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #: 05-100
Site: Giant-Ciniza

Elevation: EXISTING
Date: 9/24/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS.
					Upper Sonsela Member Continued (dry)				
				90.0					
				95.0					
	97.7-98.2				**Mudstone**, Hard, Dry, Green/Grey-White				
	98.2-101.6			100.0	**Sandstone**, Fine to Medium, Quartz Grains, Water Bearing, Hard, (Sonsela Member, Petrified Forest Formation, Chinle Group)				
	101.6			105.0	TD Boring continuopusly sampled using 5' split barreled intrusion sampler. Boring closed using 10' of 3/8" TR-30 Pel Plug capped with 50' of 8% bentonite cement slurry and backfilled to the ground surface with cuttings.				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER

C:\bill\Projects\2005\05100cinizafirewtr\[Boring 1.xls]Sheet1D

LOGGED BY: WHK

Marathon Petroleum Company LP

August 9, 2019

Mr. John E. Kieling, Chief
New Mexico Environmental Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 87SOS-6303

RE: Response to Disapproval
Investigation Work Plan [SMW-2] and [GWM-1] Areas
Marathon Petroleum Company LP, Gallup Refinery
(dba Western Refining Southwest, Inc.)
EPA ID# NMD000333211
HWB-WRG-18-007

Dear Mr. Kieling:

Marathon Petroleum Company LP (dba Western Refining Southwest, Inc.) Gallup Refinery is submitting the enclosed responses to your comments dated February 20, 2019 on the referenced Investigation Work Plan. The Investigation Work Plan has been revised per your comments and enclosed for your review. If there are any questions, please call Brian Moore at 505-726-9745.

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,
Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks
Refinery General Manager

Enclosure

cc K. Van Horn NMED
C. Chavez NMOCD
B. Moore Marathon Gallup Refinery

92 Giant Crossing Road
Jamestown, NM 87347

RESPONSE TO COMMENTS
February 20, 2019 Disapproval - Investigation Work Plan [SMW-2] and [GWM-1] Areas (August 2018)

NMED Comment 1:
The cover letter is titled as *"Investigation Work Plan SMWU-1 and GMW-1"* while the Work Plan is titled as *"Investigation Work Plan SMW-1 & GMW-1 Areas."* The content of the Work Plan suggests that the title of the submittal may be *"Investigation Work Plan SMW-2 and GWM-1 Areas"*. Accordingly, NMED revised the title of the Work Plan for the purpose of correspondence. However, if the intended subject of this submittal is different, the Permittee may change the title. The title of all future documents must be reviewed before submittal to NMED to ensure that they do not contain typographical errors. Revise the title of the Work Plan, as appropriate.

MPC Response 1:
The title of the Work Plan has been changed to *Investigation Work Plan SMW-2 & GWM-1 Areas*.

NMED Comment 2:
The cover letter states that NMED's Comments 2, 8, and 9 in the June 4, 2018 *Disapproval of Annual Groundwater Monitoring Report- Gallup Refinery 2016,* required the Permittee to prepare a work plan. Comment 2 in the *Disapproval* is pertinent to the discussion of SPH in well RW-1 and outside of the scope of this Work Plan. Comment 2 was addressed in separate submittals. Revise the cover letter to remove reference to Comment 2.

MPC Response 2:
We acknowledge that this Work Plan does not address Comment 2 in the referenced June 4, 2018 letter. There is no further reference to said Comment 2 in this cover letter.

NMED Comment 3:
In the *Executive Summary* and Section 2.2, *GMW-1 [sic} Area,* the Permittee states, "[i]n September 2015, a material apparently resembling separate-phase hydrocarbons (SPH) was observed in the well (GWM-1] for the first time." According to NMED's letter titled *Requirement to Remove Separate Phase Hydrocarbons and Monitor Groundwater Monitoring Well GWM-1,* dated October 28, 2015, the results of hydrocarbon fingerprint analysis indicated that the material resembling SPH collected from well GWM-1 consisted of 68% diesel range organics and 18% motor oil range organics. The material observed in well GWM-1 was SPH. Revise the statements and include information from the 2015 analysis in the revised Work Plan.

MPC Response 3:
The statements in the Executive Summary (page E-1) and Section 2.2 (page 2-2) are revised and the information from the 2015 analysis and a 2019 analysis of the SPH is included in the revised Work Plan (Appendix C).

NMED Comment 4:
In Section 2.1, *SMW-2 Area* first paragraph, the Permittee states, "[t]he results for SMW-2 provided in Table 1 indicate the detection of chloride, sulfate, manganese, and uranium at concentrations above the applicable screening levels per the RCRA Permit." Table 1, *SWM-2 [sic] and GWM-1 Area Water Analyses,* does not list concentrations of manganese and uranium. Table 1 must be corrected to provide the detected concentrations of the referenced constituents in

the revised Work Plan.

MPC Response 4:
Table 1 is revised to include reported concentrations of manganese and uranium.

NMED Comment 5:
In Section 2.1, *SMW-2 Area* second paragraph, the Permittee states, "[i]t is noted that the area where the NMOCD Landfarm is currently located appears to overlie former Evaporation Pond #10 (Figure 3)." Figure 3, *Sulfate and Chloride Concentrations* does not present the locations of NMOCD Landfarm or former Evaporation Pond #10. Revise the figure to depict these locations and provide the revised Work Plan. In addition, NMED's Comment 2 in the *Approval with Modifications September and October 2016 Chloride Exceedance Excavation Report Central Oil Conservation Division Land/arm,* dated March 17, 2017 directed the Permittee to provide the dimensions of the pond and landfarm and documents from OCD related to use of the evaporation pond as a landfarm. Provide the information in the revised Work Plan. Furthermore, the response to March 17, 2017 *Approval with Modifications* should have been submitted to NMED by April 1, 2017; however, NMED's administrative record indicates that the Permittee has not submitted the response. The Permittee must respond to the March 17, 2017 letter by **April 5, 2019.**

MPC Response 5:
The response to the March 17, 2017 *Approval with Modifications* letter was previously submitted to NMED on April 11, 2019. As requested, Figure 3 has been revised to depict the location of the NMOCD Landfarm and suspected location of former Evaporation Pond #10. The approximate dimensions of the pond and landfarm (375 feet by 225 feet) are included in Section 2.1 (page 2-1).

NMED Comment 6:
In Section 2.1, *SMW-2 Area* third paragraph, the Permittee states, "(a] review of the boring/well completion logs for SMW-2 and SMW-4, as well as other wells in the immediate area, indicates that well SMW-4 is screened in the transmissive media (e.g., sands) that directly overlie the Chinle bedrock. A copy of the boring logs for SMW-2 and SMW-4 are included in Appendix A. The screened interval in well SMW-2 appears to include not only any transmissive materials on top of the bedrock, but also some of the upper sands." Soil boring logs for SMW-2 and SMW-4 are included in Appendix A, *Boring Logs;* however, well construction diagrams for these wells are not included. Provide well construction diagrams for SMW-2 and SMW-4 in the revised Work Plan. In addition, boring log SMW-2 indicates that the total depth of the boring is 40 feet below ground surface (bgs). According to Table 2, *Fluid Level Measurements,* the depth of screened interval in SMW-2 is recorded as 34.31 - 54.31 feet bgs. Provide an explanation for the discrepancy in the revised Work Plan. Furthermore, the soil boring log SMW-2 does not appear to indicate the presence of bedrock or to include screened interval over upper sand lenses present above 34 feet bgs. Provide a clarification for the statement in the revised Work Plan.

MPC Response 6:
The well construction diagram for SMW-2 has been added to Appendix A. The well construction diagram for SMW-4 could not be located; however, documentation of the elevations of the well screens in SMW-2 and SMW-4 were located in the 1990 Annual Groundwater Monitoring Report and this documentation has been added to Appendix A.

Based on the available information, it is apparent that SMW-2 was drilled deeper than recorded on the available boring log. This confirmed by recent field measurements of the well depth indicating depths greater than 52 feet, while the boring log only extends to a depth of 40 feet. The depth on the SMW-2 well completion log is also generally consistent with actual field measurements. As noted by NMED, the well screen in SMW-2 does not appear to extend to the sand intervals above 34 feet bgs. The Work Plan notes that the screened interval includes "some of the upper sands" (e.g., the sand that extends from 33 to 38 feet bgs. Additional clarifying information is included in Section 2.1 (page 2-2)

NMED Comment 7:
In Section 2.1, *SMW-2 Area* fourth paragraph, the Permittee states, "[i]n response to NMED's request [sic] for additional wells in the area to evaluate the source of chloride and sulfate, two new wells (OW-59 and OW-60) were installed up-gradient ofSMW-2 in September 2016." NMED reviewed a work plan titled *Work Plan SMW-2 Area Investigation and Boundary Well Installations,* dated October 2016 and issued an *Approval with Modifications,* dated March 17, 2017. The Permittee references monitoring wells OW-59 and OW-60, which were installed near the OCD Landfarm, in tl1e work plan. However, the Permittee has not submitted the investigation report associated with an installation of those wells. The Permittee must submit the investigation report for the SWM-2 Area Investigation and Boundary Well Installations before NMED can complete a review this Work Plan. Submit an investigation report for the SMW-2 Area Investigation and Boundary Well Installations to NMED for review no later than **April 5, 2019.**

MPC Response 7:
The requested Investigation Report was sent on April 4, 2019 for delivery to MMED and MNOCD by April 5, 2019.

NMED Comment 8:
In Section 2.1, *SMW-2 Area* fifth paragraph, the Permittee states, "[b]oth the chloride and sulfate concentrations increased across the OCD landfarm area, but even higher chloride concentrations are up-gradient in well STP1-NW that is located east of Evaporation Pond No. 2. The sulfate concentrations observed in OW-59, at the down-gradient end of the OCD landfarm, are the highest observed in groundwater in the area. The sulfate concentrations in the groundwater sample collected at OW-59 are also higher than the historic sulfate concentrations in Evaporation Ponds 2 and 3 dating back to 2010." STP1-NW is located on the hill near pond STP-1 and most likely is capturing water from STP-1, rather than any other upgradient sources. Water from STP-1 as well as contaminant migration from the OCD Landfarm may be contributing to the elevated chloride and sulfate levels. In order to assess potential source areas for the elevated chloride and sulfate levels, provide a topographic map that includes the area in the vicinity of the OCD Landfarm, pond EP-10, pond STP-1 and pond EP-2 in the revised Work Plan. The map must be at a scale adequate to depict subtle changes in elevation contours. Also, explain whether the OCD Landfarm is still in active and if so provide a description of the activities associated with it. If the OCD Landfarm is determined to be the source of chloride and sulfate in groundwater, propose to submit a work plan to mitigate the issue (e.g., source removal). The OCD has regulatory authority regarding the chloride and sulfate exceedances in groundwater. Ensure that OCD is included on all correspondence related to this issue.

MPC Response 8:
A new figure (Figure 4) has been added to show the surface topography in the requested areas and is referenced in Section 3.1. Previous Figure 4 is now Figure 5. The OCD Landfarm is not active and this is now noted in Section 2.1 (fifth paragraph).

NMED Comment 9:
In Section 4.1, *SMW-2 Investigation,* the Permittee states, "[e]ach well will be screened in the upper-most saturated interval(s) with a maximum screen length of 10 feet. Due to concerns over the construction of SMW-2 using a 20-foot well screen, which possibly allows cross-communication between separate zones (upper sands vs. Chinle/alluvial Interface), care will be taken to avoid screening across intervals that may not otherwise be in hydraulic communication." NMED's Comment 8 in the June 4, 2018 *Disapproval* states, "[p]ropose to investigate whether wastewater is leaking from the northern perimeter or bottom of pond EP-2 through a work plan." The proposed locations of the two wells appear appropriate to detect potential leaks from pond EP-2; however, these wells must be screened across the depths corresponding to the base of pond EP-2. Presumably, pond EP-2 is relatively shallow and more comparable to the depths where the upper sands are present. Evaluate the depth of pond EP-2 and install the well screens at depths where the screens can detect potential leaks from the perimeter and bottom of pond EP-2. In addition, in order to accommodate the decreasing trend of groundwater elevations in recent years, a longer screened interval (e.g., 20-foot screen) may be more appropriate. The screened intervals of the proposed wells must also intersect the water table. Discuss the screened interval in the revised Work Plan.

MPC Response 9:
The discussion in Section 4.1 (page 4-1) is revised to incorporate the requirements above regarding well screen placement. We estimate the depth of EP-2 could range from 8 to 13 feet below ground level as measured from the north of the pond berms in the vicinity of the proposed wells. This will be taken into account when selecting the depth for well screen placement, along with indications of moist to saturated conditions (i.e., the potential for groundwater production).

NMED Comment 10:
In Section 4.2, *Installation of Well near GMW-1 [sic],* the Permittee states, "[a] new shallow monitoring well will be installed to the west of GWM-1, approximately halfway between the former Aeration Basin and EP-2 (Figure 4). The well will be screened just above the Chinle bedrock in the Chinle/Alluvial Interface zone." NMED's Comment 9 in the June 4, 2018 *Disapproval* directs the Permittee to propose to install a monitoring well downgradient from well GWM-1 to evaluate the extent of SPH in the shallow aquifer. Note that the screened interval of the proposed well must intersect the water table to assess presence or absence of SPH. Include the provision in the revised Work Plan.

MPC Response 10:
The discussion in Section 4.2 (page 4-1) is revised to note the well screen will be placed to intersect the water table.

NMED Comment 11:
In Section 4.3, *Soil Sample Field Screening and Logging,* the Permittee states, "[a]lthough the borings are being drilled at locations outside known areas of concern, Western will collect soil samples for laboratory analysis if screening indicates the potential for site impacts." Whether or not field screening results indicates potential impacts, the Permittee must collect at least one soil sample per boring at the depth corresponding to the capillary fringe for laboratory analyses. The

analyses required for the samples must include all contaminants of potential concern. Additionally, it is the Permittee's responsibility to investigate outside "known areas of concern" in order to evaluate contaminant migration from SWMUs or AOCs. It is not acceptable to only collect samples when field screening indicates potential impacts. Revise the Work Plan to include the requirement.

MPC Response 11:
The discussion in Section 4.3 (page 4-2) has been revised to include, at a minimum, the collection of soil samples from the capillary fringe at each boring.

NMED Comment 12:
In Section 4.3.1, *Drilling Activities,* the Permittee states, "[s]lotted (0.01 inch) PVC well screen will be placed at the bottom of the borings and will extend for 10 feet." Comment 9 states, "in order to accommodate [the] decreasing trend of groundwater depth in recent years, a longer screened interval (e.g., 20-foot screen) may be more appropriate." Revise the Work Plan, if appropriate.

MPC Response 12:
The Work Plan is revised in Section 4.3.1 (page 4-3) to provide for the use of longer well screens, as appropriate, to meet the objectives for well screen placement discussed previously in Sections 4.1 and 4.2.

NMED Comment 13:
In Section 4.4, *Groundwater Sample Collection,* the Permittee states, "[g]roundwater samples will be collected from the new monitoring wells within 24 hours of the completion of well purging using disposable bailers. Alternatively, well sampling may also be conducted in accordance with the NMED's Position Paper Use of Low-Flow and other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring (October 30, 2001, as updated). Sample collection methods will be documented in the field monitoring reports. The samples will be transferred to the appropriate, clean, laboratory-prepared containers provided by the analytical laboratory." Prior to collection of groundwater samples for laboratory analyses, the Permittee must measure depth to water (DTW), the total depths of each well, and collect groundwater quality parameter data (e.g., dissolved oxygen, pH, temperature, conductivity, redox potential, turbidity) during well purging. Include descriptions of the field procedures in the revised Work Plan. In addition, the discussion regarding well development is not included in the Work Plan. Include a discussion of well development and monitoring methods in the revised Work Plan.

MPC Response 13:
The discussion in Section 4.4 (page 4-3) is revised to clarify that the depth to water and total well depth are measured prior to well purging. In addition, new Appendix D is added to address well purging and development.

NMED Comment 14:
In Section 4.7, *Chemical Analyses,* the Permittee states, "[g]roundwater samples will also be analyzed for major cations (calcium, magnesium, sodium, and potassium) and anions (e.g., carbonate, bicarbonate, sulfate, fluoride and chloride)." The listed cations and anions are not included in the table titled as Inorganic Analytical Methods (page 4-7). Revise the table to include all inorganic constituents that will be analyzed. In addition, groundwater samples must

also be analyzed for nitrate and nitrite. Include the nitrate and nitrite analyses for groundwater samples in the revised Work Plan.

MPC Response 14:
Section 4.7 (page 4-8) is revised to list the subject cations and anions in the included table, along with nitrate and nitrite.

Work Plan
SMW-2 and GWM-1 Areas

Marathon Petroleum Company LP

Gallup Refinery
Marathon Petroleum Company
Gallup, New Mexico

EPA ID# NMD000333211

AUGUST 2018

(Revised AUGUST 2019)

Scott Crouch
Senior Geologist

DiSorbo
Environmental Consulting Firm

8501 North Mopac Expy | Suite 300 | Austin, TX 78759
512.693.4190 (P) | 512.279.3118 (F) | www.disorboconsult.com

Table of Contents

List of Acronyms i

Executive Summary 1

Section 1 Introduction 1-1

Section 2 Background 2-1

2.1 SMW-2 Area 2-1

2.2 GWM-1 Area 2-3

Section 3 Site Conditions 3-1

3.1 Surface Conditions 3-1

3.2 Subsurface Conditions 3-1

Section 4 Scope of Services 4-1

4.1 SMW-2 Investigation 4-1

4.2 Installation of Well near GWM-1 4-1

4.3 Soil Sample Field Screening and Logging 4-1

4.3.1 Drilling Activities 4-3

4.4 Groundwater Sample Collection 4-3

4.4.1 Sample Handling 4-4

4.5 Collection and Management of Investigation Derived Waste 4-5

4.6 Documentation of Field Activities 4-6

4.7 Chemical Analyses 4-7

4.8 Data Quality Objectives 4-8

Section 5 References 5-1

List of Tables

Table 1 SMW-2 and GWM-1 Area Water Analyses

Table 2 Fluid Level Measurements

List of Figures

Figure 1 Site Location Map

Figure 2 Chinle/Alluvial Interface Potentiometric Map

Figure 3 Sulfate and Chloride Concentrations Map

Figure 4 Topographic Map

Table of Contents (Continued)

Figure 5 Proposed Monitoring Well Locations

Appendices

Appendix A Boring Logs

Appendix B Investigation Derived Waste Management Plan

Appendix C Analyses of SPH at GWM-1

Appendix D Well Development and Purging Procedures

List of Acronyms

benzene, toluene, ethylbenzene, and xylene (BTEX)
Code of Federal Regulations (CFR)
Contract Laboratory Program (CLP)
data quality objective (DQO)
diesel range organics (DRO)
dilution attenuation factor (DAF)
Environmental Protection Agency (EPA)
investigation derived waste (IDW)
Maximum Contaminant Level (MCL)
mean sea level (msl)
monitoring well (MW)
motor oil range organics (MRO)
methyl tert butyl ether (MTBE)
New Mexico Administrative Code (NMAC)
New Mexico Environment Department (NMED)
New Mexico Oil Conservation Division (NMOCD)
photoionization detector (PID)
polynuclear aromatic hydrocarbon (PAH)
polyvinyl chloride (PVC)
quality assurance/quality control (QA/QC)
Resource Conservation and Recovery Act (RCRA)
separate-phase hydrocarbon (SPH)
semi-volatile organic compound (SVOC)
Solid Waste Management Unit (SWMU)
total petroleum hydrocarbon (TPH)
toxicity characteristic leaching procedure (TCLP)
volatile organic compound (VOC)

Executive Summary

The Gallup Refinery, which is located 17 miles east of Gallup, New Mexico, has been in operation since the 1950s. Pursuant to the terms and conditions of the facility Resource Conservation and Recovery Act (RCRA) Post-Closure Care Permit and 20.4.1.500 New Mexico Administrative Code, this Investigation Work Plan has been prepared for the area near the on-site evaporation ponds, specifically the area near well SMW-2 and Evaporation Pond No. 2. This area was initially identified by the New Mexico Environment Department (NMED) in comment letters regarding the 2013 and 2014 Annual Wide Ground Water Monitoring Reports as requiring additional groundwater monitoring wells and again in the a comment letter on the 2016 Annual Ground Water Monitoring Report

Groundwater samples collected from monitoring well SMW-2 have shown concentrations of chloride and sulfate above screening levels. SMW-2 is down-gradient of a nearby landfarm area and potentially the on-site evaporation ponds. In response to NMED's first request for additional monitoring wells, two new observation wells (OW-59 and OW-60) were installed up-gradient of SMW-2 in September 2016. Groundwater samples collected from these new wells confirmed the presence of chloride and sulfate above screening levels in the area of the landfarm that is authorized by the New Mexico Oil Conservation Division (NMOCD). This effort will further evaluate Evaporation Pond No. 2 (EP - 2) as a potential source of the elevated concentrations of chloride and sulfate detected at well SMW-2. To accomplish this objective, two new permanent monitoring wells will be installed immediately down-gradient of EP-2.

Monitoring well GWM-1 is located on the top of the dike that forms the western boundary of the former Aeration Basin (Solid Waste Management Unit No. 1) and lies a short distance to the east of EP-2. Groundwater samples collected at GWM-1 have routinely contained low concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl tert butyl ether (MTBE) with benzene exceeding the screening level. In September 2015, separate-phase hydrocarbons (SPH) was observed in the well for the first time. Based on the presence of this material, a new well will be installed to the west of GWM-1, halfway between the Aeration Basin and EP-2.

Section 1
Introduction

The Gallup Refinery is located approximately 17 miles east of Gallup, New Mexico along the north side of Interstate Highway I-40 in McKinley County. The physical address is I-40, Exit #39 Jamestown, New Mexico 87347. The Gallup Refinery is located on 810 acres. Figure 1 presents the refinery location and the regional vicinity.

The Gallup Refinery generally processes crude oil from the Four Corners area transported to the facility by pipeline or tanker truck. Various process units are operated at the facility, including crude distillation, reforming, fluidized catalytic cracking, alkylation, sulfur recovery, merox treater, and hydrotreating. Current and past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, and residual fuel.

This investigation work plan addresses the area up-gradient of monitoring well SMW-2 and immediately down-gradient of EP-2, and the area between the former Aeration Basin and EP-2. The purposes of this investigation are to:

- determine the source of the elevated concentrations of chloride and sulfate detected in groundwater samples collected at SMW-2; and
- evaluate the extent of SPH that has been observed in GWM-1.

The investigation activities will be conducted in accordance with Section IV.H.5 of the Post-Closure Care Permit.

Section 2
Background

This section presents background information for the area of the refinery property near monitoring well SMW-2 and GWM-1, including a review of historical waste management activities to identity the following:

- Type and characteristics of all waste and all contaminants handled in the subject areas;
- Known and possible sources of contamination;
- History of operations; and
- Prior investigations.

2.1 SMW-2 Area

Monitoring well SMW-2 is located immediately south of the closed Land Treatment Unit (LTU). This well is not included in the RCRA Permit as part of the detection or shallow monitoring well networks, but groundwater samples are routinely collected and analyzed per the Facility-Wide Ground Water Monitoring Plan. Well SMW-2 is located on the up-gradient end of the LTU. Analytical results for groundwater samples collected since 2010 are included in Table 1. Also included in Table 1 are the analytical results for groundwater samples collected in SMW-4, which is located on the north (down-gradient) end of the LTU. The results for SMW-2 provided in Table 1 indicate the detection of chloride, sulfate, manganese, and uranium at concentrations above the applicable screening levels per the RCRA Permit. Uranium was also detected in groundwater samples collected from SMW-4 at concentrations above the screening level. MTBE has been detected in groundwater samples collected at SMW-2, but has remained below the screening level (NMED, 2017).

Well SMW-2 is located down-gradient of the Central Landfarm Area, which is permitted by the New Mexico Oil Conservation Division (NMOCD) and also potentially down-gradient of the evaporation ponds (Figure 2). It is noted that the area where the NMOCD Landfarm is currently located appears to overlie former Evaporation Pond #10 (Figure 3). The dimensions of the landfarm are approximately 375 feet by 225 feet. According to information provided in the *Inventory of Solid Waste Management Units,* cell or Evaporation Pond #10 was used for wastewater from the boiler house and water softener regeneration wastes, but did not receive process wastewater discharges through the API Separator. The process of discharging directly to Evaporation Pond #10 was

replaced with the addition of a neutralization tank in 1980 (Geoscience Consultants, Ltd., 1985a). Evaporation Pond #10 was no longer in service in 1985 based on information provided in the 1985 *Discharge Plan Application* (Geoscience Consultants, Ltd., 1985b).

A review of the boring/well completion logs for SMW-2 and SMW-4, as well as other wells in the immediate area, indicates that well SMW-4 is screened in the transmissive media (e.g., sands) that directly overlie the Chinle bedrock. A copy of the boring logs for SMW-2 and SMW-4 are included in Appendix A. The well completion log is included for SWMU-2, which indicates the well screen extending from a depth of approximately 34 feet to 54 feet below ground level. It is noted that the soil boring log for SMW-2 is only recorded to a depth of 40 feet, while the well was apparently drilled deeper to allow for well screen placement to a depth of 54 feet. The screened interval in well SMW-2 appears to include not only any transmissive materials on top of the bedrock, but also some of the upper sands (e.g., a sand interval logged from 33 feet to 38 feet bgs). While the well completion log for SMW-4 could not be located for inclusion in Appendix A, documentation of the elevations of the top and bottom of the well screen were located in the *1990 Annual Ground Water Report* and these "Monitoring Well Identification Reports" are included for both SMW-2 and SMW-4 (Giant, 1991). Water levels measured in the nearby wells are provided in Table 2 and a map showing the potentiometric surface measured in the shallow wells is included as Figure 2.

In response to NMED's request for additional wells in the area to evaluate the source of chloride and sulfate, two new wells (OW-59 and OW-60) were installed up-gradient of SMW-2 in September 2016. Groundwater samples collected from these new wells confirmed the presence of chloride and sulfate above screening levels up-gradient of SMW-2 and in the area of the landfarm that is authorized by the New Mexico Oil Conservation Division (NMOCD). The analyses are summarized in Table 1 and shown on Figure 3. The boring/well completion logs for OW-59 and OW-60 are included in Appendix A.

Both the chloride and sulfate concentrations increased across the OCD landfarm area, but even higher chloride concentrations are up-gradient in well STP1-NW that is east of Evaporation Pond No. 2. The sulfate concentrations observed in OW-59, at the down-gradient end of the OCD landfarm, are the highest observed in groundwater in the area. The sulfate concentrations in the groundwater sample collected at OW-59 is also higher than the historic sulfate concentrations in Evaporation Ponds 2 and 3 dating back to 2010. The OCD landfarm is currently not active.

2.2 GWM-1 Area

Monitoring well GWM-1 is located on the top of the dike that forms the western boundary of the former Aeration Basin (Solid Waste Management Unit No. 1). This well was installed in 2004 and is screened in the Chinle/Alluvial Interface zone. The boring/well completion log is included in Appendix A. The groundwater samples collected at GWM-1 have routinely detected low concentrations of BTEX and MTBE with benzene exceeding the screening level (Table 1). In September 2015, separate-phase hydrocarbons (SPH) was observed in the well for the first time. A sample of the SPH was collected on September 18, 2015 and submitted to Hall Environmental for analysis by Method 8015. The analytical report is included in Appendix C and indicated diesel range organics (DRO) at 68 weight percent and motor oil range organics (MRO) 18 weight percent. Another sample was collected April 9, 2019 and also sent to Hall Environmental for analysis by Method 8015. The lab interpreted the sample to be "mostly diesel range and lower amount of motor oil range hydrocarbons." Based on the presence of this material, a request was made for a new well to the west of GWM-1, halfway between the Aeration Basin and EP-2.

Section 3
Site Conditions

3.1 Surface Conditions

Site topographic features include high ground in the southeast gradually decreasing to a lowland fluvial plain to the northwest. The surface topography of the area of investigation is shown in Figure 4. Elevations on the refinery property range from 7,040 feet to 6,860 feet. Surface soils within most of the area of investigation are primarily Rehobeth silty clay loam. Rehobeth soil properties include a pH ranging from 8 to 9 standard units and salinity (naturally occurring and typically measuring up to approximately 8 mmhos/cm).

Regional surface water features include the refinery evaporation ponds and a number of small ponds (one cattle water pond and two small unnamed spring fed ponds). The site is located in the Puerco River Valley, north of the Zuni Uplift with overland flows directed northward to the tributaries of the Puerco River. The Puerco River continues to the west to the confluence with the Little Colorado River. The South Fork of the Puerco River is intermittent and retains flow only during and immediately following precipitation events.

3.2 Subsurface Conditions

The shallow subsurface soils consist of fluvial and alluvial deposits comprised of clay and silt with minor inter-bedded sand layers. Very low permeability bedrock (e.g., claystones and siltstones) underlie the surface soils and effectively form an aquitard. The Chinle Group, which is Upper Triassic, crops out over a large area on the southern margin of the San Juan Basin. The uppermost recognized local Formation is the Petrified Forest Formation and the Sonsela Sandstone Bed is the uppermost recognized regional aquifer. Aquifer test of the Sonsela Bed northeast of Prewitt indicated a transmissivity of greater than 100 ft^2/day (Stone and others, 1983). The Sonsela Sandstone's highest point occurs southeast of the site and slopes downward to the northwest as it passes under the refinery. The Sonsela Sandstone forms a water-bearing reservoir with artesian conditions throughout the central and western portions of the refinery property.

The diverse properties and complex, irregular stratigraphy of the surface soils across the site cause a wide range of hydraulic conductivity ranging from less than 10^{-2} cm/sec for gravel like sands immediately overlying the Petrified Forest Formation to 10^{-8} cm/sec in the clay soils located near the

surface (Western, 2009). Generally, shallow groundwater at the refinery follows the upper contact of the Petrified Forest Formation with prevailing flow from the southeast to the northwest, although localized areas may have varying flow directions (Figure 2). Fluid level measurements for wells in the immediate area are included in Table 2.

Section 4
Scope of Services

The site investigation of groundwater will be conducted to determine the source of elevated chloride and sulfate concentrations detected in groundwater samples collected at SMW-2. An additional monitoring well will be installed to the west of GWM-1 to delineate SPH on the west side of the former Aeration Basin. The investigation will commence upon approval of this investigation work plan by NMED.

4.1 SMW-2 Investigation

An investigation of groundwater conditions in the area near SMW-2 is proposed to determine the source of chloride and sulfate detected in groundwater samples collected at SMW-2. Two new shallow monitoring wells are proposed north and northwest of EP-2 (Figure 5). One well will be located near existing well MW-4, which is completed in the Sonsela aquifer, and a second well north of EP-2, approximately halfway between MW-4 and OW-60.

Each well will be screened in the upper-most saturated interval(s) with a maximum screen length of 20 feet. Due to concerns over the construction of SMW-2 using a 20-foot well screen, which possibly allows cross-communication between separate zones (upper sands vs. Chinle/alluvial Interface), care will be taken to avoid screening across intervals that may not otherwise be in hydraulic communication. In addition, wells will be screened across the depths corresponding to the base of pond EP-2 if there is any indication of the presence of groundwater at these depths. These depths are estimated to range from 8 feet to 13 feet bgs.

4.2 Installation of Well near GWM-1

A new shallow monitoring well will be installed to the west of GWM-1, approximately halfway between the former Aeration Basin and EP-2 (Figure 5). The well will be screened just above the Chinle bedrock in the Chinle/Alluvial Interface zone and placed to ensure it will intersect the water table.

4.3 Soil Sample Field Screening and Logging

Samples obtained from the soil borings will be screened in the field on 2.0 foot intervals for evidence of contaminants. Field screening results will be recorded on the exploratory boring logs. Field screening results will be used to aid in the possible selection of soil samples for laboratory analysis.

The primary screening methods include: (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds.

Visual screening includes examination of soil samples for evidence of staining caused by petroleum-related compounds or other substances that may cause staining of natural soils such as elemental sulfur or cyanide compounds. Headspace vapor screening targets volatile organic compounds and involves placing a soil sample in a plastic sample bag or a foil sealed container allowing space for ambient air. The container will be sealed and then shaken gently to expose the soil to the air trapped in the container. The sealed container will be allowed to rest for a minimum of 5 minutes while vapors equilibrate. Vapors present within the sample bag's headspace will then be measured by inserting the probe of the instrument in a small opening in the bag or through the foil. The maximum value and the ambient air temperature will be recorded on the field boring or test pit log for each sample.

The monitoring instruments will be calibrated each day to the manufacturer's standard for instrument operation. A photoionization detector (PID) equipped with a 10.6 or higher electron volt (eV) lamp or a combustible gas indicator may be used for VOC field screening. Field screening results may be site- and boring-specific and the results may vary with instrument type, the media screened, weather conditions, moisture content, soil type, and type of contaminant, therefore, all conditions capable of influencing the results of field screening will be recorded on the field logs.

Although the borings are being drilled at locations outside known areas of concern, soil samples will be collected at the capillary fringe in each boring at a minimum and addition soil samples will be collected for laboratory analysis if screening indicates the potential for site impacts. The physical characteristics of the samples (such as mineralogy, ASTM soil classification, moisture content, texture, color, presence of stains or odors, and/or field screening results), depth where each sample was obtained, method of sample collection, and other observations will be recorded in the field log by a qualified geologist or engineer. Detailed logs of each boring will be completed in the field by a qualified engineer or geologist. Additional information, such as the presence of water-bearing zones and any unusual or noticeable conditions encountered during drilling, will be recorded on the logs.

Quality Assurance/Quality Control (QA/QC) samples will be collected to monitor the validity of the soil sample collection procedures as follows:

- Field duplicates will be collected at a rate of 10 percent; and

- Equipment blanks will be collected from all sampling apparatus at a frequency of one per day.

4.3.1 Drilling Activities

Soil borings will be drilled using hollow-stem augers. The drilling equipment will be properly decontaminated before drilling each boring. The NMED will be notified as early as practicable if conditions arise or are encountered that do not allow the advancement of borings to the specified depths or at planned sampling locations. Appropriate actions (e.g., installation of protective surface casing or relocation of borings to a less threatening location) will be taken to minimize any negative impacts from investigative borings. Slotted (0.01 inch) PVC well screen will be placed at the bottom of the borings and will extend for an appropriate length to accommodate the objectives stated in Sections 4.1 and 4.2. A 10/20 sand filter pack will be installed to two feet over the top of the well screen.

4.4 Groundwater Sample Collection

Groundwater samples shall initially be obtained from newly installed monitoring wells between ten and 30 days after completion of well development. Well development and purging prior to sample collection will be in accordance with procedures described in Appendix D. Prior to collection of groundwater samples for laboratory analyses, the fluid levels and the total depths of each well will be measured. Groundwater samples will be collected from the new monitoring wells within 24 hours of the completion of well purging using disposal bailers. Alternatively, well sampling may also be conducted in accordance with the NMED's Position Paper *Use of Low-Flow and other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring* (October 30, 2001, as updated). Sample collection methods will be documented in the field monitoring reports. The samples will be transferred to the appropriate, clean, laboratory-prepared containers provided by the analytical laboratory. Sample handling and chain-of-custody procedures will be in accordance with the procedures presented below in Section 4.4.1.

Groundwater samples intended for metals analysis will be submitted to the laboratory as both total and dissolved metals samples. QA/QC samples will be collected to monitor the validity of the groundwater sample collection procedures as follows:

- Field duplicate water samples will be obtained at a frequency of ten percent, with a minimum, of one duplicate sample per sampling event;

- Equipment rinsate blanks will be obtained for chemical analysis at the rate of ten percent or a minimum of one rinsate blank per sampling day. Equipment rinsate blanks will be collected at a rate of one per sampling day if disposable sampling equipment is used. Rinsate samples will be generated by rinsing deionized water through unused or decontaminated sampling equipment. The rinsate sample will be placed in the appropriate sample container and submitted with the groundwater samples to the analytical laboratory for the appropriate analyses; and
- Trip blanks will accompany laboratory sample bottles and shipping and storage containers intended for VOC analyses. Trip blanks will consist of a sample of analyte-free deionized water prepared by the laboratory and placed in an appropriate sample container. The trip blank will be prepared by the analytical laboratory prior to the sampling event and will be kept with the shipping containers and placed with other water samples obtained from the site each day. Trip blanks will be analyzed at a frequency of one for each shipping container of groundwater samples to be analyzed for VOCs.

4.4.1 Sample Handling

At a minimum, the following procedures will be used at all times when collecting samples during investigation, corrective action, and monitoring activities:

1. Neoprene, nitrile, or other protective gloves will be worn when collecting samples. New disposable gloves will be used to collect each sample;
2. All samples collected of each medium for chemical analysis will be transferred into clean sample containers supplied by the project analytical laboratory with the exception of soil, rock, and sediment samples obtained in Encore® samplers. Sample container volumes and preservation methods will be in accordance with the most recent standard EPA and industry accepted practices for use by accredited analytical laboratories. Sufficient sample volume will be obtained for the laboratory to complete the method-specific QC analyses on a laboratory-batch basis; and
3. Sample labels and documentation will be completed for each sample following procedures discussed below. Immediately after the samples are collected, they will be stored in a cooler with ice or other appropriate storage method until they are delivered to the analytical laboratory. Standard chain-of-custody procedures, as described below, will be followed for all samples collected. All samples will be submitted to the laboratory

soon enough to allow the laboratory to conduct the analyses within the method holding times.

Chain-of-custody and shipment procedures will include the following:

1. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site.
2. Individual sample containers will be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other EPA or industry-wide accepted method. The drainage hole at the bottom of the cooler will be sealed and secured in case of sample container leakage. Temperature blanks will be included with each shipping container.
3. Each cooler or other container will be delivered directly to the analytical laboratory.
4. Glass bottles will be separated in the shipping container by cushioning material to prevent breakage.
5. Plastic containers will be protected from possible puncture during shipping using cushioning material.
6. The chain-of-custody form and sample request form will be shipped inside the sealed storage container to be delivered to the laboratory.
7. Chain-of-custody seals will be used to seal the sample-shipping container in conformance with EPA protocol.
8. Signed and dated chain-of-custody seals will be applied to each cooler prior to transport of samples from the site.
9. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody form will be signed as received by the laboratory, and the conditions of the samples will be recorded on the form. The original chain-of-custody form will remain with the laboratory and copies will be returned to the relinquishing party.
10. Copies of all chain-of-custody forms generated as part of sampling activities will be maintained on-site.

4.5 Collection and Management of Investigation Derived Waste

Drill cuttings, excess sample material and decontamination fluids, and all other investigation derived waste (IDW) associated with soil borings will be contained and characterized using methods based on the boring location, boring depth, drilling method, and type of contaminants suspected or

encountered. All purged groundwater and decontamination water will be characterized prior to disposal unless it is disposed in the refinery wastewater treatment system upstream of the API Separator. An IDW management plan is included as Appendix B.

Field equipment requiring calibration will be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. At a minimum, calibration checks will be conducted daily, or at other intervals approved by the Department, and the instruments will be recalibrated, if necessary. Calibration measurements will be recorded in the daily field logs. If field equipment becomes inoperable, its use will be discontinued until the necessary repairs are made. In the interim, a properly calibrated replacement instrument will be used.

4.6 Documentation of Field Activities

Daily field activities, including observations and field procedures, will be recorded in a field log book. Copies of the completed forms will be maintained in a bound and sequentially numbered field file for reference during field activities. Indelible ink will be used to record all field activities. Photographic documentation of field activities will be performed, as appropriate. The daily record of field activities will include the following:

1. Site or unit designation;
2. Date;
3. Time of arrival and departure;
4. Field investigation team members including subcontractors and visitors;
5. Weather conditions;
6. Daily activities and times conducted;
7. Observations;
8. Record of samples collected with sample designations and locations specified;
9. Photographic log, as appropriate;
10. Field monitoring data, including health and safety monitoring;
11. Equipment used and calibration records, if appropriate;
12. List of additional data sheets and maps completed;
13. An inventory of the waste generated and the method of storage or disposal; and
14. Signature of personnel completing the field record.

4.7 Chemical Analyses

All samples collected for laboratory analysis will be submitted to an accredited laboratory. The laboratory will use the most recent standard EPA and industry-accepted analytical methods for target analytes as the testing methods for each medium sampled. Chemical analyses will be performed in accordance with the most recent EPA standard analytical methodologies and extraction methods.

Groundwater and soil samples will be analyzed by the following methods:

- SW-846 Method 8260 for volatile organic compounds;
- SW-846 Method 8270 for semi-volatile organic compounds; and
- SW-846 Method 8015B gasoline range (C5-C10), diesel range (>C10-C28), and motor oil range (>C28-C36) organics.

Groundwater and soil samples will also be analyzed for the following Skinner List metals and iron and manganese using the indicated analytical methods shown. The groundwater samples collected for metals analysis will be analyzed for total and dissolved concentrations. Groundwater samples will also be analyzed for major cations (calcium, magnesium, sodium, and potassium) and anions (e.g., carbonate, bicarbonate, sulfate, fluoride and chloride).

Inorganic Analytical Methods

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020

Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020
Calcium	EPA method 200.7
Magnesium	EPA method 200.7
Sodium	EPA method 200.7
Potassium	EPA method 200.7
Carbonate	EPA method 300.0
Bicarbonate	EPA method 300.0
Sulfate	EPA method 300.0
Fluoride	EPA method 300.0
Chloride	EPA method 300.0
Nitrate	EPA method 300.0
Nitrite	EPA method 300.0

Groundwater field measurements will be obtained for pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, turbidity, and temperature.

4.8 Data Quality Objectives

The Data Quality Objectives (DQOs) were developed to ensure that newly collected data are of sufficient quality and quantity to address the project goals, including Quality Assurance/Quality Control (QA/QC) issues (EPA, 2006). The project goals are established to determine and evaluate the presence, nature, and extent of releases of contaminants at specified SWMUs. The type of data required to meet the project goals includes chemical analyses of soil and groundwater to determine if there has been a release of contaminants.

The quantity of data is location specific and is based on the historical operations at individual locations. Method detection limits should be 20% or less of the applicable background levels, cleanup standards and screening levels.

Additional DQOs include precision, accuracy, representativeness, completeness, and comparability. Precision is a measurement of the reproducibility of measurements under a given set of circumstances and is commonly stated in terms of standard deviation or coefficient of variation (EPA, 1987). Precision is also specific to sampling activities and analytical performance. Sampling

precision will be evaluated through the analyses of duplicate field samples and laboratory replicates will be utilized to assess laboratory precision.

Accuracy is a measurement in the bias of a measurement system and may include many sources of potential error, including the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis techniques (EPA, 1987). An evaluation of the accuracy will be performed by reviewing the results of field/trip blanks, matrix spikes, and laboratory QC samples.

Representativeness is an expression of the degree to which the data accurately and precisely represent the true environmental conditions. Sample locations and the number of samples have been selected to ensure the data is representative of actual environmental conditions. Based on SWMU specific conditions, this may include either biased (i.e., judgmental) locations/depths or unbiased (systematic grid samples) locations. In addition, sample collection techniques (e.g., field monitoring and decontamination of sampling equipment) will be utilized to help ensure representative results.

Completeness is defined as the percentage of measurements taken that are actually valid measurements, considering field QA and laboratory QC problems. EPA Contract Laboratory Program (CLP) data has been found to be 80-85% complete on a nationwide basis and this has been extrapolated to indicate that Level III, IV, and V analytical techniques will generate data that are approximately 80% complete (EPA, 1987). As an overall project goal, the completeness goal is 85%; however, some samples may be critical based on location or field screening results and thus a sample-by-sample evaluation will be performed to determine if the completeness goals have been obtained.

Comparability is a qualitative parameter, which expresses the confidence with which one data set can be compared to another. Industry standard sample collection techniques and routine EPA analytical methods will be utilized to help ensure data are comparable to historical and future data. Analytical results will be reported in appropriate units for comparison to historical data and cleanup levels.

Section 5
References

EPA, 1987, Data Quality Objectives for Remedial Response Activities; United States Environmental Protection Agency, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, OSWER Directive 9355.0-7B, 85p.

EPA, 2006, Guidance on Systematic Planning Using the Data Quality Objectives Process, United States Environmental Protection Agency, Office of Environmental Information; EPA/240/B-06/001, p. 111.

Geoscience Consultants, Ltd, 1985a, Inventory of Solid Waste Management Units, June 14, 1985, p. 22.

Geoscience Consultants, Ltd, 1985b, Discharge Plan Application for Giant Refining Company Ciniza Refinery, Gallup New Mexico, November 21, 1985, p, 59.

Giant, 1991, 1990 Annual Ground Water Report, Giant Refining Company, Ciniza Refinery.

NMED, 2017, Risk Assessment Guidance for Site Investigation and Remediation, New Mexico Environment Department.

Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizel, N.H., and Padgett, E.T., 1983, Hydrogeology and Water Resources of San Juan Basin, New Mexico; Hydrogeologic Report 6, New Mexico Bureau of Mines and Mineral Resources, p. 70.

Western, 2009, Facility-wide Groundwater Monitoring Plan: Gallup Refinery, p. 97.

Western, 2013, Annual Ground Water Monitoring Report: Gallup Refinery - 2013, p. 225.

Tables

Table 1 SMW-2 and GWM-1 Area Water Analyses

Table 2 Fluid Level Measurements

TABLE 1 - SWM-2 and GWM-1 AREA WATER ANALYSES
Western Refining Southwest, Inc. - Gallup Refinery

		Benzene (mg/L)	Toluene (mg/L)	Ethyl Benzene (mg/L)	Total Xylenes (mg/L)	MTBE (mg/L)	Fluoride (mg/L)	Chloride (mg/L)	Bromide (mg/L)	Nitrite (mg/L)	Nitrate (mg/L)	Phosphorus (mg/L)	Sulfate (mg/L)	Calcium mg/l	Manganese (mg/l)	Potassium (mg/l)	Sodium (mg/l)	Uranium (mg/l)	DRO (mg/L)	GRO (mg/L)	MRO (mg/L)
WQCC 20NMAC 6.2.3103		0.01	**0.75**	0.75	**0.62**	NE	**1.6**	**250.0**	NE	NE	**10**	NE	**600.0**	NE	**0.2**	NE	NE	**0.03**	NE	NE	NE
40 CFR 141.62 MCL (JAN 2015)		**0.005**	1.0	**0.7**	10	NE	NE	NE	NE	**1**	10	NE	NE	NE	NE	NE	NE	0.03	NE	NE	NE
NMED Tap Water (MARCH 2017)		0.00454	1.09	0.0149	0.193	**0.143**	1.2	NE	NE	1.97	31.6	NE	NE	NE	2.02	NE	NE	0.0592	0.0398	0.0398	0.0398
EPA RSL for Tap Water (JAN 2015)		4.5E-04	0.11	0.0015	0.019	0.014	0.08	NE	NE	0.2	3.2	NE	NE	NE	0.43	NE	NE	0.06	NE	NE	NE
Well ID	**DATE SAMPLED**																				
SMW-4	6/28/2017	NA	NA	NA	NA	NA	1.1	63	0.26	NA	0.21	<1.2	180	4.5	NA	0.52	310	NA	NA	NA	NA
	9/9/2016	<0.001	<0.001	<0.001	<0.0015	<0.001	1.0	53	<1.0	<1.0	<0.5	NA	150	NA	0.0064	NA	NA	**0.032**	<1.0	0.028	<5.0
	8/14/2015	<0.001	<0.001	<0.001	<0.0015	<0.001	1.0	55	NA	<1.0	<1.0	NA	160	NA	<0.002	NA	NA	**0.035**	<1.0	<0.05	<5.0
	9/11/2014	<0.001	<0.001	<0.001	<0.0015	<0.001	1.1	53	NA	<1.0	<1.0	NA	150	NA	0.0033	NA	NA	**0.033**	<1.0	<0.05	<5.0
	9/9/2013	<0.001	<0.001	<0.001	<0.0015	<0.001	0.93	59	NA	<1.0	<1.0	NA	170	NA	<0.002	NA	NA	**0.031**	<1.0	<0.05	<5.0
	8/24/2012	<0.001	<0.001	<0.001	<0.0015	<0.001	1.0	58	NA	<1.0	<1.0	NA	150	NA	<0.002	NA	NA	0.03	<1.0	<0.05	<5.0
	10/10/2011	<0.001	<0.001	<0.001	<0.0015	<0.001	1.1	58	NA	**1.3**	1.3	NA	170	NA	0.0041	NA	NA	**0.032**	<1.0	<0.05	<5.0
	7/16/2010	<0.001	<0.001	<0.001	<0.0015	<0.001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0	<0.05	NA
SMW-2	6/28/2017	NA	NA	NA	NA	NA	<0.5	**2600**	2.8	<0.26	<0.26	<5	**1500**	300	NA	0.75	2300	NA	NA	NA	NA
	9/9/2016	<0.001	<0.001	<0.001	<0.0015	0.013	<0.1	**2500**	<2.0	<2.0	<0.5	NA	**1300**	NA	**0.24**	NA	NA	**0.11**	<1.0	1.0	<5.0
	8/17/2015	<0.001	<0.001	<0.001	<0.0015	0.011	<2.0	**3000**	NA	<4.0	<4.0	NA	**1600**	NA	**0.31**	NA	NA	**0.12**	<1.0	0.78	<5.0
	9/11/2014	<0.001	<0.001	<0.001	<0.0015	0.012	<2.0	**2500**	NA	<2.0	<2.0	NA	**1400**	NA	**0.27**	NA	NA	**0.11**	<1.0	0.23	<5.0
	9/9/2013	NA	NA	NA	NA	NA	<0.1	**2500**	NA	<4.0	<4.0	NA	**1500**	NA	0.17	NA	NA	**0.1**	<1.0	0.15	<5.0
	8/23/2012	<0.01	<0.01	<0.01	<0.015	0.012	0.16	**2400**	NA	<2.0	<2.0	NA	**1600**	NA	**0.22**	NA	NA	**0.1**	<1.0	0.28	<5.0
	10/12/2011	<0.001	<0.001	<0.001	<0.0015	0.008	0.22	**2600**	NA	<10	<10	NA	**1600**	NA	**0.24**	NA	NA	**0.11**	<1.0	0.36	<5.0
	7/16/2010	<0.001	<0.001	<0.001	<0.0015	0.009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0	<0.05	NA
OW-59	6/28/2017	<0.001	<0.001	<0.001	<0.0015	0.007	<0.5	**2000**	4	<2.0	<2.0	<10	**3000**	NA	**1.2**	NA	NA	NA	0.6	0.2	<5
OW-60	6/28/2017	<0.001	0.0002	<0.001	<0.0015	0.0009	<0.5	**1600**	2.4	NA	3	<2.5	**740**	NA	**2.2**	NA	NA	NA	<1.0	<0.05	<5
STP1-NW	6/2/2017	<0.001	<0.001	<0.001	<0.0015	0.00043J	<0.1	**2100**	4.2	24	24	<0.5	140	88	0.062	4.9	1400	0.027	<1.0	<0.05	<5.0
	10/29/2015	<0.001	<0.001	<0.001	<0.0015	<0.001	0.26	**2100**	3.66	**21**	**21**	<0.5	130	NA	0.032	NA	NA	0.023	<1.0	<0.05	<5.0
	8/11/2015	<0.001	<0.001	<0.001	<0.0015	<0.001	NA	NA	NA	NA	NA	NA	NA	NA	0.11	NA	NA	0.025	<1.0	<0.05	<5.0
	6/2/2015	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.5	**2100**	NA	**25**	**25**	NA	130	NA	0.095	NA	NA	0.022	<1.0	<0.05	<5.0
	3/10/2015	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.1	**2400**	3.9	**22**	**22**	<0.5	150	NA	0.075	NA	NA	0.02	<1.0	<0.05	<5.0
	11/18/2014	<0.001	<0.001	<0.001	<0.0015	<0.001	0.29	**1800**	2.8	<2.0	**18**	<0.5	120	NA	0.032	NA	NA	0.03	<1.0	<0.05	<5.0
	9/17/2014	<0.001	<0.001	<0.001	<0.0015	<0.001	0.26	**1800**	3.1	<2.0	**18**	<0.5	120	NA	0.15	NA	NA	0.029	<1.0	<0.05	<5.0
	6/16/2014	<0.001	<0.001	<0.001	<0.0015	<0.001	0.85	**1000**	2.2	**15**	**15**	<0.5	160	NA	0.055	NA	NA	**0.065**	<1.0	<0.05	<5.0
GWM-1	10/29/2015	NO SAMPLES COLLECTED - HAS AN SPH LEVEL																			
	9/23/2015 [1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	68	<2.5	18
	8/24/2015	**0.009**	0.033	0.011	0.11	0.04	**2.6**	**1100**	NA	<1.0	<1.0	NA	NA	NA	**2.1**	NA	NA	0.015	250	1.2	<50
	6/2/2015	**0.012**	0.003	0.006	0.024	0.051	**2.7**	**1100**	NA	<2.0	<2.0	NA	NA	NA	**2**	NA	NA	0.016	1.7	NA	<5.0
	3/10/2015	**0.011**	0.002	0.005	0.021	0.049	**2.2**	**1000**	NA	<0.5	<0.5	NA	NA	NA	**2.4**	NA	NA	0.016	2.4	0.49	<5.0
	11/13/2014	**0.012**	<0.005	0.006	0.023	0.05	**1.8**	**1000**	NA	<1.0	<1.0	NA	NA	NA	**2.2**	NA	NA	0.015	2.3	0.5	<5.0
	9/12/2014	**0.010**	0.003	0.004	0.016	0.041	**2.4**	**910**	NA	<1.0	<1.0	NA	NA	NA	**2.6**	NA	NA	0.015	2.1	0.51	<5.0
	6/5/2014	**0.011**	0.002	0.005	0.019	0.051	**2.2**	**890**	NA	<1.0	<1.0	NA	NA	NA	**2.5**	NA	NA	0.012	3.4	0.56	<5.0
	3/11/2014	**0.009**	0.002	0.004	0.015	0.039	**2.6**	**930**	NA	<1.0	<1.0	NA	NA	NA	**2.5**	NA	NA	0.015	3.3	0.66	<5.0
	11/11/2013	**0.008**	0.002	0.004	0.014	0.039	**2.3**	**1000**	NA	**4.1**	4.1	NA	NA	NA	**2.2**	NA	NA	0.015	7.1	0.49	NA
Evap. Pond 2	6/28/2017	NA	NA	NA	NA	NA	**18**	**5000**	1.9	NA	1.1	<2.5	**1400**	410	NA	140	3100	NA	NA	NA	NA
Evap. Pond 3	6/28/2017	NA	NA	NA	NA	NA	**16**	**7100**	2.3	NA	1.1	<2.5	**1800**	540	NA	230	4300	NA	NA	NA	NA

1 - SPH found in well

TABLE 2 - FLUID LEVEL MEASUREMENTS
Western Refining Southwest, Inc. - Gallup Refinery

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevations (ft)	Well Casing Rim Elevations (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation (ft)	Corrected Water Table Elevation (Factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
10/15/2003	BW-3B	09/13/17	2.00	6,876.16	6,878.59	2.43	6,809.19	69.40	N/A	N/A	33.38	6,845.21	N/A	63 - 73	Chinle/Alluvium Interface
10/14/1981	MW-1	09/20/17	5.00	6,876.63	6,878.12	1.49	6,747.29	130.83	N/A	N/A	7.02	6,871.10	N/A	117.72 - 127.72	Sonsela Sandstone
10/15/1981	MW-2	09/20/17	5.00	6,878.39	6,880.30	1.91	6,742.82	137.48	N/A	N/A	15.64	6,864.66	N/A	112 - 122	Sonsela Sandstone
10/16/1981	MW-4	09/21/17	5.00	6,879.89	6,881.63	1.74	6,759.91	121.72	N/A	N/A	7.56	6,874.07	N/A	101 - 121	Sonsela Sandstone
7/21/1986	MW-5	09/11/17	4.00	6,880.20	6,882.83	2.63	6,752.00	130.83	N/A	N/A	11.22	6,871.61	N/A	115 - 125	Sonsela Sandstone
9/26/1985	SMW-2	09/11/17	2.00	6,881.63	6,883.97	2.34	6,831.17	52.80	N/A	N/A	24.79	6,859.18	N/A	34.31 - 54.31	Chinle/Alluvium Interface
9/25/1985	SMW-4	09/11/17	2.00	6,877.63	6,879.52	1.89	6,809.84	69.68	N/A	N/A	29.33	6,850.19	N/A	51.7 - 71.7	Chinle/Alluvium Interface
7/8/2004	GWM-1	03/16/17	2.00	6,910.22	6,912.61	2.39	6,886.41	26.20	21.74	0.30	22.04	6,890.57	6890.81	17.5 - 23.5	Chinle/Alluvium Interface
		06/02/17	2.00	6,910.22	6,912.61	2.39	6,886.41	26.20	21.54	0.44	21.98	6,890.63	6890.98	17.5 - 23.5	Chinle/Alluvium Interface
		09/08/17	2.00	6,910.22	6,912.61	2.39	6,886.41	26.20	21.49	0.22	21.71	6,890.90	6891.08	17.5 - 23.5	Chinle/Alluvium Interface
		12/04/17	2.00	6,910.22	6,912.61	2.39	6,886.41	26.20	19.70	1.00	20.70	6,891.91	6892.71	17.5 - 23.5	Chinle/Alluvium Interface
9/25/2005	GWM-2	03/16/17	2.00	6,910.32	6,913.09	2.77	6,894.28	18.81	N/A	N/A	DRY	DRY	N/A	3.2 - 16.2	Chinle/Alluvium Interface
		06/02/17	2.00	6,910.32	6,913.09	2.77	6,894.28	18.81	N/A	N/A	DRY	DRY	N/A	3.2 - 16.2	Chinle/Alluvium Interface
		09/05/17	2.00	6,910.32	6,913.09	2.77	6,894.28	18.81	N/A	N/A	DRY	DRY	N/A	3.2 - 16.2	Chinle/Alluvium Interface
		12/04/17	2.00	6,910.32	6,913.09	2.77	6,894.28	18.81	N/A	N/A	DRY	DRY	N/A	3.2 - 16.2	Chinle/Alluvium Interface
9/25/2005	GWM-3	03/16/17	2.00	6,907.35	6,910.25	2.90	6,892.45	17.80	N/A	N/A	DRY	DRY	N/A	3 - 15	Chinle/Alluvium Interface
		06/02/17	2.00	6,907.35	6,910.25	2.90	6,892.45	17.80	N/A	N/A	DRY	DRY	N/A	3 - 15	Chinle/Alluvium Interface
		09/05/17	2.00	6,907.35	6,910.25	2.90	6,892.45	17.80	N/A	N/A	DRY	DRY	N/A	3 - 15	Chinle/Alluvium Interface
		12/04/17	2.00	6,907.35	6,910.25	2.90	6,892.45	17.80	N/A	N/A	DRY	DRY	N/A	3 - 15	Chinle/Alluvium Interface
5/6/2014	STP1-NW	02/21/17	2.00	6,904.50	6,904.47	-0.03	6,854.47	50.00	N/A	N/A	20.47	6,884.00	N/A	20 - 50	Chinle/Alluvium Interface
		06/02/17	2.00	6,904.50	6,904.47	-0.03	6,854.47	50.00	N/A	N/A	20.66	6,883.81	N/A	20 - 50	Chinle/Alluvium Interface
		09/05/17	2.00	6,904.50	6,904.47	-0.03	6,854.47	50.00	N/A	N/A	20.81	6,883.66	N/A	20 - 50	Chinle/Alluvium Interface
		12/04/17	2.00	6,904.50	6,904.47	-0.03	6,854.47	49.74	N/A	N/A	20.55	6,883.92	N/A	20 - 50	Chinle/Alluvium Interface
5/6/2014	STP1-SW	02/21/17	2.00	6,912.40	6,912.38	-0.02	6,880.38	29.10	N/A	N/A	DRY	N/A	N/A	15 - 30	Chinle/Alluvium Interface
		06/02/17	2.00	6,912.40	6,912.38	-0.02	6,880.38	29.10	N/A	N/A	NA	N/A	N/A	15 - 30	Chinle/Alluvium Interface
		09/05/17	2.00	6,912.40	6,912.38	-0.02	6,880.38	29.10	N/A	N/A	DRY	N/A	N/A	15 - 30	Chinle/Alluvium Interface
		12/04/17	2.00	6,912.40	6,912.38	-0.02	6,880.38	29.10	N/A	N/A	N/A	N/A	N/A	15 - 30	Chinle/Alluvium Interface
6/29/2017	OW-59	09/21/17	2.00	6,887.63	6,889.73	2.10	6,925.93	38.30	N/A	N/A	24.30	6,865.43	N/A	20 - 35	Chinle/Alluvium Interface
		12/05/17	2.00	6,887.63	6,889.73	2.10	6,926.13	38.50	N/A	N/A	24.30	6,865.43	N/A	20 - 35	Chinle/Alluvium Interface

TABLE 2 - FLUID LEVEL MEASUREMENTS
Western Refining Southwest, Inc. - Gallup Refinery

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevations (ft)	Well Casing Rim Elevations (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation (ft)	Corrected Water Table Elevation (Factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
6/29/2017	OW-60	09/21/17	2.00	6,891.06	6,893.51	2.45	6,936.61	45.55	N/A	N/A	16.45	6,877.06	N/A	25 - 45	Chinle/Alluvium Interface
		12/05/17	2.00	6,891.06	6,893.51	2.45	6,936.76	45.70	N/A	N/A	16.40	6,877.11	N/A	25 - 45	Chinle/Alluvium Interface
04/01/14	MKTF-30	03/06/17	2.00	6,898.10	6,900.80	2.70	6,877.60	23.20	ND	NA	14.13	6,886.67	NA	10 - 20	Chinle/Alluvium Interface
		06/05/17	2.00	6,898.10	6,900.80	2.70	6,877.60	23.20	ND	NA	13.87	6,886.93	NA	10 - 20	Chinle/Alluvium Interface
		10/03/17	2.00	6,898.10	6,900.80	2.70	6,877.60	23.20	ND	NA	15.03	6,885.77	NA	10 - 20	Chinle/Alluvium Interface
		11/20/17	2.00	6,898.10	6,900.80	2.70	6,877.61	23.19	ND	NA	14.91	6,885.89	NA	10 - 20	Chinle/Alluvium Interface
11/13/14	MKTF-40	03/07/17	2.00	6,891.35	6,894.33	2.98	6,870.69	23.64	ND	NA	13.14	6,881.19	NA	5 - 20	Chinle/Alluvium Interface
		06/05/17	2.00	6,891.35	6,894.33	2.98	6,870.69	23.64	ND	NA	13.29	6,881.04	NA	5 - 20	Chinle/Alluvium Interface
		09/25/17	2.00	6,891.35	6,894.33	2.98	6,870.69	23.64	ND	NA	13.28	6,881.05	NA	5 - 20	Chinle/Alluvium Interface
		11/21/17	2.00	6,891.35	6,894.33	2.98	6,870.71	23.62	ND	NA	13.71	6,880.62	NA	5 - 20	Chinle/Alluvium Interface

DEFINITIONS:

DTB - Depth to Bottom
DTW - Depth to Water
SPH = Separate Phase Hydrocarbons
* Wells also checked for Artesian flow conditions.

N/A = Not Available NS = Not Surveyed
Negative number in Stick up Length column indicates well is flushmount and located at or below ground level.
Depth to Water Column - if 0.00 is indicated - means water is at top of casing (full) under artesian flow conditions.
Dry indicates no water was detected.

Figures

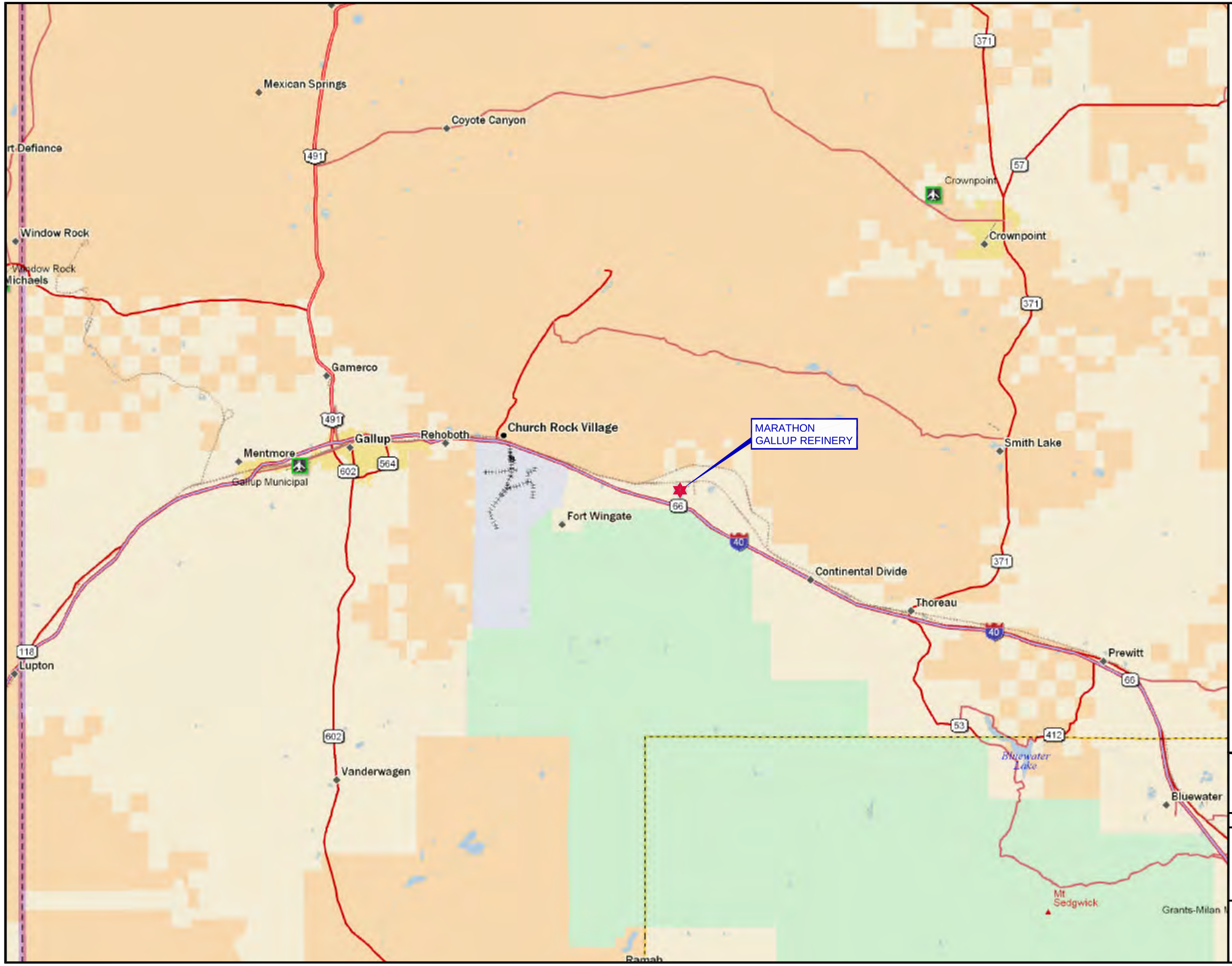
Figure 1 Site Location Map

Figure 2 Chinle/Alluvial Interface Potentiometric Map

Figure 3 Sulfate and Chloride Concentrations Map

Figure 4 Topographic Map

Figure 5 Proposed Monitoring Well Locations



Map Source: DeLorme Street Atlas USA 2007 Plus.

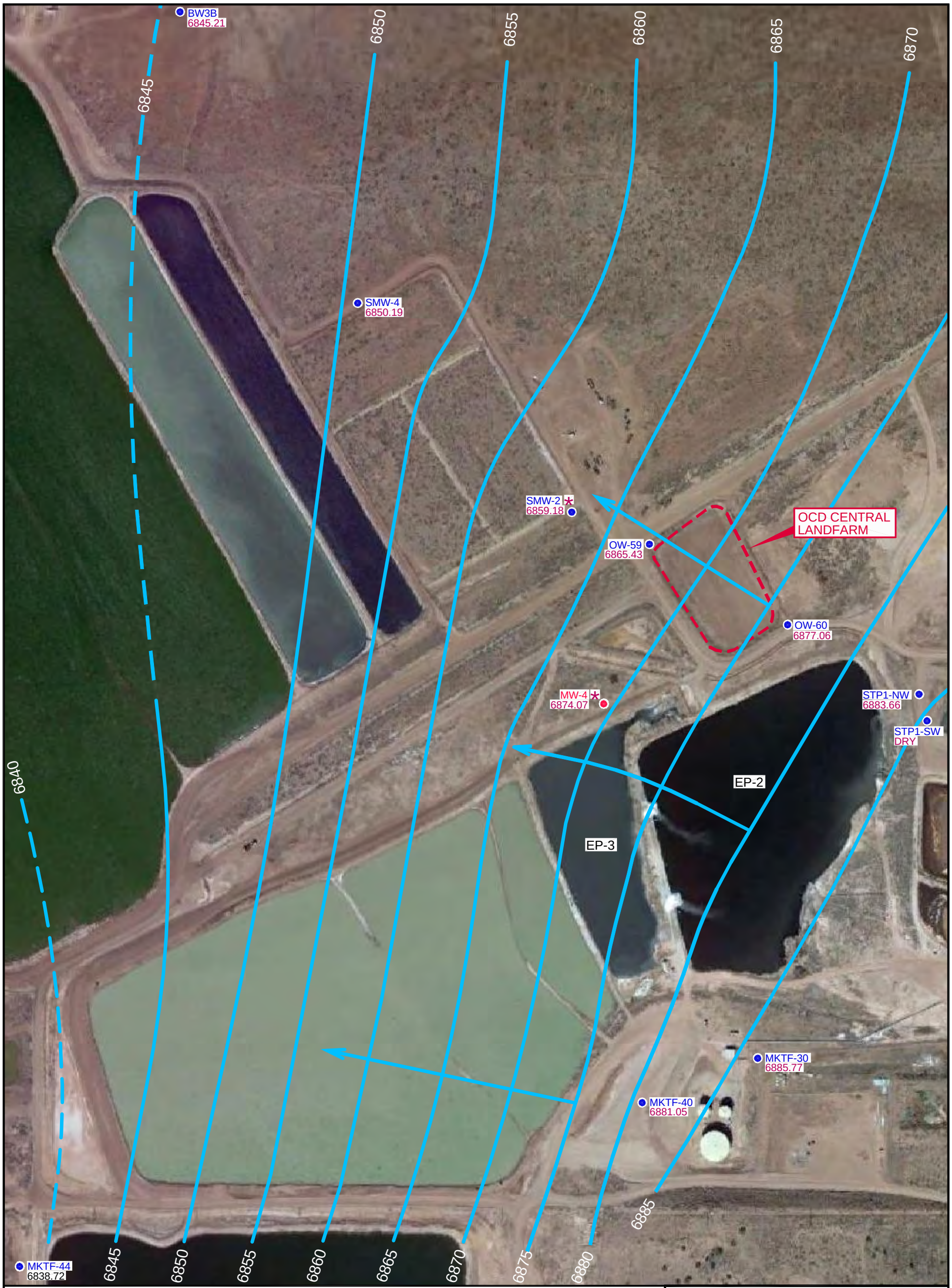
0 5
SCALE IN MILES

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 12/09/18 | FILE: Mathon-dB206

FIGURE 1
SITE LOCATION MAP
GALLUP REFINERY

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



Aerial Map Source: Google Map, 03/18/2016.

LEGEND

MKTF-40 — MONITORING WELL LOCATION (CHINLE / ALLUVIAL) AND IDENTIFICATION NUMBER

MW-04 — MONITORING WELL LOCATION (SONSELA) AND IDENTIFICATION NUMBER

6860 — POTENTIOMETRIC CONTOUR (FT) (5 FT INTERVAL)

GROUNDWATER FLOW DIRECTION

6881.05 — WATER LEVEL ELEVATION MEASURED SEPT. 2017 (ABOVE MSL)

* DATA NOT USED IN CONTOURS

N

0 250
SCALE IN FEET

NEW MEXICO
SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 08/06/19 | FILE: Mathon–dB178

FIGURE 2
CHINLE / ALLUVIUM INTERFACE
POTENTIOMETRIC MAP
SEPTEMBER 2017

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



Aerial Map Source: Google Map, 03/18/2016.

N

0 300

SCALE IN FEET

LEGEND

SMW-2 ● MONITORING WELL LOCATION (CHINLE / ALLUVIAL) AND IDENTIFICATION NUMBER

MW-4 ● MONITORING WELL LOCATION (SONSELA) AND IDENTIFICATION NUMBER

2,000 / 3,000 CHLORIDE CONCENTRATION (mg/L) / SULFATE CONCENTRATION (mg/L)

NA NOT ANALYZED

ANALYSIS FROM JUNE 2017 EXCEPT GWM-1 (AUGUST 2017)

NEW MEXICO

SITE LOCATION

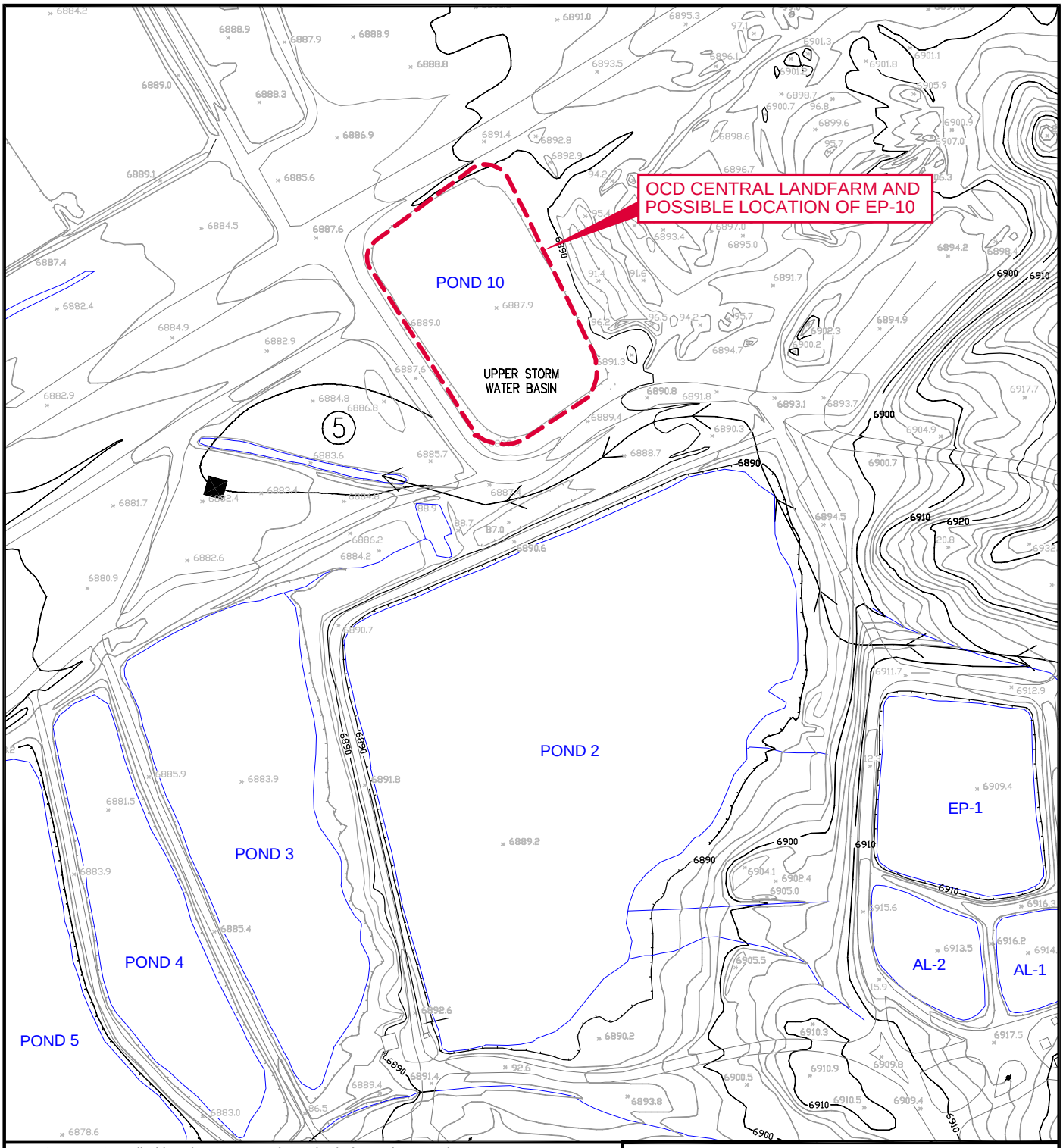
MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 08/03/19 | FILE: Mathon-dA165

FIGURE 3

SULFATE AND CHLORIDE CONCENTRATIONS

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



Map Source: Compiled by Photogrammetric Methods from Photography Acquired on March 1, 1998.

N

0 200

SCALE IN FEET

NEW MEXICO

SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon	DATE: 08/03/19	FILE: Mathon-dA166

FIGURE 4
TOPOGRAPHIC MAP

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



Aerial Map Source: Google Map, 03/18/2016.

0 300
SCALE IN FEET

LEGEND

PROPOSED MONITORING WELL LOCATION

SMW-2 MONITORING WELL LOCATION (CHINLE / ALLUVIAL) AND IDENTIFICATION NUMBER

MW-4 MONITORING WELL LOCATION (SONSELA) AND IDENTIFICATION NUMBER

NEW MEXICO

SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 08/06/19 | FILE: Mathon-dA147

FIGURE 5

PROPOSED
MONITORING WELL LOCATIONS

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Appendix A

Boring Logs

Geoscience Consultants, Ltd

WELL LOGGING FORM

Page ____ of ____

Client GIANT REFINING COMPANY Well Number SMW-2

__ ¼ __ ¼ __ ¼ __ ¼ S __ T 15 N R 15 W State New Mexico

County McKinley Contractor Fox

Spud Date 9/26/95 Completion Date

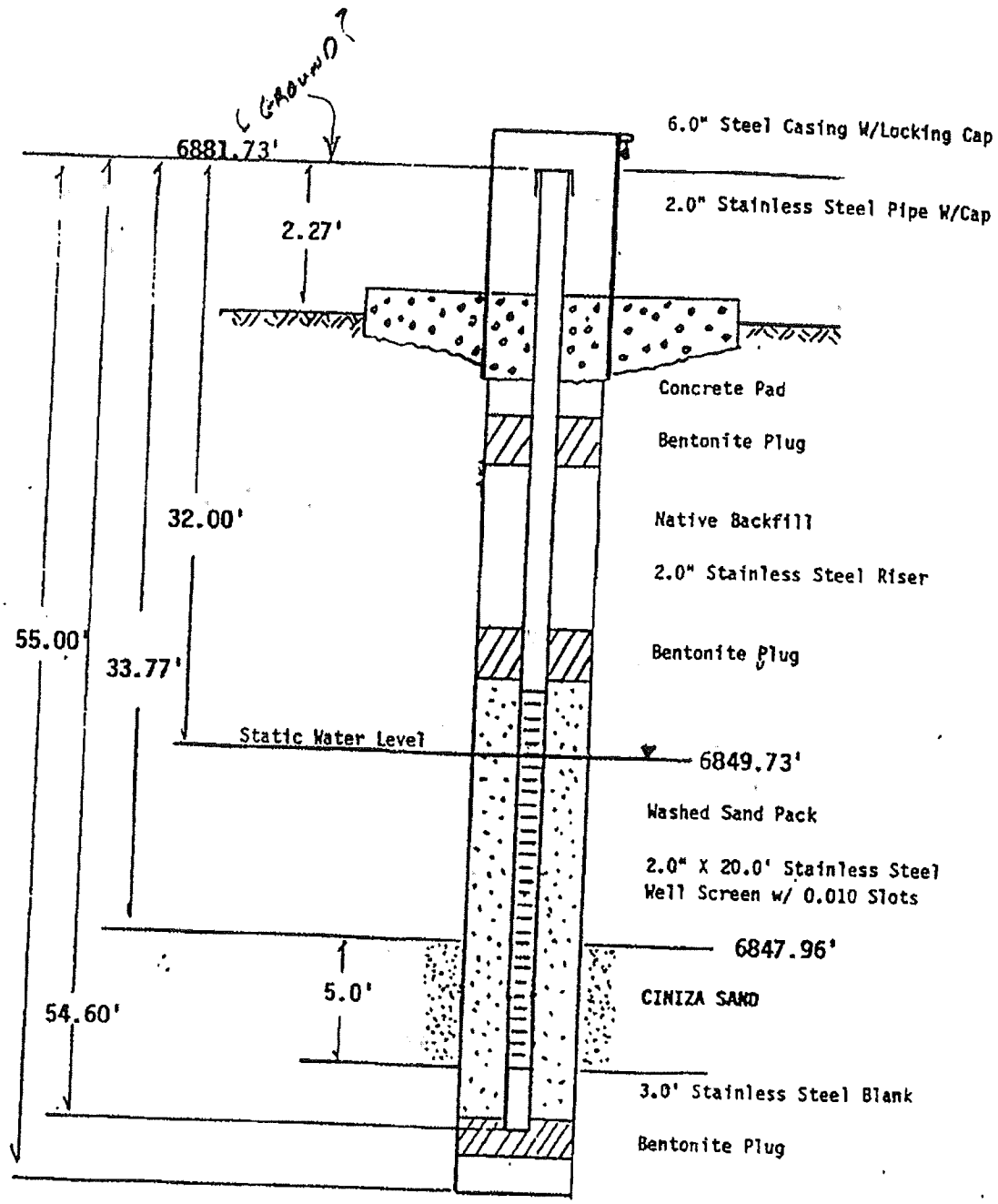
Logs Run Lith from Cores Logged By J.C. Hunter

Elevation 6882.83 Spud In (Fm.) Chinle

Remarks Drilled w/Hollow Stem Auger & Continuous Sampler. Collected samples @ 2.5 and 5.0' intervals for %H_2O. Comp. as SS monitor Well

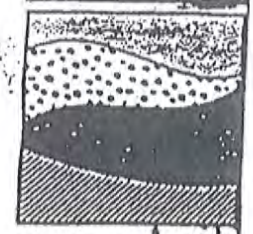
RUN	From	To	Sample#/Ft	Lith/Remarks
				SE corner of LTA Times should be 15xx, not 14xx etc
			850925	
Ø	0	5	1415/4.0 32% clay	0-1.5 SOIL
2	5	10	1420/10.0 clay 50	
3	10	15	1426/15' clay	1.5 - 4.0 CLAY
4	15	20	1432/20' 20	
5	20	25	1438/25' clay	4.0 - 19.0 SANDY CLAY
6	25	30	1445/27.5 50 1446/30.0 clay 50	
7	30	35	1452/32.5 clay 1453 35.0 50	19.0 - 24 SAND; gr rd (5R4/6); med gr, poor srt, qtz + lith cx frx
8	35	40	1458/37.5 1459/40.0	24 - 25 CLAY
				25 - 28 SAND, as above
				28 - 33 CLAYEY SAND & CLAY
			5'	33 - 38 SAND (WET) med rd brn (10R4/4) med gr, mod srt, qtz > rnd
				38 - 40 CLAY
				9/26/95 H_2O level 29'7" 9:40
				11/20° to SMW-2
				pH 7.1 #SC10926 1445

Silica 34-54



COMPLETION DIAGRAM FOR WELL SMW-2

Consultants, Ltd



Client GIANT REFINING COMPANY Well Number SMW-4

___¼ ___¼ ___¼ ___¼ S ___ T 15 N R 15 W State New Mexico

County McKinley Contractor Fox

Spud Date 9/25/85 Completion Date 9/25/85

Logs Run Lith from Cores Logged By J.C. Hunter

Elevation 6876.84 Spud In (Fm.) Chinle

Remarks Drilled w/Hollow Stem Auger & Continuous Sampler. Collected samples @ 2.5 and 5.0' intervals for %H_2O. Comp. as SS monitor Well

Depth	Litho recov	RUN	From	To	Sample#/Ft	Lith/Remarks
						Between MW1-4 MW-2 Depths from t.o.p. of auger, ~ 1.5' AGL (typical)
0						
TTR 0830 5		1	0	5	0840/40	0-1.5' (1.5) SOIL; gry rd (10R 4/2); silty cly w/ minor sd; rests & org matter
10		2	5	10	0847 cl 10.8	
15		3	10	15	0852 cl 11.5'	1.5-9.0 (7.5') CLAY; gry rd (5R 4/2) - dk rd brn (10R 3/4); dense, plastic, 1-5% si
20		4	15	20	0859 cl 10'	
25		5	20	25	0906 cl 25'	9.0-16.0 (6.0') SANDY CLAY; gry rd (10R 4/ - dsky rd (5R 3/4); cly w/ 15-20%
30	DTW 2015 ▽ 29.52'	6	25	30	0913/27.5 cl 0914/30.0 SS	
35	SCREEN 31'-71'?	7	30	35	0919/32.5 cl 0920/35.0 cl	cly (bottom 3.5') gr-cm gr sd, local f grvl, poor sor
40		8	35	40	0927/37.5 cl 0928/40.0 cl	
45		9	40	45	0936/42.5 cl 0937/45.0 cl	sand cutting @ 45')
50		10	45	50	0950/42.5 SOL 0951/50.0 CLY	15.0-23.0 (9.0) CLAY; gry rd (5R 4/2), loc. sandy, 5-10% sd
TD 1000- 55	55.84	11	50	55	0954/52.5 SOL 0955/55.0 CLY	
More to 2d		12	55	60	0958/20 1243/57.5 CLY 1244/60.0	23.0-24.0 OILSAND; pale rd brn (10R 5/4) - m rd brn (10R 4/4); f g, mod srt, loose qtz ± K-spar
Continued 9/30/85 @ 1100		13	60	65	1241/62.5 1242/65.0	
		14	65	69	1258/67.5 1259/69.0	24.0-33.0 (9.0) SILTY CLAY; mod rd (5R 5/4 cly w/ 10-20% slt, loc f g sand
						33.0-~~55.0~~ 59 (~~22~~ 26) CLAY; mod rd brn (10R 4 loc silty-sandy
						57.5-59.5
						59-61 (2') Sand (calc ↑) mod rd brn (10R 4/4); f g, mod sort
						61-69 Silty Sandstone (dry) pale red (10R 6/2)

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DR./HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME Giant Refining Company

EPA I.D. NUMBER NMD000333211-2

COUNTY McKinley

WELL NUMBER SMW-2

WELL LOCATION (LONGITUDE) ° ' ''

WELL LOCATION (LATITUDE) ° ' ''

AQUIFER NAME Ciniza Sand

AQUIFER CONFINED X UNCONFINED

WELL INSTALLATION DATE 9-26-85

DRILLING METHOD HLWAG

INNER CASING DIAMETER 2.0"

BOREHOLE DIAMETER 6.5"

CASING MATERIAL SS304

METHOD OF DEVELOPMENT COMPR

ELEV BOTTOM OF BOREHOLE 6826.73

ELEV BOTTOM OF WELL CASING 6827.13

ELEV BOTTOM OF SCREENED INT 6830.13

ELEVATION OF SCREENED INT 6850.13

SURVEYED ELEV OF CASING TOP 6881.73

DATE OF REPORT Jan. 28, 1991 SIGNATURE Claud C. Rosendale

NAME (TYPED) Claud C. Rosendale

b:wellid/bas

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DR./HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME Giant Refining Company

EPA I.D. NUMBER NMD000333211-2

COUNTY McKinley

WELL NUMBER SMW-4

WELL LOCATION (LONGITUDE) 108° 26' 01"

WELL LOCATION (LATITUDE) 35° 29' 44"

AQUIFER NAME Ciniza Sand

AQUIFER CONFINED X UNCONFINED

WELL INSTALLATION DATE 9-25-85

DRILLING METHOD HLWAG

INNER CASING DIAMETER 2.0"

BOREHOLE DIAMETER 6.5"

CASING MATERIAL SS304

METHOD OF DEVELOPMENT COMPR

ELEV BOTTOM OF BOREHOLE 6806.74

ELEV BOTTOM OF WELL CASING 6807.84

ELEV BOTTOM OF SCREENED INT 6810.84

ELEVATION OF SCREENED INT 6830.84

SURVEYED ELEV OF CASING TOP 6877.74

DATE OF REPORT Jan. 28, 1991 SIGNATURE Claud C Rosendale

NAME (TYPED) Claud C. Rosendale

b:wellid/bas

Appendix B

Investigation Derived Waste Management Plan

Investigation Derived Waste (IDW) Management Plan

All IDW will be properly characterized and disposed of in accordance with all federal, State, and local rules and regulations for storage, labeling, handling, transport, and disposal of waste. The IDW may be characterized for disposal based on the known or suspected contaminants potentially present in the waste.

A dedicated decontamination area will be setup prior to any sample collection activities. The decontamination pad will be constructed so as to capture and contain all decontamination fluids (e.g., wash water and rinse water) and foreign materials washed off the sampling equipment. The fluids will be pumped directly into suitable storage containers (e.g., labeled 55-gallon drums), which will be located at satellite accumulation areas until the fluids are disposed in the refinery wastewater treatment system upstream of the API separator. The solids captured in the decontamination pad will be shoveled into 55-gallon drums and stored at the designated satellite accumulation area pending proper waste characterization for off-site disposal.

Drill cuttings generated during installation of soil borings will be placed directly into 55-gallon drums and staged in the satellite accumulation area pending results of the waste characterization sampling. The portion of soil cores, which are not retained for analytical testing, will be placed into the same 55-gallon drums used to store the associated drill cuttings.

The solids (e.g., drill cuttings and used soil cores) will be characterized by testing to determine if there are any hazardous characteristics in accordance with 40 Code of Federal Regulations (CFR) Part 261. This includes tests for ignitability, corrosivity, reactivity, and toxicity. If the materials are not characteristically hazardous, then further testing will be performed pursuant to the requirements of the facility to which the materials will be transported. Depending upon the results of analyses for individual investigation soil samples, additional analyses may include VOCs, TPH and polynuclear aromatic hydrocarbons (PAHs).

Appendix C

Analyses of SPH at GWM-1

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

September 23, 2015

Cheryl Johnson

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-0231
FAX (505) 722-0210

RE: 2015-3rd Qtr-GWM-1 OrderNo.: 1509910

Dear Cheryl Johnson:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/18/2015 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data 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 **1509910**
Date Reported: **9/23/2015**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GWM-1
Project: 2015-3rd Qtr-GWM-1
Collection Date: 9/18/2015 9:45:00 AM
Lab ID: 1509910-001 **Matrix:** PRODUCT **Received Date:** 9/18/2015 4:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
DRO BY 8015D						Analyst: **KJH**	
Diesel Range Organics (DRO)	68	1.2		wt%	20	9/21/2015 2:03:14 PM	21396
Motor Oil Range Organics (MRO)	18	5.9		wt%	20	9/21/2015 2:03:14 PM	21396
Surr: DNOP	0	72.8-129	S	%REC	20	9/21/2015 2:03:14 PM	21396
GRO BY 8015D						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	2.5		wt%	1	9/22/2015 9:56:59 AM	21410
Surr: BFB	88.0	80-120		%REC	1	9/22/2015 9:56:59 AM	21410

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1509910**

23-Sep-15

Client: Western Refining Southwest, Gallup

Project: 2015-3rd Qtr-GWM-1

Sample ID **MB-21396**	SampType: **MBLK**	TestCode: **DRO by 8015D**							
Client ID: **PBW**	Batch ID: **21396**	RunNo: **28995**							
Prep Date: **9/21/2015**	Analysis Date: **9/21/2015**	SeqNo: **879731**	Units: **wt%**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.10								
Motor Oil Range Organics (MRO)	ND	0.50								
Surr: DNOP	0.094		0.1000		93.5	72.8	129			

Sample ID **LCSD-21396**	SampType: **LCSD**	TestCode: **DRO by 8015D**							
Client ID: **LCSS02**	Batch ID: **21396**	RunNo: **28995**							
Prep Date: **9/21/2015**	Analysis Date: **9/21/2015**	SeqNo: **879766**	Units: **wt%**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	0.41	0.10	0.5000	0	82.8	80	120	3.10	20	
Surr: DNOP	0.046		0.05000		92.7	72.8	129	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1509910**

23-Sep-15

Client: Western Refining Southwest, Gallup

Project: 2015-3rd Qtr-GWM-1

Sample ID **MB-21410**	SampType: **MBLK**	TestCode: **GRO by 8015D**							
Client ID: **PBW**	Batch ID: **21410**	RunNo: **29020**							
Prep Date: **9/21/2015**	Analysis Date: **9/22/2015**	SeqNo: **880756**	Units: **wt%**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	2.5								
Surr: BFB	880		1000		87.7	80	120			

Sample ID **LCS-21410**	SampType: **LCS**	TestCode: **GRO by 8015D**							
Client ID: **LCSW**	Batch ID: **21410**	RunNo: **29020**							
Prep Date: **9/21/2015**	Analysis Date: **9/22/2015**	SeqNo: **880757**	Units: **wt%**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	2.5	25.00	0	82.9	69.3	137			
Surr: BFB	970		1000		96.7	80	120			

Sample ID **LCSD-21410**	SampType: **LCSD**	TestCode: **GRO by 8015D**							
Client ID: **LCSS02**	Batch ID: **21410**	RunNo: **29020**							
Prep Date: **9/21/2015**	Analysis Date: **9/22/2015**	SeqNo: **880758**	Units: **wt%**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	2.5	25.00	0	85.0	69.3	137	2.48	20	
Surr: BFB	980		1000		98.0	80	120	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

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: **Western Refining Gallup** Work Order Number: **1509910** RcptNo: **1**

Received by/date: CS 09/18/15

Logged By: **Ashley Gallegos** **9/18/2015 4:15:00 PM**

Completed By: **Ashley Gallegos** **9/19/2015 11:00:08 AM**

Reviewed By: 09/21/15

Chain of Custody

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

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° 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 ☑	# of preserved bottles checked for pH: (<2 or >12 unless noted)
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 ☐	Adjusted?
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 ☐	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	5.1	Good	Yes			

Chain-of-Custody Record

Client: Western Refining Company

GALLUP REFINERY

Mailing Address: 92 Giant Crossing Road, Gallup, NM 87301

Phone #: 505-722-3833

email or Fax#: 505-863-0930

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

Accreditation:
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
Standard X Rush

Project Name:
2015 - 3rd Qtr - GWM-1

Project #:
PO #20825207

Project Manager:
C. JOHNSON (cheryl.johnson@wnr.com)

Sampler:

On Ice: ☒ Yes ☐ No

Sample Temperature: 6.1-1.0CF=5.1°C

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. 1509910	8015D (DRO/GRO/MRO)	8270 + Phenols	WQCC Metals - Total	WQCC Metals - Dissolved (Filtered)	Major Cations/Anions	Cyanide	8021	Air Bubbles (Y or N)
9/18/2015	945	OIL	GWM-1	2-40ML VOAS	NONE	-001	X							

Date	Time	Relinquished by	Received by	Date	Time
9/18/2015	1045			9-18-15	1:30
9-18-15	1615			09/19/15	1615

Remarks:

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

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

Brian Moore
Marathon
92 Giant Crossing Rd
Gallup, NM 87301
TEL: (505) 722-3833
FAX:

RE: SPH Investigation

OrderNo.: 1904580

Dear Brian Moore:

Hall Environmental Analysis Laboratory received 2 sample(s) on 4/10/2019 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Case Narrative

WO#: **1904580**

Date:

CLIENT: Marathon
Project: SPH Investigation

Hall Environmental has analyzed NAPIS-1 and GMW-1 for hydrocarbons using EPA Method 8015D. Our interpretation of the type of hydrocarbons present in each sample is detailed below. Copies of the chromatograms for each sample and standards are provided after this narrative.

NAPIS-1 - This product sample appears to be fairly fresh gasoline.

GMW-1 - This product sample does not contain gasoline range hydrocarbons. The sample appears to be mostly diesel range and lower amount of motor oil range hydrocarbons.

Chain-of-Custody Record

Client: **Marathon Petroleum Company**

Gallup Refinery

Mailing Address: **92 Giant Crossing Road**

Gallup, NM 87301

Phone #: **505-726-9745**

email or Fax#: BMoore1@Marathonpetroleum.com

QA/QC Package:

☒ Standard

☐ Other _____

X EDD (Type) **EXCEL**

Turn-Around Time:

X Standard ☐ Rush_____

Project Name:

SPH Investigation

Project #:

Project Manager: **Brian Moore**

Sampler: **Tracy Payne**

On Ice: ☒ Yes ☐ No 2 coolers

Sample Temperature: 0.4°C, 0.5°C

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. 1904580	BTEX+MTBE	BTEX+MTBE+TPH(Gas only)	TPH 8015B (Fingerprint Analysis)	TPH (Method 418.1)	EDB & EDC (Method 8011)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B	8270 (Semi-VOA)	WQCC Metals(Total & Dissolved)	Major Cations/Anions*			Air Bubbles (Y or N)
4/8/19	1245	HC	NAPIS-1	1 40 mL VOA	—	-001			X													
4/8/19	1550	HC	GMW-1	40 mL VOA 1	—	-002			X	–												

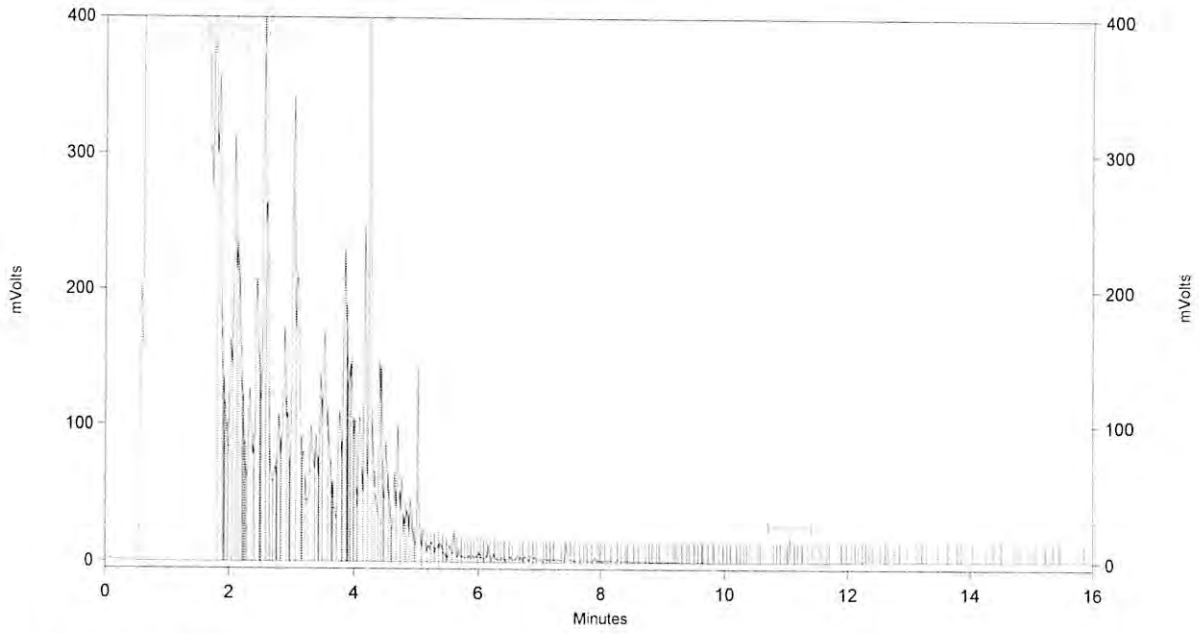
Date:	Time:	Relinquished by:	Received by:	Date	Time
4/9/19	0745		courier ENM	4/10/19	1007
Date:	Time:	Relinquished by:	Received by:	Date	Time
				4/10/19	

Remarks:

NAPIS-1

Instrument: **SmaugFID (Offline)** Vial #: **27** User: **System**
Sample ID: **1904580-001A** Data Description: **PRODUCT X10**

Method: H:\EZsemi\8015dro\DATA\Smaug\Methods\032719.met
File: H:\EZsemi\8015dro\DATA\Smaug\Data\2019\APRIL 2019\041519\PROD RE-INT's\1904580-001A X10 4-15-2019 7-26-40 PM.dat
Aquired: 4/15/2019 7:32:51 PM



FID-2010 Plus Results

Name	Retention Time	Area	ug/ml
DNOP	11.056	25724	0.874
DRO		2818833	93.142
MRO		1837	16.244

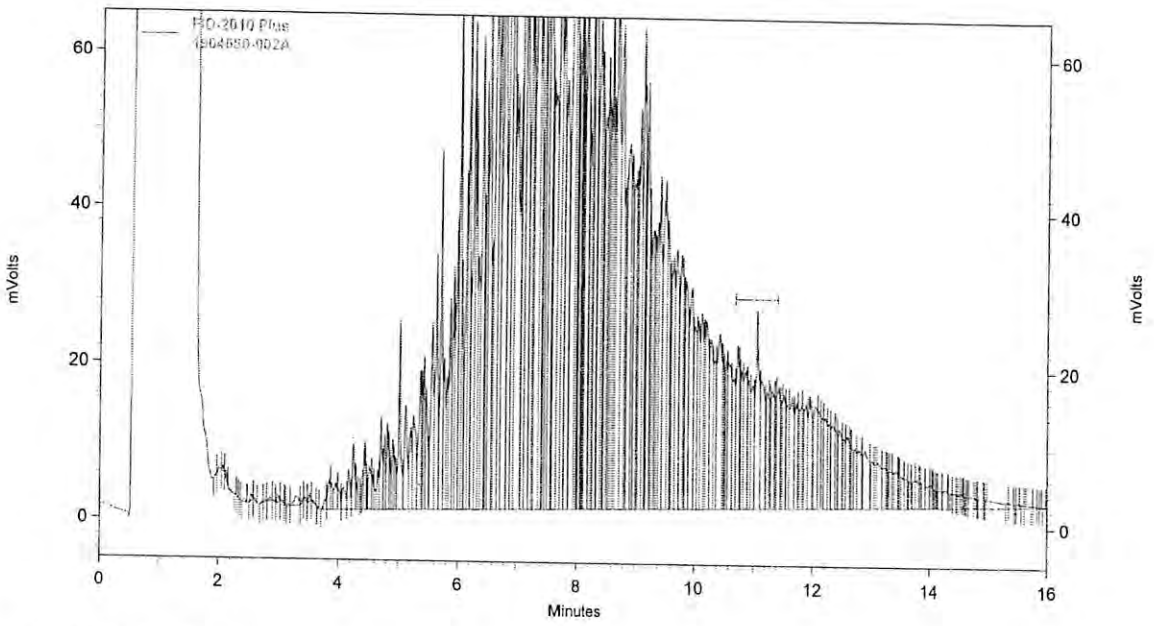
Analyst _____

Reviewed By _____

GWM-1

Instrument: **SmaugFID (Offline)** Vial #: **28** User: **System**
Sample ID: **1904580-002A** Data Description: **PRODUCT X20**

Method: H:\EZsemi\8015dro\DATA\Smaug\Methods\032719.met
File: H:\EZsemi\8015dro\DATA\Smaug\Data\1904580-002A X20 4-15-2019 8-33-35 PM.dat
Aquired: 4/15/2019 8:39:52 PM



FID-2010 Plus Results

Name	Retention Time	Area	ug/ml
DNOP	11.061	106224	3.938
DRO		12611601	404.713
MRO		1660723	73.257

Analyst Tom

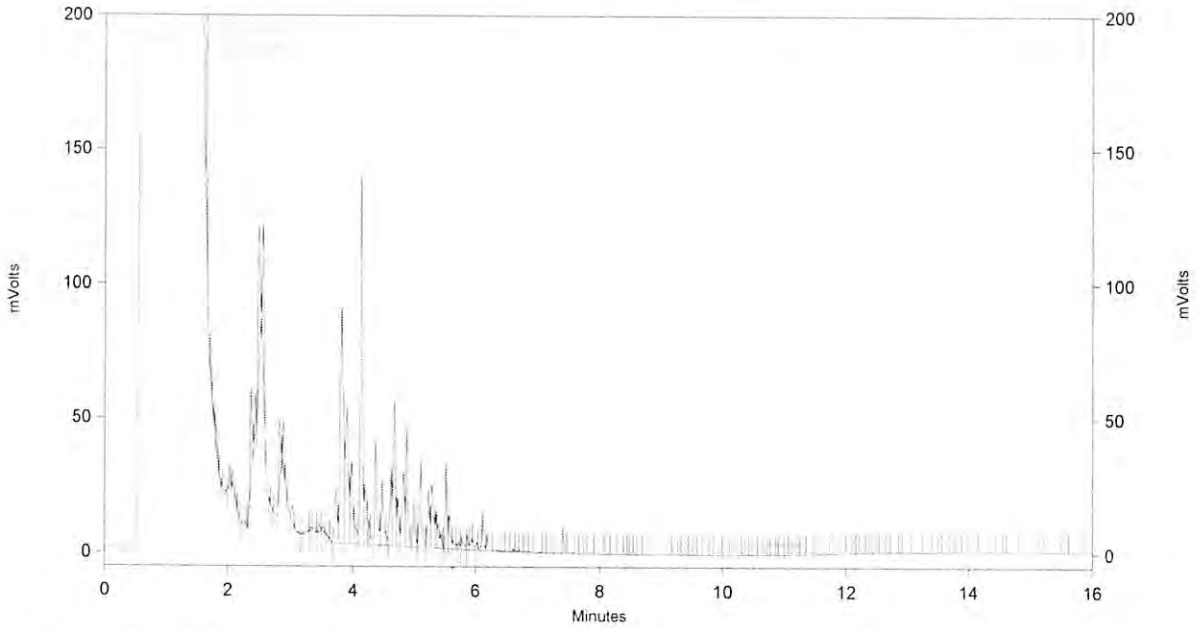
Reviewed By

Surrogate not recovered due to dilution

500 ppm Gasoline standard

Instrument: **SmaugFID (Offline)** Vial #: **23** User: **System**
Sample ID: **CONDITIONER** Data Description: **~500 ppm Gasoline**

Method: H:\EZsemi\8015dro\DATA\Smaug\Methods\032719.met
File: H:\EZsemi\8015dro\DATA\Smaug\Data\CONDITIONER 4-25-2019 10-53-34 AM.dat
Aquired: 4/25/2019 10:58:57 AM



FID-2010 Plus Results

Name	Retention Time	**Area**	**ug/ml**
DNOP	10.997	182	0.000
DRO		1058065	35.142
MRO		2753	16.275

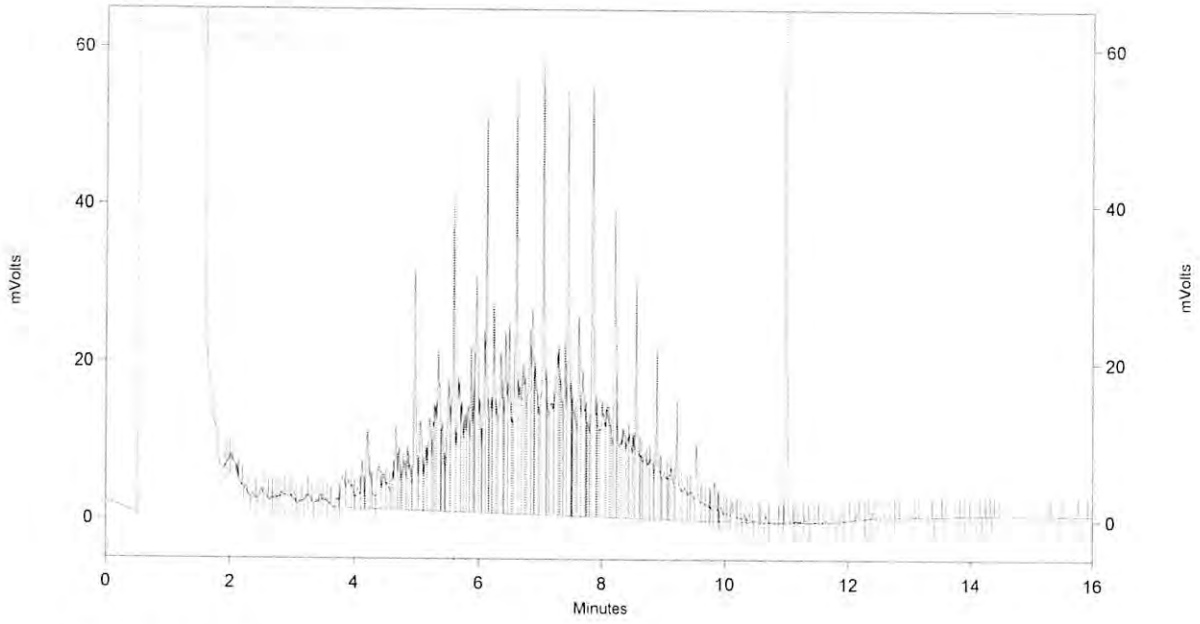
Analyst _____

Reviewed By _____

100 ppm Diesel Standard

Instrument: **SmaugFID (Offline)** Vial #: **3** User: **System**
Sample ID: **100 PPM DRO CCV** Data Description: **SV195-3268**

Method: H:\EZsemi\8015dro\DATA\Smaug\Methods\032719.met
File: H:\EZsemi\8015dro\DATA\Smaug\Data\042519\100 PPM DRO CCV 4-25-2019 7-32-54 AM.dat
Aquired: 4/25/2019 7:38:35 AM



FID-2010 Plus Results

Name	Retention Time	Area	ug/ml
DNOP	10.992	288719	10.819
DRO		3552010	117.115
MRO		11316	16.570

Analyst _____

Reviewed By _____

Appendix D

Well Development and Purging Procedures

Well Development

All monitoring wells will be developed to create an effective filter pack around the well screen, correct damage to the formation caused by drilling, remove fine particles from the formation near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of the well. Newly installed monitoring wells will not be developed for at least 48 hours after the surface pad and outer protective casing are installed. This will allow sufficient time for the well materials to cure before the development procedures are initiated. A new monitoring well will be developed until the column of water in the well is free of visible sediment, and the pH, temperature, turbidity, and specific conductivity have stabilized. In most cases, the above requirements can be satisfied. However, in some cases, the pH, temperature, and specific conductivity may stabilize but the water remains turbid. In this case, continuous flushing may be necessary to complete the well development. If the well is pumped dry, the water level will be allowed to sufficiently recover before the next development period is initiated. The common methods used for developing wells include:

(1) pumping and over-pumping;

(2) backwashing;

(3) surging (with a surge block);

(4) bailing;

(5) jetting; and

(6) airlift pumping.

These development procedures will be used, either individually or in combination, to achieve the most effective well development. However, the most favorable well development methods include pumping, over-pumping, bailing, surging, or a combination of these methods. Well development methods and equipment that alter the chemical composition of the groundwater will not be used.

Development methods that involve adding water or other fluids to the well or borehole, or that use air to accomplish well development will be avoided, if possible. Approval will be obtained from the NMED prior to introducing air, water, or other fluids into the well for the purpose of well development. If water is introduced to a borehole during well drilling and completion, then the same or greater volume of water will be removed from the well during development. In addition, the volume of water withdrawn from a well during development will be recorded, and best efforts will be used to avoid pumping wells dry during development activities.

Well Purging

All zones in each monitoring well will be purged by removing groundwater prior to sampling and in order to ensure that formation water is being sampled. Purge volumes will be determined by monitoring, at a minimum, groundwater pH, specific conductance, dissolved oxygen concentrations, turbidity, redox potential, and temperature during purging of volumes and at measurement intervals of not less than ¼ the pre-purge well volume. The groundwater quality parameters and fluid levels will be measured using a YSI Professional Plus Multiparameter Meter, YSI Water Quality Sonde, Hach Portable Turbidimeter, and a Geotech Interface Meter. The volume of groundwater purged, the instruments used, and the readings obtained at each interval will be recorded on the field monitoring log. In general, water samples may be obtained from the well after the measured parameters of the purge water have stabilized to within ten percent for three consecutive measurements. Well purging

may also be conducted in accordance with the NMED's Position Paper "Use of Low-Flow and other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring" (October 30, 2001). If necessary, a written request for a variance from the described methods of well purging for individual wells may be submitted to NMED no later than 90 days prior to scheduled sampling activities.

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6313
Phone (505) 476-6000 Fax (505) 476-6030
www.env.nm.gov

Michelle Lujan Grisham
Governor

Howie C. Morales
Lt. Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

May 21, 2019

John Moore
Environmental Superintendent
Western Refining, Southwest Inc., Gallup Refinery
92 Giant Crossing Road
Gallup, New Mexico 87301

RE: DISAPPROVAL
SMW-2 AREA AND BOUNDARY WELL INSTALLATION REPORT
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-19-008

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has reviewed the *SMW-2 Area and Boundary Well Installation Report* (Report), dated April 2019, submitted on behalf of Marathon Petroleum Company dba Western Refining Southwest Inc., Gallup Refinery (the Permittee). NMED hereby issues this Disapproval. The Permittee must address the following comments.

Comment 1
The cover letter states, "[t]his report was prepared in response to New Mexico Environmental Department (NMED) comments in the 2013 and 2014 Annual Facility-Wide Ground Water Monitoring Reports." More accurately, the Report was submitted based on the Permittee's Investigation Work Plan and NMED's comments. No response is necessary.

Comment 2
The Executive Summary, page E-i, states, "[t]he sample was very turbid and dissolved metals analyses were not performed." A turbid groundwater sample should have been filtered to remove excessive suspended solids. Turbidity in groundwater should not prevent collection of

groundwater samples for dissolved metals analysis. Provide a more detailed explanation in a response letter.

Comment 3

The Executive Summary, page E-i, states, "[c]hloride was detected at a concentration (1,400 mg/L) above the screening level (250 mg/L) in one sample collected from well BW-5C. Diesel range organics (DRO) were detected at low concentrations of 0.47 mg/L and 0.74 mg/L in groundwater samples collected at wells BW-4B and BW-5B, respectively, in comparison to the screening level of 0.086 mg/L." There are currently no other groundwater monitoring wells west of these boundary wells. The extent of groundwater contamination west of pond EP-9 is not delineated. Comment 1 in NMED's *Disapproval Annual Groundwater Monitoring Report: Gallup Refinery – 2017*, dated March 21, 2019, requires installation of more wells west of these boundary wells. These new wells are intended to delineate the contaminant plumes west of Pond EP-9. In addition, other organic constituents (e.g., MTBE, EDC) were detected in the groundwater sample collected from well BW-5C according to Appendix E (Groundwater Analytical Reports). Revise the Report for accuracy.

Comment 4

In Section 2.1 (SMW-2 Area), page 2-1, the Permittee states, "MTBE has been detected in groundwater samples collected at SMW-2, but has remained below the screening level." According to the *2017 Annual Groundwater Monitoring Report,* the MTBE concentration in the groundwater sample collected from well SMW-2 exceeded the screening level in August 2015. Revise the Report for accuracy.

Comment 5

In Section 2.2 (OW-1 Area), page 2-2, the Permittee states, "[o]ther organic constituents that have been detected at very low concentrations below screening levels in water samples collected at OW-1 include benzene, toluene, and total xylenes." According to the *2017 Annual Groundwater Monitoring Report,* the MTBE, ethylbenzene, and EDC concentrations in groundwater samples collected from well OW-1 were also detected (below the screening levels). The detection of MTBE in the groundwater samples collected from well OW-1 prompted further groundwater investigation west of well OW-1 (see Comment 3). Revise the Report for accuracy.

Comment 6

In Section 2.2 (OW-1 Area), page 2-2, the Permittee states, "[o]rganic constituents that have been detected at very low concentrations below screening levels in water samples collected at OW-10 include 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene." According to the *2017 Annual Groundwater Monitoring Report,* the cis-1, 2-DCE, 1, 2, 4-trimethylbenzene, toluene, ethylbenzene, and xylenes were also detected at concentrations below the screening levels in groundwater samples collected from well OW-10. Revise the Report for accuracy.

Comment 7

Section 3.1.1 (Boundary Wells), page 3-1, states, "[n]o discrete soil samples were retained for laboratory analysis since the field screening methods did not indicate any potential contamination." As stated numerous times in previous NMED's comments, it is necessary to

collect soil samples for laboratory analysis even though field screening did not indicate any potential contamination. At a minimum of three soil samples should have been collected from each boring (e.g., from the bottom of boring, at the water table, and from vadose zone at the depth with the highest PID readings). Include the provision for all future work plans. No revision required.

Comment 8

Section 3.1.2 (SMW-2 Area), page 3-2, states, "[o]ne discrete soil sample was collected from each soil boring. The samples were from the interval exhibiting the highest soil vapor reading." Soil samples should have been collected from each boring to delineate the extent of chloride exceedance. In addition, one discrete sample per boring is not adequate (see Comment 7). NMED's *Approval, Response to Comments NMED Approval with Modifications Letter dated March 17, 2017 [Chloride Exceedance Excavation Report],* dated May 16, 2019 requires the Permittee to submit a work plan to install soil borings to investigate the extent of chloride exceedances. If soil data had been collected from the borings, it could be used to guide the investigation. It is important to collect soil data to provide characterization data for the site.

Comment 9

Section 4.3.1 (Well Installation and Groundwater Sample Collection) includes two subsections titled as "Boundary Wells" and "SMW-2 Areas". The section numbers of "Boundary Wells" and "SMW-2 Areas" are presented incorrectly. The sections regarding "Boundary Wells" and "SMW-2 Areas" are numbered as Section 3.3.1.1 and 3.3.1.2, respectively. These sections should be numbered as Section 4.3.1.1 and 4.3.1.2. Correct the typographical errors in the revised Report.

Comment 10

Section 3.3.1.1 (sic) (Boundary Wells), page 4-7, states, "[t]he well [BW-5A] was installed with the screened interval ranging from 10 feet bgl to 20 feet bgl. The screen was set to intercept possible groundwater that may exist in the gravel and sand encountered from 12 feet bgl to 14 feet bgl and the very fine grain sands encountered within the silty clay from 14 feet bgl to 20.50 feet bgl." The screened interval of well BW-5A should have been set deeper with longer screen. The lithology description for the boring (page 4-6) indicates that the targeted sandy layers were dry. Potential water presence is first recorded at the depth of 30 feet bgs in nearby boring BW-5B. Therefore, groundwater production is unlikely at the depth shallower than 30 feet bgs at the location. In addition, the depth-to-water (DTW) measurements in the closest upgradient groundwater monitoring well MKTF-44 ranged from 22.85 to 31.16 feet bgs in 2017. Since the upper sandy layer and Chinle/Alluvial Interface are unlikely to be different water bearing zones, the groundwater elevation at the location of BW-5A is expected to be comparable to that of well MKTF-44. The DTW data in MKTF-44 should have been used to guide the decision regarding the placement of the well screen. In the future, in order to make appropriate decisions regarding the placement of screened intervals in unconfined or semi-confined aquifers, review the boring logs for nearby wells for the depths where water is potentially present and historic groundwater elevation data in nearby wells. Also, a longer screen (e.g., 20 feet) is acceptable to intercept the water table and to accommodate the trend of decreasing groundwater levels in recent years.

Include the measure to appropriately select screened intervals in future work plans. No revision is required.

Comment 11
Section 3.3.1.1 (sic) (Boundary Wells), page 4-8, states, "[t]he sampling was terminated at 58.5 feet bgl." The statement is misleading. No soil samples were collected from the boring. The statement "[t]he sampling was terminated at..." appears multiple times in the Report. Revise this statement as well as all similar statements that appear in the Report for clarity.

Comment 12
Section 3.3.1.1 (sic) (Boundary Wells), page 4-8, states, "[n]o apparent saturated sediments were encountered [at boring BW-5B]." Although no apparent saturated sediments are encountered, groundwater is produced from well BW-5B. Indications of saturation are not always obvious in tight clay characteristic of the Chinle formation. A 24-hour delay prior to well construction to allow water to enter the boring could aid in appropriate screened interval selection. No response required.

Comment 13
Section 3.3.1.1 (sic) (Boundary Wells), page 4-8, states, "[t]he screen [for well BW-5B] was set to intercept possible groundwater that may exist in the sandstone encountered within the silty clays from 48 feet bgl to 54 feet bgl." Well BW-5B is screened across the Chinle/Alluvial Interface according to Table 7 (Fluid Levels). However, since the sandstone describes the Sonsela formation, well BW-5B is likely screened across Sonsela/Chinle rather than Chinle/Alluvial Interface. Additionally, the DTW measurements for well BW-5B ranged from 8.65 to 10.57 feet bgs according to Table 7. The higher groundwater elevation in well BW-5B in comparison to that of upgradient well MKTF-44 is indicative of confined conditions, typically seen in the Sonsela formation. Revise the Report accordingly or provide explanation for why the Permittee believes well BW-5B is screened to Chinle/Alluvial Interface.

Comment 14
In Section 5 (Regulatory Criteria), page 5-2, the Permittee states, "[o]nly one constituent (di-n-octyl-phthalate) was detected in groundwater that does not have a screening level." Table 8.2.3 (OW-59 and OW-60 Semi-Volatile and Volatile Organic Compounds, Analytical Results Summary) does not present the detection of di-n-octyl-phthalate. Include all detections of SVOCs and VOCs regardless of presence or absence of screening levels in the table. Revise the Report accordingly.

Comment 15
In Section 6.2 (Groundwater Analytical Results), page 6-3, the Permittee states, "[g]roundwater samples were also analyzed for the following total metals using the indicated analytical methods." Cyanide and mercury are listed following the statement. However, cyanide is not a RCRA metal. Revise the Report accordingly.

Comment 16
In Section 6.2 (Groundwater Analytical Results), page 6-5, the Permittee states, "[d]etectable concentrations of acetone and benzoic acid were reported in the sample collected from BW-4B. The concentrations were below the screening levels." The tables presenting the analytical results for groundwater samples collected from well BW-4B are not included in the Report. Provide these tables in the revised Report.

Comment 17
In Section 6.2 (Groundwater Analytical Results), page 6-5, the Permittee states, "[i]n the sample collected from BW-5B acetone, toluene and benzoic acid were reported at concentrations below the screening levels. Detectable concentrations of 1,1-dichloroethane, 1,2-dichloroethane, acetone, MTBE, benzoic acid, di-n-octyl phthalate, and GRO were reported in the sample collected from BW-5C." According to Table 8.1 (BW-5B and BW-5C BTEX and MTBE Analytical Result Summary) and Table 8.1.1 (BW-5B and BW-5C General Chemistry and DRO/GRO/MRO Analytical Result Summary), MTBE and GRO are detected below the screening level in the groundwater sample collected from well BW-5B; however, these detections are not included in the statement. In addition, the detections of acetone and benzoic acid in the groundwater samples collected from well BW-5B are not presented in any tables included in the Report. Similarly, the detections of 1,1-dichloroethane, 1,2-dichloroethane, acetone, benzoic acid, and di-n-octyl phthalate are not presented in any tables included in the Report. Revise the Report for accuracy and include the analytical data tables pertinent to the discussion in the revised Report.

Comment 18
In Section 6.2 (Groundwater Analytical Results), page 6-5, the Permittee states, "[d]etectable concentrations of 1,2,4-trimethybenzene, acetone, MTBE, and benzoic acid, were reported in the groundwater sample collected from OW-59." The tables presenting the detection of 1,2,4-trimethybenzene and benzoic acid are not included in the Report. Include the analytical data tables pertinent to the discussion in the revised Report.

Comment 19
In Section 6.2 (Groundwater Analytical Results), page 6-6, the Permittee states, "[d]etectable concentrations of 4-isopropyltoluene, acetone, MTBE, toluene, benzoic acid, and bis(2-ethyhexyl) phthalate were reported in the groundwater sample collected from OW-60." The tables presenting the detection of 4-isopropyltoluene and benzoic acid are not included in the Report. Include the analytical data tables pertinent to the discussion in the revised Report. In addition, toluene is not detected from well OW-60 according to Table 8.2 (OW-59 and OW-60 BTEX, MTBE, General Chemistry and DRO/GRO/MRO Analytical Result Summary). Revise the Report for accuracy.

Comment 20
In Section 6.3 (SMW-2 Area – Additional Sampling), page 6-7, the Permittee states, "[b]ased on the flow direction of groundwater and the reported concentrations, the elevated chloride concentrations in SMW-2 may be originating from a source located in the area of the OCD Central landfarm, or further up-gradient." The laboratory reports included in the *Response to*

Comments NMED Approval with Modifications Letter dated March 17, 2017 [Chloride Exceedance Excavation Report] indicate that the chloride concentrations in the soil samples collected from the OCD Central Landfarm range from 170 mg/kg to 570 mg/kg. With exception of one sample, the chloride concentrations in soil samples collected from the landfarm did not exceed the screening level of 500 mg/kg. Although the chloride concentrations in the excavation confirmation samples, collected from depths of approximately six feet bgs, exceed the screening level in multiple locations, these soil samples were likely collected within the footprint of Evaporation Pond (EP)-10 or native soils below the pond, rather than shallow soils within the OCD Landfarm. Therefore, the landfarm is not the likely source of chloride in groundwater. Since the landfarm overlies former Pond EP-10 and Pond EP-10 may be the source of the chloride contamination in groundwater, the depth of Pond EP-10 must be identified and the soils below the landfarm must be investigated (see Comment 8). Note that the OCD has regulatory authority regarding the chloride and sulfate exceedances in groundwater. Ensure that OCD is included on all correspondence related to this issue.

Comment 21
In Section 6.3 (SMW-2 Area – Additional Sampling), page 6-7, the Permittee states, "[t]he sulfate concentrations increase across the OCD Central landfarm moving down-gradient, with the highest reported concentrations in the area in the groundwater sample collected in OW-59. This could suggest the OCD Central landfarm is a source of the sulfate." The laboratory reports included in the *Response to Comments NMED Approval with Modifications Letter dated March 17, 2017 [Chloride Exceedance Excavation Report]* indicate that the sulfate concentrations in the soil samples collected from the OCD Central Landfarm range from 400 mg/kg to 770 mg/kg. Since the sulfate concentration in groundwater sample collected from well OW-59 is recorded as 3,000 mg/L, the landfarm is not the likely source of sulfate in groundwater. Pond EP-10 that underlies the landfarm may be the source of the sulfate contamination in groundwater; thus, the soils below the landfarm also must be investigated for sulfate contamination (see Comment 20).

Comment 22
In Section 7 (Conclusions and Recommendations), page 7-1, the Permittee states, "[i]t is recommended to install additional monitoring wells to better determine if a local source of chloride and/or sulfate is present. An Investigation Work Plan for additional monitoring wells was submitted in August, 2018 pursuant to NMED's request." NMED issued a disapproval for the work plan on February 20, 2019 and required a revised work plan by August 9, 2019. This comment serves as a reminder. No response is required.

Comment 23
The groundwater elevation data collected from well SMW-2 is not included in Figure 5 (Chinle/Alluvium Interface Potentiometric Map September 2017). Although well SMW-2 is screened to the Chinle/Alluvial Interface, the groundwater elevation in well SMW-2 is significantly higher compared to the rest of the wells screened within the same formation in the area. Provide an explanation for the higher groundwater elevation in well SMW-2 in the revised Report.

The Permittee must address all comments in this Disapproval and submit a revised Report. Two bound hard copies and an electronic version of the revised Report must be submitted to NMED. In addition, include a red-line strikeout version in electronic format showing where all revisions to the Report have been made. The revised Report must be accompanied with a response letter that details where revisions have been made, cross-referencing NMED's numbered comments. The revised Report must be submitted to NMED no later than **October 4, 2019**.

If you have questions regarding this Disapproval, please contact Michiya Suzuki of my staff at 505-476-6059.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: K. Van Horn, NMED HWB
D. Cobrain, NMED HWB
M. Suzuki, NMED HWB
C. Chavez, OCD
L. King, EPA Region 6 (6LCRRC)
B. Moore, WRG

File: Reading File and WRG 2019 File
HWB-WRG-19-008

Marathon Petroleum Company LP

April 11, 2019

Mr. John E. Kieling, Chief
New Mexico Environmental Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

RE: Response to Comments
NMED Approval with Modifications Letter dated March 17, 2017
Marathon Petroleum Company LP, Gallup Refinery
(dba Western Refining Southwest, Inc.)
EPA ID# NMD000333211
HWB-WRG-17-003

Dear Mr. Kieling:

Attached please find the Response to Comment 5 in the New Mexico Environmental Department (NMED) Disapproval Letter, dated February 20, 2019, regarding the Investigation Work Plan for the SMW-2 and GWM-1 Area. Comment 5 requested a response to the NMED Approval with Modifications Letter, dated March 17, 2017, regarding the September and October 2016 chloride exceedance excavation report for the Central Oil Conservation Division (OCD) Landfarm.

If you have any questions or comments regarding the information contained in the attached report, please do not hesitate to contact Mr. Brian Moore at 505-726-9745.

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

Robert S. Hanks
Refinery General Manager
Marathon Petroleum Company – Gallup Refinery

Cc: C. Chavez (OCD)

92 Giant Crossing Road
Jamestown, NM 87347

RESPONSE TO COMMENTS

Comments on the September and October 2016 Chloride Exceedance Excavation Report (March 17, 2017 Approval with Modifications Letter)

1. **NMED Comment 1:**

Generally, NMED has not reviewed the Permittee's chloride reports regarding the OCD Central Landfarm, because they do not fall within NMED's regulatory authority. However, as pointed out in the Report, the Central OCD Landfarm lies within the footprint of Evaporation Pond 10 (EP-10), which is part of Solid Waste Management Unit (SWMU) 2. The OCD regulates the Central OCD Landfarm under 19.15.36 NMAC (also known as Part 36) and required the Permittee to address chloride exceedances discovered in the landfarm. On page 3, paragraph 1, the Permittee states:

> "The Response Action Plan and subsequent excavations were intended to satisfy Rule 36 requirements and Central OCD Landfarm-specific agreements reached between Western and OCD. In light of the information presented in this correspondence, Western does not believe that vadose zone chloride concentrations in excess of the 500 mg/kg action level/ABRSC are a result of landfarm operation. Accordingly, Western does not believe that vadose zone chloride contamination needs to be addressed or remediated in accordance with NMAC Rule 36 or previous Central OCD Landfarm-specific agreements. The elevated chloride concentrations are believed to be associated with former Evaporation Pond #10. Former Evaporation Pond #10 is part of Solid Waste Management Unit (SWMU) 2. Therefore, Western believes that it would be appropriate to address the chloride contaminated soils as part of SWMU 2 remedies."

The updated corrective action schedule in the RCRA Permit defers corrective action at SWMU 2 because the unit is an active unit. However, because EP-10 is not being used as an evaporation pond and the Permittee not only has access, but is currently conducting work within the footprint of the pond/landfarm, the Permittee can address OCD's concerns and continue to follow through with the Response Action Plan and Central Landfarm-specific agreements with the OCD.

MPC Response 1:

No comment.

2. **NMED Comment 2:**

On page 2, under the heading "Former Evaporation Pond #1O", the Permittee discusses the rationale behind the belief that the chlorides in the landfarm are from use of EP-10 for boiler house and water softener regeneration effluent.

The Permittee states in paragraph 2 of that section,

> "This idea is further supported by soil data collected from the landfarm's treatment zone over the past 4 years. Western has collected 6 treatment zone samples since 2013 to assist in determining if the landfarm may be eligible for closure or soil reuse. As shown in Table 2, the maximum reported chloride concentration for samples collected from the treatment zone (1 ft bgs) is 310 mg/kg. This is less than the 500 mg/kg action level/ABRSC and far less than some of the more elevated vadose zone samples which are in excess of 2,500 mg/kg (see Table l); If soils in the landfarm were the source of the vadose zone chloride contamination, it would be expected that the treatment zone chloride concentrations would be greater that the vadose zone chloride concentrations, but the data indicate the opposite. This line of evidence suggests a non-landfarm source."

NMED disagrees with this line of evidence. EP-10 has been used at the OCD Central Landfarm since the mid-1990s. Chloride is highly soluble and moves through the vadose zone relatively quickly. It is possible that the high levels of chlorides beneath the treatment zone are from the landfarm and not from former EP-10 discharges. There are also high levels of chlorides in groundwater in this area and NMED and OCD required the Permittee to submit a work plan to investigate this issue. The work plan is currently under review. Provide the dimensions of EP-10 and documents from OCD related to use of the evaporation pond as a landfarm (email response is sufficient).

MPC Response 2:

While Marathon Petroleum Company (MPC) is unaware of any design drawings for Pond 10, the surface expression of the pond currently appears to be approximately 325 feet by 200 feet. The figure included as Attachment A illustrates the possible location of former Pond 10. Also, please find attached an email exchange with Carl Chavez regarding the possible location of Pond 10 over the OCD Landfarm.

3. NMED Comment 3:

OCD's Rule 36 requires that semiannual vadose zone samples be analyzed for total petroleum hydrocarbons (TPH); benzene, toluene, ethylbenzene, and xylenes (BTEX); and, chloride. Sampling results for TPH and BTEX were not included with the Report. If samples were collected for TPH and BTEX analyses, provide the results to OCD and NMED.

MPC Response 3:

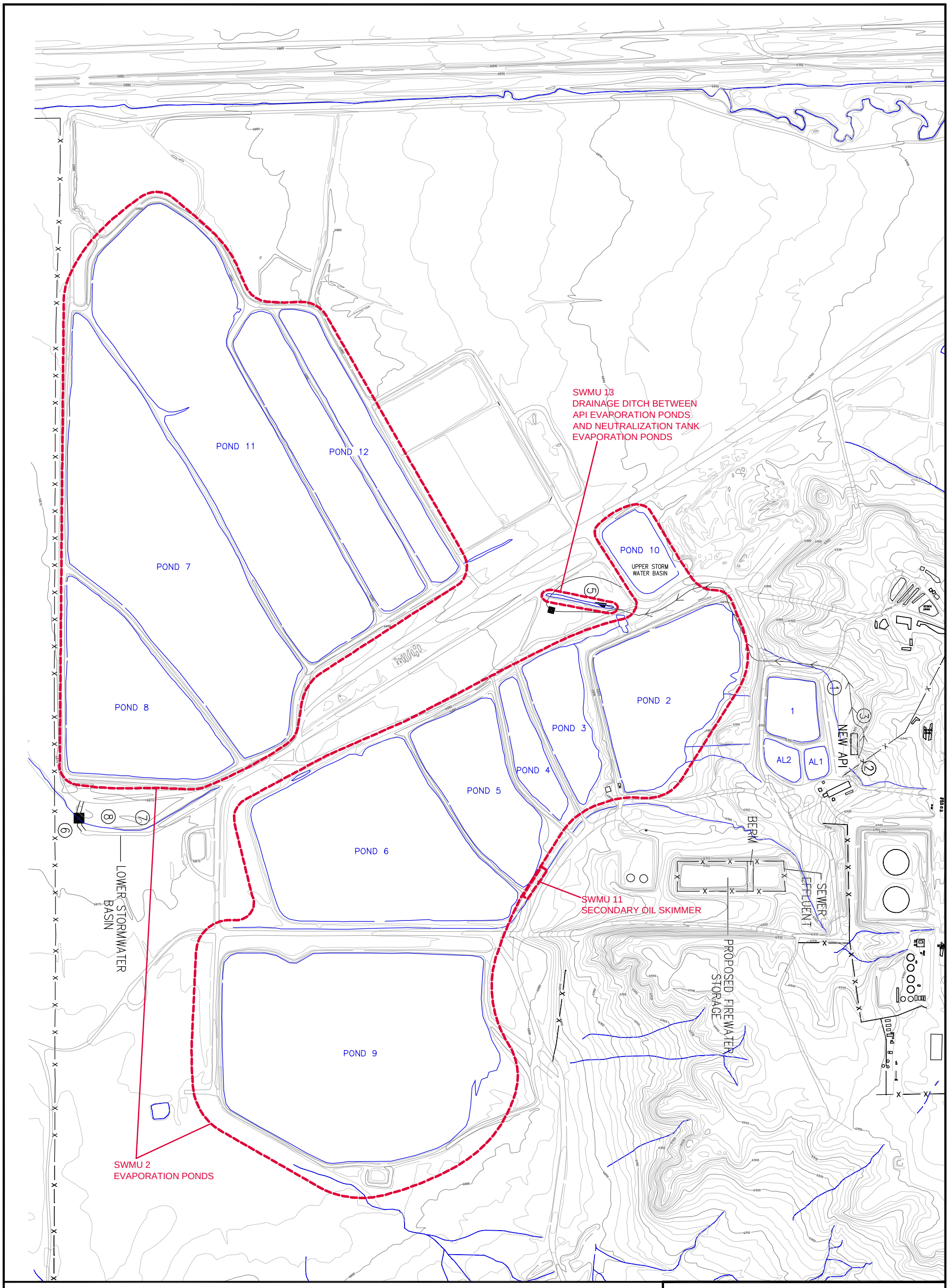
Attachment B to this response provides the analytical results for samples collected in 2016.

4. **NMED Comment 4:**

If, at a future time, the Permittee chooses to close the OCD Central Landfarm, then the Permittee may also propose to conduct corrective action under the RCRA Permit and submit a work plan to NMED for review. The information gathered at that time may be used to support future corrective action activities at SWMU 2. A letter titled *Clarification of RCRA Corrective Action Process Evaporation Pond Closure Plan,* dated April 11, 2008 outlined the general requirements for the RCRA corrective action process and NMED can provide additional guidance when the time comes.

MPC Response 4:

No comment.



N

0 400

SCALE IN FEET

LEGEND

SWMU LOCATIONS

Western Refining
GALLUP REFINERY

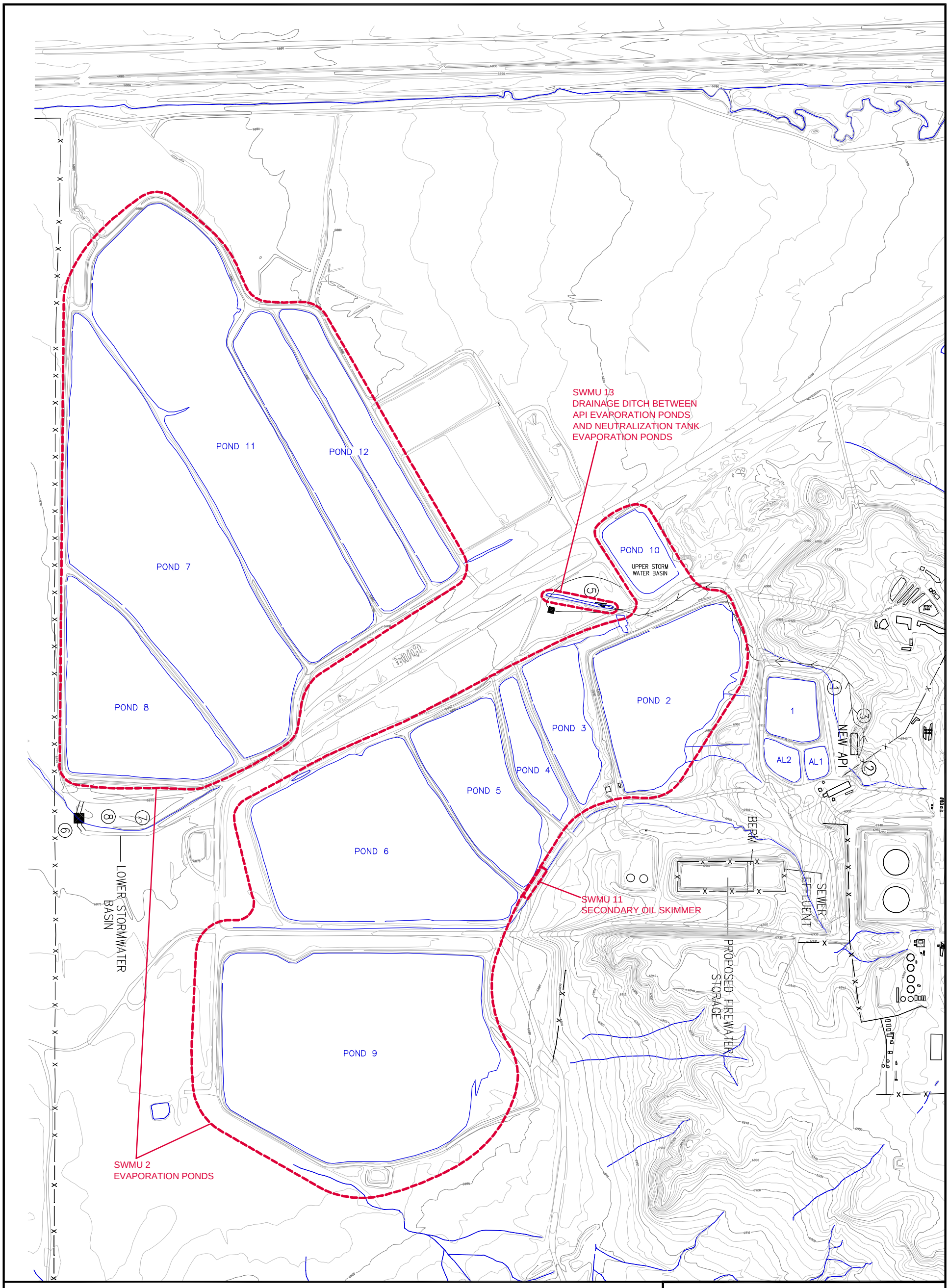
PROJ. NO.: Western Refining | DATE: 02/17/14 | FILE: WestRef-B181

FIGURE 3
SWMU / AOC LOCATIONS

DiSorbo
Environmental Consulting Firm

8501 N. Mopac Expy
Suite 300
Austin, Texas 78759

Attachment A
Pond 10 Location Map
OCD Email Exchange



N

0 400

SCALE IN FEET

LEGEND

SWMU LOCATIONS

Western Refining
GALLUP REFINERY

PROJ. NO.: Western Refining | DATE: 02/17/14 | FILE: WestRef-B181

FIGURE 3
SWMU / AOC LOCATIONS

DiSorbo
Environmental Consulting Firm

8501 N. Mopac Expy
Suite 300
Austin, Texas 78759

AP - 111

LANDFARMS

2017

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, February 2, 2017 10:57 AM
To: 'Ed.Riege@wnr.com'
Cc: Griswold, Jim, EMNRD; Smith, Cory, EMNRD; VanHorn, Kristen, NMENV
Subject: Gallup Refinery (AP-111) "September and October 2016 Chloride Exceedance Excavation Report" dated January 25, 2017

Mr. Riege:

Re: OCD Central Landfarm

The New Mexico Oil Conservation Division (OCD) and New Mexico Environment Department (NMED) (Agencies) have completed review of the above subject report (report).

On page 3, "Proposed Path Forward", paragraph 1: The OCD Central Landfarm was built within Evaporation Pond 10 which is part of SWMU 2 (Evaporation Ponds) under Western's RCRA Permit. The updated schedule in the RCRA Permit lists corrective action at SWMU 2 as deferred since the SWMU is still in use. However, since Evaporation Pond 10 is not in use as an evaporation pond, Western can access soils for chloride remediation to address OCD's concerns. Additionally, the landfarm is permitted by OCD under Part 36 (i.e., 19.15.36 NMAC), so the continued operation of the landfarm also falls under OCD Regulations. OCD agrees with Western's proposed hot spot corrective actions in the report. Documentation (i.e., photos of excavation, C-138 manifest, etc. is required within 30-days of completion of corrective actions to verify the remediation was completed.

If Western plans to close the OCD Central Landfarm, NMED recommends in addition to OCD Regulations that NMED RCRA requirements also be addressed at the same time to avoid re-investigation of the area during SWMU 2 corrective action. OCD cannot guarantee that alternate remedial limits would be required based on the proposed source of contamination; however, OCD would consider recommended closure limits with the scientific basis if proposed in a landfarm closure plan by Western to the agencies.

Please contact me if you have questions, to request a telephone conference call, or wish to discuss this matter further. Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD **and see "Publications")**

Chavez, Carl J, EMNRD

From: Riege, Ed <Ed.Riege@wnr.com>
Sent: Thursday, January 26, 2017 10:19 AM
To: Chavez, Carl J, EMNRD
Cc: Griswold, Jim, EMNRD; VanHorn, Kristen, NMENV; Hains, Allen
Subject: September and October 2016 Chloride Exceedance Excavation Report
Attachments: 201701250903.pdf

Carl,
Please see attached correspondence chloride excavation report. The email does not include attachments due to size. A hard copy is being sent certified mail to you and Kristen.

Thanks,
Ed

Ed Riege
Remediation Manager

Western Refining
Gallup Refinery
92 Giant Crossing Road
Gallup, NM 87301
(505) 722-0217
ed.riege@wnr.com

January 25, 2017

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

RE: September and October 2016 Chloride Exceedance Excavation Report
Central Oil Conservation Division Landfarm
Western Refining Company Southwest, Inc., Gallup Refinery, Gallup, New Mexico

Dear Mr. Chavez:

Western Refining Company Southwest, Inc. (Western) is submitting this correspondence to present the results of chloride-contaminated soil excavation and confirmation sampling conducted in accordance with the "Chloride Exceedance Response Action Plan, Central Oil Conservation Division Landfarm, Western Refining Company Southwest, Inc., Gallup Refinery, Gallup, New Mexico" (Response Action Plan), dated July 26, 2016. This correspondence is also intended to inform the Oil Conservation Division (OCD) of a recently discovered non-landfarm chloride potential alternate source believed to be the cause of the elevated chloride concentrations reported in samples collected from the vadose zone beneath the Central OCD Landfarm.

Background

Semiannual vadose zone monitoring is conducted at random locations in accordance with New Mexico Administrative Code (NMAC) Rule 36 (19.15.36 NMAC). The landfarm had been divided into 6 foot (ft) by 6 ft grids to assist with random sample location selection. As required by the Response Action Plan, Western excavated chloride-contaminated soil associated with two these grids. Chloride contamination was originally identified within these grids during the April 2016 semiannual vadose zone sampling event and the June 2016 confirmation sampling event. Per the Response Action Plan, soils with chloride concentrations in excess of the 500 milligram per kilogram (mg/kg) action level/alternate beneficial reuse screening concentration (ABRSC) were to be excavated. Confirmation samples were to be collected from the floor of the excavations, as well as the from the sidewalls of the excavation at the depths of the original exceedances (6 ft below ground surface (bgs)) in the four cardinal directions. The excavations were to be extended or deepened in the direction of chloride concentrations in excess of 500 mg/kg, as determined via the confirmation sampling.

Excavation Extents and Confirmation Sampling Results

Excavation of chloride-contaminated soils began in September 2016 and continued through October 2016. Western contracted Trihydro Corporation (Trihydro) to oversee excavation completion and collect confirmation samples. The two grids scheduled for excavation were grids 1021 and 2271. The

excavations associated with each grid are shown on Figure 1. Confirmation sampling results are summarized in Table 1. Analytical laboratory reports and data validation reports are provided as Attachments A and B, respectively.

As shown in Table 1, the chloride concentrations reported for the September 2016 floor and sidewall samples associated with Grid 1021 are below the 500 mg/kg action level/ARBSC. Accordingly, the excavation of chloride-contaminated soil associated with Grid 1021 was deemed complete. The approximate excavation extents are illustrated on Figure 1, and the total depth of the excavation is 8 ft bgs.

Chloride concentrations reported for two of the September 2016 sidewall samples associated with Grid 2271 exceed the 500 mg/kg action level/ARBSC. In response to these confirmation sample exceedances, the excavation was expanded in the direction of the exceedances and additional confirmation samples were collected. Two such excavation expansion/resampling events were conducted in October 2016, and as shown on Figure 1, sidewall sample exceedances persist on the northern and eastern excavation boundaries. The growing size of the Grid 2271 excavation and the fact that contamination appears to extend to and possibly beyond the berms of the landfarm prompted Gallup and Trihydro to regroup and assess whether the current excavation plans (those outlined in the Response Action Plan) remain appropriate. This resulted in the acknowledgement that the refinery's former Evaporation Pond #10 occupied nearly the exact footprint of the Central OCD Landfarm prior to landfarm operation. Figure 2 illustrates the location of the former Evaporation Pond #10 and the Central OCD Landfarm. As discussed in the following section, former Evaporation Pond # 10 is believed to be the source of the elevated chloride concentrations present in the vadose zone soils beneath the Central OCD Landfarm.

Former Evaporation Pond # 10

According to the "Inventory of Solid Waste Management Units", dated June 14, 1985, "cell" or Evaporation Pond # 10 received "wastewater from the boiler house and water softener regeneration wastes". The pond was replaced in 1980 with an in-line neutralization tank. Both of these wastes would be expected to contain elevated chloride concentrations. Since these wastes were stored in the unlined evaporation pond whose footprint is similar to the Central OCD Landfarm prior to landfarm operation, it is likely that the pond may have contributed to the chloride contamination in the area and may be the cause of the vadose zone chloride exceedances.

This idea is further supported by soil data collected from the landfarm's treatment zone over the past four years. Western has collected 6 treatment zone samples since 2013 to assist in determining if the landfarm may be eligible for closure or soil reuse. As shown in Table 2, the maximum reported chloride concentration for samples collected from the treatment zone (1 ft bgs) is 310 mg/kg. This is less than the 500 mg/kg action level/ABRSC and far less than some of the more elevated vadose zone samples which are in excess of 2,500 mg/kg (see Table 1). If soils treated in the landfarm were the source of the vadose zone chloride contamination, it would be expected that the treatment zone chloride concentrations would be greater than the vadose zone chloride concentrations, but the data indicate the opposite. This line of evidence suggests a non-landfarm chloride source.

Proposed Path Forward

OCD Landfarm operation is governed by NMAC Rule 36. The Response Action Plan and subsequent excavations were intended to satisfy Rule 36 requirements and Central OCD Landfarm-specific agreements reached between Western and OCD. In light of the information presented in this correspondence, Western does not believe that vadose zone chloride concentrations in excess of the 500 mg/kg action level/ABRSC are a result of landfarm operation. Accordingly, Western does not believe vadose zone chloride contamination needs be addressed or remedied in accordance with NMAC Rule 36 or previous Central OCD Landfarm-specific agreements. The elevated chloride concentrations are believed to be associated with former Evaporation Pond # 10. Former Evaporation Pond # 10 is part of Solid Waste Management Unit (SWMU) 2. Therefore, Western believes that it would be appropriate to address the chloride contaminated soil as part of SWMU 2 remedies.

Western does intend to dispose of the already excavated chloride contaminated soil at an off-site disposal facility permitted to receive such wastes and to the fill the excavations with clean fill material. The excavated soil is currently stock piled on plastic sheeting within the landfarm berms. Pending OCD approval of this correspondence, Western will begin soil disposal and excavation backfilling.

Western is also still considering closure of the Central OCD landfarm. When closure is sought, Western believes that closure should still be conducted in general accordance with NMAC Rule 36. However, Central OCD Landfarm-specific agreements reached between Western and OCD, as well as the alternate chloride source identified in this correspondence (i.e., former Evaporation Pond # 10) should be taken into consideration. Pending OCD approval of this correspondence, Western will discuss closure details and expectations with OCD. If you have any questions or comments, please do not hesitate to call me at (505) 722-0217.

Sincerely,
Western Refining Company Southwest, Inc.

Ed Riege
Remediation Manager

697-052-003

Attachments

cc: G. Price, Trihydro Corporation
K. Van Horn, NMED

TABLES

TABLE 1. CHLORIDE-CONTAMINATED SOIL EXCAVATION CONFIRMATION SAMPLING RESULTS
WESTERN REFINING COMPANY SOUTHWEST, INC., GALLUP, NEW MEXICO

Sample Type	Sample ID	Date Sampled	Chloride (mg/kg)
Grid 1021 Confirmation Sample	CentralOCD-1021-09062016-F	09/06/16	270
Grid 1021 Confirmation Sample	CentralOCD-1021-09062016-SW-E	09/06/16	130
Grid 1021 Confirmation Sample	CentralOCD-1021-09062016-SW-E Dup	09/06/16	110
Grid 1021 Confirmation Sample	CentralOCD-1021-09062016-SW-N	09/06/16	160
Grid 1021 Confirmation Sample	CentralOCD-1021-09062016-SW-S	09/06/16	280
Grid 1021 Confirmation Sample	CentralOCD-1021-09062016-SW-W	09/06/16	490
Grid 2271 Confirmation Sample	CentralOCD-2271-09062016-F	09/06/16	170
Grid 2271 Confirmation Sample	CentralOCD-2271-09062016-SW-E	09/06/16	**1500**
Grid 2271 Confirmation Sample	CentralOCD-2271-09062016-SW-N	09/06/16	**2200**
Grid 2271 Confirmation Sample	CentralOCD-2271-09062016-SW-S	09/06/16	160
Grid 2271 Confirmation Sample	CentralOCD-2271-09062016-SW-W	09/06/16	300
Grid 2271 Confirmation Sample	CentralOCD-2271-10062016-SW-E	10/06/16	**800**
Grid 2271 Confirmation Sample	CentralOCD-2271-10062016-SW-E Dup	10/06/16	480
Grid 2271 Confirmation Sample	CentralOCD-2271-10062016-SW-N	10/06/16	**790**
Grid 2271 Confirmation Sample	CentralOCD-2271-10202016-SW-E	10/20/16	**640**
Grid 2271 Confirmation Sample	CentralOCD-2271-10202016-SW-E Dup	10/20/16	**600**
Grid 2271 Confirmation Sample	CentralOCD-2271-10202016-SW-NE	10/20/16	**2600**
Grid 2271 Confirmation Sample	CentralOCD-2271-10202016-SW-NW	10/20/16	**2600**
Action Level and ABRSC			500

Notes:
Action Level/Alternate Beneficial Reuse Soil Screening Level (ABRSC) exceedances are shown in bold font.

TABLE 2. HISTORICAL TREATMENT ZONE CHLORIDE ANALYTICAL DATA SUMMARY
WESTERN REFINING COMPANY SOUTHWEST, INC., GALLUP, NEW MEXICO

Sample Type	Sample ID	Date Sampled	Chloride (mg/kg)
Treatment Zone Sample	CentralOCD-TZ_032713	03/27/13	310
Treatment Zone Sample	CentralOCD-TZ_091614	09/16/14	130
Treatment Zone Sample	CentralOCD-TZ-04062015	04/06/15	130
Treatment Zone Sample	Central OCD-TZ-11242015	11/24/15	280
Treatment Zone Sample	CentralOCD-TZ-04072016	04/07/16	260 J
Treatment Zone Sample	CentralOCD-TZ-06162016	06/16/16	290
Action Level and ABRSC			500

Notes:
Action Level/Alternate Beneficial Reuse Soil Screening Level (ABRSC) exceedances are shown in bold font.
J - Estimated concentration

FIGURES



Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307.745.7474 (F) 307.745.7729

FIGURE 1

SEPTEMBER/OCTOBER 2016 CHLORIDE EXCAVATION CONFIRMATION SAMPLE LOCATIONS

WESTERN REFINING COMPANY L.L.C
GALLUP REFINERY
GALLUP, NEW MEXICO

Drawn By: PH	Checked By: GP	Scale: 1" = 42'	Date: 12/5/16	File: Gallup_OCDLF_Fig1.mxd



EXPLANATION

- FORMER EVAPORATION POND #10
- SWMU 2
- CENTRAL OCD LANDFARM

N

0 350'

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 2

LOCATIONS OF FORMER EVAPORATION POND #10 AND THE CENTRAL OCD LANDFARM

WESTERN REFINING COMPANY L.L.C
GALLUP REFINERY
GALLUP, NEW MEXICO

Drawn By: PH	Checked By: GP	Scale: 1" = 350'	Date: 12/5/16	File: Gallup_OCDLF_Fig2.mxd

Attachment B
2016 Analytical Reports

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

July 19, 2016

Ed Riege

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-3833
FAX (505) 722-0210

RE: OCD Central Landfarm Semiannual Sampling OrderNo.: 1606995

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 9 sample(s) on 6/17/2016 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued July 15, 2016.

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, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-01-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:20:00 PM
Lab ID: 1606995-001 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Fluoride	4.4	0.042	0.30		mg/Kg	1	6/27/2016 10:00:56 PM	26092
Chloride	330	12	30		mg/Kg	20	6/27/2016 10:13:21 PM	26092
Nitrogen, Nitrate (As N)	2.9	0.016	0.30		mg/Kg	1	6/27/2016 10:00:56 PM	26092
Sulfate	550	5.4	30		mg/Kg	20	6/27/2016 10:13:21 PM	26092
EPA METHOD 7471: MERCURY							Analyst: **DBD**	
Mercury	0.013	0.00053	0.031	J	mg/Kg	1	6/28/2016 9:21:40 AM	26093
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Arsenic	1.1	0.70	2.4	J	mg/Kg	1	6/30/2016 10:50:31 AM	26123
Barium	150	0.046	0.096		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Cadmium	ND	0.061	0.096		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Chromium	8.0	0.12	0.29		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Copper	3.4	0.15	0.29		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Iron	13000	93	240		mg/Kg	100	6/30/2016 10:31:34 AM	26123
Lead	3.2	0.17	0.24		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Manganese	280	0.085	0.19		mg/Kg	2	6/30/2016 11:28:12 AM	26123
Selenium	ND	1.0	2.4		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Silver	ND	0.030	0.24		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Uranium	ND	0.95	4.8		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Zinc	14	0.54	2.4		mg/Kg	1	6/30/2016 10:50:31 AM	26123
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Acenaphthylene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Aniline	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Anthracene	ND	0.13	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Azobenzene	ND	0.24	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benz(a)anthracene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benzo(a)pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benzo(b)fluoranthene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benzo(g,h,i)perylene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benzo(k)fluoranthene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benzoic acid	ND	0.16	0.99	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benzyl alcohol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Bis(2-chloroethoxy)methane	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Bis(2-chloroethyl)ether	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Bis(2-chloroisopropyl)ether	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Bis(2-ethylhexyl)phthalate	0.19	0.16	0.99	JD	mg/Kg	1	6/30/2016 2:11:19 PM	26116
4-Bromophenyl phenyl ether	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Butyl benzyl phthalate	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-01-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:20:00 PM
Lab ID: 1606995-001 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Carbazole	ND	0.13	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
4-Chloro-3-methylphenol	ND	0.24	0.99	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
4-Chloroaniline	ND	0.22	0.99	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2-Chloronaphthalene	ND	0.16	0.50	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2-Chlorophenol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
4-Chlorophenyl phenyl ether	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Chrysene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Di-n-butyl phthalate	0.17	0.15	0.79	JD	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Di-n-octyl phthalate	ND	0.17	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Dibenz(a,h)anthracene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Dibenzofuran	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
1,2-Dichlorobenzene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
1,3-Dichlorobenzene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
1,4-Dichlorobenzene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
3,3´-Dichlorobenzidine	ND	0.15	0.50	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Diethyl phthalate	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Dimethyl phthalate	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,4-Dichlorophenol	ND	0.18	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,4-Dimethylphenol	ND	0.22	0.60	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
4,6-Dinitro-2-methylphenol	ND	0.12	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,4-Dinitrophenol	ND	0.13	0.99	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,4-Dinitrotoluene	ND	0.18	0.99	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,6-Dinitrotoluene	ND	0.21	0.99	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Fluoranthene	ND	0.11	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Fluorene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Hexachlorobenzene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Hexachlorobutadiene	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Hexachlorocyclopentadiene	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Hexachloroethane	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Indeno(1,2,3-cd)pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
1-Methylnaphthalene	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2-Methylnaphthalene	ND	0.24	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2-Methylphenol	ND	0.17	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
3+4-Methylphenol	ND	0.14	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
N-Nitrosodi-n-propylamine	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
N-Nitrosodiphenylamine	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Naphthalene	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2-Nitroaniline	ND	0.21	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
3-Nitroaniline	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-01-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:20:00 PM
Lab ID: 1606995-001 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	0.14	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Nitrobenzene	ND	0.20	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2-Nitrophenol	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
4-Nitrophenol	ND	0.15	0.50	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Pentachlorophenol	ND	0.13	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Phenanthrene	ND	0.13	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Phenol	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Pyridine	ND	0.16	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
1,2,4-Trichlorobenzene	ND	0.21	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,4,5-Trichlorophenol	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,4,6-Trichlorophenol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Surr: 2-Fluorophenol	63.8	0	28.3-102	D	%Rec	1	6/30/2016 2:11:19 PM	26116
Surr: Phenol-d5	69.5	0	35.7-103	D	%Rec	1	6/30/2016 2:11:19 PM	26116
Surr: 2,4,6-Tribromophenol	80.0	0	35.2-108	D	%Rec	1	6/30/2016 2:11:19 PM	26116
Surr: Nitrobenzene-d5	75.2		24-118	D	%Rec	1	6/30/2016 2:11:19 PM	26116
Surr: 2-Fluorobiphenyl	86.6		35.4-111	D	%Rec	1	6/30/2016 2:11:19 PM	26116
Surr: 4-Terphenyl-d14	65.6		15-91.7	D	%Rec	1	6/30/2016 2:11:19 PM	26116
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.018	0.023		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Toluene	ND	0.0027	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Ethylbenzene	ND	0.0037	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Methyl tert-butyl ether (MTBE)	ND	0.014	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2,4-Trimethylbenzene	ND	0.0034	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,3,5-Trimethylbenzene	ND	0.0033	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2-Dichloroethane (EDC)	ND	0.012	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2-Dibromoethane (EDB)	ND	0.0032	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Naphthalene	ND	0.0071	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1-Methylnaphthalene	ND	0.010	0.18		mg/Kg	1	6/20/2016 8:01:30 PM	25923
2-Methylnaphthalene	ND	0.0098	0.18		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Acetone	ND	0.059	0.68		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Bromobenzene	ND	0.0037	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Bromodichloromethane	ND	0.0027	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Bromoform	ND	0.0056	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Bromomethane	0.019	0.017	0.14	J	mg/Kg	1	6/20/2016 8:01:30 PM	25923
2-Butanone	ND	0.026	0.46		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Carbon disulfide	ND	0.015	0.46		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Carbon tetrachloride	ND	0.0030	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Chlorobenzene	ND	0.0037	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-01-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:20:00 PM
Lab ID: 1606995-001 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Chloroethane	ND	0.0091	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Chloroform	ND	0.0034	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Chloromethane	0.081	0.0041	0.14	J	mg/Kg	1	6/20/2016 8:01:30 PM	25923
2-Chlorotoluene	ND	0.0034	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
4-Chlorotoluene	ND	0.0040	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
cis-1,2-DCE	ND	0.0027	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
cis-1,3-Dichloropropene	ND	0.0042	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2-Dibromo-3-chloropropane	ND	0.014	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Dibromochloromethane	ND	0.0041	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Dibromomethane	ND	0.0040	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2-Dichlorobenzene	ND	0.0040	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,3-Dichlorobenzene	ND	0.0037	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,4-Dichlorobenzene	ND	0.0057	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Dichlorodifluoromethane	ND	0.014	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,1-Dichloroethane	ND	0.0025	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,1-Dichloroethene	ND	0.015	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2-Dichloropropane	ND	0.0038	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,3-Dichloropropane	ND	0.0052	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
2,2-Dichloropropane	ND	0.0026	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,1-Dichloropropene	ND	0.0036	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Hexachlorobutadiene	ND	0.0056	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
2-Hexanone	ND	0.025	0.46		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Isopropylbenzene	ND	0.0039	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
4-Isopropyltoluene	ND	0.0041	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
4-Methyl-2-pentanone	ND	0.013	0.46		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Methylene chloride	ND	0.013	0.14		mg/Kg	1	6/20/2016 8:01:30 PM	25923
n-Butylbenzene	ND	0.0040	0.14		mg/Kg	1	6/20/2016 8:01:30 PM	25923
n-Propylbenzene	ND	0.0035	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
sec-Butylbenzene	ND	0.0063	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Styrene	ND	0.0041	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
tert-Butylbenzene	ND	0.0038	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,1,1,2-Tetrachloroethane	ND	0.0044	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,1,2,2-Tetrachloroethane	ND	0.0074	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Tetrachloroethene (PCE)	ND	0.0038	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
trans-1,2-DCE	ND	0.013	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
trans-1,3-Dichloropropene	ND	0.0067	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2,3-Trichlorobenzene	ND	0.0068	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2,4-Trichlorobenzene	ND	0.0049	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,1,1-Trichloroethane	ND	0.0028	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-01-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:20:00 PM
Lab ID: 1606995-001
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,2-Trichloroethane	ND	0.0054	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Trichloroethene (TCE)	ND	0.0049	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Trichlorofluoromethane	ND	0.0034	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2,3-Trichloropropane	ND	0.0079	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Vinyl chloride	ND	0.0037	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Xylenes, Total	ND	0.0086	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Surr: Dibromofluoromethane	108		70-130		%Rec	1	6/20/2016 8:01:30 PM	25923
Surr: 1,2-Dichloroethane-d4	106		70-130		%Rec	1	6/20/2016 8:01:30 PM	25923
Surr: Toluene-d8	95.3		70-130		%Rec	1	6/20/2016 8:01:30 PM	25923
Surr: 4-Bromofluorobenzene	98.7		70-130		%Rec	1	6/20/2016 8:01:30 PM	25923
EPA METHOD 418.1: TPH							Analyst: **TOM**	
Petroleum Hydrocarbons, TR	33	8.5	20		mg/Kg	1	6/23/2016	25996

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-02-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:50:00 PM
Lab ID: 1606995-002
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Fluoride	3.4	0.042	0.30		mg/Kg	1	6/27/2016 10:25:45 PM	26092
Chloride	350	12	30		mg/Kg	20	6/27/2016 10:38:10 PM	26092
Nitrogen, Nitrate (As N)	8.8	0.016	0.30		mg/Kg	1	6/27/2016 10:25:45 PM	26092
Sulfate	400	5.4	30		mg/Kg	20	6/27/2016 10:38:10 PM	26092
EPA METHOD 7471: MERCURY							Analyst: **DBD**	
Mercury	0.0033	0.00057	0.033	J	mg/Kg	1	6/28/2016 9:25:13 AM	26093
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Arsenic	0.88	0.71	2.4	J	mg/Kg	1	6/30/2016 3:45:33 PM	26123
Barium	170	0.047	0.098		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Cadmium	ND	0.062	0.098		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Chromium	8.1	0.12	0.29		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Copper	2.4	0.15	0.29		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Iron	13000	95	240		mg/Kg	100	6/30/2016 10:33:05 AM	26123
Lead	3.6	0.17	0.24		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Manganese	230	0.043	0.098		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Selenium	ND	1.1	2.4		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Silver	ND	0.031	0.24		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Uranium	ND	0.97	4.9		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Zinc	13	0.56	2.4		mg/Kg	1	6/30/2016 3:45:33 PM	26123
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Aniline	ND	0.094	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Anthracene	ND	0.066	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Azobenzene	ND	0.12	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benzoic acid	ND	0.082	0.50		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Bis(2-ethylhexyl)phthalate	0.10	0.081	0.50	J	mg/Kg	1	6/30/2016 2:39:19 PM	26116
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-02-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:50:00 PM
Lab ID: 1606995-002 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Carbazole	ND	0.067	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	6/30/2016 2:39:19 PM	26116
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Chrysene	ND	0.085	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Di-n-butyl phthalate	0.092	0.074	0.40	J	mg/Kg	1	6/30/2016 2:39:19 PM	26116
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
3,3´-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Diethyl phthalate	ND	0.10	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	6/30/2016 2:39:19 PM	26116
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Fluoranthene	ND	0.057	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Fluorene	ND	0.091	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Naphthalene	ND	0.095	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-02-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:50:00 PM
Lab ID: 1606995-002 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Phenanthrene	ND	0.068	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Phenol	ND	0.075	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Pyrene	ND	0.075	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Pyridine	ND	0.079	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Surr: 2-Fluorophenol	59.5	0	28.3-102		%Rec	1	6/30/2016 2:39:19 PM	26116
Surr: Phenol-d5	69.6	0	35.7-103		%Rec	1	6/30/2016 2:39:19 PM	26116
Surr: 2,4,6-Tribromophenol	80.2	0	35.2-108		%Rec	1	6/30/2016 2:39:19 PM	26116
Surr: Nitrobenzene-d5	68.1		24-118		%Rec	1	6/30/2016 2:39:19 PM	26116
Surr: 2-Fluorobiphenyl	75.7		35.4-111		%Rec	1	6/30/2016 2:39:19 PM	26116
Surr: 4-Terphenyl-d14	58.0		15-91.7		%Rec	1	6/30/2016 2:39:19 PM	26116
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.020	0.025		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Toluene	ND	0.0030	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Ethylbenzene	ND	0.0041	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Methyl tert-butyl ether (MTBE)	ND	0.016	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2,4-Trimethylbenzene	ND	0.0037	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,3,5-Trimethylbenzene	ND	0.0036	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2-Dichloroethane (EDC)	ND	0.013	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2-Dibromoethane (EDB)	ND	0.0035	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Naphthalene	ND	0.0078	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	6/20/2016 8:29:59 PM	25923
2-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Acetone	ND	0.064	0.75		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Bromobenzene	ND	0.0040	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Bromodichloromethane	ND	0.0029	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Bromoform	ND	0.0061	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Bromomethane	ND	0.018	0.15		mg/Kg	1	6/20/2016 8:29:59 PM	25923
2-Butanone	ND	0.028	0.50		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Carbon disulfide	ND	0.016	0.50		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Carbon tetrachloride	ND	0.0033	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Chlorobenzene	ND	0.0041	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-02-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:50:00 PM
Lab ID: 1606995-002
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Chloroethane	ND	0.0099	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Chloroform	ND	0.0038	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Chloromethane	0.080	0.0044	0.15	J	mg/Kg	1	6/20/2016 8:29:59 PM	25923
2-Chlorotoluene	ND	0.0037	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
4-Chlorotoluene	ND	0.0044	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
cis-1,2-DCE	ND	0.0029	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
cis-1,3-Dichloropropene	ND	0.0046	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2-Dibromo-3-chloropropane	ND	0.015	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Dibromochloromethane	ND	0.0045	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Dibromomethane	ND	0.0043	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2-Dichlorobenzene	ND	0.0043	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,3-Dichlorobenzene	ND	0.0041	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,4-Dichlorobenzene	ND	0.0062	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Dichlorodifluoromethane	ND	0.015	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,1-Dichloroethane	ND	0.0027	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,1-Dichloroethene	ND	0.016	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2-Dichloropropane	ND	0.0042	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,3-Dichloropropane	ND	0.0057	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
2,2-Dichloropropane	ND	0.0029	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,1-Dichloropropene	ND	0.0040	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Hexachlorobutadiene	ND	0.0061	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
2-Hexanone	ND	0.027	0.50		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Isopropylbenzene	ND	0.0043	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
4-Isopropyltoluene	ND	0.0045	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
4-Methyl-2-pentanone	ND	0.015	0.50		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Methylene chloride	ND	0.014	0.15		mg/Kg	1	6/20/2016 8:29:59 PM	25923
n-Butylbenzene	ND	0.0044	0.15		mg/Kg	1	6/20/2016 8:29:59 PM	25923
n-Propylbenzene	ND	0.0038	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
sec-Butylbenzene	ND	0.0069	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Styrene	ND	0.0045	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
tert-Butylbenzene	ND	0.0041	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,1,1,2-Tetrachloroethane	ND	0.0048	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,1,2,2-Tetrachloroethane	ND	0.0081	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Tetrachloroethene (PCE)	ND	0.0041	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
trans-1,2-DCE	ND	0.014	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
trans-1,3-Dichloropropene	ND	0.0073	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2,3-Trichlorobenzene	ND	0.0075	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2,4-Trichlorobenzene	ND	0.0053	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,1,1-Trichloroethane	ND	0.0030	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-02-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:50:00 PM
Lab ID: 1606995-002 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,2-Trichloroethane	ND	0.0059	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Trichloroethene (TCE)	ND	0.0053	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Trichlorofluoromethane	ND	0.0037	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2,3-Trichloropropane	ND	0.0086	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Vinyl chloride	ND	0.0041	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Xylenes, Total	ND	0.0094	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Surr: Dibromofluoromethane	105		70-130		%Rec	1	6/20/2016 8:29:59 PM	25923
Surr: 1,2-Dichloroethane-d4	97.2		70-130		%Rec	1	6/20/2016 8:29:59 PM	25923
Surr: Toluene-d8	95.7		70-130		%Rec	1	6/20/2016 8:29:59 PM	25923
Surr: 4-Bromofluorobenzene	101		70-130		%Rec	1	6/20/2016 8:29:59 PM	25923
EPA METHOD 418.1: TPH							Analyst: **TOM**	
Petroleum Hydrocarbons, TR	ND	8.0	19		mg/Kg	1	6/23/2016	25996

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-03-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:20:00 PM
Lab ID: 1606995-003
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Fluoride	2.6	0.042	0.30		mg/Kg	1	6/27/2016 10:50:35 PM	26092
Chloride	570	12	30		mg/Kg	20	6/27/2016 11:02:59 PM	26092
Nitrogen, Nitrate (As N)	21	0.32	6.0		mg/Kg	20	6/27/2016 11:02:59 PM	26092
Sulfate	540	5.4	30		mg/Kg	20	6/27/2016 11:02:59 PM	26092
EPA METHOD 7471: MERCURY							Analyst: **DBD**	
Mercury	0.0048	0.00058	0.034	J	mg/Kg	1	6/28/2016 9:34:18 AM	26093
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Arsenic	ND	1.5	5.1		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Barium	220	0.099	0.20		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Cadmium	ND	0.13	0.20		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Chromium	11	0.26	0.61		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Copper	3.4	0.32	0.61		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Iron	17000	100	260		mg/Kg	100	6/30/2016 10:34:35 AM	26123
Lead	4.7	0.36	0.51		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Manganese	290	0.091	0.20		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Selenium	ND	2.2	5.1		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Silver	ND	0.065	0.51		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Uranium	ND	2.0	10		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Zinc	18	1.2	5.1		mg/Kg	2	6/30/2016 11:41:01 AM	26123
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	0.086	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Aniline	ND	0.095	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Anthracene	ND	0.066	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Azobenzene	ND	0.12	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benzo(a)pyrene	ND	0.076	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benzoic acid	ND	0.083	0.50		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Bis(2-chloroethyl)ether	ND	0.074	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Bis(2-ethylhexyl)phthalate	0.11	0.082	0.50	J	mg/Kg	1	6/30/2016 4:03:22 PM	26116
4-Bromophenyl phenyl ether	ND	0.096	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Butyl benzyl phthalate	ND	0.089	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-03-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:20:00 PM
Lab ID: 1606995-003
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Carbazole	ND	0.068	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	6/30/2016 4:03:22 PM	26116
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2-Chloronaphthalene	ND	0.079	0.25		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2-Chlorophenol	ND	0.079	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Chrysene	ND	0.085	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Di-n-butyl phthalate	ND	0.075	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
1,2-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
1,4-Dichlorobenzene	ND	0.085	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
3,3´-Dichlorobenzidine	ND	0.074	0.25		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Diethyl phthalate	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Dimethyl phthalate	ND	0.098	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	6/30/2016 4:03:22 PM	26116
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Fluoranthene	ND	0.058	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Fluorene	ND	0.092	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2-Methylphenol	ND	0.084	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
N-Nitrosodiphenylamine	ND	0.098	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Naphthalene	ND	0.096	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-03-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:20:00 PM
Lab ID: 1606995-003
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	0.071	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Phenanthrene	ND	0.068	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Phenol	ND	0.075	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Pyrene	ND	0.076	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Pyridine	ND	0.079	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Surr: 2-Fluorophenol	50.9	0	28.3-102		%Rec	1	6/30/2016 4:03:22 PM	26116
Surr: Phenol-d5	59.5	0	35.7-103		%Rec	1	6/30/2016 4:03:22 PM	26116
Surr: 2,4,6-Tribromophenol	73.1	0	35.2-108		%Rec	1	6/30/2016 4:03:22 PM	26116
Surr: Nitrobenzene-d5	59.0		24-118		%Rec	1	6/30/2016 4:03:22 PM	26116
Surr: 2-Fluorobiphenyl	72.0		35.4-111		%Rec	1	6/30/2016 4:03:22 PM	26116
Surr: 4-Terphenyl-d14	59.7		15-91.7		%Rec	1	6/30/2016 4:03:22 PM	26116
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.019	0.024		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Toluene	ND	0.0029	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Ethylbenzene	ND	0.0040	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Methyl tert-butyl ether (MTBE)	ND	0.015	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2,4-Trimethylbenzene	ND	0.0036	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,3,5-Trimethylbenzene	ND	0.0035	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2-Dichloroethane (EDC)	ND	0.013	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2-Dibromoethane (EDB)	ND	0.0034	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Naphthalene	ND	0.0076	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1-Methylnaphthalene	ND	0.011	0.19		mg/Kg	1	6/20/2016 9:55:03 PM	25923
2-Methylnaphthalene	ND	0.010	0.19		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Acetone	ND	0.063	0.73		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Bromobenzene	ND	0.0039	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Bromodichloromethane	ND	0.0028	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Bromoform	ND	0.0059	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Bromomethane	0.018	0.018	0.15	J	mg/Kg	1	6/20/2016 9:55:03 PM	25923
2-Butanone	ND	0.028	0.48		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Carbon disulfide	ND	0.016	0.48		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Carbon tetrachloride	ND	0.0032	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Chlorobenzene	ND	0.0039	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-03-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:20:00 PM
Lab ID: 1606995-003
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Chloroethane	ND	0.0096	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Chloroform	ND	0.0036	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Chloromethane	0.070	0.0043	0.15	J	mg/Kg	1	6/20/2016 9:55:03 PM	25923
2-Chlorotoluene	ND	0.0036	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
4-Chlorotoluene	ND	0.0043	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
cis-1,2-DCE	ND	0.0028	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
cis-1,3-Dichloropropene	ND	0.0045	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2-Dibromo-3-chloropropane	ND	0.015	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Dibromochloromethane	ND	0.0044	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Dibromomethane	ND	0.0042	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2-Dichlorobenzene	ND	0.0042	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,3-Dichlorobenzene	ND	0.0040	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,4-Dichlorobenzene	ND	0.0060	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Dichlorodifluoromethane	ND	0.015	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,1-Dichloroethane	ND	0.0026	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,1-Dichloroethene	ND	0.016	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2-Dichloropropane	ND	0.0041	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,3-Dichloropropane	ND	0.0055	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
2,2-Dichloropropane	ND	0.0028	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,1-Dichloropropene	ND	0.0038	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Hexachlorobutadiene	ND	0.0059	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
2-Hexanone	ND	0.026	0.48		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Isopropylbenzene	ND	0.0042	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
4-Isopropyltoluene	ND	0.0043	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
4-Methyl-2-pentanone	ND	0.014	0.48		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Methylene chloride	ND	0.014	0.15		mg/Kg	1	6/20/2016 9:55:03 PM	25923
n-Butylbenzene	ND	0.0043	0.15		mg/Kg	1	6/20/2016 9:55:03 PM	25923
n-Propylbenzene	ND	0.0037	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
sec-Butylbenzene	ND	0.0067	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Styrene	ND	0.0043	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
tert-Butylbenzene	ND	0.0040	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,1,1,2-Tetrachloroethane	ND	0.0046	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,1,2,2-Tetrachloroethane	ND	0.0078	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Tetrachloroethene (PCE)	ND	0.0040	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
trans-1,2-DCE	ND	0.014	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
trans-1,3-Dichloropropene	ND	0.0071	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2,3-Trichlorobenzene	ND	0.0072	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2,4-Trichlorobenzene	ND	0.0052	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,1,1-Trichloroethane	ND	0.0030	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-03-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:20:00 PM
Lab ID: 1606995-003
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,2-Trichloroethane	ND	0.0057	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Trichloroethene (TCE)	ND	0.0052	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Trichlorofluoromethane	ND	0.0036	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2,3-Trichloropropane	ND	0.0084	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Vinyl chloride	ND	0.0040	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Xylenes, Total	ND	0.0092	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Surr: Dibromofluoromethane	105		70-130		%Rec	1	6/20/2016 9:55:03 PM	25923
Surr: 1,2-Dichloroethane-d4	99.5		70-130		%Rec	1	6/20/2016 9:55:03 PM	25923
Surr: Toluene-d8	97.5		70-130		%Rec	1	6/20/2016 9:55:03 PM	25923
Surr: 4-Bromofluorobenzene	103		70-130		%Rec	1	6/20/2016 9:55:03 PM	25923
EPA METHOD 418.1: TPH							Analyst: **TOM**	
Petroleum Hydrocarbons, TR	ND	8.6	20		mg/Kg	1	6/23/2016	25996

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-04-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 11:45:00 AM
Lab ID: 1606995-004
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Fluoride	2.9	0.042	0.30		mg/Kg	1	6/27/2016 11:40:14 PM	26092
Chloride	170	12	30		mg/Kg	20	6/27/2016 11:52:38 PM	26092
Nitrogen, Nitrate (As N)	7.1	0.016	0.30		mg/Kg	1	6/27/2016 11:40:14 PM	26092
Sulfate	630	5.4	30		mg/Kg	20	6/27/2016 11:52:38 PM	26092
EPA METHOD 7471: MERCURY							Analyst: **DBD**	
Mercury	0.0042	0.00054	0.031	J	mg/Kg	1	6/28/2016 9:36:06 AM	26093
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Arsenic	ND	1.4	4.8		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Barium	200	0.093	0.19		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Cadmium	ND	0.12	0.19		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Chromium	9.5	0.24	0.57		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Copper	3.0	0.30	0.57		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Iron	15000	93	240		mg/Kg	100	6/30/2016 10:36:09 AM	26123
Lead	5.2	0.33	0.48		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Manganese	310	0.085	0.19		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Selenium	ND	2.1	4.8		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Silver	ND	0.061	0.48		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Uranium	ND	1.9	9.6		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Zinc	15	1.1	4.8		mg/Kg	2	6/30/2016 11:42:53 AM	26123
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Aniline	ND	0.094	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Anthracene	ND	0.066	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Azobenzene	ND	0.12	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benzoic acid	ND	0.083	0.50		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Bis(2-ethylhexyl)phthalate	0.099	0.081	0.50	J	mg/Kg	1	6/30/2016 4:31:23 PM	26116
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-04-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 11:45:00 AM
Lab ID: 1606995-004 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Carbazole	ND	0.067	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	6/30/2016 4:31:23 PM	26116
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Chrysene	ND	0.085	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Di-n-butyl phthalate	ND	0.074	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
3,3´-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Diethyl phthalate	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	6/30/2016 4:31:23 PM	26116
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Fluoranthene	ND	0.057	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Fluorene	ND	0.091	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Naphthalene	ND	0.096	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-04-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 11:45:00 AM
Lab ID: 1606995-004 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Phenanthrene	ND	0.068	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Phenol	ND	0.075	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Pyrene	ND	0.075	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Pyridine	ND	0.079	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Surr: 2-Fluorophenol	69.7	0	28.3-102		%Rec	1	6/30/2016 4:31:23 PM	26116
Surr: Phenol-d5	76.7	0	35.7-103		%Rec	1	6/30/2016 4:31:23 PM	26116
Surr: 2,4,6-Tribromophenol	84.1	0	35.2-108		%Rec	1	6/30/2016 4:31:23 PM	26116
Surr: Nitrobenzene-d5	81.5		24-118		%Rec	1	6/30/2016 4:31:23 PM	26116
Surr: 2-Fluorobiphenyl	84.2		35.4-111		%Rec	1	6/30/2016 4:31:23 PM	26116
Surr: 4-Terphenyl-d14	71.3		15-91.7		%Rec	1	6/30/2016 4:31:23 PM	26116
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.020	0.025		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Toluene	ND	0.0029	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Ethylbenzene	ND	0.0041	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Methyl tert-butyl ether (MTBE)	ND	0.016	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2,4-Trimethylbenzene	ND	0.0037	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,3,5-Trimethylbenzene	ND	0.0036	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2-Dichloroethane (EDC)	ND	0.013	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2-Dibromoethane (EDB)	ND	0.0035	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Naphthalene	ND	0.0078	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	6/23/2016 12:50:04 PM	25923
2-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Acetone	ND	0.064	0.75		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Bromobenzene	ND	0.0040	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Bromodichloromethane	ND	0.0029	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Bromoform	ND	0.0061	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Bromomethane	0.023	0.018	0.15	J	mg/Kg	1	6/23/2016 12:50:04 PM	25923
2-Butanone	ND	0.028	0.50		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Carbon disulfide	ND	0.016	0.50		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Carbon tetrachloride	ND	0.0033	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Chlorobenzene	ND	0.0040	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-04-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 11:45:00 AM
Lab ID: 1606995-004 **Matrix:** SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Chloroethane	ND	0.0099	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Chloroform	ND	0.0038	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Chloromethane	0.065	0.0044	0.15	J	mg/Kg	1	6/23/2016 12:50:04 PM	25923
2-Chlorotoluene	ND	0.0037	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
4-Chlorotoluene	ND	0.0044	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
cis-1,2-DCE	ND	0.0029	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
cis-1,3-Dichloropropene	ND	0.0046	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2-Dibromo-3-chloropropane	ND	0.015	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Dibromochloromethane	ND	0.0045	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Dibromomethane	ND	0.0043	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2-Dichlorobenzene	ND	0.0043	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,3-Dichlorobenzene	ND	0.0041	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,4-Dichlorobenzene	ND	0.0062	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Dichlorodifluoromethane	ND	0.015	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,1-Dichloroethane	ND	0.0027	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,1-Dichloroethene	ND	0.016	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2-Dichloropropane	ND	0.0042	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,3-Dichloropropane	ND	0.0056	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
2,2-Dichloropropane	ND	0.0028	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,1-Dichloropropene	ND	0.0039	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Hexachlorobutadiene	ND	0.0061	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
2-Hexanone	ND	0.027	0.50		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Isopropylbenzene	ND	0.0043	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
4-Isopropyltoluene	ND	0.0045	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
4-Methyl-2-pentanone	ND	0.014	0.50		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Methylene chloride	ND	0.014	0.15		mg/Kg	1	6/23/2016 12:50:04 PM	25923
n-Butylbenzene	ND	0.0044	0.15		mg/Kg	1	6/23/2016 12:50:04 PM	25923
n-Propylbenzene	ND	0.0038	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
sec-Butylbenzene	ND	0.0069	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Styrene	ND	0.0044	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
tert-Butylbenzene	ND	0.0041	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,1,1,2-Tetrachloroethane	ND	0.0048	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,1,2,2-Tetrachloroethane	ND	0.0081	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Tetrachloroethene (PCE)	ND	0.0041	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
trans-1,2-DCE	ND	0.014	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
trans-1,3-Dichloropropene	ND	0.0073	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2,3-Trichlorobenzene	ND	0.0074	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2,4-Trichlorobenzene	ND	0.0053	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,1,1-Trichloroethane	ND	0.0030	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-04-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 11:45:00 AM
Lab ID: 1606995-004
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,2-Trichloroethane	ND	0.0059	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Trichloroethene (TCE)	ND	0.0053	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Trichlorofluoromethane	ND	0.0037	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2,3-Trichloropropane	ND	0.0086	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Vinyl chloride	ND	0.0041	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Xylenes, Total	ND	0.0094	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Surr: Dibromofluoromethane	99.8		70-130		%Rec	1	6/23/2016 12:50:04 PM	25923
Surr: 1,2-Dichloroethane-d4	102		70-130		%Rec	1	6/23/2016 12:50:04 PM	25923
Surr: Toluene-d8	92.8		70-130		%Rec	1	6/23/2016 12:50:04 PM	25923
Surr: 4-Bromofluorobenzene	103		70-130		%Rec	1	6/23/2016 12:50:04 PM	25923
EPA METHOD 418.1: TPH							Analyst: **TOM**	
Petroleum Hydrocarbons, TR	ND	8.0	19		mg/Kg	1	6/23/2016	25996

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BD-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016
Lab ID: 1606995-005
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Fluoride	2.7	0.042	0.30		mg/Kg	1	6/28/2016 12:05:03 AM	26092
Chloride	360	12	30		mg/Kg	20	6/28/2016 12:17:27 AM	26092
Nitrogen, Nitrate (As N)	3.0	0.016	0.30		mg/Kg	1	6/28/2016 12:05:03 AM	26092
Sulfate	770	5.4	30		mg/Kg	20	6/28/2016 12:17:27 AM	26092
EPA METHOD 7471: MERCURY							Analyst: **DBD**	
Mercury	0.0054	0.00053	0.031	J	mg/Kg	1	6/28/2016 9:37:56 AM	26093
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Arsenic	ND	1.4	4.8		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Barium	190	0.094	0.19		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Cadmium	ND	0.12	0.19		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Chromium	11	0.24	0.58		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Copper	3.8	0.30	0.58		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Iron	15000	94	240		mg/Kg	100	6/30/2016 10:45:16 AM	26123
Lead	3.6	0.34	0.48		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Manganese	240	0.086	0.19		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Selenium	ND	2.1	4.8		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Silver	ND	0.061	0.48		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Uranium	ND	1.9	9.7		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Zinc	17	1.1	4.8		mg/Kg	2	6/30/2016 11:45:00 AM	26123
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Acenaphthylene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Aniline	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Anthracene	ND	0.13	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Azobenzene	ND	0.24	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benz(a)anthracene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benzo(a)pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benzo(b)fluoranthene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benzo(g,h,i)perylene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benzo(k)fluoranthene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benzoic acid	ND	0.17	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benzyl alcohol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Bis(2-chloroethoxy)methane	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Bis(2-chloroethyl)ether	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Bis(2-chloroisopropyl)ether	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Bis(2-ethylhexyl)phthalate	ND	0.16	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
4-Bromophenyl phenyl ether	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Butyl benzyl phthalate	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BD-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016
Lab ID: 1606995-005
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Carbazole	ND	0.14	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
4-Chloro-3-methylphenol	ND	0.24	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
4-Chloroaniline	ND	0.22	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2-Chloronaphthalene	ND	0.16	0.50	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2-Chlorophenol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
4-Chlorophenyl phenyl ether	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Chrysene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Di-n-butyl phthalate	0.16	0.15	0.80	JD	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Di-n-octyl phthalate	ND	0.17	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Dibenz(a,h)anthracene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Dibenzofuran	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
1,2-Dichlorobenzene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
1,3-Dichlorobenzene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
1,4-Dichlorobenzene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
3,3´-Dichlorobenzidine	ND	0.15	0.50	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Diethyl phthalate	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Dimethyl phthalate	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,4-Dichlorophenol	ND	0.19	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,4-Dimethylphenol	ND	0.22	0.60	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
4,6-Dinitro-2-methylphenol	ND	0.12	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,4-Dinitrophenol	ND	0.13	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,4-Dinitrotoluene	ND	0.18	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,6-Dinitrotoluene	ND	0.21	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Fluoranthene	ND	0.12	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Fluorene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Hexachlorobenzene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Hexachlorobutadiene	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Hexachlorocyclopentadiene	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Hexachloroethane	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Indeno(1,2,3-cd)pyrene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
1-Methylnaphthalene	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2-Methylnaphthalene	ND	0.24	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2-Methylphenol	ND	0.17	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
3+4-Methylphenol	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
N-Nitrosodi-n-propylamine	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
N-Nitrosodiphenylamine	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Naphthalene	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2-Nitroaniline	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
3-Nitroaniline	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BD-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016
Lab ID: 1606995-005
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	0.14	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Nitrobenzene	ND	0.21	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2-Nitrophenol	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
4-Nitrophenol	ND	0.15	0.50	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Pentachlorophenol	ND	0.13	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Phenanthrene	ND	0.14	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Phenol	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Pyridine	ND	0.16	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
1,2,4-Trichlorobenzene	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,4,5-Trichlorophenol	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,4,6-Trichlorophenol	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Surr: 2-Fluorophenol	63.7	0	28.3-102	D	%Rec	1	6/30/2016 4:59:04 PM	26116
Surr: Phenol-d5	66.9	0	35.7-103	D	%Rec	1	6/30/2016 4:59:04 PM	26116
Surr: 2,4,6-Tribromophenol	79.4	0	35.2-108	D	%Rec	1	6/30/2016 4:59:04 PM	26116
Surr: Nitrobenzene-d5	68.2		24-118	D	%Rec	1	6/30/2016 4:59:04 PM	26116
Surr: 2-Fluorobiphenyl	73.5		35.4-111	D	%Rec	1	6/30/2016 4:59:04 PM	26116
Surr: 4-Terphenyl-d14	102		15-91.7	SD	%Rec	1	6/30/2016 4:59:04 PM	26116
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.019	0.023		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Toluene	ND	0.0028	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Ethylbenzene	ND	0.0038	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Methyl tert-butyl ether (MTBE)	ND	0.015	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2,4-Trimethylbenzene	ND	0.0034	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,3,5-Trimethylbenzene	ND	0.0034	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2-Dichloroethane (EDC)	ND	0.012	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2-Dibromoethane (EDB)	ND	0.0033	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Naphthalene	ND	0.0073	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1-Methylnaphthalene	ND	0.010	0.19		mg/Kg	1	6/23/2016 1:18:39 PM	25923
2-Methylnaphthalene	ND	0.010	0.19		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Acetone	ND	0.060	0.70		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Bromobenzene	ND	0.0038	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Bromodichloromethane	ND	0.0027	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Bromoform	ND	0.0057	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Bromomethane	0.021	0.017	0.14	J	mg/Kg	1	6/23/2016 1:18:39 PM	25923
2-Butanone	ND	0.027	0.47		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Carbon disulfide	ND	0.015	0.47		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Carbon tetrachloride	ND	0.0031	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Chlorobenzene	ND	0.0038	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BD-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016
Lab ID: 1606995-005
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Chloroethane	ND	0.0093	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Chloroform	ND	0.0035	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Chloromethane	0.058	0.0041	0.14	J	mg/Kg	1	6/23/2016 1:18:39 PM	25923
2-Chlorotoluene	ND	0.0034	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
4-Chlorotoluene	ND	0.0041	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
cis-1,2-DCE	ND	0.0027	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
cis-1,3-Dichloropropene	ND	0.0043	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2-Dibromo-3-chloropropane	ND	0.014	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Dibromochloromethane	ND	0.0042	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Dibromomethane	ND	0.0040	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2-Dichlorobenzene	ND	0.0041	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,3-Dichlorobenzene	ND	0.0038	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,4-Dichlorobenzene	ND	0.0058	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Dichlorodifluoromethane	ND	0.014	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,1-Dichloroethane	ND	0.0025	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,1-Dichloroethene	ND	0.015	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2-Dichloropropane	ND	0.0039	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,3-Dichloropropane	ND	0.0053	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
2,2-Dichloropropane	ND	0.0027	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,1-Dichloropropene	ND	0.0037	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Hexachlorobutadiene	ND	0.0057	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
2-Hexanone	ND	0.025	0.47		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Isopropylbenzene	ND	0.0040	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
4-Isopropyltoluene	ND	0.0042	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
4-Methyl-2-pentanone	ND	0.014	0.47		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Methylene chloride	ND	0.013	0.14		mg/Kg	1	6/23/2016 1:18:39 PM	25923
n-Butylbenzene	ND	0.0041	0.14		mg/Kg	1	6/23/2016 1:18:39 PM	25923
n-Propylbenzene	ND	0.0036	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
sec-Butylbenzene	ND	0.0065	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Styrene	ND	0.0042	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
tert-Butylbenzene	ND	0.0039	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,1,1,2-Tetrachloroethane	ND	0.0045	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,1,2,2-Tetrachloroethane	ND	0.0076	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Tetrachloroethene (PCE)	ND	0.0039	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
trans-1,2-DCE	ND	0.013	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
trans-1,3-Dichloropropene	ND	0.0068	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2,3-Trichlorobenzene	ND	0.0070	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2,4-Trichlorobenzene	ND	0.0050	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,1,1-Trichloroethane	ND	0.0028	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BD-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016
Lab ID: 1606995-005
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,2-Trichloroethane	ND	0.0055	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Trichloroethene (TCE)	ND	0.0050	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Trichlorofluoromethane	ND	0.0035	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2,3-Trichloropropane	ND	0.0081	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Vinyl chloride	ND	0.0038	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Xylenes, Total	ND	0.0088	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Surr: Dibromofluoromethane	102		70-130		%Rec	1	6/23/2016 1:18:39 PM	25923
Surr: 1,2-Dichloroethane-d4	100		70-130		%Rec	1	6/23/2016 1:18:39 PM	25923
Surr: Toluene-d8	91.6		70-130		%Rec	1	6/23/2016 1:18:39 PM	25923
Surr: 4-Bromofluorobenzene	103		70-130		%Rec	1	6/23/2016 1:18:39 PM	25923
EPA METHOD 418.1: TPH							Analyst: **TOM**	
Petroleum Hydrocarbons, TR	ND	8.7	21		mg/Kg	1	6/23/2016	25996

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-TZ-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:40:00 PM
Lab ID: 1606995-006
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	180	1.8	9.6		mg/Kg	1	6/23/2016 6:14:17 PM	25944
Motor Oil Range Organics (MRO)	200	48	48		mg/Kg	1	6/23/2016 6:14:17 PM	25944
Surr: DNOP	115	0	70-130		%Rec	1	6/23/2016 6:14:17 PM	25944
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	0.96	4.6		mg/Kg	1	6/24/2016 7:46:24 PM	25923
Surr: BFB	86.5	0	80-120		%Rec	1	6/24/2016 7:46:24 PM	25923
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Fluoride	9.4	0.84	6.0		mg/Kg	20	6/28/2016 12:42:17 AM	26092
Chloride	290	12	30		mg/Kg	20	6/28/2016 12:42:17 AM	26092
Nitrogen, Nitrate (As N)	5.2	0.016	0.30		mg/Kg	1	6/28/2016 12:29:52 AM	26092
Sulfate	860	5.4	30		mg/Kg	20	6/28/2016 12:42:17 AM	26092
EPA METHOD 7471: MERCURY							Analyst: **DBD**	
Mercury	0.35	0.0011	0.064		mg/Kg	2	6/28/2016 9:45:27 AM	26093
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Arsenic	1.4	0.71	2.4	J	mg/Kg	1	6/30/2016 11:12:22 AM	26123
Barium	170	0.047	0.097		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Cadmium	ND	0.062	0.097		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Chromium	10	0.12	0.29		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Copper	8.9	0.15	0.29		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Iron	15000	95	240		mg/Kg	100	6/30/2016 10:46:51 AM	26123
Lead	9.0	0.17	0.24		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Manganese	280	0.086	0.19		mg/Kg	2	6/30/2016 11:46:55 AM	26123
Selenium	ND	1.1	2.4		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Silver	ND	0.031	0.24		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Uranium	ND	0.96	4.9		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Zinc	38	0.55	2.4		mg/Kg	1	6/30/2016 11:12:22 AM	26123
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Acenaphthylene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Aniline	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Anthracene	ND	0.13	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Azobenzene	ND	0.24	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Benz(a)anthracene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Benzo(a)pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Benzo(b)fluoranthene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Benzo(g,h,i)perylene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Benzo(k)fluoranthene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-TZ-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:40:00 PM
Lab ID: 1606995-006
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Benzoic acid	ND	0.17	1.0	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Benzyl alcohol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Bis(2-chloroethoxy)methane	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Bis(2-chloroethyl)ether	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Bis(2-chloroisopropyl)ether	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Bis(2-ethylhexyl)phthalate	0.18	0.16	1.0	JD	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4-Bromophenyl phenyl ether	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Butyl benzyl phthalate	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Carbazole	ND	0.13	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4-Chloro-3-methylphenol	ND	0.24	1.0	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4-Chloroaniline	ND	0.22	1.0	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2-Chloronaphthalene	ND	0.16	0.50	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2-Chlorophenol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4-Chlorophenyl phenyl ether	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Chrysene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Di-n-butyl phthalate	0.15	0.15	0.80	JD	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Di-n-octyl phthalate	ND	0.17	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Dibenz(a,h)anthracene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Dibenzofuran	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
1,2-Dichlorobenzene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
1,3-Dichlorobenzene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
1,4-Dichlorobenzene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
3,3´-Dichlorobenzidine	ND	0.15	0.50	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Diethyl phthalate	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Dimethyl phthalate	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,4-Dichlorophenol	ND	0.19	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,4-Dimethylphenol	ND	0.22	0.60	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4,6-Dinitro-2-methylphenol	ND	0.12	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,4-Dinitrophenol	ND	0.13	1.0	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,4-Dinitrotoluene	ND	0.18	1.0	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,6-Dinitrotoluene	ND	0.21	1.0	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Fluoranthene	ND	0.11	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Fluorene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Hexachlorobenzene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Hexachlorobutadiene	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Hexachlorocyclopentadiene	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Hexachloroethane	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Indeno(1,2,3-cd)pyrene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
1-Methylnaphthalene	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-TZ-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:40:00 PM
Lab ID: 1606995-006
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
2-Methylnaphthalene	ND	0.24	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2-Methylphenol	ND	0.17	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
3+4-Methylphenol	ND	0.14	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
N-Nitrosodi-n-propylamine	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
N-Nitrosodiphenylamine	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Naphthalene	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2-Nitroaniline	ND	0.21	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
3-Nitroaniline	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4-Nitroaniline	ND	0.14	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Nitrobenzene	ND	0.21	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2-Nitrophenol	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4-Nitrophenol	ND	0.15	0.50	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Pentachlorophenol	ND	0.13	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Phenanthrene	ND	0.14	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Phenol	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Pyridine	ND	0.16	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
1,2,4-Trichlorobenzene	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,4,5-Trichlorophenol	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,4,6-Trichlorophenol	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Surr: 2-Fluorophenol	67.1	0	28.3-102	D	%Rec	1	6/30/2016 5:26:58 PM	26116
Surr: Phenol-d5	71.9	0	35.7-103	D	%Rec	1	6/30/2016 5:26:58 PM	26116
Surr: 2,4,6-Tribromophenol	80.0	0	35.2-108	D	%Rec	1	6/30/2016 5:26:58 PM	26116
Surr: Nitrobenzene-d5	75.6		24-118	D	%Rec	1	6/30/2016 5:26:58 PM	26116
Surr: 2-Fluorobiphenyl	86.3		35.4-111	D	%Rec	1	6/30/2016 5:26:58 PM	26116
Surr: 4-Terphenyl-d14	73.4		15-91.7	D	%Rec	1	6/30/2016 5:26:58 PM	26116
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.019	0.023		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Toluene	0.0090	0.0027	0.046	J	mg/Kg	1	6/23/2016 1:47:16 PM	25923
Ethylbenzene	ND	0.0038	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Methyl tert-butyl ether (MTBE)	ND	0.015	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2,4-Trimethylbenzene	ND	0.0034	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,3,5-Trimethylbenzene	ND	0.0034	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2-Dichloroethane (EDC)	ND	0.012	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2-Dibromoethane (EDB)	ND	0.0033	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Naphthalene	ND	0.0073	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1-Methylnaphthalene	ND	0.010	0.19		mg/Kg	1	6/23/2016 1:47:16 PM	25923
2-Methylnaphthalene	ND	0.0099	0.19		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Acetone	ND	0.060	0.70		mg/Kg	1	6/23/2016 1:47:16 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-TZ-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:40:00 PM
Lab ID: 1606995-006
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromobenzene	ND	0.0037	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Bromodichloromethane	ND	0.0027	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Bromoform	ND	0.0057	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Bromomethane	0.024	0.017	0.14	J	mg/Kg	1	6/23/2016 1:47:16 PM	25923
2-Butanone	0.070	0.027	0.46	J	mg/Kg	1	6/23/2016 1:47:16 PM	25923
Carbon disulfide	ND	0.015	0.46		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Carbon tetrachloride	ND	0.0030	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Chlorobenzene	ND	0.0038	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Chloroethane	ND	0.0093	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Chloroform	ND	0.0035	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Chloromethane	0.056	0.0041	0.14	J	mg/Kg	1	6/23/2016 1:47:16 PM	25923
2-Chlorotoluene	ND	0.0034	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
4-Chlorotoluene	ND	0.0041	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
cis-1,2-DCE	ND	0.0027	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
cis-1,3-Dichloropropene	ND	0.0043	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2-Dibromo-3-chloropropane	ND	0.014	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Dibromochloromethane	ND	0.0042	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Dibromomethane	ND	0.0040	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2-Dichlorobenzene	ND	0.0041	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,3-Dichlorobenzene	ND	0.0038	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,4-Dichlorobenzene	ND	0.0058	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Dichlorodifluoromethane	ND	0.014	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,1-Dichloroethane	ND	0.0025	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,1-Dichloroethene	ND	0.015	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2-Dichloropropane	ND	0.0039	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,3-Dichloropropane	ND	0.0053	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
2,2-Dichloropropane	ND	0.0027	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,1-Dichloropropene	ND	0.0037	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Hexachlorobutadiene	ND	0.0057	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
2-Hexanone	ND	0.025	0.46		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Isopropylbenzene	ND	0.0040	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
4-Isopropyltoluene	ND	0.0042	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
4-Methyl-2-pentanone	ND	0.014	0.46		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Methylene chloride	ND	0.013	0.14		mg/Kg	1	6/23/2016 1:47:16 PM	25923
n-Butylbenzene	ND	0.0041	0.14		mg/Kg	1	6/23/2016 1:47:16 PM	25923
n-Propylbenzene	ND	0.0036	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
sec-Butylbenzene	ND	0.0064	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Styrene	ND	0.0041	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
tert-Butylbenzene	ND	0.0038	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-TZ-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:40:00 PM
Lab ID: 1606995-006
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,1,2-Tetrachloroethane	ND	0.0044	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,1,2,2-Tetrachloroethane	ND	0.0075	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Tetrachloroethene (PCE)	ND	0.0038	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
trans-1,2-DCE	ND	0.013	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
trans-1,3-Dichloropropene	ND	0.0068	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2,3-Trichlorobenzene	ND	0.0069	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2,4-Trichlorobenzene	ND	0.0050	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,1,1-Trichloroethane	ND	0.0028	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,1,2-Trichloroethane	ND	0.0055	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Trichloroethene (TCE)	ND	0.0050	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Trichlorofluoromethane	ND	0.0035	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2,3-Trichloropropane	ND	0.0080	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Vinyl chloride	ND	0.0038	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Xylenes, Total	0.010	0.0088	0.093	J	mg/Kg	1	6/23/2016 1:47:16 PM	25923
Surr: Dibromofluoromethane	103		70-130		%Rec	1	6/23/2016 1:47:16 PM	25923
Surr: 1,2-Dichloroethane-d4	105		70-130		%Rec	1	6/23/2016 1:47:16 PM	25923
Surr: Toluene-d8	93.7		70-130		%Rec	1	6/23/2016 1:47:16 PM	25923
Surr: 4-Bromofluorobenzene	100		70-130		%Rec	1	6/23/2016 1:47:16 PM	25923
EPA METHOD 418.1: TPH							Analyst: **TOM**	
Petroleum Hydrocarbons, TR	610	83	200		mg/Kg	10	6/23/2016	25996

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: EB-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 2:00:00 PM
Lab ID: 1606995-007
Matrix: AQUEOUS
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: **BCN**	
Benzene	ND	0.096	1.0		µg/L	1	6/28/2016 2:06:00 AM	A35246
Toluene	ND	0.12	1.0		µg/L	1	6/28/2016 2:06:00 AM	A35246
Ethylbenzene	ND	0.11	1.0		µg/L	1	6/28/2016 2:06:00 AM	A35246
Xylenes, Total	ND	0.37	1.5		µg/L	1	6/28/2016 2:06:00 AM	A35246
Surr: 1,2-Dichloroethane-d4	86.2	0	70-130		%Rec	1	6/28/2016 2:06:00 AM	A35246
Surr: 4-Bromofluorobenzene	101	0	70-130		%Rec	1	6/28/2016 2:06:00 AM	A35246
Surr: Dibromofluoromethane	95.3	0	70-130		%Rec	1	6/28/2016 2:06:00 AM	A35246
Surr: Toluene-d8	101	0	70-130		%Rec	1	6/28/2016 2:06:00 AM	A35246

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: FB-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 2:15:00 PM
Lab ID: 1606995-008
Matrix: AQUEOUS
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: **BCN**	
Benzene	ND	0.096	1.0		µg/L	1	6/28/2016 2:29:00 AM	A35246
Toluene	ND	0.12	1.0		µg/L	1	6/28/2016 2:29:00 AM	A35246
Ethylbenzene	ND	0.11	1.0		µg/L	1	6/28/2016 2:29:00 AM	A35246
Xylenes, Total	ND	0.37	1.5		µg/L	1	6/28/2016 2:29:00 AM	A35246
Surr: 1,2-Dichloroethane-d4	88.0	0	70-130		%Rec	1	6/28/2016 2:29:00 AM	A35246
Surr: 4-Bromofluorobenzene	103	0	70-130		%Rec	1	6/28/2016 2:29:00 AM	A35246
Surr: Dibromofluoromethane	92.7	0	70-130		%Rec	1	6/28/2016 2:29:00 AM	A35246
Surr: Toluene-d8	98.7	0	70-130		%Rec	1	6/28/2016 2:29:00 AM	A35246

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: Trip Blank
Project: OCD Central Landfarm Semiannual Sam
Collection Date:
Lab ID: 1606995-009
Matrix: AQUEOUS
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: **BCN**	
Benzene	ND	0.096	1.0		µg/L	1	6/28/2016 3:40:00 AM	A35246
Toluene	ND	0.12	1.0		µg/L	1	6/28/2016 3:40:00 AM	A35246
Ethylbenzene	ND	0.11	1.0		µg/L	1	6/28/2016 3:40:00 AM	A35246
Xylenes, Total	ND	0.37	1.5		µg/L	1	6/28/2016 3:40:00 AM	A35246
Surr: 1,2-Dichloroethane-d4	86.1	0	70-130		%Rec	1	6/28/2016 3:40:00 AM	A35246
Surr: 4-Bromofluorobenzene	99.5	0	70-130		%Rec	1	6/28/2016 3:40:00 AM	A35246
Surr: Dibromofluoromethane	91.7	0	70-130		%Rec	1	6/28/2016 3:40:00 AM	A35246
Surr: Toluene-d8	99.0	0	70-130		%Rec	1	6/28/2016 3:40:00 AM	A35246

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 160622057
Project Name: 1606995

Analytical Results Report

Sample Number 160622057-001 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-001B / CENTRALOCD-01-6/16/2016 **Sampling Time** 12:20 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.283	6/30/2016 5:55:00 PM	MER	EPA 335.4	
%moisture	15.5	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-002 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-002B / CENTRALOCD-02-6/16/2016 **Sampling Time** 12:50 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.297	6/30/2016 5:51:00 PM	MER	EPA 335.4	
%moisture	17.2	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-003 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-003B / CENTRALOCD-03-6/16/2016 **Sampling Time** 1:20 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.3	6/30/2016 5:57:00 PM	MER	EPA 335.4	
%moisture	16.8	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-004 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-004B / CENTRALOCD-04-6/16/2016 **Sampling Time** 11:45 AM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.295	6/30/2016 6:05:00 PM	MER	EPA 335.4	
%moisture	17.4	Percent		6/29/2016	ETL	%moisture	

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 160622057
Project Name: 1606995

Analytical Results Report

Sample Number 160622057-005 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-005B / BD-6/16/2016 **Sampling Time**
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.29	6/30/2016 6:06:00 PM	MER	EPA 335.4	
%moisture	17.6	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-006 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-006B / CENTRALOCD-TZ-6/16/2016 **Sampling Time** 1:40 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	0.487	mg/Kg	0.25	6/30/2016 6:08:00 PM	MER	EPA 335.4	
%moisture	8.6	Percent		6/29/2016	ETL	%moisture	

Authorized Signature

John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 160622057
Project Name: 1606995

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Cyanide	0.501	mg/kg	0.5	100.2	90-110	6/30/2016	6/30/2016

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
160622057-002	Cyanide	ND	14.6	mg/kg	15.1	96.7	70-130	6/30/2016	6/30/2016

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	14.7	mg/kg	14.9	98.7	0.7	0-25	6/30/2016	6/30/2016

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/Kg	5	6/30/2016	6/30/2016

AR Acceptable Range
ND Not Detected
PQL Practical Quantitation Limit
RPD Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Pace Analytical®
www.pacelabs.com

1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1606995
Pace Project No.: 30187563

Sample: 1606995-001C CentralOCD-01-6/1 **Lab ID: 30187563001** Collected: 06/16/16 12:20 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis
Comments: • Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.255 ± 2.582 (3.112) C:NA T:NA**	pCi/g	07/14/16 12:06	13982-63-3	
Radium-228	EPA 901.1	**2.152 ± 0.446 (0.252) C:NA T:NA**	pCi/g	07/14/16 12:06	15262-20-1	

Sample: 1606995-002C CentralOCD-02-6/1 **Lab ID: 30187563002** Collected: 06/16/16 12:50 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**4.070 ± 2.123 (2.252) C:NA T:NA**	pCi/g	07/14/16 12:22	13982-63-3	
Radium-228	EPA 901.1	**1.806 ± 0.441 (0.138) C:NA T:NA**	pCi/g	07/14/16 12:22	15262-20-1	

Sample: 1606995-003C CentralOCD-03-6/1 **Lab ID: 30187563003** Collected: 06/16/16 13:20 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**2.237 ± 2.544 (3.016) C:NA T:NA**	pCi/g	07/14/16 12:39	13982-63-3	
Radium-228	EPA 901.1	**2.290 ± 0.514 (0.145) C:NA T:NA**	pCi/g	07/14/16 12:39	15262-20-1	

Sample: 1606995-004C CentralOCD-06-6/1 **Lab ID: 30187563004** Collected: 06/16/16 11:45 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.888 ± 2.288 (2.754) C:NA T:NA**	pCi/g	07/14/16 12:40	13982-63-3	
Radium-228	EPA 901.1	**1.553 ± 0.446 (0.391) C:NA T:NA**	pCi/g	07/14/16 12:40	15262-20-1	

Sample: 1606995-005C BD-6/16/2016 **Lab ID: 30187563005** Collected: 06/16/16 00:01 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**0.721 ± 2.612 (3.200) C:NA T:NA**	pCi/g	07/14/16 12:56	13982-63-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1606995
Pace Project No.: 30187563

Sample: 1606995-005C BD-6/16/2016 **Lab ID: 30187563005** Collected: 06/16/16 00:01 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-228	EPA 901.1	**2.102 ± 0.475 (0.295) C:NA T:NA**	pCi/g	07/14/16 12:56	15262-20-1	

Sample: 1606995-006C CentralOCD-TZ-6/1 **Lab ID: 30187563006** Collected: 06/16/16 13:40 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.237 ± 1.946 (2.382) C:NA T:NA**	pCi/g	07/14/16 12:57	13982-63-3	
Radium-228	EPA 901.1	**1.210 ± 0.397 (0.240) C:NA T:NA**	pCi/g	07/14/16 12:57	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1606995
Pace Project No.: 30187563

QC Batch: 225883 Analysis Method: EPA 901.1
QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec
Associated Lab Samples: 30187563001, 30187563002, 30187563003, 30187563004, 30187563005, 30187563006

METHOD BLANK: 1106602 Matrix: Solid
Associated Lab Samples: 30187563001, 30187563002, 30187563003, 30187563004, 30187563005, 30187563006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.249 ± 1.401 (1.846) C:NA T:NA	pCi/g	07/11/16 20:46	
Radium-228	0.000 ± 0.066 (0.290) C:NA T:NA	pCi/g	07/11/16 20:46	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1606995
Pace Project No.: 30187563

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **MB-26092**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **26092**	RunNo: **35241**
Prep Date: **6/27/2016**	Analysis Date: **6/27/2016**	SeqNo: **1089804** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.30								
Chloride	ND	1.5								
Nitrogen, Nitrate (As N)	ND	0.30								
Sulfate	0.48	1.5								J

Sample ID **LCS-26092**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **26092**	RunNo: **35241**
Prep Date: **6/27/2016**	Analysis Date: **6/27/2016**	SeqNo: **1089805** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.5	0.30	1.500	0	102	90	110			
Chloride	14	1.5	15.00	0	94.7	90	110			
Nitrogen, Nitrate (As N)	7.4	0.30	7.500	0	98.3	90	110			
Sulfate	29	1.5	30.00	0	97.5	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **MB-25996**	SampType: **MBLK**	TestCode: **EPA Method 418.1: TPH**							
Client ID: **PBS**	Batch ID: **25996**	RunNo: **35151**							
Prep Date: **6/22/2016**	Analysis Date: **6/23/2016**	SeqNo: **1087694**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	ND	20								

Sample ID **LCS-25996**	SampType: **LCS**	TestCode: **EPA Method 418.1: TPH**							
Client ID: **LCSS**	Batch ID: **25996**	RunNo: **35151**							
Prep Date: **6/22/2016**	Analysis Date: **6/23/2016**	SeqNo: **1087695**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	96	20	100.0	0	95.7	83.4	127			

Sample ID **1606995-002AMS**	SampType: **MS**	TestCode: **EPA Method 418.1: TPH**							
Client ID: **CentralOCD-02-6/16/**	Batch ID: **25996**	RunNo: **35151**							
Prep Date: **6/22/2016**	Analysis Date: **6/23/2016**	SeqNo: **1087698**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	89	19	96.99	0	91.7	80	120			

Sample ID **1606995-002AMSD**	SampType: **MSD**	TestCode: **EPA Method 418.1: TPH**							
Client ID: **CentralOCD-02-6/16/**	Batch ID: **25996**	RunNo: **35151**							
Prep Date: **6/22/2016**	Analysis Date: **6/23/2016**	SeqNo: **1087699**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	93	20	100.3	0	93.0	80	120	4.79	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **MB-25944**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **25944**	RunNo: **35116**
Prep Date: **6/20/2016**	Analysis Date: **6/23/2016**	SeqNo: **1086562** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.8		10.00		88.1	70	130			

Sample ID **LCS-25944**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **25944**	RunNo: **35116**
Prep Date: **6/20/2016**	Analysis Date: **6/23/2016**	SeqNo: **1086657** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	38	10	50.00	0	75.2	62.6	124			
Surr: DNOP	4.4		5.000		87.1	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **1606995-006AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **CentralOCD-TZ-6/16**	Batch ID: **25923**	RunNo: **35159**
Prep Date: **6/17/2016**	Analysis Date: **6/24/2016**	SeqNo: **1088051** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.6	23.02	0	93.3	59.3	143			
Surr: BFB	840		920.8		90.9	80	120			

Sample ID **1606995-006AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **CentralOCD-TZ-6/16**	Batch ID: **25923**	RunNo: **35159**
Prep Date: **6/17/2016**	Analysis Date: **6/24/2016**	SeqNo: **1088052** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	24.90	0	107	59.3	143	21.1	20	R
Surr: BFB	950		996.0		95.2	80	120	0	0	

Sample ID **LCS-25923**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **25923**	RunNo: **35159**
Prep Date: **6/17/2016**	Analysis Date: **6/24/2016**	SeqNo: **1088059** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	108	80	120			
Surr: BFB	910		1000		90.9	80	120			

Sample ID **MB-25923**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **25923**	RunNo: **35159**
Prep Date: **6/17/2016**	Analysis Date: **6/24/2016**	SeqNo: **1088060** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	930		1000		93.3	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **mb-25923**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **25923**	RunNo: **35020**
Prep Date: **6/17/2016**	Analysis Date: **6/20/2016**	SeqNo: **1083254** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Methyl tert-butyl ether (MTBE)	ND	0.050								
1,2,4-Trimethylbenzene	ND	0.050								
1,3,5-Trimethylbenzene	ND	0.050								
1,2-Dichloroethane (EDC)	0.020	0.050								J
1,2-Dibromoethane (EDB)	ND	0.050								
Naphthalene	ND	0.10								
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
Acetone	ND	0.75								
Bromobenzene	ND	0.050								
Bromodichloromethane	ND	0.050								
Bromoform	ND	0.050								
Bromomethane	0.028	0.15								J
2-Butanone	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.050								
Chlorobenzene	ND	0.050								
Chloroethane	ND	0.10								
Chloroform	ND	0.050								
Chloromethane	0.10	0.15								J
2-Chlorotoluene	ND	0.050								
4-Chlorotoluene	ND	0.050								
cis-1,2-DCE	ND	0.050								
cis-1,3-Dichloropropene	ND	0.050								
1,2-Dibromo-3-chloropropane	ND	0.10								
Dibromochloromethane	ND	0.050								
Dibromomethane	ND	0.050								
1,2-Dichlorobenzene	ND	0.050								
1,3-Dichlorobenzene	ND	0.050								
1,4-Dichlorobenzene	ND	0.050								
Dichlorodifluoromethane	ND	0.050								
1,1-Dichloroethane	ND	0.050								
1,1-Dichloroethene	ND	0.050								
1,2-Dichloropropane	ND	0.050								
1,3-Dichloropropane	ND	0.050								
2,2-Dichloropropane	ND	0.10								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **mb-25923**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **25923**	RunNo: **35020**
Prep Date: **6/17/2016**	Analysis Date: **6/20/2016**	SeqNo: **1083254** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.49		0.5000		97.7	70	130			
Surr: 1,2-Dichloroethane-d4	0.48		0.5000		95.9	70	130			
Surr: Toluene-d8	0.47		0.5000		94.5	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		101	70	130			

Sample ID **lcs-25923**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS**	Batch ID: **25923**	RunNo: **35020**
Prep Date: **6/17/2016**	Analysis Date: **6/20/2016**	SeqNo: **1083256** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	108	70	130			
Toluene	1.0	0.050	1.000	0	101	70	130			
Chlorobenzene	0.96	0.050	1.000	0	96.4	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **lcs-25923**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS**	Batch ID: **25923**	RunNo: **35020**
Prep Date: **6/17/2016**	Analysis Date: **6/20/2016**	SeqNo: **1083256** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	1.1	0.050	1.000	0	109	70	130			
Trichloroethene (TCE)	1.1	0.050	1.000	0	110	70	130			
Surr: Dibromofluoromethane	0.50		0.5000		101	70	130			
Surr: 1,2-Dichloroethane-d4	0.48		0.5000		96.4	70	130			
Surr: Toluene-d8	0.49		0.5000		97.5	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		101	70	130			

Sample ID **1606995-002ams**	SampType: **MS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **CentralOCD-02-6/16/**	Batch ID: **25923**	RunNo: **35020**
Prep Date: **6/17/2016**	Analysis Date: **6/20/2016**	SeqNo: **1083261** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.84	0.023	0.9302	0	90.1	49.2	155			
Toluene	0.75	0.047	0.9302	0	80.3	52	154			
Chlorobenzene	0.78	0.047	0.9302	0	84.0	53.2	150			
1,1-Dichloroethene	0.72	0.047	0.9302	0	77.5	34.2	163			
Trichloroethene (TCE)	0.84	0.047	0.9302	0	90.6	48.2	151			
Surr: Dibromofluoromethane	0.48		0.4651		103	70	130			
Surr: 1,2-Dichloroethane-d4	0.46		0.4651		97.9	70	130			
Surr: Toluene-d8	0.44		0.4651		95.7	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.4651		99.8	70	130			

Sample ID **1606995-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **CentralOCD-02-6/16/**	Batch ID: **25923**	RunNo: **35020**
Prep Date: **6/17/2016**	Analysis Date: **6/20/2016**	SeqNo: **1083262** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.024	0.9506	0	101	49.2	155	13.6	20	
Toluene	0.86	0.048	0.9506	0	90.3	52	154	13.9	20	
Chlorobenzene	0.82	0.048	0.9506	0	86.2	53.2	150	4.81	20	
1,1-Dichloroethene	0.94	0.048	0.9506	0	98.7	34.2	163	26.2	20	R
Trichloroethene (TCE)	0.98	0.048	0.9506	0	103	48.2	151	15.1	20	
Surr: Dibromofluoromethane	0.50		0.4753		104	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	0.46		0.4753		97.1	70	130	0	0	
Surr: Toluene-d8	0.44		0.4753		93.5	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.48		0.4753		100	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A35246**	RunNo: **35246**
Prep Date:	Analysis Date: **6/27/2016**	SeqNo: **1090124** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	8.9		10.00		88.6	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		105	70	130			
Surr: Dibromofluoromethane	9.6		10.00		95.6	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **A35246**	RunNo: **35246**
Prep Date:	Analysis Date: **6/27/2016**	SeqNo: **1090133** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	17	1.0	20.00	0	83.2	70	130			
Toluene	19	1.0	20.00	0	95.3	70	130			
Surr: 1,2-Dichloroethane-d4	8.1		10.00		80.9	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	9.3		10.00		92.8	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID **1606995-008ams**	SampType: **MS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **FB-6/16/2016**	Batch ID: **A35246**	RunNo: **35246**
Prep Date:	Analysis Date: **6/28/2016**	SeqNo: **1090146** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	89.9	70	130			
Toluene	19	1.0	20.00	0	94.1	70	130			
Surr: 1,2-Dichloroethane-d4	8.4		10.00		84.5	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	9.4		10.00		93.9	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID **1606995-008amsd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **FB-6/16/2016**	Batch ID: **A35246**	RunNo: **35246**
Prep Date:	Analysis Date: **6/28/2016**	SeqNo: **1090147** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	17	1.0	20.00	0	83.9	70	130	6.95	20	
Toluene	19	1.0	20.00	0	94.1	70	130	0.0106	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID	**1606995-008amsd**	SampType:	**MSD**	TestCode:	**EPA Method 8260: Volatiles Short List**
Client ID:	**FB-6/16/2016**	Batch ID:	**A35246**	RunNo:	**35246**
Prep Date:		Analysis Date:	**6/28/2016**	SeqNo:	**1090147** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	8.3		10.00		83.3	70	130	0	0	
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130	0	0	
Surr: Dibromofluoromethane	8.9		10.00		88.7	70	130	0	0	
Surr: Toluene-d8	10		10.00		104	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **mb-26116**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBS**	Batch ID: **26116**	RunNo: **35339**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1093291** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	0.20								
Acenaphthylene	ND	0.20								
Aniline	ND	0.20								
Anthracene	ND	0.20								
Azobenzene	ND	0.20								
Benz(a)anthracene	ND	0.20								
Benzo(a)pyrene	ND	0.20								
Benzo(b)fluoranthene	ND	0.20								
Benzo(g,h,i)perylene	ND	0.20								
Benzo(k)fluoranthene	ND	0.20								
Benzoic acid	0.088	0.50								J
Benzyl alcohol	ND	0.20								
Bis(2-chloroethoxy)methane	ND	0.20								
Bis(2-chloroethyl)ether	ND	0.20								
Bis(2-chloroisopropyl)ether	ND	0.20								
Bis(2-ethylhexyl)phthalate	0.11	0.50								J
4-Bromophenyl phenyl ether	ND	0.20								
Butyl benzyl phthalate	ND	0.20								
Carbazole	ND	0.20								
4-Chloro-3-methylphenol	ND	0.50								
4-Chloroaniline	ND	0.50								
2-Chloronaphthalene	ND	0.25								
2-Chlorophenol	ND	0.20								
4-Chlorophenyl phenyl ether	ND	0.20								
Chrysene	ND	0.20								
Di-n-butyl phthalate	0.11	0.40								J
Di-n-octyl phthalate	ND	0.40								
Dibenz(a,h)anthracene	ND	0.20								
Dibenzofuran	ND	0.20								
1,2-Dichlorobenzene	ND	0.20								
1,3-Dichlorobenzene	ND	0.20								
1,4-Dichlorobenzene	ND	0.20								
3,3´-Dichlorobenzidine	ND	0.25								
Diethyl phthalate	ND	0.20								
Dimethyl phthalate	ND	0.20								
2,4-Dichlorophenol	ND	0.40								
2,4-Dimethylphenol	ND	0.30								
4,6-Dinitro-2-methylphenol	0.086	0.40								J
2,4-Dinitrophenol	ND	0.50								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **mb-26116**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBS**	Batch ID: **26116**	RunNo: **35339**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1093291** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	0.50								
2,6-Dinitrotoluene	ND	0.50								
Fluoranthene	ND	0.20								
Fluorene	ND	0.20								
Hexachlorobenzene	ND	0.20								
Hexachlorobutadiene	ND	0.20								
Hexachlorocyclopentadiene	ND	0.20								
Hexachloroethane	ND	0.20								
Indeno(1,2,3-cd)pyrene	ND	0.20								
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
2-Methylphenol	ND	0.40								
3+4-Methylphenol	ND	0.20								
N-Nitrosodi-n-propylamine	ND	0.20								
N-Nitrosodiphenylamine	ND	0.20								
Naphthalene	ND	0.20								
2-Nitroaniline	ND	0.20								
3-Nitroaniline	ND	0.20								
4-Nitroaniline	ND	0.40								
Nitrobenzene	ND	0.40								
2-Nitrophenol	ND	0.20								
4-Nitrophenol	ND	0.25								
Pentachlorophenol	ND	0.40								
Phenanthrene	ND	0.20								
Phenol	ND	0.20								
Pyrene	ND	0.20								
Pyridine	ND	0.40								
1,2,4-Trichlorobenzene	ND	0.20								
2,4,5-Trichlorophenol	ND	0.20								
2,4,6-Trichlorophenol	ND	0.20								
Surr: 2-Fluorophenol	2.8		3.330		83.4	28.3	102			
Surr: Phenol-d5	3.0		3.330		89.4	35.7	103			
Surr: 2,4,6-Tribromophenol	3.0		3.330		89.0	35.2	108			
Surr: Nitrobenzene-d5	1.4		1.670		83.8	24	118			
Surr: 2-Fluorobiphenyl	1.6		1.670		95.1	35.4	111			
Surr: 4-Terphenyl-d14	1.1		1.670		65.6	15	91.7			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **lcs-26116**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS**	Batch ID: **26116**	RunNo: **35339**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1093292** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.5	0.20	1.670	0	87.1	45.8	99.8			
4-Chloro-3-methylphenol	2.9	0.50	3.330	0	88.2	51.5	103			
2-Chlorophenol	2.8	0.20	3.330	0	82.6	46.5	105			
1,4-Dichlorobenzene	1.3	0.20	1.670	0	79.5	45.5	103			
2,4-Dinitrotoluene	1.3	0.50	1.670	0	80.3	36	87.2			
N-Nitrosodi-n-propylamine	1.1	0.20	1.670	0	63.4	47.3	104			
4-Nitrophenol	2.8	0.25	3.330	0	84.6	47.3	95.3			
Pentachlorophenol	2.6	0.40	3.330	0	79.1	38.7	89.3			
Phenol	2.7	0.20	3.330	0	82.2	47.8	106			
Pyrene	1.4	0.20	1.670	0	83.1	33.4	105			
1,2,4-Trichlorobenzene	1.5	0.20	1.670	0	90.9	50.4	115			
Surr: 2-Fluorophenol	2.5		3.330		75.9	28.3	102			
Surr: Phenol-d5	2.7		3.330		79.7	35.7	103			
Surr: 2,4,6-Tribromophenol	3.0		3.330		89.0	35.2	108			
Surr: Nitrobenzene-d5	1.5		1.670		88.9	24	118			
Surr: 2-Fluorobiphenyl	1.5		1.670		87.5	35.4	111			
Surr: 4-Terphenyl-d14	1.3		1.670		75.7	15	91.7			

Sample ID **1606995-002ams**	SampType: **MS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **CentralOCD-02-6/16/**	Batch ID: **26116**	RunNo: **35369**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1094093** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.2	0.20	1.651	0	70.1	39.3	86.4			
4-Chloro-3-methylphenol	2.4	0.49	3.292	0	71.8	37.5	96.4			
2-Chlorophenol	2.4	0.20	3.292	0	71.6	37.4	90.6			
1,4-Dichlorobenzene	0.91	0.20	1.651	0	55.4	31.7	85			
2,4-Dinitrotoluene	0.98	0.49	1.651	0	59.3	26.4	86			
N-Nitrosodi-n-propylamine	1.0	0.20	1.651	0	61.2	43.5	83			
4-Nitrophenol	2.1	0.25	3.292	0	65.2	32.7	98			
Pentachlorophenol	1.9	0.40	3.292	0	57.5	26.6	87.4			
Phenol	2.3	0.20	3.292	0	69.9	40.5	85.3			
Pyrene	1.0	0.20	1.651	0	61.9	23.2	93.9			
1,2,4-Trichlorobenzene	1.2	0.20	1.651	0	70.6	38.7	99			
Surr: 2-Fluorophenol	2.1		3.292		63.6	28.3	102			
Surr: Phenol-d5	2.3		3.292		69.3	35.7	103			
Surr: 2,4,6-Tribromophenol	2.1		3.292		63.6	35.2	108			
Surr: Nitrobenzene-d5	1.2		1.651		71.4	24	118			
Surr: 2-Fluorobiphenyl	1.2		1.651		69.9	35.4	111			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **1606995-002ams**	SampType: **MS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **CentralOCD-02-6/16/**	Batch ID: **26116**	RunNo: **35369**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1094093** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	0.91		1.651		55.1	15	91.7			

Sample ID **1606995-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **CentralOCD-02-6/16/**	Batch ID: **26116**	RunNo: **35369**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1094094** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.1	0.20	1.653	0	64.2	39.3	86.4	8.70	30.2	
4-Chloro-3-methylphenol	2.2	0.49	3.296	0	65.3	37.5	96.4	9.36	37.2	
2-Chlorophenol	2.1	0.20	3.296	0	62.3	37.4	90.6	13.7	48	
1,4-Dichlorobenzene	0.80	0.20	1.653	0	48.1	31.7	85	13.9	40.6	
2,4-Dinitrotoluene	0.92	0.49	1.653	0	55.8	26.4	86	5.97	47.7	
N-Nitrosodi-n-propylamine	0.92	0.20	1.653	0	55.6	43.5	83	9.40	52.5	
4-Nitrophenol	2.1	0.25	3.296	0	62.7	32.7	98	3.78	36.6	
Pentachlorophenol	1.9	0.40	3.296	0	57.6	26.6	87.4	0.375	65.5	
Phenol	1.9	0.20	3.296	0	58.8	40.5	85.3	17.2	44	
Pyrene	0.94	0.20	1.653	0	56.9	23.2	93.9	8.27	42.1	
1,2,4-Trichlorobenzene	1.0	0.20	1.653	0	60.9	38.7	99	14.6	31.5	
Surr: 2-Fluorophenol	1.8		3.296		54.8	28.3	102	0	0	
Surr: Phenol-d5	2.0		3.296		61.9	35.7	103	0	0	
Surr: 2,4,6-Tribromophenol	2.1		3.296		64.3	35.2	108	0	0	
Surr: Nitrobenzene-d5	1.0		1.653		61.0	24	118	0	0	
Surr: 2-Fluorobiphenyl	1.1		1.653		66.3	35.4	111	0	0	
Surr: 4-Terphenyl-d14	0.87		1.653		52.6	15	91.7	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID	**MB-26093**	SampType:	**MBLK**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**PBS**	Batch ID:	**26093**	RunNo:	**35255**					
Prep Date:	**6/27/2016**	Analysis Date:	**6/28/2016**	SeqNo:	**1090434**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.033								

Sample ID	**LCS-26093**	SampType:	**LCS**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**LCSS**	Batch ID:	**26093**	RunNo:	**35255**					
Prep Date:	**6/27/2016**	Analysis Date:	**6/28/2016**	SeqNo:	**1090435**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.17	0.033	0.1667	0	105	80	120			

Sample ID	**1606995-002AMS**	SampType:	**MS**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**CentralOCD-02-6/16/**	Batch ID:	**26093**	RunNo:	**35255**					
Prep Date:	**6/27/2016**	Analysis Date:	**6/28/2016**	SeqNo:	**1090442**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.16	0.031	0.1548	0.003335	99.7	75	125			

Sample ID	**1606995-002AMSD**	SampType:	**MSD**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**CentralOCD-02-6/16/**	Batch ID:	**26093**	RunNo:	**35255**					
Prep Date:	**6/27/2016**	Analysis Date:	**6/28/2016**	SeqNo:	**1090443**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.18	0.033	0.1683	0.003335	103	75	125	11.4	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **MB-26123**	SampType: **MBLK**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **PBS**	Batch ID: **26123**	RunNo: **35332**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1093114** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	2.5								
Barium	ND	0.10								
Cadmium	ND	0.10								
Chromium	ND	0.30								
Copper	ND	0.30								
Iron	ND	2.5								
Lead	ND	0.25								
Manganese	ND	0.10								
Selenium	ND	2.5								
Silver	ND	0.25								
Uranium	ND	5.0								
Zinc	ND	2.5								

Sample ID **LCS-26123**	SampType: **LCS**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS**	Batch ID: **26123**	RunNo: **35332**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1093115** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	23	2.5	25.00	0	93.0	80	120			
Barium	24	0.10	25.00	0	94.8	80	120			
Cadmium	24	0.10	25.00	0	94.4	80	120			
Chromium	23	0.30	25.00	0	93.9	80	120			
Copper	25	0.30	25.00	0	98.1	80	120			
Iron	24	2.5	25.00	0	94.8	80	120			
Lead	22	0.25	25.00	0	88.1	80	120			
Manganese	23	0.10	25.00	0	92.3	80	120			
Selenium	23	2.5	25.00	0	92.1	80	120			
Silver	4.7	0.25	5.000	0	93.1	80	120			
Uranium	24	5.0	25.00	0	98.0	80	120			
Zinc	24	2.5	25.00	0	94.2	80	120			

Sample ID **1606995-002AMS**	SampType: **MS**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **CentralOCD-02-6/16/**	Batch ID: **26123**	RunNo: **35362**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1093792** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	15	2.4	24.42	0.8789	57.7	75	125			S
Barium	160	0.098	24.42	165.2	-4.64	75	125			S
Cadmium	16	0.098	24.42	0	64.2	75	125			S
Chromium	24	0.29	24.42	8.131	66.6	75	125			S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **1606995-002AMS** SampType: **MS** TestCode: **EPA Method 6010B: Soil Metals**

Client ID: **CentralOCD-02-6/16/** Batch ID: **26123** RunNo: **35362**

Prep Date: **6/28/2016** Analysis Date: **6/30/2016** SeqNo: **1093792** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Copper	19	0.29	24.42	2.413	67.0	75	125			S
Lead	17	0.24	24.42	3.606	52.9	75	125			S
Selenium	12	2.4	24.42	0	50.2	75	125			S
Silver	3.2	0.24	4.885	0	65.0	75	125			S
Uranium	14	4.9	24.42	0	58.6	75	125			S
Zinc	28	2.4	24.42	12.53	62.3	75	125			S

Sample ID **1606995-002AMSD** SampType: **MSD** TestCode: **EPA Method 6010B: Soil Metals**

Client ID: **CentralOCD-02-6/16/** Batch ID: **26123** RunNo: **35362**

Prep Date: **6/28/2016** Analysis Date: **6/30/2016** SeqNo: **1093793** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	17	2.5	25.41	0.8789	63.0	75	125	11.9	20	S
Barium	210	0.10	25.41	165.2	157	75	125	22.2	20	RS
Cadmium	17	0.10	25.41	0	65.5	75	125	6.02	20	S
Chromium	26	0.30	25.41	8.131	70.2	75	125	6.27	20	S
Copper	21	0.30	25.41	2.413	71.9	75	125	9.71	20	S
Lead	18	0.25	25.41	3.606	55.0	75	125	6.18	20	S
Selenium	11	2.5	25.41	0	44.7	75	125	7.71	20	S
Silver	3.4	0.25	5.082	0	67.5	75	125	7.68	20	S
Uranium	15	5.1	25.41	0	60.3	75	125	6.96	20	S
Zinc	30	2.5	25.41	12.53	69.5	75	125	8.40	20	S

Sample ID **1606995-002APS** SampType: **PS** TestCode: **EPA Method 6010B: Soil Metals**

Client ID: **CentralOCD-02-6/16/** Batch ID: **26123** RunNo: **35362**

Prep Date: Analysis Date: **6/30/2016** SeqNo: **1093794** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	21	2.4	24.44	0.8789	82.8	80	120			
Barium	200	0.098	24.44	165.2	133	80	120			S
Cadmium	20	0.098	24.44	0	81.9	80	120			
Chromium	28	0.29	24.44	8.131	81.1	80	120			
Copper	24	0.29	24.44	2.413	89.9	80	120			
Lead	22	0.24	24.44	3.606	74.9	80	120			S
Selenium	19	2.4	24.44	0	76.3	80	120			S
Silver	3.9	0.24	4.888	0	80.3	80	120			
Uranium	18	4.9	24.44	0	75.5	80	120			S
Zinc	32	2.4	24.44	12.53	79.8	80	120			S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **Western Refining Gallup** Work Order Number: **1606995** RcptNo: **1**

Received by/date: AG 06/17/16

Logged By: **Anne Thorne** 6/17/2016 10:00:00 AM Anne Thorne

Completed By: **Anne Thorne** 6/17/2016 Anne Thorne

Reviewed By: AJ 6/17/16

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?	Client		

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	4.4	Good				

Chain-of-Custody Record

Client: Western Refining

Mailing Address: Route 3 Box 7

Gallup, NM 87301

Phone #: 505-722-3833

email or Fax#: 505-722-0210

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation:
☐ NELAP ☐ Other

☐ EDD (Type) _Please provide EDD

Turn-Around Time:
☒ Standard ☐ Rush

Project Name:
OCD Central Landfarm Semiannual Sampling

Project #:
697-052-004

Project Manager:
Ed Riege

Sampler: Joey Waldmann

On Ice: ☒ Yes ☐ No

Sample Temperature: 4.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1606995	Vadose Zone List (see attached)	NMAC List (see attached)	TPH-DRO, GRO, and MRO by 8015M	BTEX (8260)	Air Bubbles (Y or N)
6/16/2016	1220	soil	CentralOCD-01-6/16/2016	8ox - 3, 4oz - 1	none	-001	X	X			
6/16/2016	1250	soil	CentralOCD-02-6/16/2016	8ox - 3, 4oz - 1	none	-002	X	X			
6/16/2016	1320	soil	CentralOCD-03-6/16/2016	8ox - 3, 4oz - 1	none	-003	X	X			
6/16/2016	1145	soil	CentralOCD-04-6/16/2016	8ox - 3, 4oz - 1	none	-004	X	X			
6/16/2016	———	soil	BD-6/16/2016	8ox - 3, 4oz - 1	none	-005	X	X			
6/16/2016	1250	soil	CentralOCD-02-6/16/2016-MS	8ox - 3, 4oz - 1	none	-002	X	X			
6/16/2016	1250	soil	CentralOCD-02-6/16/2016-MSD	8ox - 3, 4oz - 1	none	-002	X	X			
6/16/2016	1340	soil	CentralOCD-TZ-6/16/2016	8oz - 3, 4oz - 1	none	-006	X	X	X		
6/16/2016	1400	water	EB-6/16/2016	VOA - 3	HCL	-007				X	
6/16/2016	1415	water	FB-6/16/2016	VOA - 3	HCL	-008				X	
		water	Trip Blank	VOA - 3	HCL	-009				X	

Analysis Request

Date:	Time:	Relinquished by:	Received by:	Date Time
6/17/2016	10:00	Joey Waldmann		06/17/16 1000
Date:	Time:	Relinquished by:	Received by:	Date Time

Remarks: Please cc Grant Price (gprice@trihydro.com) with results. Call Grant @ 307-745-7474 w/ questions. **Verify that Reporting limits comply with those shown on the attached. PCBs need DL of 0.02 mg/kg. Data report and package w/ Trihydro EDD needed within 10 days of reciept. Any way to prevent low surrogate recoveries as w/ Sept. 2014 data package (Rpt 1409874)?**

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.

VADOSE ZONE ANALYTES AND REPORTING LIMITS, CENTRAL OIL CONSERVATION DIVISION LANDFARM
WESTERN REFINING SOUTHWEST, GALLUP REFINERY, GALLUP, NEW MEXICO

Analyte	Analytical Method	Reporting Units	Requested Reporting Limit
Chloride	E300	mg/kg	30
Benzene	SW8260B	mg/kg	0.050
Ethylbenzene	SW8260B	mg/kg	0.050
Toluene	SW8260B	mg/kg	0.050
Xylenes, Total	SW8260B	mg/kg	0.100
Petroleum Hydrocarbons, TR	E418.1	mg/kg	20

NMAC LIST ANALYTES AND REPORTING LIMITS, CONSTITUENTS LISTED IN SUBSECTIONS A AND B OF 20.6.2.3103 NMAC, CENTRAL OIL CONSERVATION DIVISION LANDFARM WESTERN REFINING SOUTHWEST, GALLUP REFINERY, GALLUP, NEW MEXICO

20.6.2.3103 NMAC (6/9/2016)

A. **Human Health Standards**-Ground water shall meet the standards of Subsection A and B of this section unless otherwise provided. If more than one water contaminant affecting human health is present, the toxic pollutant criteria as set forth in the definition of toxic pollutant in Section 20.6.2.1101 NMAC for the combination of contaminants, or the Human Health Standard of Subsection A of Section 20.6.2.3103 NMAC for each contaminant shall apply, whichever is more stringent. Non-aqueous phase liquid shall not be present floating atop of or immersed within ground water, as can be reasonably measured.

-1 Arsenic (As)	0.1 mg/l
-2 Barium (Ba)	1.0 mg/l
-3 Cadmium (Cd)	0.01 mg/l
-4 Chromium (Cr)	0.05 mg/l
-5 Cyanide (CN)	0.2 mg/l
-6 Fluoride (F)	1.6 mg/l
-7 Lead (Pb)	0.05 mg/l
-8 Total Mercury (Hg)	0.002 mg/l
-9 Nitrate (NO_3 as N)	10.0 mg/l
-10 Selenium (Se)	0.05 mg/l
-11 Silver (Ag)	0.05 mg/l
-12 Uranium (U)	0.03 mg/l
-13 Radioactivity: Combined Radium-226 & Radium-228	30 pCi/l
-14 Benzene	0.01 mg/l
~~**-15** Polychlorinated biphenyls (PCB's)~~	~~0.001 mg/l~~
-16 Toluene	0.75 mg/l
-17 Carbon Tetrachloride	0.01 mg/l
-18 1,2-dichloroethane (EDC)	0.01 mg/l
-19 1,1-dichloroethylene (1,1-DCE)	0.005 mg/l
-20 1,1,2,2-tetrachloroethylene (PCE)	0.02 mg/l
-21 1,1,2-trichloroethylene (TCE)	0.1 mg/l
-22 ethylbenzene	0.75 mg/l
-23 total xylenes	0.62 mg/l
-24 methylene chloride	0.1 mg/l
-25 chloroform	0.1 mg/l
-26 1,1-dichloroethane	0.025 mg/l
-27 ethylene dibromide (EDB)	0.0001 mg/l
-28 1,1,1-trichloroethane	0.06 mg/l
-29 1,1,2-trichloroethane	0.01 mg/l
-30 1,1,2,2-tetrachloroethane	0.01 mg/l
-31 vinyl chloride	0.001 mg/l
-32 PAHs: total naphthalene plus monomethylnaphthalenes	0.03 mg/l
-33 benzo-a-pyrene	0.0007 mg/l

B. **Other Standards for Domestic Water Supply**

-1 Chloride (Cl)	250.0 mg/l
-2 Copper (Cu)	1.0 mg/l
-3 Iron (Fe)	1.0 mg/l
-4 Manganese (Mn)	0.2 mg/l
-6 Phenols	0.005 mg/l
-7 Sulfate (SO_4)	600.0 mg/l
-8 Total Dissolved Solids (TDS)	1000.0 mg/l
-9 Zinc (Zn)	10.0 mg/l
-10 pH	between 6 and 9

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 160622057
Project Name: 1606995

Analytical Results Report

Sample Number 160622057-001 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-001B / CENTRALOCD-01-6/16/2016 **Sampling Time** 12:20 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.283	6/30/2016 5:55:00 PM	MER	EPA 335.4	
%moisture	15.5	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-002 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-002B / CENTRALOCD-02-6/16/2016 **Sampling Time** 12:50 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.297	6/30/2016 5:51:00 PM	MER	EPA 335.4	
%moisture	17.2	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-003 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-003B / CENTRALOCD-03-6/16/2016 **Sampling Time** 1:20 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.3	6/30/2016 5:57:00 PM	MER	EPA 335.4	
%moisture	16.8	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-004 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-004B / CENTRALOCD-04-6/16/2016 **Sampling Time** 11:45 AM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.295	6/30/2016 6:05:00 PM	MER	EPA 335.4	
%moisture	17.4	Percent		6/29/2016	ETL	%moisture	

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 160622057
Project Name: 1606995

Analytical Results Report

Sample Number 160622057-005 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-005B / BD-6/16/2016 **Sampling Time**
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.29	6/30/2016 6:06:00 PM	MER	EPA 335.4	
%moisture	17.6	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-006 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-006B / CENTRALOCD-TZ-6/16/2016 **Sampling Time** 1:40 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	0.487	mg/Kg	0.25	6/30/2016 6:08:00 PM	MER	EPA 335.4	
%moisture	8.6	Percent		6/29/2016	ETL	%moisture	

Authorized Signature

John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 160622057
Project Name: 1606995

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Cyanide	0.501	mg/kg	0.5	100.2	90-110	6/30/2016	6/30/2016

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
160622057-002	Cyanide	ND	14.6	mg/kg	15.1	96.7	70-130	6/30/2016	6/30/2016

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	14.7	mg/kg	14.9	98.7	0.7	0-25	6/30/2016	6/30/2016

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/Kg	5	6/30/2016	6/30/2016

AR Acceptable Range
ND Not Detected
PQL Practical Quantitation Limit
RPD Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1606995
Pace Project No.: 30187563

Sample: 1606995-001C CentralOCD-01-6/1 **Lab ID: 30187563001** Collected: 06/16/16 12:20 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis
Comments: • Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.255 ± 2.582 (3.112) C:NA T:NA**	pCi/g	07/14/16 12:06	13982-63-3	
Radium-228	EPA 901.1	**2.152 ± 0.446 (0.252) C:NA T:NA**	pCi/g	07/14/16 12:06	15262-20-1	

Sample: 1606995-002C CentralOCD-02-6/1 **Lab ID: 30187563002** Collected: 06/16/16 12:50 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**4.070 ± 2.123 (2.252) C:NA T:NA**	pCi/g	07/14/16 12:22	13982-63-3	
Radium-228	EPA 901.1	**1.806 ± 0.441 (0.138) C:NA T:NA**	pCi/g	07/14/16 12:22	15262-20-1	

Sample: 1606995-003C CentralOCD-03-6/1 **Lab ID: 30187563003** Collected: 06/16/16 13:20 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**2.237 ± 2.544 (3.016) C:NA T:NA**	pCi/g	07/14/16 12:39	13982-63-3	
Radium-228	EPA 901.1	**2.290 ± 0.514 (0.145) C:NA T:NA**	pCi/g	07/14/16 12:39	15262-20-1	

Sample: 1606995-004C CentralOCD-06-6/1 **Lab ID: 30187563004** Collected: 06/16/16 11:45 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.888 ± 2.288 (2.754) C:NA T:NA**	pCi/g	07/14/16 12:40	13982-63-3	
Radium-228	EPA 901.1	**1.553 ± 0.446 (0.391) C:NA T:NA**	pCi/g	07/14/16 12:40	15262-20-1	

Sample: 1606995-005C BD-6/16/2016 **Lab ID: 30187563005** Collected: 06/16/16 00:01 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**0.721 ± 2.612 (3.200) C:NA T:NA**	pCi/g	07/14/16 12:56	13982-63-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1606995
Pace Project No.: 30187563

Sample: 1606995-005C BD-6/16/2016 **Lab ID: 30187563005** Collected: 06/16/16 00:01 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-228	EPA 901.1	**2.102 ± 0.475 (0.295) C:NA T:NA**	pCi/g	07/14/16 12:56	15262-20-1	

Sample: 1606995-006C CentralOCD-TZ-6/1 **Lab ID: 30187563006** Collected: 06/16/16 13:40 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.237 ± 1.946 (2.382) C:NA T:NA**	pCi/g	07/14/16 12:57	13982-63-3	
Radium-228	EPA 901.1	**1.210 ± 0.397 (0.240) C:NA T:NA**	pCi/g	07/14/16 12:57	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1606995
Pace Project No.: 30187563

QC Batch: 225883 Analysis Method: EPA 901.1
QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec
Associated Lab Samples: 30187563001, 30187563002, 30187563003, 30187563004, 30187563005, 30187563006

METHOD BLANK: 1106602 Matrix: Solid
Associated Lab Samples: 30187563001, 30187563002, 30187563003, 30187563004, 30187563005, 30187563006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.249 ± 1.401 (1.846) C:NA T:NA	pCi/g	07/11/16 20:46	
Radium-228	0.000 ± 0.066 (0.290) C:NA T:NA	pCi/g	07/11/16 20:46	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1606995
Pace Project No.: 30187563

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

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

November 03, 2016

Ed Riege

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-3833
FAX (505) 722-0210

RE: OCD Central Landfarm Semiannual Sampling OrderNo.: 1610A38

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 4 sample(s) on 10/20/2016 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: **1610A38**
Date Reported: **11/3/2016**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Project: OCD Central Landfarm Semiannual Sampling
Lab Order: 1610A38

Lab ID: 1610A38-001 **Collection Date:** 10/20/2016 9:38:00 AM
Client Sample ID: CentralOCD-2271-10202016-SW-NW **Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Chloride	2600	31	75		mg/Kg	50	10/29/2016 12:36:19 AM	28324

Lab ID: 1610A38-002 **Collection Date:** 10/20/2016 10:40:00 AM
Client Sample ID: CentralOCD-2271-10202016-SW-NE **Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Chloride	2600	31	75		mg/Kg	50	10/29/2016 12:48:43 AM	28324

Lab ID: 1610A38-003 **Collection Date:** 10/20/2016 11:10:00 AM
Client Sample ID: CentralOCD-2271-10202016-SW-E **Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Chloride	640	12	30		mg/Kg	20	10/27/2016 3:14:33 PM	28324

Lab ID: 1610A38-004 **Collection Date:** 10/20/2016
Client Sample ID: CentralOCD-BD-10202016 **Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Chloride	600	12	30		mg/Kg	20	10/27/2016 3:26:57 PM	28324

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610A38**

03-Nov-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID	**MB-28324**	SampType:	**MBLK**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**28324**	RunNo:	**38293**					
Prep Date:	**10/27/2016**	Analysis Date:	**10/27/2016**	SeqNo:	**1194989**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-28324**	SampType:	**LCS**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**28324**	RunNo:	**38293**					
Prep Date:	**10/27/2016**	Analysis Date:	**10/27/2016**	SeqNo:	**1194990**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.4	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **Western Refining Gallup** Work Order Number: **1610A38** RcptNo: **1**

Received by/date: LC 10/20/16

Logged By: **Lindsay Mangin** 10/20/2016 4:40:00 PM

Completed By: **Lindsay Mangin** 10/21/2016 8:47:40 AM

Reviewed By: JC 10/21/16

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?	Client		

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 ☐	# of preserved bottles checked for pH: (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted?
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 ☐	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	2.8	Good	Not Present			

Chain-of-Custody Record

Client: ~~W~~ ~~Refining~~ West Western Refining

Mailing Address: Route 3 Box 7

Gallup, NM 87301

Phone #: 505-722-3833

email or Fax#: 505-722-0210

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation:
☐ NELAP ☐ Other_____

☐ EDD (Type) _Please provide EDD_____

Turn-Around Time:
☒ Standard ☐ Rush_____

Project Name:
OCD Central Landfarm Semiannual Sampling

Project #:
697-052-004

Project Manager:
Ed Riege

Sampler: Zac Bitsie

On Ice: ☒ Yes ☐ No

Sample Temperature: 2.8

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1610A38	Analysis Request: Chloride by EPA 300.0	Air Bubbles (Y or N)
10/20/2016	938	soil	CentralOCD-2271-10202016-SW-NW	4oz-1	none	-001	X	
10/20/2016	1040	soil	CentralOCD-2271-10202016-SW-NE	4oz-1	none	-002	X	
10/20/2016	1110	soil	CentralOCD-2271-10202016-SW-E	4oz-1	none	-003	X	
10/20/2016	NA	soil	CentralOCD-BD-~~10020216~~ 10202016	4oz-1	none	-004	X	

Date	Time	Relinquished by:	Received by:	Date	Time
10-20-16	1300			10/20/16	1325
10/20/16	1620		Lindsey Conoha	10/20/16	1640

Remarks: Please cc Grant Price (gprice@trihydro.com) with results. Call Grant @ 307-745-7474 w/ questions. **Data report and package w/ Trihydro EDD needed within 10 days of reciept.**

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.

AP - 111

LANDFARMS

2017

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, February 2, 2017 10:57 AM
To: 'Ed.Riege@wnr.com'
Cc: Griswold, Jim, EMNRD; Smith, Cory, EMNRD; VanHorn, Kristen, NMENV
Subject: Gallup Refinery (AP-111) "September and October 2016 Chloride Exceedance Excavation Report" dated January 25, 2017

Mr. Riege:

Re: OCD Central Landfarm

The New Mexico Oil Conservation Division (OCD) and New Mexico Environment Department (NMED) (Agencies) have completed review of the above subject report (report).

On page 3, "Proposed Path Forward", paragraph 1: The OCD Central Landfarm was built within Evaporation Pond 10 which is part of SWMU 2 (Evaporation Ponds) under Western's RCRA Permit. The updated schedule in the RCRA Permit lists corrective action at SWMU 2 as deferred since the SWMU is still in use. However, since Evaporation Pond 10 is not in use as an evaporation pond, Western can access soils for chloride remediation to address OCD's concerns. Additionally, the landfarm is permitted by OCD under Part 36 (i.e., 19.15.36 NMAC), so the continued operation of the landfarm also falls under OCD Regulations. OCD agrees with Western's proposed hot spot corrective actions in the report. Documentation (i.e., photos of excavation, C-138 manifest, etc. is required within 30-days of completion of corrective actions to verify the remediation was completed.

If Western plans to close the OCD Central Landfarm, NMED recommends in addition to OCD Regulations that NMED RCRA requirements also be addressed at the same time to avoid re-investigation of the area during SWMU 2 corrective action. OCD cannot guarantee that alternate remedial limits would be required based on the proposed source of contamination; however, OCD would consider recommended closure limits with the scientific basis if proposed in a landfarm closure plan by Western to the agencies.

Please contact me if you have questions, to request a telephone conference call, or wish to discuss this matter further. Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD **and see "Publications")**

Chavez, Carl J, EMNRD

From: Riege, Ed <Ed.Riege@wnr.com>
Sent: Thursday, January 26, 2017 10:19 AM
To: Chavez, Carl J, EMNRD
Cc: Griswold, Jim, EMNRD; VanHorn, Kristen, NMENV; Hains, Allen
Subject: September and October 2016 Chloride Exceedance Excavation Report
Attachments: 201701250903.pdf

Carl,
Please see attached correspondence chloride excavation report. The email does not include attachments due to size. A hard copy is being sent certified mail to you and Kristen.

Thanks,
Ed

Ed Riege
Remediation Manager

Western Refining
Gallup Refinery
92 Giant Crossing Road
Gallup, NM 87301
(505) 722-0217
ed.riege@wnr.com

January 25, 2017

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

RE: September and October 2016 Chloride Exceedance Excavation Report
Central Oil Conservation Division Landfarm
Western Refining Company Southwest, Inc., Gallup Refinery, Gallup, New Mexico

Dear Mr. Chavez:

Western Refining Company Southwest, Inc. (Western) is submitting this correspondence to present the results of chloride-contaminated soil excavation and confirmation sampling conducted in accordance with the "Chloride Exceedance Response Action Plan, Central Oil Conservation Division Landfarm, Western Refining Company Southwest, Inc., Gallup Refinery, Gallup, New Mexico" (Response Action Plan), dated July 26, 2016. This correspondence is also intended to inform the Oil Conservation Division (OCD) of a recently discovered non-landfarm chloride potential alternate source believed to be the cause of the elevated chloride concentrations reported in samples collected from the vadose zone beneath the Central OCD Landfarm.

Background

Semiannual vadose zone monitoring is conducted at random locations in accordance with New Mexico Administrative Code (NMAC) Rule 36 (19.15.36 NMAC). The landfarm had been divided into 6 foot (ft) by 6 ft grids to assist with random sample location selection. As required by the Response Action Plan, Western excavated chloride-contaminated soil associated with two these grids. Chloride contamination was originally identified within these grids during the April 2016 semiannual vadose zone sampling event and the June 2016 confirmation sampling event. Per the Response Action Plan, soils with chloride concentrations in excess of the 500 milligram per kilogram (mg/kg) action level/alternate beneficial reuse screening concentration (ABRSC) were to be excavated. Confirmation samples were to be collected from the floor of the excavations, as well as the from the sidewalls of the excavation at the depths of the original exceedances (6 ft below ground surface (bgs)) in the four cardinal directions. The excavations were to be extended or deepened in the direction of chloride concentrations in excess of 500 mg/kg, as determined via the confirmation sampling.

Excavation Extents and Confirmation Sampling Results

Excavation of chloride-contaminated soils began in September 2016 and continued through October 2016. Western contracted Trihydro Corporation (Trihydro) to oversee excavation completion and collect confirmation samples. The two grids scheduled for excavation were grids 1021 and 2271. The

excavations associated with each grid are shown on Figure 1. Confirmation sampling results are summarized in Table 1. Analytical laboratory reports and data validation reports are provided as Attachments A and B, respectively.

As shown in Table 1, the chloride concentrations reported for the September 2016 floor and sidewall samples associated with Grid 1021 are below the 500 mg/kg action level/ARBSC. Accordingly, the excavation of chloride-contaminated soil associated with Grid 1021 was deemed complete. The approximate excavation extents are illustrated on Figure 1, and the total depth of the excavation is 8 ft bgs.

Chloride concentrations reported for two of the September 2016 sidewall samples associated with Grid 2271 exceed the 500 mg/kg action level/ARBSC. In response to these confirmation sample exceedances, the excavation was expanded in the direction of the exceedances and additional confirmation samples were collected. Two such excavation expansion/resampling events were conducted in October 2016, and as shown on Figure 1, sidewall sample exceedances persist on the northern and eastern excavation boundaries. The growing size of the Grid 2271 excavation and the fact that contamination appears to extend to and possibly beyond the berms of the landfarm prompted Gallup and Trihydro to regroup and assess whether the current excavation plans (those outlined in the Response Action Plan) remain appropriate. This resulted in the acknowledgement that the refinery's former Evaporation Pond #10 occupied nearly the exact footprint of the Central OCD Landfarm prior to landfarm operation. Figure 2 illustrates the location of the former Evaporation Pond #10 and the Central OCD Landfarm. As discussed in the following section, former Evaporation Pond # 10 is believed to be the source of the elevated chloride concentrations present in the vadose zone soils beneath the Central OCD Landfarm.

Former Evaporation Pond # 10

According to the "Inventory of Solid Waste Management Units", dated June 14, 1985, "cell" or Evaporation Pond # 10 received "wastewater from the boiler house and water softener regeneration wastes". The pond was replaced in 1980 with an in-line neutralization tank. Both of these wastes would be expected to contain elevated chloride concentrations. Since these wastes were stored in the unlined evaporation pond whose footprint is similar to the Central OCD Landfarm prior to landfarm operation, it is likely that the pond may have contributed to the chloride contamination in the area and may be the cause of the vadose zone chloride exceedances.

This idea is further supported by soil data collected from the landfarm's treatment zone over the past four years. Western has collected 6 treatment zone samples since 2013 to assist in determining if the landfarm may be eligible for closure or soil reuse. As shown in Table 2, the maximum reported chloride concentration for samples collected from the treatment zone (1 ft bgs) is 310 mg/kg. This is less than the 500 mg/kg action level/ABRSC and far less than some of the more elevated vadose zone samples which are in excess of 2,500 mg/kg (see Table 1). If soils treated in the landfarm were the source of the vadose zone chloride contamination, it would be expected that the treatment zone chloride concentrations would be greater than the vadose zone chloride concentrations, but the data indicate the opposite. This line of evidence suggests a non-landfarm chloride source.

Proposed Path Forward

OCD Landfarm operation is governed by NMAC Rule 36. The Response Action Plan and subsequent excavations were intended to satisfy Rule 36 requirements and Central OCD Landfarm-specific agreements reached between Western and OCD. In light of the information presented in this correspondence, Western does not believe that vadose zone chloride concentrations in excess of the 500 mg/kg action level/ABRSC are a result of landfarm operation. Accordingly, Western does not believe vadose zone chloride contamination needs be addressed or remedied in accordance with NMAC Rule 36 or previous Central OCD Landfarm-specific agreements. The elevated chloride concentrations are believed to be associated with former Evaporation Pond # 10. Former Evaporation Pond # 10 is part of Solid Waste Management Unit (SWMU) 2. Therefore, Western believes that it would be appropriate to address the chloride contaminated soil as part of SWMU 2 remedies.

Western does intend to dispose of the already excavated chloride contaminated soil at an off-site disposal facility permitted to receive such wastes and to the fill the excavations with clean fill material. The excavated soil is currently stock piled on plastic sheeting within the landfarm berms. Pending OCD approval of this correspondence, Western will begin soil disposal and excavation backfilling.

Western is also still considering closure of the Central OCD landfarm. When closure is sought, Western believes that closure should still be conducted in general accordance with NMAC Rule 36. However, Central OCD Landfarm-specific agreements reached between Western and OCD, as well as the alternate chloride source identified in this correspondence (i.e., former Evaporation Pond # 10) should be taken into consideration. Pending OCD approval of this correspondence, Western will discuss closure details and expectations with OCD. If you have any questions or comments, please do not hesitate to call me at (505) 722-0217.

Sincerely,
Western Refining Company Southwest, Inc.

Ed Riege
Remediation Manager

697-052-003

Attachments

cc: G. Price, Trihydro Corporation
K. Van Horn, NMED

TABLES

TABLE 1. CHLORIDE-CONTAMINATED SOIL EXCAVATION CONFIRMATION SAMPLING RESULTS
WESTERN REFINING COMPANY SOUTHWEST, INC., GALLUP, NEW MEXICO

Sample Type	Sample ID	Date Sampled	Chloride (mg/kg)
Grid 1021 Confirmation Sample	CentralOCD-1021-09062016-F	09/06/16	270
Grid 1021 Confirmation Sample	CentralOCD-1021-09062016-SW-E	09/06/16	130
Grid 1021 Confirmation Sample	CentralOCD-1021-09062016-SW-E Dup	09/06/16	110
Grid 1021 Confirmation Sample	CentralOCD-1021-09062016-SW-N	09/06/16	160
Grid 1021 Confirmation Sample	CentralOCD-1021-09062016-SW-S	09/06/16	280
Grid 1021 Confirmation Sample	CentralOCD-1021-09062016-SW-W	09/06/16	490
Grid 2271 Confirmation Sample	CentralOCD-2271-09062016-F	09/06/16	170
Grid 2271 Confirmation Sample	CentralOCD-2271-09062016-SW-E	09/06/16	**1500**
Grid 2271 Confirmation Sample	CentralOCD-2271-09062016-SW-N	09/06/16	**2200**
Grid 2271 Confirmation Sample	CentralOCD-2271-09062016-SW-S	09/06/16	160
Grid 2271 Confirmation Sample	CentralOCD-2271-09062016-SW-W	09/06/16	300
Grid 2271 Confirmation Sample	CentralOCD-2271-10062016-SW-E	10/06/16	**800**
Grid 2271 Confirmation Sample	CentralOCD-2271-10062016-SW-E Dup	10/06/16	480
Grid 2271 Confirmation Sample	CentralOCD-2271-10062016-SW-N	10/06/16	**790**
Grid 2271 Confirmation Sample	CentralOCD-2271-10202016-SW-E	10/20/16	**640**
Grid 2271 Confirmation Sample	CentralOCD-2271-10202016-SW-E Dup	10/20/16	**600**
Grid 2271 Confirmation Sample	CentralOCD-2271-10202016-SW-NE	10/20/16	**2600**
Grid 2271 Confirmation Sample	CentralOCD-2271-10202016-SW-NW	10/20/16	**2600**
Action Level and ABRSC			500

Notes:
Action Level/Alternate Beneficial Reuse Soil Screening Level (ABRSC) exceedances are shown in bold font.

TABLE 2. HISTORICAL TREATMENT ZONE CHLORIDE ANALYTICAL DATA SUMMARY
WESTERN REFINING COMPANY SOUTHWEST, INC., GALLUP, NEW MEXICO

Sample Type	Sample ID	Date Sampled	Chloride (mg/kg)
Treatment Zone Sample	CentralOCD-TZ_032713	03/27/13	310
Treatment Zone Sample	CentralOCD-TZ_091614	09/16/14	130
Treatment Zone Sample	CentralOCD-TZ-04062015	04/06/15	130
Treatment Zone Sample	Central OCD-TZ-11242015	11/24/15	280
Treatment Zone Sample	CentralOCD-TZ-04072016	04/07/16	260 J
Treatment Zone Sample	CentralOCD-TZ-06162016	06/16/16	290
Action Level and ABRSC			500

Notes:
Action Level/Alternate Beneficial Reuse Soil Screening Level (ABRSC) exceedances are shown in bold font.
J - Estimated concentration

FIGURES



Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307.745.7474 (F) 307.745.7729

FIGURE 1

SEPTEMBER/OCTOBER 2016 CHLORIDE EXCAVATION CONFIRMATION SAMPLE LOCATIONS

WESTERN REFINING COMPANY L.L.C
GALLUP REFINERY
GALLUP, NEW MEXICO

Drawn By: PH	Checked By: GP	Scale: 1" = 42'	Date: 12/5/16	File: Gallup_OCDLF_Fig1.mxd



EXPLANATION

- FORMER EVAPORATION POND #10
- SWMU 2
- CENTRAL OCD LANDFARM

N

0 350'

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 2

LOCATIONS OF FORMER EVAPORATION POND #10 AND THE CENTRAL OCD LANDFARM

WESTERN REFINING COMPANY L.L.C
GALLUP REFINERY
GALLUP, NEW MEXICO

Drawn By: PH	Checked By: GP	Scale: 1" = 350'	Date: 12/5/16	File: Gallup_OCDLF_Fig2.mxd

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

July 19, 2016

Ed Riege

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-3833
FAX (505) 722-0210

RE: OCD Central Landfarm Semiannual Sampling OrderNo.: 1606995

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 9 sample(s) on 6/17/2016 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued July 15, 2016.

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, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-01-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:20:00 PM
Lab ID: 1606995-001 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Fluoride	4.4	0.042	0.30		mg/Kg	1	6/27/2016 10:00:56 PM	26092
Chloride	330	12	30		mg/Kg	20	6/27/2016 10:13:21 PM	26092
Nitrogen, Nitrate (As N)	2.9	0.016	0.30		mg/Kg	1	6/27/2016 10:00:56 PM	26092
Sulfate	550	5.4	30		mg/Kg	20	6/27/2016 10:13:21 PM	26092
EPA METHOD 7471: MERCURY							Analyst: **DBD**	
Mercury	0.013	0.00053	0.031	J	mg/Kg	1	6/28/2016 9:21:40 AM	26093
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Arsenic	1.1	0.70	2.4	J	mg/Kg	1	6/30/2016 10:50:31 AM	26123
Barium	150	0.046	0.096		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Cadmium	ND	0.061	0.096		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Chromium	8.0	0.12	0.29		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Copper	3.4	0.15	0.29		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Iron	13000	93	240		mg/Kg	100	6/30/2016 10:31:34 AM	26123
Lead	3.2	0.17	0.24		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Manganese	280	0.085	0.19		mg/Kg	2	6/30/2016 11:28:12 AM	26123
Selenium	ND	1.0	2.4		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Silver	ND	0.030	0.24		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Uranium	ND	0.95	4.8		mg/Kg	1	6/30/2016 10:50:31 AM	26123
Zinc	14	0.54	2.4		mg/Kg	1	6/30/2016 10:50:31 AM	26123
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Acenaphthylene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Aniline	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Anthracene	ND	0.13	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Azobenzene	ND	0.24	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benz(a)anthracene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benzo(a)pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benzo(b)fluoranthene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benzo(g,h,i)perylene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benzo(k)fluoranthene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benzoic acid	ND	0.16	0.99	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Benzyl alcohol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Bis(2-chloroethoxy)methane	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Bis(2-chloroethyl)ether	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Bis(2-chloroisopropyl)ether	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Bis(2-ethylhexyl)phthalate	0.19	0.16	0.99	JD	mg/Kg	1	6/30/2016 2:11:19 PM	26116
4-Bromophenyl phenyl ether	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Butyl benzyl phthalate	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-01-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:20:00 PM
Lab ID: 1606995-001 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Carbazole	ND	0.13	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
4-Chloro-3-methylphenol	ND	0.24	0.99	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
4-Chloroaniline	ND	0.22	0.99	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2-Chloronaphthalene	ND	0.16	0.50	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2-Chlorophenol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
4-Chlorophenyl phenyl ether	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Chrysene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Di-n-butyl phthalate	0.17	0.15	0.79	JD	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Di-n-octyl phthalate	ND	0.17	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Dibenz(a,h)anthracene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Dibenzofuran	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
1,2-Dichlorobenzene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
1,3-Dichlorobenzene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
1,4-Dichlorobenzene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
3,3´-Dichlorobenzidine	ND	0.15	0.50	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Diethyl phthalate	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Dimethyl phthalate	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,4-Dichlorophenol	ND	0.18	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,4-Dimethylphenol	ND	0.22	0.60	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
4,6-Dinitro-2-methylphenol	ND	0.12	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,4-Dinitrophenol	ND	0.13	0.99	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,4-Dinitrotoluene	ND	0.18	0.99	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,6-Dinitrotoluene	ND	0.21	0.99	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Fluoranthene	ND	0.11	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Fluorene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Hexachlorobenzene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Hexachlorobutadiene	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Hexachlorocyclopentadiene	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Hexachloroethane	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Indeno(1,2,3-cd)pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
1-Methylnaphthalene	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2-Methylnaphthalene	ND	0.24	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2-Methylphenol	ND	0.17	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
3+4-Methylphenol	ND	0.14	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
N-Nitrosodi-n-propylamine	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
N-Nitrosodiphenylamine	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Naphthalene	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2-Nitroaniline	ND	0.21	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
3-Nitroaniline	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-01-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:20:00 PM
Lab ID: 1606995-001 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	0.14	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Nitrobenzene	ND	0.20	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2-Nitrophenol	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
4-Nitrophenol	ND	0.15	0.50	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Pentachlorophenol	ND	0.13	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Phenanthrene	ND	0.13	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Phenol	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Pyridine	ND	0.16	0.79	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
1,2,4-Trichlorobenzene	ND	0.21	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,4,5-Trichlorophenol	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
2,4,6-Trichlorophenol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 2:11:19 PM	26116
Surr: 2-Fluorophenol	63.8	0	28.3-102	D	%Rec	1	6/30/2016 2:11:19 PM	26116
Surr: Phenol-d5	69.5	0	35.7-103	D	%Rec	1	6/30/2016 2:11:19 PM	26116
Surr: 2,4,6-Tribromophenol	80.0	0	35.2-108	D	%Rec	1	6/30/2016 2:11:19 PM	26116
Surr: Nitrobenzene-d5	75.2		24-118	D	%Rec	1	6/30/2016 2:11:19 PM	26116
Surr: 2-Fluorobiphenyl	86.6		35.4-111	D	%Rec	1	6/30/2016 2:11:19 PM	26116
Surr: 4-Terphenyl-d14	65.6		15-91.7	D	%Rec	1	6/30/2016 2:11:19 PM	26116
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.018	0.023		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Toluene	ND	0.0027	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Ethylbenzene	ND	0.0037	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Methyl tert-butyl ether (MTBE)	ND	0.014	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2,4-Trimethylbenzene	ND	0.0034	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,3,5-Trimethylbenzene	ND	0.0033	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2-Dichloroethane (EDC)	ND	0.012	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2-Dibromoethane (EDB)	ND	0.0032	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Naphthalene	ND	0.0071	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1-Methylnaphthalene	ND	0.010	0.18		mg/Kg	1	6/20/2016 8:01:30 PM	25923
2-Methylnaphthalene	ND	0.0098	0.18		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Acetone	ND	0.059	0.68		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Bromobenzene	ND	0.0037	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Bromodichloromethane	ND	0.0027	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Bromoform	ND	0.0056	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Bromomethane	0.019	0.017	0.14	J	mg/Kg	1	6/20/2016 8:01:30 PM	25923
2-Butanone	ND	0.026	0.46		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Carbon disulfide	ND	0.015	0.46		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Carbon tetrachloride	ND	0.0030	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Chlorobenzene	ND	0.0037	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-01-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:20:00 PM
Lab ID: 1606995-001 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Chloroethane	ND	0.0091	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Chloroform	ND	0.0034	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Chloromethane	0.081	0.0041	0.14	J	mg/Kg	1	6/20/2016 8:01:30 PM	25923
2-Chlorotoluene	ND	0.0034	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
4-Chlorotoluene	ND	0.0040	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
cis-1,2-DCE	ND	0.0027	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
cis-1,3-Dichloropropene	ND	0.0042	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2-Dibromo-3-chloropropane	ND	0.014	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Dibromochloromethane	ND	0.0041	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Dibromomethane	ND	0.0040	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2-Dichlorobenzene	ND	0.0040	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,3-Dichlorobenzene	ND	0.0037	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,4-Dichlorobenzene	ND	0.0057	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Dichlorodifluoromethane	ND	0.014	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,1-Dichloroethane	ND	0.0025	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,1-Dichloroethene	ND	0.015	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2-Dichloropropane	ND	0.0038	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,3-Dichloropropane	ND	0.0052	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
2,2-Dichloropropane	ND	0.0026	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,1-Dichloropropene	ND	0.0036	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Hexachlorobutadiene	ND	0.0056	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
2-Hexanone	ND	0.025	0.46		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Isopropylbenzene	ND	0.0039	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
4-Isopropyltoluene	ND	0.0041	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
4-Methyl-2-pentanone	ND	0.013	0.46		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Methylene chloride	ND	0.013	0.14		mg/Kg	1	6/20/2016 8:01:30 PM	25923
n-Butylbenzene	ND	0.0040	0.14		mg/Kg	1	6/20/2016 8:01:30 PM	25923
n-Propylbenzene	ND	0.0035	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
sec-Butylbenzene	ND	0.0063	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Styrene	ND	0.0041	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
tert-Butylbenzene	ND	0.0038	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,1,1,2-Tetrachloroethane	ND	0.0044	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,1,2,2-Tetrachloroethane	ND	0.0074	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Tetrachloroethene (PCE)	ND	0.0038	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
trans-1,2-DCE	ND	0.013	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
trans-1,3-Dichloropropene	ND	0.0067	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2,3-Trichlorobenzene	ND	0.0068	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2,4-Trichlorobenzene	ND	0.0049	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,1,1-Trichloroethane	ND	0.0028	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-01-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:20:00 PM
Lab ID: 1606995-001
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,2-Trichloroethane	ND	0.0054	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Trichloroethene (TCE)	ND	0.0049	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Trichlorofluoromethane	ND	0.0034	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
1,2,3-Trichloropropane	ND	0.0079	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Vinyl chloride	ND	0.0037	0.046		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Xylenes, Total	ND	0.0086	0.091		mg/Kg	1	6/20/2016 8:01:30 PM	25923
Surr: Dibromofluoromethane	108		70-130		%Rec	1	6/20/2016 8:01:30 PM	25923
Surr: 1,2-Dichloroethane-d4	106		70-130		%Rec	1	6/20/2016 8:01:30 PM	25923
Surr: Toluene-d8	95.3		70-130		%Rec	1	6/20/2016 8:01:30 PM	25923
Surr: 4-Bromofluorobenzene	98.7		70-130		%Rec	1	6/20/2016 8:01:30 PM	25923
EPA METHOD 418.1: TPH							Analyst: **TOM**	
Petroleum Hydrocarbons, TR	33	8.5	20		mg/Kg	1	6/23/2016	25996

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-02-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:50:00 PM
Lab ID: 1606995-002
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Fluoride	3.4	0.042	0.30		mg/Kg	1	6/27/2016 10:25:45 PM	26092
Chloride	350	12	30		mg/Kg	20	6/27/2016 10:38:10 PM	26092
Nitrogen, Nitrate (As N)	8.8	0.016	0.30		mg/Kg	1	6/27/2016 10:25:45 PM	26092
Sulfate	400	5.4	30		mg/Kg	20	6/27/2016 10:38:10 PM	26092
EPA METHOD 7471: MERCURY							Analyst: **DBD**	
Mercury	0.0033	0.00057	0.033	J	mg/Kg	1	6/28/2016 9:25:13 AM	26093
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Arsenic	0.88	0.71	2.4	J	mg/Kg	1	6/30/2016 3:45:33 PM	26123
Barium	170	0.047	0.098		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Cadmium	ND	0.062	0.098		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Chromium	8.1	0.12	0.29		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Copper	2.4	0.15	0.29		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Iron	13000	95	240		mg/Kg	100	6/30/2016 10:33:05 AM	26123
Lead	3.6	0.17	0.24		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Manganese	230	0.043	0.098		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Selenium	ND	1.1	2.4		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Silver	ND	0.031	0.24		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Uranium	ND	0.97	4.9		mg/Kg	1	6/30/2016 3:45:33 PM	26123
Zinc	13	0.56	2.4		mg/Kg	1	6/30/2016 3:45:33 PM	26123
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Aniline	ND	0.094	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Anthracene	ND	0.066	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Azobenzene	ND	0.12	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benzoic acid	ND	0.082	0.50		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Bis(2-ethylhexyl)phthalate	0.10	0.081	0.50	J	mg/Kg	1	6/30/2016 2:39:19 PM	26116
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-02-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:50:00 PM
Lab ID: 1606995-002 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Carbazole	ND	0.067	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	6/30/2016 2:39:19 PM	26116
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Chrysene	ND	0.085	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Di-n-butyl phthalate	0.092	0.074	0.40	J	mg/Kg	1	6/30/2016 2:39:19 PM	26116
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
3,3´-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Diethyl phthalate	ND	0.10	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	6/30/2016 2:39:19 PM	26116
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Fluoranthene	ND	0.057	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Fluorene	ND	0.091	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Naphthalene	ND	0.095	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-02-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:50:00 PM
Lab ID: 1606995-002 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Phenanthrene	ND	0.068	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Phenol	ND	0.075	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Pyrene	ND	0.075	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Pyridine	ND	0.079	0.40		mg/Kg	1	6/30/2016 2:39:19 PM	26116
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	6/30/2016 2:39:19 PM	26116
Surr: 2-Fluorophenol	59.5	0	28.3-102		%Rec	1	6/30/2016 2:39:19 PM	26116
Surr: Phenol-d5	69.6	0	35.7-103		%Rec	1	6/30/2016 2:39:19 PM	26116
Surr: 2,4,6-Tribromophenol	80.2	0	35.2-108		%Rec	1	6/30/2016 2:39:19 PM	26116
Surr: Nitrobenzene-d5	68.1		24-118		%Rec	1	6/30/2016 2:39:19 PM	26116
Surr: 2-Fluorobiphenyl	75.7		35.4-111		%Rec	1	6/30/2016 2:39:19 PM	26116
Surr: 4-Terphenyl-d14	58.0		15-91.7		%Rec	1	6/30/2016 2:39:19 PM	26116
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.020	0.025		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Toluene	ND	0.0030	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Ethylbenzene	ND	0.0041	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Methyl tert-butyl ether (MTBE)	ND	0.016	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2,4-Trimethylbenzene	ND	0.0037	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,3,5-Trimethylbenzene	ND	0.0036	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2-Dichloroethane (EDC)	ND	0.013	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2-Dibromoethane (EDB)	ND	0.0035	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Naphthalene	ND	0.0078	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	6/20/2016 8:29:59 PM	25923
2-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Acetone	ND	0.064	0.75		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Bromobenzene	ND	0.0040	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Bromodichloromethane	ND	0.0029	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Bromoform	ND	0.0061	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Bromomethane	ND	0.018	0.15		mg/Kg	1	6/20/2016 8:29:59 PM	25923
2-Butanone	ND	0.028	0.50		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Carbon disulfide	ND	0.016	0.50		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Carbon tetrachloride	ND	0.0033	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Chlorobenzene	ND	0.0041	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-02-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:50:00 PM
Lab ID: 1606995-002
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Chloroethane	ND	0.0099	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Chloroform	ND	0.0038	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Chloromethane	0.080	0.0044	0.15	J	mg/Kg	1	6/20/2016 8:29:59 PM	25923
2-Chlorotoluene	ND	0.0037	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
4-Chlorotoluene	ND	0.0044	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
cis-1,2-DCE	ND	0.0029	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
cis-1,3-Dichloropropene	ND	0.0046	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2-Dibromo-3-chloropropane	ND	0.015	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Dibromochloromethane	ND	0.0045	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Dibromomethane	ND	0.0043	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2-Dichlorobenzene	ND	0.0043	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,3-Dichlorobenzene	ND	0.0041	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,4-Dichlorobenzene	ND	0.0062	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Dichlorodifluoromethane	ND	0.015	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,1-Dichloroethane	ND	0.0027	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,1-Dichloroethene	ND	0.016	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2-Dichloropropane	ND	0.0042	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,3-Dichloropropane	ND	0.0057	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
2,2-Dichloropropane	ND	0.0029	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,1-Dichloropropene	ND	0.0040	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Hexachlorobutadiene	ND	0.0061	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
2-Hexanone	ND	0.027	0.50		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Isopropylbenzene	ND	0.0043	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
4-Isopropyltoluene	ND	0.0045	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
4-Methyl-2-pentanone	ND	0.015	0.50		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Methylene chloride	ND	0.014	0.15		mg/Kg	1	6/20/2016 8:29:59 PM	25923
n-Butylbenzene	ND	0.0044	0.15		mg/Kg	1	6/20/2016 8:29:59 PM	25923
n-Propylbenzene	ND	0.0038	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
sec-Butylbenzene	ND	0.0069	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Styrene	ND	0.0045	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
tert-Butylbenzene	ND	0.0041	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,1,1,2-Tetrachloroethane	ND	0.0048	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,1,2,2-Tetrachloroethane	ND	0.0081	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Tetrachloroethene (PCE)	ND	0.0041	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
trans-1,2-DCE	ND	0.014	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
trans-1,3-Dichloropropene	ND	0.0073	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2,3-Trichlorobenzene	ND	0.0075	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2,4-Trichlorobenzene	ND	0.0053	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,1,1-Trichloroethane	ND	0.0030	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-02-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 12:50:00 PM
Lab ID: 1606995-002 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,2-Trichloroethane	ND	0.0059	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Trichloroethene (TCE)	ND	0.0053	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Trichlorofluoromethane	ND	0.0037	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
1,2,3-Trichloropropane	ND	0.0086	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Vinyl chloride	ND	0.0041	0.050		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Xylenes, Total	ND	0.0094	0.10		mg/Kg	1	6/20/2016 8:29:59 PM	25923
Surr: Dibromofluoromethane	105		70-130		%Rec	1	6/20/2016 8:29:59 PM	25923
Surr: 1,2-Dichloroethane-d4	97.2		70-130		%Rec	1	6/20/2016 8:29:59 PM	25923
Surr: Toluene-d8	95.7		70-130		%Rec	1	6/20/2016 8:29:59 PM	25923
Surr: 4-Bromofluorobenzene	101		70-130		%Rec	1	6/20/2016 8:29:59 PM	25923
EPA METHOD 418.1: TPH							Analyst: **TOM**	
Petroleum Hydrocarbons, TR	ND	8.0	19		mg/Kg	1	6/23/2016	25996

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-03-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:20:00 PM
Lab ID: 1606995-003
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Fluoride	2.6	0.042	0.30		mg/Kg	1	6/27/2016 10:50:35 PM	26092
Chloride	570	12	30		mg/Kg	20	6/27/2016 11:02:59 PM	26092
Nitrogen, Nitrate (As N)	21	0.32	6.0		mg/Kg	20	6/27/2016 11:02:59 PM	26092
Sulfate	540	5.4	30		mg/Kg	20	6/27/2016 11:02:59 PM	26092
EPA METHOD 7471: MERCURY							Analyst: **DBD**	
Mercury	0.0048	0.00058	0.034	J	mg/Kg	1	6/28/2016 9:34:18 AM	26093
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Arsenic	ND	1.5	5.1		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Barium	220	0.099	0.20		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Cadmium	ND	0.13	0.20		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Chromium	11	0.26	0.61		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Copper	3.4	0.32	0.61		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Iron	17000	100	260		mg/Kg	100	6/30/2016 10:34:35 AM	26123
Lead	4.7	0.36	0.51		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Manganese	290	0.091	0.20		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Selenium	ND	2.2	5.1		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Silver	ND	0.065	0.51		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Uranium	ND	2.0	10		mg/Kg	2	6/30/2016 11:41:01 AM	26123
Zinc	18	1.2	5.1		mg/Kg	2	6/30/2016 11:41:01 AM	26123
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	0.086	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Aniline	ND	0.095	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Anthracene	ND	0.066	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Azobenzene	ND	0.12	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benzo(a)pyrene	ND	0.076	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benzoic acid	ND	0.083	0.50		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Bis(2-chloroethyl)ether	ND	0.074	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Bis(2-ethylhexyl)phthalate	0.11	0.082	0.50	J	mg/Kg	1	6/30/2016 4:03:22 PM	26116
4-Bromophenyl phenyl ether	ND	0.096	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Butyl benzyl phthalate	ND	0.089	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-03-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:20:00 PM
Lab ID: 1606995-003
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Carbazole	ND	0.068	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	6/30/2016 4:03:22 PM	26116
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2-Chloronaphthalene	ND	0.079	0.25		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2-Chlorophenol	ND	0.079	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Chrysene	ND	0.085	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Di-n-butyl phthalate	ND	0.075	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
1,2-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
1,4-Dichlorobenzene	ND	0.085	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
3,3´-Dichlorobenzidine	ND	0.074	0.25		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Diethyl phthalate	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Dimethyl phthalate	ND	0.098	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	6/30/2016 4:03:22 PM	26116
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Fluoranthene	ND	0.058	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Fluorene	ND	0.092	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2-Methylphenol	ND	0.084	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
N-Nitrosodiphenylamine	ND	0.098	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Naphthalene	ND	0.096	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-03-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:20:00 PM
Lab ID: 1606995-003
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	0.071	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Phenanthrene	ND	0.068	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Phenol	ND	0.075	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Pyrene	ND	0.076	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Pyridine	ND	0.079	0.40		mg/Kg	1	6/30/2016 4:03:22 PM	26116
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	6/30/2016 4:03:22 PM	26116
Surr: 2-Fluorophenol	50.9	0	28.3-102		%Rec	1	6/30/2016 4:03:22 PM	26116
Surr: Phenol-d5	59.5	0	35.7-103		%Rec	1	6/30/2016 4:03:22 PM	26116
Surr: 2,4,6-Tribromophenol	73.1	0	35.2-108		%Rec	1	6/30/2016 4:03:22 PM	26116
Surr: Nitrobenzene-d5	59.0		24-118		%Rec	1	6/30/2016 4:03:22 PM	26116
Surr: 2-Fluorobiphenyl	72.0		35.4-111		%Rec	1	6/30/2016 4:03:22 PM	26116
Surr: 4-Terphenyl-d14	59.7		15-91.7		%Rec	1	6/30/2016 4:03:22 PM	26116
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.019	0.024		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Toluene	ND	0.0029	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Ethylbenzene	ND	0.0040	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Methyl tert-butyl ether (MTBE)	ND	0.015	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2,4-Trimethylbenzene	ND	0.0036	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,3,5-Trimethylbenzene	ND	0.0035	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2-Dichloroethane (EDC)	ND	0.013	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2-Dibromoethane (EDB)	ND	0.0034	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Naphthalene	ND	0.0076	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1-Methylnaphthalene	ND	0.011	0.19		mg/Kg	1	6/20/2016 9:55:03 PM	25923
2-Methylnaphthalene	ND	0.010	0.19		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Acetone	ND	0.063	0.73		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Bromobenzene	ND	0.0039	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Bromodichloromethane	ND	0.0028	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Bromoform	ND	0.0059	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Bromomethane	0.018	0.018	0.15	J	mg/Kg	1	6/20/2016 9:55:03 PM	25923
2-Butanone	ND	0.028	0.48		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Carbon disulfide	ND	0.016	0.48		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Carbon tetrachloride	ND	0.0032	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Chlorobenzene	ND	0.0039	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-03-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:20:00 PM
Lab ID: 1606995-003
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Chloroethane	ND	0.0096	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Chloroform	ND	0.0036	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Chloromethane	0.070	0.0043	0.15	J	mg/Kg	1	6/20/2016 9:55:03 PM	25923
2-Chlorotoluene	ND	0.0036	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
4-Chlorotoluene	ND	0.0043	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
cis-1,2-DCE	ND	0.0028	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
cis-1,3-Dichloropropene	ND	0.0045	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2-Dibromo-3-chloropropane	ND	0.015	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Dibromochloromethane	ND	0.0044	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Dibromomethane	ND	0.0042	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2-Dichlorobenzene	ND	0.0042	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,3-Dichlorobenzene	ND	0.0040	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,4-Dichlorobenzene	ND	0.0060	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Dichlorodifluoromethane	ND	0.015	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,1-Dichloroethane	ND	0.0026	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,1-Dichloroethene	ND	0.016	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2-Dichloropropane	ND	0.0041	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,3-Dichloropropane	ND	0.0055	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
2,2-Dichloropropane	ND	0.0028	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,1-Dichloropropene	ND	0.0038	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Hexachlorobutadiene	ND	0.0059	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
2-Hexanone	ND	0.026	0.48		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Isopropylbenzene	ND	0.0042	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
4-Isopropyltoluene	ND	0.0043	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
4-Methyl-2-pentanone	ND	0.014	0.48		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Methylene chloride	ND	0.014	0.15		mg/Kg	1	6/20/2016 9:55:03 PM	25923
n-Butylbenzene	ND	0.0043	0.15		mg/Kg	1	6/20/2016 9:55:03 PM	25923
n-Propylbenzene	ND	0.0037	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
sec-Butylbenzene	ND	0.0067	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Styrene	ND	0.0043	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
tert-Butylbenzene	ND	0.0040	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,1,1,2-Tetrachloroethane	ND	0.0046	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,1,2,2-Tetrachloroethane	ND	0.0078	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Tetrachloroethene (PCE)	ND	0.0040	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
trans-1,2-DCE	ND	0.014	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
trans-1,3-Dichloropropene	ND	0.0071	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2,3-Trichlorobenzene	ND	0.0072	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2,4-Trichlorobenzene	ND	0.0052	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,1,1-Trichloroethane	ND	0.0030	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-03-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:20:00 PM
Lab ID: 1606995-003
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,2-Trichloroethane	ND	0.0057	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Trichloroethene (TCE)	ND	0.0052	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Trichlorofluoromethane	ND	0.0036	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
1,2,3-Trichloropropane	ND	0.0084	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Vinyl chloride	ND	0.0040	0.048		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Xylenes, Total	ND	0.0092	0.097		mg/Kg	1	6/20/2016 9:55:03 PM	25923
Surr: Dibromofluoromethane	105		70-130		%Rec	1	6/20/2016 9:55:03 PM	25923
Surr: 1,2-Dichloroethane-d4	99.5		70-130		%Rec	1	6/20/2016 9:55:03 PM	25923
Surr: Toluene-d8	97.5		70-130		%Rec	1	6/20/2016 9:55:03 PM	25923
Surr: 4-Bromofluorobenzene	103		70-130		%Rec	1	6/20/2016 9:55:03 PM	25923
EPA METHOD 418.1: TPH							Analyst: **TOM**	
Petroleum Hydrocarbons, TR	ND	8.6	20		mg/Kg	1	6/23/2016	25996

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-04-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 11:45:00 AM
Lab ID: 1606995-004
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Fluoride	2.9	0.042	0.30		mg/Kg	1	6/27/2016 11:40:14 PM	26092
Chloride	170	12	30		mg/Kg	20	6/27/2016 11:52:38 PM	26092
Nitrogen, Nitrate (As N)	7.1	0.016	0.30		mg/Kg	1	6/27/2016 11:40:14 PM	26092
Sulfate	630	5.4	30		mg/Kg	20	6/27/2016 11:52:38 PM	26092
EPA METHOD 7471: MERCURY							Analyst: **DBD**	
Mercury	0.0042	0.00054	0.031	J	mg/Kg	1	6/28/2016 9:36:06 AM	26093
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Arsenic	ND	1.4	4.8		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Barium	200	0.093	0.19		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Cadmium	ND	0.12	0.19		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Chromium	9.5	0.24	0.57		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Copper	3.0	0.30	0.57		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Iron	15000	93	240		mg/Kg	100	6/30/2016 10:36:09 AM	26123
Lead	5.2	0.33	0.48		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Manganese	310	0.085	0.19		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Selenium	ND	2.1	4.8		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Silver	ND	0.061	0.48		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Uranium	ND	1.9	9.6		mg/Kg	2	6/30/2016 11:42:53 AM	26123
Zinc	15	1.1	4.8		mg/Kg	2	6/30/2016 11:42:53 AM	26123
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Aniline	ND	0.094	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Anthracene	ND	0.066	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Azobenzene	ND	0.12	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benzoic acid	ND	0.083	0.50		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Bis(2-ethylhexyl)phthalate	0.099	0.081	0.50	J	mg/Kg	1	6/30/2016 4:31:23 PM	26116
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-04-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 11:45:00 AM
Lab ID: 1606995-004 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Carbazole	ND	0.067	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	6/30/2016 4:31:23 PM	26116
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Chrysene	ND	0.085	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Di-n-butyl phthalate	ND	0.074	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
3,3´-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Diethyl phthalate	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	6/30/2016 4:31:23 PM	26116
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Fluoranthene	ND	0.057	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Fluorene	ND	0.091	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Naphthalene	ND	0.096	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-04-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 11:45:00 AM
Lab ID: 1606995-004 **Matrix:** SOIL **Received Date:** 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Phenanthrene	ND	0.068	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Phenol	ND	0.075	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Pyrene	ND	0.075	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Pyridine	ND	0.079	0.40		mg/Kg	1	6/30/2016 4:31:23 PM	26116
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	6/30/2016 4:31:23 PM	26116
Surr: 2-Fluorophenol	69.7	0	28.3-102		%Rec	1	6/30/2016 4:31:23 PM	26116
Surr: Phenol-d5	76.7	0	35.7-103		%Rec	1	6/30/2016 4:31:23 PM	26116
Surr: 2,4,6-Tribromophenol	84.1	0	35.2-108		%Rec	1	6/30/2016 4:31:23 PM	26116
Surr: Nitrobenzene-d5	81.5		24-118		%Rec	1	6/30/2016 4:31:23 PM	26116
Surr: 2-Fluorobiphenyl	84.2		35.4-111		%Rec	1	6/30/2016 4:31:23 PM	26116
Surr: 4-Terphenyl-d14	71.3		15-91.7		%Rec	1	6/30/2016 4:31:23 PM	26116
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.020	0.025		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Toluene	ND	0.0029	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Ethylbenzene	ND	0.0041	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Methyl tert-butyl ether (MTBE)	ND	0.016	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2,4-Trimethylbenzene	ND	0.0037	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,3,5-Trimethylbenzene	ND	0.0036	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2-Dichloroethane (EDC)	ND	0.013	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2-Dibromoethane (EDB)	ND	0.0035	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Naphthalene	ND	0.0078	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	6/23/2016 12:50:04 PM	25923
2-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Acetone	ND	0.064	0.75		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Bromobenzene	ND	0.0040	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Bromodichloromethane	ND	0.0029	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Bromoform	ND	0.0061	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Bromomethane	0.023	0.018	0.15	J	mg/Kg	1	6/23/2016 12:50:04 PM	25923
2-Butanone	ND	0.028	0.50		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Carbon disulfide	ND	0.016	0.50		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Carbon tetrachloride	ND	0.0033	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Chlorobenzene	ND	0.0040	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-04-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 11:45:00 AM
Lab ID: 1606995-004 **Matrix:** SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Chloroethane	ND	0.0099	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Chloroform	ND	0.0038	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Chloromethane	0.065	0.0044	0.15	J	mg/Kg	1	6/23/2016 12:50:04 PM	25923
2-Chlorotoluene	ND	0.0037	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
4-Chlorotoluene	ND	0.0044	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
cis-1,2-DCE	ND	0.0029	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
cis-1,3-Dichloropropene	ND	0.0046	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2-Dibromo-3-chloropropane	ND	0.015	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Dibromochloromethane	ND	0.0045	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Dibromomethane	ND	0.0043	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2-Dichlorobenzene	ND	0.0043	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,3-Dichlorobenzene	ND	0.0041	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,4-Dichlorobenzene	ND	0.0062	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Dichlorodifluoromethane	ND	0.015	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,1-Dichloroethane	ND	0.0027	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,1-Dichloroethene	ND	0.016	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2-Dichloropropane	ND	0.0042	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,3-Dichloropropane	ND	0.0056	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
2,2-Dichloropropane	ND	0.0028	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,1-Dichloropropene	ND	0.0039	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Hexachlorobutadiene	ND	0.0061	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
2-Hexanone	ND	0.027	0.50		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Isopropylbenzene	ND	0.0043	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
4-Isopropyltoluene	ND	0.0045	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
4-Methyl-2-pentanone	ND	0.014	0.50		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Methylene chloride	ND	0.014	0.15		mg/Kg	1	6/23/2016 12:50:04 PM	25923
n-Butylbenzene	ND	0.0044	0.15		mg/Kg	1	6/23/2016 12:50:04 PM	25923
n-Propylbenzene	ND	0.0038	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
sec-Butylbenzene	ND	0.0069	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Styrene	ND	0.0044	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
tert-Butylbenzene	ND	0.0041	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,1,1,2-Tetrachloroethane	ND	0.0048	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,1,2,2-Tetrachloroethane	ND	0.0081	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Tetrachloroethene (PCE)	ND	0.0041	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
trans-1,2-DCE	ND	0.014	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
trans-1,3-Dichloropropene	ND	0.0073	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2,3-Trichlorobenzene	ND	0.0074	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2,4-Trichlorobenzene	ND	0.0053	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,1,1-Trichloroethane	ND	0.0030	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-04-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 11:45:00 AM
Lab ID: 1606995-004
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,2-Trichloroethane	ND	0.0059	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Trichloroethene (TCE)	ND	0.0053	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Trichlorofluoromethane	ND	0.0037	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
1,2,3-Trichloropropane	ND	0.0086	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Vinyl chloride	ND	0.0041	0.050		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Xylenes, Total	ND	0.0094	0.10		mg/Kg	1	6/23/2016 12:50:04 PM	25923
Surr: Dibromofluoromethane	99.8		70-130		%Rec	1	6/23/2016 12:50:04 PM	25923
Surr: 1,2-Dichloroethane-d4	102		70-130		%Rec	1	6/23/2016 12:50:04 PM	25923
Surr: Toluene-d8	92.8		70-130		%Rec	1	6/23/2016 12:50:04 PM	25923
Surr: 4-Bromofluorobenzene	103		70-130		%Rec	1	6/23/2016 12:50:04 PM	25923
EPA METHOD 418.1: TPH							Analyst: **TOM**	
Petroleum Hydrocarbons, TR	ND	8.0	19		mg/Kg	1	6/23/2016	25996

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BD-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016
Lab ID: 1606995-005
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Fluoride	2.7	0.042	0.30		mg/Kg	1	6/28/2016 12:05:03 AM	26092
Chloride	360	12	30		mg/Kg	20	6/28/2016 12:17:27 AM	26092
Nitrogen, Nitrate (As N)	3.0	0.016	0.30		mg/Kg	1	6/28/2016 12:05:03 AM	26092
Sulfate	770	5.4	30		mg/Kg	20	6/28/2016 12:17:27 AM	26092
EPA METHOD 7471: MERCURY							Analyst: **DBD**	
Mercury	0.0054	0.00053	0.031	J	mg/Kg	1	6/28/2016 9:37:56 AM	26093
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Arsenic	ND	1.4	4.8		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Barium	190	0.094	0.19		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Cadmium	ND	0.12	0.19		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Chromium	11	0.24	0.58		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Copper	3.8	0.30	0.58		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Iron	15000	94	240		mg/Kg	100	6/30/2016 10:45:16 AM	26123
Lead	3.6	0.34	0.48		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Manganese	240	0.086	0.19		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Selenium	ND	2.1	4.8		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Silver	ND	0.061	0.48		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Uranium	ND	1.9	9.7		mg/Kg	2	6/30/2016 11:45:00 AM	26123
Zinc	17	1.1	4.8		mg/Kg	2	6/30/2016 11:45:00 AM	26123
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Acenaphthylene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Aniline	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Anthracene	ND	0.13	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Azobenzene	ND	0.24	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benz(a)anthracene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benzo(a)pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benzo(b)fluoranthene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benzo(g,h,i)perylene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benzo(k)fluoranthene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benzoic acid	ND	0.17	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Benzyl alcohol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Bis(2-chloroethoxy)methane	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Bis(2-chloroethyl)ether	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Bis(2-chloroisopropyl)ether	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Bis(2-ethylhexyl)phthalate	ND	0.16	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
4-Bromophenyl phenyl ether	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Butyl benzyl phthalate	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BD-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016
Lab ID: 1606995-005
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Carbazole	ND	0.14	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
4-Chloro-3-methylphenol	ND	0.24	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
4-Chloroaniline	ND	0.22	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2-Chloronaphthalene	ND	0.16	0.50	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2-Chlorophenol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
4-Chlorophenyl phenyl ether	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Chrysene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Di-n-butyl phthalate	0.16	0.15	0.80	JD	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Di-n-octyl phthalate	ND	0.17	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Dibenz(a,h)anthracene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Dibenzofuran	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
1,2-Dichlorobenzene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
1,3-Dichlorobenzene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
1,4-Dichlorobenzene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
3,3´-Dichlorobenzidine	ND	0.15	0.50	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Diethyl phthalate	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Dimethyl phthalate	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,4-Dichlorophenol	ND	0.19	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,4-Dimethylphenol	ND	0.22	0.60	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
4,6-Dinitro-2-methylphenol	ND	0.12	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,4-Dinitrophenol	ND	0.13	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,4-Dinitrotoluene	ND	0.18	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,6-Dinitrotoluene	ND	0.21	1.0	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Fluoranthene	ND	0.12	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Fluorene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Hexachlorobenzene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Hexachlorobutadiene	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Hexachlorocyclopentadiene	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Hexachloroethane	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Indeno(1,2,3-cd)pyrene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
1-Methylnaphthalene	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2-Methylnaphthalene	ND	0.24	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2-Methylphenol	ND	0.17	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
3+4-Methylphenol	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
N-Nitrosodi-n-propylamine	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
N-Nitrosodiphenylamine	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Naphthalene	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2-Nitroaniline	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
3-Nitroaniline	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BD-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016
Lab ID: 1606995-005
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	0.14	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Nitrobenzene	ND	0.21	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2-Nitrophenol	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
4-Nitrophenol	ND	0.15	0.50	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Pentachlorophenol	ND	0.13	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Phenanthrene	ND	0.14	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Phenol	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Pyridine	ND	0.16	0.80	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
1,2,4-Trichlorobenzene	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,4,5-Trichlorophenol	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
2,4,6-Trichlorophenol	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 4:59:04 PM	26116
Surr: 2-Fluorophenol	63.7	0	28.3-102	D	%Rec	1	6/30/2016 4:59:04 PM	26116
Surr: Phenol-d5	66.9	0	35.7-103	D	%Rec	1	6/30/2016 4:59:04 PM	26116
Surr: 2,4,6-Tribromophenol	79.4	0	35.2-108	D	%Rec	1	6/30/2016 4:59:04 PM	26116
Surr: Nitrobenzene-d5	68.2		24-118	D	%Rec	1	6/30/2016 4:59:04 PM	26116
Surr: 2-Fluorobiphenyl	73.5		35.4-111	D	%Rec	1	6/30/2016 4:59:04 PM	26116
Surr: 4-Terphenyl-d14	102		15-91.7	SD	%Rec	1	6/30/2016 4:59:04 PM	26116
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.019	0.023		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Toluene	ND	0.0028	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Ethylbenzene	ND	0.0038	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Methyl tert-butyl ether (MTBE)	ND	0.015	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2,4-Trimethylbenzene	ND	0.0034	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,3,5-Trimethylbenzene	ND	0.0034	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2-Dichloroethane (EDC)	ND	0.012	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2-Dibromoethane (EDB)	ND	0.0033	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Naphthalene	ND	0.0073	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1-Methylnaphthalene	ND	0.010	0.19		mg/Kg	1	6/23/2016 1:18:39 PM	25923
2-Methylnaphthalene	ND	0.010	0.19		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Acetone	ND	0.060	0.70		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Bromobenzene	ND	0.0038	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Bromodichloromethane	ND	0.0027	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Bromoform	ND	0.0057	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Bromomethane	0.021	0.017	0.14	J	mg/Kg	1	6/23/2016 1:18:39 PM	25923
2-Butanone	ND	0.027	0.47		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Carbon disulfide	ND	0.015	0.47		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Carbon tetrachloride	ND	0.0031	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Chlorobenzene	ND	0.0038	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BD-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016
Lab ID: 1606995-005
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Chloroethane	ND	0.0093	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Chloroform	ND	0.0035	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Chloromethane	0.058	0.0041	0.14	J	mg/Kg	1	6/23/2016 1:18:39 PM	25923
2-Chlorotoluene	ND	0.0034	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
4-Chlorotoluene	ND	0.0041	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
cis-1,2-DCE	ND	0.0027	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
cis-1,3-Dichloropropene	ND	0.0043	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2-Dibromo-3-chloropropane	ND	0.014	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Dibromochloromethane	ND	0.0042	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Dibromomethane	ND	0.0040	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2-Dichlorobenzene	ND	0.0041	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,3-Dichlorobenzene	ND	0.0038	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,4-Dichlorobenzene	ND	0.0058	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Dichlorodifluoromethane	ND	0.014	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,1-Dichloroethane	ND	0.0025	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,1-Dichloroethene	ND	0.015	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2-Dichloropropane	ND	0.0039	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,3-Dichloropropane	ND	0.0053	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
2,2-Dichloropropane	ND	0.0027	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,1-Dichloropropene	ND	0.0037	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Hexachlorobutadiene	ND	0.0057	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
2-Hexanone	ND	0.025	0.47		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Isopropylbenzene	ND	0.0040	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
4-Isopropyltoluene	ND	0.0042	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
4-Methyl-2-pentanone	ND	0.014	0.47		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Methylene chloride	ND	0.013	0.14		mg/Kg	1	6/23/2016 1:18:39 PM	25923
n-Butylbenzene	ND	0.0041	0.14		mg/Kg	1	6/23/2016 1:18:39 PM	25923
n-Propylbenzene	ND	0.0036	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
sec-Butylbenzene	ND	0.0065	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Styrene	ND	0.0042	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
tert-Butylbenzene	ND	0.0039	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,1,1,2-Tetrachloroethane	ND	0.0045	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,1,2,2-Tetrachloroethane	ND	0.0076	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Tetrachloroethene (PCE)	ND	0.0039	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
trans-1,2-DCE	ND	0.013	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
trans-1,3-Dichloropropene	ND	0.0068	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2,3-Trichlorobenzene	ND	0.0070	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2,4-Trichlorobenzene	ND	0.0050	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,1,1-Trichloroethane	ND	0.0028	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BD-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016
Lab ID: 1606995-005
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,2-Trichloroethane	ND	0.0055	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Trichloroethene (TCE)	ND	0.0050	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Trichlorofluoromethane	ND	0.0035	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
1,2,3-Trichloropropane	ND	0.0081	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Vinyl chloride	ND	0.0038	0.047		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Xylenes, Total	ND	0.0088	0.093		mg/Kg	1	6/23/2016 1:18:39 PM	25923
Surr: Dibromofluoromethane	102		70-130		%Rec	1	6/23/2016 1:18:39 PM	25923
Surr: 1,2-Dichloroethane-d4	100		70-130		%Rec	1	6/23/2016 1:18:39 PM	25923
Surr: Toluene-d8	91.6		70-130		%Rec	1	6/23/2016 1:18:39 PM	25923
Surr: 4-Bromofluorobenzene	103		70-130		%Rec	1	6/23/2016 1:18:39 PM	25923
EPA METHOD 418.1: TPH							Analyst: **TOM**	
Petroleum Hydrocarbons, TR	ND	8.7	21		mg/Kg	1	6/23/2016	25996

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-TZ-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:40:00 PM
Lab ID: 1606995-006
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	180	1.8	9.6		mg/Kg	1	6/23/2016 6:14:17 PM	25944
Motor Oil Range Organics (MRO)	200	48	48		mg/Kg	1	6/23/2016 6:14:17 PM	25944
Surr: DNOP	115	0	70-130		%Rec	1	6/23/2016 6:14:17 PM	25944
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	0.96	4.6		mg/Kg	1	6/24/2016 7:46:24 PM	25923
Surr: BFB	86.5	0	80-120		%Rec	1	6/24/2016 7:46:24 PM	25923
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Fluoride	9.4	0.84	6.0		mg/Kg	20	6/28/2016 12:42:17 AM	26092
Chloride	290	12	30		mg/Kg	20	6/28/2016 12:42:17 AM	26092
Nitrogen, Nitrate (As N)	5.2	0.016	0.30		mg/Kg	1	6/28/2016 12:29:52 AM	26092
Sulfate	860	5.4	30		mg/Kg	20	6/28/2016 12:42:17 AM	26092
EPA METHOD 7471: MERCURY							Analyst: **DBD**	
Mercury	0.35	0.0011	0.064		mg/Kg	2	6/28/2016 9:45:27 AM	26093
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Arsenic	1.4	0.71	2.4	J	mg/Kg	1	6/30/2016 11:12:22 AM	26123
Barium	170	0.047	0.097		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Cadmium	ND	0.062	0.097		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Chromium	10	0.12	0.29		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Copper	8.9	0.15	0.29		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Iron	15000	95	240		mg/Kg	100	6/30/2016 10:46:51 AM	26123
Lead	9.0	0.17	0.24		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Manganese	280	0.086	0.19		mg/Kg	2	6/30/2016 11:46:55 AM	26123
Selenium	ND	1.1	2.4		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Silver	ND	0.031	0.24		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Uranium	ND	0.96	4.9		mg/Kg	1	6/30/2016 11:12:22 AM	26123
Zinc	38	0.55	2.4		mg/Kg	1	6/30/2016 11:12:22 AM	26123
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Acenaphthylene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Aniline	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Anthracene	ND	0.13	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Azobenzene	ND	0.24	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Benz(a)anthracene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Benzo(a)pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Benzo(b)fluoranthene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Benzo(g,h,i)perylene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Benzo(k)fluoranthene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-TZ-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:40:00 PM
Lab ID: 1606995-006
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Benzoic acid	ND	0.17	1.0	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Benzyl alcohol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Bis(2-chloroethoxy)methane	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Bis(2-chloroethyl)ether	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Bis(2-chloroisopropyl)ether	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Bis(2-ethylhexyl)phthalate	0.18	0.16	1.0	JD	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4-Bromophenyl phenyl ether	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Butyl benzyl phthalate	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Carbazole	ND	0.13	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4-Chloro-3-methylphenol	ND	0.24	1.0	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4-Chloroaniline	ND	0.22	1.0	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2-Chloronaphthalene	ND	0.16	0.50	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2-Chlorophenol	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4-Chlorophenyl phenyl ether	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Chrysene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Di-n-butyl phthalate	0.15	0.15	0.80	JD	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Di-n-octyl phthalate	ND	0.17	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Dibenz(a,h)anthracene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Dibenzofuran	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
1,2-Dichlorobenzene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
1,3-Dichlorobenzene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
1,4-Dichlorobenzene	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
3,3´-Dichlorobenzidine	ND	0.15	0.50	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Diethyl phthalate	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Dimethyl phthalate	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,4-Dichlorophenol	ND	0.19	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,4-Dimethylphenol	ND	0.22	0.60	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4,6-Dinitro-2-methylphenol	ND	0.12	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,4-Dinitrophenol	ND	0.13	1.0	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,4-Dinitrotoluene	ND	0.18	1.0	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,6-Dinitrotoluene	ND	0.21	1.0	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Fluoranthene	ND	0.11	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Fluorene	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Hexachlorobenzene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Hexachlorobutadiene	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Hexachlorocyclopentadiene	ND	0.23	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Hexachloroethane	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Indeno(1,2,3-cd)pyrene	ND	0.16	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
1-Methylnaphthalene	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-TZ-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:40:00 PM
Lab ID: 1606995-006
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
2-Methylnaphthalene	ND	0.24	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2-Methylphenol	ND	0.17	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
3+4-Methylphenol	ND	0.14	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
N-Nitrosodi-n-propylamine	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
N-Nitrosodiphenylamine	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Naphthalene	ND	0.19	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2-Nitroaniline	ND	0.21	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
3-Nitroaniline	ND	0.18	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4-Nitroaniline	ND	0.14	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Nitrobenzene	ND	0.21	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2-Nitrophenol	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
4-Nitrophenol	ND	0.15	0.50	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Pentachlorophenol	ND	0.13	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Phenanthrene	ND	0.14	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Phenol	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Pyrene	ND	0.15	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Pyridine	ND	0.16	0.80	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
1,2,4-Trichlorobenzene	ND	0.22	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,4,5-Trichlorophenol	ND	0.20	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
2,4,6-Trichlorophenol	ND	0.17	0.40	D	mg/Kg	1	6/30/2016 5:26:58 PM	26116
Surr: 2-Fluorophenol	67.1	0	28.3-102	D	%Rec	1	6/30/2016 5:26:58 PM	26116
Surr: Phenol-d5	71.9	0	35.7-103	D	%Rec	1	6/30/2016 5:26:58 PM	26116
Surr: 2,4,6-Tribromophenol	80.0	0	35.2-108	D	%Rec	1	6/30/2016 5:26:58 PM	26116
Surr: Nitrobenzene-d5	75.6		24-118	D	%Rec	1	6/30/2016 5:26:58 PM	26116
Surr: 2-Fluorobiphenyl	86.3		35.4-111	D	%Rec	1	6/30/2016 5:26:58 PM	26116
Surr: 4-Terphenyl-d14	73.4		15-91.7	D	%Rec	1	6/30/2016 5:26:58 PM	26116
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.019	0.023		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Toluene	0.0090	0.0027	0.046	J	mg/Kg	1	6/23/2016 1:47:16 PM	25923
Ethylbenzene	ND	0.0038	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Methyl tert-butyl ether (MTBE)	ND	0.015	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2,4-Trimethylbenzene	ND	0.0034	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,3,5-Trimethylbenzene	ND	0.0034	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2-Dichloroethane (EDC)	ND	0.012	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2-Dibromoethane (EDB)	ND	0.0033	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Naphthalene	ND	0.0073	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1-Methylnaphthalene	ND	0.010	0.19		mg/Kg	1	6/23/2016 1:47:16 PM	25923
2-Methylnaphthalene	ND	0.0099	0.19		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Acetone	ND	0.060	0.70		mg/Kg	1	6/23/2016 1:47:16 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-TZ-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:40:00 PM
Lab ID: 1606995-006
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromobenzene	ND	0.0037	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Bromodichloromethane	ND	0.0027	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Bromoform	ND	0.0057	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Bromomethane	0.024	0.017	0.14	J	mg/Kg	1	6/23/2016 1:47:16 PM	25923
2-Butanone	0.070	0.027	0.46	J	mg/Kg	1	6/23/2016 1:47:16 PM	25923
Carbon disulfide	ND	0.015	0.46		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Carbon tetrachloride	ND	0.0030	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Chlorobenzene	ND	0.0038	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Chloroethane	ND	0.0093	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Chloroform	ND	0.0035	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Chloromethane	0.056	0.0041	0.14	J	mg/Kg	1	6/23/2016 1:47:16 PM	25923
2-Chlorotoluene	ND	0.0034	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
4-Chlorotoluene	ND	0.0041	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
cis-1,2-DCE	ND	0.0027	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
cis-1,3-Dichloropropene	ND	0.0043	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2-Dibromo-3-chloropropane	ND	0.014	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Dibromochloromethane	ND	0.0042	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Dibromomethane	ND	0.0040	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2-Dichlorobenzene	ND	0.0041	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,3-Dichlorobenzene	ND	0.0038	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,4-Dichlorobenzene	ND	0.0058	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Dichlorodifluoromethane	ND	0.014	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,1-Dichloroethane	ND	0.0025	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,1-Dichloroethene	ND	0.015	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2-Dichloropropane	ND	0.0039	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,3-Dichloropropane	ND	0.0053	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
2,2-Dichloropropane	ND	0.0027	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,1-Dichloropropene	ND	0.0037	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Hexachlorobutadiene	ND	0.0057	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
2-Hexanone	ND	0.025	0.46		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Isopropylbenzene	ND	0.0040	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
4-Isopropyltoluene	ND	0.0042	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
4-Methyl-2-pentanone	ND	0.014	0.46		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Methylene chloride	ND	0.013	0.14		mg/Kg	1	6/23/2016 1:47:16 PM	25923
n-Butylbenzene	ND	0.0041	0.14		mg/Kg	1	6/23/2016 1:47:16 PM	25923
n-Propylbenzene	ND	0.0036	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
sec-Butylbenzene	ND	0.0064	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Styrene	ND	0.0041	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
tert-Butylbenzene	ND	0.0038	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: CentralOCD-TZ-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 1:40:00 PM
Lab ID: 1606995-006
Matrix: SOIL
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,1,2-Tetrachloroethane	ND	0.0044	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,1,2,2-Tetrachloroethane	ND	0.0075	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Tetrachloroethene (PCE)	ND	0.0038	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
trans-1,2-DCE	ND	0.013	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
trans-1,3-Dichloropropene	ND	0.0068	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2,3-Trichlorobenzene	ND	0.0069	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2,4-Trichlorobenzene	ND	0.0050	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,1,1-Trichloroethane	ND	0.0028	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,1,2-Trichloroethane	ND	0.0055	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Trichloroethene (TCE)	ND	0.0050	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Trichlorofluoromethane	ND	0.0035	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
1,2,3-Trichloropropane	ND	0.0080	0.093		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Vinyl chloride	ND	0.0038	0.046		mg/Kg	1	6/23/2016 1:47:16 PM	25923
Xylenes, Total	0.010	0.0088	0.093	J	mg/Kg	1	6/23/2016 1:47:16 PM	25923
Surr: Dibromofluoromethane	103		70-130		%Rec	1	6/23/2016 1:47:16 PM	25923
Surr: 1,2-Dichloroethane-d4	105		70-130		%Rec	1	6/23/2016 1:47:16 PM	25923
Surr: Toluene-d8	93.7		70-130		%Rec	1	6/23/2016 1:47:16 PM	25923
Surr: 4-Bromofluorobenzene	100		70-130		%Rec	1	6/23/2016 1:47:16 PM	25923
EPA METHOD 418.1: TPH							Analyst: **TOM**	
Petroleum Hydrocarbons, TR	610	83	200		mg/Kg	10	6/23/2016	25996

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: EB-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 2:00:00 PM
Lab ID: 1606995-007
Matrix: AQUEOUS
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: **BCN**	
Benzene	ND	0.096	1.0		µg/L	1	6/28/2016 2:06:00 AM	A35246
Toluene	ND	0.12	1.0		µg/L	1	6/28/2016 2:06:00 AM	A35246
Ethylbenzene	ND	0.11	1.0		µg/L	1	6/28/2016 2:06:00 AM	A35246
Xylenes, Total	ND	0.37	1.5		µg/L	1	6/28/2016 2:06:00 AM	A35246
Surr: 1,2-Dichloroethane-d4	86.2	0	70-130		%Rec	1	6/28/2016 2:06:00 AM	A35246
Surr: 4-Bromofluorobenzene	101	0	70-130		%Rec	1	6/28/2016 2:06:00 AM	A35246
Surr: Dibromofluoromethane	95.3	0	70-130		%Rec	1	6/28/2016 2:06:00 AM	A35246
Surr: Toluene-d8	101	0	70-130		%Rec	1	6/28/2016 2:06:00 AM	A35246

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: FB-6/16/2016
Project: OCD Central Landfarm Semiannual Sam
Collection Date: 6/16/2016 2:15:00 PM
Lab ID: 1606995-008
Matrix: AQUEOUS
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: **BCN**	
Benzene	ND	0.096	1.0		µg/L	1	6/28/2016 2:29:00 AM	A35246
Toluene	ND	0.12	1.0		µg/L	1	6/28/2016 2:29:00 AM	A35246
Ethylbenzene	ND	0.11	1.0		µg/L	1	6/28/2016 2:29:00 AM	A35246
Xylenes, Total	ND	0.37	1.5		µg/L	1	6/28/2016 2:29:00 AM	A35246
Surr: 1,2-Dichloroethane-d4	88.0	0	70-130		%Rec	1	6/28/2016 2:29:00 AM	A35246
Surr: 4-Bromofluorobenzene	103	0	70-130		%Rec	1	6/28/2016 2:29:00 AM	A35246
Surr: Dibromofluoromethane	92.7	0	70-130		%Rec	1	6/28/2016 2:29:00 AM	A35246
Surr: Toluene-d8	98.7	0	70-130		%Rec	1	6/28/2016 2:29:00 AM	A35246

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: Trip Blank
Project: OCD Central Landfarm Semiannual Sam
Collection Date:
Lab ID: 1606995-009
Matrix: AQUEOUS
Received Date: 6/17/2016 10:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: **BCN**	
Benzene	ND	0.096	1.0		µg/L	1	6/28/2016 3:40:00 AM	A35246
Toluene	ND	0.12	1.0		µg/L	1	6/28/2016 3:40:00 AM	A35246
Ethylbenzene	ND	0.11	1.0		µg/L	1	6/28/2016 3:40:00 AM	A35246
Xylenes, Total	ND	0.37	1.5		µg/L	1	6/28/2016 3:40:00 AM	A35246
Surr: 1,2-Dichloroethane-d4	86.1	0	70-130		%Rec	1	6/28/2016 3:40:00 AM	A35246
Surr: 4-Bromofluorobenzene	99.5	0	70-130		%Rec	1	6/28/2016 3:40:00 AM	A35246
Surr: Dibromofluoromethane	91.7	0	70-130		%Rec	1	6/28/2016 3:40:00 AM	A35246
Surr: Toluene-d8	99.0	0	70-130		%Rec	1	6/28/2016 3:40:00 AM	A35246

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 160622057
Project Name: 1606995

Analytical Results Report

Sample Number 160622057-001 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-001B / CENTRALOCD-01-6/16/2016 **Sampling Time** 12:20 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.283	6/30/2016 5:55:00 PM	MER	EPA 335.4	
%moisture	15.5	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-002 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-002B / CENTRALOCD-02-6/16/2016 **Sampling Time** 12:50 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.297	6/30/2016 5:51:00 PM	MER	EPA 335.4	
%moisture	17.2	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-003 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-003B / CENTRALOCD-03-6/16/2016 **Sampling Time** 1:20 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.3	6/30/2016 5:57:00 PM	MER	EPA 335.4	
%moisture	16.8	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-004 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-004B / CENTRALOCD-04-6/16/2016 **Sampling Time** 11:45 AM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.295	6/30/2016 6:05:00 PM	MER	EPA 335.4	
%moisture	17.4	Percent		6/29/2016	ETL	%moisture	

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 160622057
Project Name: 1606995

Analytical Results Report

Sample Number 160622057-005 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-005B / BD-6/16/2016 **Sampling Time**
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.29	6/30/2016 6:06:00 PM	MER	EPA 335.4	
%moisture	17.6	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-006 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-006B / CENTRALOCD-TZ-6/16/2016 **Sampling Time** 1:40 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	0.487	mg/Kg	0.25	6/30/2016 6:08:00 PM	MER	EPA 335.4	
%moisture	8.6	Percent		6/29/2016	ETL	%moisture	

Authorized Signature

John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 160622057
Project Name: 1606995

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Cyanide	0.501	mg/kg	0.5	100.2	90-110	6/30/2016	6/30/2016

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
160622057-002	Cyanide	ND	14.6	mg/kg	15.1	96.7	70-130	6/30/2016	6/30/2016

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	14.7	mg/kg	14.9	98.7	0.7	0-25	6/30/2016	6/30/2016

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/Kg	5	6/30/2016	6/30/2016

AR Acceptable Range
ND Not Detected
PQL Practical Quantitation Limit
RPD Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Pace Analytical®
www.pacelabs.com

1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1606995
Pace Project No.: 30187563

Sample: 1606995-001C CentralOCD-01-6/1 **Lab ID: 30187563001** Collected: 06/16/16 12:20 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis
Comments: • Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.255 ± 2.582 (3.112) C:NA T:NA**	pCi/g	07/14/16 12:06	13982-63-3	
Radium-228	EPA 901.1	**2.152 ± 0.446 (0.252) C:NA T:NA**	pCi/g	07/14/16 12:06	15262-20-1	

Sample: 1606995-002C CentralOCD-02-6/1 **Lab ID: 30187563002** Collected: 06/16/16 12:50 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**4.070 ± 2.123 (2.252) C:NA T:NA**	pCi/g	07/14/16 12:22	13982-63-3	
Radium-228	EPA 901.1	**1.806 ± 0.441 (0.138) C:NA T:NA**	pCi/g	07/14/16 12:22	15262-20-1	

Sample: 1606995-003C CentralOCD-03-6/1 **Lab ID: 30187563003** Collected: 06/16/16 13:20 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**2.237 ± 2.544 (3.016) C:NA T:NA**	pCi/g	07/14/16 12:39	13982-63-3	
Radium-228	EPA 901.1	**2.290 ± 0.514 (0.145) C:NA T:NA**	pCi/g	07/14/16 12:39	15262-20-1	

Sample: 1606995-004C CentralOCD-06-6/1 **Lab ID: 30187563004** Collected: 06/16/16 11:45 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.888 ± 2.288 (2.754) C:NA T:NA**	pCi/g	07/14/16 12:40	13982-63-3	
Radium-228	EPA 901.1	**1.553 ± 0.446 (0.391) C:NA T:NA**	pCi/g	07/14/16 12:40	15262-20-1	

Sample: 1606995-005C BD-6/16/2016 **Lab ID: 30187563005** Collected: 06/16/16 00:01 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**0.721 ± 2.612 (3.200) C:NA T:NA**	pCi/g	07/14/16 12:56	13982-63-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1606995
Pace Project No.: 30187563

Sample: 1606995-005C BD-6/16/2016 **Lab ID: 30187563005** Collected: 06/16/16 00:01 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-228	EPA 901.1	**2.102 ± 0.475 (0.295) C:NA T:NA**	pCi/g	07/14/16 12:56	15262-20-1	

Sample: 1606995-006C CentralOCD-TZ-6/1 **Lab ID: 30187563006** Collected: 06/16/16 13:40 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.237 ± 1.946 (2.382) C:NA T:NA**	pCi/g	07/14/16 12:57	13982-63-3	
Radium-228	EPA 901.1	**1.210 ± 0.397 (0.240) C:NA T:NA**	pCi/g	07/14/16 12:57	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1606995
Pace Project No.: 30187563

QC Batch: 225883 Analysis Method: EPA 901.1
QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec
Associated Lab Samples: 30187563001, 30187563002, 30187563003, 30187563004, 30187563005, 30187563006

METHOD BLANK: 1106602 Matrix: Solid
Associated Lab Samples: 30187563001, 30187563002, 30187563003, 30187563004, 30187563005, 30187563006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.249 ± 1.401 (1.846) C:NA T:NA	pCi/g	07/11/16 20:46	
Radium-228	0.000 ± 0.066 (0.290) C:NA T:NA	pCi/g	07/11/16 20:46	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1606995
Pace Project No.: 30187563

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **MB-26092**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **26092**	RunNo: **35241**
Prep Date: **6/27/2016**	Analysis Date: **6/27/2016**	SeqNo: **1089804** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.30								
Chloride	ND	1.5								
Nitrogen, Nitrate (As N)	ND	0.30								
Sulfate	0.48	1.5								J

Sample ID **LCS-26092**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **26092**	RunNo: **35241**
Prep Date: **6/27/2016**	Analysis Date: **6/27/2016**	SeqNo: **1089805** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.5	0.30	1.500	0	102	90	110			
Chloride	14	1.5	15.00	0	94.7	90	110			
Nitrogen, Nitrate (As N)	7.4	0.30	7.500	0	98.3	90	110			
Sulfate	29	1.5	30.00	0	97.5	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **MB-25996**	SampType: **MBLK**	TestCode: **EPA Method 418.1: TPH**							
Client ID: **PBS**	Batch ID: **25996**	RunNo: **35151**							
Prep Date: **6/22/2016**	Analysis Date: **6/23/2016**	SeqNo: **1087694**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	ND	20								

Sample ID **LCS-25996**	SampType: **LCS**	TestCode: **EPA Method 418.1: TPH**							
Client ID: **LCSS**	Batch ID: **25996**	RunNo: **35151**							
Prep Date: **6/22/2016**	Analysis Date: **6/23/2016**	SeqNo: **1087695**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	96	20	100.0	0	95.7	83.4	127			

Sample ID **1606995-002AMS**	SampType: **MS**	TestCode: **EPA Method 418.1: TPH**							
Client ID: **CentralOCD-02-6/16/**	Batch ID: **25996**	RunNo: **35151**							
Prep Date: **6/22/2016**	Analysis Date: **6/23/2016**	SeqNo: **1087698**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	89	19	96.99	0	91.7	80	120			

Sample ID **1606995-002AMSD**	SampType: **MSD**	TestCode: **EPA Method 418.1: TPH**							
Client ID: **CentralOCD-02-6/16/**	Batch ID: **25996**	RunNo: **35151**							
Prep Date: **6/22/2016**	Analysis Date: **6/23/2016**	SeqNo: **1087699**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	93	20	100.3	0	93.0	80	120	4.79	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **MB-25944**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **25944**	RunNo: **35116**
Prep Date: **6/20/2016**	Analysis Date: **6/23/2016**	SeqNo: **1086562** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.8		10.00		88.1	70	130			

Sample ID **LCS-25944**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **25944**	RunNo: **35116**
Prep Date: **6/20/2016**	Analysis Date: **6/23/2016**	SeqNo: **1086657** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	38	10	50.00	0	75.2	62.6	124			
Surr: DNOP	4.4		5.000		87.1	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **1606995-006AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **CentralOCD-TZ-6/16**	Batch ID: **25923**	RunNo: **35159**
Prep Date: **6/17/2016**	Analysis Date: **6/24/2016**	SeqNo: **1088051** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.6	23.02	0	93.3	59.3	143			
Surr: BFB	840		920.8		90.9	80	120			

Sample ID **1606995-006AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **CentralOCD-TZ-6/16**	Batch ID: **25923**	RunNo: **35159**
Prep Date: **6/17/2016**	Analysis Date: **6/24/2016**	SeqNo: **1088052** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	24.90	0	107	59.3	143	21.1	20	R
Surr: BFB	950		996.0		95.2	80	120	0	0	

Sample ID **LCS-25923**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **25923**	RunNo: **35159**
Prep Date: **6/17/2016**	Analysis Date: **6/24/2016**	SeqNo: **1088059** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	108	80	120			
Surr: BFB	910		1000		90.9	80	120			

Sample ID **MB-25923**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **25923**	RunNo: **35159**
Prep Date: **6/17/2016**	Analysis Date: **6/24/2016**	SeqNo: **1088060** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	930		1000		93.3	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **mb-25923**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **25923**	RunNo: **35020**
Prep Date: **6/17/2016**	Analysis Date: **6/20/2016**	SeqNo: **1083254** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Methyl tert-butyl ether (MTBE)	ND	0.050								
1,2,4-Trimethylbenzene	ND	0.050								
1,3,5-Trimethylbenzene	ND	0.050								
1,2-Dichloroethane (EDC)	0.020	0.050								J
1,2-Dibromoethane (EDB)	ND	0.050								
Naphthalene	ND	0.10								
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
Acetone	ND	0.75								
Bromobenzene	ND	0.050								
Bromodichloromethane	ND	0.050								
Bromoform	ND	0.050								
Bromomethane	0.028	0.15								J
2-Butanone	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.050								
Chlorobenzene	ND	0.050								
Chloroethane	ND	0.10								
Chloroform	ND	0.050								
Chloromethane	0.10	0.15								J
2-Chlorotoluene	ND	0.050								
4-Chlorotoluene	ND	0.050								
cis-1,2-DCE	ND	0.050								
cis-1,3-Dichloropropene	ND	0.050								
1,2-Dibromo-3-chloropropane	ND	0.10								
Dibromochloromethane	ND	0.050								
Dibromomethane	ND	0.050								
1,2-Dichlorobenzene	ND	0.050								
1,3-Dichlorobenzene	ND	0.050								
1,4-Dichlorobenzene	ND	0.050								
Dichlorodifluoromethane	ND	0.050								
1,1-Dichloroethane	ND	0.050								
1,1-Dichloroethene	ND	0.050								
1,2-Dichloropropane	ND	0.050								
1,3-Dichloropropane	ND	0.050								
2,2-Dichloropropane	ND	0.10								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **mb-25923**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **25923**	RunNo: **35020**
Prep Date: **6/17/2016**	Analysis Date: **6/20/2016**	SeqNo: **1083254** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.49		0.5000		97.7	70	130			
Surr: 1,2-Dichloroethane-d4	0.48		0.5000		95.9	70	130			
Surr: Toluene-d8	0.47		0.5000		94.5	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		101	70	130			

Sample ID **lcs-25923**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS**	Batch ID: **25923**	RunNo: **35020**
Prep Date: **6/17/2016**	Analysis Date: **6/20/2016**	SeqNo: **1083256** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	108	70	130			
Toluene	1.0	0.050	1.000	0	101	70	130			
Chlorobenzene	0.96	0.050	1.000	0	96.4	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **lcs-25923**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS**	Batch ID: **25923**	RunNo: **35020**
Prep Date: **6/17/2016**	Analysis Date: **6/20/2016**	SeqNo: **1083256** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	1.1	0.050	1.000	0	109	70	130			
Trichloroethene (TCE)	1.1	0.050	1.000	0	110	70	130			
Surr: Dibromofluoromethane	0.50		0.5000		101	70	130			
Surr: 1,2-Dichloroethane-d4	0.48		0.5000		96.4	70	130			
Surr: Toluene-d8	0.49		0.5000		97.5	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		101	70	130			

Sample ID **1606995-002ams**	SampType: **MS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **CentralOCD-02-6/16/**	Batch ID: **25923**	RunNo: **35020**
Prep Date: **6/17/2016**	Analysis Date: **6/20/2016**	SeqNo: **1083261** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.84	0.023	0.9302	0	90.1	49.2	155			
Toluene	0.75	0.047	0.9302	0	80.3	52	154			
Chlorobenzene	0.78	0.047	0.9302	0	84.0	53.2	150			
1,1-Dichloroethene	0.72	0.047	0.9302	0	77.5	34.2	163			
Trichloroethene (TCE)	0.84	0.047	0.9302	0	90.6	48.2	151			
Surr: Dibromofluoromethane	0.48		0.4651		103	70	130			
Surr: 1,2-Dichloroethane-d4	0.46		0.4651		97.9	70	130			
Surr: Toluene-d8	0.44		0.4651		95.7	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.4651		99.8	70	130			

Sample ID **1606995-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **CentralOCD-02-6/16/**	Batch ID: **25923**	RunNo: **35020**
Prep Date: **6/17/2016**	Analysis Date: **6/20/2016**	SeqNo: **1083262** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.024	0.9506	0	101	49.2	155	13.6	20	
Toluene	0.86	0.048	0.9506	0	90.3	52	154	13.9	20	
Chlorobenzene	0.82	0.048	0.9506	0	86.2	53.2	150	4.81	20	
1,1-Dichloroethene	0.94	0.048	0.9506	0	98.7	34.2	163	26.2	20	R
Trichloroethene (TCE)	0.98	0.048	0.9506	0	103	48.2	151	15.1	20	
Surr: Dibromofluoromethane	0.50		0.4753		104	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	0.46		0.4753		97.1	70	130	0	0	
Surr: Toluene-d8	0.44		0.4753		93.5	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.48		0.4753		100	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A35246**	RunNo: **35246**
Prep Date:	Analysis Date: **6/27/2016**	SeqNo: **1090124** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	8.9		10.00		88.6	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		105	70	130			
Surr: Dibromofluoromethane	9.6		10.00		95.6	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **A35246**	RunNo: **35246**
Prep Date:	Analysis Date: **6/27/2016**	SeqNo: **1090133** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	17	1.0	20.00	0	83.2	70	130			
Toluene	19	1.0	20.00	0	95.3	70	130			
Surr: 1,2-Dichloroethane-d4	8.1		10.00		80.9	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	9.3		10.00		92.8	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID **1606995-008ams**	SampType: **MS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **FB-6/16/2016**	Batch ID: **A35246**	RunNo: **35246**
Prep Date:	Analysis Date: **6/28/2016**	SeqNo: **1090146** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	89.9	70	130			
Toluene	19	1.0	20.00	0	94.1	70	130			
Surr: 1,2-Dichloroethane-d4	8.4		10.00		84.5	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	9.4		10.00		93.9	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID **1606995-008amsd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **FB-6/16/2016**	Batch ID: **A35246**	RunNo: **35246**
Prep Date:	Analysis Date: **6/28/2016**	SeqNo: **1090147** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	17	1.0	20.00	0	83.9	70	130	6.95	20	
Toluene	19	1.0	20.00	0	94.1	70	130	0.0106	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID	**1606995-008amsd**	SampType:	**MSD**	TestCode:	**EPA Method 8260: Volatiles Short List**
Client ID:	**FB-6/16/2016**	Batch ID:	**A35246**	RunNo:	**35246**
Prep Date:		Analysis Date:	**6/28/2016**	SeqNo:	**1090147** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	8.3		10.00		83.3	70	130	0	0	
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130	0	0	
Surr: Dibromofluoromethane	8.9		10.00		88.7	70	130	0	0	
Surr: Toluene-d8	10		10.00		104	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **mb-26116**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBS**	Batch ID: **26116**	RunNo: **35339**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1093291** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	0.20								
Acenaphthylene	ND	0.20								
Aniline	ND	0.20								
Anthracene	ND	0.20								
Azobenzene	ND	0.20								
Benz(a)anthracene	ND	0.20								
Benzo(a)pyrene	ND	0.20								
Benzo(b)fluoranthene	ND	0.20								
Benzo(g,h,i)perylene	ND	0.20								
Benzo(k)fluoranthene	ND	0.20								
Benzoic acid	0.088	0.50								J
Benzyl alcohol	ND	0.20								
Bis(2-chloroethoxy)methane	ND	0.20								
Bis(2-chloroethyl)ether	ND	0.20								
Bis(2-chloroisopropyl)ether	ND	0.20								
Bis(2-ethylhexyl)phthalate	0.11	0.50								J
4-Bromophenyl phenyl ether	ND	0.20								
Butyl benzyl phthalate	ND	0.20								
Carbazole	ND	0.20								
4-Chloro-3-methylphenol	ND	0.50								
4-Chloroaniline	ND	0.50								
2-Chloronaphthalene	ND	0.25								
2-Chlorophenol	ND	0.20								
4-Chlorophenyl phenyl ether	ND	0.20								
Chrysene	ND	0.20								
Di-n-butyl phthalate	0.11	0.40								J
Di-n-octyl phthalate	ND	0.40								
Dibenz(a,h)anthracene	ND	0.20								
Dibenzofuran	ND	0.20								
1,2-Dichlorobenzene	ND	0.20								
1,3-Dichlorobenzene	ND	0.20								
1,4-Dichlorobenzene	ND	0.20								
3,3´-Dichlorobenzidine	ND	0.25								
Diethyl phthalate	ND	0.20								
Dimethyl phthalate	ND	0.20								
2,4-Dichlorophenol	ND	0.40								
2,4-Dimethylphenol	ND	0.30								
4,6-Dinitro-2-methylphenol	0.086	0.40								J
2,4-Dinitrophenol	ND	0.50								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **mb-26116**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBS**	Batch ID: **26116**	RunNo: **35339**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1093291** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	0.50								
2,6-Dinitrotoluene	ND	0.50								
Fluoranthene	ND	0.20								
Fluorene	ND	0.20								
Hexachlorobenzene	ND	0.20								
Hexachlorobutadiene	ND	0.20								
Hexachlorocyclopentadiene	ND	0.20								
Hexachloroethane	ND	0.20								
Indeno(1,2,3-cd)pyrene	ND	0.20								
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
2-Methylphenol	ND	0.40								
3+4-Methylphenol	ND	0.20								
N-Nitrosodi-n-propylamine	ND	0.20								
N-Nitrosodiphenylamine	ND	0.20								
Naphthalene	ND	0.20								
2-Nitroaniline	ND	0.20								
3-Nitroaniline	ND	0.20								
4-Nitroaniline	ND	0.40								
Nitrobenzene	ND	0.40								
2-Nitrophenol	ND	0.20								
4-Nitrophenol	ND	0.25								
Pentachlorophenol	ND	0.40								
Phenanthrene	ND	0.20								
Phenol	ND	0.20								
Pyrene	ND	0.20								
Pyridine	ND	0.40								
1,2,4-Trichlorobenzene	ND	0.20								
2,4,5-Trichlorophenol	ND	0.20								
2,4,6-Trichlorophenol	ND	0.20								
Surr: 2-Fluorophenol	2.8		3.330		83.4	28.3	102			
Surr: Phenol-d5	3.0		3.330		89.4	35.7	103			
Surr: 2,4,6-Tribromophenol	3.0		3.330		89.0	35.2	108			
Surr: Nitrobenzene-d5	1.4		1.670		83.8	24	118			
Surr: 2-Fluorobiphenyl	1.6		1.670		95.1	35.4	111			
Surr: 4-Terphenyl-d14	1.1		1.670		65.6	15	91.7			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **lcs-26116**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS**	Batch ID: **26116**	RunNo: **35339**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1093292** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.5	0.20	1.670	0	87.1	45.8	99.8			
4-Chloro-3-methylphenol	2.9	0.50	3.330	0	88.2	51.5	103			
2-Chlorophenol	2.8	0.20	3.330	0	82.6	46.5	105			
1,4-Dichlorobenzene	1.3	0.20	1.670	0	79.5	45.5	103			
2,4-Dinitrotoluene	1.3	0.50	1.670	0	80.3	36	87.2			
N-Nitrosodi-n-propylamine	1.1	0.20	1.670	0	63.4	47.3	104			
4-Nitrophenol	2.8	0.25	3.330	0	84.6	47.3	95.3			
Pentachlorophenol	2.6	0.40	3.330	0	79.1	38.7	89.3			
Phenol	2.7	0.20	3.330	0	82.2	47.8	106			
Pyrene	1.4	0.20	1.670	0	83.1	33.4	105			
1,2,4-Trichlorobenzene	1.5	0.20	1.670	0	90.9	50.4	115			
Surr: 2-Fluorophenol	2.5		3.330		75.9	28.3	102			
Surr: Phenol-d5	2.7		3.330		79.7	35.7	103			
Surr: 2,4,6-Tribromophenol	3.0		3.330		89.0	35.2	108			
Surr: Nitrobenzene-d5	1.5		1.670		88.9	24	118			
Surr: 2-Fluorobiphenyl	1.5		1.670		87.5	35.4	111			
Surr: 4-Terphenyl-d14	1.3		1.670		75.7	15	91.7			

Sample ID **1606995-002ams**	SampType: **MS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **CentralOCD-02-6/16/**	Batch ID: **26116**	RunNo: **35369**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1094093** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.2	0.20	1.651	0	70.1	39.3	86.4			
4-Chloro-3-methylphenol	2.4	0.49	3.292	0	71.8	37.5	96.4			
2-Chlorophenol	2.4	0.20	3.292	0	71.6	37.4	90.6			
1,4-Dichlorobenzene	0.91	0.20	1.651	0	55.4	31.7	85			
2,4-Dinitrotoluene	0.98	0.49	1.651	0	59.3	26.4	86			
N-Nitrosodi-n-propylamine	1.0	0.20	1.651	0	61.2	43.5	83			
4-Nitrophenol	2.1	0.25	3.292	0	65.2	32.7	98			
Pentachlorophenol	1.9	0.40	3.292	0	57.5	26.6	87.4			
Phenol	2.3	0.20	3.292	0	69.9	40.5	85.3			
Pyrene	1.0	0.20	1.651	0	61.9	23.2	93.9			
1,2,4-Trichlorobenzene	1.2	0.20	1.651	0	70.6	38.7	99			
Surr: 2-Fluorophenol	2.1		3.292		63.6	28.3	102			
Surr: Phenol-d5	2.3		3.292		69.3	35.7	103			
Surr: 2,4,6-Tribromophenol	2.1		3.292		63.6	35.2	108			
Surr: Nitrobenzene-d5	1.2		1.651		71.4	24	118			
Surr: 2-Fluorobiphenyl	1.2		1.651		69.9	35.4	111			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **1606995-002ams**	SampType: **MS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **CentralOCD-02-6/16/**	Batch ID: **26116**	RunNo: **35369**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1094093** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	0.91		1.651		55.1	15	91.7			

Sample ID **1606995-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **CentralOCD-02-6/16/**	Batch ID: **26116**	RunNo: **35369**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1094094** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.1	0.20	1.653	0	64.2	39.3	86.4	8.70	30.2	
4-Chloro-3-methylphenol	2.2	0.49	3.296	0	65.3	37.5	96.4	9.36	37.2	
2-Chlorophenol	2.1	0.20	3.296	0	62.3	37.4	90.6	13.7	48	
1,4-Dichlorobenzene	0.80	0.20	1.653	0	48.1	31.7	85	13.9	40.6	
2,4-Dinitrotoluene	0.92	0.49	1.653	0	55.8	26.4	86	5.97	47.7	
N-Nitrosodi-n-propylamine	0.92	0.20	1.653	0	55.6	43.5	83	9.40	52.5	
4-Nitrophenol	2.1	0.25	3.296	0	62.7	32.7	98	3.78	36.6	
Pentachlorophenol	1.9	0.40	3.296	0	57.6	26.6	87.4	0.375	65.5	
Phenol	1.9	0.20	3.296	0	58.8	40.5	85.3	17.2	44	
Pyrene	0.94	0.20	1.653	0	56.9	23.2	93.9	8.27	42.1	
1,2,4-Trichlorobenzene	1.0	0.20	1.653	0	60.9	38.7	99	14.6	31.5	
Surr: 2-Fluorophenol	1.8		3.296		54.8	28.3	102	0	0	
Surr: Phenol-d5	2.0		3.296		61.9	35.7	103	0	0	
Surr: 2,4,6-Tribromophenol	2.1		3.296		64.3	35.2	108	0	0	
Surr: Nitrobenzene-d5	1.0		1.653		61.0	24	118	0	0	
Surr: 2-Fluorobiphenyl	1.1		1.653		66.3	35.4	111	0	0	
Surr: 4-Terphenyl-d14	0.87		1.653		52.6	15	91.7	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID	**MB-26093**	SampType:	**MBLK**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**PBS**	Batch ID:	**26093**	RunNo:	**35255**					
Prep Date:	**6/27/2016**	Analysis Date:	**6/28/2016**	SeqNo:	**1090434**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.033								

Sample ID	**LCS-26093**	SampType:	**LCS**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**LCSS**	Batch ID:	**26093**	RunNo:	**35255**					
Prep Date:	**6/27/2016**	Analysis Date:	**6/28/2016**	SeqNo:	**1090435**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.17	0.033	0.1667	0	105	80	120			

Sample ID	**1606995-002AMS**	SampType:	**MS**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**CentralOCD-02-6/16/**	Batch ID:	**26093**	RunNo:	**35255**					
Prep Date:	**6/27/2016**	Analysis Date:	**6/28/2016**	SeqNo:	**1090442**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.16	0.031	0.1548	0.003335	99.7	75	125			

Sample ID	**1606995-002AMSD**	SampType:	**MSD**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**CentralOCD-02-6/16/**	Batch ID:	**26093**	RunNo:	**35255**					
Prep Date:	**6/27/2016**	Analysis Date:	**6/28/2016**	SeqNo:	**1090443**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.18	0.033	0.1683	0.003335	103	75	125	11.4	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **MB-26123**	SampType: **MBLK**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **PBS**	Batch ID: **26123**	RunNo: **35332**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1093114** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	2.5								
Barium	ND	0.10								
Cadmium	ND	0.10								
Chromium	ND	0.30								
Copper	ND	0.30								
Iron	ND	2.5								
Lead	ND	0.25								
Manganese	ND	0.10								
Selenium	ND	2.5								
Silver	ND	0.25								
Uranium	ND	5.0								
Zinc	ND	2.5								

Sample ID **LCS-26123**	SampType: **LCS**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS**	Batch ID: **26123**	RunNo: **35332**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1093115** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	23	2.5	25.00	0	93.0	80	120			
Barium	24	0.10	25.00	0	94.8	80	120			
Cadmium	24	0.10	25.00	0	94.4	80	120			
Chromium	23	0.30	25.00	0	93.9	80	120			
Copper	25	0.30	25.00	0	98.1	80	120			
Iron	24	2.5	25.00	0	94.8	80	120			
Lead	22	0.25	25.00	0	88.1	80	120			
Manganese	23	0.10	25.00	0	92.3	80	120			
Selenium	23	2.5	25.00	0	92.1	80	120			
Silver	4.7	0.25	5.000	0	93.1	80	120			
Uranium	24	5.0	25.00	0	98.0	80	120			
Zinc	24	2.5	25.00	0	94.2	80	120			

Sample ID **1606995-002AMS**	SampType: **MS**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **CentralOCD-02-6/16/**	Batch ID: **26123**	RunNo: **35362**
Prep Date: **6/28/2016**	Analysis Date: **6/30/2016**	SeqNo: **1093792** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	15	2.4	24.42	0.8789	57.7	75	125			S
Barium	160	0.098	24.42	165.2	-4.64	75	125			S
Cadmium	16	0.098	24.42	0	64.2	75	125			S
Chromium	24	0.29	24.42	8.131	66.6	75	125			S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606995**

19-Jul-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID **1606995-002AMS** SampType: **MS** TestCode: **EPA Method 6010B: Soil Metals**

Client ID: **CentralOCD-02-6/16/** Batch ID: **26123** RunNo: **35362**

Prep Date: **6/28/2016** Analysis Date: **6/30/2016** SeqNo: **1093792** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Copper	19	0.29	24.42	2.413	67.0	75	125			S
Lead	17	0.24	24.42	3.606	52.9	75	125			S
Selenium	12	2.4	24.42	0	50.2	75	125			S
Silver	3.2	0.24	4.885	0	65.0	75	125			S
Uranium	14	4.9	24.42	0	58.6	75	125			S
Zinc	28	2.4	24.42	12.53	62.3	75	125			S

Sample ID **1606995-002AMSD** SampType: **MSD** TestCode: **EPA Method 6010B: Soil Metals**

Client ID: **CentralOCD-02-6/16/** Batch ID: **26123** RunNo: **35362**

Prep Date: **6/28/2016** Analysis Date: **6/30/2016** SeqNo: **1093793** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	17	2.5	25.41	0.8789	63.0	75	125	11.9	20	S
Barium	210	0.10	25.41	165.2	157	75	125	22.2	20	RS
Cadmium	17	0.10	25.41	0	65.5	75	125	6.02	20	S
Chromium	26	0.30	25.41	8.131	70.2	75	125	6.27	20	S
Copper	21	0.30	25.41	2.413	71.9	75	125	9.71	20	S
Lead	18	0.25	25.41	3.606	55.0	75	125	6.18	20	S
Selenium	11	2.5	25.41	0	44.7	75	125	7.71	20	S
Silver	3.4	0.25	5.082	0	67.5	75	125	7.68	20	S
Uranium	15	5.1	25.41	0	60.3	75	125	6.96	20	S
Zinc	30	2.5	25.41	12.53	69.5	75	125	8.40	20	S

Sample ID **1606995-002APS** SampType: **PS** TestCode: **EPA Method 6010B: Soil Metals**

Client ID: **CentralOCD-02-6/16/** Batch ID: **26123** RunNo: **35362**

Prep Date: Analysis Date: **6/30/2016** SeqNo: **1093794** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	21	2.4	24.44	0.8789	82.8	80	120			
Barium	200	0.098	24.44	165.2	133	80	120			S
Cadmium	20	0.098	24.44	0	81.9	80	120			
Chromium	28	0.29	24.44	8.131	81.1	80	120			
Copper	24	0.29	24.44	2.413	89.9	80	120			
Lead	22	0.24	24.44	3.606	74.9	80	120			S
Selenium	19	2.4	24.44	0	76.3	80	120			S
Silver	3.9	0.24	4.888	0	80.3	80	120			
Uranium	18	4.9	24.44	0	75.5	80	120			S
Zinc	32	2.4	24.44	12.53	79.8	80	120			S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **Western Refining Gallup** Work Order Number: **1606995** RcptNo: **1**

Received by/date: AG 06/17/16

Logged By: **Anne Thorne** 6/17/2016 10:00:00 AM Anne Thorne

Completed By: **Anne Thorne** 6/17/2016 Anne Thorne

Reviewed By: AJ 6/17/16

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?	Client		

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	4.4	Good				

Chain-of-Custody Record

Client: Western Refining

Mailing Address: Route 3 Box 7

Gallup, NM 87301

Phone #: 505-722-3833

email or Fax#: 505-722-0210

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation:
☐ NELAP ☐ Other

☐ EDD (Type) _Please provide EDD

Turn-Around Time:
☒ Standard ☐ Rush

Project Name:
OCD Central Landfarm Semiannual Sampling

Project #:
697-052-004

Project Manager:
Ed Riege

Sampler: Joey Waldmann

On Ice: ☒ Yes ☐ No

Sample Temperature: 4.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1606995	Vadose Zone List (see attached)	NMAC List (see attached)	TPH-DRO, GRO, and MRO by 8015M	BTEX (8260)	Air Bubbles (Y or N)
6/16/2016	1220	soil	CentralOCD-01-6/16/2016	8ox - 3, 4oz - 1	none	-001	X	X			
6/16/2016	1250	soil	CentralOCD-02-6/16/2016	8ox - 3, 4oz - 1	none	-002	X	X			
6/16/2016	1320	soil	CentralOCD-03-6/16/2016	8ox - 3, 4oz - 1	none	-003	X	X			
6/16/2016	1145	soil	CentralOCD-04-6/16/2016	8ox - 3, 4oz - 1	none	-004	X	X			
6/16/2016	———	soil	BD-6/16/2016	8ox - 3, 4oz - 1	none	-005	X	X			
6/16/2016	1250	soil	CentralOCD-02-6/16/2016-MS	8ox - 3, 4oz - 1	none	-002	X	X			
6/16/2016	1250	soil	CentralOCD-02-6/16/2016-MSD	8ox - 3, 4oz - 1	none	-002	X	X			
6/16/2016	1340	soil	CentralOCD-TZ-6/16/2016	8oz - 3, 4oz - 1	none	-006	X	X	X		
6/16/2016	1400	water	EB-6/16/2016	VOA - 3	HCL	-007				X	
6/16/2016	1415	water	FB-6/16/2016	VOA - 3	HCL	-008				X	
		water	Trip Blank	VOA - 3	HCL	-009				X	

Analysis Request

Date:	Time:	Relinquished by:	Received by:	Date Time
6/17/2016	10:00	Joey Waldmann		06/17/16 1000
Date:	Time:	Relinquished by:	Received by:	Date Time

Remarks: Please cc Grant Price (gprice@trihydro.com) with results. Call Grant @ 307-745-7474 w/ questions. **Verify that Reporting limits comply with those shown on the attached. PCBs need DL of 0.02 mg/kg. Data report and package w/ Trihydro EDD needed within 10 days of reciept. Any way to prevent low surrogate recoveries as w/ Sept. 2014 data package (Rpt 1409874)?**

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.

VADOSE ZONE ANALYTES AND REPORTING LIMITS, CENTRAL OIL CONSERVATION DIVISION LANDFARM
WESTERN REFINING SOUTHWEST, GALLUP REFINERY, GALLUP, NEW MEXICO

Analyte	Analytical Method	Reporting Units	Requested Reporting Limit
Chloride	E300	mg/kg	30
Benzene	SW8260B	mg/kg	0.050
Ethylbenzene	SW8260B	mg/kg	0.050
Toluene	SW8260B	mg/kg	0.050
Xylenes, Total	SW8260B	mg/kg	0.100
Petroleum Hydrocarbons, TR	E418.1	mg/kg	20

NMAC LIST ANALYTES AND REPORTING LIMITS, CONSTITUENTS LISTED IN SUBSECTIONS A AND B OF 20.6.2.3103 NMAC, CENTRAL OIL CONSERVATION DIVISION LANDFARM WESTERN REFINING SOUTHWEST, GALLUP REFINERY, GALLUP, NEW MEXICO

20.6.2.3103 NMAC (6/9/2016)

A. **Human Health Standards**-Ground water shall meet the standards of Subsection A and B of this section unless otherwise provided. If more than one water contaminant affecting human health is present, the toxic pollutant criteria as set forth in the definition of toxic pollutant in Section 20.6.2.1101 NMAC for the combination of contaminants, or the Human Health Standard of Subsection A of Section 20.6.2.3103 NMAC for each contaminant shall apply, whichever is more stringent. Non-aqueous phase liquid shall not be present floating atop of or immersed within ground water, as can be reasonably measured.

-1 Arsenic (As)	0.1 mg/l
-2 Barium (Ba)	1.0 mg/l
-3 Cadmium (Cd)	0.01 mg/l
-4 Chromium (Cr)	0.05 mg/l
-5 Cyanide (CN)	0.2 mg/l
-6 Fluoride (F)	1.6 mg/l
-7 Lead (Pb)	0.05 mg/l
-8 Total Mercury (Hg)	0.002 mg/l
-9 Nitrate (NO_3 as N)	10.0 mg/l
-10 Selenium (Se)	0.05 mg/l
-11 Silver (Ag)	0.05 mg/l
-12 Uranium (U)	0.03 mg/l
-13 Radioactivity: Combined Radium-226 & Radium-228	30 pCi/l
-14 Benzene	0.01 mg/l
~~**-15** Polychlorinated biphenyls (PCB's)~~	~~0.001 mg/l~~
-16 Toluene	0.75 mg/l
-17 Carbon Tetrachloride	0.01 mg/l
-18 1,2-dichloroethane (EDC)	0.01 mg/l
-19 1,1-dichloroethylene (1,1-DCE)	0.005 mg/l
-20 1,1,2,2-tetrachloroethylene (PCE)	0.02 mg/l
-21 1,1,2-trichloroethylene (TCE)	0.1 mg/l
-22 ethylbenzene	0.75 mg/l
-23 total xylenes	0.62 mg/l
-24 methylene chloride	0.1 mg/l
-25 chloroform	0.1 mg/l
-26 1,1-dichloroethane	0.025 mg/l
-27 ethylene dibromide (EDB)	0.0001 mg/l
-28 1,1,1-trichloroethane	0.06 mg/l
-29 1,1,2-trichloroethane	0.01 mg/l
-30 1,1,2,2-tetrachloroethane	0.01 mg/l
-31 vinyl chloride	0.001 mg/l
-32 PAHs: total naphthalene plus monomethylnaphthalenes	0.03 mg/l
-33 benzo-a-pyrene	0.0007 mg/l

B. **Other Standards for Domestic Water Supply**

-1 Chloride (Cl)	250.0 mg/l
-2 Copper (Cu)	1.0 mg/l
-3 Iron (Fe)	1.0 mg/l
-4 Manganese (Mn)	0.2 mg/l
-6 Phenols	0.005 mg/l
-7 Sulfate (SO_4)	600.0 mg/l
-8 Total Dissolved Solids (TDS)	1000.0 mg/l
-9 Zinc (Zn)	10.0 mg/l
-10 pH	between 6 and 9

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 160622057
Project Name: 1606995

Analytical Results Report

Sample Number 160622057-001 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-001B / CENTRALOCD-01-6/16/2016 **Sampling Time** 12:20 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.283	6/30/2016 5:55:00 PM	MER	EPA 335.4	
%moisture	15.5	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-002 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-002B / CENTRALOCD-02-6/16/2016 **Sampling Time** 12:50 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.297	6/30/2016 5:51:00 PM	MER	EPA 335.4	
%moisture	17.2	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-003 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-003B / CENTRALOCD-03-6/16/2016 **Sampling Time** 1:20 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.3	6/30/2016 5:57:00 PM	MER	EPA 335.4	
%moisture	16.8	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-004 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-004B / CENTRALOCD-04-6/16/2016 **Sampling Time** 11:45 AM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.295	6/30/2016 6:05:00 PM	MER	EPA 335.4	
%moisture	17.4	Percent		6/29/2016	ETL	%moisture	

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 160622057
Project Name: 1606995

Analytical Results Report

Sample Number 160622057-005 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-005B / BD-6/16/2016 **Sampling Time**
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.29	6/30/2016 6:06:00 PM	MER	EPA 335.4	
%moisture	17.6	Percent		6/29/2016	ETL	%moisture	

Sample Number 160622057-006 **Sampling Date** 6/16/2016 **Date/Time Received** 6/22/2016 10:45 AM
Client Sample ID 1606995-006B / CENTRALOCD-TZ-6/16/2016 **Sampling Time** 1:40 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	0.487	mg/Kg	0.25	6/30/2016 6:08:00 PM	MER	EPA 335.4	
%moisture	8.6	Percent		6/29/2016	ETL	%moisture	

Authorized Signature

John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 160622057
Project Name: 1606995

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Cyanide	0.501	mg/kg	0.5	100.2	90-110	6/30/2016	6/30/2016

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
160622057-002	Cyanide	ND	14.6	mg/kg	15.1	96.7	70-130	6/30/2016	6/30/2016

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	14.7	mg/kg	14.9	98.7	0.7	0-25	6/30/2016	6/30/2016

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/Kg	5	6/30/2016	6/30/2016

AR Acceptable Range
ND Not Detected
PQL Practical Quantitation Limit
RPD Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1606995
Pace Project No.: 30187563

Sample: 1606995-001C CentralOCD-01-6/1 **Lab ID: 30187563001** Collected: 06/16/16 12:20 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis
Comments: • Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.255 ± 2.582 (3.112) C:NA T:NA**	pCi/g	07/14/16 12:06	13982-63-3	
Radium-228	EPA 901.1	**2.152 ± 0.446 (0.252) C:NA T:NA**	pCi/g	07/14/16 12:06	15262-20-1	

Sample: 1606995-002C CentralOCD-02-6/1 **Lab ID: 30187563002** Collected: 06/16/16 12:50 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**4.070 ± 2.123 (2.252) C:NA T:NA**	pCi/g	07/14/16 12:22	13982-63-3	
Radium-228	EPA 901.1	**1.806 ± 0.441 (0.138) C:NA T:NA**	pCi/g	07/14/16 12:22	15262-20-1	

Sample: 1606995-003C CentralOCD-03-6/1 **Lab ID: 30187563003** Collected: 06/16/16 13:20 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**2.237 ± 2.544 (3.016) C:NA T:NA**	pCi/g	07/14/16 12:39	13982-63-3	
Radium-228	EPA 901.1	**2.290 ± 0.514 (0.145) C:NA T:NA**	pCi/g	07/14/16 12:39	15262-20-1	

Sample: 1606995-004C CentralOCD-06-6/1 **Lab ID: 30187563004** Collected: 06/16/16 11:45 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.888 ± 2.288 (2.754) C:NA T:NA**	pCi/g	07/14/16 12:40	13982-63-3	
Radium-228	EPA 901.1	**1.553 ± 0.446 (0.391) C:NA T:NA**	pCi/g	07/14/16 12:40	15262-20-1	

Sample: 1606995-005C BD-6/16/2016 **Lab ID: 30187563005** Collected: 06/16/16 00:01 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**0.721 ± 2.612 (3.200) C:NA T:NA**	pCi/g	07/14/16 12:56	13982-63-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1606995
Pace Project No.: 30187563

Sample: 1606995-005C BD-6/16/2016 **Lab ID: 30187563005** Collected: 06/16/16 00:01 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-228	EPA 901.1	**2.102 ± 0.475 (0.295) C:NA T:NA**	pCi/g	07/14/16 12:56	15262-20-1	

Sample: 1606995-006C CentralOCD-TZ-6/1 **Lab ID: 30187563006** Collected: 06/16/16 13:40 Received: 06/23/16 10:50 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.237 ± 1.946 (2.382) C:NA T:NA**	pCi/g	07/14/16 12:57	13982-63-3	
Radium-228	EPA 901.1	**1.210 ± 0.397 (0.240) C:NA T:NA**	pCi/g	07/14/16 12:57	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1606995
Pace Project No.: 30187563

QC Batch: 225883 Analysis Method: EPA 901.1
QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec
Associated Lab Samples: 30187563001, 30187563002, 30187563003, 30187563004, 30187563005, 30187563006

METHOD BLANK: 1106602 Matrix: Solid
Associated Lab Samples: 30187563001, 30187563002, 30187563003, 30187563004, 30187563005, 30187563006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.249 ± 1.401 (1.846) C:NA T:NA	pCi/g	07/11/16 20:46	
Radium-228	0.000 ± 0.066 (0.290) C:NA T:NA	pCi/g	07/11/16 20:46	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1606995
Pace Project No.: 30187563

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

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

November 03, 2016

Ed Riege

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-3833
FAX (505) 722-0210

RE: OCD Central Landfarm Semiannual Sampling OrderNo.: 1610A38

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 4 sample(s) on 10/20/2016 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: **1610A38**
Date Reported: **11/3/2016**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Project: OCD Central Landfarm Semiannual Sampling
Lab Order: 1610A38

Lab ID: 1610A38-001 **Collection Date:** 10/20/2016 9:38:00 AM
Client Sample ID: CentralOCD-2271-10202016-SW-NW **Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Chloride	2600	31	75		mg/Kg	50	10/29/2016 12:36:19 AM	28324

Lab ID: 1610A38-002 **Collection Date:** 10/20/2016 10:40:00 AM
Client Sample ID: CentralOCD-2271-10202016-SW-NE **Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Chloride	2600	31	75		mg/Kg	50	10/29/2016 12:48:43 AM	28324

Lab ID: 1610A38-003 **Collection Date:** 10/20/2016 11:10:00 AM
Client Sample ID: CentralOCD-2271-10202016-SW-E **Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Chloride	640	12	30		mg/Kg	20	10/27/2016 3:14:33 PM	28324

Lab ID: 1610A38-004 **Collection Date:** 10/20/2016
Client Sample ID: CentralOCD-BD-10202016 **Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **LGT**	
Chloride	600	12	30		mg/Kg	20	10/27/2016 3:26:57 PM	28324

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610A38**

03-Nov-16

Client: Western Refining Southwest, Gallup

Project: OCD Central Landfarm Semiannual Sampling

Sample ID	**MB-28324**	SampType:	**MBLK**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**28324**	RunNo:	**38293**					
Prep Date:	**10/27/2016**	Analysis Date:	**10/27/2016**	SeqNo:	**1194989**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-28324**	SampType:	**LCS**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**28324**	RunNo:	**38293**					
Prep Date:	**10/27/2016**	Analysis Date:	**10/27/2016**	SeqNo:	**1194990**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.4	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **Western Refining Gallup** Work Order Number: **1610A38** RcptNo: **1**

Received by/date: LC 10/20/16

Logged By: **Lindsay Mangin** 10/20/2016 4:40:00 PM

Completed By: **Lindsay Mangin** 10/21/2016 8:47:40 AM

Reviewed By: JC 10/21/16

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?	Client		

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 ☐	# of preserved bottles checked for pH: (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted?
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 ☐	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	2.8	Good	Not Present			

Chain-of-Custody Record

Client: ~~W~~ ~~Refining~~ West Western Refining

Mailing Address: Route 3 Box 7

Gallup, NM 87301

Phone #: 505-722-3833

email or Fax#: 505-722-0210

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation:
☐ NELAP ☐ Other_____

☐ EDD (Type) _Please provide EDD_____

Turn-Around Time:
☒ Standard ☐ Rush_____

Project Name:
OCD Central Landfarm Semiannual Sampling

Project #:
697-052-004

Project Manager:
Ed Riege

Sampler: Zac Bitsie

On Ice: ☒ Yes ☐ No

Sample Temperature: 2.8

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1610A38	Analysis Request: Chloride by EPA 300.0	Air Bubbles (Y or N)
10/20/2016	938	soil	CentralOCD-2271-10202016-SW-NW	4oz-1	none	-001	X	
10/20/2016	1040	soil	CentralOCD-2271-10202016-SW-NE	4oz-1	none	-002	X	
10/20/2016	1110	soil	CentralOCD-2271-10202016-SW-E	4oz-1	none	-003	X	
10/20/2016	NA	soil	CentralOCD-BD-~~10020216~~ 10202016	4oz-1	none	-004	X	

Date	Time	Relinquished by:	Received by:	Date	Time
10-20-16	1300			10/20/16	1325
10/20/16	1620		Lindsey Conoha	10/20/16	1640

Remarks: Please cc Grant Price (gprice@trihydro.com) with results. Call Grant @ 307-745-7474 w/ questions. **Data report and package w/ Trihydro EDD needed within 10 days of reciept.**

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.

SMW-2 Area and Boundary Well Installation Report

Marathon Petroleum Company LP

Gallup Refinery
Marathon Petroleum Company
Gallup, New Mexico

EPA ID# NMD000333211

APRIL 2019

Scott Crouch, P.G
DiSorbo Consulting, LLC

DiSorbo
Environmental Consulting Firm

8501 North Mopac Expy | Suite 300 | Austin, TX 78759
512.693.4190 (P) | 512.279.3118 (F) | www.disorboconsult.com

Table of Contents

List of Acronyms i

Executive Summary i

Section 1 Introduction 1-1

Section 2 Background 2-1

2.1 SMW-2 Area 2-1

2.2 OW-1 Area 2-2

Section 3 Scope of Activities 3-1

3.1 Monitor Well Installation and Sample Collection 3-1

3.1.1 Boundary Wells 3-1

3.1.2 SMW-2 Area 3-2

3.2 Collection and Management of Investigation Derived Waste 3-3

3.3 Surveys 3-3

Section 4 Field Investigation Results 4-1

4.1 Surface Conditions 4-1

4.2 Subsurface Conditions 4-1

4.3 Subsurface Investigations 4-2

4.3.1 Well Installation and Groundwater Sample Collection 4-3

4.4 SMW-2 Area – Additional Sampling 4-14

Section 5 Regulatory Criteria 5-1

Section 6 Site Impacts 6-1

6.1 Soil Analytical Results 6-1

6.2 Groundwater Analytical Results 6-2

6.3 SMW-2 Area – Additional Sampling 6-6

6.4 General Groundwater Chemistry 6-8

6.5 Subsequent Data 6-8

Section 7 Conclusions and Recommendations 7-1

Section 8 References 8-1

List of Tables

Table 1 Soil Vapor Screening Results

Table 2 Soil Analytical Data

Table of Contents (Continued)

Table 3 Groundwater Analytical Data

Table 4 SMW-2 Area Additional Sampling

Table 5 Groundwater and Surface Water Field Measurements

Table 6 Groundwater Gauging Results

Table 7 Fluid Levels

Table 8 Fourth Quarter 2017 Groundwater Analytical Data

List of Figures

Figure 1 Site Location Map

Figure 2 Well Location Map – Boundary Wells

Figure 3 Well Location Map – SMW-2 Area

Figure 4 Geologic Map of New Mexico

Figure 5 Chinle/Alluvium Interface Potentiometric Map - September 2017

Figure 6 Sulfate and Chloride Concentrations

Appendices

Appendix A Well Logs

Appendix B Waste Analyses and Waste Manifests

Appendix C Field Methods

Appendix D Soil Analytical Reports

Appendix E Groundwater Analytical Reports

Appendix F SMW-2 Area – Analytical Reports

List of Acronyms

API	American Petroleum Institute
bgl	below ground level (bgl)
btoc	below top of casing
DRO	diesel range organics
EPA	Environmental Protection Agency
HSA	hollow-stem auger
IDW	investigation derived waste
MCL	maximum contaminant level
msl	mean sea level
MW	monitor well
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
RCRA	Resource Conservation and Recovery Act
PID	photoionization detector
PPM	parts per million
PVC	polyvinyl chloride
SPH	separate phase hydrocarbon
SVOC	semi volatile organic compound
SWMUs	Solid Waste Management Units
TPH	total petroleum hydrocarbon
TCLP	toxicity characteristic leaching procedure
USCS	unified soil classification system
VOC	volatile organic compound
WQCC	Water Quality Control Commission

Executive Summary

The Gallup Refinery, which is located 17 miles east of Gallup, New Mexico, has been in operation since the 1950s. Pursuant to the terms and conditions of the facility Resource Conservation and Recovery Act (RCRA) Post-Closure Care Permit and 20.4.1.500 New Mexico Administrative Code, this report documents installation of boundary wells west of the on-site evaporation ponds and installation of wells in the area of well SMW-2. This area was identified by the New Mexico Environment Department (NMED) in comment letters regarding the 2013 and 2014 Annual Facility-Wide Ground Water Monitoring Reports as requiring additional groundwater monitoring wells.

The activities completed include the installation of five permanent monitoring wells (BW-4A, BW-4B, BW-5A, BW-5B, and BW-5C) and groundwater sampling along the western property boundary in an area approximately 500 feet west of Pond 9 and 780 feet south of existing monitor well OW-1. The activities also included the installation of two permanent monitoring wells (OW-59 and OW-60) in the area of SMW-2. Water samples were also collected at monitoring wells SMW-2 and SMW-4 and evaporation ponds EP-2 and EP-3. The field activities began on June 6, 2017 and continued through June 29, 2017.

Boundary Wells

Five permanent well completions were installed, although two of the wells were dry. Three groundwater samples (excluding additional quality assurance samples) were collected for analysis of potential site-related constituents (e.g., volatile and semi-volatile organics, total petroleum hydrocarbons (TPH), metals, and inorganic/general water quality parameters) at wells BW-4B, BW-5B and BW-5C.

Total metals concentrations exceeded the respective screening levels for arsenic, barium, beryllium, chromium, cobalt, iron, lead, manganese, nickel, and vanadium in one groundwater sample collected from well BW-4B. The sample was very turbid and dissolved metals analyses were not performed. Chloride was detected at a concentration (1,400 mg/L) above the screening level (250 mg/L) in one sample collected from well BW-5C. Diesel range organics (DRO) were detected at low concentrations of 0.47 mg/L and 0.74 mg/L in groundwater samples collected at wells BW-4B and BW-5B, respectively, in comparison to the screening level of 0.086 mg/L.

Detectable concentrations of acetone and benzoic acid were reported in the sample collected from BW-4B. The concentrations were below the screening levels. In the sample collected from BW-5B acetone, toluene and benzoic acid were reported at concentrations below the screening levels.

SMW-2 Area Wells

Two permanent well completions were installed. Two soil samples (excluding additional quality assurance samples) were collected during the advancement of the soil borings for analysis of potential site-related constituents (e.g., volatile and semi-volatile organics, TPH, and metals).

In the soil sample collected from OW-59 the lead concentration exceeded the screening level for the leachate DAF of 20. In the soil sample collected from OW-60 the iron and lead concentrations exceeded the screening level for the leachate DAF of 20. The manganese concentration exceeded non-residential soil screening level. Detectable concentrations of volatile and semi-volatile organics were reported in both soil samples but did not exceed the screening levels.

Two groundwater samples (excluding additional quality assurance samples) were collected for analysis of potential site-related constituents (e.g., volatile and semi-volatile organics, TPH, metals, inorganic/general water quality parameters and major cations/anions) at wells OW-59 and OW-60.

Total metals concentrations exceeded the respective screening levels for iron and manganese in both wells. Arsenic exceeded the screening level in OW-59. Beryllium exceeded the screening level in OW-60. Chloride and sulfate exceeded the respective screening levels in both wells. Dissolved metals concentrations exceeded the screening level for manganese in both wells. GRO and DRO concentrations exceeded the screening levels in the sample collected from OW-59. Detectable concentrations of volatile and semi-volatile organics were reported in both groundwater samples but did not exceed the screening levels.

SMW-2 Area – Additional Sampling

Water samples collected from Monitoring wells SMW-2 and SMW-4 and evaporation ponds EP-2 and EP-3 were analyzed for major cations/anions. The chloride concentrations reported from the surface water samples collected from evaporation ponds EP-2 and EP-3 were the highest concentrations reported during the sampling event. The chloride concentrations decreased moving up-gradient from SMW-2 to OW-59 and OW-60. The highest sulfate concentrations were observed in the groundwater

sample collected from OW-59, located on the down-gradient end of the OCD Central landfarm. The sulfate concentrations decreased down-gradient at SMW-2 and were significantly lower up-gradient in the groundwater sample collected from OW-60. Based on the existing information, the source(s) of the elevated concentrations of chloride and sulfate observed in SWMU-2 are not conclusive. It is possible that there may be separate sources for sulfate and chloride.

Section 1
Introduction

The Gallup Refinery is located approximately 17 miles east of Gallup, New Mexico along the north side of Interstate Highway I-40 in McKinley County. The physical address is I-40, Exit #39 Jamestown, New Mexico 87347. The Gallup Refinery property covers approximately 810 acres. Figure 1 presents the refinery location and the regional vicinity, which is characterized as high desert plain comprised primarily of public lands used for grazing by cattle and sheep.

The Gallup Refinery generally processes crude oil from the Four Corners area transported to the facility by pipeline or tanker truck. Various process units are operated at the facility, including crude distillation, reforming, fluidized catalytic cracking, alkylation, isomerization, sulfur recovery, merox treater, and hydrotreating. Current and past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, and residual fuel.

The location of the new boundary wells is shown on Figure 2. The purpose of these wells is to provide additional groundwater monitoring down-gradient of Evaporation Ponds 6 and 9. To accomplish this objective, two additional shallower monitoring wells (BW-4A and BW-4B) were installed near existing monitor well OW-1 to create three clustered wells similar to what was installed earlier at the boundary well locations (BW-1, BW-2, and BW-3). Three additional clustered wells (BW-5A, BW-5B and BW-5C) were installed approximately 500 feet west of Pond 9.

The location of the new wells in the area of SMW-2 is shown on Figure 3. The purposed of these wells (OW-59 and OW-60) is to determine the source of the elevated chloride and sulfated detected at monitoring well SMW-2. Groundwater samples were also collected from SMW-2 and SMW-4. Surface water samples were collected from Evaporation Ponds EP-2 and EP-3.

Section 2 describes the scope of work completed, including completion of soil borings, installation of permanent monitoring wells, soil sample collection, groundwater sample collection and surface water sample collection. Section 3 explains the results of the field investigation, including the general surface and subsurface conditions and detailed site-specific information acquired during subsurface investigations. Section 4 presents the analytical results of soil samples, groundwater samples, and surface water samples. The results of these analyses are compared to applicable State or federal screening levels.

Section 2
Background

This section presents background information for the area of the refinery property near monitoring wells SMW-2 and OW-1, including a review of historical waste management activities to identity the following:

Type and characteristics of all waste and all contaminants handled in the subject areas;
Known and possible sources of contamination;
History of operations; and
Prior investigations.

2.1 SMW-2 Area

Monitoring well SMW-2 is located immediately south of the closed Land Treatment Unit (LTU). This well is not included in the RCRA Permit as part of the detection or shallow monitoring well networks, but groundwater samples are routinely collected and analyzed per the Facility-Wide Ground Water Monitoring Plan. Well SMW-2 is located on the up-gradient end of the LTU. Historical analytical results for groundwater samples collected since 2010 are included in Table 1 of the *Work Plan SWM-2 Area Investigation and Boundary Wells Installations* (DiSorbo, 2016). Also included in Table 1 of the work plan are the analytical results for groundwater samples collected in SMW-4, which is located on the north (down-gradient) end of the LTU. These historical analyses indicate the detection of chloride, sulfate, manganese, and uranium at concentrations above the applicable screening levels per the RCRA Permit. Uranium was also detected in groundwater samples collected from SMW-4 at concentrations above the screening level. MTBE has been detected in groundwater samples collected at SMW-2, but has remained below the screening level.

Well SMW-2 is located down-gradient of the Central Landfarm, which is permitted by the New Mexico Oil Conservation Division (NMOCD) and also potentially down-gradient of the evaporation ponds (Figure 3). It is noted that the area where the NMOCD Central Landfarm is currently located may overlie former Evaporation Pond #10. According to information provided in the *Inventory of Solid Waste Management Units,* cell or Evaporation Pond #10 was used for wastewater from the boiler house and water softener regeneration wastes, but did not receive process wastewater discharges through the API Separator. The process of discharging directly to Evaporation Pond #10 was

replaced with the addition of a neutralization tank in 1980 (Geoscience Consultants, Ltd., 1985a). Evaporation Pond #10 was no longer in service in 1985 based on information provided in the 1985 *Discharge Plan Application* (Geoscience Consultants, Ltd., 1985b).

2.2 OW-1 Area

Monitoring well OW-1 was installed in November 1980 as part of the initial site investigations conducted pursuant to RCRA (Figure 2). The well was drilled to depth of 100 feet and is screened in the Sonsela Sandstone aquifer. Well OW-10, which is also screened in the Sonsela Sandstone aquifer, is located to the east and up-gradient of OW-1. The only site operations known to have been conducted in the area are the evaporation ponds located to the east and hydraulically up-gradient of OW-1.

Analytical results for groundwater samples collected from OW-1 and OW-10 are included in Table 2 in the *Work Plan SWM-2 Area Investigation and Boundary Wells Installations* (DiSorbo, 2016.) MTBE was detected in groundwater samples collected at OW-10 in 2012 and 2013 at concentrations above the screening level, but has since shown concentrations below the screening level. There have been a few detections of nitrate above screening levels in OW-1 and OW-10. Chloride has consistently been detected above the screening level in groundwater samples collected at OW-10. Total metals analyses of water samples collected at OW-1 have shown sporadic occurrences of arsenic, chromium, iron, lead, and manganese above screening levels. Total analyses of uranium have consistently exceeded screening levels in samples collected at both OW-1 and OW-10. Dissolved metals analyses of water samples collected at OW-1 have shown sporadic occurrences of iron, lead, and manganese above screening levels. Dissolved analyses of uranium have consistently exceeded screening levels in samples collected at both OW-1 and OW-10. Other organic constituents that have been detected at very low concentrations below screening levels in water samples collected at OW-1 include benzene, toluene, and total xylenes. Organic constituents that have been detected at very low concentrations below screening levels in water samples collected at OW-10 include 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene,

Section 3
Scope of Activities

3.1 Monitor Well Installation and Sample Collection

Pursuant to the approved SWMU-2 Area Investigation and Boundary Well Installations Work Plan, five permanent monitoring wells were installed west of Evaporation Ponds 6 and 9 (Figure 2). Two permanent monitoring wells were installed in the area of the OCD Landfarm (Figure 3).

3.1.1 Boundary Wells

Two new wells were installed near OW-1. Well BW-4A was installed with the screen interval set in the zone designated as the Upper Sand. Well BW-4B was installed with the screen interval set just above the Chinle bedrock in the Chinle/Alluvial Interface zone. Copies of the well logs are included in Appendix A.

Three clustered wells were drilled approximately 500 feet west of Pond 9 and 780 feet south of existing monitor well OW-1. Monitor well BW-5A was installed with screened interval set in the zone designated as the Upper Sand. Monitor well BW-5B was installed with screened interval set just above the Chinle bedrock in the Chinle/Alluvial Interface zone. Monitor well BW-5C was installed with the screened interval set in the Sonsela Sandstone aquifer. Copies of the well logs are included in Appendix A.

Soil samples obtained from the soil borings were screened in the field on 2.0 foot intervals for evidence of contaminants. The screening methods included, (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds. No discrete soil samples were retained for laboratory analysis since the field screening methods did not indicate any potential contamination.

The following list provides a summary of the five permanent wells advanced using hollow stem augers:

- BW-4A; screened from 21 feet below ground level (bgl) to 36 feet bgl;
- BW-4B; screened from 41 feet bgl to 61 feet bgl;
- BW-5A; screened from 10 feet bgl to 20 feet bgl;

- BW-5B; screened from 48 feet bgl to 58 feet bgl; and
- BW-5C; screened from 64.3 feet bgl to 74.3 feet bgl.

Groundwater samples were collected from three of the five permanent monitoring wells. The groundwater samples were analyzed for volatile and semi-volatile organics, TPH (GRO, DRO, and MRO), Skinner List metals, cyanide, iron, manganese, chloride, fluoride, and sulfate. The following list provides a brief summary of the groundwater sample collection:

- BW-4A; dry; well did not yield enough water to sample;
- BW-4B; developed and sampled; yielded enough water for a full analytical suite, the groundwater was too turbid to collect a filtered sample for dissolved metals analyses;
- BW-5A; dry; well did not yield enough water to sample;
- BW-5B; developed and sampled; yielded enough water for a full analytical suite; and
- BW-5C; developed and sampled; yielded enough water for a full analytical suite.

3.1.2 SMW-2 Area

Two new wells were installed adjacent to the OCD Landfarm, which is located north of evaporation ponds EP-2 and EP-3 and up-gradient of SMW-2. Well OW-59 was installed adjacent to the northwest (down-gradient) corner of the OCD Landfarm. Well OW-60 was installed adjacent to the southeast (up-gradient) corner of the OCD Landfarm. OW-59 and OW-60 are located outside of the bermed area for the OCD Landfarm. The wells are screened in the Chinle/Alluvial Interface zone. Copies of the well logs are included in Appendix A.

Soil samples obtained from the soil borings were screened in the field on 2.0 foot intervals for evidence of contaminants. The screening methods included, (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds. One discrete soil sample was collected from each soil boring. The samples were from the interval exhibiting the highest soil vapor reading.

The following list provides a summary of the two permanent wells advanced using hollow stem augers:

- OW-59; screened from 20 feet bgl to 35 feet bgl; and
- OW-60; screened from 25 feet bgl to 45 feet bgl.

3.2 Collection and Management of Investigation Derived Waste

Drill cuttings, excess sample material and decontamination fluids, and all other investigation derived waste (IDW) associated with the installation of the permanent wells were contained and characterized using methods based on the boring locations and type of contaminants suspected or encountered. All drill cuttings generated during the boundary well installations were collected and placed into 55-gallon drums. A composite sample of the drums generated during the June 2017 well installation event was collected using a decontaminated stainless steel spoon and sent to Hall Environmental Laboratory for waste characterization analysis. The sample was analyzed for the following:

- Reactivity – Cyanide (SW846 CH7);
- Reactivity – Sulfide (SW846 CH7);
- Ignitability (Method 1030);
- Corrosivity – pH (Method 9045);
- RCRA 8 (TCLP) Metals (Method 6010B);
- Diesel Range Organics (Method 8015B);
- Motor Oil Range Organics (Method 8015B);
- Gasoline Range Organics (Method 8015B); and
- TCLP Volatiles (Method 1311/8260B).

The Hall analytical report (#1708D66) is included in Appendix B. Based on the analyses, 28 non-hazardous/non-DOT regulated drums (16,380 pounds) were shipped off-site to Advanced Chemical Treatment in Albuquerque, NM for disposal on 8/30/2017.

Copies of the waste manifests are included in Appendix B. All purge water and decontamination water was disposed in the refinery wastewater system upstream of the API Separator.

3.3 Surveys

A global positioning system receiver was used to record the coordinates of each permanent monitor well. These coordinates were recorded on the field boring logs. Surveys were completed by a registered land surveyor for the seven permanent wells to include geographic position and land surface elevation.

Section 4
Field Investigation Results

This section provides a summary of the surface and subsurface conditions at the refinery, including the area west of Evaporation Ponds 6 and 9 and the SMW-2 area. A discussion is included on the installation of soil borings and field screening of soils. This is followed by a description of the installation of permanent monitoring wells and the collection of groundwater samples.

4.1 Surface Conditions

Site topographic features include high ground in the southeast gradually decreasing to a lowland fluvial plain to the northwest. Elevations on the refinery property range from 6,860 feet to 7,040 feet above mean sea level (msl). The area near monitor well OW-1 is at an approximate elevation of 6,866 feet msl. The elevation in the area of SMW-2 is approximately 6,887 feet msl.

Surface soils within most of the area of investigation are primarily Rehobeth silty clay loam. Rehobeth soil properties include a pH ranging from 8 to 9 standard units and salinity (naturally occurring and typically measuring up to approximately 8 mmhos/cm).

Regional surface water features include the refinery evaporation ponds and a number of small ponds (one cattle water pond and two small unnamed spring fed ponds). The site is located in the Puerco River Valley, north of the Zuni Uplift with overland flows directed northward to the tributaries of the Puerco River. The Puerco River continues to the west to the confluence with the Little Colorado River. The South Fork of the Puerco River is intermittent and retains flow only during and immediately following precipitation events.

4.2 Subsurface Conditions

The shallow subsurface soils consist of fluvial and alluvial deposits comprised of clay and silt with minor inter-bedded sand layers. The diverse properties and complex, irregular stratigraphy of the surface soils across the site cause a wide range of hydraulic conductivity ranging from less than 10^{-2} cm/sec for gravelly sands immediately overlying the Petrified Forest Formation to 10^{-8} cm/sec in the clay soils located near the surface (Western Refining, 2009). Generally, shallow groundwater at the refinery follows the upper contact of the Chinle Group (i.e., Chinle/Alluvial Interface zone) with prevailing flow from the southeast to the northwest, with some flow potentially to the northeast on

the northeastern portion of the refinery property. In the northwestern portion of the facility there are thin intermittent sand layers above the Chinle/Alluvial Interface zone, which may be saturated. These intervals are referred to as the Upper Sands with groundwater flow directions downdip to the northwest.

The Quaternary alluvium, which occurs at the land surface in the area of the refinery is mapped regionally as a narrow band trending west-northwest and running just north of I-40 (Figure 4). The Quaternary alluvium is thought to be the parent material of the Rehobeth soils, which are present at the facility.

Subcropping beneath the Quaternary alluvium is the Triassic Chinle Group (Figure 4). The stratigraphy of the Chinle Group was described in detail for the nearby Fort Wingate quadrangle by Lucas et al, 1997. The Painted Desert Member of the Petrified Forest Formation is the uppermost member of the Chinle Group present in the area of the refinery. The Painted Desert Member is described as reddish-brown and greyish red mudstone with minor beds of resistant, laminated or crossbedded, litharenite. This is consistent with the bedrock encountered at the refinery. Beneath the Painted Desert Member is the Sonsela Member, which is described by Lucas et al (1997) as grey to yellowish-brown, fine-grained to conglomeratic, crossbedded sandstone. The Sonsela Member forms an artesian aquifer across most of the facility. The base of the Sonsela Member is recognized as a basin wide unconformity, which was termed the Tr-4 unconformity (Heckert and Lucas, 1996). The Blue Mesa Member, which underlies the Sonsela Member, is the lowest member of the Petrified Forest Formation. The Blue Mesa Member is described as mostly purple and greenish-grey mudstone.

4.3 Subsurface Investigations

No underground pipelines were detected during clearance of utilities in the area of the well installations. This subsection provides a detailed description of subsurface soil and groundwater investigations conducted during the installation of the seven permanent monitoring wells.

A description of the field screening procedures are presented in Appendix C – Field Methods. Copies of the boring logs/well construction logs are provided in Appendix A. In addition to being included on the soil boring logs, the soil vapor (i.e., headspace) screening results are summarized in Table 1. The locations of the soil borings/monitor wells appear on Figure 2 and Figure 3.

4.3.1 Well Installation and Groundwater Sample Collection

Seven soil borings were advanced using the hollow-stem auger (HSA) method. The drilling equipment was decontaminated between each borehole, as described in Appendix C. The well development and purging is also discussed in Appendix C. Detailed soil boring logs are included in Appendix A. The soil boring logs describe the subsurface lithology, the presence of saturation, the field screening results, and permanent well construction details. The drilling of the soil borings, well installation, and groundwater sampling is discussed below in numerical order.

3.3.1.1 Boundary Wells

BW-4A

On June 14, 2017 the drilling rig was set up on location BW-4A. Well BW-4A is located approximately 10 feet north of monitor well OW-1. Sample collection was accomplished using the HSA drilling method and split spoon samplers. No discrete soil samples were retained for laboratory analysis since the field screening results did not indicate potential contamination. The lithology encountered consisted of the following:

- Silty Clay: 0 – 2 feet below ground level (bgl) (low plasticity, firm, dry to damp, brown, no odor);
- Clay: 2 feet bgl – 18 feet bgl (high plasticity, stiff to very stiff, damp, brown, no odor);
- Clayey Silt/Silty Clay: 18 feet bgl – 26 feet bgl (low plasticity, firm/crumbly, damp, light brown/tan, no odor, interbedded);
- Clay: 26 feet bgl – 32 feet bgl (high plasticity, very stiff, damp, brown to darker brown, no odor); and
- Silty Clay: 32 feet bgl – 34 feet bgl (low plasticity, very stiff, damp, light reddish brown, trace very fine grain sand, no odor).
- Clayey Silt/Silty Clay: 34 feet bgl – 36 feet bgl (low plasticity, firm to stiff, damp, reddish brown and grey, alternating silt/clay, no odor)
- Silty Clay: 36 feet bgl – 44 feet bgl (low plasticity, stiff, damp, reddish brown and grey, no odor).

The sampling was terminated at 44 feet bgl. Activities at this location were then shut down for the day. The augers were left in the borehole. On June 15, 2017 an interface probe was lowered inside the augers. No groundwater was detected. A permanent monitor well was installed at this location

with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 21 feet bgl to 36 feet bgl. The screen was set to intercept possible groundwater bearing sediments in the clayey silt (22 feet bgl to 24 feet bgl) and the silty clay (32 feet bgl to 34 feet bgl) that exhibited traces of very fine grain sands. A sand filter pack was installed to approximately 18 feet bgl. A bentonite seal was installed to approximately 14.5 feet bgl. The top of the well casing is approximately 3 feet above ground level.

On June 15, 2017, June 16, 2017, June 19, 2017, and June 26, 2017 the well was gauged. No groundwater was detected during the gauging events, thus no water sample was collected.

The annular seal (bentonite grout) was installed on June 27, 2017. The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

BW-4B

On June 15, 2017 the drilling rig was set up on location BW-4B. Well BW-4B is located approximately 10 feet south of monitor well OW-1. Sample collection was accomplished using the HSA drilling method and split spoon samplers. No discrete soil samples were retained for laboratory analysis since the field screening results did not indicate potential contamination. The lithology encountered consisted of the following:

- Silty Clay: 0 – 2 feet bgl (low plasticity, firm, dry to damp, brown, no odor);
- Clay: 2 feet bgl – 18 feet bgl (high plasticity, stiff to very stiff, damp, brown, no odor);
- Clayey Silt/Silty Clay: 18 feet bgl – 25 feet bgl (low plasticity, firm/crumbly, damp, light brown/tan, no odor, interbedded);
- Clay: 25 feet bgl – 28 feet bgl (high plasticity, very stiff, damp, brown to darker brown, no odor);
- Silty Clay: 28 feet bgl – 31 feet bgl (moderate to low plasticity, very stiff, damp, dark brown grading to light reddish brown, trace fine grain sand at base, no odor);
- Sandy Gravelly Clay: 31 feet bgl – 31.75 feet bgl (low plasticity, stiff, dry to damp, light grey and brown, no odor);
- Silty Clay: 31.75 feet bgl – 32 feet bgl (low plasticity, stiff, damp, reddish brown, no odor);

- Clayey Silt/Silty Clay: 32 feet bgl - 34 feet bgl (low plasticity, firm/crumbly, damp, reddish brown and grey);
- Silty Clay: 34 feet bgl – 44.75 feet bgl (low plasticity, firm/crumbly, damp, reddish brown and grey, no odor);
- Gravelly Silty Clay: 44.75 feet bgl – 45.50 feet bgl (low plasticity, firm/crumbly, dry, grey and reddish brown, no odor, calcium carbonate nodules present);
- Sandy Clay: 45.50 feet bgl – 46 feet bgl (low plasticity, firm/crumbly, dry, grey and reddish brown, very fine grain sand present, no odor);
- Silty Clay: 46 feet bgl – 54 feet bgl (low plasticity, very stiff, dry to damp, reddish brown, no odor, trace grey clay at base with occasional gravel);
- Silty Clay: 54 feet bgl – 60 feet bgl (low plasticity, very stiff, dry to damp, reddish brown, no odor, trace grey clay); and
- Silty Clay: 60 feet bgl – 68 feet bgl (low plasticity, very stiff, dry to damp, reddish brown and grey, no odor).

The sampling was terminated at 68 feet bgl. Activities at this location were then shut down for the day. The augers were left in the borehole. On July 16, 2017 the sampling resumed. The lithology encountered consisted of the following:

- Silty Clay: 68 feet bgl – 70 feet bgl (low plasticity, very stiff, dry to damp, reddish brown and bluish grey, no odor, calcareous);
- Silty Clay: 70 feet bgl – 84 feet bgl (low plasticity, firm/crumbly, damp, reddish brown, no odor);
- Silty Clay: 84 feet bgl – 88 feet bgl (low plasticity, very stiff, damp, reddish brown and trace of grey clay, no odor); and
- Silty Clay: 88 feet bgl – 90 feet bgl (low plasticity, very stiff, damp, reddish brown and trace of grey clay, no odor, interbedded with fine grain sandstone – white, hard/dense).

The sampling was terminated at 90 feet bgl. Activities at this location were then shut down for the day. The augers were left in the borehole. At 0926 on June 19, 2017 an interface probe was lowered inside the augers. The depth to groundwater was approximately 71 feet bgl. Activities at this location were then shut down for the day. The augers were left in the borehole and the rig was mobilized to a different location. At 1730 an interface probe was lowered inside the augers. The depth to groundwater was approximately 69.50 feet bgl.

On June 20, 2017 the rig was mobilized to the location for BW-4B. Bentonite pellets were installed in the bottom of the borehole from a depth of 64.5 feet bgl to 90 feet bgl. The pellets were allowed to hydrate. A permanent monitoring well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 41 feet bgl to 61 feet bgl. The screen was set to intercept possible groundwater bearing sediments in the gravelly silty clay encountered from 44.75 to 45.50 feet bgl. A sand filter pack was installed to approximately 39 feet bgl. A bentonite seal was installed to approximately 36 feet bgl. The top of the well casing is approximately 3 feet above ground level. The annular seal (bentonite grout) was installed on June 26, 2017.

On June 27, 2017 the well was gauged. The depth to groundwater was 30.92 feet btoc (27.92 feet bgl). The well was developed on June 27, 2017. The depth to groundwater after well development was 63.88 feet btoc. The water sample was collected on June 28, 2017. The depth to groundwater prior to sampling was 51.65 feet btoc (48.65 feet bgl).

The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

BW-5A

On June 23, 2017 the drilling rig was set up on location BW-5A. Well BW-5A is the southernmost well in the BW-5A, 5B, and 5C well cluster. Sample collection was accomplished using the HSA drilling method and split spoon samplers. No discrete soil samples were retained for laboratory analysis since the field screening results did not indicate potential contamination. The lithology encountered consisted of the following:

- Silty Clay: 0 – 6 feet bgl (low plasticity, firm, dry, brown, no odor);
- Clay: 6 feet bgl – 10 feet bgl (high plasticity, very stiff, dry, brown, no odor);
- Clay: 10 feet bgl – 12 feet bgl (moderate plasticity, very stiff, dry, brown, no odor, gravel at base);
- Gravelly Silt/Sand: 12 feet bgl – 14 feet bgl (very fine grain sand, dry, tan, no odor, 5-10 mm sized gravel was present, a stiff clay was at the base of this interval);
- Silty Clay: 14 feet bgl – 18 feet bgl (low plasticity, stiff, dry, light reddish brown, tan and grey, trace very fine grain sand, no odor); and

- Sandy Silty Clay: 18 feet bgl – 20.50 feet bgl (low plasticity, very stiff, dry, light reddish brown with occasional grey, no odor, very fine grain sand present).

The sampling was terminated at 20.50 feet bgl. No apparent saturated sediments were encountered. A permanent monitoring well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 10 feet bgl to 20 feet bgl. The screen was set to intercept possible groundwater that may exist in the gravel and sand encountered from 12 feet bgl to 14 feet bgl and the very fine grain sands encountered within the silty clay from 14 feet bgl to 20.50 feet bgl. A sand filter pack was installed to approximately 8 feet bgl. A bentonite seal was installed to approximately 4 feet bgl. The top of the well casing is approximately 3 feet above ground level. The annular seal (bentonite grout) was installed on June 26, 2017.

On June 26, 2017 the well was gauged. The depth to groundwater was 22.80 feet btoc (19.80 feet bgl) and the total depth was gauged at 23.28 feet btoc (20.28 feet bgl). The well was developed on June 26, 2017. BW-5A was bailed dry with the depth to groundwater at 23.20 feet after bailing was completed.

On June 27, 2017 the well was gauged. The depth to groundwater was 23.21 feet btoc. A water sample was not collected since there was an insufficient amount of groundwater in the well for a water sample.

The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

BW-5B

On June 23, 2017 the drilling rig was set up on location BW-5B. Well BW-5B is the middle well in the BW-5A, 5B, and 5C well cluster. The well is located approximately 10 feet from BW-5A and 10 feet from BW-5C. Sample collection was accomplished using the HSA drilling method and split spoon samplers. No discrete soil samples were retained for laboratory analysis since the field screening methods did not indicate potential contamination. The lithology encountered consisted of the following:

- Silty Clay: 0 – 6 feet bgl (low plasticity, firm, dry, brown, no odor);
- Clay: 6 feet bgl – 11 feet bgl (high plasticity, very stiff, dry, brown, no odor);
- Silty Clay: 11 feet bgl – 12 feet bgl (low plasticity, very stiff, dry, tan to light brown, no odor, calcareous);
- Gravelly Silt/Sand: 12 feet bgl – 14 feet bgl (very fine grain sand, very dense, dry, tan, no odor, sandstone and chert gravel);
- Silty Clay: 14 feet bgl – 16 feet bgl (low plasticity, firm to stiff/crumbly, dry to damp, reddish brown and grey, trace gravel and very fine grain sand, no odor);
- Clayey Silt/Sand: 16 feet bgl – 20 feet bgl (very fine grain sand, firm/crumbly, dry, light brown and grey to light reddish brown, no odor);
- Sandy Silty Clay: 20 feet bgl – 30 feet bgl (low plasticity, very stiff, dry, light reddish brown and light grey, no odor, very fine grain sand present);
- Silty Clay: 30 feet bgl – 48 feet bgl (low plasticity, firm to stiff, damp, reddish brown, no odor, softer than above, trace grey clay);
- Silty Clay: 48 feet bgl – 54 feet bgl (low plasticity, very stiff, damp, light reddish brown, no odor, pink sandstone present); and
- Silty Clay: 54 feet bgl – 58.5 feet bgl (low plasticity, very stiff, damp/dry, reddish brown, and grey, bluish grey from 56 feet bgl to 58 feet bgl, no odor).

The sampling was terminated at 58.5 feet bgl. No apparent saturated sediments were encountered. A permanent monitoring well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 48 feet bgl to 58 feet bgl. The screen was set to intercept possible groundwater that may exist in the sandstone encountered within the silty clays from 48 feet bgl to 54 feet bgl. A sand filter pack was installed to approximately 46 feet bgl. A bentonite seal was installed to approximately 44 feet bgl. The top of the well casing is approximately 3 feet above ground level. The annular seal (bentonite grout) was installed on June 26, 2017.

On June 26, 2017 the well was gauged. The depth to groundwater was 29.80 feet btoc (26.80 feet bgl). On June 27, 2017 the well was gauged. The depth to groundwater was 13.50 feet btoc (10.50 feet bgl). The well was developed on June 26, 2017. BW-5B was bailed down with the depth to groundwater at 61.10 feet btoc after bailing was completed. A water sample was collected on June 28, 2017. The depth to water prior to sampling was 20.60 feet btoc (17.60 feet bgl).

The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

BW-5C

On June 19, 2017 the drilling rig was set up on location BW-5C. Well BW-5C is the northernmost well in the BW-5A, 5B, and 5C well cluster. Sample collection was accomplished using the HSA drilling method and split spoon samplers. No discrete soil samples were retained for laboratory analysis since the field screening results did not indicate potential contamination. The lithology encountered consisted of the following:

- Silty Clay: 0 – 6 feet bgl (low plasticity, firm, dry, brown, no odor);
- Clay: 6 feet bgl – 11 feet bgl (high plasticity, very stiff, dry, brown, no odor);
- Silty Clay: 11 feet bgl – 12 feet bgl (low plasticity, very stiff, dry, tan to light brown, no odor, calcareous);
- Gravelly Silt/Sand: 12 feet bgl – 14 feet bgl (very fine grain sand, very dense, dry, tan, no odor, sandstone and chert gravel);
- Silty Clay: 14 feet bgl – 16 feet bgl (low plasticity, firm to stiff/crumbly, dry to damp, reddish brown and grey, trace gravel and very fine grain sand, no odor);
- Clayey Silt/Sand: 16 feet bgl – 20 feet bgl (very fine grain sand, firm/crumbly, dry, light brown and grey to light reddish brown, no odor);
- Sandy Silty Clay: 20 feet bgl - 30 feet bgl (low plasticity, very stiff, dry, light reddish brown and light grey, no odor, very fine grain sand present);
- Silty Clay: 30 feet bgl – 38 feet bgl (low plasticity, firm to stiff, damp, reddish brown, no odor, softer than above, trace grey clay); and
- Silty Clay: 38 feet bgl – 50 feet bgl (low plasticity, stiff to very stiff, damp, reddish brown, no odor, calcareous, pink sandstone at base – very dense, dry, no odor).

The sampling was terminated at 50 feet bgl. Activities at this location were then shut down for the day. The augers were left in the borehole. At 0840 on June 20, 2017 an interface probe was lowered inside the augers. No groundwater was detected. Activities at this location were then shut down for the day. The augers were left in the borehole and the rig was mobilized to a different location.

On June 21, 2017 the rig was mobilized back to the location for BW-5C and sampling continued. The lithology encountered consisted of the following:

- Silty Clay: 50 feet bgl – 54 feet bgl (low plasticity, stiff, dry, reddish brown and grey, calcareous, no odor, sandstone present – white and very dense);
- Silty Clay: 54 feet bgl – 58 feet bgl (low plasticity, very stiff, dry, reddish brown, occasional grey clay that increases with depth, no odor);
- Shale: 58 feet bgl – 64 feet bgl (very dense, light brown and grey, damp to saturated in cracks, no odor, fissile, becomes dry from 60 feet bgl to 64 feet bgl, very fine grain sand present and increases with interbedded clays present, no odor);
- Sandstone: 64 feet bgl – 66 feet bgl (very dense, fine grain sand, dry, brown, interbedded with clay lenses, no odor);
- Sandstone: 66 feet bgl – 68 feet bgl (very dense, fine grain sand, damp in fractures, light purplish brown, interbedded with clay lenses, weathered, soft, micaceous, no odor);
- Sand: 68 feet bgl – 69 feet bgl (fine to medium grain, loose, saturated, brown, no odor)
- Siltstone: 69 feet bgl – 69.5 feet bgl (dense, dry to damp, brown, no odor); and
- Sandstone: 69.5 feet bgl – 76 feet bgl (firm to dense, damp to moist, grey, no odor – dark grey to black shale at base, damp, stiff).

The sampling was terminated at 76 feet bgl. Activities at this location were then shut down for the day. The augers were left in the borehole. At 0950 on June 22, 2017 an interface probe was lowered inside the augers. The depth to groundwater was approximately 11.40 feet bgl.

A permanent monitoring well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 64.30 feet bgl to 74.30 feet bgl. The top of the screen was set approximately 4 foot above the occurrence of saturated sand (68 feet bgl to 69 feet bgl). The screen was extended to a depth of 74.3 feet bgl which allowed for the screening across additional moist intervals encountered within a sandstone (69.5 feet bgl to 74 feet bgl). A sand filter pack was installed to approximately 60 feet bgl. A bentonite seal was installed to approximately 56.90 feet bgl. The top of the well casing is approximately 3 feet above ground level. The annular seal (bentonite grout) was installed on June 22, 2017.

On June 23 and 26, 2017 the well was gauged. The depth to groundwater readings were 2.30 ft btoc and 2.42 ft btoc, respectively.

On June 27, 2017 the well was gauged. The depth to groundwater was 2.44 feet btoc. The well was developed on June 27, 2017. The depth to water after development was 47.90 feet btoc. A water sample was collected on June 28, 2017. The depth to water prior to sampling was 2.70 feet btoc.

The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

3.3.1.2 SMW-2 Area

Monitoring wells OW-59 and OW-60 were installed, developed and groundwater samples collected during the June 2017 field activities. The wells yielded enough water for a full analytical suite. The soil borings and subsequent wells are located adjacent to the OCD Landfarm.

OW-59

On June 12, 2017 the drilling rig was set up on location OW-59. Well OW-59 is located adjacent to the northwest (down-gradient) corner of the OCD Landfarm. Sample collection was accomplished using the HSA drilling method and split spoon samplers. One discrete soil sample was retained for laboratory analysis. The lithology encountered consisted of the following:

- Silty Clay: 0 – 6 feet bgl (low plasticity, firm, damp, brown, no odor);
- Clay: 6 feet bgl – 8 feet bgl (high plasticity, stiff, damp, brown, no odor);
- Silty Clay: 8 feet bgl – 10 feet bgl (low plasticity, stiff, damp, light brown, no odor, sandy at the base);
- Silt: 10 feet bgl – 12 feet bgl (low plasticity, compact, damp, brown, no odor);
- Silty Clay: 12 feet bgl – 14 feet bgl (low plasticity, very stiff, damp, brown, no odor, trace sand);
- Silty Clay: 14 feet bgl – 18 feet bgl (high plasticity, very stiff, damp, brown, no odor);
- Silty Clay: 18 feet bgl – 20 feet bgl (low to moderate plasticity, stiff, damp, brown, no odor);
- Sandy Silty Clay: 20 feet bgl – 22 feet bgl (low plasticity, firm to soft, damp, brown, no odor);
- Sandy Clay: 22 feet bgl – 24 feet bgl (low plasticity, soft, damp, brown, no odor);
- Silty Clay: 24 feet bgl – 26 feet bgl (low plasticity, soft, damp, brown, no odor);
- Sandy Silt: 26 feet bgl – 30 feet bgl (very fine grain, very moist, brown, no odor);
- Silty Clay: 30 feet bgl – 33 feet bgl (low plasticity, firm, damp, brown, no odor);

- Silty Sand: 33 feet bgl – 34 feet bgl (very fine grain, compact, saturated, brown, no odor);
- Silty Clay: 34 feet bgl – 38 feet bgl (low plasticity, firm, damp, brown, no odor);
- Clay: 38 feet bgl – 39 feet bgl (high plasticity, firm, damp, brown, no odor); and
- Silty Clay: 39 feet bgl – 40 feet bgl (low plasticity, firm to soft, damp, grey and white, no odor, trace sand and white nodules).

The sampling was terminated at 40 feet bgl. One soil sample was collected for laboratory analysis from the soil boring for OW-59. The sample was collected from the interval 33 to 34 feet bgl, which exhibited the highest soil vapor reading of 16.3 ppm.

Activities at this location were then shut down for the day. The augers were left in the borehole. On June 13, 2017 an interface probe was lowered inside the augers. The depth to groundwater was 24 feet bgl. A permanent monitor well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 20 feet bgl to 35 feet bgl. The screen was set to intercept possible groundwater bearing sediments in the sandy silt (26 feet bgl to 30 feet bgl) and the silty sand (33 feet bgl to 34 feet bgl). A sand filter pack was installed to approximately 18 feet bgl. A bentonite seal was installed to approximately 15.75 feet bgl. The top of the well casing is approximately 2.67 feet above ground level. The annular seal (bentonite grout) was installed on June 26, 2017.

On June 14, 2017 the well was gauged and the depth to groundwater was 24.44 feet btoc. On June 19, 2017 the well was gauged and the depth to groundwater was 24.75 feet btoc. On June 27, 2017 the well was gauged and the depth to groundwater was 25.00 feet btoc. The well was developed on June 27, 2017 using a disposable bailer. The well was bailed dry after approximately 8 gallons of groundwater was removed. On June 28, 2017 the well was gauged and the depth to groundwater was 26.15 feet btoc. The well was sampled and yielded enough groundwater for a full analytical suite.

The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

OW-60

On June 13, 2017 the drilling rig was set up on location OW-60. Well OW-60 is located adjacent to the southeast (up-gradient) corner of the OCD Landfarm. Sample collection was accomplished using the HSA drilling method and split spoon samplers. One discrete soil sample was retained for laboratory analysis. The lithology encountered consisted of the following:

- Silty Clay: 0 – 2 feet bgl (low plasticity, firm, damp, brown, no odor);
- Clay: 2 feet bgl – 10 feet bgl (high plasticity, firm to stiff, damp, brown, no odor);
- Silty Clay: 10 feet bgl – 28 feet bgl (moderate plasticity, firm to soft, damp, brown, no odor, traces of gravel from 24 to 26 feet and pockets of tan silt from 26 to 28 feet);
- Clayey Silt: 28 feet bgl – 30 feet bgl (low plasticity, soft/crumbly, damp, light brown and grey, no odor);
- Silty Clay: 30 feet bgl – 36 feet bgl (low plasticity, firm to crumbly, damp, light reddish brown with a trace of grey);
- Silty Clay: 36 feet bgl – 38 feet bgl (low plasticity, very stiff, crumbly, damp, light reddish brown and grey, no odor); and
- Silt: 38 feet bgl – 48 feet bgl (low plasticity, compact to dense/stiff, crumbly, damp, light grey, no odor, trace reddish brown clay from 46 to 48 feet).

The sampling was terminated at 48 feet bgl. One soil sample was collected for laboratory analysis from the soil boring for OW-60. The sample was collected from the interval 20 to 22 feet bgl, which exhibited the highest soil vapor reading of 15.3 ppm.

Activities at this location were then shut down for the day. The augers were left in the borehole. On June 14, 2017 an interface probe was lowered inside the augers. No groundwater was detected. A monitor well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 25 feet bgl to 45 feet bgl. The screen was set to intercept possible groundwater bearing sediments in the silt (38 feet bgl to 48 feet bgl). A sand filter pack was installed to approximately 22.5 feet bgl. A bentonite seal was not installed in order to adjust the well setting if necessary. The top of the well casing was approximately 3.00 feet above ground level. Water was present with the soil cuttings that were removed from the augers as they were removed from the wellbore. The well was gauged after the installation of the well materials. No groundwater was encountered. Additional gauging was conducted on OW-60 with the following results:

- June 15, 2017 - 24.68 feet below top of casing (btoc);
- June 16, 2017 – 17.74 feet btoc; and
- June 19, 2017 – 17.45 feet btoc.

It was determined that the sidewalls of the wellbore had caved off into the wellbore onto the top of the sand filter pack. On June 26, 2017 the well materials were removed from the wellbore and the borehole was reamed. New well materials were installed in the borehole. A permanent monitor well was installed at this location with 2-inch Schedule 40 PVC screen and casing. The well was installed with the screened interval ranging from 25 feet bgl to 45 feet bgl. The screen was set to intercept possible groundwater bearing sediments in the silt (38 feet bgl to 48 feet bgl). A sand filter pack was installed to approximately 21.70 feet bgl. A bentonite seal was installed to approximately 19.40 feet bgl. The annular seal (bentonite grout) was installed on June 27, 2017.

On June 27, 2017 the well was gauged and the depth to groundwater was 10.25 feet btoc. The well was developed on June 27, 2017 using a disposable bailer. The well was bailed down after approximately 12 gallons of groundwater was removed. The depth to water was 44.65 feet btoc. On June 28, 2017 the well was gauged and the depth to groundwater was 33.15 feet btoc. The well was sampled and yielded enough groundwater for a full analytical suite.

The surface completion consists of a stickup completion, which included a protective steel cover secured in a concrete pad. The protective steel cover is equipped with a lid that is locked. Bollards were installed around the concrete pad. The surface completion and bollards were installed on June 29, 2017.

4.4 SMW-2 Area – Additional Sampling

On June 27, 2017 monitoring well SMW-2 was purged. On June 28, 2017 SMW-2 was sampled. Monitoring well SWM-4 was purged and groundwater samples collected on June 28, 2017. SMW-2 and SMW-4 yielded enough water for a full analytical suite. The measurement of field purging parameters included measurement of groundwater pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature. The groundwater field parameters collected during the sampling event are included in Table 5. Groundwater gauging measurements collected during the field activities are presented in Table 6.

In addition to collecting groundwater samples at SMW-2 and SMW-4, surface water samples were collected from Evaporation Ponds EP-2 and EP-3. The field parameters collected during the collection of the samples are included in Table 5.

Section 5
Regulatory Criteria

The applicable screening and potential cleanup levels are specified in NMED's *Risk Assessment Guidance for Site Investigations and Remediation* dated March 2019 and in the Environmental Protection Agency's (EPA) Regional Screening Levels dated November 2018.

For non-residential properties (e.g., the Gallup Refinery), the soil screening levels must be protective of commercial/industrial workers throughout the upper one foot of surface soils and construction workers throughout the upper ten feet based on NMED criteria. NMED residential soil screening levels are applied to the upper ten feet and soil screening levels for protection of groundwater apply throughout the vadose zone. EPA soil screening levels for direct contact exposure apply to the upper two feet of the vadose zone. The soil screening levels are included in Table 2 for comparison to concentrations of constituents reported for soil samples. The sample results are not segregated based on the aforementioned depths for this initial comparison.

The groundwater cleanup levels are based on New Mexico Water Quality Control Commission (WQCC) standards (20.6.2.7 WW NMAC, 20.6.2.3103, and 20.6.2.4103) unless there is a federal maximum contaminant level (MCL), in which case the lower of the two values is selected as the cleanup level. If neither a WCQQ standard nor an MCL is available, then the cleanup level is based on a NMED Tap Water Screening Level. If a NMED Tap Water Screening Level is not available for a constituent, then an EPA Regional Screening Level is used. If an EPA Regional Screening Level is for a carcinogenic compound, then the screening level is multiplied by 10 to bring the risk level to 1E-05 to be consistent with the NMED screening levels. Table 3 presents the groundwater cleanup levels used for comparison to reported groundwater concentrations. The same screening levels are also used in Tables 4 and 8.

The aforementioned Table 2 has soil screening levels for the soil-to-groundwater pathway that are based on a dilution/attenuation factor (DAF) of 20. Pursuant the discussion in Section 4.9 of NMED's most recent Risk Assessment Guidance, the highest soil leachate-based soil screening level based on a DAF of 20 has been provided in Table A-1 of the guidance and is to be applied for initial screening. If an MCL based value is available, then it is used, if not, then NMED's Cw soil screening

level from Table A-1 is used. If neither of these screening levels is available for a particular constituent, then an EPA screening level is used.

The applicable TPH screening levels for comparison to the individual soil samples are selected from Tables 6-2 and 6-4 of the NMED guidance (NMED, 2019). The groundwater screening levels for TPH are taken from Table 6-4. Both soil and groundwater TPH screening levels for "unknown oil" are used for comparison to site concentrations.

Only one constituent (di-n-octyl-phthalate) was detected in groundwater that does not have a screening level. It is not classified as a known carcinogen.

Section 6
Site Impacts

This section discusses the chemical analyses performed and presents the analytical results that were obtained through the analysis of soil, groundwater and surface water samples.

6.1 Soil Analytical Results

One soil sample was collected from each of the soil borings for OW-59 and OW-60. The samples were collected from the interval with the highest soil vapor reading. In the boring for OW-59 a sample was collected from the interval 33 to 34 feet bgl, which exhibited the highest soil vapor reading of 16.3 ppm. In the boring for OW-60 a sample was collected from the interval 20 to 22 feet bgl, which exhibited the highest soil vapor reading of 15.3 ppm.

The soil samples were analyzed for organic constituents by the following methods:

- SW-846 Method 8260 volatile organic compounds;
- SW-846 Method 8270 semi-volatile organic compounds;
- SW-846 Method 8015D gasoline range organics; and
- SW-846 Method 8015M/D diesel and motor oil range organics.

Soil samples were analyzed for the following metals using the indicated analytical methods:

- SW-846 Method 6010B
    - Antimony
    - Arsenic
    - Barium
    - Beryllium
    - Cadmium
    - Chromium
    - Cobalt
    - Iron
    - Manganese
    - Nickel
    - Selenium
    - Silver
    - Vanadium
    - Zinc

- SW-846 Method 7471
  - Mercury
- SW-846 Method 9012
  - Cyanide

The analytical results and the applicable screening levels are presented in Table 2. The laboratory analytical reports are included in Appendix D. The individual results that exceed the applicable cleanup levels are highlighted. The constituents with reported concentrations that exceed screening levels are discussed below.

The following soil samples exceeded the screening levels for the listed constituents. The screening level is included in the parenthesis:

OW-59 (33-34')

- Lead (0.052 mg/kg – Leachate DAF of 20) – 0.72 mg/kg

OW-60 (20-22')

- Iron (6,958.86 mg/kg – Leachate DAF of 20) – 10,000 mg/kg
- Lead (0.052 mg/kg – Leachate DAF of 20) – 1.6 mg/kg
- Manganese (463.84 mg/kg – Non-Residential Soil Screening Level) – 470 mg/kg

Detectable concentrations of 1-methylnaphthalene, 2-methylnaphthalene, acetone, benzene, ethylbenzene, toluene, xylenes, bis(2-ethylhexyl)phthalate, diethyl phthalate, and di-n-butyl phthalate were detected in the soil samples from OW-59 and OW-60. MTBE and naphthalene were also detected in the soil sample from OW-59. None of the volatile or semi-volatile constituents detected in the soil samples from OW-59 and OW-60 exceeded the screening levels.

6.2 Groundwater Analytical Results

The groundwater samples collected from the boundary wells (BW-4B, BW-5B and BW-5C) and the SMW-2 area wells (OW-59 and OW-60) were analyzed for organic constituents by the following methods:

- SW-846 Method 8260 volatile organic compounds;

- SW-846 Method 8270 semi-volatile organic compounds;
- SW-846 Method 8015D gasoline range organics; and
- SW-846 Method 8015M/D diesel and motor oil range organics.

Groundwater samples were analyzed for the following total and dissolved metals using the indicated analytical methods.

Analyte	Analytical Method
Antimony	SW-846 Method 200.8
Arsenic	SW-846 Method 200.8
Barium	SW-846 Method 200.7
Beryllium	SW-846 Method 200.7
Cadmium	SW-846 Method 200.7
Chromium	SW-846 Method 200.7
Cobalt	SW-846 Method 200.7
Iron	SW-846 Method 200.7
Lead	SW-846 Method 200.8
Manganese	SW-846 Method 200.7
Nickel	SW-846 Method 200.7
Selenium	SW-846 Method 200.8
Silver	SW-846 Method 200.7
Vanadium	SW-846 Method 200.7
Zinc	SW-846 Method 200.7

Groundwater samples were also analyzed for the following total metals using the indicated analytical methods.

Analyte	Analytical Method
Cyanide	SW-846 Method 9012B

Analyte	Analytical Method
Mercury	SW-846 Method 245.1

In addition, groundwater samples were analyzed for chloride, fluoride, bromide, phosphorus, sulfate and nitrate+nitrite as N using EPA method 300.

The analytical results and the applicable screening levels are presented in Table 3. The laboratory analytical reports are included in Appendix E. The individual results that exceed the applicable cleanup levels are highlighted. The constituents with reported concentrations that exceed screening levels are discussed below.

The following boundary wells exceeded the screening levels for the listed constituents. The screening level is included in the parenthesis:

BW-4B

- Arsenic (10 ug/L) – 12 ug/L;
- Barium (2,000 ug/L) – 4,700 ug/L;
- Beryllium (4 ug/L) – 48 ug/L;
- Chromium (50 ug/L) – 170 ug/L;
- Cobalt (50 ug/L) – 79 ug/L;
- Iron (1,000 ug/L) – 82,000 ug/L;
- Lead (15 ug/L) – 200 ug/L;
- Manganese (200 ug/L) – 5,600 ug/L;
- Nickel (372 ug/L) – 540 ug/L;
- Vanadium (63.1 ug/L) – 140 ug/L; and
- DRO (0.04 mg/L) – 0.47 mg/L.

BW-5B

- DRO (0.04 mg/L) – 0.74 mg/L.

BW-5C

- Chloride (250,000 ug/L) – 1,400,000 ug/L.

Detectable concentrations of acetone and benzoic acid were reported in the sample collected from BW-4B. The concentrations were below the screening levels. In the sample collected from BW-5B acetone, toluene and benzoic acid were reported at concentrations below the screening levels. Detectable concentrations of 1,1-dichloroethane, 1,2-dichloroethane, acetone, MTBE, benzoic acid, di-n-octyl phthalate, and GRO were reported in the sample collected from BW-5C. The concentrations were below the screening levels.

The following groundwater results from the SMW-2 area exceeded the screening levels for the listed constituents. The screening level is included in the parenthesis.

OW-59

- Arsenic (10 ug/L) – 11 ug/L;
- Iron (1,000 ug/L) – 9,700 ug/L;
- Manganese (200 ug/L) – 1,200 ug/L;
- Manganese – Dissolved (200 ug/L) – 670 ug/L;
- Chloride (250,000 ug/L) – 2,000,000 ug/L;
- Sulfate (600,000 ug/L) – 3,000,000 ug/L;
- GRO (0.04 mg/L) – 0.23 mg/L; and
- DRO (0.04 mg/L) – 0.56 mg/L.

Detectable concentrations of 1,2,4-trimethybenzene, acetone, MTBE, and benzoic acid, were reported in the groundwater sample collected from OW-59. None of the constituents exceeded the screening levels.

OW-60

- Beryllium (4 ug/L) – 4.6 ug/L;
- Iron (1,000 ug/L) – 28,000 ug/L;
- Manganese (200 ug/L) – 2,200 ug/L;
- Manganese – Dissolved (200 ug/L) – 550 ug/L;
- Chloride (250,000 ug/L) – 1,600,000 ug/L; and

- Sulfate (600,000 ug/L) – 740,000 ug/L.

Detectable concentrations of 4-Isopropyltoluene, acetone, MTBE, toluene, benzoic acid, and bis(2-ethyhexyl)phthalate were reported in the groundwater sample collected from OW-60. None of the concentrations exceeded the screening levels.

6.3 SMW-2 Area – Additional Sampling

Groundwater samples from SMW-2 and SWM-4 and surface water samples collected from Evaporation Ponds EP-2 and EP-3 were analyzed for chloride, fluoride, bromide, phosphorus, sulfate and nitrate+nitrite as N using EPA method 300. The samples were also analyzed for calcium, magnesium, potassium, and sodium using EPA method 200.7.

The analytical results and the applicable screening levels are presented in Table 4. The laboratory analytical reports are included in Appendix F. The analytical results for the aforementioned constituents reported for OW-59 and OW-60 are also included in Table 4 for a direct comparison to the nearby sampling locations. The individual results that exceed the applicable cleanup levels are bolded. The constituents with reported concentrations that exceed screening levels are discussed below. The screening level is included in the parenthesis:

<u>OW-59</u>

- Chloride (250 mg/L) – 2,000 mg/L; and
- Sulfate (600 mg/L) – 3,000 mg/L.

<u>OW-60</u>

- Chloride (250 mg/L) – 1,600 mg/L; and
- Sulfate (600 mg/L) – 740 mg/L.

<u>SMW-2</u>

- Chloride (250 mg/L) – 2,600 mg/L; and
- Sulfate (600 mg/L) – 1,500 mg/L.

<u>Evaporation Pond #2 (Surface Water Sample)</u>

- Chloride (250 mg/L) – 5,000 mg/L;

- Sulfate (600 mg/L) – 1,400 mg/L; and
- Fluoride (1.6 mg/L) – 18 mg/L.

Evaporation Pond #3 (Surface Water Sample)

- Chloride (250 mg/L) – 7,100 mg/L;
- Sulfate (600 mg/L) – 1,800 mg/L; and
- Fluoride (1.6 mg/L) – 16 mg/L.

Included as Figure 5 is a potentiometric map developed from groundwater elevations collected in September 2017 in the SMW-2 area. As shown on Figure 5 the groundwater flow direction is from the east-southeast to the west-northwest. OW-60 is an up-gradient well located near the southeast corner of the OCD Central Landfarm. OW-59 is located approximately 440 feet downgradient to OW-60 and 230 feet upgradient to SMW-2. Monitoring well SMW-4 is located approximately 780 feet downgradient of SMW-2.

Figure 6 presents sulfate and chloride concentrations reported from groundwater and surface water samples collected in the SWM-2 area. The chloride concentrations reported from the surface water samples collected from EP-2 and EP-3 were the highest concentrations reported during the sampling event, 5,000 mg/l and 7,100 mg/l, respectively. The chloride concentrations increased downgradient from OW-60 (1,600 mg/L) to OW-59 (2,000 mg/L) and increase in SMW-2 (2,600 mg/L). The chloride concentrations decreased from 2,600 mg/L in SMW-2 to 63 mg/L in the sample from SMW-4.

The sulfate concentrations in samples collected from EP-2 and EP-3 were elevated, but were not the highest concentrations reported in the sampling area. The highest reported concentration reported was from OW-59 (3,000 mg/L). Figure 6 indicates that the sulfate concentration increased from OW-60 (740 mg/L) to OW-59 (3,000 mg/L) and then decreased in SMW-2 (1,500 mg/L). The sulfate concentration in the sample from SMW-4 (downgradient well) was the lowest reported at 180 mg/L.

Based on the flow direction of groundwater and the reported concentrations, the elevated chloride concentrations in SMW-2 may be originating from a source located in the area of the OCD Central landfarm, or further up-gradient. The sulfate concentrations increase across the OCD Central landfarm moving down-gradient, with the highest reported concentrations in the area in the groundwater sample collected in OW-59. This could suggest the OCD Central landfarm is a source of the sulfate.

6.4 General Groundwater Chemistry

The measurement of field purging parameters included measurement of groundwater pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature. The groundwater field parameters collected during the sampling event are included in Table 5. Groundwater gauging measurements collected during the field activities are presented in Table 6.

6.5 Subsequent Data

Additional groundwater data has been collected from the five monitoring wells installed and sampled in June 2017. Included as Table 7 are the fluid level measurements of the five wells through the 2018 fourth quarter gauging event. Table 8 presents the analytical data collected during the 2017 fourth quarter sampling event.

Section 7
Conclusions and Recommendations

The analytical results from groundwater samples collected at new wells OW-59 and OW-60, along with groundwater samples collected at existing well SMW-2 and surface water samples collected from Evaporation Ponds EP-2 and EP-3 provide a better understanding of the distribution of chloride and sulfate in the immediate vicinity. However, the data is not conclusive as to a particular source of either constituent. The highest sulfate concentrations appear at the down-gradient end of the OCD Central landfarm, which could be the primary source of sulfate affecting groundwater at SMW-2. An obvious source of the chloride was not identified in the immediate area.

It is recommended to install additional monitoring wells to better determine if a local source of chloride and/or sulfate is present. An Investigation Work Plan for additional monitoring wells was submitted in August, 2018 pursuant to NMED's request.

Section 8
References

DiSorbo, 2016, Work Plan SMW-2 Area Investigation and Boundary Well Installations, Gallup Refinery.

Geoscience Consultants, Ltd, 1985a, Inventory of Solid Waste Management Units, June 14, 1985, p. 22.

Geoscience Consultants, Ltd, 1985b, Discharge Plan Application for Giant Refining Company Ciniza Refinery, Gallup New Mexico, November 21, 1985, p, 59.

Heckert, A.B. and Lucas, S.G., 1996, *Stratigraphic description of the Tr-4 unconformity in west-central New Mexico and eastern Arizona*: New Mexico Geology, Vol. 18, No. 3, pp. 61-70.

Lucas, S. G., Heckert, A.B., and Anderson, O. J., 1997, *Triassic Stratigraphy and Paleontology on the Fort Wingate quadrangle, west-central New Mexico*, New Mexico Geology, Vol. 19, No. 2. pp 33 - 42.

NMED, 2019, *Risk Assessment Guidance for Site Investigations and Remediation*, New Mexico Environment Department, p.105.

Western Refining, 2009, *Facility Wide Groundwater Monitoring Work Plan*, Western Refining Company Southwest, Inc., p. 78.

Tables

Table 1 Soil Vapor Screening Results

Table 2 Soil Analytical Data

Table 3 Groundwater Analytical Data

Table 4 SMW-2 Area Additional Sampling

Table 5 Groundwater and Surface Water Field Measurements

Table 6 Groundwater Gauging Results

Table 7 Fluid Levels

Table 8 Fourth Quarter 2017 Groundwater Analytical Data

Table 1
Soil Vapor Screening Results
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Sample Interval Depth (ftbgl)	BW-4A (ppm)	BW-4B (ppm)	BW-5A (ppm)	BW-5B (ppm)	BW-5C (ppm)	OW-59 (ppm)	OW-60 (ppm)
0 - 2	7.7	1.3	NR	NR	0.0	0.0	6.5
2 - 4	9.5	1.2	NR	NR	0.1	0.0	5.8
4 - 6	9.0	1.3	NR	NR	0.0	0.0	6.3
6 - 8	6.8	1.7	NR	NR	0.0	2.0	8.1
8 - 10	5.4	2.0	NR	NR	0.1	1.0	9.6
10 - 12	3.3	2.1	0.0	NR	0.0	0.3	9.1
12 - 14	5.8	3.1	0.0	NR	0.1	0.5	8.2
14 - 16	4.0	3.4	0.0	NR	0.0	1.3	7.9
16 - 18	2.0	5.1	0.0	NR	0.0	1.7	8.3
18 - 20	6.9	3.2	0.0	NR	0.0	1.1	10.1
20 - 22	5.0	3.9	TD 20 ftbgl	NR	0.0	1.2	15.3
22 - 24	3.6	3.5		NR	0.0	0.2	12.1
24 - 26	3.7	3.9		NR	0.0	3.3	11.6
26 - 28	6.2	1.8		NR	0.0	10.9	10.9
28 - 30	3.5	1.8		NR	0.0	11.6	10.5
30 - 32	6.1	2.0		NR	0.0	11.4	11.1
32 - 34	6.1	2.2		NR	0.0	14.9/16.3	15.0
34 - 36	3.8	5.6		NR	0.0	10.5	12.8
36 - 38	6.1	3.6		NR	0.0	7.3	12.7
38 - 40	5.2	2.3		NR	0.0	10.0	10.4
40 - 42	4.2	6.2		NR	0.0	TD 40 ftbgl	9.9
42 - 44	3.9	5.0		NR	0.0		10.7
44 - 46	TD 44 ftbgl	2.6		NR	0.0		10.1
46 - 48		3.5		NR	0.1		9.6
48 - 50		1.9		0.0	0.0		TD 48 ftbgl
50 - 52		5.1		0.0	0.0		
52 - 54		5.6		0.0	0.0		
54 - 56		3.8		0.0	0.0		
56 - 58		3.4		0.0	0.0		
58 - 60		2.4		TD 58 ftbgl	0.0		
60 - 62		4.9			0.0		
62 - 64		1.7			0.0		
64 - 66		5.8			0.0		
66 - 68		2.7			0.0		
68 - 70		3.9			0.0		
70 - 72		1.6			NR		
72 - 74		1.7			NR		
74 - 76		1.0			NR		
76 - 78		0.1			TD 76 ftbgl		
78 - 80		0.4					
80 - 82		0.1					
82 - 84		0.2					
84 - 86		0.0					
86 - 88		0.1					
88 - 90		0.2					
		TD 90 ftbgl					

ftbgl - feet below ground level ppm - parts per million NR - No reading was collected.

Table 2
Soil Analytical Data
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Residential Soil Screening Level	Source	Non-Residential Soil Screening Level	Source	Leachate DAF (20) (mg/kg) SoilGW	Source	OW-59 (33-34')		OW-60 (20-22')	
					Lab ID		1706910-003		1706910-004	
					Sample Date		6/12/2017		6/13/2017	
Metals (mg/kg)										
Antimony	3.13E+01	(1)	1.42E+02	(5)	5.42E+00	(10)	< 0.996	u	< 1.0017	u
Arsenic	7.07E+00	(1)	3.59E+01	(4)	5.83E+00	(8)	< 0.8796	u	1.3	J
Barium	1.56E+04	(1)	4.39E+03	(5)	1.65E+03	(10)	130	v	160	v
Beryllium	1.56E+02	(1)	1.48E+02	(5)	6.32E+01	(10)	0.34	v	0.52	v
Cadmium	7.05E+01	(1)	7.21E+01	(5)	7.52E+00	(10)	< 0.0628	u	< 0.0631	u
Chromium (Total)	9.66E+01	(1)	1.34E+02	(5)	3.60E+06	(10)	4.6	v	6.4	v
Cobalt	2.34E+01	(1)	3.67E+01	(5)	5.40E+00	(8)	2.1	v	3.1	v
Cyanide	1.12E+01	(1)	1.21E+01	(5)	7.13E-01	(8)	< 0.25	u	< 0.25	u
Iron	5.48E+04	(1)	2.48E+05	(5)	6.96E+03	(8)	6,400	v	10,000	v
Lead	4.00E+02	(2)	8.00E+02	(6)	5.20E-02	(10)	0.72	v	1.6	v
Manganese	1.05E+04	(1)	4.64E+02	(5)	2.63E+03	(8)	180	v	**470**	v
Mercury (elemental)	2.38E+01	(1)	2.07E+01	(5)	2.09E+00	(8)	< 0.0063	u	< 0.0063	u
Nickel	1.56E+03	(1)	7.53E+02	(5)	4.85E+02	(8)	3.5	v	4.9	v
Selenium	3.91E+02	(1)	1.75E+03	(5)	5.17E+00	(10)	< 1.8009	u	< 1.8111	u
Silver	3.91E+02	(1)	1.77E+03	(5)	1.38E+01	(8)	< 0.062	u	< 0.0623	u
Vanadium	3.94E+02	(1)	6.14E+02	(5)	1.26E+03	(8)	11	v	14	v
Zinc	2.35E+04	(1)	1.06E+05	(5)	7.41E+03	(8)	7.5	v	10	v
Volatiles (mg/kg)										
1,1,1,2-Tetrachloroethane	2.81E+01	(1)	1.37E+02	(4)	3.60E-02	(8)	<0.0001	u	<0.0001	u
1,1,1-Trichloroethane	1.44E+04	(1)	1.36E+04	(5)	1.28E+00	(10)	<0.0001	u	<0.0001	u
1,1,2,2-Tetrachloroethane	7.98E+00	(1)	3.94E+01	(4)	4.81E-03	(8)	<0.0002	u	<0.0001	u
1,1,2-Trichloroethane	2.61E+00	(1)	2.30E+00	(5)	2.68E-02	(8)	<0.0001	u	<0.0001	u
1,1-Dichloroethane	7.86E+01	(1)	3.83E+02	(4)	1.36E-01	(8)	<0.0001	u	<0.0001	u
1,1-Dichloroethene	4.40E+02	(1)	4.24E+02	(5)	4.79E-02	(10)	<0.0001	u	<0.0001	u
1,1-Dichloropropene	-	-	-	-	-	-	<0.0002	u	<0.0001	u
Trichlorobenzene, 1,2,3-	6.30E+01	(2)	9.30E+02	(6)	4.20E-01	(9)	<0.0001	u	<0.0001	u
1,2,3-Trichloropropane	5.10E-02	(1)	1.21E+00	(4)	5.82E-05	(8)	<0.0003	u	<0.0003	u
1,2,4-Trichlorobenzene	8.29E+01	(1)	7.91E+01	(5)	3.10E+00	(8)	<0.0002	u	<0.0001	u
Trimethylbenzene, 1,2,4-	3.00E+02	(2)	1.80E+03	(6)	1.62E+00	(9)	<0.0002	u	<0.0002	u
1,2-Dibromo-3-chloropropane	8.58E-02	(1)	1.18E+00	(4)	1.39E-03	(8)	<0.0002	u	<0.0002	u
1,2-Dibromoethane (Ethylene dibromide)	6.72E-01	(1)	3.31E+00	(4)	2.36E-04	(10)	<0.0002	u	<0.0001	u
1,2-Dichlorobenzene	2.15E+03	(1)	2.50E+03	(5)	9.08E+00	(8)	<0.0002	u	<0.0001	u
1,2-Dichloroethane	8.32E+00	(1)	4.07E+01	(4)	2.38E-02	(8)	<0.0002	u	<0.0001	u
1,2-Dichloropropane	1.78E+01	(1)	2.54E+01	(5)	2.77E-02	(8)	<0.0002	u	<0.0001	u
Trimethylbenzene, 1,3,5-	2.70E+02	(2)	1.50E+03	(6)	1.74E+00	(9)	<0.0002	u	<0.0002	u
1,3-Dichlorobenzene	-	-	-	-	-	-	<0.0002	u	<0.0001	u
Dichloropropane, 1,3-	1.60E+03	(2)	2.30E+04	(6)	2.60E+00	(9)	<0.0001	u	<0.0001	u
1,4-Dichlorobenzene	1.29E+03	(1)	6.73E+03	(4)	1.12E+00	(8)	<0.0002	u	<0.0001	u
1-Methylnaphthalene	1.72E+02	(1)	8.13E+02	(4)	8.93E-01	(8)	0.0003	J	0.0003	J
2,2-Dichloropropane	-	-	-	-	-	-	<0.0001	u	<0.0001	u
2-Butanone (Methyl ethyl ketone, MEK)	3.74E+04	(1)	9.17E+04	(5)	2.01E+01	(8)	<0.0006	u	<0.0005	u
o-Chlorotoluene	1.56E+03	(1)	7.08E+03	(5)	3.56E+00	(8)	<0.0002	u	<0.0001	u
Hexanone, 2-	2.00E+02	(2)	1.30E+03	(6)	1.76E-01	(9)	<0.0003	u	<0.0002	u
2-Methylnaphthalene	2.32E+02	(1)	1.00E+03	(5)	2.76E+00	(8)	0.0004	J	0.0003	J
Chlorotoluene, p-	1.60E+03	(2)	2.30E+04	(6)	4.80E+00	(9)	<0.0002	u	<0.0002	u
4-Isopropyltoluene	-	-	-	-	-	-	<0.0002	u	<0.0002	u
Methyl isobutyl ketone	5.81E+03	(1)	2.02E+04	(5)	4.80E+00	(8)	<0.0005	u	<0.0004	u

Table 2
Soil Analytical Data
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Residential Soil Screening Level	Source	Non-Residential Soil Screening Level	Source	Leachate DAF (20) (mg/kg) SoilGW	Source	OW-59 (33-34')		OW-60 (20-22')	
					Lab ID		1706910-003		1706910-004	
					Sample Date		6/12/2017		6/13/2017	
Acetone	6.63E+04	(1)	2.42E+05	(5)	4.98E+01	(8)	0.0119	v	0.011	v
Benzene	1.78E+01	(1)	8.72E+01	(4)	4.18E-02	(8)	0.0019	v	0.0007	v
Bromobenzene	2.90E+02	(2)	1.80E+03	(6)	8.40E-01	(9)	<0.0002	u	<0.0002	u
Bromodichloromethane	6.19E+00	(1)	3.02E+01	(4)	6.21E-03	(8)	<0.0002	u	<0.0002	u
Tribromomethane (Bromoform)	6.74E+02	(1)	1.76E+03	(4)	1.47E-01	(8)	<0.0002	u	<0.0001	u
Bromomethane	1.77E+01	(1)	1.79E+01	(5)	3.43E-02	(8)	<0.0004	u	<0.0003	u
Carbon disulfide	1.55E+03	(1)	1.62E+03	(5)	4.42E+00	(8)	<0.0003	u	<0.0003	u
Carbon tetrachloride	1.07E+01	(1)	5.25E+01	(4)	3.67E-02	(8)	<0.0001	u	<0.0001	u
Chlorobenzene (Monochlorobenzene	3.78E+02	(1)	4.12E+02	(5)	1.08E+00	(8)	<0.0001	u	<0.0001	u
Ethyl chloride	1.90E+04	(1)	1.66E+04	(5)	1.07E+02	(8)	<0.0002	u	<0.0001	u
Chloroform	5.90E+00	(1)	2.87E+01	(4)	1.09E-02	(8)	<0.0002	u	<0.0001	u
Chloromethane	4.11E+01	(1)	2.01E+02	(4)	9.52E-02	(8)	<0.0002	u	<0.0002	u
cis-1,2-Dichloroethene	1.56E+02	(1)	7.08E+02	(5)	3.52E-01	(8)	<0.0002	u	<0.0001	u
cis-1,3-Dichloropropene	-	-	-	-	-	-	<0.0001	u	<0.0001	u
Dibromochloromethane	1.39E+01	(1)	6.74E+01	(4)	7.55E-03	(8)	<0.0001	u	<0.0001	u
Dibromomethane (Methylene Bromide)	2.40E+01	(2)	9.90E+01	(6)	4.20E-02	(9)	<0.0001	u	<0.0001	u
Dichlorodifluoromethane	1.82E+02	(1)	1.61E+02	(5)	7.23E+00	(8)	<0.0002	u	<0.0001	u
Ethylbenzene	7.51E+01	(1)	3.68E+02	(4)	1.23E+01	(8)	0.0003	J	0.0002	J
Hexachloro-1,3-butadiene	6.16E+01	(1)	5.21E+01	(4)	4.13E-02	(8)	<0.0002	u	<0.0002	u
Cumene (isopropylbenzene)	2.36E+03	(1)	2.74E+03	(5)	1.14E+01	(8)	<0.0002	u	<0.0002	u
tert-Butyl methyl ether (MTBE)	9.75E+02	(1)	4.82E+03	(4)	5.53E-01	(8)	0.0007	J	<0.0003	u
Methylene chloride (Dichloromethan	4.09E+02	(1)	1.21E+03	(5)	2.21E-02	(10)	<0.0003	u	<0.0003	u
Naphthalene	1.16E+03	(1)	5.02E+03	(5)	8.23E-02	(8)	0.0003	J	<0.0001	u
Butylbenzene, n-	3.90E+03	(2)	5.80E+04	(6)	6.40E+01	(9)	<0.0002	u	<0.0002	u
Propyl benzene	3.80E+03	(2)	2.40E+04	(6)	2.40E+01	(9)	<0.0002	u	<0.0002	u
Butylbenzene, sec-	7.80E+03	(2)	1.20E+05	(6)	1.18E+02	(9)	<0.0002	u	<0.0002	u
Styrene	7.26E+03	(1)	1.02E+04	(5)	1.71E+00	(10)	<0.0001	u	<0.0001	u
Butylbenzene, tert-	7.80E+03	(2)	1.20E+05	(6)	3.20E+01	(9)	<0.0002	u	<0.0002	u
Tetrachloroethene	1.11E+02	(1)	1.20E+02	(5)	3.98E-02	(10)	<0.0001	u	<0.0001	u
Toluene	5.23E+03	(1)	1.40E+04	(5)	1.11E+01	(10)	0.0008	v	0.0004	J
trans-1,2-Dichloroethene	2.95E+02	(1)	3.05E+02	(5)	5.03E-01	(8)	<0.0002	u	<0.0001	u
trans-1,3-Dichloropropene	-	-	-	-	-	-	<0.0001	u	<0.0001	u
Trichloroethylene	6.77E+00	(1)	6.90E+00	(5)	3.10E-02	(8)	<0.0001	u	<0.0001	u
Trichlorofluoromethane	1.23E+03	(1)	1.13E+03	(5)	1.57E+01	(8)	<0.0001	u	<0.0001	u
Vinyl chloride	7.42E-01	(1)	2.84E+01	(4)	1.34E-02	(8)	<0.0001	u	<0.0001	u
Xylenes	8.71E+02	(1)	7.98E+02	(5)	1.54E+02	(8)	0.001	J	0.0007	J
Semi-volatiles (mg/kg)										
1,2,4-Trichlorobenzene	8.29E+01	(1)	7.91E+01	(5)	3.10E+00	(8)	< 0.183	u	< 0.1838	u
1,2-Dichlorobenzene	2.15E+03	(1)	2.50E+03	(5)	9.08E+00	(8)	< 0.1492	u	< 0.1499	u
1,3-Dichlorobenzene	-	-	-	-	-	-	< 0.1377	u	< 0.1384	u
1,4-Dichlorobenzene	1.29E+03	(1)	6.73E+03	(4)	1.12E+00	(8)	< 0.1615	u	< 0.1622	u
1-Methylnaphthalene	1.72E+02	(1)	8.13E+02	(7)	8.93E-01	(8)	< 0.192	u	< 0.1929	u
2,4,5-Trichlorophenol	6.16E+03	(1)	2.69E+04	(5)	6.62E+01	(8)	< 0.1472	u	< 0.1479	u
2,4,6-Trichlorophenol	6.16E+01	(1)	2.69E+02	(5)	6.74E-01	(8)	< 0.1565	u	< 0.1572	u
2,4-Dichlorophenol	1.85E+02	(1)	8.07E+02	(5)	8.25E-01	(8)	< 0.1567	u	< 0.1575	u
2,4-Dimethylphenol	1.23E+03	(1)	5.38E+03	(5)	6.45E+00	(8)	< 0.0883	u	< 0.0887	u
2,4-Dinitrophenol	1.23E+02	(1)	5.38E+02	(5)	6.69E-01	(8)	< 0.1179	u	< 0.1184	u
2,4-Dinitrotoluene	1.71E+01	(1)	8.23E+01	(4)	4.92E-02	(8)	< 0.1855	u	< 0.1863	u
2,6-Dintitrotoluene	3.56E+00	(1)	1.72E+01	(4)	1.02E-02	(8)	< 0.1746	u	< 0.1754	u
b-Chloronaphthalene	6.26E+03	(1)	2.83E+04	(5)	5.70E+01	(8)	< 0.178	u	< 0.1788	u

Table 2
Soil Analytical Data
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Residential Soil Screening Level	Source	Non-Residential Soil Screening Level	Source	Leachate DAF (20) (mg/kg) SoilGW	Source	OW-59 (33-34')		OW-60 (20-22')	
					Lab ID		1706910-003		1706910-004	
					Sample Date		6/12/2017		6/13/2017	
2-Chlorophenol	3.91E+02	(1)	1.77E+03	(5)	1.15E+00	(8)	< 0.1437	u	< 0.1444	u
2-Methylnaphthalene	2.32E+02	(1)	1.00E+03	(5)	2.76E+00	(8)	< 0.1668	u	< 0.1676	u
Cresol, o-	3.20E+03	(2)	4.10E+04	(6)	1.50E+01	(9)	< 0.1469	u	< 0.1476	u
Nitroaniline, 2-	6.30E+02	(2)	8.00E+03	(6)	1.60E+00	(9)	< 0.1824	u	< 0.1832	u
2-Nitrophenol	-	-	-	-	-	-	< 0.1869	u	< 0.1878	u
3,3-Dichlorobenzidine	1.18E+01	(1)	5.70E+01	(4)	1.24E-01	(8)	< 0.1462	u	< 0.1469	u
3+4-Methylphenol	-	-	-	-	-	-	< 0.1338	u	< 0.1344	u
3-Nitroaniline	-	-	-	-	-	-	< 0.1774	u	< 0.1782	u
4,6-Dinitro-o-cresol	4.93E+00	(1)	2.15E+01	(5)	3.98E-02	(8)	< 0.1504	u	< 0.1511	u
4-Bromophenyl phenyl ether	-	-	-	-	-	-	< 0.162	u	< 0.1628	u
4-Chloro-3-methylphenol	-	-	-	-	-	-	< 0.1803	u	< 0.1812	u
Chloroaniline, p-	2.70E+01	(3)	1.10E+02	(7)	3.20E-03	(9)	< 0.1541	u	< 0.1549	u
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	< 0.1548	u	< 0.1555	u
Nitroaniline, 4-	2.70E+02	(3)	1.10E+03	(7)	3.20E-02	(9)	< 0.1687	u	< 0.1695	u
4-Nitrophenol	-	-	-	-	-	-	< 0.1542	u	< 0.1549	u
Acenaphthene	3.48E+03	(1)	1.51E+04	(5)	8.25E+01	(8)	< 0.163	u	< 0.1637	u
Acenaphthylene	-	-	-	-	-	-	< 0.1829	u	< 0.1837	u
Aniline	9.50E+02	(3)	4.00E+03	(7)	9.20E-02	(9)	< 0.1121	u	< 0.1127	u
Anthracene	1.74E+04	(1)	7.53E+04	(5)	8.51E+02	(8)	< 0.1813	u	< 0.1822	u
Azobenzene	5.60E+01	(3)	2.60E+02	(7)	1.86E+06	(9)	< 0.183	u	< 0.1839	u
Benzo(a)anthracene	1.53E+00	(1)	3.23E+01	(4)	6.37E-01	(8)	< 0.1704	u	< 0.1712	u
Benzo(a)pyrene	1.12E+00	(1)	2.36E+01	(4)	3.53E+00	(10)	< 0.1568	u	< 0.1575	u
Benzo(b)fluoranthene	1.53E+00	(1)	3.23E+01	(4)	6.17E+00	(8)	< 0.1892	u	< 0.1901	u
Benzo(g,h,i)perylene	-	-	-	-	-	-	< 0.1618	u	< 0.1626	u
Benzo(k)fluoranthene	1.53E+01	(1)	3.23E+02	(4)	6.05E+01	(8)	< 0.1494	u	< 0.1501	u
Benzoic acid	2.50E+05	(2)	3.30E+06	(6)	3.00E+02	(9)	< 0.1502	u	< 0.1509	u
Benzyl alcohol	6.30E+03	(2)	8.20E+04	(6)	9.60E+00	(9)	< 0.1665	u	< 0.1673	u
Bis(2-chloroethoxy)methane	1.90E+02	(2)	2.50E+03	(6)	2.60E-01	(9)	< 0.1795	u	< 0.1803	u
Bis(2-chloroethyl) ether	3.11E+00	(1)	1.95E+00	(5)	6.05E-04	(8)	< 0.1276	u	< 0.1281	u
Bis(2-chloroisopropyl) ether	9.93E+01	(1)	5.19E+02	(4)	4.75E-02	(8)	< 0.1981	u	< 0.199	u
Bis(2-ethylhexyl)phthalate [Di(2-ethylhexyl)phthalate, DEHP]	3.80E+02	(1)	1.83E+03	(4)	2.15E+01	(10)	0.21	J	0.25	J
Butyl Benzyl Phthalate	2.90E+03	(3)	1.20E+04	(7)	4.60E+00	(9)	< 0.1648	u	< 0.1656	u
Carbazole	-	-	-	-	-	-	< 0.1576	u	< 0.1584	u
Chrysene	1.53E+02	(1)	3.23E+03	(4)	1.86E+02	(8)	< 0.1496	u	< 0.1503	u
Dibenz(a,h)anthracene	1.53E-01	(1)	3.23E+00	(4)	1.97E+00	(8)	< 0.1596	u	< 0.1603	u
Dibenzofuran	-	-	-	-	-	-	< 0.1714	u	< 0.1722	u
Diethyl phthalate	4.93E+04	(1)	2.15E+05	(5)	9.79E+01	(8)	0.19	J	0.26	b
Dimethyl phthalate (DMP, Phthalic Acid)	6.16E+04	(1)	2.69E+05	(5)	3.57E+00	(8)	< 0.1858	u	< 0.1867	u
Di-n-butyl phthalate (Dibutyl phthalate)	6.16E+03	(1)	2.69E+04	(5)	3.38E+01	(8)	0.17	J	0.34	J
Di-n-octyl phthalate	-		-		-	-	< 0.1491	u	< 0.1498	u
Fluoranthene	2.32E+03	(1)	1.00E+04	(5)	1.34E+03	(8)	< 0.1655	u	< 0.1663	u
Fluorene	2.32E+03	(1)	1.00E+04	(5)	8.00E+01	(8)	< 0.152	u	< 0.1527	u
Hexachlorobenzene	3.33E+00	(1)	1.17E+02	(5)	1.89E-01	(8)	< 0.1831	u	< 0.184	u
Hexachloro-1,3-butadiene	6.16E+01	(1)	5.21E+01	(4)	4.13E-02	(8)	< 0.1694	u	< 0.1702	u
Hexachlorocyclopentadiene	2.30E+00	(1)	8.67E+02	(5)	2.40E+00	(8)	< 0.1584	u	< 0.1592	u
Hexachloroethane	1.33E+02	(1)	1.88E+02	(5)	3.20E-02	(8)	< 0.1434	u	< 0.144	u
Indeno(1,2,3-c,d)pyrene	1.53E+00	(1)	3.23E+01	(4)	2.01E+01	(8)	< 0.164	u	< 0.1648	u
Isophorone	5.61E+03	(1)	2.70E+04	(4)	0.00E+00	(9)	< 0.1902	u	< 0.1911	u

Table 2
Soil Analytical Data
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Residential Soil Screening Level	Source	Non-Residential Soil Screening Level	Source	Leachate DAF (20) (mg/kg) SoilGW	Source	OW-59 (33-34')		OW-60 (20-22')	
					Lab ID		1706910-003		1706910-004	
					Sample Date		6/12/2017		6/13/2017	
Naphthalene	1.16E+03	(1)	5.02E+03	(5)	8.23E-02	(8)	< 0.1845	u	< 0.1854	u
Nitrobenzene	6.04E+01	(1)	2.93E+02	(4)	1.44E-02	(8)	< 0.1654	u	< 0.1661	u
Nitroso-di-N-propylamine, N-	7.80E-01	(3)	3.30E+00	(7)	1.62E-04	(9)	< 0.1759	u	< 0.1767	u
N-Nitrosodiphenylamine	1.09E+03	(1)	5.24E+03	(4)	1.00E+01	(8)	< 0.1908	u	< 0.1917	u
Pentachlorophenol	9.85E+00	(1)	4.45E+01	(4)	1.52E-01	(8)	< 0.1705	u	< 0.1713	u
Phenanthrene	1.74E+03	(1)	7.53E+03	(5)	8.59E+01	(8)	< 0.1756	u	< 0.1764	u
Phenol	1.85E+04	(1)	7.74E+04	(5)	5.23E+01	(8)	< 0.1375	u	< 0.1381	u
Pyrene	1.74E+03	(1)	7.53E+03	(5)	1.92E+02	(8)	< 0.1493	u	< 0.15	u
Pyridine	7.80E+01	(2)	1.20E+03	(6)	1.36E-01	(9)	< 0.1322	u	< 0.1328	u
Total Petroleum Hydrocarbons (mg/kg)										
Gasoline Range Organics (GRO)	1.00E+03	(11)	3.80E+03	(11)	4.61E+03	(11)	< 1.1271	u	< 1.1271	u
Diesel Range Organics (DRO)	1.00E+03	(11)	3.80E+03	(11)	4.61E+03	(11)	< 1.529	u	< 1.5232	u
Motor Oil Range Organics (MRO)	1.00E+03	(11)	3.80E+03	(11)	4.61E+03	(11)	< 47.4834	u	< 47.3037	u

- No screening level or analytical result available
NMED - Risk Assessment Guidance for Site Investigations and Remediation (March 2019)
EPA - Regional Screening Levels (Nov. 2018)
(1) NMED Residential Screening Level
(2) EPA Residential Screening Level
(3) EPA Residential - Screening Levels multiplied by 10 pursuant to Section IV.D.2 of the Oct. 31, 2013 RCRA Post-Closure Permit because the constituent is listed as carcinogenic
(4) NMED Industrial Occupational Screening Level
(5) NMED Construction Worker Screening Level
(6) EPA Industrial - Screening Levels
(7) EPA Industrial - Screening Levels multiplied by 10 pursuant to Section IV.D.2 of the Oct. 31, 2013 RCRA Post-Closure Permit because the constituent is listed as carcinogenic
(8) SoilGW NMED Cw Dilution Attenuation Factor (DAF) = 20
(9) SoilGW Risk-based EPA DAF = 20
(10) SoilGW MCL-based NMED DAF = 20
(11) NMED Tables 6-2 and 6-4 TPH Soil Screening Levels "unknown oil" - see report Section 5 for use of screening levels

Bold represents value above Non-Residential Screening Level
yellow highlight represents value above Leachate (DAF) Screening Level
Bold with yellow highlight value exceeds Residential Screening Level and DAF

v = reportable detection above the Practical quantitation limit (PQL)
u - result is not detected at method detection limit (MDL)
J - estimated result at concentration above MDL but less than PQL

Table 3
Groundwater Analytical Results Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	BW-4B		BW-5B		BW-5C		OW-59		OW-60	
Lab ID			1706G62-003		1706G62-005		1706G62-004		1706G62-007		1706G62-001	
Sample Date			6/28/2017		6/28/2017		6/28/2017		6/28/2017		6/28/2017	
Metals (ug/l) TOTAL												
Antimony	6	(3)	<1.86	u	<1.86	u	<1.86	u	<1.86	u	<1.86	u
Arsenic	10	(3)	**12**	Z	2.8	J	<1.49	u	**11**	Z	8.1	v
Barium	2000	(3)	**4700**	Z	73	v	210	v	350	v	1600	v
Beryllium	4	(3)	**48**	Z	<0.26	u	<0.26	u	1.5	J	**4.6**	Z
Cadmium	5	(3)	<2.91	u	<0.58	u	<0.58	u	<0.58	u	<0.58	u
Chromium	50	(3)	**170**	Z	3	J	<1.09	u	14	v	48	v
Cobalt	50	(3)	**79**	v	1	J	1.2	J	8	v	21	v
Cyanide	200	(3)	<5	u	<5	u	<5	u	26.8	v	<5	u
Iron	1000	(3)	**82000**	Z	**1500**	Z	740	Z	**9700**	Z	**28000**	Z
Lead	15	(3)	**200**	Z	0.93	J	<0.48	u	9.4	v	**31**	Z
Manganese	200	(3)	**5600**	Z	26	v	130	Z	**1200**	Z	**2200**	Z
Mercury	2	(3)	0.24	v	0.07	J	0.18	J	0.08	J	0.1	J
Nickel	372	(4)	**540**	Z	<3.61	u	<3.61	u	20	v	47	v
Selenium	50	(3)	<7.11	u	4.4	J	4.9	J	15	v	13	v
Silver	50	(3)	<2.09	u	<0.42	u	<0.42	u	<0.42	u	<0.42	u
Vanadium	63.1	(4)	**140**	J	22	J	2.9	J	26	J	**70**	v
Zinc	10000	(3)	3400	v	3.8	J	3.6	J	32	v	71	v
Chloride	250000	(3)	73000	v	50000	v	**1400000**	Z	**2000000**	Z	**1600000**	Z
Fluoride	1600	(3)	1300	v	280	J	<218.5	u	<218.5	u	<218.5	u
Sulfate	600000	(3)	230000	v	100000	v	220000	v	**3000000**	Z	**740000**	Z
Metals (ug/l) DISSOLVED												
Antimony (D)	6	(3)	**NS**		<0.17	u	<0.17	u	1	J	0.28	J
Arsenic (D)	10	(3)	**NS**		2.4	v	1.9	J	9.4	J	4.4	J
Barium (D)	2000	(3)	**NS**		52	v	210	v	14	v	44	v
Beryllium (D)	4	(3)	**NS**		<0.29	u	<0.29	u	0.39	J	0.45	J
Cadmium (D)	5	(3)	**NS**		<1	u	<1	u	<1	u	<0.58	u
Calcium (D)	-	-	**NS**		2800	v	64000	v	210000	v	170000	v
Chromium (D)	50	(3)	**NS**		1.8	J	1.6	J	<1.01	u	<1.09	u
Cobalt (D)	50	(3)	**NS**		<1.59	u	<1.59	u	3.5	J	1.9	J
Cyanide (D)	200	(3)	**NS**		-		-		-		-	
Iron (D)	1000	(3)	**NS**		110	v	<16.45	u	30	v	<10.21	u
Lead (D)	15	(3)	**NS**		<0.00013	J	<0.00013	u	<0.84	u	<0.84	u
Magnesium (D)	-	-	**NS**		350	J	8300	v	65000	v	33000	v
Manganese (D)	200	(3)	**NS**		8.2	v	120	Z	**670**	Z	**550**	Z
Nickel (D)	372	(4)	**NS**		<1.07	u	4.9	J	10	v	6.1	J
Potassium (D)	-	-	**NS**		850	J	3500	v	1700	v	5000	v
Selenium (D)	50	(3)	**NS**		5.3	v	6.8	v	23	v	14	v
Sodium (D)	-	-	**NS**		260000	v	950000	v	2400000	v	1100000	v
Silver (D)	50	(3)	**NS**		<0.88	u	<0.88	u	<0.88	u	<0.42	u
Vanadium (D)	63.1	(4)	**NS**		18	J	<1.94	u	4.2	J	6.6	J
Zinc (D)	10000	(3)	**NS**		12	v	11	v	13	v	11	v
Volatiles (ug/l)												
1,1,1,2-Tetrachloroethane	5.74	(4)	<0.21	u	<0.1	u	<0.1	u	<0.1	u	<0.1	u
1,1,1-Trichloroethane	200	(3)	<0.15	u	<0.07	u	<0.07	u	<0.07	u	<0.07	u
1,1,2,2-Tetrachloroethane	10	(3)	<0.27	u	<0.14	u	<0.14	u	<0.14	u	<0.14	u
1,1,2-Trichloroethane	5	(3)	<0.28	u	<0.14	u	<0.14	u	<0.14	u	<0.14	u
1,1-Dichloroethane	25	(3)	<0.8	u	<0.4	u	0.61	J	<0.4	u	<0.4	u
1,1-Dichloroethene	7	(3)	<0.16	u	<0.08	u	<0.08	u	<0.08	u	<0.08	u
1,1-Dichloropropene	-	-	<0.19	u	<0.09	u	<0.09	u	<0.09	u	<0.09	u
1,2,3-Trichlorobenzene	7	(1)	<0.23	u	<0.12	u	<0.12	u	<0.12	u	<0.12	u
1,2,3-Trichloropropane	0.00835	(4)	<0.78	u	<0.39	u	<0.39	u	<0.39	u	<0.39	u

Table 3
Groundwater Analytical Results Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	BW-4B		BW-5B		BW-5C		OW-59		OW-60	
Lab ID			1706G62-003		1706G62-005		1706G62-004		1706G62-007		1706G62-001	
Sample Date			6/28/2017		6/28/2017		6/28/2017		6/28/2017		6/28/2017	
1,2,4-Trichlorobenzene (V)	70	(3)	<0.28	u	<0.14	u	<0.14	u	<0.14	u	<0.14	u
1,2,4-Trimethylbenzene	56	(1)	<0.23	u	<0.11	u	<0.11	u	0.13	J	<0.11	u
1,2-Dibromo-3-chloropropane	0.2	(2)	<2.77	u	<1.39	u	<1.39	u	<1.39	u	<1.39	u
1,2-Dibromoethane (EDB)	0.05	(3)	<0.26	u	<0.13	u	<0.13	u	<0.13	u	<0.13	u
1,2-Dichlorobenzene (V)	600	(3)	<0.18	u	<0.09	u	<0.09	u	<0.09	u	<0.09	u
1,2-Dichloroethane (EDC)	5	(3)	<0.8	u	<0.4	u	0.57	J	<0.4	u	<0.4	u
1,2-Dichloropropane	5	(3)	<0.2	u	<0.1	u	<0.1	u	<0.1	u	<0.1	u
1,3,5-Trimethylbenzene	60	(1)	<0.17	u	<0.09	u	<0.09	u	<0.09	u	<0.09	u
1,3-Dichlorobenzene (V)	-	-	<0.3	u	<0.15	u	<0.15	u	<0.15	u	<0.15	u
1,3-Dichloropropane	370	(1)	<0.33	u	<0.17	u	<0.17	u	<0.17	u	<0.17	u
1,4-Dichlorobenzene (V)	75	(2)	<0.8	u	<0.4	u	<0.4	u	<0.4	u	<0.4	u
1-Methylnaphthalene (V)	11.37	(4)	<0.32	u	<0.16	u	<0.16	u	<0.16	u	<0.16	u
2,2-Dichloropropane	-	-	<0.31	u	<0.16	u	<0.16	u	<0.16	u	<0.16	u
2-Butanone	5564	(4)	<2.26	u	<1.13	u	<1.13	u	<1.13	u	<1.13	u
2-Chlorotoluene	233	(4)	<0.8	u	<0.4	u	<0.4	u	<0.4	u	<0.4	u
2-Hexanone	38	(1)	<1.31	u	<0.66	u	<0.66	u	<0.66	u	<0.66	u
2-Methylnaphthalene (V)	35.11	(4)	<0.3	u	<0.15	u	<0.15	u	<0.15	u	<0.15	u
4-Chlorotoluene	250	(1)	<0.8	u	<0.4	u	<0.4	u	<0.4	u	<0.4	u
4-Isopropyltoluene	-	-	<0.19	u	<0.1	u	<0.1	u	<0.1	u	0.21	J
4-Methyl-2-pentanone	1243	(4)	<1.41	u	<0.71	u	<0.71	u	<0.71	u	<0.71	u
Acetone	14063	(4)	10	J	3.1	J	5.4	J	6	J	13	v
Benzene	5	(3)	<0.12	u	<0.06	u	<0.06	u	<0.06	u	<0.06	u
Bromobenzene	62	(1)	<0.28	u	<0.14	u	<0.14	u	<0.14	u	<0.14	u
Bromodichloromethane	1.34	(4)	<0.35	u	<0.18	u	<0.18	u	<0.18	u	<0.18	u
Bromoform	32.85	(4)	<0.42	u	<0.21	u	<0.21	u	<0.21	u	<0.21	u
Bromomethane	7.54	(4)	<0.51	u	<0.26	u	<0.26	u	<0.26	u	<0.26	u
Carbon disulfide	810	(4)	<0.8	u	<0.4	u	<0.4	u	<0.4	u	<0.4	u
Carbon Tetrachloride	5	(3)	<0.22	u	<0.11	u	<0.11	u	<0.11	u	<0.11	u
Chlorobenzene	100	(2)	<0.21	u	<0.11	u	<0.11	u	<0.11	u	<0.11	u
Chloroethane	20900	(4)	<0.47	u	<0.23	u	<0.23	u	<0.23	u	<0.23	u
Chloroform	100	(3)	<0.8	u	<0.4	u	<0.4	u	<0.4	u	<0.4	u
Chloromethane	20.3	(4)	<0.59	u	<0.29	u	<0.29	u	<0.29	u	<0.29	u
cis-1,2-DCE	70	(3)	<0.41	u	<0.2	u	<0.2	u	<0.2	u	<0.2	u
cis-1,3-Dichloropropene	4.71	(4)	<0.16	u	<0.08	u	<0.08	u	<0.08	u	<0.08	u
Dibromochloromethane	1.68	(4)	<0.14	u	<0.07	u	<0.07	u	<0.07	u	<0.07	u
Dibromomethane	8.3	(1)	<0.18	u	<0.09	u	<0.09	u	<0.09	u	<0.09	u
Dichlorodifluoromethane	197	(4)	<2	u	<1	u	<1	u	<1	u	<1	u
Ethylbenzene	700	(3)	<0.19	u	<0.09	u	<0.09	u	<0.09	u	<0.09	u
Hexachlorobutadiene (V)	1.39	(4)	<1.6	u	<0.8	u	<0.8	u	<0.8	u	<0.8	u
Isopropylbenzene	447	(4)	<0.1	u	<0.05	u	<0.05	u	<0.05	u	<0.05	u
Methyl tert-butyl ether (MTBE)	100	(4)	<0.48	u	<0.24	u	38	v	6.8	v	0.86	J
Methylene Chloride	5	(3)	<0.22	u	<0.11	u	<0.11	u	<0.11	u	<0.11	u
Naphthalene (V)	30	(3)	<0.23	u	<0.11	u	<0.11	u	<0.11	u	<0.11	u
n-Butylbenzene	-	-	<0.26	u	<0.13	u	<0.13	u	<0.13	u	<0.13	u
n-Propylbenzene	-	-	<0.15	u	<0.07	u	<0.07	u	<0.07	u	<0.07	u
sec-Butylbenzene	-	-	<0.22	u	<0.11	u	<0.11	u	<0.11	u	<0.11	u
Styrene	100	(3)	<0.31	u	<0.16	u	<0.16	u	<0.16	u	<0.16	u
tert-Butylbenzene	-	-	<0.21	u	<0.1	u	<0.1	u	<0.1	u	<0.1	u
Tetrachloroethene (PCE)	5	(3)	<0.26	u	<0.13	u	<0.13	u	<0.13	u	<0.13	u
Toluene	1000	(3)	<0.13	u	0.23	J	<0.06	u	<0.06	u	0.24	J
trans-1,2-DCE	100	(3)	<0.37	u	<0.18	u	<0.18	u	<0.18	u	<0.18	u
trans-1,3-Dichloropropene	4.71	(4)	<0.44	u	<0.22	u	<0.22	u	<0.22	u	<0.22	u

Table 3
Groundwater Analytical Results Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	BW-4B		BW-5B		BW-5C		OW-59		OW-60	
Lab ID			1706G62-003		1706G62-005		1706G62-004		1706G62-007		1706G62-001	
Sample Date			6/28/2017		6/28/2017		6/28/2017		6/28/2017		6/28/2017	
Trichloroethene (TCE)	5	(3)	<0.22	u	<0.11	u	<0.11	u	<0.11	u	<0.11	u
Trichlorofluoromethane	1140	(4)	<0.37	u	<0.18	u	<0.18	u	<0.18	u	<0.18	u
Vinyl chloride	2	(3)	<0.36	u	<0.18	u	<0.18	u	<0.18	u	<0.18	u
Xylenes, Total	620	(3)	<0.64	u	<0.32	u	<0.32	u	<0.32	u	<0.32	u
Semivolatiles (ug/l)												
1,2,4-Trichlorobenzene	70	(2)	<21.28	u	<2.13	u	<2.13	u	<2.13	u	<2.13	u
1,2-Dichlorobenzene	600	(3)	<20.1	u	<2.01	u	<2.01	u	<2.01	u	<2.01	u
1,3-Dichlorobenzene	-	-	<18.27	u	<1.83	u	<1.83	u	<1.83	u	<1.83	u
1,4-Dichlorobenzene	75	(3)	<21.37	u	<2.14	u	<2.14	u	<2.14	u	<2.14	u
1-Methylnaphthalene	11.38	(4)	<33.08	u	<3.31	u	<3.31	u	<3.31	u	<3.31	u
2,4,5-Trichlorophenol	1166	(4)	<51	u	<5.1	u	<5.1	u	<5.1	u	<5.1	u
2,4,6-Trichlorophenol	11.9	(4)	<55	u	<5.5	u	<5.5	u	<5.5	u	<5.5	u
2,4-Dichlorophenol	45.3	(4)	<56.81	u	<5.68	u	<5.68	u	<5.68	u	<5.68	u
2,4-Dimethylphenol	354	(4)	<28.29	u	<2.83	u	<2.83	u	<2.83	u	<2.83	u
2,4-Dinitrophenol	38.7	(4)	<25.79	u	<2.58	u	<2.58	u	<2.58	u	<2.58	u
2,4-Dinitrotoluene	2.37	(4)	<39.66	u	<3.97	u	<3.97	u	<3.97	u	<3.97	u
2,6-Dinitrotoluene	0.485	(4)	<44.92	u	<4.49	u	<4.49	u	<4.49	u	<4.49	u
2-Chloronaphthalene	733	(4)	<36.96	u	<3.7	u	<3.7	u	<3.7	u	<3.7	u
2-Chlorophenol	91	(4)	<75.34	u	<7.53	u	<7.53	u	<7.53	u	<7.53	u
2-Methylnaphthalene	35.1	(4)	<32.65	u	<3.27	u	<3.27	u	<3.27	u	<3.27	u
2-Methylphenol	930	(1)	<33.03	u	<3.3	u	<3.3	u	<3.3	u	<3.3	u
2-Nitroaniline	190	(1)	<49.46	u	<4.95	u	<4.95	u	<4.95	u	<4.95	u
2-Nitrophenol	-	-	<51.95	u	<5.19	u	<5.19	u	<5.19	u	<5.19	u
3,3´-Dichlorobenzidine	1.25	(4)	<39.18	u	<3.92	u	<3.92	u	<3.92	u	<3.92	u
3+4-Methylphenol	930	(1)	<32.07	u	<3.21	u	<3.21	u	<3.21	u	<3.21	u
3-Nitroaniline	-	-	<43.42	u	<4.34	u	<4.34	u	<4.34	u	<4.34	u
4,6-Dinitro-2-methylphenol	1.52	(4)	<38.67	u	<3.87	u	<3.87	u	<3.87	u	<3.87	u
4-Bromophenyl phenyl ether	-	-	<46.2	u	<4.62	u	<4.62	u	<4.62	u	<4.62	u
4-Chloro-3-methylphenol	-	-	<63.41	u	<6.34	u	<6.34	u	<6.34	u	<6.34	u
4-Chloroaniline	3.7	(5)	<35.17	u	<3.52	u	<3.52	u	<3.52	u	<3.52	u
4-Chlorophenyl phenyl ether	-	-	<36.15	u	<3.61	u	<3.61	u	<3.61	u	<3.61	u
4-Nitroaniline	38	(5)	<40.33	u	<4.03	u	<4.03	u	<4.03	u	<4.03	u
4-Nitrophenol	-	-	<54.78	u	<5.48	u	<5.48	u	<5.48	u	<5.48	u
Acenaphthene	535	(4)	<36.15	u	<3.61	u	<3.61	u	<3.61	u	<3.61	u
Acenaphthylene	-	-	<35.31	u	<3.53	u	<3.53	u	<3.53	u	<3.53	u
Aniline	130	(5)	<30.59	u	<3.06	u	<3.06	u	<3.06	u	<3.06	u
Anthracene	1721	(4)	<35.37	u	<3.54	u	<3.54	u	<3.54	u	<3.54	u
Azobenzene	1.2	(5)	<45.33	u	<4.53	u	<4.53	u	<4.53	u	<4.53	u
Benz(a)anthracene	0.12	(4)	<38.66	u	<3.87	u	<3.87	u	<3.87	u	<3.87	u
Benzo(a)pyrene	0.2	(3)	<39.92	u	<3.99	u	<3.99	u	<3.99	u	<3.99	u
Benzo(b)fluoranthene	0.343	(4)	<39.52	u	<3.95	u	<3.95	u	<3.95	u	<3.95	u
Benzo(g,h,i)perylene	-	-	<40.38	u	<4.04	u	<4.04	u	<4.04	u	<4.04	u
Benzo(k)fluoranthene	3.43	(4)	<43.87	u	<4.39	u	<4.39	u	<4.39	u	<4.39	u
Benzoic acid	75000	(1)	93	J	8.2	J	7.9	J	8.3	J	7.8	J
Benzyl alcohol	2000	(1)	<45.91	u	<4.59	u	<4.59	u	<4.59	u	<4.59	u
Bis(2-chloroethoxy)methane	59	(1)	<43.22	u	<4.32	u	<4.32	u	<4.32	u	<4.32	u
Bis(2-chloroethyl)ether	0.1365	(4)	<43.28	u	<4.33	u	<4.33	u	<4.33	u	<4.33	u
Bis(2-chloroisopropyl)ether	9.81	(4)	<38.74	u	<3.87	u	<3.87	u	<3.87	u	<3.87	u
Bis(2-ethylhexyl)phthalate	6	(2)	<48.24	u	<4.82	u	<4.82	u	<4.82	u	5.1	J
Butyl benzyl phthalate	160	(5)	<46.27	u	<4.63	u	<4.63	u	<4.63	u	<4.63	u
Carbazole	-	-	<45.82	u	<4.58	u	<4.58	u	<4.58	u	<4.58	u
Chrysene	34.3	(4)	<38.19	u	<3.82	u	<3.82	u	<3.82	u	<3.82	u

Table 3
Groundwater Analytical Results Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	BW-4B		BW-5B		BW-5C		OW-59		OW-60	
Lab ID			1706G62-003		1706G62-005		1706G62-004		1706G62-007		1706G62-001	
Sample Date			6/28/2017		6/28/2017		6/28/2017		6/28/2017		6/28/2017	
Dibenz(a,h)anthracene	0.0343	(4)	<46.4	u	<4.64	u	<4.64	u	<4.64	u	<4.64	u
Dibenzofuran	7.9	(1)	<40.75	u	<4.08	u	<4.08	u	<4.08	u	<4.08	u
Diethyl phthalate	14800	(4)	<40.49	u	<4.05	u	<4.05	u	<4.05	u	<4.05	u
Dimethyl phthalate	611.56	(4)	<35.78	u	<3.58	u	<3.58	u	<3.58	u	<3.58	u
Di-n-butyl phthalate	885	(4)	<50.34	u	<5.03	u	<5.03	u	<5.03	u	<5.03	u
Di-n-octyl phthalate	-	-	<46.77	u	<4.68	u	5	J	<4.68	u	<4.68	u
Fluoranthene	802	(4)	<42.64	u	<4.26	u	<4.26	u	<4.26	u	<4.26	u
Fluorene	288	(4)	<40.08	u	<4.01	u	<4.01	u	<4.01	u	<4.01	u
Hexachlorobenzene	1	(2)	<38.49	u	<3.85	u	<3.85	u	<3.85	u	<3.85	u
Hexachlorobutadiene	1.39	(4)	<13.49	u	<1.35	u	<1.35	u	<1.35	u	<1.35	u
Hexachlorocyclopentadiene	50	(2)	<12.74	u	<1.27	u	<1.27	u	<1.27	u	<1.27	u
Hexachloroethane	3.28	(4)	<11.99	u	<1.2	u	<1.2	u	<1.2	u	<1.2	u
Indeno(1,2,3-cd)pyrene	0.343	(4)	<41.62	u	<4.16	u	<4.16	u	<4.16	u	<4.16	u
Isophorone	780.63	(4)	<43.58	u	<4.36	u	<4.36	u	<4.36	u	<4.36	u
Naphthalene	1.65	(4)	<28.73	u	<2.87	u	<2.87	u	<2.87	u	<2.87	u
Nitrobenzene	1.4	(4)	<35.87	u	<3.59	u	<3.59	u	<3.59	u	<3.59	u
N-Nitrosodimethylamine	0.00167	(4)	<35.01	u	<3.5	u	<3.5	u	<3.5	u	<3.5	u
N-Nitrosodi-n-propylamine	0.11	(5)	<45.68	u	<4.57	u	<4.57	u	<4.57	u	<4.57	u
N-Nitrosodiphenylamine	121.92	(4)	<38.86	u	<3.89	u	<3.89	u	<3.89	u	<3.89	u
Phenanthrene	170	(4)	<43.44	u	<4.34	u	<4.34	u	<4.34	u	<4.34	u
Pentachlorophenol	1	(3)	<49.21	u	<4.92	u	<4.92	u	<4.92	u	<4.92	u
Phenol	5760	(4)	<31.14	u	<3.11	u	<3.11	u	<3.11	u	<3.11	u
Pyrene	117	(4)	<44.33	u	<4.43	u	<4.43	u	<4.43	u	<4.43	u
Pyridine	20	(1)	<22.96	u	<2.3	u	<2.3	u	<2.3	u	<2.3	u
TPH (mg/l)												
Gasoline Range Organics (GRO	0.0858	(6)	< 0.05	v	< 0.025	u	0.039	J	**0.23**	v	< 0.025	v
Diesel Range Organics (DRO)	0.0858	(6)	**0.47**	J	**0.74**	J	< 0.36	u	**0.56**	J	< 0.36	u
Motor Oil Range Organics (MR	0.0858	(6)	< 5	u	< 5	u	< 5	u	< 5	u	< 5	u

- No screening level or analytical result available

450 - bolded value exceeds screening level

(1) EPA - Regional Screening Levels (November 2018) -Tap Water

(2) EPA - Regional Screening Levels (November 2018) - MCL

(3) NMED WQCC standards - Title 20 Chapter 6, Part 2, - 20.6.2.3101 Standards for Ground Water of 10,000 mg/l TDS Concentration or less (December 2018)

(4) NMED Tap Water Screening Level - Risk Assessment Guidance for Site Investigations and Remediation (February 2019)

(5) EPA Screening Level - Tap Water x 10 for carcinogenic compounds

(6) NMED SSG (March 2019)

v = reportable detection above the Practical quantitation limit (PQL)

u - result is not detected at method detection limit (MDL)

j - estimated result at concentration above MDL but less than PQL

z - concentration exceeds MCL

Table 4
SMW-2 Area Additional Sampling
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Sample Location			OW-59		OW-60		SMW-2		SMW-4		Evaporation Pond #2		Evaporation Pond #3	
Lab Sample ID			1706G62-007		1706G62-001		1706G37-001		1706G37-002		1706G37-003		1706G37-002	
Sample Date			6/28/2017		6/28/2017		6/28/2017		6/28/2017		6/28/2017		6/28/2017	
Parameter	Screening Level	Source												
Method E300 (mg/L) Total														
Bromide	NE	-	3.6	v	2.4	v	2.8	v	0.26	J	1.9	v	2.3	v
Chloride	250	4	**2000**	Z	**1600**	Z	**2600**	v	63	v	**5000**	v	**7100**	v
Fluoride	1.6	4	<0.2185	u	<0.2185	u	<0.2185	u	1.1	v	**18**	Z	**16**	Z
Nitrate+Nitrite as N	10	6	<0.26	u	3	v	<0.26	u	0.21	J	1.1	J	1.1	J
Phosphorus, Orthophosphate (As P)	NE	-	<5	u	<1.25	u	<5	u	<1.25	u	<2.5	u	<2.5	u
Sulfate	600	4	**3000**	Z	**740**	Z	**1500**	v	180	v	**1400**	v	**1800**	v
Method E200.7 (mg/L) Dissolved														
Calcium - E200.7	NE	-	210	v	170	v	300	v	4.5	v	410	v	540	v
Magnesium	NE	-	65	v	33	v	90	v	1.2	v	100	v	150	v
Potassium	NE	-	1.7	v	5	v	0.75	J	0.52	J	140	v	230	v
Sodium	NE	-	2400	v	1100	v	2300	v	310	v	3100	v	4300	v

NE - Not Established

450 - bolded value exceeds screening level

(1) EPA - Regional Screening Levels (November 2018) - Tap Water

(2) EPA - Regional Screening Levels (November 2018) - MCL

(3) NMED WQCC standards - Title 20 Chapter 6, Part 2, - 20.6.2.3101 Standards for Ground Water of 10,000 mg/l TDS Concentration or less (December 2018)

(4) NMED Tap Water Screening Level - Risk Assessment Guidance for Site Investigations and Remediation (February 2019)

(5) EPA Screening Level - Tap Water x 10 for carcinogenic compounds

(6) 40 CFR 141.61 MCL (November 2015)

v = reportable detection above the Practical quantitation limit (PQL)

u - result is not detected at method detection limit (MDL)

J - estimated result at concentration above MDL but less than PQL

Z - concentration exceeds MCL

Table 5
Groundwater and Surface Water Field Measurements
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

WELL	DATE	DEPTH TO GROUNDWATER (ft BTOC)	TEMPERATURE °C	SPECIFIC CONDUCTIVITY (uS/cm)	DISSOLVED OXYGEN (mg/L)	pH	OXYGEN REDUCTION POTENTIAL
BW-4A	06/28/17	ND	Well was not sampled due to insufficient groundwater volume.				
BW-4B	06/28/17	51.65	16.3	1458	3.66	8.87	11.2
BW-5A	06/28/17	23.21	Well was not sampled due to insufficient groundwater volume.				
BW-5B	06/28/17	20.60	18.0	1155	6.04	8.80	48
BW-5C	06/28/17	2.70	20.2	5274	1.83	7.65	-28.0
OW-59	06/28/17	26.15	15.4	11067	9.61	7.40	111.1
OW-60	06/28/17	33.15	16.3	6189	8.12	7.43	98.1
SMW-2	06/28/17	24.80	16.3	11232	5.24	7.08	117.7
SMW-4	06/28/17	32.13	16.2	1384	4.37	8.44	86.7
EP-2	06/28/17	NA	22.9	16175	1.31	8.17	-212.7
EP-3	06/28/17	NA	23.6	22127	1.33	8.17	-56.7

ND - not detected
NA - not applicable
ft BTOC - feet below top of casing

Table 6
Groundwater Gauging Results
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

WELL	STICKUP (ft ABGL)	DATE	DATUM	DEPTH TO GROUNDWATER (ft BGL)	DEPTH TO GROUNDWATER (ft BTOC)	COMMENTS
BW-4A	-	06/15/17	BGL	ND	NA	COLLECTED FROM INSIDE THE AUGERS
	3.00	06/16/17	BTOC	ND	ND	
	3.00	06/19/17	BTOC	ND	ND	
	3.00	06/26/17	BTOC	ND	ND	
	3.00	06/28/17	BTOC	ND	ND	
BW-4B	-	06/19/17	BGL	71.00	NA	COLLECTED FROM INSIDE THE AUGERS
	-	06/19/17	BGL	69.50	NA	COLLECTED FROM INSIDE THE AUGERS
	3.00	06/27/17	BTOC	27.92	30.92	PRIOR TO DEVELOPMENT
	3.00	06/27/17	BTOC	60.88	63.88	IMMEDIATELY AFTER WELL DEVELOPMENT
	3.00	06/28/17	BTOC	48.65	51.65	PRIOR TO SAMPLING
BW-5A	3.00	06/26/17	BTOC	19.80	22.80	PRIOR TO DEVELOPMENT
	3.00	06/26/17	BTOC	20.20	23.20	IMMEDIATELY AFTER WELL DEVELOPMENT
	3.00	06/27/17	BTOC	20.21	23.21	
BW-5B	3.00	06/26/17	BTOC	26.80	29.80	
	3.00	06/27/17	BTOC	10.50	13.50	PRIOR TO DEVELOPMENT
	3.00	06/27/17	BTOC	58.10	61.10	IMMEDIATELY AFTER WELL DEVELOPMENT
	3.00	06/28/17	BTOC	17.60	20.60	PRIOR TO SAMPLING
BW-5C	-	06/20/17	BGL	ND	ND	COLLECTED FROM INSIDE THE AUGERS-TD@47.80'
	-	06/22/17	BGL	11.40	NA	COLLECTED FROM INSIDE THE AUGERS
	3.00	06/23/17	BTOC	0.70 ft ABGL	2.30	
	3.00	06/26/17	BTOC	0.58 ft ABGL	2.42	
	3.00	06/27/17	BTOC	0.56 ft ABGL	2.44	PRIOR TO DEVELOPMENT
	3.00	06/27/17	BTOC	44.90	47.90	IMMEDIATELY AFTER WELL DEVELOPMENT
	3.00	06/27/17	BTOC	0.30 ft ABGL	2.70	PRIOR TO SAMPLING

Table 6
Groundwater Gauging Results
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

WELL	STICKUP (ft ABGL)	DATE	DATUM	DEPTH TO GROUNDWATER (ft BGL)	DEPTH TO GROUNDWATER (ft BTOC)	COMMENTS
OW-59	-	06/13/17	BGL	24 ft BGL	NA	COLLECTED FROM INSIDE THE AUGERS
	2.67	06/14/17	BTOC	21.77	24.44	
	2.67	06/19/17	BTOC	22.08	24.75	
	2.67	06/27/17	BTOC	22.33	25.00	PRIOR TO DEVELOPMENT
	2.67	06/28/17	BTOC	23.48	26.15	PRIOR TO SAMPLING
OW-60	3.00	06/14/17	BGL	ND	ND	COLLECTED FROM INSIDE THE AUGERS
	3.00	06/14/17	BGL	ND	ND	IMMEDIATELY AFTER WELL INSTALLATION
	3.00	06/15/17	BTOC	21.68	24.68	
	3.00	06/16/17	BTOC	14.74	17.74	
	3.00	06/19/17	BTOC	14.45	17.45	
	2.50	06/27/17	-	-	-	WELL WAS REINSTALLED
	2.50	06/27/17	BTOC	7.75	10.25	PRIOR TO DEVELOPMENT
	2.50	06/27/17	BTOC	42.15	44.65	IMMEDIATELY AFTER WELL DEVELOPMENT
	2.50	06/28/17	BTOC	30.65	33.15	PRIOR TO SAMPLING

BGL - below ground level
BTOC - below top of casing
ABGL - above ground level
ND - not detected
NA - not available

Table 7
Fluid Levels
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevation (ft)	Well Casing Rim Elevation (ft)	Stick-up length (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation (ft)	Corrected Water Table Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
06/29/17	BW-4A	09/21/17	2.00	6,870.67	6,873.18	2.51	38.80	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
		12/08/17	2.00	6,870.67	6,873.18	2.51	38.30	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
		02/26/18	2.00	6,870.67	6,873.18	2.51	38.80	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
		04/25/18	2.00	6,870.67	6,873.18	2.51	38.80	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
		08/15/18	2.00	6,870.67	6,873.18	2.51	38.80	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
		11/07/18	2.00	6,870.67	6,873.18	2.51	38.30	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
06/29/17	BW-4B	09/21/17	2.00	6,870.62	6,873.23	2.61	63.50	ND	NA	31.58	6,841.65	NA	41 - 61	Chinle/Alluvial Interface
		12/08/17	2.00	6,870.62	6,873.23	2.61	63.50	ND	NA	37.95	6,835.28	NA	41 - 61	Chinle/Alluvial Interface
		02/26/18	2.00	6,870.62	6,873.23	2.61	63.50	ND	NA	38.43	6,834.80	NA	41 - 61	Chinle/Alluvial Interface
		04/25/18	2.00	6,870.62	6,873.23	2.61	63.50	ND	NA	43.60	6,829.63	NA	41 - 61	Chinle/Alluvial Interface
		08/15/18	2.00	6,870.62	6,873.23	2.61	63.50	ND	NA	39.05	6,834.18	NA	41 - 61	Chinle/Alluvial Interface
		11/13/18	2.00	6,870.62	6,873.23	2.61	63.50	ND	NA	44.87	6,828.36	NA	41 - 61	Chinle/Alluvial Interface
06/29/17	BW-5A	09/21/17	2.00	6,874.39	6,877.00	2.61	23.00	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
		12/08/17	2.00	6,874.39	6,877.00	2.61	23.02	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
		02/26/18	2.00	6,874.39	6,877.00	2.61	23.02	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
		04/25/18	2.00	6,874.39	6,877.00	2.61	23.02	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
		08/15/18	2.00	6,874.39	6,877.00	2.61	23.02	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
		11/13/18	2.00	6,874.39	6,877.00	2.61	23.02	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
06/29/17	BW-5B	09/21/17	2.00	6,874.32	6,876.82	2.50	61.45	ND	NA	8.65	6,868.17	NA	48 - 58	Chinle/Alluvial Interface
		12/08/17	2.00	6,874.32	6,876.82	2.50	61.45	ND	NA	9.00	6,867.82	NA	48 - 58	Chinle/Alluvial Interface
		02/26/18	2.00	6,874.32	6,876.82	2.50	61.45	ND	NA	10.28	6,866.54	NA	48 - 58	Chinle/Alluvial Interface
		04/25/18	2.00	6,874.32	6,876.82	2.50	61.45	ND	NA	9.75	6,867.07	NA	48 - 58	Chinle/Alluvial Interface
		08/15/18	2.00	6,874.32	6,876.82	2.50	61.45	ND	NA	10.04	6,866.78	NA	48 - 58	Chinle/Alluvial Interface
		11/13/18	2.00	6,874.32	6,876.82	2.50	61.45	ND	NA	10.57	6,866.25	NA	48 - 58	Chinle/Alluvial Interface
06/29/17	BW-5C	09/21/17	2.00	6,874.22	6,876.85	2.63	76.35	ND	NA	2.99	6,873.86	NA	64.3-74.30	Sonsela Sandstone
		12/08/17	2.00	6,874.22	6,876.85	2.63	76.35	ND	NA	2.80	6,874.05	NA	64.3-74.30	Sonsela Sandstone
		02/26/18	2.00	6,874.22	6,876.85	2.63	76.35	ND	NA	2.63	6,874.22	NA	64.3-74.30	Sonsela Sandstone
		04/25/18	2.00	6,874.22	6,876.85	2.63	76.35	ND	NA	2.55	6,874.30	NA	64.3-74.30	Sonsela Sandstone
		08/15/18	2.00	6,874.22	6,876.85	2.63	76.35	ND	NA	3.32	6,873.53	NA	64.3-74.30	Sonsela Sandstone
		11/13/18	2.00	6,874.22	6,876.85	2.63	76.35	ND	NA	3.49	6,873.36	NA	64.3-74.30	Sonsela Sandstone

Table 7
Fluid Levels
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevation (ft)	Well Casing Rim Elevation (ft)	Stick-up length (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation (ft)	Corrected Water Table Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
06/29/17	OW-59	09/21/17	2.00	6,887.63	6,889.73	2.10	38.30	ND	NA	24.30	6,865.43	NA	20 - 35	Chinle/Alluvial Interface
		12/05/17	2.00	6,887.63	6,889.73	2.10	38.50	ND	NA	24.30	6,865.43	NA	20 - 35	Chinle/Alluvial Interface
		02/21/18	2.00	6,887.63	6,889.73	2.10	38.55	ND	NA	24.00	6,865.73	NA	20 - 35	Chinle/Alluvial Interface
		04/26/18	2.00	6,887.63	6,889.73	2.10	38.48	ND	NA	24.05	6,865.68	NA	20 - 35	Chinle/Alluvial Interface
		08/14/18	2.00	6,887.63	6,889.73	2.10	38.52	ND	NA	24.13	6,865.60	NA	20 - 35	Chinle/Alluvial Interface
		11/06/18	2.00	6,887.63	6,889.73	2.10	38.50	ND	NA	23.90	6,865.83	NA	20 - 35	Chinle/Alluvial Interface
06/29/17	OW-60	09/21/17	2.00	6,891.06	6,893.51	2.45	45.55	ND	NA	16.45	6,877.06	NA	25 - 45	Chinle/Alluvial Interface
		12/05/17	2.00	6,891.06	6,893.51	2.45	45.70	ND	NA	16.40	6,877.11	NA	25 - 45	Chinle/Alluvial Interface
		02/21/18	2.00	6,891.06	6,893.51	2.45	46.06	ND	NA	16.26	6,877.25	NA	25 - 45	Chinle/Alluvial Interface
		04/26/18	2.00	6,891.06	6,893.51	2.45	46.15	ND	NA	16.52	6,876.99	NA	25 - 45	Chinle/Alluvial Interface
		08/14/18	2.00	6,891.06	6,893.51	2.45	46.42	ND	NA	16.52	6,876.99	NA	25 - 45	Chinle/Alluvial Interface
		11/06/18	2.00	6,891.06	6,893.51	2.45	45.70	ND	NA	16.25	6,877.26	NA	25 - 45	Chinle/Alluvial Interface

DEFINITIONS:

DTB - Depth to Bottom
DTW - Depth to Water
SPH = Separate Phase Hydrocarbons

NA = Not Applicable
Dry indicates no water was detected.

NM = Not Measured

Table 8.1
BW-5B and BW-5C BTEX and MTBE Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

STANDARDS			PARAMETERS				
			Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	MTBE (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**0.005**	**1**	**0.7**	**0.62**	**0.1**
40 CFR 141.61 MCL (NOVEMBER 2015)			0.005	1	0.7	10	NE
NMED TAP WATER (FEBRUARY 2019)			0.00455	1.09	0.0149	0.193	0.143
EPA RSL TAP WATER (NOVEMBER 2018)			0.00046	1.1	0.0015	0.19	0.014
WELL ID	**DATE SAMPLED**	**METHOD**					
BW-5B	12/08/17	8260B	<0.001	0.0018	<0.001	<0.0015	0.00064
BW-5C	12/08/17	8260B	<0.001	<0.001	<0.001	<0.0015	0.039

DEFINITIONS
NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.61 Detection Limits for Organic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1

NOTES

Table 8.1.1
BW-5B and BW-5C General Chemistry and DRO/GRO/MRO Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

			PARAMETERS									
STANDARDS			**Fluoride (mg/L)**	**Chloride (mg/L)**	**Bromide (mg/L)**	**Nitrite (mg/L)**	**Nitrate (mg/L)**	**Phosphorus (mg/L)**	**Sulfate (mg/L)**	**DRO (mg/L)**	**GRO (mg/L)**	**MRO (mg/L)**
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**1.6**	**250.0**	NE	**1**	**10**	NE	**600.0**	NE	NE	NE
40 CFR 141.62 MCL			4.0	NE	NE	1	10	NE	NE	NE	NE	NE
NMED TAP WATER (FEBRUARY 2019)			1.18	NE	NE	1.97	31.59	NE	NE	NE	NE	NE
EPA RSL TAP WATER (NOVEMBER 2018)			0.8	NE	NE	2	32	NE	NE	NE	NE	NE
NMED SSG (March 2019)			NE	NE	NE	NE	NE	NE	NE	**0.0858**	**0.0858**	**0.0858**
Well ID	**DATE SAMPLED**	**METHOD**										
BW-5B	12/08/17	E300	0.27	110	0.47	0.15	0.15	<2.5	110	<1	0.014	<5
BW-5C	12/08/17	E300	<0.5	**1400**	1.2	0.23	0.23	<2.5	210	<1	0.035	<5

DEFINITIONS
NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.62 Detection Limits for Inorganic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1
NMED Soil Screening Guidance Volume 1, Table 6-4 (groundwater), (March 2017)

NOTES

Table 8.1.2
BW-5B and BW-5C Total Metals Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

STANDARDS			PARAMETERS										
			Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)	Selenium (mg/L)	Mercury (mg/L)	Uranium (mg/L)	Zinc (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**0.01**	**2**	**0.005**	**0.05**	**1.0**	**1.0**	**0.015**	**0.2**	**0.05**	**0.002**	**0.03**	**10.0**
40 CFR 141.62 MCL (NOVEMBER 2015)			0.01	2.0	0.005	0.1	1.3	NE	0.015	NE	0.05	0.002	0.03	NE
NMED TAP WATER (FEBRUARY 2019)			0.000855	3.28	0.00624	0.0057	0.7898	13.8	NE	2.02	0.0987	0.000626	0.0592	5.96
EPA RSL TAP WATER (NOVEMBER 2018)			0.000052	3.8	0.0092	NE	0.8	14	0.015	0.43	0.1	0.00063	0.004	6
Well ID	**DATE SAMPLED**	**METHOD**												
BW-5B	12/08/17	200.7/200.8	0.003	0.085	<0.002	0.012	<0.006	**1.7**	0.00097	0.042	<0.005	0.00015	**0.042**	0.0086
BW-5C	12/08/17	200.7/200.8	0.0022	0.12	<0.002	<0.006	<0.006	0.54	<0.0025	0.058	<0.005	0.000081	**0.038**	<0.01

DEFINITIONS

NE = Not established

NA = Not analyzed

Bold and highlighted values represent values above the applicable standards

STANDARDS

WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.

a) Human Health Standards; b) Other Standards for Domestic Water

40 CFR 141.62 Detection Limits for Inorganic Contaminants

EPA Regional Screening Level (RSL) Summary Table

NMED Risk Assessment Guidance for Investigations and Remediations Table A-1 (Dec 2014)

NOTES

Table 8.1.3
BW-5B and BW-5C Dissolved Metals Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

STANDARDS			PARAMETERS									
			Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)	Selenium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**0.01**	**2**	**0.005**	**0.05**	**1.0**	**1.0**	**0.015**	**0.2**	**0.05**	**0.03**	**10.0**
40 CFR 141.62 MCL (NOVEMBER 2015)			0.01	2.0	0.005	0.1	1.3	NE	0.015	NE	0.05	0.03	NE
NMED TAP WATER (FEBRUARY 2019)			0.000855	3.28	0.00624	0.0057	0.7898	13.8	NE	2.02	0.0987	0.0592	5.96
EPA RSL TAP WATER (NOVEMBER 2018)			0.000052	3.8	0.0092	NE	0.8	14	0.015	0.43	0.1	0.004	6
Well ID	**DATE SAMPLED**	**METHOD**											
BW-5B	12/08/17	200.7/200.14	0.0032	0.05	<0.002	<0.006	<0.006	0.024	<0.0005	0.0064	0.0039	**0.04**	0.007
BW-5C	12/08/17	200.7/200.15	<0.02	0.11	<0.002	<0.006	<0.006	0.29	<0.0005	0.043	<0.01	**0.041**	0.0074

DEFINITIONS
NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.62 Detection Limits for Inorganic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1

Table 8.1.4
BW-5A and BW-5B Semi-Volatile Organic Compound Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

			PARAMETERS
STANDARDS			Bis(2-ethylhexyl)phthalate (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			NE
40 CFR 141.61 MCL (NOVEMBER 2015)			**0.006**
NMED TAP WATER (FEBRUARY 2019)			0.0556
EPA RSL TAP WATER (NOVEMBER 2018)			0.0056
Well ID	**DATE SAMPLED**	**METHOD**	
BW-5B	12/08/17	8270C	<0.01
BW-5C	12/08/17	8270C	<0.01

DEFINITIONS
NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.62 Detection Limits for Inorganic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1 (Dec 2014)

NOTES
1) Detected for the first time. Possible lab contaminant.

2) Request to remove 8270C Analysis in 2015 approved per NMED Comment 7(b), Approval with Modification, FWGWMWP - 2012 Updates; 2013 Updates; 2014 Updates for 2015.

Table 8.2
OW-59 and OW-60 BTEX, MTBE, General Chemistry and DRO/GRO/MRO Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

			PARAMETERS											
STANDARDS			**Benzene (mg/L)**	**Toluene (mg/L)**	**Ethyl Benzene (mg/L)**	**Total Xylenes (mg/L)**	**MTBE (mg/L)**	**Fluoride (mg/L)**	**Chloride (mg/L)**	**Nitrite (mg/L)**	**Nitrate (mg/L)**	**Sulfate (mg/L)**	**DRO (mg/L)**	**GRO (mg/L)**	**MRO (mg/L)**
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**0.005**	**1**	**0.7**	**0.62**	**0.1**	**1.6**	**250**	**1**	**10**	**600**	NE	NE	NE
40 CFR 141.61 MCL (NOVEMBER 2015)			0.005	1	0.7	10	NE	4.0	NE	1	10	NE	NE	NE	NE
NMED TAP WATER (FEBRUARY 2019)			0.00455	1.09	0.0149	0.193	0.143	1.18	NE	1.97	31.59	NE	NE	NE	NE
EPA RSL TAP WATER (NOVEMBER 2018)			0.00046	1.1	0.0015	0.19	0.014	0.8	NE	2	32	NE	NE	NE	NE
NMED SSG (MARCH 2019)			NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	**0.0858**	**0.0858**	**0.0858**
Well ID	**DATE SAMPLED**	**METHOD**													
OW-59	12/06/17	8260B	<0.001	<0.001	<0.001	<0.0015	0.0094	<0.5	**1700**	<2	<2	**2600**	**0.55**	**3.1**	<5
OW-60	12/06/17	8260B	<0.001	<0.001	<0.001	<0.0015	0.00028	1.1	**1700**	**14**	**14**	**780**	<1	0.031	<5

DEFINITIONS

NE = Not established

NA = Not analyzed

Bold and highlighted values represent values above the applicable standards

STANDARDS

WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.

a) Human Health Standards; b) Other Standards for Domestic Water

40 CFR 141.62 Detection Limits for Inorganic Contaminants

EPA Regional Screening Level (RSL) Summary Table

NMED Risk Assessment Guidance for Investigations and Remediations Table A-1

NMED Soil Screening Guidance Volume 1, Table 6-4 (groundwater), (March 2017)

NOTES

Table 8.2.1
OW-59 and OW-60 Total Metals Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

STANDARDS			PARAMETERS											
			Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)	Selenium (mg/L)	Silver	Mercury (mg/L)	Uranium (mg/L)	Zinc (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**0.01**	**2**	**0.005**	**0.05**	**1.0**	**1.0**	**0.015**	**0.2**	**0.05**	**0.05**	**0.002**	**0.03**	**10.0**
40 CFR 141.62 MCL (NOVEMBER 2015)			0.01	2.0	0.005	0.1	1.3	NE	0.015	NE	0.05	**NE**	0.002	0.03	NE
NMED TAP WATER (FEBRUARY 2019)			0.000855	3.28	0.00624	0.0057	0.7898	13.8	NE	2.02	0.0987	0.0812	0.000626	0.0592	5.96
EPA RSL TAP WATER (NOVEMBER 2018)			0.000052	3.8	0.0092	NE	0.8	14	0.015	0.43	0.1	0.094	0.00063	0.004	6
Well ID	**DATE SAMPLED**	**METHOD**													
OW-59	12/06/17	200.7/200.8	0.0095	0.064	<0.002	<0.006	0.0042	**2.1**	0.0014	0.17	<0.02	0.0037	<0.0002	**0.17**	0.0041
OW-60	12/06/17	200.7/200.8	<0.02	0.12	<0.002	0.0033	<0.006	**3.1**	0.002	0.13	0.021	0.0024	<0.0002	**0.048**	0.0097

DEFINITIONS

NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS

WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.62 Detection Limits for Inorganic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1

NOTES

Table 8.2.2
OW-59 and OW-60 Dissolved Metals Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

STANDARDS			PARAMETERS										
			Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)	Selenium (mg/L)	Silver	Uranium (mg/L)	Zinc (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			**0.01**	**2**	**0.005**	**0.05**	**1.0**	**1.0**	**0.015**	**0.2**	**0.05**	**0.05**	**0.03**	**10.0**
40 CFR 141.62 MCL (NOVEMBER 2015)			0.01	2.0	0.005	0.1	1.3	NE	0.015	NE	0.05	**NE**	0.03	NE
NMED TAP WATER (FEBRUARY 2019)			0.000855	3.28	0.00624	0.0057	0.7898	13.8	NE	2.02	0.0987	0.0812	0.0592	5.96
EPA RSL TAP WATER (NOVEMBER 2018)			0.000052	3.8	0.0092	NE	0.8	14	0.015	0.43	0.1	0.094	0.004	6
Well ID	**DATE SAMPLED**	**METHOD**												
OW-59	12/06/17	200.7/200.8	**0.012**	0.013	<0.002	<0.006	<0.006	0.024	<0.0025	0.13	0.023	0.0047	**0.14**	0.011
OW-60	12/06/17	200.7/200.8	**0.013**	0.029	<0.002	<0.006	<0.006	0.02	<0.0005	0.042	0.031	0.0029	**0.047**	0.01

DEFINITIONS
NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.62 Detection Limits for Inorganic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1

NOTES

Table 8.2.3
OW-59 and OW-60 Semi-Volatile and Volatile Organic Compounds, Analytical Result Summary
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

STANDARDS			PARAMETERS		
			1-Methyl naphthalene (mg/L)	Acetone (mg/L)	Bis(2-ethylhexyl)phthalate (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)			NE	NE	NE
40 CFR 141.61 MCL (NOVEMBER 2015)			NE	NE	**0.006**
NMED TAP WATER (FEBRUARY 2019)			**0.0114**	**14.06**	0.0556
EPA RSL TAP WATER (NOVEMBER 2018)			0.0011	14	0.0056
Well ID	**DATE SAMPLED**	**METHOD**			
OW-59	12/06/17	8260B	<0.004	0.0028	<0.01
OW-60	12/06/17	8260B	<0.004	0.0025	**0.045**

DEFINITIONS
NE = Not established
NA = Not analyzed
Bold and highlighted values represent values above the applicable standards

STANDARDS
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.
a) Human Health Standards; b) Other Standards for Domestic Water
40 CFR 141.62 Detection Limits for Inorganic Contaminants
EPA Regional Screening Level (RSL) Summary Table
NMED Risk Assessment Guidance for Investigations and Remediations Table A-1

NOTES

Figures

Figure 1 Site Location Map

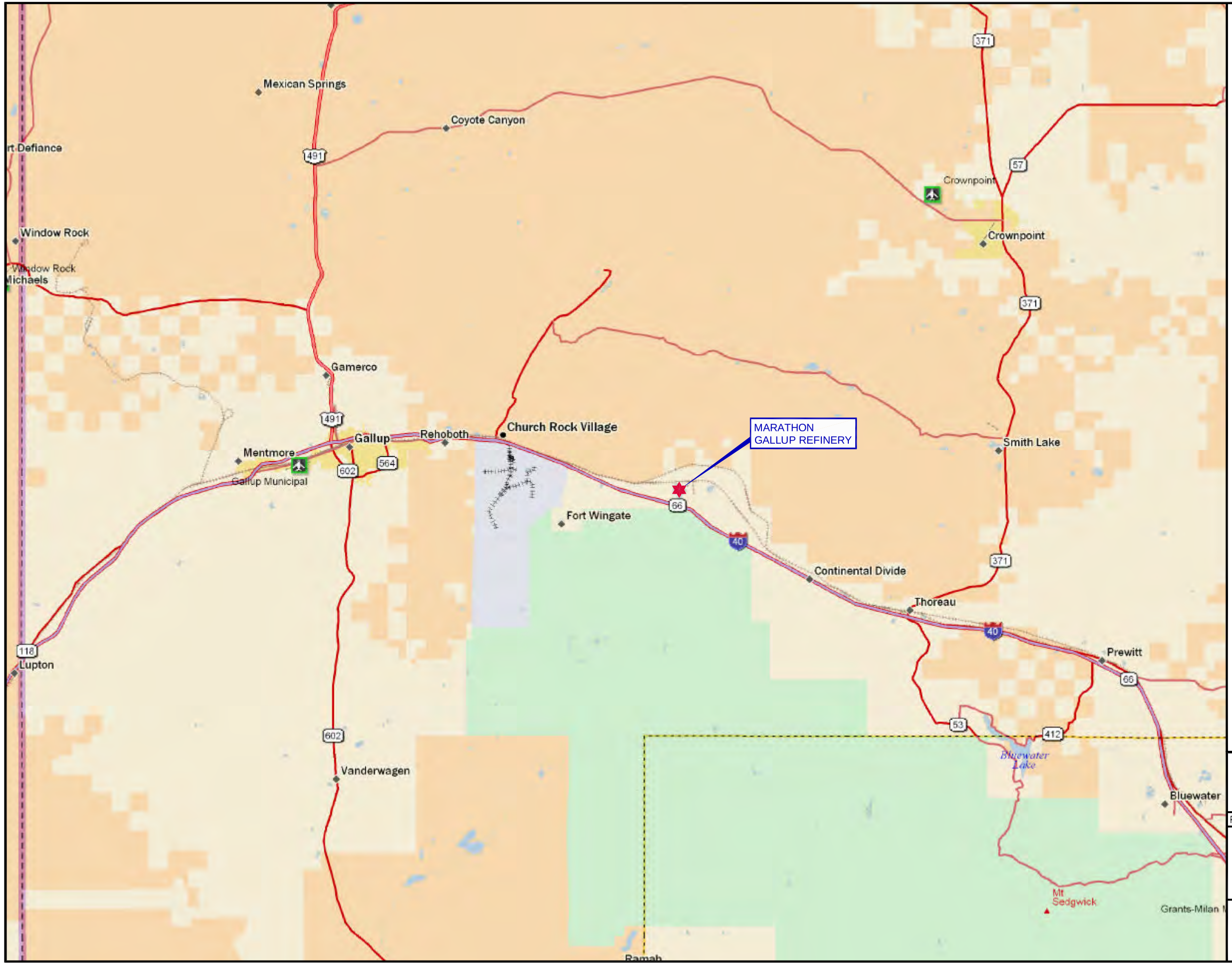
Figure 2 Well Location Map – Boundary Wells

Figure 3 Well Location Map – SMW-2 Area

Figure 4 Geologic Map of New Mexico

Figure 5 Chinle/Alluvium Interface Potentiometric Map – September 2017

Figure 6 Sulfate and Chloride Concentrations



Map Source: DeLorme Street Atlas USA 2007 Plus.

N

0 5
SCALE IN MILES

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 03/24/19 | FILE: Mathon–dB206

FIGURE 1
SITE LOCATION MAP
GALLUP REFINERY

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



Aerial Map Source: Google Map, 03/18/2016.

N

0 300

SCALE IN FEET

LEGEND

MKTF-43 MONITORING WELL LOCATION (CHINLE / ALLUVIAL) AND IDENTIFICATION NUMBER

OW-01 MONITORING WELL LOCATION (SONSELA) AND IDENTIFICATION NUMBER

PW-2 RAW WATER PRODUCTION WELL LOCATION AND IDENTIFICATION NUMBER

NEW MEXICO

SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 03/24/19 | FILE: Mathon-dA128

FIGURE 2
WELL LOCATION MAP
BOUNDARY WELLS

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



Aerial Map Source: Google Map, 03/18/2016.

N

0 300

SCALE IN FEET

NEW MEXICO

SITE LOCATION

LEGEND

MKTF-43 ● MONITORING WELL LOCATION (CHINLE / ALLUVIAL) AND IDENTIFICATION NUMBER

OW-01 ● MONITORING WELL LOCATION (SONSELA) AND IDENTIFICATION NUMBER

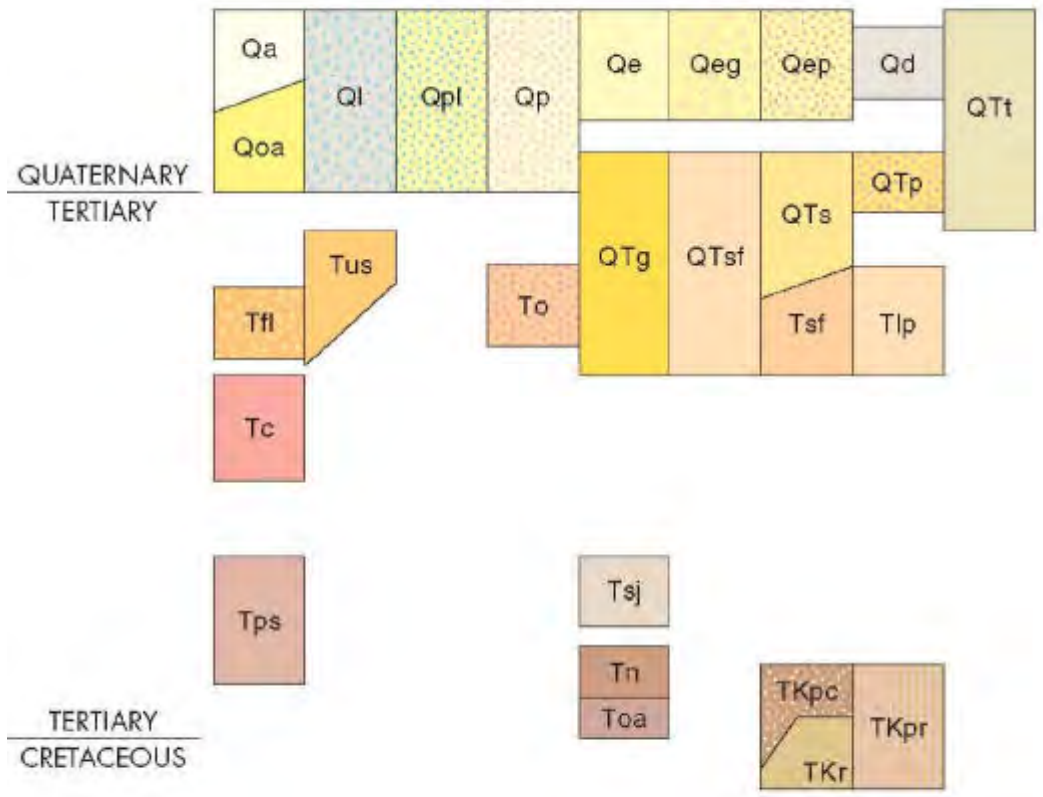
MARATHON PETROLEUM COMPANY
GALLUP REFINERY

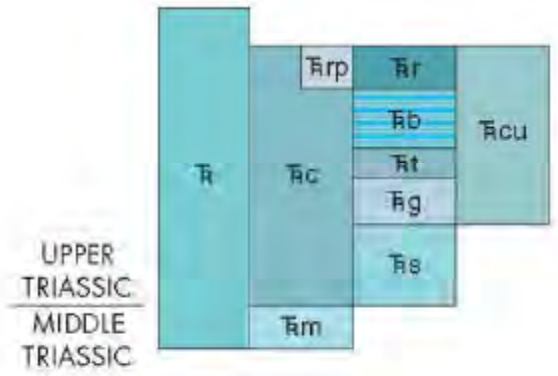
PROJ. NO.: Marathon	DATE: 03/24/19	FILE: Mathon-dA76

FIGURE 3
WELL LOCATION MAP
SMW-2 AREA

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Sedimentary







DESCRIPTION OF MAP UNITS

QUATERNARY

Qa Alluvium (Holocene to upper Pleistocene)

Ql Landslide deposits and colluvium (Holocene to Pleistocene)—Landslide deposits on western flanks of Socorro Mountains not shown for clarity

Qpl Lacustrine and playa deposits (Holocene)—Includes associated alluvial and eolian deposits of major lake basins

Qp Piedmont alluvial deposits (Holocene to lower Pleistocene)—Includes deposits of higher gradient tributaries bordering major stream valleys, alluvial veneers of the piedmont slope, and alluvial fans. May locally include uppermost Pliocene deposits

TRIASSIC

Chinle Formation of previous workers (e.g., Stewart et al., 1972) is used here as Chinle Group, following Lucas (1993)

Tr Triassic rocks, undivided—Continental red beds

Trp Rock Point Formation of Chinle Group (Upper Triassic)—May locally include Wingate Sandstone (Triassic)

Trc Chinle Group (Upper Triassic)—Map unit includes Moenkopi Formation (Middle Triassic) at base in many areas; in eastern part of state the following five formations are mapped:

Trr Redonda Formation (Upper Triassic)

Trb Bull Canyon Formation (Norian)

Trt Trujillo Formation (Norian)

Trg Garita Creek Formation (Carnian)

Trs Santa Rosa Formation (Carnian)—Includes Moenkopi Formation (Middle Triassic) at base in most areas

Trcu Upper Chinle Group, Garita Creek through Redonda Formations, undivided

Trm Moenkopi Formation (Middle Triassic)

JURASSIC

To compare this map nomenclature to the USGS nomenclature, see the diagram included on this sheet (at right)

J Upper and Middle Jurassic rocks, undivided. In southwest includes the basalt-bearing Broken Jug Formation

Jm Morrison Formation—Upper Jurassic nonmarine rocks

Jmsu Morrison Formation and upper San Rafael Group (lowermost Cretaceous?–upper Jurassic)

Jz Zuni Sandstone (Callovian)—Consists of undivided equivalents of the Summerville Formation and Bluff Sandstone; restricted to Zuni Basin area

Jze Zuni and Entrada Sandstones, undivided

Je Entrada Sandstone (Middle Jurassic)

Jsr San Rafael Group (Middle Jurassic)—Consists of Entrada Sandstone, Todilto and Summerville Formations, Bluff Sandstone, and locally Zuni Sandstone (or only Acoma Tongue of Zuni)

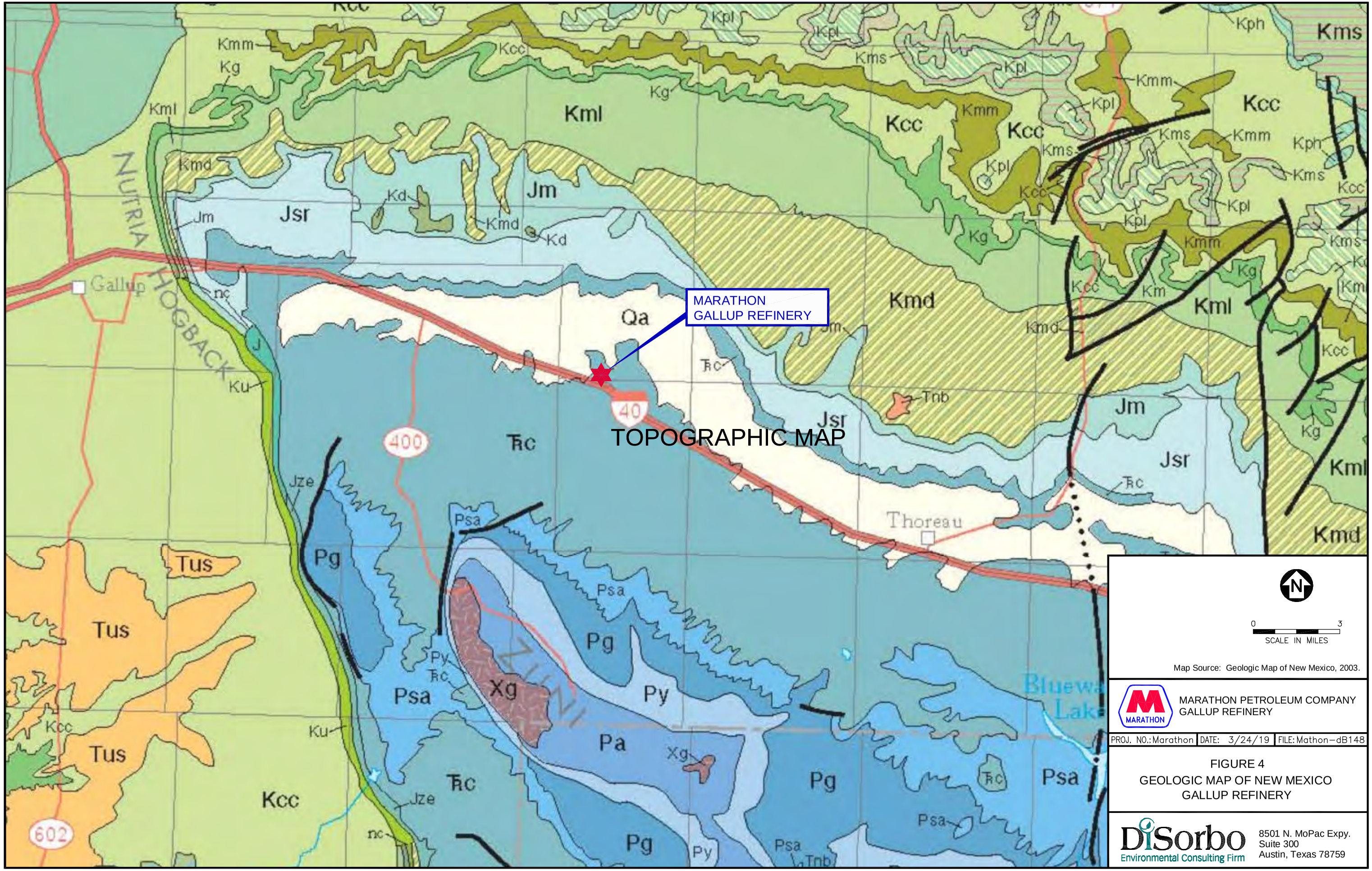
Map Source: Geologic Map of New Mexico, 2003.

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 3/24/19 | FILE: Mathon–dB148

FIGURE 4
GEOLOGIC MAP OF NEW MEXICO
GALLUP REFINERY

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



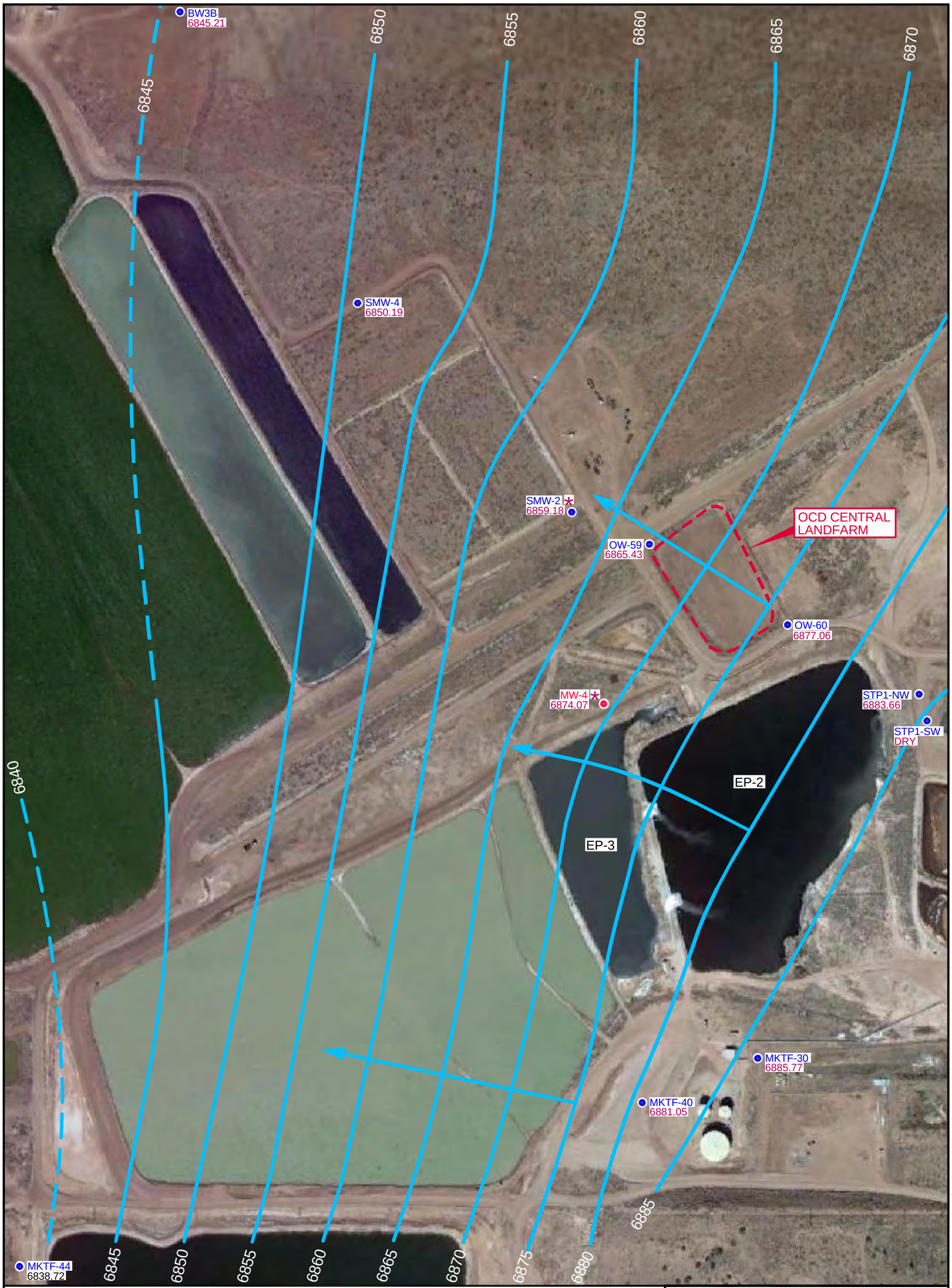
TOPOGRAPHIC MAP

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 3/24/19 | FILE: Mathon-dB148

FIGURE 4
GEOLOGIC MAP OF NEW MEXICO
GALLUP REFINERY

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



Aerial Map Source: Google Map, 03/18/2016.

LEGEND

- MKTF-40 — MONITORING WELL LOCATION (CHINLE / ALLUVIAL) AND IDENTIFICATION NUMBER
- MW-04 — MONITORING WELL LOCATION (SONSELA) AND IDENTIFICATION NUMBER
- 6860 — POTENTIOMETRIC CONTOUR (FT) (5 FT INTERVAL)
- GROUNDWATER FLOW DIRECTION
- 6881.05 — WATER LEVEL ELEVATION MEASURED SEPT. 2017 (ABOVE MSL)
- * — DATA NOT USED IN CONTOURS

N

0 250
SCALE IN FEET

NEW MEXICO
SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 03/24/19 | FILE: Mathon–dB178

FIGURE 5
CHINLE / ALLUVIUM INTERFACE POTENTIOMETRIC MAP SEPTEMBER 2017

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



Aerial Map Source: Google Map, 03/18/2016.

0 300

SCALE IN FEET

LEGEND

SMW-2 MONITORING WELL LOCATION (CHINLE / ALLUVIAL) AND IDENTIFICATION NUMBER

MW-4 MONITORING WELL LOCATION (SONSELA) AND IDENTIFICATION NUMBER

2,000 CHLORIDE CONCENTRATION (mg/L)
3,000 SULFATE CONCENTRATION (mg/L)

NA NOT ANALYZED

ANALYSIS FROM JUNE 2017 EXCEPT GWM-1 (AUGUST 2017)

NEW MEXICO

SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 03/24/19 | FILE: Mathon-dA146

FIGURE 6

SULFATE AND CHLORIDE CONCENTRATIONS

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Appendix A

Well Logs

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon/
Comments	: Hand Auger to 5' BGL
Total Depth	: 44'
Ground Water	: Not Encountered
Start Date	: 6/14/2017
Finish Date	: 6/14/2017

WELL NO. BW-4A

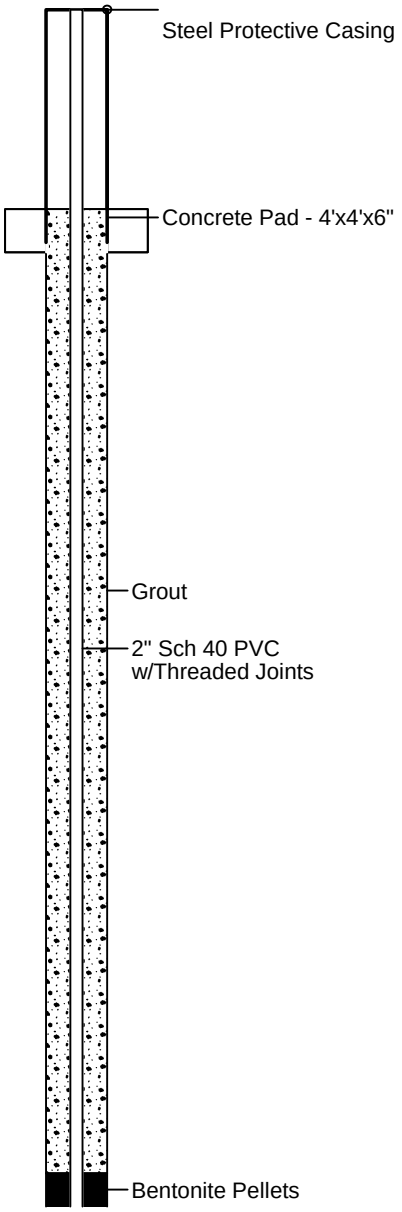
(Sheet 1 of 3)

Elev., TOC (ft.msl)	: 6873.18
Elev., PAD (ft. msl)	: 6870.67
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634063.05
E	: W2542465.22

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, dry to damp, brown, no odor,
1	7.7			CL	100		
2							CLAY, high, stiff, damp, brown, no odor,
3	9.5			CH	100		
4							CLAY, SIMILAR TO ABOVE (STA), very stiff, no odor,
5	9.0			CH	100		
6							CLAY, STA, no odor,
7	6.8			CH	90		
8							CLAY, STA, no odor,
9	5.4			CH	80		
10							CLAY, STA, no odor,
11	3.3			CH	80		
12							CLAY, STA, no odor,
13	5.8			CH	50		
14							CLAY, STA, no odor,
15	4.0			CH			

Completion Results

Well No. BW-4A



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4A.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon/
Comments	: Hand Auger to 5' BGL
Total Depth	: 44'
Ground Water	: Not Encountered
Start Date	: 6/14/2017
Finish Date	: 6/14/2017

WELL NO. BW-4A

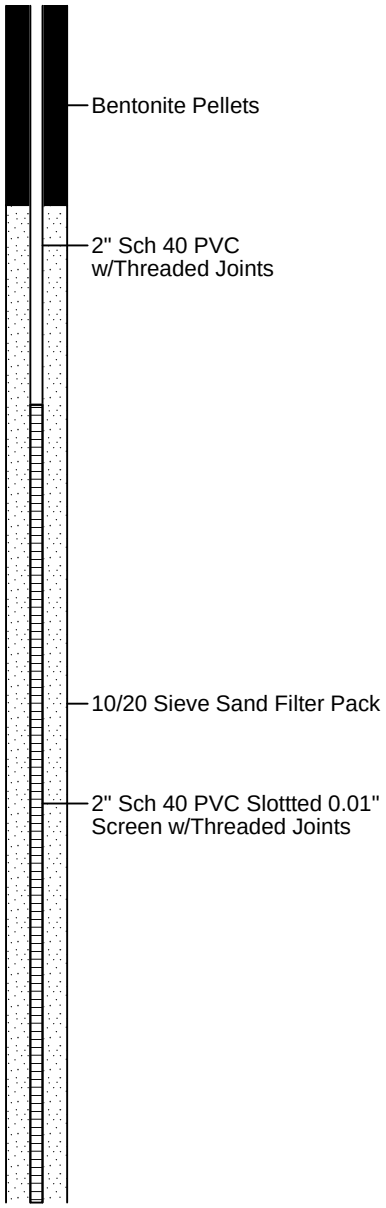
(Sheet 2 of 3)

Elev., TOC (ft.msl)	: 6873.18
Elev., PAD (ft. msl)	: 6870.67
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634063.05
E	: W2542465.22

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
15	4.0			CH	60		
16							CLAY, STA, no odor,
17	2.0			CH	80		
18							CLAYEY SILT, low, firm/crumbly, damp, light brown/tan, no odor,
19	6.9			ML	40		
20							CLAYEY SILT/SILTY CLAY, STA, interbedded, no odor,
21	5.0			ML/CL	70		
22							CLAYEY SILT, low, firm/crumbly,damp, tan, no odor,
23	3.6			ML	50		
24							CLAYEY SILT/SILTY CLAY, STA, interbedded, no odor,
25	3.7			ML/CL	60		
26							CLAY, high, very stiff, damp, brown, no odor,
27	6.2			CH	60		
28							CLAY, STA, darker brown, no odor,
29	3.5			CH	70		
30							CLAY, STA, no odor,
31	6.1			CH	80		
32	6.1			CL			SILTY CLAY, low, very stiff, damp, no odor, light brown (reddish), trace very fine grain sand,
33							

Completion Results

Well No. BW-4A



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4A.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon/
Comments	: Hand Auger to 5' BGL
Total Depth	: 44'
Ground Water	: Not Encountered
Start Date	: 6/14/2017
Finish Date	: 6/14/2017

WELL NO. BW-4A

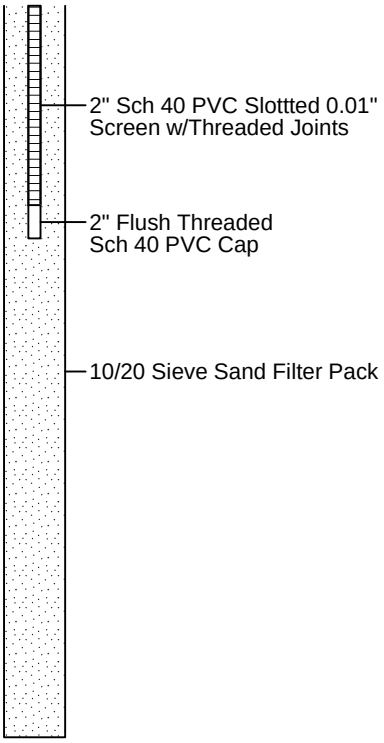
(Sheet 3 of 3)

Elev., TOC (ft.msl)	: 6873.18
Elev., PAD (ft. msl)	: 6870.67
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634063.05
E	: W2542465.22

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
33	6.1			CL	60		
34							CLAYEY SILT/SILTY CLAY, low, firm to stiff, damp, reddish brown and grey, alternating silt/clay, no odor,
35	3.8			ML/CL	80		
36							SILTY CLAY, low, stiff, damp, reddish brown and grey (less grey than above), no odor,
37	6.1			CL	60		
38							SILTY CLAY, STA, no odor,
39	5.2			CL	60		
40							SILTY CLAY, STA, reddish brown and grey, no odor,
41	4.2			CL	70		
42							SILTY CLAY, STA, no odor.
43	3.9			CL	60		
44							
45							
46							
47							
48							
49							
50							
51							

Completion Results

Well No. BW-4A



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4A.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon -
Comments	: Hand Auger to 5' BGL
Total Depth	: 90'
Ground Water	: Not Encountered
Start Date	: 6/15/2017
Finish Date	: 6/16/2017

WELL NO. BW-4B

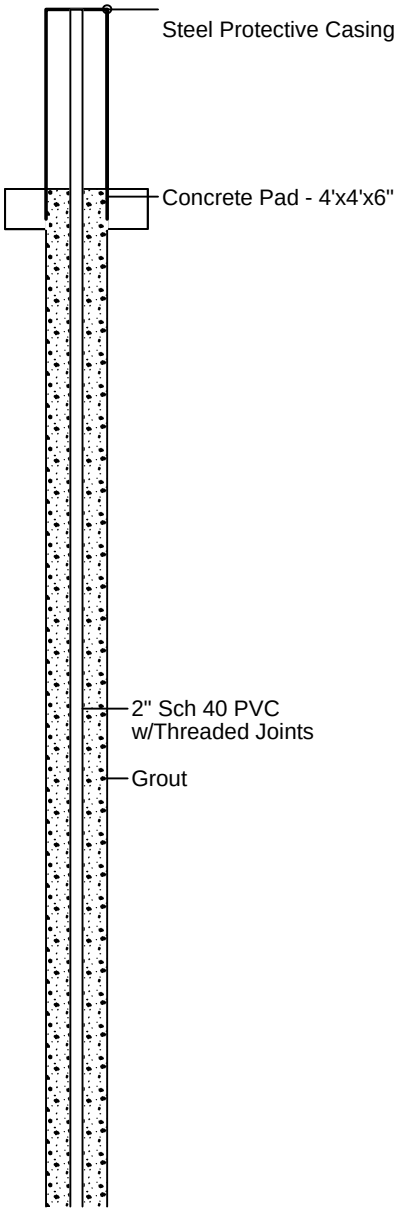
(Sheet 1 of 5)

Elev., TOC (ft.msl)	: 6873.23
Elev., PAD (ft. msl)	: 6870.62
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634043.22
E	: W2542462.98

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
0-1	1.3			CL	100		SILTY CLAY, low, firm, dry to damp, brown, no odor,
2-3	1.2			CH	100		CLAY, high, stiff, damp, brown, no odor,
4-5	1.3			CH	100		CLAY, SIMILAR TO ABOVE (STA), very stiff, no odor,
6-7	1.7			CH	90		CLAY, STA, no odor,
8-9	2.0			CH	80		CLAY, STA, no odor,
10-11	2.1			CH	80		CLAY, STA, no odor,
12-13	3.1			CH	80		CLAY, STA, no odor,
14-15	3.4			CH	80		CLAY, STA, no odor,
16-17	5.1			CH			CLAY, STA, no odor,

Completion Results

Well No. BW-4B



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4B.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon -
Comments	: Hand Auger to 5' BGL
Total Depth	: 90'
Ground Water	: Not Encountered
Start Date	: 6/15/2017
Finish Date	: 6/16/2017

WELL NO. BW-4B

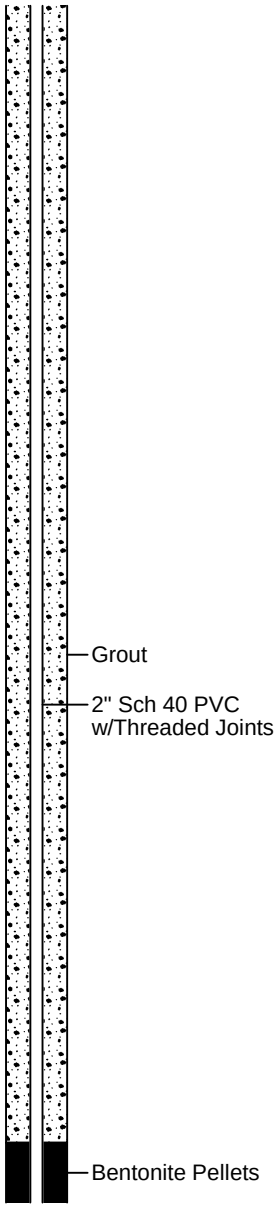
(Sheet 2 of 5)

Elev., TOC (ft.msl)	: 6873.23
Elev., PAD (ft. msl)	: 6870.62
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634043.22
E	: W2542462.98

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
17							
	5.1			CH	70		
18							CLAYEY SILT, low, firm/crumbly, damp, light brown/tan, no odor,
19	3.2			ML	60		
20							CLAYEY SILT/SILTY CLAY, STA, no odor, interbedded,
21	3.9			ML/CL	70		
22							CLAYEY SILT, low, firm/crumbly, damp, brown and tan, no odor,
23	3.5			ML	60		
24				ML/CL	60		CLAYEY SILT/SILTY CLAY, STA, no odor,
25	3.9			CH	60		CLAY, high, very stiff, damp, brown, no odor,
26							CLAY, STA, darker brown, no odor,
27	1.8			CH	70		
28							SILTY CLAY, moderate to low, very stiff, damp, dark brown grading to light reddish brown, trace fine grain sand at base, no odor,
29	1.8			CL	80		
30				CL	80		SILTY CLAY, STA,
31	2.0			CL	80		SANDY GRAVELLY CLAY, low, stiff, dry to damp, light grey and brown, no odor,
32				CL	80		SILTY CLAY, low, stiff, damp, reddish brown, no odor,
33	2.2			ML/CL	80		CLAYEY SILT/SILTY CLAY, low, firm/crumbly, damp, reddish brown and grey,
34							SILTY CLAY, STA, no odor,
35	5.6			CL	80		
36							SILTY CLAY, STA, no odor,
	3.6			CL			
37							

Completion Results

Well No. BW-4B



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4B.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon -
Comments	: Hand Auger to 5' BGL
Total Depth	: 90'
Ground Water	: Not Encountered
Start Date	: 6/15/2017
Finish Date	: 6/16/2017

WELL NO. BW-4B

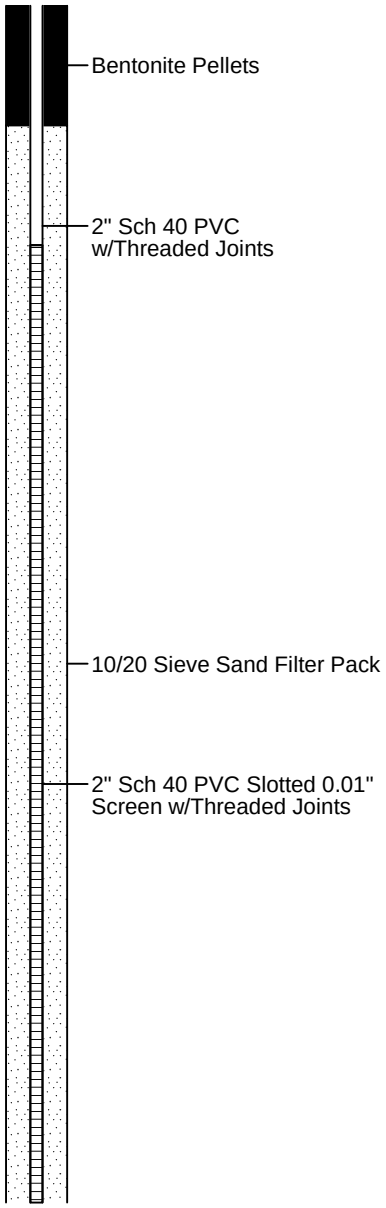
(Sheet 3 of 5)

Elev., TOC (ft.msl)	: 6873.23
Elev., PAD (ft. msl)	: 6870.62
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634043.22
E	: W2542462.98

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
37							
	3.6			CL	80		
38							SILTY CLAY, STA, no odor,
39	2.3			CL	80		
40							SILTY CLAY, STA, no odor,
41	6.2			CL	80		
42							SILTY CLAY, STA, no odor,
43	5.0			CL	70		
44				CL	80		SILTY CLAY, STA, no odor,
45	2.6			CL	80		GRAVELLY SILTY CLAY, low, firm/crumbly, dry-calcium carbonate nodules, grey and reddish brown, no odor,
46				CL	80		SANDY CLAY, low, firm/crumbly, dry, grey and reddish brown, very fine grain sand, no odor,
47	3.5			CL	80		SILTY CLAY, low, very stiff, dry to damp, reddish brown, no odor,
48							SILTY CLAY, STA, no odor,
49	1.9			CL	80		
50							SILTY CLAY, STA, no odor,
51	5.1			CL	80		
52							SILTY CLAY, STA, trace grey clay, occasional gravel, no odor,
53	5.6			CL	70		
54							SILTY CLAY, low, very stiff, dry to damp, reddish brown, no odor,
55	3.8			CL	70		
56							SILTY CLAY, STA, trace grey clay, no odor,
	3.4			CL			
57							

Completion Results

Well No. BW-4B



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4B.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon -
Comments	: Hand Auger to 5' BGL
Total Depth	: 90'
Ground Water	: Not Encountered
Start Date	: 6/15/2017
Finish Date	: 6/16/2017

WELL NO. BW-4B

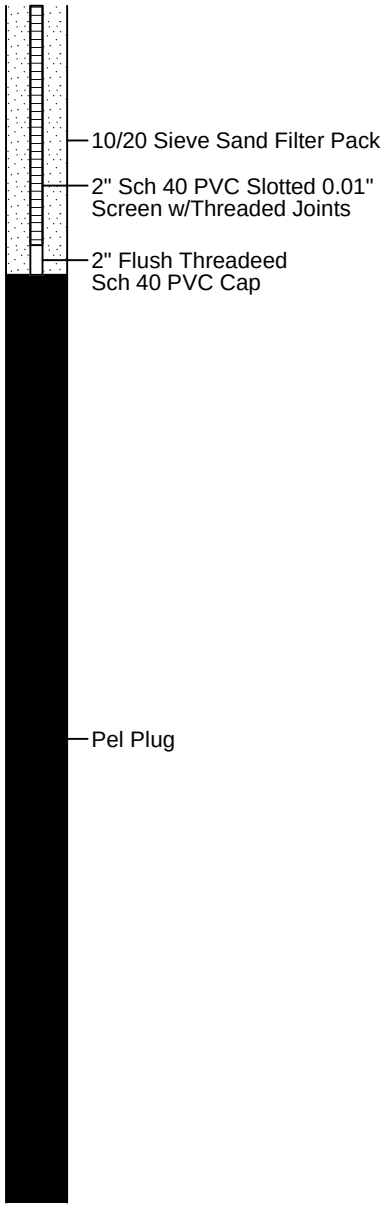
(Sheet 4 of 5)

Elev., TOC (ft.msl)	: 6873.23
Elev., PAD (ft. msl)	: 6870.62
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634043.22
E	: W2542462.98

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
57							
	3.4			CL	60		
58							SILTY CLAY, STA, no odor,
59	2.4			CL	80		
60							SILTY CLAY, low, very stiff, dry to damp, reddish brown grey clay, no odor,
61	4.9			CL	80		
62							SILTY CLAY, STA, no odor,
63	1.7			CL	80		
64							SILTY CLAY, STA, no odor,
65	5.8			CL	80		
66							SILTY CLAY, STA,
67	2.7			CL	80		
68							SILTY CLAY, low, very stiff, calcareous, dry to damp, brown and blueish grey, no odor,
69	3.9			CL	80		
70							SILTY CLAY, low, firm/crumbly, damp, reddish brown, no odor,
71	1.6			CL	80		
72							SILTY CLAY, STA, no odor,
73	1.7			CL	60		
74							SILTY CLAY, STA, no odor,
75	1.0			CL	60		
76							SILTY CLAY, STA, no odor,
	0.1			CL			
77							

Completion Results

Well No. BW-4B



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4B.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon -
Comments	: Hand Auger to 5' BGL
Total Depth	: 90'
Ground Water	: Not Encountered
Start Date	: 6/15/2017
Finish Date	: 6/16/2017

WELL NO. BW-4B

(Sheet 5 of 5)

Elev., TOC (ft.msl)	: 6873.23
Elev., PAD (ft. msl)	: 6870.62
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1634043.22
E	: W2542462.98

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
77							
	0.1			CL	70		
78							SILTY CLAY, STA, no odor,
79	0.4			CL	60		
80							SILTY CLAY, STA, no odor,
81	0.1			CL	70		
82							SILTY CLAY, STA, no odor,
83	0.2			CL	60		
84							SILTY CLAY, STA, very stiff, trace grey clay, no odor,
85	0.0			CL	70		
86							SILTY CLAY, STA, no odor,
87	0.1			CL	40		
88							SILTY CLAY, STA, imbedded with fine grain sandstone, hard/dense, white.
89	0.2			CL/SS	40		
90							
91							
92							
93							
94							
95							
96							
97							

Completion Results

Well No. BW-4B

Pel Plug

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-4B.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	:
Total Depth	: 20.5'
Ground Water	: Not Encountered
Start Date	: 06/23/2017
Finish Date	: 06/23/2017

WELL NO. BW-5A

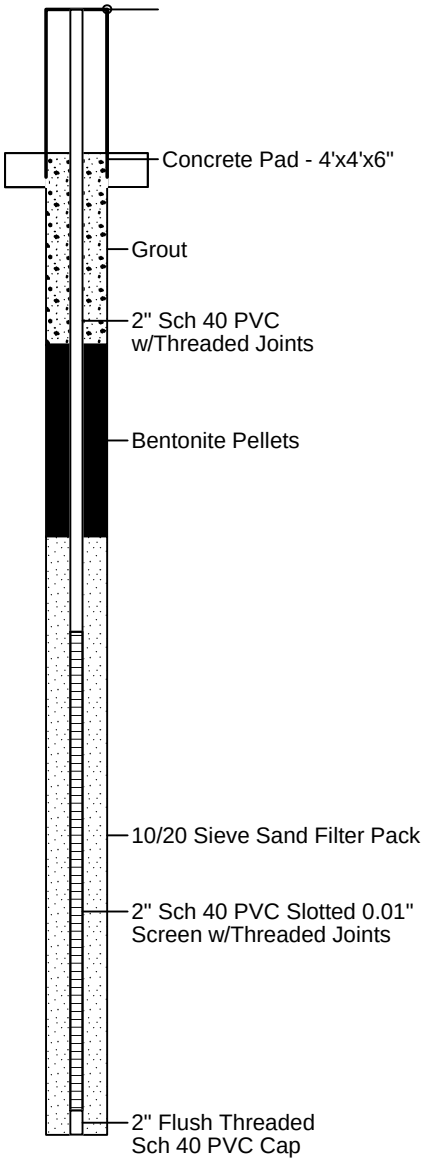
(Sheet 1 of 1)

Elev., TOC (ft.msl)	: 6877.00
Elev., PAD (ft. msl)	: 6874.39
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633259.56
E	: W2542551.45

Depth (ft.)	PID (ppm)	USCS	Recovery	DESCRIPTION
0-1	0.0	CL	100	SILTY CLAY, low, firm, dry, brown, no odor,
1-2				
2-3	0.1	CL	100	SILTY CLAY, SIMILAR TO ABOVE (STA), no odor,
3-4				
4-5	0.0	CL	100	SILTY CLAY, STA, no odor,
5-6				
6-7	0.0	CH	40	CLAY, high, very stiff, dry, brown, no odor,
7-8				
8-9	0.1	CH	80	CLAY, STA, no odor,
9-10				
10-11	0.0	CL	60	CLAY, moderate, very stiff, gravel at base, dry, brown, no odor,
11-12				
12-13	0.0	SP	80	GRAVELLY SILT/SAND, very fine, 5-10 mm gravel-clay at base - stiff, dry, tan, no odor,
13-14				
14-15	0.0	CL	70	SILTY CLAY, low, stiff, dry, light reddish brown, tan and grey, trace very fine grain sand,
15-16				
16-17	0.0	CL	60	SILTY CLAY, STA,
17-18				
18-19	0.0	CL	80	SANDY SILTY CLAY, low, very stiff, very fine sand, light reddish brown, occasional grey, no odor.
19-20				
20-21				
21-22				

Completion Results

Well No. BW-5A



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5A.boı

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to .5'
Total Depth	: 58'
Ground Water	: Not Encountered
Start Date	: 06/23/2017
Finish Date	: 06/23/2017

WELL NO. BW-5B

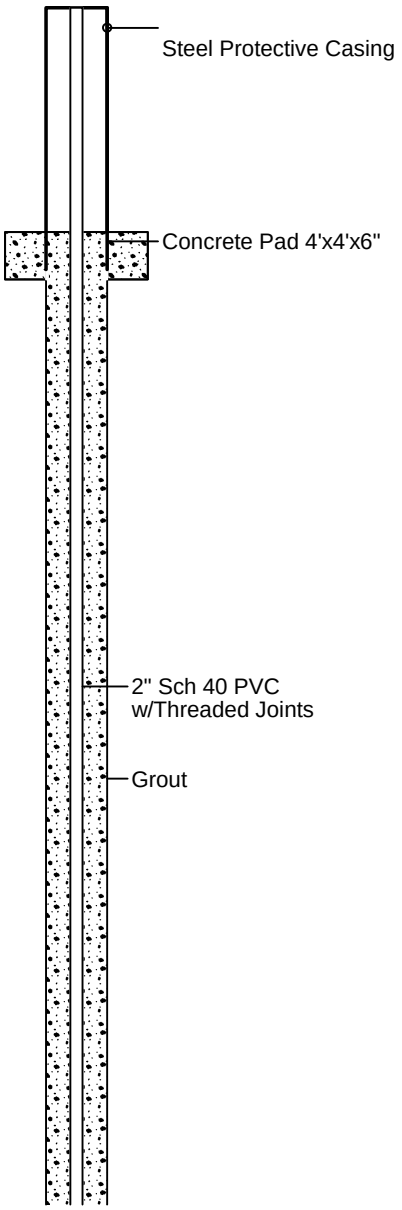
(Sheet 1 of 4)

Elev., TOC (ft.msl)	: 6876.82
Elev., PAD (ft. msl)	: 6874.32
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633269.31
E	: W2542551.84

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, dry, brown, no odor,
1	0.0			CL	100		
2							SILTY CLAY, SIMILAR TO ABOVE (STA), no odor,
3	0.1			CL	100		
4							SILTY CLAY, STA, no odor,
5	0.0			CL	100		
6							CLAY, high, very stiff, dry, brown, no odor,
7	0.0			CH	40		
8							CLAY, STA, no odor,
9	0.1			CH	80		
10				CH	60		CLAY, STA, no odor,
11	0.0			CL	60		SILTY CLAY, low, very stiff, dry, calcareous, tan to light brown, no odor,
12							GRAVELLY SILT/SAND, very fine, very
13	0.1			SP			dense, dry, tan, no odor, sandstone and chert gravel,

Completion Results

Well No. BW-5B



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5B.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to .5'
Total Depth	: 58'
Ground Water	: Not Encountered
Start Date	: 06/23/2017
Finish Date	: 06/23/2017

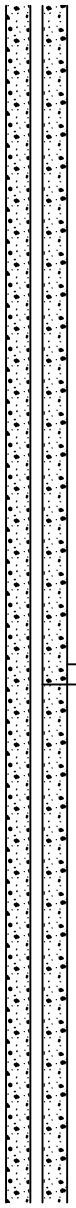
WELL NO. BW-5B

Elev., TOC (ft.msl)	: 6876.82
Elev., PAD (ft. msl)	: 6874.32
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633269.31
E	: W2542551.84

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
13	0.1			SP	90		
14							SILTY CLAY, low, firm to stiff/crumbly, dry to damp, reddish brown and grey, trace gravel and very fine grain sand, no odor,
15	0.0			CL	90		
16							CLAYEY SILT/SAND, very fine grain, firm/crumbly, dry, light brown and grey, no odor,
17	0.0			SP	50		
18							CLAYEY SILT/SAND, STA, dry, light reddish brown, no odor,
19	0.0			SP	50		
20							SANDY SILTY CLAY, low, very stiff, dry, light reddish brown and light grey, no odor, very fine grain sand,
21	0.0			CL	60		
22							SANDY SILTY CLAY, STA, no odor,
23	0.0			CL	90		
24							SANDY SILTY CLAY, STA, no odor,
25	0.0			CL	60		
26							SANDY SILTY CLAY, STA, no odor,
27	0.0			CL	70		
28							SANDY SILTY CLAY, STA, no odor,
29	0.0			CL			

Completion Results

Well No. BW-5B



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5B.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to .5'
Total Depth	: 58'
Ground Water	: Not Encountered
Start Date	: 06/23/2017
Finish Date	: 06/23/2017

WELL NO. BW-5B

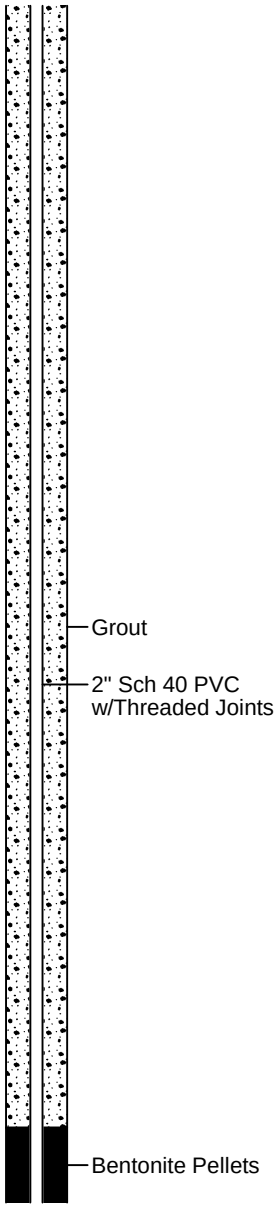
(Sheet 3 of 4)

Elev., TOC (ft.msl)	: 6876.82
Elev., PAD (ft. msl)	: 6874.32
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633269.31
E	: W2542551.84

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
29	0.0			CL	60		
30							SILTY CLAY, low, firm to stiff, damp, reddish brown, no odor, softer than above,
31	0.0			CL	60		
32							SILTY CLAY, STA, no odor, trace grey clay,
33	0.0			CL	70		
34							SILTY CLAY, STA, no odor, trace grey clay,
35	0.0			CL	70		
36							SILTY CLAY, STA, no odor,
37	0.0			CL	60		
38							SILTY CLAY, low, stiff to very stiff, damp, reddish brown, no odor,
39	0.0			CL	70		
40							SILTY CLAY, STA, stiff, damp, no odor,
41	0.0			CL	70		
42							SILTY CLAY, STA,
43	0.0			CL	60		
44							SILTY CLAY, STA, calcareous,
45	0.0			CL			

Completion Results

Well No. BW-5B



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5B.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to .5'
Total Depth	: 58'
Ground Water	: Not Encountered
Start Date	: 06/23/2017
Finish Date	: 06/23/2017

WELL NO. BW-5B

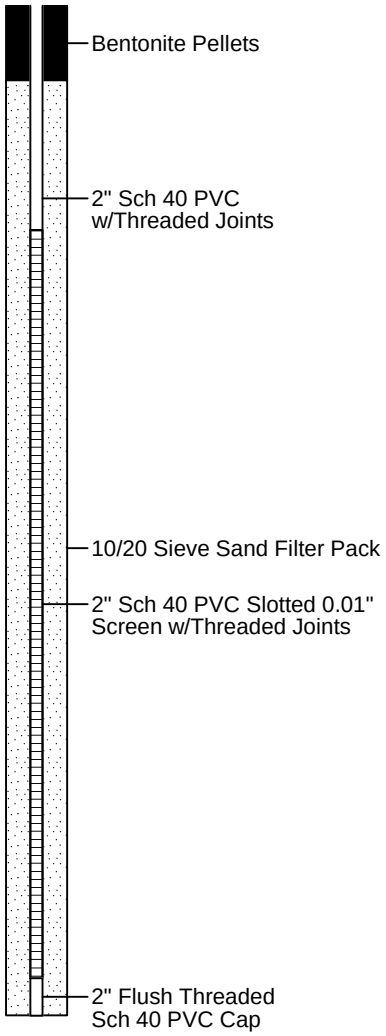
(Sheet 4 of 4)

Elev., TOC (ft.msl)	: 6876.82
Elev., PAD (ft. msl)	: 6874.32
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633269.31
E	: W2542551.84

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
45	0.0			CL	60		
46							SILTY CLAY, STA,
47	0.1			CL	60		
48							SILTY CLAY, low, very stiff, damp, light reddish brown, no odor, trace pink sandstone at base,
49	0.0			CL	80		
50							SILTY CLAY, STA, trace grey clay and sandstone present,
51	0.0			CL	70		
52							SILTY CLAY, STA, sandstone present,
53	0.0			CL	20		
54							SILTY CLAY, low, very stiff, damp/dry, reddish brown and grey, bluish grey at base, no odor,
55	0.0			CL	80		
56							SILTY CLAY, STA, increase in bluish grey clay, damp.
57	0.0			CL	90		
58							
59							
60							
61							

Completion Results

Well No. BW-5B



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5B.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	:
Total Depth	: 76'
Ground Water	: 68'
Start Date	: 06/19/2017
Finish Date	: 06/21/2017

WELL NO. BW-5C

(Sheet 1 of 4)

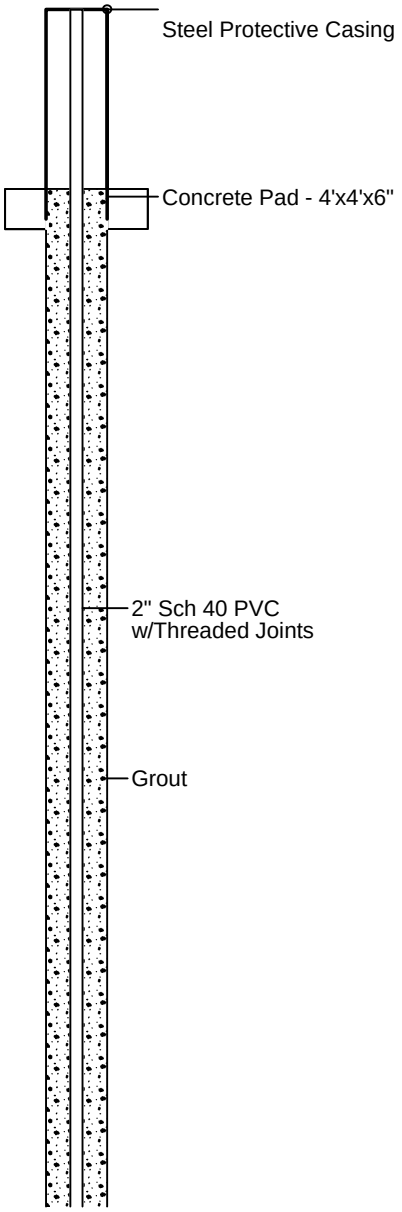
Elev., TOC (ft.msl)	: 6876.85
Elev., PAD (ft. msl)	: 6874.22
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633279.54
E	: W2542553.04

Saturation
▼ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, dry, brown, no odor,
1	0.0			CL	100		
2							SILTY CLAY, SIMILAR TO ABOVE (STA), no odor,
3	0.1			CL	100		
4							SILTY CLAY, STA, no odor,
5	0.0			CL	100		
6							CLAY, high, very stiff, dry, brown, no odor,
7	0.0			CH	40		
8							CLAY, STA, no odor,
9	0.1			CH	80		
10				CH	60		CLAY, STA, no odor,
11	0.0			CL	60		SILTY CLAY, low, very stiff, dry, calcareous, tan to light brown, no odor,
12							GRAVELLY SILT/SAND, very fine, very dense, dry, tan, no odor, sandstone and chert gravel,
13	0.1			SP	90		
14							SILTY CLAY, low, firm to stiff/crumbly, dry to damp, reddish brown and grey, trace gravel and very fine grain sand, no odor,
15	0.0			CL	90		
16							CLAYEY SILT/SAND, very fine grain, firm/crumbly, dry, light brown and grey, no odor,
17	0.0			SP			

Completion Results

Well No. BW-5C



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5C.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	:
Total Depth	: 76'
Ground Water	: 68'
Start Date	: 06/19/2017
Finish Date	: 06/21/2017

WELL NO. BW-5C

(Sheet 2 of 4)

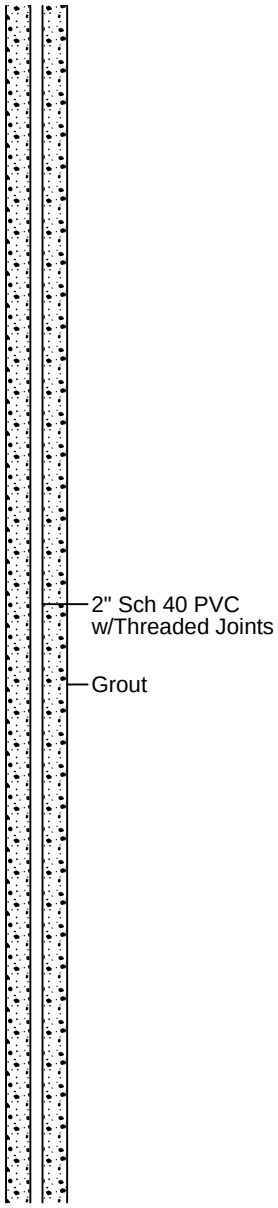
Elev., TOC (ft.msl)	: 6876.85
Elev., PAD (ft. msl)	: 6874.22
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633279.54
E	: W2542553.04

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
17							
	0.0			SP	50		
18							CLAYEY SILT/SAND, STA, dry, light reddish brown, no odor,
19	0.0			SP	50		
20							SANDY SILTY CLAY, low, very stiff, dry, light reddish brown and light grey, no odor, very fine grain sand,
21	0.0			CL	60		
22							SANDY SILTY CLAY, STA, no odor,
23	0.0			CL	90		
24							SANDY SILTY CLAY, STA, no odor,
25	0.0			CL	60		
26							SANDY SILTY CLAY, STA, no odor,
27	0.0			CL	70		
28							SANDY SILTY CLAY, STA, no odor,
29	0.0			CL	60		
30							SILTY CLAY, low, firm to stiff, damp, reddish brown, no odor, softer than above,
31	0.0			CL	60		
32							SILTY CLAY, STA, no odor, trace grey clay,
33	0.0			CL	70		
34							SILTY CLAY, STA, no odor, trace grey clay,
35	0.0			CL	70		
36							SILTY CLAY, STA, no odor,
	0.0			CL			
37							

Saturation
▼ Saturation

Completion Results

Well No. BW-5C



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5C.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	:
Total Depth	: 76'
Ground Water	: 68'
Start Date	: 06/19/2017
Finish Date	: 06/21/2017

WELL NO. BW-5C

(Sheet 3 of 4)

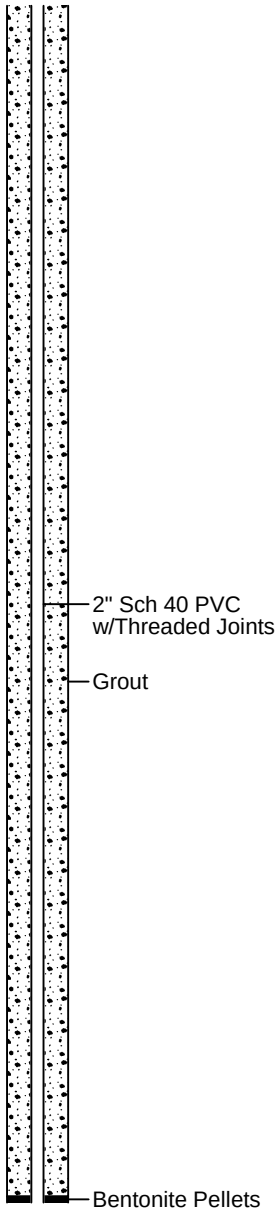
Elev., TOC (ft.msl)	: 6876.85
Elev., PAD (ft. msl)	: 6874.22
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633279.54
E	: W2542553.04

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery	Sample	DESCRIPTION
37	0.0			CL	60		
38							SILTY CLAY, low, stiff to very stiff, damp, reddish brown, no odor,
39	0.0			CL	70		
40							SILTY CLAY, STA, stiff, damp, no odor,
41	0.0			CL	70		
42							SILTY CLAY, STA,
43	0.0			CL	60		
44							SILTY CLAY, STA, calcareous,
45	0.0			CL	60		
46							SILTY CLAY, STA,
47	0.1			CL	60		
48							SILTY CLAY, STA, pink sandstone at base, very dense, dry, no odor,
49	0.0			CL	60		
50							SILTY CLAY, low, stiff, calcareous, dry, reddish brown and grey, no odor,
51	0.0			CL	90		
52							SILTY CLAY, STA, sandstone lense present near base, very dense, white,
53	0.0			CL	60		
54							SILTY CLAY, low, very stiff, dry, reddish brown, occasional grey, no odor,
55	0.0			CL	80		
56							SILTY CLAY, STA, increase in grey clay, no odor,
57	0.0			CL			

Saturation
▼ Saturation

Completion Results

Well No. BW-5C



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5C.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	:
Total Depth	: 76'
Ground Water	: 68'
Start Date	: 06/19/2017
Finish Date	: 06/21/2017

WELL NO. BW-5C

(Sheet 4 of 4)

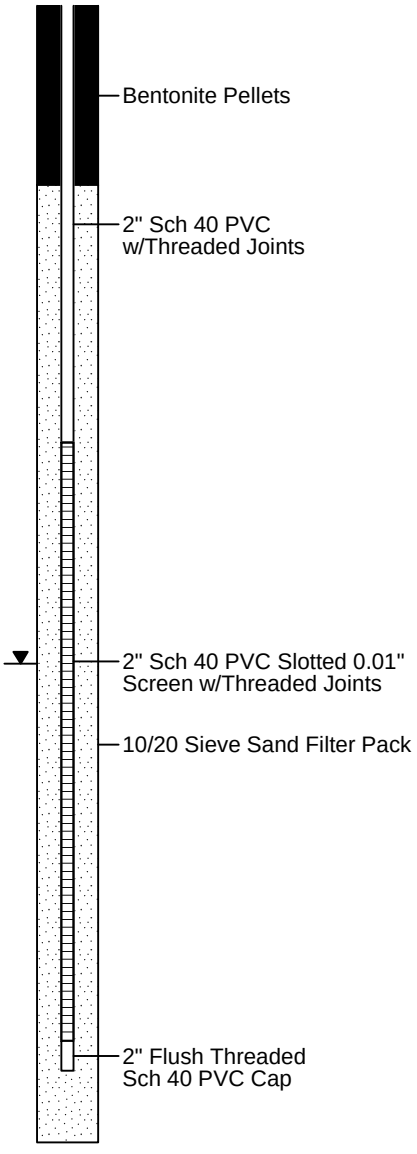
Elev., TOC (ft.msl)	: 6876.85
Elev., PAD (ft. msl)	: 6874.22
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N1633279.54
E	: W2542553.04

Depth (ft.)	PID (ppm)	USCS	Recovery	DESCRIPTION
57	0.0	CL	60	
58				SHALE, very dense, damp to saturated in cracks, fissle, light brown and grey, no odor,
59	0.0		60	
60				SHALE, STA, very fine grain sand, dry, brown, no odor,
61	0.0		50	
62				SHALE, STA, sand increases with interbedded clays, dry,
63	0.0		40	
64				SANDSTONE, very dense, fine grain, interbedded with clay lenses, dry, brown,
65	0.0	SST	40	
66				SANDSTONE, STA, interbedded with clay, damp in fractures, weathered, soft, micaceous, light purple brown,
67	0.0	SST	40	
68		SP	80	SAND, fine to medium, loose, saturated, brown,
69	0.0	SP	80	SILTSTONE, dense, dry/damp, brown,
70		SST	80	SANDSTONE, firm/dense, damp to moist, grey, no odor,
71		SST	20	SANDSTONE, STA, moist,
72				SANDSTONE, STA, moist,
73		SST	10	
74				SANDSTONE, STA, moist, shale at base, stiff, damp, dark grey to black.
75		SST	10	
76				
77				

Saturation
▼ Saturation

Completion Results

Well No. BW-5C



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-29-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\Boundary Wells\BW-5C.boi

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to 5 BGL
Total Depth	: 40'
Ground Water	: 26'
Start Date	: 06/12/2017
Finish Date	: 06/12/2017

WELL NO. OW-59

(Sheet 1 of 3)

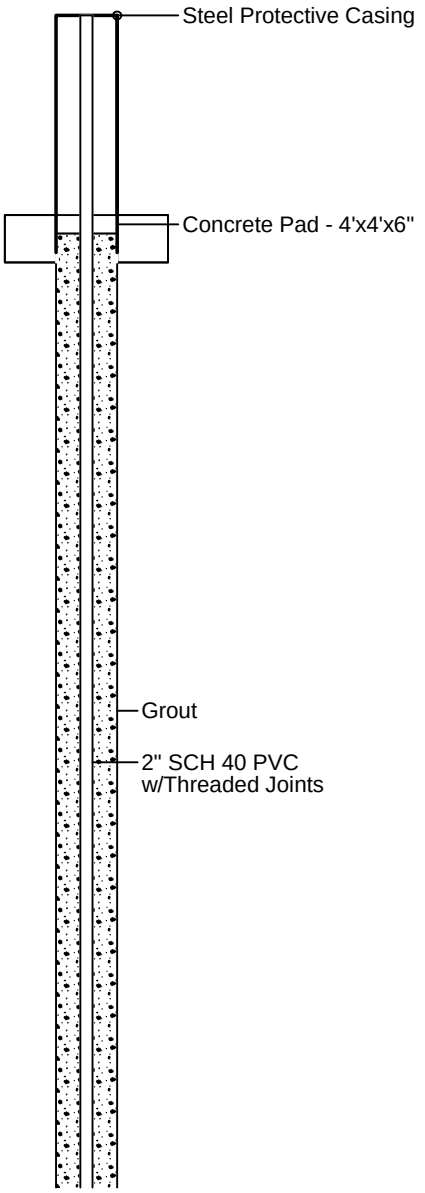
Elev., TOC (ft.msl)	: 6889.73
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6887.63
Site Coordinates	:
N	: N1635547.14
E	: W2544633.00

Saturation
▼ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0	0.0			CL	100		SILTY CLAY, low, firm, damp, brown, no odor,
2	0.0			CL	100		SILTY CLAY, SIMILAR TO ABOVE (STA),
4	0.0			CL	100		SILTY CLAY, STA,
6	2.0			CH	70		CLAY, high, stiff, damp, brown, no odor,
8	1.0			CL	80		SILTY CLAY, low, stiff, damp, light brown, no odor, sandy at base,
10	0.3			ML	70		SILT, low, compact, damp, brown, no odor,
12	0.5			CL			SILTY CLAY, low, very stiff, damp, brown, no odor, trace sand,

Completion Results

Well No. OW-59



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-20-2019 C:\Users\cholmes\Desktop\WEST\OW-59.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to 5 BGL
Total Depth	: 40'
Ground Water	: 26'
Start Date	: 06/12/2017
Finish Date	: 06/12/2017

WELL NO. OW-59

(Sheet 2 of 3)

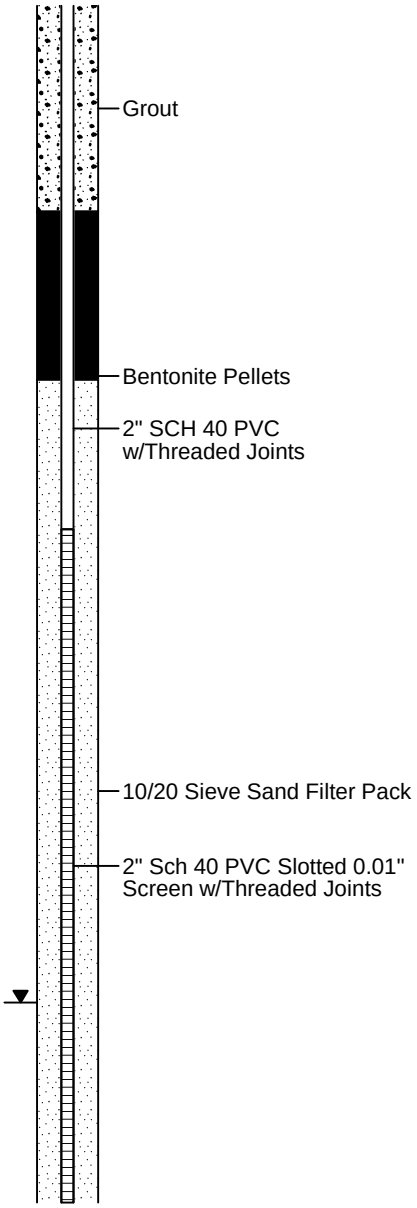
Elev., TOC (ft.msl)	: 6889.73
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6887.63
Site Coordinates	:
N	: N1635547.14
E	: W2544633.00

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
13	0.5			CL	50		
14							SILTY CLAY, high, very stiff, damp, brown, no odor,
15	1.3			CH	50		
16							SILTY CLAY, STA, no odor,
17	1.7			CH	60		
18							SILTY CLAY, low to moderate, stiff, damp, brown, no odor,
19	1.1			CL	50		
20							SANDY SILTY CLAY, low, firm to soft, damp, brown, no odor,
21	1.2			CL	50		
22							SANDY CLAY, low, soft, damp, brown, no odor,
23	0.2			CL	60		
24							SILTY CLAY, low, soft, damp, brown, no odor,
25	3.3			CL	70		
26		▼					SANDY SILT, very fine, very moist, brown, no odor,
27	10.9			ML	80		
28							SANDY SILT, STA, very moist, no odor,
29	11.6			ML			

Saturation
▼ Saturation

Completion Results

Well No. OW-59



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-20-2019 C:\Users\cholmes\Desktop\WEST\OW-59.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to 5 BGL
Total Depth	: 40'
Ground Water	: 26'
Start Date	: 06/12/2017
Finish Date	: 06/12/2017

WELL NO. OW-59

(Sheet 3 of 3)

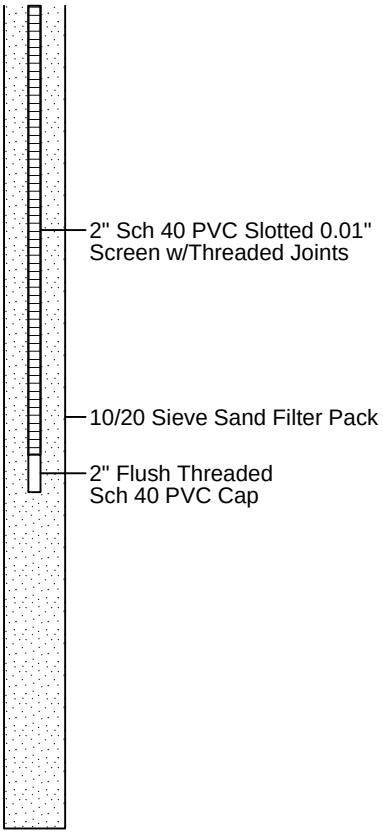
Elev., TOC (ft.msl)	: 6889.73
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6887.63
Site Coordinates	:
N	: N1635547.14
E	: W2544633.00

Saturation
▼ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
29	11.6			ML	80		
30							SILTY CLAY, low, firm, damp, brown, no odor,
31	11.4			CL	90		
32	14.9			CL	90		SILTY CLAY, STA, no odor,
33	16.3			SM	90	X	SILTY SAND, very fine, compact, saturated, brown, no odor,
34							SILTY CLAY, low, firm, damp, brown, no odor,
35	10.5			CL	60		
36							SILTY CLAY, STA, no odor,
37	7.3			CL	70		
38				CH	70		CLAY, high, firm, damp, brown, no odor,
39	10.0			CL	70		SILTY CLAY, low, firm to soft, grey and white, no odor, trace sand and white nodules.
40							
41							
42							
43							
44							
45							

Completion Results

Well No. OW-59



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-20-2019 C:\Users\cholmes\Desktop\WEST\OW-59.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to 5' BGL
Total Depth	: 48'
Ground Water	: Not Encountered
Start Date	: 6/13/2017
Finish Date	: 6/13/2017

WELL NO. OW-60

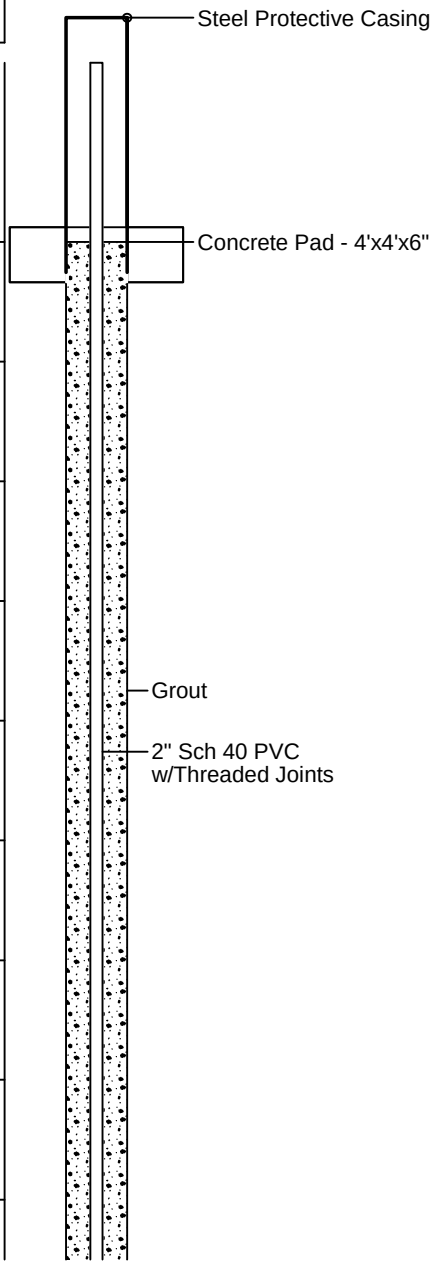
(Sheet 1 of 3)

Elev., TOC (ft.msl)	: 6893.51
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6891.06
Site Coordinates	:
N	: N1635335.02
E	: W2545018.21

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
1	6.5			CL	100		SILTY CLAY, low, firm, damp, brown, no odor,
3	5.8			CH	100		CLAY, high, firm to stiff, damp, brown, no odor,
5	6.3			CH	100		CLAY, SIMILAR TO ABOVE (STA), no odor,
7	8.1			CH	90		CLAY, STA, no odor,
9	9.6			CH	100		CLAY, STA, no odor,
11	9.1			CL	50		SILTY CLAY, moderate, firm, damp, brown, no odor,
13	8.2			CL	50		SILTY CLAY, STA, soft, no odor,
15	7.9			CL	70		SILTY CLAY, STA, firm, no odor,
16	8.3			CL			SILTY CLAY, STA, no odor,

Completion Results

Well No. OW-60



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-20-2019 C:\Users\cholmes\Desktop\WEST\OW-60.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to 5' BGL
Total Depth	: 48'
Ground Water	: Not Encountered
Start Date	: 6/13/2017
Finish Date	: 6/13/2017

WELL NO. OW-60

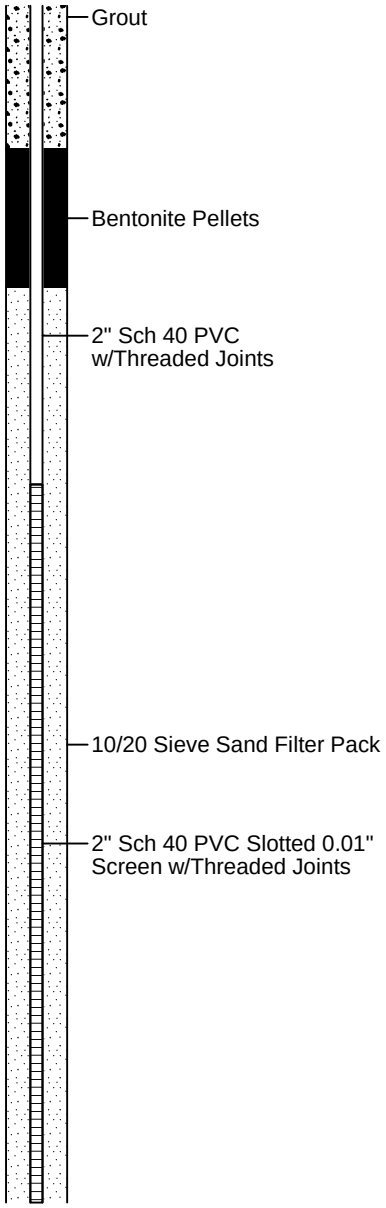
(Sheet 2 of 3)

Elev., TOC (ft.msl)	: 6893.51
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6891.06
Site Coordinates	:
N	: N1635335.02
E	: W2545018.21

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
17	8.3			CL	70		
18							SILTY CLAY, STA, no odor,
19	10.1			CL	50		
20							SILTY CLAY, moderate, soft, damp, brown, no odor,
21	15.3			CL	60		
22							SILTY CLAY, STA, firm, no odor,
23	12.1			CL	70		
24							SILTY CLAY, STA,calcareous nodules (white) present, trace gravel, no odor,
25	11.6			CL	80		
26							SILTY CLAY, STA, tan-silt pockets throughout, no odor,
27	10.9			CL	80		
28							CLAYEY SILT, low, soft/crumbly, damp, light brown and grey, no odor,
29	10.5			ML	80		
30							SILTY CLAY, low, firm to crumbly, damp, light reddish brown with trace grey, no odor,
31	11.1			CL	70		
32							SILTY CLAY, STA, no odor,
33	15.0			CL	70		
34							SILTY CLAY, STA, no odor,
35	12.8			CL	80		
36							SILTY CLAY, low, very stiff, crumbly, damp, light reddish brown, grey, no odor,
37	12.7			CL			

Completion Results

Well No. OW-60



03-20-2019 C:\Users\cholmes\Desktop\WEST\OW-60.bor

DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery
Job No. WEST17020

Geologist	: Tracy Payne
Driller	: Enviro-Drill Inc/Cohagan
Drilling Rig	: CME75
Drilling Method	: Hollow Stem Auger 7 1/4"
Sampling Method	: 2' Split Spoon
Comments	: Hand Auger to 5' BGL
Total Depth	: 48'
Ground Water	: Not Encountered
Start Date	: 6/13/2017
Finish Date	: 6/13/2017

WELL NO. OW-60

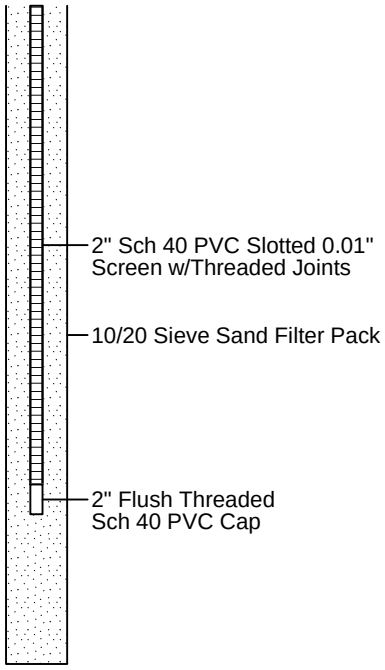
(Sheet 3 of 3)

Elev., TOC (ft.msl)	: 6893.51
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6891.06
Site Coordinates	:
N	: N1635335.02
E	: W2545018.21

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
37	12.7			CL	70		
38							SILT, low, compact to dense/stiff crumbly, damp, light grey, no odor,
39	10.4			ML	50		
40							SILT, STA, no odor,
41	9.9			ML	60		
42							SILT, STA, trace very fine sand, no odor,
43	10.7			ML	60		
44							SILT, STA, no odor,
45	10.1			ML	50		
46							SILT, STA, trace reddish brown clay with grey, no odor.
47	9.6			ML	50		
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							

Completion Results

Well No. OW-60



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

03-20-2019 C:\Users\cholmes\Desktop\WEST\OW-60.bor

Appendix B

Waste Analyses and Waste Manifests

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

August 30, 2017

Cheryl Johnson

Western Refining Southwest, Gallup
Rt. 3 Box 7
Gallup, NM 87301
TEL:
FAX

RE: Soil T-35 Drill Cuttings OrderNo.: 1708D66

Dear Cheryl Johnson:

Hall Environmental Analysis Laboratory received 2 sample(s) on 8/23/2017 for the analyses presented in the following report.

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

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

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

Sincerely,



Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: T-35 Soil Clean Up
Project: Soil T-35 Drill Cuttings
Collection Date: 8/23/2017 9:50:00 AM
Lab ID: 1708D66-001
Matrix: SLUDGE
Received Date: 8/23/2017 3:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	10000	31	190		mg/Kg	20	8/28/2017 2:56:47 PM	33552
Motor Oil Range Organics (MRO)	4400	960	960		mg/Kg	20	8/28/2017 2:56:47 PM	33552
Surr: DNOP	0	0	70-130	S	%Rec	20	8/28/2017 2:56:47 PM	33552
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.1	5.0		mg/Kg	1	8/25/2017 11:01:22 AM	33543
Surr: BFB	77.3	0	54-150		%Rec	1	8/25/2017 11:01:22 AM	33543
MERCURY, TCLP							Analyst: **pmf**	
Mercury	ND	0.00075	0.020		mg/L	1	8/28/2017 1:59:07 PM	33583
EPA METHOD 6010B: TCLP METALS							Analyst: **MED**	
Arsenic	0.040	0.013	5.0	J	mg/L	1	8/28/2017 1:57:50 PM	33562
Barium	0.68	0.00062	100	J	mg/L	1	8/28/2017 1:57:50 PM	33562
Cadmium	ND	0.00063	1.0		mg/L	1	8/28/2017 1:57:50 PM	33562
Chromium	ND	0.0017	5.0		mg/L	1	8/28/2017 1:57:50 PM	33562
Lead	ND	0.0053	5.0		mg/L	1	8/28/2017 1:57:50 PM	33562
Selenium	ND	0.032	1.0		mg/L	1	8/28/2017 1:57:50 PM	33562
Silver	ND	0.0018	5.0		mg/L	1	8/28/2017 1:57:50 PM	33562
EPA METHOD 8260B: TCLP COMPOUNDS							Analyst: **DJF**	
Benzene	ND	0.049	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
Toluene	ND	0.040	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
Ethylbenzene	ND	0.035	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
1,2-Dichloroethane (EDC)	ND	0.052	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
2-Butanone	ND	0.30	200		ppm	10	8/25/2017 11:59:53 AM	33543
Carbon tetrachloride	ND	0.049	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
Chlorobenzene	ND	0.030	100		ppm	10	8/25/2017 11:59:53 AM	33543
Chloroform	ND	0.030	6.0		ppm	10	8/25/2017 11:59:53 AM	33543
1,4-Dichlorobenzene	ND	0.056	7.5		ppm	10	8/25/2017 11:59:53 AM	33543
1,1-Dichloroethene	ND	0.20	0.70		ppm	10	8/25/2017 11:59:53 AM	33543
Tetrachloroethene (PCE)	ND	0.040	0.70		ppm	10	8/25/2017 11:59:53 AM	33543
Trichloroethene (TCE)	ND	0.061	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
Vinyl chloride	ND	0.042	0.20		ppm	10	8/25/2017 11:59:53 AM	33543
Xylenes, Total	ND	0.16	0.50		ppm	10	8/25/2017 11:59:53 AM	33543
Surr: 1,2-Dichloroethane-d4	106		70-130		%Rec	10	8/25/2017 11:59:53 AM	33543
Surr: 4-Bromofluorobenzene	94.6		70-130		%Rec	10	8/25/2017 11:59:53 AM	33543
Surr: Dibromofluoromethane	104		70-130		%Rec	10	8/25/2017 11:59:53 AM	33543
Surr: Toluene-d8	96.0		70-130		%Rec	10	8/25/2017 11:59:53 AM	33543

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: Drill Cuttings
Project: Soil T-35 Drill Cuttings
Collection Date: 8/23/2017 10:32:00 AM
Lab ID: 1708D66-002
Matrix: SLUDGE
Received Date: 8/23/2017 3:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	2.3	1.6	10	J	mg/Kg	1	8/28/2017 3:41:24 PM	33552
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	8/28/2017 3:41:24 PM	33552
Surr: DNOP	93.6	0	70-130		%Rec	1	8/28/2017 3:41:24 PM	33552
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.1	5.0		mg/Kg	1	8/25/2017 10:37:23 AM	33543
Surr: BFB	77.5	0	54-150		%Rec	1	8/25/2017 10:37:23 AM	33543
MERCURY, TCLP							Analyst: **pmf**	
Mercury	ND	0.00075	0.020		mg/L	1	8/28/2017 2:00:51 PM	33583
EPA METHOD 6010B: TCLP METALS							Analyst: **MED**	
Arsenic	0.031	0.013	5.0	J	mg/L	1	8/28/2017 1:59:04 PM	33562
Barium	1.9	0.00062	100	J	mg/L	1	8/28/2017 1:59:04 PM	33562
Cadmium	ND	0.00063	1.0		mg/L	1	8/28/2017 1:59:04 PM	33562
Chromium	ND	0.0017	5.0		mg/L	1	8/28/2017 1:59:04 PM	33562
Lead	ND	0.0053	5.0		mg/L	1	8/28/2017 1:59:04 PM	33562
Selenium	ND	0.032	1.0		mg/L	1	8/28/2017 1:59:04 PM	33562
Silver	ND	0.0018	5.0		mg/L	1	8/28/2017 1:59:04 PM	33562
EPA METHOD 8260B: TCLP COMPOUNDS							Analyst: **DJF**	
Benzene	ND	0.049	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
Toluene	ND	0.040	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
Ethylbenzene	ND	0.035	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
1,2-Dichloroethane (EDC)	ND	0.052	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
2-Butanone	ND	0.30	200		ppm	10	8/25/2017 12:28:45 PM	33543
Carbon tetrachloride	ND	0.049	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
Chlorobenzene	ND	0.030	100		ppm	10	8/25/2017 12:28:45 PM	33543
Chloroform	ND	0.030	6.0		ppm	10	8/25/2017 12:28:45 PM	33543
1,4-Dichlorobenzene	ND	0.055	7.5		ppm	10	8/25/2017 12:28:45 PM	33543
1,1-Dichloroethene	ND	0.20	0.70		ppm	10	8/25/2017 12:28:45 PM	33543
Tetrachloroethene (PCE)	ND	0.040	0.70		ppm	10	8/25/2017 12:28:45 PM	33543
Trichloroethene (TCE)	ND	0.060	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
Vinyl chloride	ND	0.042	0.20		ppm	10	8/25/2017 12:28:45 PM	33543
Xylenes, Total	ND	0.16	0.50		ppm	10	8/25/2017 12:28:45 PM	33543
Surr: 1,2-Dichloroethane-d4	106		70-130		%Rec	10	8/25/2017 12:28:45 PM	33543
Surr: 4-Bromofluorobenzene	91.1		70-130		%Rec	10	8/25/2017 12:28:45 PM	33543
Surr: Dibromofluoromethane	104		70-130		%Rec	10	8/25/2017 12:28:45 PM	33543
Surr: Toluene-d8	97.5		70-130		%Rec	10	8/25/2017 12:28:45 PM	33543

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Wet Chemistry by Method 9012 B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Reactive Cyanide	ND		0.250	1	08/25/2017 22:23	WG1013530

Wet Chemistry by Method 9034-9030B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Reactive Sulfide	ND		25.0	1	08/25/2017 16:05	WG1013568

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
Corrosivity by pH	8.51	T8	1	08/29/2017 10:37	WG1014298

Sample Narrative:

L931847-01 WG1014298: 8.51 at 20.5c

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	Deg. F			date / time	
Ignitability	DNI at 170		1	08/28/2017 13:00	WG1014260

Wet Chemistry by Method 9012 B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Reactive Cyanide	ND		0.250	1	08/25/2017 22:26	WG1013530

Wet Chemistry by Method 9034-9030B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Reactive Sulfide	ND		25.0	1	08/25/2017 16:05	WG1013568

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
Corrosivity by pH	10.0	T8	1	08/29/2017 10:37	WG1014298

Sample Narrative:

L931847-02 WG1014298: 10.03 at 20.1c

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	Deg. F			date / time	
Ignitability	DNI at 170		1	08/28/2017 13:00	WG1014260

Method Blank (MB)

(MB) R3244658-1 08/25/17 22:01

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Reactive Cyanide	U		0.039	0.250

L931815-01 Original Sample (OS) • Duplicate (DUP)

(OS) L931815-01 08/25/17 22:20 • (DUP) R3244658-6 08/25/17 22:21

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/kg	mg/kg		%		%
Reactive Cyanide	ND	0.0532	1	0		20

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

(LCS) R3244658-2 08/25/17 22:02 • (LCSD) R3244658-3 08/25/17 22:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Reactive Cyanide	2.50	2.57	2.47	103	99	50-150			4	20

L931767-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L931767-05 08/25/17 22:16 • (MS) R3244658-4 08/25/17 22:17 • (MSD) R3244658-5 08/25/17 22:18

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Reactive Cyanide	1.67	ND	1.55	1.57	89	90	1	75-125			1	20

Method Blank (MB)

(MB) WG1013568-1 08/25/17 16:05

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Reactive Sulfide	U		7.63	25.0

L931847-01 Original Sample (OS) • Duplicate (DUP)

(OS) L931847-01 08/25/17 16:05 • (DUP) WG1013568-4 08/25/17 16:05

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

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

(LCS) WG1013568-2 08/25/17 16:05 • (LCSD) WG1013568-3 08/25/17 16:05

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Reactive Sulfide	100	73.1	73.1	73.1	73.1	70.0-130			0.000	20

Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

L931847-02 Original Sample (OS) • Duplicate (DUP)

(OS) L931847-02 08/29/17 10:37 • (DUP) WG1014298-3 08/29/17 10:37

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
Corrosivity by pH	10.0	10.0	1	0.399	T8	1

Sample Narrative:

OS: 10.03 at 20.1c

DUP: 10.04 at 20.2c

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

(LCS) WG1014298-1 08/29/17 10:37 • (LCSD) WG1014298-2 08/29/17 10:37

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
Corrosivity by pH	10.0	10.1	10.1	101	101	98.4-102			0.000	1

Sample Narrative:

LCS: 10.06 at 20.0c

LCSD: 10.06 at 20.1c

L931842-01 Original Sample (OS) • Duplicate (DUP)

(OS) L931842-01 08/28/17 13:00 • (DUP) R3244961-3 08/28/17 13:00

Analyte	Original Result Deg. F	DUP Result Deg. F	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ignitability	131	135	1	3.00		10

L931859-01 Original Sample (OS) • Duplicate (DUP)

(OS) L931859-01 08/28/17 13:00 • (DUP) R3244961-4 08/28/17 13:00

Analyte	Original Result Deg. F	DUP Result Deg. F	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ignitability	148	142	1	4.00		10

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

(LCS) R3244961-1 08/28/17 13:00 • (LCSD) R3244961-2 08/28/17 13:00

Analyte	Spike Amount Deg. F	LCS Result Deg. F	LCSD Result Deg. F	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ignitability	82.0	79.9	80.3	97.0	98.0	96.0-104			0.000	10

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Rec.	Recovery.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1708D66**

30-Aug-17

Client: Western Refining Southwest, Gallup

Project: Soil T-35 Drill Cuttings

Sample ID	**LCS-33552**	SampType:	**LCS**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**LCSS**	Batch ID:	**33552**		RunNo:	**45247**				
Prep Date:	**8/25/2017**	Analysis Date:	**8/28/2017**		SeqNo:	**1432934**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	10	50.00	0	96.0	73.2	114			
Surr: DNOP	4.8		5.000		95.7	70	130			

Sample ID	**MB-33552**	SampType:	**MBLK**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**PBS**	Batch ID:	**33552**		RunNo:	**45247**				
Prep Date:	**8/25/2017**	Analysis Date:	**8/28/2017**		SeqNo:	**1432935**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.4	10								J
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.8		10.00		97.7	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1708D66**

30-Aug-17

Client: Western Refining Southwest, Gallup

Project: Soil T-35 Drill Cuttings

Sample ID	**MB-33543**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**PBS**	Batch ID:	**33543**	RunNo:	**45235**					
Prep Date:	**8/24/2017**	Analysis Date:	**8/25/2017**	SeqNo:	**1432593**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	790		1000		78.6	54	150			

Sample ID	**LCS-33543**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**LCSS**	Batch ID:	**33543**	RunNo:	**45235**					
Prep Date:	**8/24/2017**	Analysis Date:	**8/25/2017**	SeqNo:	**1432594**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	95.0	76.4	125			
Surr: BFB	880		1000		88.1	54	150			

Sample ID	**1708D66-001AMS**	SampType:	**MS**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**T-35 Soil Clean Up**	Batch ID:	**33543**	RunNo:	**45235**					
Prep Date:	**8/24/2017**	Analysis Date:	**8/25/2017**	SeqNo:	**1432598**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	24.95	0	95.0	77.8	128			
Surr: BFB	930		998.0		92.9	54	150			

Sample ID	**1708D66-001AMSD**	SampType:	**MSD**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**T-35 Soil Clean Up**	Batch ID:	**33543**	RunNo:	**45235**					
Prep Date:	**8/24/2017**	Analysis Date:	**8/25/2017**	SeqNo:	**1432599**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	24.90	0	94.9	77.8	128	0.326	20	
Surr: BFB	940		996.0		94.7	54	150	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1708D66**

30-Aug-17

Client: Western Refining Southwest, Gallup

Project: Soil T-35 Drill Cuttings

Sample ID **mb-33543**	SampType: **MBLK**	TestCode: **EPA Method 8260B: TCLP Compounds**
Client ID: **PBS**	Batch ID: **33543**	RunNo: **45237**
Prep Date: **8/24/2017**	Analysis Date: **8/25/2017**	SeqNo: **1432746** Units: **ppm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
1,2-Dichloroethane (EDC)	ND	0.050								
2-Butanone	ND	20								
Carbon tetrachloride	ND	0.050								
Chlorobenzene	ND	10								
Chloroform	ND	0.60								
1,4-Dichlorobenzene	ND	0.75								
1,1-Dichloroethene	ND	0.070								
Tetrachloroethene (PCE)	ND	0.070								
Trichloroethene (TCE)	ND	0.050								
Vinyl chloride	ND	0.020								
Surr: 1,2-Dichloroethane-d4	0.52		0.5000		104	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.5000		92.8	70	130			
Surr: Dibromofluoromethane	0.50		0.5000		101	70	130			
Surr: Toluene-d8	0.48		0.5000		96.3	70	130			

Sample ID **lcs-33543**	SampType: **LCS**	TestCode: **EPA Method 8260B: TCLP Compounds**
Client ID: **LCSS**	Batch ID: **33543**	RunNo: **45237**
Prep Date: **8/24/2017**	Analysis Date: **8/25/2017**	SeqNo: **1432747** Units: **ppm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.050	1.000	0	111	70	130			
Chlorobenzene	0.94	0.050	1.000	0	93.9	70	130			
1,1-Dichloroethene	1.2	0.050	1.000	0	120	68.8	161			
Trichloroethene (TCE)	1.0	0.050	1.000	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	0.55		0.5000		109	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		95.2	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		104	70	130			
Surr: Toluene-d8	0.49		0.5000		98.3	70	130			

Sample ID **1708d66-002ams**	SampType: **MS**	TestCode: **EPA Method 8260B: TCLP Compounds**
Client ID: **Drill Cuttings**	Batch ID: **33543**	RunNo: **45237**
Prep Date: **8/24/2017**	Analysis Date: **8/25/2017**	SeqNo: **1432750** Units: **ppm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.3	0.50	0.9990	0	127	61.9	146			
Chlorobenzene	1.0	0.50	0.9990	0	103	70	130			
1,1-Dichloroethene	1.3	0.50	0.9990	0	125	37.1	170			
Trichloroethene (TCE)	1.2	0.50	0.9990	0	116	49.8	150			
Surr: 1,2-Dichloroethane-d4	5.5		4.995		109	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1708D66**

30-Aug-17

Client: Western Refining Southwest, Gallup

Project: Soil T-35 Drill Cuttings

Sample ID	**1708d66-002ams**	SampType:	**MS**		TestCode:	**EPA Method 8260B: TCLP Compounds**				
Client ID:	**Drill Cuttings**	Batch ID:	**33543**		RunNo:	**45237**				
Prep Date:	**8/24/2017**	Analysis Date:	**8/25/2017**		SeqNo:	**1432750**	Units:	**ppm**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	4.8		4.995		95.8	70	130			
Surr: Dibromofluoromethane	5.3		4.995		106	70	130			
Surr: Toluene-d8	4.9		4.995		98.0	70	130			

Sample ID	**1708d66-002amsd**	SampType:	**MSD**		TestCode:	**EPA Method 8260B: TCLP Compounds**				
Client ID:	**Drill Cuttings**	Batch ID:	**33543**		RunNo:	**45237**				
Prep Date:	**8/24/2017**	Analysis Date:	**8/25/2017**		SeqNo:	**1432751**	Units:	**ppm**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.50	0.9980	0	115	61.9	146	10.2	20	
Chlorobenzene	0.95	0.50	0.9980	0	94.8	70	130	8.41	20	
1,1-Dichloroethene	1.2	0.50	0.9980	0	119	37.1	170	5.29	20	
Trichloroethene (TCE)	1.1	0.50	0.9980	0	106	49.8	150	8.97	20	
Surr: 1,2-Dichloroethane-d4	5.6		4.990		111	70	130	0	0	
Surr: 4-Bromofluorobenzene	4.7		4.990		95.1	70	130	0	0	
Surr: Dibromofluoromethane	5.3		4.990		105	70	130	0	0	
Surr: Toluene-d8	4.9		4.990		98.4	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1708D66**

30-Aug-17

Client: Western Refining Southwest, Gallup

Project: Soil T-35 Drill Cuttings

Sample ID	**MB-33583**	SampType:	**MBLK**	TestCode:	**MERCURY, TCLP**					
Client ID:	**PBW**	Batch ID:	**33583**	RunNo:	**45252**					
Prep Date:	**8/28/2017**	Analysis Date:	**8/28/2017**	SeqNo:	**1433185**	Units:	**mg/L**			

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

Sample ID	**LCS-33583**	SampType:	**LCS**	TestCode:	**MERCURY, TCLP**					
Client ID:	**LCSW**	Batch ID:	**33583**	RunNo:	**45252**					
Prep Date:	**8/28/2017**	Analysis Date:	**8/28/2017**	SeqNo:	**1433186**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0050	0.020	0.005000	0	101	80	120			J

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1708D66**

30-Aug-17

Client: Western Refining Southwest, Gallup

Project: Soil T-35 Drill Cuttings

Sample ID	**MB-33562**	SampType:	**MBLK**	TestCode:	**EPA Method 6010B: TCLP Metals**
Client ID:	**PBW**	Batch ID:	**33562**	RunNo:	**45251**
Prep Date:	**8/25/2017**	Analysis Date:	**8/28/2017**	SeqNo:	**1433165** 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-33562**	SampType:	**LCS**	TestCode:	**EPA Method 6010B: TCLP Metals**
Client ID:	**LCSW**	Batch ID:	**33562**	RunNo:	**45251**
Prep Date:	**8/25/2017**	Analysis Date:	**8/28/2017**	SeqNo:	**1433166** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.56	5.0	0.5000	0	112	80	120			J
Barium	0.49	100	0.5000	0	97.6	80	120			J
Cadmium	0.50	1.0	0.5000	0	100	80	120			J
Chromium	0.50	5.0	0.5000	0	99.4	80	120			J
Lead	0.48	5.0	0.5000	0	95.1	80	120			J
Selenium	0.55	1.0	0.5000	0	111	80	120			J
Silver	0.10	5.0	0.1000	0	103	80	120			J

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **Western Refining Gallup** Work Order Number: **1708D66** RcptNo: **1**

Received By: **Isaiah Ortiz** **8/23/2017 3:55:00 PM** IO

Completed By: **Ashley Gallegos** **8/23/2017 4:40:39 PM** AG

Reviewed By: SRC 08/24/17

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	4.4	Good	Yes			

Chain-of-Custody Record

Client:	WESTERN REFINING
	GALLUP REFINERY
Mailing Address:	92 Giant Crossing Road
	Gallup, NM 87301
Phone #:	505-722-3833
Email or Fax#:	505-863-0830
QA/QC Package:	
X Standard	☐ Level 4 (Full Validation)
Accreditation:	
☐ NELAP	☐ Other:
☐ EDD (Type)	

Turn-Around Time: Standard / Rush x

Project Name: Soil - T-35/Drill Cuttings

Project #:

Project Manager: CherylJohnson@wnr.com

Sampler: C JOHNSON

On Ice: X Yes ☐ No

Sample Temperature: 4.4 °C

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. 1708D066	8015D (GRO/DRO/MRO)		8260B - (BTEX) TCLP		RCRA 8 METALS - TCLP	RCI									Air Bubbles (Y or N)
8-23-17	9:50	SOLID	T-35 soil clean up	2-9oz jar	None	-001	X		X		X	X									
8-23-17	10:32	SOLID	DRILL CUTINGS -	2-9oz jar	None	-002	X		X		X	X									

Date	Time	Relinquished by	Received by	Date	Time
8-23-17	~~1450~~ 1555			8-23-17	1555

Remarks:

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.

ase print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	NMD000333211	2	800-424-9300	009001800 FLE

GENERATOR

5. Generator's Name and Mailing Address
WESTERN REFINING SOUTHWEST GALLUP REFINING
92 GIANT CROSSING ROAD
GALLUP, NM 87301
Generator's Phone: 505 722 0654

Generator's Site Address (if different than mailing address)

6. Transporter 1 Company Name
Advanced Chemical Transport Inc. (GV)

U.S. EPA ID Number
CAR000070540

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address
Advanced Chemical Treatment
6133 Edith Blvd NE
Albuquerque, NM 87107

U.S. EPA ID Number
NMD982208527

Facility's Phone: 505-345-5220

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ, UN3475, Waste Solids containing flammable liquid n.o.s. (acetone, methanol) 4.1, PGII	01	MEDBA CF	312	P	D001
X	2. ~~HAZARDS Hazardous waste, solid, n.o.s., (D001, D035), UN3077, BENZENE, 9, PGIII~~ MIL		~~DM~~ MT		~~M~~ P	~~D001~~ D035
X	3. UN2809, Waste Mercury, 8, PGIII	01	DF	184	P	D009
X	4. NA1993, Combustible liquid, n.o.s., Contains PCB (DIESEL IN VIALS)	01	DF	131	P	NONE

14. Special Handling Instructions and Additional Information
1) LHGM33, AC15180 WEA (1)CYB
~~2) LHGM44, AC15750 WEA~~ MIL
Project Number 12751 Document # D165090
3) LHGM172, AC15750 WEA (1)55DM
4) LHGM28, AC15480 WEA (1)55DM
24 hour emergency contact CHEMTREC 800-424-9300

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: ALVIN DORSEY — Signature — Month 08 Day 30 Year 17

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Mike Ramirez — Signature — Month 8 Day 30 Year 17

Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name — Signature — Month Day Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

. HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number	22. Page	23. Manifest Tracking Number
	NMD988553211	2 of 2	00560 UKAFLE

24. Generator's Name

WESTERN REFINING SOUTHWEST GALLUP REFINING
92 GIANT CROSSING ROAD
GALLUP, NM 87301

25. Transporter _____ Company Name — U.S. EPA ID Number

26. Transporter _____ Company Name — U.S. EPA ID Number

GENERATOR

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		
	5) Non-RCRA/Non-DOT Regulated Material Solid (SOIL - DRILL CUTTINGS)	28	DM	16,380	P	NONE		
X	6) UN3077, Environmentally hazardous substances, solid, n.o.s. (refractory solids), 9, PGIII	01	DM	407	P			
	7) Non-RCRA/Non-DOT Regulated Material Solid (USED FILTERS)	03	CF and DM	510	P			
	8) Non-DOT Regulated Material Solid (TPH SOIL)	04	DM	1,000	P	NONE		
	9) Non-DOT Regulated Material Solid (OIL, PPE, RAGS, DEBRIS)	17	DM	5,404	P	NONE		
	10) Non-DOT Regulated Material Solid (OIL CONTAMINATED CERAMIC SUPPORT MEDIA)	01	DM	186	P	NONE		
	11) Non-RCRA/Non-DOT Regulated Material Solid (spent carbon)	32	DM	11,564	P	NONE		
X	12) RQ UN1325, Waste Flammable solids, organic, n.o.s. (cans and rags contaminated with paint), 4.1, PGII (D001)	01	DM	53	P	D001	D035	F003
	13) Non-DOT Regulated Material Solid (RESIN BEADS)	01	DM	213	P	F005 NONE		

32. Special Handling Instructions and Additional Information

5) ERG#; ACT14825 WEA (28) 55 DM 6) ERG#171; ACT58435 WEA (1) 55 DM 7) ERG#; ACT59624 WEA (3) CYB 8) ERG#; RC7145 WEA (4) 55 DM 9) ERG#; RC7334 WEA (17) 55 DM 10) ERG#; RC8009 WEA (1) 55 DM 11) ERG#; RC8751 WEA (2) 55 DM 12) ERG#133; RC8365 WEA (1) 55 DM 13) ERG#; RC8783 WEA (1) 55 DM

TRANSPORTER

33. Transporter _____ Acknowledgment of Receipt of Materials
Printed/Typed Name | Signature | Month | Day | Year

34. Transporter _____ Acknowledgment of Receipt of Materials
Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

Appendix C
Field Methods

Field Methods

Pursuant to the Work Plan for the SMW-2 Area Investigation and Boundary Well Installations, additional groundwater monitoring wells were installed downgradient of evaporation ponds EP-6 and EP-9 and in the SMW-2 area. The field methods are described below and individual discussions are presented for the following activities:

- Drilling procedures;
- Soil screening;
- Decontamination procedures;
- Monitor well development;
- Fluid level measurements;
- Purging of wells/groundwater sample collection;
- Sample collection and handling procedures;
- Equipment calibration; and
- Management of investigation derived waste.

Drilling Procedures

The soil borings were drilled using the hollow-stem auger (HSA) method. Soil samples were collected continuously and logged by a qualified geologist in accordance with the Unified Soil Classification System (USCS) nomenclature. As shown on the boring logs, the data recorded included the lithologic interval, symbol, percent recovery, field screening results, and a sample description of the cuttings and core samples.

Soil Screening

Samples obtained from the borings were screened in the field on 2-foot intervals for evidence of contaminants. Field screening results were recorded on the soil boring logs. Field screening results were used to aid in the selection of soil samples for laboratory analysis. The primary screening methods include: (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds.

Visual screening included examining the soil samples for evidence of staining caused by petroleum-related compounds or other substances that may have caused staining of soils such as elemental sulfur or cyanide compounds. Headspace vapor screening was conducted and involved placing a soil sample in a plastic sealable bag allowing space for ambient air. The bag was sealed, labeled and then shaken gently to expose the soil to the air trapped in the container. The sealed bag was allowed to rest for a minimum of 5 minutes while the vapors equilibrated. Vapors present within the

sample bag's headspace were then measured by inserting the probe of a MiniRae 3000 portable volatile organic constituent (VOC) monitor in a small opening in the bag. The maximum value and the ambient air temperature were recorded on the field boring log for each sample. Field screening results and any conditions that were considered to be capable of influencing the results of the field screening were recorded on the field logs.

Decontamination Procedures

The drilling equipment (e.g., hollow-stem augers) was decontaminated between each borehole using a high pressure potable water wash. The sampling equipment coming in direct contact with the samples (e.g., hand augers and split-spoon samplers) were decontaminated using a brush, as necessary, to remove larger particulate matter followed by a rinse with potable water, wash with non-phosphate detergent, rinse with potable water, and double rinse with deionized water.

Fluid Level Measurements

The depth to separate phase hydrocarbon, if present, and groundwater was measured prior to purging the wells of potentially stagnant groundwater. A Geotech Interface Probe was used to measure fluid levels to 0.01 foot. Fluid level measurements collected during the field activities are presented in Table 6.

Well Development/Purging

All wells were developed/purged using a new disposable bailer attached to the end of the clean rope. The groundwater and sediment removed from the wells were transported to the bundle cleaning pad in sealed 5-gallon buckets or in a plastic tote.

The purge volumes are calculated as follows:

Volume (gallons) = water column thickness (ft) x 3.14 x radius of well casing^2 (ft) x 7.48 (gals/ft). The calculated purge volumes and actual volumes removed from each well are presented below.

Well (Date)	Water Column Thickness (ft)	Calculated Purge Volume (gallons) – 3 well volumes	Actual Purge Volume (gallons)
BW-4A	Dry	NA	NA
BW-4B	33.43	16	Bailed down at 12

BW-5A	0.07	NA	NA
BW-5B	48.18	24	Bailed down at 16
BW-5C	75.36	37	45
OW-59	13.50	7	Bailed down at 8
OW-60	34.65	18	Bailed down at 12

NA – not applicable

Field measurements of groundwater stabilization parameters included pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature and the readings are presented in Table 5.

Sample Collection and Handling Procedures

Soil samples were collected using split-spoon samplers. The selected portion of the sample interval was placed in pre-cleaned, laboratory-prepared sample containers for laboratory chemical analysis. Three soil samples were collected for VOC analysis in the following manner:

- Two sample aliquots were collected using a syringe for low-level VOC analysis pursuant to EPA method 5035. For the sodium bisulfate preserved kits, 4- 5 grams (4cc) of soil was injected into each vial using the syringe. The syringes were disposed after soil collection.
- Two sample aliquots were collected using a syringe for preservation with methanol. For the methanol preserved kits, 10 grams (10 cc) of soil was injected into each methanol vial using the syringe. The syringes were disposed after soil collection.
- The third sample aliquot was placed in an 8-ounce glass jar, which was filled to the top to minimize any head space.

Two additional soil samples were collected in 8-ounce glass jars for semivolatile and metals analyses.

Groundwater samples were collected using clean disposable bailers and clean rope. Surface water samples were collected using a decontaminated polypropylene dipper attached to an extendable handle. The water was immediately poured directly into clean laboratory supplied sample containers with the exception of samples collected for dissolved metals analyses. Samples specified for dissolved metals analyses were filtered in the field using a disposable 0.45 micron filter. A new filter and syringe were used for each sample. All samples were immediately placed into an ice chest with

ice. The samples were maintained in the custody of the sampler until the chain-of-custody form was completed and the ice chest was sealed for delivery to the laboratory.

Equipment Calibration

Soil vapor screening was conducted using a MiniRae 3000 portable VOC monitor. The instrument was calibrated at the beginning of each work day to a concentration of 100 ppm isobutylene.

The instruments used to measure groundwater stabilization parameters included an YSI Professional Series Data Logger and YSI Quatro Sonde. The calibration solutions used at the beginning of each day are as follows:

- 4.0 pH solution;
- 7.0 pH solution;
- 10.0 pH solution; and
- 1.413 mS/cm conductivity solution.

Management of Investigation Derived Waste

The drilling rig and drilling equipment were decontaminated on the bundle cleaning pad. The water is diverted to the Refinery's wastewater treatment system up-stream of the API Separator. The decontamination water generated from sampling equipment was collected in buckets and disposed at the bundle cleaning pad at the end of each day of sampling. All development/purge water was collected in five gallon buckets and disposed at the bundle cleaning pad.

Soil cuttings were placed into open top 55-gallon drums and were sealed when not in use. Each drum of soils was labeled and temporarily stored in a concrete curbed area pending waste characterization and disposal.

Appendix D

Soil Analytical Reports

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 11, 2017

Cheryl Johnson

Western Refining Company
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-0231
FAX

RE: SMW-2 AND BOUNDARY WELLS OrderNo.: 1706910

Dear Cheryl Johnson:

Hall Environmental Analysis Laboratory received 4 sample(s) on 6/15/2017 for the analyses presented in the following report.

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

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

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

Sincerely,



Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB01
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 6:10:00 PM
Lab ID: 1706910-001
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.36	1.0		mg/L	1	6/20/2017 4:35:45 PM	32351
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	6/20/2017 4:35:45 PM	32351
Surr: DNOP	121	0	72.4-157		%Rec	1	6/20/2017 4:35:45 PM	32351
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	6/19/2017 4:33:28 PM	G43605
Surr: BFB	114	0	52.3-138		%Rec	1	6/19/2017 4:33:28 PM	G43605
EPA METHOD 200.7: METALS							Analyst: **pmf**	
Barium	ND	0.00093	0.0020		mg/L	1	6/20/2017 3:40:02 PM	A43653
Beryllium	ND	0.00029	0.0020		mg/L	1	6/20/2017 3:40:02 PM	A43653
Cadmium	ND	0.0010	0.0020		mg/L	1	6/20/2017 3:40:02 PM	A43653
Chromium	ND	0.0011	0.0060		mg/L	1	6/20/2017 3:40:02 PM	A43653
Cobalt	ND	0.0016	0.0060		mg/L	1	6/20/2017 3:40:02 PM	A43653
Iron	ND	0.016	0.020		mg/L	1	6/20/2017 3:40:02 PM	A43653
Manganese	ND	0.0011	0.0020		mg/L	1	6/20/2017 3:40:02 PM	A43653
Nickel	ND	0.0036	0.010		mg/L	1	6/20/2017 3:40:02 PM	A43653
Silver	ND	0.00088	0.0050		mg/L	1	6/20/2017 3:40:02 PM	A43653
Vanadium	ND	0.0019	0.050		mg/L	1	6/20/2017 3:40:02 PM	A43653
Zinc	ND	0.0028	0.010		mg/L	1	6/20/2017 3:40:02 PM	A43653
EPA 200.8: METALS							Analyst: **JLF**	
Antimony	ND	0.00037	0.0010		mg/L	1	6/26/2017 4:37:29 PM	B43799
Arsenic	ND	0.00030	0.0010		mg/L	1	6/26/2017 4:37:29 PM	B43799
Lead	ND	0.00017	0.00050		mg/L	1	6/26/2017 4:37:29 PM	B43799
Selenium	ND	0.00071	0.0010		mg/L	1	6/26/2017 4:37:29 PM	B43799
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	ND	0.000037	0.00020		mg/L	1	6/27/2017 1:47:23 PM	32504
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Acenaphthylene	ND	3.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Aniline	ND	3.1	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Anthracene	ND	3.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Azobenzene	ND	4.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Benz(a)anthracene	ND	3.9	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Benzo(a)pyrene	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Benzoic acid	7.2	3.9	20	J	µg/L	1	6/21/2017 4:02:29 PM	32356

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB01
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 6:10:00 PM
Lab ID: 1706910-001
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Benzyl alcohol	ND	4.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Bis(2-ethylhexyl)phthalate	ND	4.8	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Carbazole	ND	4.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4-Chloroaniline	ND	3.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2-Chloronaphthalene	ND	3.7	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2-Chlorophenol	ND	7.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Chrysene	ND	3.8	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Di-n-octyl phthalate	ND	4.7	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Dibenzofuran	ND	4.1	10		µg/L	1	6/21/2017 4:02:29 PM	32356
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	6/21/2017 4:02:29 PM	32356
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	6/21/2017 4:02:29 PM	32356
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Diethyl phthalate	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Dimethyl phthalate	ND	3.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	6/21/2017 4:02:29 PM	32356
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	6/21/2017 4:02:29 PM	32356
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	6/21/2017 4:02:29 PM	32356
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Fluoranthene	ND	4.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Fluorene	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Hexachlorobenzene	ND	3.8	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Hexachlorobutadiene	ND	1.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Hexachloroethane	ND	1.2	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Isophorone	ND	4.4	10		µg/L	1	6/21/2017 4:02:29 PM	32356
1-Methylnaphthalene	ND	3.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB01
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 6:10:00 PM
Lab ID: 1706910-001
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
2-Methylnaphthalene	ND	3.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2-Methylphenol	ND	3.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
3+4-Methylphenol	ND	3.2	10		µg/L	1	6/21/2017 4:02:29 PM	32356
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Naphthalene	ND	2.9	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2-Nitroaniline	ND	4.9	10		µg/L	1	6/21/2017 4:02:29 PM	32356
3-Nitroaniline	ND	4.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4-Nitroaniline	ND	4.0	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Nitrobenzene	ND	3.6	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2-Nitrophenol	ND	5.2	10		µg/L	1	6/21/2017 4:02:29 PM	32356
4-Nitrophenol	ND	5.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Pentachlorophenol	ND	4.9	20		µg/L	1	6/21/2017 4:02:29 PM	32356
Phenanthrene	ND	4.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Phenol	ND	3.1	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Pyrene	ND	4.4	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Pyridine	ND	2.3	10		µg/L	1	6/21/2017 4:02:29 PM	32356
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	6/21/2017 4:02:29 PM	32356
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	6/21/2017 4:02:29 PM	32356
Surr: 2-Fluorophenol	46.0	0	15-98.1		%Rec	1	6/21/2017 4:02:29 PM	32356
Surr: Phenol-d5	36.5	0	15-80.7		%Rec	1	6/21/2017 4:02:29 PM	32356
Surr: 2,4,6-Tribromophenol	74.5	0	15-112		%Rec	1	6/21/2017 4:02:29 PM	32356
Surr: Nitrobenzene-d5	82.4	0	27.2-90.7		%Rec	1	6/21/2017 4:02:29 PM	32356
Surr: 2-Fluorobiphenyl	69.5	0	23.3-85.6		%Rec	1	6/21/2017 4:02:29 PM	32356
Surr: 4-Terphenyl-d14	65.7	0	27.6-107		%Rec	1	6/21/2017 4:02:29 PM	32356
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.062	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Toluene	0.072	0.064	1.0	J	µg/L	1	6/16/2017 11:04:36 PM	B43587
Ethylbenzene	ND	0.093	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Methyl tert-butyl ether (MTBE)	ND	0.24	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Naphthalene	ND	0.11	2.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	6/16/2017 11:04:36 PM	B43587

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB01
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 6:10:00 PM
Lab ID: 1706910-001
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Acetone	ND	0.82	10		µg/L	1	6/16/2017 11:04:36 PM	B43587
Bromobenzene	ND	0.14	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Bromodichloromethane	ND	0.18	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Bromoform	ND	0.21	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Bromomethane	ND	0.26	3.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
2-Butanone	ND	1.1	10		µg/L	1	6/16/2017 11:04:36 PM	B43587
Carbon disulfide	ND	0.40	10		µg/L	1	6/16/2017 11:04:36 PM	B43587
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Chlorobenzene	ND	0.11	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Chloroethane	ND	0.23	2.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Chloroform	ND	0.40	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Chloromethane	ND	0.29	3.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Dibromochloromethane	ND	0.072	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Dibromomethane	ND	0.091	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
2-Hexanone	ND	0.66	10		µg/L	1	6/16/2017 11:04:36 PM	B43587
Isopropylbenzene	ND	0.051	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	6/16/2017 11:04:36 PM	B43587
Methylene Chloride	ND	0.11	3.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
n-Butylbenzene	ND	0.13	3.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
n-Propylbenzene	ND	0.074	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Styrene	ND	0.16	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB01
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 6:10:00 PM
Lab ID: 1706910-001
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Vinyl chloride	ND	0.18	1.0		µg/L	1	6/16/2017 11:04:36 PM	B43587
Xylenes, Total	ND	0.32	1.5		µg/L	1	6/16/2017 11:04:36 PM	B43587
Surr: 1,2-Dichloroethane-d4	100	0	70-130		%Rec	1	6/16/2017 11:04:36 PM	B43587
Surr: 4-Bromofluorobenzene	96.7	0	70-130		%Rec	1	6/16/2017 11:04:36 PM	B43587
Surr: Dibromofluoromethane	102	0	70-130		%Rec	1	6/16/2017 11:04:36 PM	B43587
Surr: Toluene-d8	98.6	0	70-130		%Rec	1	6/16/2017 11:04:36 PM	B43587

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB02
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 5:15:00 PM
Lab ID: 1706910-002
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.36	1.0		mg/L	1	6/20/2017 5:43:20 PM	32351
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	6/20/2017 5:43:20 PM	32351
Surr: DNOP	122	0	72.4-157		%Rec	1	6/20/2017 5:43:20 PM	32351
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	6/19/2017 4:57:21 PM	G43605
Surr: BFB	116	0	52.3-138		%Rec	1	6/19/2017 4:57:21 PM	G43605
EPA METHOD 200.7: METALS							Analyst: **pmf**	
Barium	ND	0.00093	0.0020		mg/L	1	6/20/2017 3:44:25 PM	A43653
Beryllium	ND	0.00029	0.0020		mg/L	1	6/20/2017 3:44:25 PM	A43653
Cadmium	ND	0.0010	0.0020		mg/L	1	6/20/2017 3:44:25 PM	A43653
Chromium	ND	0.0011	0.0060		mg/L	1	6/20/2017 3:44:25 PM	A43653
Cobalt	ND	0.0016	0.0060		mg/L	1	6/20/2017 3:44:25 PM	A43653
Iron	ND	0.016	0.020		mg/L	1	6/20/2017 3:44:25 PM	A43653
Manganese	ND	0.0011	0.0020		mg/L	1	6/20/2017 3:44:25 PM	A43653
Nickel	ND	0.0036	0.010		mg/L	1	6/20/2017 3:44:25 PM	A43653
Silver	ND	0.00088	0.0050		mg/L	1	6/20/2017 3:44:25 PM	A43653
Vanadium	ND	0.0019	0.050		mg/L	1	6/20/2017 3:44:25 PM	A43653
Zinc	ND	0.0028	0.010		mg/L	1	6/20/2017 3:44:25 PM	A43653
EPA 200.8: METALS							Analyst: **JLF**	
Antimony	ND	0.00037	0.0010		mg/L	1	6/26/2017 4:42:37 PM	B43799
Arsenic	ND	0.00030	0.0010		mg/L	1	6/26/2017 4:42:37 PM	B43799
Lead	ND	0.00017	0.00050		mg/L	1	6/26/2017 4:42:37 PM	B43799
Selenium	ND	0.00071	0.0010		mg/L	1	6/26/2017 4:42:37 PM	B43799
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	ND	0.000037	0.00020		mg/L	1	6/27/2017 1:49:21 PM	32504
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Acenaphthylene	ND	3.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Aniline	ND	3.1	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Anthracene	ND	3.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Azobenzene	ND	4.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Benz(a)anthracene	ND	3.9	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Benzo(a)pyrene	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Benzoic acid	7.1	3.9	20	J	µg/L	1	6/21/2017 4:30:48 PM	32356

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB02
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 5:15:00 PM
Lab ID: 1706910-002
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Benzyl alcohol	ND	4.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Bis(2-ethylhexyl)phthalate	5.0	4.8	10	J	µg/L	1	6/21/2017 4:30:48 PM	32356
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Carbazole	ND	4.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
4-Chloroaniline	ND	3.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2-Chloronaphthalene	ND	3.7	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2-Chlorophenol	ND	7.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Chrysene	ND	3.8	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Di-n-octyl phthalate	ND	4.7	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Dibenzofuran	ND	4.1	10		µg/L	1	6/21/2017 4:30:48 PM	32356
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	6/21/2017 4:30:48 PM	32356
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	6/21/2017 4:30:48 PM	32356
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Diethyl phthalate	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Dimethyl phthalate	ND	3.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	6/21/2017 4:30:48 PM	32356
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	6/21/2017 4:30:48 PM	32356
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	6/21/2017 4:30:48 PM	32356
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	6/21/2017 4:30:48 PM	32356
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Fluoranthene	ND	4.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Fluorene	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Hexachlorobenzene	ND	3.8	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Hexachlorobutadiene	ND	1.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Hexachloroethane	ND	1.2	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Isophorone	ND	4.4	10		µg/L	1	6/21/2017 4:30:48 PM	32356
1-Methylnaphthalene	ND	3.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB02
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 5:15:00 PM
Lab ID: 1706910-002
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
2-Methylnaphthalene	ND	3.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2-Methylphenol	ND	3.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
3+4-Methylphenol	ND	3.2	10		µg/L	1	6/21/2017 4:30:48 PM	32356
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Naphthalene	ND	2.9	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2-Nitroaniline	ND	4.9	10		µg/L	1	6/21/2017 4:30:48 PM	32356
3-Nitroaniline	ND	4.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
4-Nitroaniline	ND	4.0	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Nitrobenzene	ND	3.6	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2-Nitrophenol	ND	5.2	10		µg/L	1	6/21/2017 4:30:48 PM	32356
4-Nitrophenol	ND	5.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Pentachlorophenol	ND	4.9	20		µg/L	1	6/21/2017 4:30:48 PM	32356
Phenanthrene	ND	4.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Phenol	ND	3.1	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Pyrene	ND	4.4	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Pyridine	ND	2.3	10		µg/L	1	6/21/2017 4:30:48 PM	32356
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	6/21/2017 4:30:48 PM	32356
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	6/21/2017 4:30:48 PM	32356
Surr: 2-Fluorophenol	45.9	0	15-98.1		%Rec	1	6/21/2017 4:30:48 PM	32356
Surr: Phenol-d5	34.4	0	15-80.7		%Rec	1	6/21/2017 4:30:48 PM	32356
Surr: 2,4,6-Tribromophenol	76.8	0	15-112		%Rec	1	6/21/2017 4:30:48 PM	32356
Surr: Nitrobenzene-d5	80.1	0	27.2-90.7		%Rec	1	6/21/2017 4:30:48 PM	32356
Surr: 2-Fluorobiphenyl	68.9	0	23.3-85.6		%Rec	1	6/21/2017 4:30:48 PM	32356
Surr: 4-Terphenyl-d14	67.6	0	27.6-107		%Rec	1	6/21/2017 4:30:48 PM	32356
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.062	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Toluene	0.085	0.064	1.0	J	µg/L	1	6/16/2017 11:32:59 PM	B43587
Ethylbenzene	ND	0.093	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Methyl tert-butyl ether (MTBE)	ND	0.24	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Naphthalene	ND	0.11	2.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	6/16/2017 11:32:59 PM	B43587

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB02
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 5:15:00 PM
Lab ID: 1706910-002
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Acetone	ND	0.82	10		µg/L	1	6/16/2017 11:32:59 PM	B43587
Bromobenzene	ND	0.14	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Bromodichloromethane	ND	0.18	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Bromoform	ND	0.21	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Bromomethane	ND	0.26	3.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
2-Butanone	ND	1.1	10		µg/L	1	6/16/2017 11:32:59 PM	B43587
Carbon disulfide	ND	0.40	10		µg/L	1	6/16/2017 11:32:59 PM	B43587
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Chlorobenzene	ND	0.11	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Chloroethane	ND	0.23	2.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Chloroform	ND	0.40	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Chloromethane	ND	0.29	3.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Dibromochloromethane	ND	0.072	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Dibromomethane	ND	0.091	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
2-Hexanone	ND	0.66	10		µg/L	1	6/16/2017 11:32:59 PM	B43587
Isopropylbenzene	ND	0.051	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	6/16/2017 11:32:59 PM	B43587
Methylene Chloride	ND	0.11	3.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
n-Butylbenzene	ND	0.13	3.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
n-Propylbenzene	ND	0.074	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Styrene	ND	0.16	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: EB02
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 5:15:00 PM
Lab ID: 1706910-002
Matrix: AQUEOUS
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Vinyl chloride	ND	0.18	1.0		µg/L	1	6/16/2017 11:32:59 PM	B43587
Xylenes, Total	ND	0.32	1.5		µg/L	1	6/16/2017 11:32:59 PM	B43587
Surr: 1,2-Dichloroethane-d4	103	0	70-130		%Rec	1	6/16/2017 11:32:59 PM	B43587
Surr: 4-Bromofluorobenzene	98.0	0	70-130		%Rec	1	6/16/2017 11:32:59 PM	B43587
Surr: Dibromofluoromethane	102	0	70-130		%Rec	1	6/16/2017 11:32:59 PM	B43587
Surr: Toluene-d8	102	0	70-130		%Rec	1	6/16/2017 11:32:59 PM	B43587

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-59 (33-34')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 5:00:00 PM
Lab ID: 1706910-003 **Matrix:** SOIL **Received Date:** 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	1.5	9.5		mg/Kg	1	6/20/2017 11:00:19 AM	32362
Motor Oil Range Organics (MRO)	ND	47	47		mg/Kg	1	6/20/2017 11:00:19 AM	32362
Surr: DNOP	89.5	0	70-130		%Rec	1	6/20/2017 11:00:19 AM	32362
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.1	5.0		mg/Kg	1	6/19/2017 4:40:03 PM	32325
Surr: BFB	102	0	54-150		%Rec	1	6/19/2017 4:40:03 PM	32325
EPA METHOD 7471: MERCURY							Analyst: **ELS**	
Mercury	ND	0.0063	0.031		mg/Kg	1	6/20/2017 11:30:58 AM	32380
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Antimony	ND	1.0	2.5		mg/Kg	1	6/26/2017 8:40:45 AM	32349
Arsenic	ND	0.88	2.5		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Barium	130	0.070	0.099		mg/Kg	1	6/26/2017 8:40:45 AM	32349
Beryllium	0.34	0.034	0.15		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Cadmium	ND	0.063	0.099		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Chromium	4.6	0.093	0.30		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Cobalt	2.1	0.11	0.30		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Iron	6400	37	120		mg/Kg	50	6/26/2017 8:58:04 AM	32349
Lead	0.72	0.17	0.25		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Manganese	180	0.053	0.099		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Nickel	3.5	0.15	0.49		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Selenium	ND	1.8	2.5		mg/Kg	1	6/26/2017 8:40:45 AM	32349
Silver	ND	0.062	0.25		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Vanadium	11	0.17	2.5		mg/Kg	1	6/20/2017 12:32:04 PM	32349
Zinc	7.5	0.34	2.5		mg/Kg	1	6/20/2017 12:32:04 PM	32349
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Acenaphthene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Acenaphthylene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Aniline	ND	0.11	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Anthracene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Azobenzene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benz(a)anthracene	ND	0.17	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benzo(a)pyrene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benzo(b)fluoranthene	ND	0.19	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benzo(g,h,i)perylene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benzo(k)fluoranthene	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benzoic acid	ND	0.15	0.50		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Benzyl alcohol	ND	0.17	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-59 (33-34')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 5:00:00 PM
Lab ID: 1706910-003
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Bis(2-chloroethoxy)methane	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Bis(2-chloroethyl)ether	ND	0.13	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Bis(2-chloroisopropyl)ether	ND	0.20	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Bis(2-ethylhexyl)phthalate	0.21	0.19	0.50	J	mg/Kg	1	6/28/2017 11:41:38 AM	32411
4-Bromophenyl phenyl ether	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Butyl benzyl phthalate	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Carbazole	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
4-Chloro-3-methylphenol	ND	0.18	0.50		mg/Kg	1	6/28/2017 11:41:38 AM	32411
4-Chloroaniline	ND	0.15	0.50		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2-Chloronaphthalene	ND	0.18	0.25		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2-Chlorophenol	ND	0.14	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
4-Chlorophenyl phenyl ether	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Chrysene	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Di-n-butyl phthalate	0.17	0.11	0.40	J	mg/Kg	1	6/28/2017 11:41:38 AM	32411
Di-n-octyl phthalate	ND	0.15	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Dibenz(a,h)anthracene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Dibenzofuran	ND	0.17	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
1,2-Dichlorobenzene	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
1,3-Dichlorobenzene	ND	0.14	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
1,4-Dichlorobenzene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
3,3´-Dichlorobenzidine	ND	0.15	0.25		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Diethyl phthalate	0.19	0.17	0.20	J	mg/Kg	1	6/28/2017 11:41:38 AM	32411
Dimethyl phthalate	ND	0.19	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,4-Dichlorophenol	ND	0.16	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,4-Dimethylphenol	ND	0.088	0.30		mg/Kg	1	6/28/2017 11:41:38 AM	32411
4,6-Dinitro-2-methylphenol	ND	0.15	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,4-Dinitrophenol	ND	0.12	0.50		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,4-Dinitrotoluene	ND	0.19	0.50		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,6-Dinitrotoluene	ND	0.17	0.50		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Fluoranthene	ND	0.17	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Fluorene	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Hexachlorobenzene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Hexachlorobutadiene	ND	0.17	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Hexachlorocyclopentadiene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Hexachloroethane	ND	0.14	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Indeno(1,2,3-cd)pyrene	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Isophorone	ND	0.19	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
1-Methylnaphthalene	ND	0.19	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2-Methylnaphthalene	ND	0.17	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-59 (33-34')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 5:00:00 PM
Lab ID: 1706910-003
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
2-Methylphenol	ND	0.15	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
3+4-Methylphenol	ND	0.13	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
N-Nitrosodi-n-propylamine	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
N-Nitrosodiphenylamine	ND	0.19	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Naphthalene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2-Nitroaniline	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
3-Nitroaniline	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
4-Nitroaniline	ND	0.17	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Nitrobenzene	ND	0.17	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2-Nitrophenol	ND	0.19	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
4-Nitrophenol	ND	0.15	0.25		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Pentachlorophenol	ND	0.17	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Phenanthrene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Phenol	ND	0.14	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Pyrene	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Pyridine	ND	0.13	0.40		mg/Kg	1	6/28/2017 11:41:38 AM	32411
1,2,4-Trichlorobenzene	ND	0.18	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,4,5-Trichlorophenol	ND	0.15	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
2,4,6-Trichlorophenol	ND	0.16	0.20		mg/Kg	1	6/28/2017 11:41:38 AM	32411
Surr: 2-Fluorophenol	52.0	0	21.4-101		%Rec	1	6/28/2017 11:41:38 AM	32411
Surr: Phenol-d5	55.4	0	32-110		%Rec	1	6/28/2017 11:41:38 AM	32411
Surr: 2,4,6-Tribromophenol	64.4	0	38.7-115		%Rec	1	6/28/2017 11:41:38 AM	32411
Surr: Nitrobenzene-d5	63.6		26.2-120		%Rec	1	6/28/2017 11:41:38 AM	32411
Surr: 2-Fluorobiphenyl	61.0		36.2-124		%Rec	1	6/28/2017 11:41:38 AM	32411
Surr: 4-Terphenyl-d14	45.0		15-114		%Rec	1	6/28/2017 11:41:38 AM	32411
METHOD 8260B/5035LOW: VOLATILES							Analyst: **RAA**	
Benzene	1.86	0.113	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Toluene	0.833	0.116	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Ethylbenzene	0.264	0.132	0.801	J	µg/Kg	1	6/19/2017 3:57:00 PM	32370
Methyl tert-butyl ether (MTBE)	0.657	0.340	0.801	J	µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2,4-Trimethylbenzene	ND	0.241	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,3,5-Trimethylbenzene	ND	0.219	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2-Dichloroethane (EDC)	ND	0.162	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2-Dibromoethane (EDB)	ND	0.151	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Naphthalene	0.336	0.167	1.60	J	µg/Kg	1	6/19/2017 3:57:00 PM	32370
1-Methylnaphthalene	0.336	0.206	3.20	J	µg/Kg	1	6/19/2017 3:57:00 PM	32370
2-Methylnaphthalene	0.368	0.168	3.20	J	µg/Kg	1	6/19/2017 3:57:00 PM	32370
Acetone	11.9	0.485	8.01		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Bromobenzene	ND	0.195	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-59 (33-34')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 5:00:00 PM
Lab ID: 1706910-003
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: **RAA**	
Bromodichloromethane	ND	0.184	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Bromoform	ND	0.170	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Bromomethane	ND	0.386	2.40		µg/Kg	1	6/19/2017 3:57:00 PM	32370
2-Butanone	ND	0.600	8.01		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Carbon disulfide	ND	0.321	8.01		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Carbon tetrachloride	ND	0.148	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Chlorobenzene	ND	0.122	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Chloroethane	ND	0.158	1.60		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Chloroform	ND	0.172	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Chloromethane	ND	0.202	2.40		µg/Kg	1	6/19/2017 3:57:00 PM	32370
2-Chlorotoluene	ND	0.170	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
4-Chlorotoluene	ND	0.175	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
cis-1,2-DCE	ND	0.165	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
cis-1,3-Dichloropropene	ND	0.128	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2-Dibromo-3-chloropropane	ND	0.214	1.60		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Dibromochloromethane	ND	0.113	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Dibromomethane	ND	0.129	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2-Dichlorobenzene	ND	0.172	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,3-Dichlorobenzene	ND	0.164	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,4-Dichlorobenzene	ND	0.169	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Dichlorodifluoromethane	ND	0.164	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,1-Dichloroethane	ND	0.138	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,1-Dichloroethene	ND	0.133	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2-Dichloropropane	ND	0.160	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,3-Dichloropropane	ND	0.143	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
2,2-Dichloropropane	ND	0.129	1.60		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,1-Dichloropropene	ND	0.159	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Hexachlorobutadiene	ND	0.227	1.60		µg/Kg	1	6/19/2017 3:57:00 PM	32370
2-Hexanone	ND	0.281	8.01		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Isopropylbenzene	ND	0.195	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
4-Isopropyltoluene	ND	0.234	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
4-Methyl-2-pentanone	ND	0.474	8.01		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Methylene chloride	ND	0.319	2.40		µg/Kg	1	6/19/2017 3:57:00 PM	32370
n-Butylbenzene	ND	0.186	2.40		µg/Kg	1	6/19/2017 3:57:00 PM	32370
n-Propylbenzene	ND	0.228	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
sec-Butylbenzene	ND	0.234	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Styrene	ND	0.147	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
tert-Butylbenzene	ND	0.250	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,1,1,2-Tetrachloroethane	ND	0.133	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-59 (33-34')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/12/2017 5:00:00 PM
Lab ID: 1706910-003
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: **RAA**	
1,1,2,2-Tetrachloroethane	ND	0.164	1.60		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Tetrachloroethene (PCE)	ND	0.102	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
trans-1,2-DCE	ND	0.164	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
trans-1,3-Dichloropropene	ND	0.117	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2,3-Trichlorobenzene	ND	0.141	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2,4-Trichlorobenzene	ND	0.165	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,1,1-Trichloroethane	ND	0.139	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,1,2-Trichloroethane	ND	0.113	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Trichloroethene (TCE)	ND	0.130	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Trichlorofluoromethane	ND	0.114	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
1,2,3-Trichloropropane	ND	0.326	1.60		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Vinyl chloride	ND	0.146	0.801		µg/Kg	1	6/19/2017 3:57:00 PM	32370
Xylenes, Total	1.00	0.439	1.60	J	µg/Kg	1	6/19/2017 3:57:00 PM	32370
Surr: 1,2-Dichloroethane-d4	147	0	70-130	S	%Rec	1	6/19/2017 3:57:00 PM	32370
Surr: 4-Bromofluorobenzene	105	0	70-130		%Rec	1	6/19/2017 3:57:00 PM	32370
Surr: Dibromofluoromethane	129	0	70-130		%Rec	1	6/19/2017 3:57:00 PM	32370
Surr: Toluene-d8	96.5	0	70-130		%Rec	1	6/19/2017 3:57:00 PM	32370

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-60 (20-22')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 4:05:00 PM
Lab ID: 1706910-004 **Matrix:** SOIL **Received Date:** 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	1.5	9.5		mg/Kg	1	6/20/2017 11:28:46 AM	32362
Motor Oil Range Organics (MRO)	ND	47	47		mg/Kg	1	6/20/2017 11:28:46 AM	32362
Surr: DNOP	90.7	0	70-130		%Rec	1	6/20/2017 11:28:46 AM	32362
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.1	5.0		mg/Kg	1	6/19/2017 5:04:24 PM	32325
Surr: BFB	95.7	0	54-150		%Rec	1	6/19/2017 5:04:24 PM	32325
EPA METHOD 7471: MERCURY							Analyst: **ELS**	
Mercury	ND	0.0063	0.031		mg/Kg	1	6/20/2017 11:32:38 AM	32380
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Antimony	ND	1.0	2.5		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Arsenic	1.3	0.88	2.5	J	mg/Kg	1	6/20/2017 12:36:26 PM	32349
Barium	160	0.071	0.099		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Beryllium	0.52	0.034	0.15		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Cadmium	ND	0.063	0.099		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Chromium	6.4	0.094	0.30		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Cobalt	3.1	0.11	0.30		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Iron	10000	38	120		mg/Kg	50	6/26/2017 9:01:24 AM	32349
Lead	1.6	0.17	0.25		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Manganese	470	0.27	0.50		mg/Kg	5	6/26/2017 8:59:45 AM	32349
Nickel	4.9	0.15	0.50		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Selenium	ND	1.8	2.5		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Silver	ND	0.062	0.25		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Vanadium	14	0.17	2.5		mg/Kg	1	6/20/2017 12:36:26 PM	32349
Zinc	10	0.35	2.5		mg/Kg	1	6/20/2017 12:36:26 PM	32349
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Acenaphthene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Acenaphthylene	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Aniline	ND	0.11	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Anthracene	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Azobenzene	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benz(a)anthracene	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benzo(a)pyrene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benzo(b)fluoranthene	ND	0.19	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benzo(g,h,i)perylene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benzo(k)fluoranthene	ND	0.15	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benzoic acid	ND	0.15	0.50		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Benzyl alcohol	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-60 (20-22')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 4:05:00 PM
Lab ID: 1706910-004
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Bis(2-chloroethoxy)methane	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Bis(2-chloroethyl)ether	ND	0.13	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Bis(2-chloroisopropyl)ether	ND	0.20	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Bis(2-ethylhexyl)phthalate	0.25	0.19	0.50	J	mg/Kg	1	6/28/2017 1:04:56 PM	32411
4-Bromophenyl phenyl ether	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Butyl benzyl phthalate	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Carbazole	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
4-Chloro-3-methylphenol	ND	0.18	0.50		mg/Kg	1	6/28/2017 1:04:56 PM	32411
4-Chloroaniline	ND	0.15	0.50		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2-Chloronaphthalene	ND	0.18	0.25		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2-Chlorophenol	ND	0.14	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
4-Chlorophenyl phenyl ether	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Chrysene	ND	0.15	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Di-n-butyl phthalate	0.34	0.11	0.40	J	mg/Kg	1	6/28/2017 1:04:56 PM	32411
Di-n-octyl phthalate	ND	0.15	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Dibenz(a,h)anthracene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Dibenzofuran	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
1,2-Dichlorobenzene	ND	0.15	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
1,3-Dichlorobenzene	ND	0.14	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
1,4-Dichlorobenzene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
3,3´-Dichlorobenzidine	ND	0.15	0.25		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Diethyl phthalate	0.26	0.17	0.20	B	mg/Kg	1	6/28/2017 1:04:56 PM	32411
Dimethyl phthalate	ND	0.19	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,4-Dichlorophenol	ND	0.16	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,4-Dimethylphenol	ND	0.089	0.30		mg/Kg	1	6/28/2017 1:04:56 PM	32411
4,6-Dinitro-2-methylphenol	ND	0.15	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,4-Dinitrophenol	ND	0.12	0.50		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,4-Dinitrotoluene	ND	0.19	0.50		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,6-Dinitrotoluene	ND	0.18	0.50		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Fluoranthene	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Fluorene	ND	0.15	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Hexachlorobenzene	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Hexachlorobutadiene	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Hexachlorocyclopentadiene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Hexachloroethane	ND	0.14	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Indeno(1,2,3-cd)pyrene	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Isophorone	ND	0.19	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
1-Methylnaphthalene	ND	0.19	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2-Methylnaphthalene	ND	0.17	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-60 (20-22')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 4:05:00 PM
Lab ID: 1706910-004
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
2-Methylphenol	ND	0.15	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
3+4-Methylphenol	ND	0.13	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
N-Nitrosodi-n-propylamine	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
N-Nitrosodiphenylamine	ND	0.19	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Naphthalene	ND	0.19	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2-Nitroaniline	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
3-Nitroaniline	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
4-Nitroaniline	ND	0.17	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Nitrobenzene	ND	0.17	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2-Nitrophenol	ND	0.19	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
4-Nitrophenol	ND	0.15	0.25		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Pentachlorophenol	ND	0.17	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Phenanthrene	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Phenol	ND	0.14	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Pyrene	ND	0.15	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Pyridine	ND	0.13	0.40		mg/Kg	1	6/28/2017 1:04:56 PM	32411
1,2,4-Trichlorobenzene	ND	0.18	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,4,5-Trichlorophenol	ND	0.15	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
2,4,6-Trichlorophenol	ND	0.16	0.20		mg/Kg	1	6/28/2017 1:04:56 PM	32411
Surr: 2-Fluorophenol	61.6	0	21.4-101		%Rec	1	6/28/2017 1:04:56 PM	32411
Surr: Phenol-d5	66.8	0	32-110		%Rec	1	6/28/2017 1:04:56 PM	32411
Surr: 2,4,6-Tribromophenol	76.3	0	38.7-115		%Rec	1	6/28/2017 1:04:56 PM	32411
Surr: Nitrobenzene-d5	70.3		26.2-120		%Rec	1	6/28/2017 1:04:56 PM	32411
Surr: 2-Fluorobiphenyl	73.0		36.2-124		%Rec	1	6/28/2017 1:04:56 PM	32411
Surr: 4-Terphenyl-d14	66.5		15-114		%Rec	1	6/28/2017 1:04:56 PM	32411
METHOD 8260B/5035LOW: VOLATILES							Analyst: **RAA**	
Benzene	0.728	0.0973	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Toluene	0.440	0.0997	0.687	J	µg/Kg	1	6/19/2017 4:23:00 PM	32370
Ethylbenzene	0.151	0.113	0.687	J	µg/Kg	1	6/19/2017 4:23:00 PM	32370
Methyl tert-butyl ether (MTBE)	ND	0.292	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2,4-Trimethylbenzene	ND	0.207	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,3,5-Trimethylbenzene	ND	0.188	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2-Dichloroethane (EDC)	ND	0.139	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2-Dibromoethane (EDB)	ND	0.129	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Naphthalene	ND	0.144	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1-Methylnaphthalene	0.261	0.177	2.75	J	µg/Kg	1	6/19/2017 4:23:00 PM	32370
2-Methylnaphthalene	0.295	0.144	2.75	J	µg/Kg	1	6/19/2017 4:23:00 PM	32370
Acetone	11.0	0.416	6.87		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Bromobenzene	ND	0.167	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-60 (20-22')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 4:05:00 PM
Lab ID: 1706910-004
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: **RAA**	
Bromodichloromethane	ND	0.158	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Bromoform	ND	0.146	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Bromomethane	ND	0.331	2.06		µg/Kg	1	6/19/2017 4:23:00 PM	32370
2-Butanone	ND	0.515	6.87		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Carbon disulfide	ND	0.275	6.87		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Carbon tetrachloride	ND	0.127	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Chlorobenzene	ND	0.105	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Chloroethane	ND	0.135	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Chloroform	ND	0.147	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Chloromethane	ND	0.173	2.06		µg/Kg	1	6/19/2017 4:23:00 PM	32370
2-Chlorotoluene	ND	0.146	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
4-Chlorotoluene	ND	0.150	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
cis-1,2-DCE	ND	0.142	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
cis-1,3-Dichloropropene	ND	0.110	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2-Dibromo-3-chloropropane	ND	0.184	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Dibromochloromethane	ND	0.0974	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Dibromomethane	ND	0.111	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2-Dichlorobenzene	ND	0.147	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,3-Dichlorobenzene	ND	0.141	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,4-Dichlorobenzene	ND	0.145	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Dichlorodifluoromethane	ND	0.141	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,1-Dichloroethane	ND	0.118	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,1-Dichloroethene	ND	0.114	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2-Dichloropropane	ND	0.137	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,3-Dichloropropane	ND	0.123	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
2,2-Dichloropropane	ND	0.111	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,1-Dichloropropene	ND	0.136	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Hexachlorobutadiene	ND	0.195	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
2-Hexanone	ND	0.241	6.87		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Isopropylbenzene	ND	0.167	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
4-Isopropyltoluene	ND	0.201	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
4-Methyl-2-pentanone	ND	0.406	6.87		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Methylene chloride	ND	0.273	2.06		µg/Kg	1	6/19/2017 4:23:00 PM	32370
n-Butylbenzene	ND	0.160	2.06		µg/Kg	1	6/19/2017 4:23:00 PM	32370
n-Propylbenzene	ND	0.196	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
sec-Butylbenzene	ND	0.201	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Styrene	ND	0.126	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
tert-Butylbenzene	ND	0.214	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,1,1,2-Tetrachloroethane	ND	0.114	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-60 (20-22')
Project: SMW-2 AND BOUNDARY WELLS
Collection Date: 6/13/2017 4:05:00 PM
Lab ID: 1706910-004
Matrix: SOIL
Received Date: 6/15/2017 11:15:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: **RAA**	
1,1,2,2-Tetrachloroethane	ND	0.141	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Tetrachloroethene (PCE)	ND	0.0879	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
trans-1,2-DCE	ND	0.141	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
trans-1,3-Dichloropropene	ND	0.101	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2,3-Trichlorobenzene	ND	0.121	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2,4-Trichlorobenzene	ND	0.141	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,1,1-Trichloroethane	ND	0.119	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,1,2-Trichloroethane	ND	0.0971	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Trichloroethene (TCE)	ND	0.111	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Trichlorofluoromethane	ND	0.0981	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
1,2,3-Trichloropropane	ND	0.280	1.37		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Vinyl chloride	ND	0.125	0.687		µg/Kg	1	6/19/2017 4:23:00 PM	32370
Xylenes, Total	0.708	0.376	1.37	J	µg/Kg	1	6/19/2017 4:23:00 PM	32370
Surr: 1,2-Dichloroethane-d4	153	0	70-130	S	%Rec	1	6/19/2017 4:23:00 PM	32370
Surr: 4-Bromofluorobenzene	105	0	70-130		%Rec	1	6/19/2017 4:23:00 PM	32370
Surr: Dibromofluoromethane	137	0	70-130	S	%Rec	1	6/19/2017 4:23:00 PM	32370
Surr: Toluene-d8	98.8	0	70-130		%Rec	1	6/19/2017 4:23:00 PM	32370

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Wet Chemistry by Method 4500CN E-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Cyanide	ND		0.00500	1	06/22/2017 17:26	WG991209

Wet Chemistry by Method 4500CN E-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Cyanide	ND		0.00500	1	06/22/2017 17:27	WG991209

Wet Chemistry by Method 9012B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Cyanide	ND		0.250	1	06/23/2017 20:37	WG991279

Wet Chemistry by Method 9012B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Cyanide	ND		0.250	1	06/23/2017 20:39	WG991279

Tc
Ss
Cn
Sr
Qc
Gl
Al
Sc

Method Blank (MB)

(MB) R3227997-1 06/22/17 17:07

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Cyanide	U		0.0018	0.00500

L917084-01 Original Sample (OS) • Duplicate (DUP)

(OS) L917084-01 06/22/17 17:20 • (DUP) R3227997-4 06/22/17 17:21

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Cyanide	0.00197	0.00245	1	22	J P1	20

L917108-01 Original Sample (OS) • Duplicate (DUP)

(OS) L917108-01 06/22/17 17:33 • (DUP) R3227997-7 06/22/17 17:34

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Cyanide	ND	0.000	1	0		20

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

(LCS) R3227997-2 06/22/17 17:08 • (LCSD) R3227997-3 06/22/17 17:09

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Cyanide	0.100	0.0985	0.105	99	105	85-115			6	20

L917102-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L917102-04 06/22/17 17:23 • (MS) R3227997-5 06/22/17 17:24 • (MSD) R3227997-6 06/22/17 17:25

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Cyanide	0.100	ND	0.0435	0.0896	44	90	1	75-125	J6	J3	69	20

Method Blank (MB)

(MB) R3228415-1 06/23/17 20:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cyanide	U		0.039	0.250

L917105-03 Original Sample (OS) • Duplicate (DUP)

(OS) L917105-03 06/23/17 20:37 • (DUP) R3228415-4 06/23/17 20:38

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Cyanide	ND	0.0472	1	0		20

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

(LCS) R3228415-2 06/23/17 20:23 • (LCSD) R3228415-3 06/23/17 20:24

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cyanide	2.50	2.52	2.62	101	105	50-150			4	20

L917238-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L917238-03 06/23/17 20:48 • (MS) R3228415-6 06/23/17 20:49 • (MSD) R3228415-7 06/23/17 20:50

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Cyanide	3.33	ND	1.47	1.68	42	49	1	75-125	J6	J6	14	20

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Rec.	Recovery.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **MB-A**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Metals**
Client ID: **PBW**	Batch ID: **A43653**	RunNo: **43653**
Prep Date:	Analysis Date: **6/20/2017**	SeqNo: **1375201** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Iron	ND	0.020								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Sample ID **LCSLL-A**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Metals**
Client ID: **BatchQC**	Batch ID: **A43653**	RunNo: **43653**
Prep Date:	Analysis Date: **6/20/2017**	SeqNo: **1375202** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0018	0.0020	0.002000	0	90.0	50	150			J
Beryllium	0.0019	0.0020	0.002000	0	96.0	50	150			J
Cadmium	0.0019	0.0020	0.002000	0	96.0	50	150			J
Chromium	0.0059	0.0060	0.006000	0	97.7	50	150			J
Cobalt	0.0064	0.0060	0.006000	0	107	50	150			
Iron	0.024	0.020	0.02000	0	121	50	150			
Manganese	0.0020	0.0020	0.002000	0	102	50	150			
Nickel	0.0056	0.010	0.005000	0	113	50	150			J
Silver	0.0052	0.0050	0.005000	0	105	50	150			
Vanadium	0.0098	0.050	0.01000	0	98.2	50	150			J
Zinc	0.0055	0.010	0.005000	0	109	50	150			J

Sample ID **LCS-A**	SampType: **LCS**	TestCode: **EPA Method 200.7: Metals**
Client ID: **LCSW**	Batch ID: **A43653**	RunNo: **43653**
Prep Date:	Analysis Date: **6/20/2017**	SeqNo: **1375203** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	97.0	85	115			
Beryllium	0.50	0.0020	0.5000	0	100	85	115			
Cadmium	0.49	0.0020	0.5000	0	97.7	85	115			
Chromium	0.49	0.0060	0.5000	0	97.0	85	115			
Cobalt	0.46	0.0060	0.5000	0	91.7	85	115			
Iron	0.47	0.020	0.5000	0	95.0	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **LCS-A**	SampType: **LCS**	TestCode: **EPA Method 200.7: Metals**
Client ID: **LCSW**	Batch ID: **A43653**	RunNo: **43653**
Prep Date:	Analysis Date: **6/20/2017**	SeqNo: **1375203** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.47	0.0020	0.5000	0	93.6	85	115			
Nickel	0.46	0.010	0.5000	0	91.8	85	115			
Silver	0.099	0.0050	0.1000	0	99.3	85	115			
Vanadium	0.51	0.050	0.5000	0	102	85	115			
Zinc	0.48	0.010	0.5000	0	95.5	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**LCS**	SampType:	**LCS**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**LCSW**	Batch ID:	**B43799**	RunNo:	**43799**					
Prep Date:		Analysis Date:	**6/26/2017**	SeqNo:	**1379729**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.023	0.0010	0.02500	0	91.1	85	115			
Arsenic	0.024	0.0010	0.02500	0	94.4	85	115			
Lead	0.011	0.00050	0.01250	0	90.6	85	115			
Selenium	0.023	0.0010	0.02500	0	93.4	85	115			

Sample ID	**LLLCS**	SampType:	**LCSLL**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**BatchQC**	Batch ID:	**B43799**	RunNo:	**43799**					
Prep Date:		Analysis Date:	**6/26/2017**	SeqNo:	**1379730**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00094	0.0010	0.001000	0	94.4	50	150			J
Arsenic	0.0011	0.0010	0.001000	0	107	50	150			
Lead	0.00047	0.00050	0.0005000	0	94.9	50	150			J
Selenium	0.0013	0.0010	0.001000	0	134	50	150			

Sample ID	**MB**	SampType:	**MBLK**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**PBW**	Batch ID:	**B43799**	RunNo:	**43799**					
Prep Date:		Analysis Date:	**6/26/2017**	SeqNo:	**1379732**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**MB-32504**	SampType:	**MBLK**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**PBW**	Batch ID:	**32504**	RunNo:	**43819**					
Prep Date:	**6/27/2017**	Analysis Date:	**6/27/2017**	SeqNo:	**1380679**	Units:	**mg/L**			

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

Sample ID	**LCS-32504**	SampType:	**LCS**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**LCSW**	Batch ID:	**32504**	RunNo:	**43819**					
Prep Date:	**6/27/2017**	Analysis Date:	**6/27/2017**	SeqNo:	**1380680**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0047	0.00020	0.005000	0	93.8	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **LCS-32362**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32362**	RunNo: **43629**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1374617** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	91.4	73.2	114			
Surr: DNOP	4.9		5.000		97.7	70	130			

Sample ID **MB-32362**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32362**	RunNo: **43629**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1374618** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		100	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **1706910-001CMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **EB01**	Batch ID: **32351**	RunNo: **43629**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1375391** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.9	1.0	5.000	0	119	87.2	145			
Surr: DNOP	0.60		0.5000		121	72.4	157			

Sample ID **1706910-001CMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **EB01**	Batch ID: **32351**	RunNo: **43629**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1375392** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.8	1.0	5.000	0	116	87.2	145	2.61	20	
Surr: DNOP	0.60		0.5000		121	72.4	157	0	0	

Sample ID **LCS-32351**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **LCSW**	Batch ID: **32351**	RunNo: **43629**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1375408** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.7	1.0	5.000	0	114	82.8	146			
Surr: DNOP	0.59		0.5000		118	72.4	157			

Sample ID **MB-32351**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **PBW**	Batch ID: **32351**	RunNo: **43629**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1375409** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	1.2		1.000		121	72.4	157			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**MB-32325**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**PBS**	Batch ID:	**32325**	RunNo:	**43604**
Prep Date:	**6/16/2017**	Analysis Date:	**6/19/2017**	SeqNo:	**1374087** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	950		1000		94.9	54	150			

Sample ID	**LCS-32325**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**LCSS**	Batch ID:	**32325**	RunNo:	**43604**
Prep Date:	**6/16/2017**	Analysis Date:	**6/19/2017**	SeqNo:	**1374088** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	95.6	76.4	125			
Surr: BFB	1100		1000		108	54	150			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G43605**	RunNo: **43605**
Prep Date:	Analysis Date: **6/19/2017**	SeqNo: **1374131** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	24		20.00		118	52.3	138			

Sample ID **2.5UG GRO LCSB**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G43605**	RunNo: **43605**
Prep Date:	Analysis Date: **6/19/2017**	SeqNo: **1374132** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.42	0.050	0.5000	0	84.4	79.1	123			
Surr: BFB	26		20.00		128	52.3	138			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **lcs-32370**	SampType: **LCS4**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **BatchQC**	Batch ID: **32370**	RunNo: **43615**
Prep Date: **6/19/2017**	Analysis Date: **6/19/2017**	SeqNo: **1373913** Units: **µg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	10.8	1.00	10.00	0	108	70	130			
Toluene	9.91	1.00	10.00	0	99.1	70	130			
Ethylbenzene	9.83	1.00	10.00	0	98.3	70	130			
Methyl tert-butyl ether (MTBE)	21.6	1.00	20.00	0	108	70	130			
1,2,4-Trimethylbenzene	10.1	1.00	10.00	0	101	70	130			
1,3,5-Trimethylbenzene	9.91	1.00	10.00	0	99.1	70	130			
1,2-Dichloroethane (EDC)	11.5	1.00	10.00	0	115	70	130			
1,2-Dibromoethane (EDB)	10.1	1.00	10.00	0	101	70	130			
Naphthalene	10.1	2.00	10.00	0	101	73.3	147			
1-Methylnaphthalene	11.2	4.00	10.00	0	112	69.6	154			
2-Methylnaphthalene	9.00	4.00	10.00	0	90.0	67.7	155			
Acetone	22.9	10.0	20.00	0	115	60	140			
Bromobenzene	10.2	1.00	10.00	0	102	70	130			
Bromodichloromethane	11.5	1.00	10.00	0	115	70	130			
Bromoform	9.88	1.00	10.00	0	98.8	70	130			
Bromomethane	8.35	3.00	10.00	0	83.5	70	130			
2-Butanone	24.3	10.0	20.00	0	121	60	140			
Carbon disulfide	21.2	10.0	20.00	0	106	60	140			
Carbon tetrachloride	10.8	1.00	10.00	0	108	70	130			
Chlorobenzene	9.97	1.00	10.00	0	99.7	70	130			
Chloroethane	10.9	2.00	10.00	0	109	70	130			
Chloroform	11.2	1.00	10.00	0	112	70	130			
Chloromethane	9.34	3.00	10.00	0	93.4	66.4	132			
2-Chlorotoluene	10.0	1.00	10.00	0	100	70	130			
4-Chlorotoluene	10.2	1.00	10.00	0	102	70	130			
cis-1,2-DCE	11.3	1.00	10.00	0	113	70	130			
cis-1,3-Dichloropropene	10.1	1.00	10.00	0	101	70	130			
1,2-Dibromo-3-chloropropane	8.90	2.00	10.00	0	89.0	70	130			
Dibromochloromethane	9.57	1.00	10.00	0	95.7	70	130			
Dibromomethane	11.5	1.00	10.00	0	115	70	130			
1,2-Dichlorobenzene	10.1	1.00	10.00	0	101	70	130			
1,3-Dichlorobenzene	10.2	1.00	10.00	0	102	70	130			
1,4-Dichlorobenzene	10.3	1.00	10.00	0	103	70	130			
Dichlorodifluoromethane	11.8	1.00	10.00	0	118	35.6	131			
1,1-Dichloroethane	10.7	1.00	10.00	0	107	63.7	129			
1,1-Dichloroethene	10.6	1.00	10.00	0	106	70	130			
1,2-Dichloropropane	10.6	1.00	10.00	0	106	70	130			
1,3-Dichloropropane	10.1	1.00	10.00	0	101	70	130			
2,2-Dichloropropane	10.4	2.00	10.00	0	104	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **lcs-32370**	SampType: **LCS4**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **BatchQC**	Batch ID: **32370**	RunNo: **43615**
Prep Date: **6/19/2017**	Analysis Date: **6/19/2017**	SeqNo: **1373913** Units: **µg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	11.0	1.00	10.00	0	110	70	130			
Hexachlorobutadiene	9.23	2.00	10.00	0	92.3	70	130			
2-Hexanone	19.4	10.0	20.00	0	96.8	60	140			
Isopropylbenzene	9.68	1.00	10.00	0	96.8	70	130			
4-Isopropyltoluene	10.2	1.00	10.00	0	102	70	130			
4-Methyl-2-pentanone	21.6	10.0	20.00	0	108	60	140			
Methylene chloride	10.6	3.00	10.00	0	106	70	130			
n-Butylbenzene	9.98	3.00	10.00	0	99.8	70	130			
n-Propylbenzene	9.98	1.00	10.00	0	99.8	70	130			
sec-Butylbenzene	9.62	1.00	10.00	0	96.2	70	130			
Styrene	10.0	1.00	10.00	0	101	70	130			
tert-Butylbenzene	9.54	1.00	10.00	0	95.4	70	130			
1,1,1,2-Tetrachloroethane	9.54	1.00	10.00	0	95.4	70	130			
1,1,2,2-Tetrachloroethane	10.4	2.00	10.00	0	104	70	130			
Tetrachloroethene (PCE)	9.91	1.00	10.00	0	99.1	70	130			
trans-1,2-DCE	10.6	1.00	10.00	0	106	70	130			
trans-1,3-Dichloropropene	8.98	1.00	10.00	0	89.8	70	130			
1,2,3-Trichlorobenzene	10.3	1.00	10.00	0	103	70	130			
1,2,4-Trichlorobenzene	10.4	1.00	10.00	0	104	70	130			
1,1,1-Trichloroethane	10.7	1.00	10.00	0	107	70	130			
1,1,2-Trichloroethane	10.2	1.00	10.00	0	103	70	130			
Trichloroethene (TCE)	10.9	1.00	10.00	0	109	70	130			
Trichlorofluoromethane	11.1	1.00	10.00	0	111	70	130			
1,2,3-Trichloropropane	10.9	2.00	10.00	0	109	70	130			
Vinyl chloride	10.1	1.00	10.00	0	101	70	130			
Xylenes, Total	30.0	2.00	30.00	0	99.9	70	130			
Surr: 1,2-Dichloroethane-d4	11.9		10.00		119	70	130			
Surr: 4-Bromofluorobenzene	10.4		10.00		104	70	130			
Surr: Dibromofluoromethane	11.8		10.00		118	70	130			
Surr: Toluene-d8	10.2		10.00		103	70	130			

Sample ID **mb-32370**	SampType: **MBLK**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **PBS**	Batch ID: **32370**	RunNo: **43615**
Prep Date: **6/19/2017**	Analysis Date: **6/19/2017**	SeqNo: **1373982** Units: **µg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.00								
Toluene	ND	1.00								
Ethylbenzene	ND	1.00								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**
11-Jul-17

Client: Western Refining Company
Project: SMW-2 AND BOUNDARY WELLS

Sample ID **mb-32370**	SampType: **MBLK**	TestCode: **Method 8260B/5035LOW: VOLATILES**	
Client ID: **PBS**	Batch ID: **32370**	RunNo: **43615**	
Prep Date: **6/19/2017**	Analysis Date: **6/19/2017**	SeqNo: **1373982**	Units: **µg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	1.00								
1,2,4-Trimethylbenzene	ND	1.00								
1,3,5-Trimethylbenzene	ND	1.00								
1,2-Dichloroethane (EDC)	ND	1.00								
1,2-Dibromoethane (EDB)	ND	1.00								
Naphthalene	0.420	2.00								J
1-Methylnaphthalene	0.630	4.00								J
2-Methylnaphthalene	0.620	4.00								J
Acetone	0.980	10.0								J
Bromobenzene	ND	1.00								
Bromodichloromethane	ND	1.00								
Bromoform	ND	1.00								
Bromomethane	ND	3.00								
2-Butanone	ND	10.0								
Carbon disulfide	ND	10.0								
Carbon tetrachloride	ND	1.00								
Chlorobenzene	ND	1.00								
Chloroethane	ND	2.00								
Chloroform	ND	1.00								
Chloromethane	ND	3.00								
2-Chlorotoluene	ND	1.00								
4-Chlorotoluene	ND	1.00								
cis-1,2-DCE	ND	1.00								
cis-1,3-Dichloropropene	ND	1.00								
1,2-Dibromo-3-chloropropane	ND	2.00								
Dibromochloromethane	ND	1.00								
Dibromomethane	ND	1.00								
1,2-Dichlorobenzene	ND	1.00								
1,3-Dichlorobenzene	ND	1.00								
1,4-Dichlorobenzene	ND	1.00								
Dichlorodifluoromethane	ND	1.00								
1,1-Dichloroethane	ND	1.00								
1,1-Dichloroethene	ND	1.00								
1,2-Dichloropropane	ND	1.00								
1,3-Dichloropropane	ND	1.00								
2,2-Dichloropropane	ND	2.00								
1,1-Dichloropropene	ND	1.00								
Hexachlorobutadiene	ND	2.00								
2-Hexanone	ND	10.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **mb-32370**	SampType: **MBLK**	TestCode: **Method 8260B/5035LOW: VOLATILES**	
Client ID: **PBS**	Batch ID: **32370**	RunNo: **43615**	
Prep Date: **6/19/2017**	Analysis Date: **6/19/2017**	SeqNo: **1373982**	Units: **µg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Isopropylbenzene	ND	1.00								
4-Isopropyltoluene	ND	1.00								
4-Methyl-2-pentanone	ND	10.0								
Methylene chloride	ND	3.00								
n-Butylbenzene	ND	3.00								
n-Propylbenzene	ND	1.00								
sec-Butylbenzene	ND	1.00								
Styrene	ND	1.00								
tert-Butylbenzene	ND	1.00								
1,1,1,2-Tetrachloroethane	ND	1.00								
1,1,2,2-Tetrachloroethane	ND	2.00								
Tetrachloroethene (PCE)	ND	1.00								
trans-1,2-DCE	ND	1.00								
trans-1,3-Dichloropropene	ND	1.00								
1,2,3-Trichlorobenzene	ND	1.00								
1,2,4-Trichlorobenzene	ND	1.00								
1,1,1-Trichloroethane	ND	1.00								
1,1,2-Trichloroethane	ND	1.00								
Trichloroethene (TCE)	ND	1.00								
Trichlorofluoromethane	ND	1.00								
1,2,3-Trichloropropane	ND	2.00								
Vinyl chloride	ND	1.00								
Xylenes, Total	ND	2.00								
Surr: 1,2-Dichloroethane-d4	13.1		10.00		131	70	130			S
Surr: 4-Bromofluorobenzene	10.2		10.00		102	70	130			
Surr: Dibromofluoromethane	12.6		10.00		126	70	130			
Surr: Toluene-d8	9.94		10.00		99.4	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **rb1**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B43587**	RunNo: **43587**
Prep Date:	Analysis Date: **6/16/2017**	SeqNo: **1373146** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **rb1**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B43587**	RunNo: **43587**
Prep Date:	Analysis Date: **6/16/2017**	SeqNo: **1373146** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		107	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	11		10.00		105	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **B43587**	RunNo: **43587**
Prep Date:	Analysis Date: **6/16/2017**	SeqNo: **1373147** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	104	70	130			
Toluene	19	1.0	20.00	0	95.1	70	130			
Chlorobenzene	20	1.0	20.00	0	101	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **B43587**	RunNo: **43587**
Prep Date:	Analysis Date: **6/16/2017**	SeqNo: **1373147** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	21	1.0	20.00	0	103	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	91.9	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		96.7	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID **1706910-001a ms2**	SampType: **MS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **EB01**	Batch ID: **B43587**	RunNo: **43587**
Prep Date:	Analysis Date: **6/17/2017**	SeqNo: **1373151** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	102	70	130			
Toluene	19	1.0	20.00	0.07200	96.4	70	130			
Chlorobenzene	20	1.0	20.00	0	101	70	130			
1,1-Dichloroethene	20	1.0	20.00	0	102	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	90.1	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	9.4		10.00		94.1	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID **1706910-001a msd2**	SampType: **MSD**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **EB01**	Batch ID: **B43587**	RunNo: **43587**
Prep Date:	Analysis Date: **6/17/2017**	SeqNo: **1373152** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	100	70	130	2.31	20	
Toluene	18	1.0	20.00	0.07200	91.7	70	130	5.02	20	
Chlorobenzene	19	1.0	20.00	0	96.4	70	130	4.50	20	
1,1-Dichloroethene	19	1.0	20.00	0	96.9	70	130	4.98	20	
Trichloroethene (TCE)	18	1.0	20.00	0	88.5	70	130	1.74	20	
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130	0	0	
Surr: 4-Bromofluorobenzene	9.4		10.00		94.3	70	130	0	0	
Surr: Dibromofluoromethane	10		10.00		104	70	130	0	0	
Surr: Toluene-d8	10		10.00		102	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **W43599**	RunNo: **43599**
Prep Date:	Analysis Date: **6/19/2017**	SeqNo: **1374263** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.3		10.00		93.0	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.1	70	130			
Surr: Dibromofluoromethane	9.7		10.00		96.8	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **W43599**	RunNo: **43599**
Prep Date:	Analysis Date: **6/19/2017**	SeqNo: **1374264** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		100	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		93.1	70	130			
Surr: Dibromofluoromethane	9.8		10.00		97.6	70	130			
Surr: Toluene-d8	9.9		10.00		99.0	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **1706910-003ams**	SampType: **MS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **OW-59 (33-34')**	Batch ID: **32411**	RunNo: **43869**
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382769** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.1	0.20	1.667	0	64.3	24.7	111			
4-Chloro-3-methylphenol	2.3	0.50	3.323	0	70.3	21.7	108			
2-Chlorophenol	1.9	0.20	3.323	0	58.5	21.9	103			
1,4-Dichlorobenzene	0.99	0.20	1.667	0	59.5	15.8	93.9			
2,4-Dinitrotoluene	0.91	0.50	1.667	0	54.5	19.9	101			
N-Nitrosodi-n-propylamine	1.0	0.20	1.667	0	62.4	17.7	100			
4-Nitrophenol	2.1	0.25	3.323	0	61.7	19.3	112			
Pentachlorophenol	2.0	0.40	3.323	0	60.5	20.5	105			
Phenol	2.2	0.20	3.323	0	65.1	23.1	101			
Pyrene	1.2	0.20	1.667	0	70.8	18.3	113			
1,2,4-Trichlorobenzene	1.2	0.20	1.667	0	70.0	21.8	108			
Surr: 2-Fluorophenol	1.9		3.323		57.9	21.4	101			
Surr: Phenol-d5	2.3		3.323		68.6	32	110			
Surr: 2,4,6-Tribromophenol	2.4		3.323		72.8	38.7	115			
Surr: Nitrobenzene-d5	1.2		1.667		74.2	26.2	120			
Surr: 2-Fluorobiphenyl	1.2		1.667		72.9	36.2	124			
Surr: 4-Terphenyl-d14	0.98		1.667		58.9	15	114			

Sample ID **1706910-003amsd**	SampType: **MSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **OW-59 (33-34')**	Batch ID: **32411**	RunNo: **43869**
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382770** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.0	0.20	1.664	0	61.7	24.7	111	4.25	30.2	
4-Chloro-3-methylphenol	2.0	0.50	3.319	0	61.3	21.7	108	13.8	37.2	
2-Chlorophenol	1.9	0.20	3.319	0	57.4	21.9	103	2.14	48	
1,4-Dichlorobenzene	1.0	0.20	1.664	0	60.0	15.8	93.9	0.736	40.6	
2,4-Dinitrotoluene	0.86	0.50	1.664	0	51.5	19.9	101	5.90	47.7	
N-Nitrosodi-n-propylamine	0.95	0.20	1.664	0	57.0	17.7	100	9.26	52.5	
4-Nitrophenol	2.0	0.25	3.319	0	61.7	19.3	112	0.0843	36.6	
Pentachlorophenol	1.9	0.40	3.319	0	57.6	20.5	105	4.98	65.5	
Phenol	2.0	0.20	3.319	0	60.7	23.1	101	7.15	44	
Pyrene	1.2	0.20	1.664	0	73.1	18.3	113	2.97	42.1	
1,2,4-Trichlorobenzene	1.2	0.20	1.664	0	73.5	21.8	108	4.68	31.5	
Surr: 2-Fluorophenol	1.8		3.319		54.3	21.4	101	0	0	
Surr: Phenol-d5	2.1		3.319		62.2	32	110	0	0	
Surr: 2,4,6-Tribromophenol	2.3		3.319		67.9	38.7	115	0	0	
Surr: Nitrobenzene-d5	1.2		1.664		72.9	26.2	120	0	0	
Surr: 2-Fluorobiphenyl	1.1		1.664		67.9	36.2	124	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **1706910-003amsd**	SampType: **MSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **OW-59 (33-34')**	Batch ID: **32411**	RunNo: **43869**
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382770** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	0.97		1.664		58.3	15	114	0	0	

Sample ID **lcs-32411**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS**	Batch ID: **32411**	RunNo: **43869**
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382773** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.0	0.20	1.670	0	61.7	39.4	110			
4-Chloro-3-methylphenol	1.9	0.50	3.330	0	56.2	41.6	108			
2-Chlorophenol	1.8	0.20	3.330	0	55.1	35	107			
1,4-Dichlorobenzene	0.96	0.20	1.670	0	57.7	31	105			
2,4-Dinitrotoluene	0.86	0.50	1.670	0	51.7	35.6	101			
N-Nitrosodi-n-propylamine	0.86	0.20	1.670	0	51.2	26	100			
4-Nitrophenol	1.6	0.25	3.330	0	48.6	34.1	106			
Pentachlorophenol	1.7	0.40	3.330	0	51.9	35.3	95.4			
Phenol	1.9	0.20	3.330	0	55.6	39.3	96.5			
Pyrene	1.2	0.20	1.670	0	70.3	47.8	95.7			
1,2,4-Trichlorobenzene	1.2	0.20	1.670	0	69.5	36.6	117			
Surr: 2-Fluorophenol	1.7		3.330		49.8	21.4	101			
Surr: Phenol-d5	1.9		3.330		58.1	32	110			
Surr: 2,4,6-Tribromophenol	2.1		3.330		64.4	38.7	115			
Surr: Nitrobenzene-d5	1.1		1.670		67.2	26.2	120			
Surr: 2-Fluorobiphenyl	1.2		1.670		70.9	36.2	124			
Surr: 4-Terphenyl-d14	0.96		1.670		57.3	15	114			

Sample ID **mb-32411**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBS**	Batch ID: **32411**	RunNo: **43869**
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382774** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	0.20								
Acenaphthylene	ND	0.20								
Aniline	ND	0.20								
Anthracene	ND	0.20								
Azobenzene	ND	0.20								
Benz(a)anthracene	ND	0.20								
Benzo(a)pyrene	ND	0.20								
Benzo(b)fluoranthene	ND	0.20								
Benzo(g,h,i)perylene	ND	0.20								
Benzo(k)fluoranthene	ND	0.20								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**
11-Jul-17

Client: Western Refining Company
Project: SMW-2 AND BOUNDARY WELLS

Sample ID **mb-32411**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**	
Client ID: **PBS**	Batch ID: **32411**	RunNo: **43869**	
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382774**	Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzoic acid	ND	0.50								
Benzyl alcohol	ND	0.20								
Bis(2-chloroethoxy)methane	ND	0.20								
Bis(2-chloroethyl)ether	ND	0.20								
Bis(2-chloroisopropyl)ether	ND	0.20								
Bis(2-ethylhexyl)phthalate	0.27	0.50								J
4-Bromophenyl phenyl ether	ND	0.20								
Butyl benzyl phthalate	ND	0.20								
Carbazole	ND	0.20								
4-Chloro-3-methylphenol	ND	0.50								
4-Chloroaniline	ND	0.50								
2-Chloronaphthalene	ND	0.25								
2-Chlorophenol	ND	0.20								
4-Chlorophenyl phenyl ether	ND	0.20								
Chrysene	ND	0.20								
Di-n-butyl phthalate	0.32	0.40								J
Di-n-octyl phthalate	ND	0.40								
Dibenz(a,h)anthracene	ND	0.20								
Dibenzofuran	ND	0.20								
1,2-Dichlorobenzene	ND	0.20								
1,3-Dichlorobenzene	ND	0.20								
1,4-Dichlorobenzene	ND	0.20								
3,3´-Dichlorobenzidine	ND	0.25								
Diethyl phthalate	0.23	0.20								
Dimethyl phthalate	ND	0.20								
2,4-Dichlorophenol	ND	0.40								
2,4-Dimethylphenol	ND	0.30								
4,6-Dinitro-2-methylphenol	ND	0.40								
2,4-Dinitrophenol	ND	0.50								
2,4-Dinitrotoluene	ND	0.50								
2,6-Dinitrotoluene	ND	0.50								
Fluoranthene	ND	0.20								
Fluorene	ND	0.20								
Hexachlorobenzene	ND	0.20								
Hexachlorobutadiene	ND	0.20								
Hexachlorocyclopentadiene	ND	0.20								
Hexachloroethane	ND	0.20								
Indeno(1,2,3-cd)pyrene	ND	0.20								
Isophorone	ND	0.40								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **mb-32411**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**	
Client ID: **PBS**	Batch ID: **32411**	RunNo: **43869**	
Prep Date: **6/21/2017**	Analysis Date: **6/28/2017**	SeqNo: **1382774**	Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
2-Methylphenol	ND	0.40								
3+4-Methylphenol	ND	0.20								
N-Nitrosodi-n-propylamine	ND	0.20								
N-Nitrosodiphenylamine	ND	0.20								
Naphthalene	ND	0.20								
2-Nitroaniline	ND	0.20								
3-Nitroaniline	ND	0.20								
4-Nitroaniline	ND	0.40								
Nitrobenzene	ND	0.40								
2-Nitrophenol	ND	0.20								
4-Nitrophenol	ND	0.25								
Pentachlorophenol	ND	0.40								
Phenanthrene	ND	0.20								
Phenol	ND	0.20								
Pyrene	ND	0.20								
Pyridine	ND	0.40								
1,2,4-Trichlorobenzene	ND	0.20								
2,4,5-Trichlorophenol	ND	0.20								
2,4,6-Trichlorophenol	ND	0.20								
Surr: 2-Fluorophenol	2.0		3.330		59.6	21.4	101			
Surr: Phenol-d5	2.1		3.330		64.2	32	110			
Surr: 2,4,6-Tribromophenol	2.3		3.330		68.5	38.7	115			
Surr: Nitrobenzene-d5	1.3		1.670		77.5	26.2	120			
Surr: 2-Fluorobiphenyl	1.3		1.670		77.5	36.2	124			
Surr: 4-Terphenyl-d14	1.0		1.670		60.9	15	114			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **mb-32356**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBW**	Batch ID: **32356**	RunNo: **43713**
Prep Date: **6/19/2017**	Analysis Date: **6/21/2017**	SeqNo: **1376917** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Aniline	ND	10								
Anthracene	ND	10								
Azobenzene	ND	10								
Benz(a)anthracene	ND	10								
Benzo(a)pyrene	ND	10								
Benzo(b)fluoranthene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Benzo(k)fluoranthene	ND	10								
Benzoic acid	12	20								J
Benzyl alcohol	ND	10								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	5.2	10								J
4-Bromophenyl phenyl ether	ND	10								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								
4-Chloro-3-methylphenol	ND	10								
4-Chloroaniline	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
Chrysene	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	10								
Dibenz(a,h)anthracene	ND	10								
Dibenzofuran	ND	10								
1,2-Dichlorobenzene	ND	10								
1,3-Dichlorobenzene	ND	10								
1,4-Dichlorobenzene	ND	10								
3,3´-Dichlorobenzidine	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
2,4-Dichlorophenol	ND	20								
2,4-Dimethylphenol	ND	10								
4,6-Dinitro-2-methylphenol	ND	20								
2,4-Dinitrophenol	ND	20								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **mb-32356**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**	
Client ID: **PBW**	Batch ID: **32356**	RunNo: **43713**	
Prep Date: **6/19/2017**	Analysis Date: **6/21/2017**	SeqNo: **1376917**	Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	10								
2,6-Dinitrotoluene	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Hexachlorobenzene	ND	10								
Hexachlorobutadiene	ND	10								
Hexachlorocyclopentadiene	ND	10								
Hexachloroethane	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
Isophorone	ND	10								
1-Methylnaphthalene	ND	10								
2-Methylnaphthalene	ND	10								
2-Methylphenol	ND	10								
3+4-Methylphenol	ND	10								
N-Nitrosodi-n-propylamine	ND	10								
N-Nitrosodimethylamine	ND	10								
N-Nitrosodiphenylamine	ND	10								
Naphthalene	ND	10								
2-Nitroaniline	ND	10								
3-Nitroaniline	ND	10								
4-Nitroaniline	ND	10								
Nitrobenzene	ND	10								
2-Nitrophenol	ND	10								
4-Nitrophenol	ND	10								
Pentachlorophenol	ND	20								
Phenanthrene	ND	10								
Phenol	ND	10								
Pyrene	ND	10								
Pyridine	ND	10								
1,2,4-Trichlorobenzene	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
Surr: 2-Fluorophenol	110		200.0		53.6	15	98.1			
Surr: Phenol-d5	80		200.0		39.9	15	80.7			
Surr: 2,4,6-Tribromophenol	170		200.0		84.0	15	112			
Surr: Nitrobenzene-d5	87		100.0		87.3	27.2	90.7			
Surr: 2-Fluorobiphenyl	71		100.0		70.6	23.3	85.6			
Surr: 4-Terphenyl-d14	71		100.0		70.8	27.6	107			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **lcs-32356**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSW**	Batch ID: **32356**	RunNo: **43713**
Prep Date: **6/19/2017**	Analysis Date: **6/21/2017**	SeqNo: **1376918** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	70	10	100.0	0	70.2	41.2	98.9			
4-Chloro-3-methylphenol	150	10	200.0	0	75.0	29.1	111			
2-Chlorophenol	150	10	200.0	0	73.2	23.3	108			
1,4-Dichlorobenzene	49	10	100.0	0	48.6	29.4	84.5			
2,4-Dinitrotoluene	71	10	100.0	0	70.9	36.6	88.7			
N-Nitrosodi-n-propylamine	79	10	100.0	0	79.1	46.9	106			
4-Nitrophenol	90	10	200.0	0	44.8	15	74.7			
Pentachlorophenol	150	20	200.0	0	72.8	28.1	85.4			
Phenol	91	10	200.0	0	45.4	15	78.2			
Pyrene	80	10	100.0	0	80.1	44.4	96.8			
1,2,4-Trichlorobenzene	63	10	100.0	0	63.2	34.3	89			
Surr: 2-Fluorophenol	94		200.0		47.2	15	98.1			
Surr: Phenol-d5	72		200.0		35.8	15	80.7			
Surr: 2,4,6-Tribromophenol	160		200.0		77.8	15	112			
Surr: Nitrobenzene-d5	80		100.0		80.1	27.2	90.7			
Surr: 2-Fluorobiphenyl	67		100.0		67.2	23.3	85.6			
Surr: 4-Terphenyl-d14	65		100.0		64.7	27.6	107			

Sample ID **lcsd-32356**	SampType: **LCSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS02**	Batch ID: **32356**	RunNo: **43713**
Prep Date: **6/19/2017**	Analysis Date: **6/21/2017**	SeqNo: **1376919** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	56	10	100.0	0	56.1	41.2	98.9	22.2	37.4	
4-Chloro-3-methylphenol	120	10	200.0	0	59.2	29.1	111	23.5	26.8	
2-Chlorophenol	110	10	200.0	0	55.9	23.3	108	26.8	30.3	
1,4-Dichlorobenzene	35	10	100.0	0	35.1	29.4	84.5	32.2	32	R
2,4-Dinitrotoluene	54	10	100.0	0	53.5	36.6	88.7	27.9	36.7	
N-Nitrosodi-n-propylamine	63	10	100.0	0	62.7	46.9	106	23.1	29.9	
4-Nitrophenol	70	10	200.0	0	34.9	15	74.7	24.7	28.8	
Pentachlorophenol	110	20	200.0	0	54.0	28.1	85.4	29.7	38.2	
Phenol	62	10	200.0	0	31.2	15	78.2	36.9	39.8	
Pyrene	64	10	100.0	0	64.0	44.4	96.8	22.3	28.3	
1,2,4-Trichlorobenzene	44	10	100.0	0	44.2	34.3	89	35.4	39.8	
Surr: 2-Fluorophenol	81		200.0		40.6	15	98.1	0	0	
Surr: Phenol-d5	63		200.0		31.5	15	80.7	0	0	
Surr: 2,4,6-Tribromophenol	130		200.0		65.0	15	112	0	0	
Surr: Nitrobenzene-d5	70		100.0		70.2	27.2	90.7	0	0	
Surr: 2-Fluorobiphenyl	56		100.0		56.4	23.3	85.6	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**
11-Jul-17

Client: Western Refining Company
Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**lcsd-32356**	SampType: **LCSD**		TestCode: **EPA Method 8270C: Semivolatiles**					
Client ID:	**LCSS02**	Batch ID: **32356**		RunNo: **43713**					
Prep Date:	**6/19/2017**	Analysis Date: **6/21/2017**		SeqNo: **1376919**	Units: **µg/L**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	56		100.0		56.3	27.6	107	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**MB-32380**	SampType:	**MBLK**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**PBS**	Batch ID:	**32380**	RunNo:	**43637**					
Prep Date:	**6/20/2017**	Analysis Date:	**6/20/2017**	SeqNo:	**1374889**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.033								

Sample ID	**LCS-32380**	SampType:	**LCS**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**LCSS**	Batch ID:	**32380**	RunNo:	**43637**					
Prep Date:	**6/20/2017**	Analysis Date:	**6/20/2017**	SeqNo:	**1374890**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.17	0.033	0.1667	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID **MB-32349**	SampType: **MBLK**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **PBS**	Batch ID: **32349**	RunNo: **43643**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1374994** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	2.5								
Arsenic	ND	2.5								
Barium	ND	0.10								
Beryllium	ND	0.15								
Cadmium	ND	0.10								
Chromium	ND	0.30								
Cobalt	ND	0.30								
Iron	0.91	2.5								J
Lead	ND	0.25								
Manganese	0.065	0.10								J
Nickel	ND	0.50								
Selenium	ND	2.5								
Silver	ND	0.25								
Vanadium	ND	2.5								
Zinc	0.51	2.5								J

Sample ID **LCS-32349**	SampType: **LCS**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS**	Batch ID: **32349**	RunNo: **43643**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1374995** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	24	2.5	25.00	0	97.7	80	120			
Arsenic	25	2.5	25.00	0	102	80	120			
Barium	25	0.10	25.00	0	99.7	80	120			
Beryllium	26	0.15	25.00	0	103	80	120			
Cadmium	25	0.10	25.00	0	99.2	80	120			
Chromium	25	0.30	25.00	0	98.5	80	120			
Cobalt	23	0.30	25.00	0	93.9	80	120			
Iron	29	2.5	25.00	0	117	80	120			
Lead	23	0.25	25.00	0	93.7	80	120			
Manganese	24	0.10	25.00	0	97.8	80	120			
Nickel	24	0.50	25.00	0	94.3	80	120			
Selenium	24	2.5	25.00	0	96.6	80	120			
Silver	5.0	0.25	5.000	0	101	80	120			
Vanadium	26	2.5	25.00	0	103	80	120			
Zinc	24	2.5	25.00	0	95.6	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**1706910-003BMS**	SampType: **MS**		TestCode: **EPA Method 6010B: Soil Metals**						
Client ID:	**OW-59 (33-34')**	Batch ID: **32349**		RunNo: **43643**						
Prep Date:	**6/19/2017**	Analysis Date: **6/20/2017**		SeqNo: **1375007**		Units: **mg/Kg**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	22	2.4	24.39	0	90.9	75	125			
Beryllium	22	0.15	24.39	0.3383	90.7	75	125			
Cadmium	21	0.098	24.39	0	87.0	75	125			
Chromium	26	0.29	24.39	4.643	85.5	75	125			
Cobalt	21	0.29	24.39	2.130	78.1	75	125			
Lead	19	0.24	24.39	0.7202	76.2	75	125			
Manganese	200	0.098	24.39	180.8	94.5	75	125			
Nickel	22	0.49	24.39	3.504	77.1	75	125			
Silver	4.3	0.24	4.878	0	88.1	75	125			
Vanadium	33	2.4	24.39	10.95	92.4	75	125			
Zinc	27	2.4	24.39	7.461	79.0	75	125			

Sample ID	**1706910-003BMSD**	SampType: **MSD**		TestCode: **EPA Method 6010B: Soil Metals**						
Client ID:	**OW-59 (33-34')**	Batch ID: **32349**		RunNo: **43643**						
Prep Date:	**6/19/2017**	Analysis Date: **6/20/2017**		SeqNo: **1375008**		Units: **mg/Kg**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	23	2.5	24.89	0	90.7	75	125	1.74	20	
Beryllium	23	0.15	24.89	0.3383	89.5	75	125	0.681	20	
Cadmium	21	0.10	24.89	0	86.3	75	125	1.17	20	
Chromium	26	0.30	24.89	4.643	86.9	75	125	2.93	20	
Cobalt	21	0.30	24.89	2.130	77.6	75	125	1.21	20	
Lead	19	0.25	24.89	0.7202	75.1	75	125	0.552	20	
Manganese	200	0.10	24.89	180.8	93.0	75	125	0.0506	20	
Nickel	23	0.50	24.89	3.504	77.0	75	125	1.60	20	
Silver	4.3	0.25	4.977	0	86.9	75	125	0.614	20	
Vanadium	33	2.5	24.89	10.95	89.5	75	125	0.802	20	
Zinc	27	2.5	24.89	7.461	79.2	75	125	1.62	20	

Sample ID	**1706910-003BMS**	SampType: **MS**		TestCode: **EPA Method 6010B: Soil Metals**						
Client ID:	**OW-59 (33-34')**	Batch ID: **32349**		RunNo: **43774**						
Prep Date:	**6/19/2017**	Analysis Date: **6/26/2017**		SeqNo: **1378919**		Units: **mg/Kg**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	8.4	2.4	24.39	0	34.6	75	125			S
Barium	180	0.098	24.39	132.5	178	75	125			S
Selenium	12	2.4	24.39	0	49.9	75	125			S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706910**

11-Jul-17

Client: Western Refining Company

Project: SMW-2 AND BOUNDARY WELLS

Sample ID	**1706910-003BMSD**	SampType: **MSD**		TestCode: **EPA Method 6010B: Soil Metals**	
Client ID:	**OW-59 (33-34')**	Batch ID: **32349**		RunNo: **43774**	
Prep Date:	**6/19/2017**	Analysis Date: **6/26/2017**		SeqNo: **1378920**	Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	7.8	2.5	24.89	0	31.5	75	125	7.50	20	S
Barium	180	0.10	24.89	132.5	185	75	125	1.56	20	S
Selenium	14	2.5	24.89	0	56.1	75	125	13.6	20	S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **Western Refining Gallup** Work Order Number: **1706910** RcptNo: 1

Received By: **Anne Thorne** 6/15/2017 11:15:00 AM Anne Thorne

Completed By: **Anne Thorne** 6/16/2017 12:41:46 PM Anne Thorne

Reviewed By: ENM 06/16/17

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?	Client		

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: Re

Special Handling (if applicable)

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

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

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1706910	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL ~~& DISSOLVED~~)	CYANIDE			Air Bubbles (Y or N)
6/12/17	1810	WATER	EB01	40 ML VOA-5	HCL	001			✓							✓						
				250 ML AMBER-1	NEAT	001			✓													
				1 LITER AMBER-1	NEAT	001											✓		✓			
				~~125 ML PLASTIC-1~~	~~HNO3~~	001												~~✓~~	~~✓~~			
				500 ML PLASTIC-1	HNO_3	001												✓				
				500 ML PLASTIC-1	NaOH	001													✓			
6/13/17	1715	WATER	EB02	40 ML VOA-5	HCL	002			✓							✓						
				250 ML AMBER-1	NEAT	002			✓													
				1 LITER AMBER-1	NEAT	002											✓					
				500 ML PLASTIC-1	HNO_3	002												✓				
				500 ML PLASTIC-1	NaOH	002													✓			

Date:	Time:	Relinquished by:	Received by:	Date	Time
6/15/17	0800			6/15/17	0800
6/15/17	1115			6/15/17	1115

Remarks:

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.

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0

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. 1706910	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS AND CYANIDE				Air Bubbles (Y or N)
6/12/17	1700	SOIL	OW-59 (33-34')	JARS-3	NEAT	-003			X							X	X	X				
				VIALS-2	MEOH	-003										X						
				VIALS-2	SOBI	-003										X						
6/13/17	1605	SOIL	OW-60 (20-22')	JARS-3	NEAT	-004			X							X	X	X				
				VIALS-2	MEOH	-004										X						
				VIALS-2	SOBI	-004										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time	Remarks:
6/15/17	0800			6/15/17	0805	
6/15/17	1115			6/15/17	1115	

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.

WESTERN REFINING SOUTHWEST, INC.

GALLUP REFINERY - GALLUP, NEW MEXICO

SMW-2 AND BOUNDARY WELLS - JUNE 2016

METALS AND CYANIDE ANALYSES FOR GROUNDWATER SAMPLES

AND WATER QA/QC SAMPLES

TOTAL METALS ANALYSIS ~~AND DISSOLVED METALS ANALYSIS~~

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

GENERAL CHEMISTRY PARAMETERS FOR GROUNDWATER SAMPLES

AND WATER QA/QC SAMPLES

Analyte	Analytical Method
Chloride	EPA method 300.0
Fluoride	EPA method 300.0
Sulfate	EPA method 300.0

WESTERN REFINING SOUTHWEST, INC.

GALLUP REFINERY - GALLUP, NEW MEXICO

SMW-2 AND BOUNDARY WELLS - JUNE 2016

METALS AND CYANIDE ANALYSES FOR SOIL SAMPLES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

Appendix E

Groundwater Analytical Reports

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

August 03, 2017

Cheryl Johnson

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-3833
FAX (505) 722-0210

RE: SMW 2 and Boundary Wells OrderNo.: 1706G62

Dear Cheryl Johnson:

Hall Environmental Analysis Laboratory received 8 sample(s) on 6/30/2017 for the analyses presented in the following report.

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

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

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

Sincerely,



Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-60
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 11:10:00 AM
Lab ID: 1706G62-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.36	1.0		mg/L	1	7/5/2017 10:10:22 AM	32608
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	7/5/2017 10:10:22 AM	32608
Surr: DNOP	115	0	72.4-157		%Rec	1	7/5/2017 10:10:22 AM	32608
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	7/6/2017 1:51:07 PM	G44019
Surr: BFB	295	0	52.3-138	S	%Rec	1	7/6/2017 1:51:07 PM	G44019
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	ND	0.22	0.50		mg/L	5	7/3/2017 6:30:12 PM	R43973
Chloride	1600	50	100	*	mg/L	200	7/19/2017 1:32:26 PM	R44381
Bromide	2.4	0.072	0.50		mg/L	5	7/3/2017 6:30:12 PM	R43973
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/3/2017 6:30:12 PM	R43973
Sulfate	740	1.9	10	*	mg/L	20	7/3/2017 6:42:37 PM	R43973
Nitrate+Nitrite as N	3.0	0.13	1.0		mg/L	5	7/3/2017 9:23:59 PM	R43973
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Barium	0.044	0.00093	0.0020		mg/L	1	7/18/2017 1:13:37 PM	A44298
Beryllium	0.00045	0.00026	0.0020	J	mg/L	1	7/18/2017 1:13:37 PM	A44298
Cadmium	ND	0.00058	0.0020		mg/L	1	7/18/2017 1:13:37 PM	A44298
Calcium	170	0.45	10		mg/L	10	7/18/2017 1:21:54 PM	A44298
Chromium	ND	0.0011	0.0060		mg/L	1	7/18/2017 1:13:37 PM	A44298
Cobalt	0.0019	0.00076	0.0060	J	mg/L	1	7/18/2017 1:13:37 PM	A44298
Iron	ND	0.010	0.020		mg/L	1	7/18/2017 1:13:37 PM	A44298
Magnesium	33	0.12	1.0		mg/L	1	7/18/2017 1:13:37 PM	A44298
Manganese	0.55	0.0011	0.0020	*	mg/L	1	7/18/2017 1:13:37 PM	A44298
Nickel	0.0061	0.0036	0.010	J	mg/L	1	7/18/2017 1:13:37 PM	A44298
Potassium	5.0	0.071	1.0		mg/L	1	7/18/2017 1:13:37 PM	A44298
Silver	ND	0.00042	0.0050		mg/L	1	7/18/2017 1:13:37 PM	A44298
Sodium	1100	3.2	20		mg/L	20	7/18/2017 1:39:26 PM	A44298
Vanadium	0.0066	0.00076	0.050	J	mg/L	1	7/18/2017 1:13:37 PM	A44298
Zinc	0.011	0.0028	0.010		mg/L	1	7/18/2017 1:13:37 PM	A44298
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Barium	1.6	0.0093	0.020		mg/L	10	7/6/2017 5:42:54 PM	32644
Beryllium	0.0046	0.00026	0.0020	*	mg/L	1	7/6/2017 5:41:00 PM	32644
Cadmium	ND	0.00058	0.0020		mg/L	1	7/6/2017 5:41:00 PM	32644
Chromium	0.048	0.0011	0.0060		mg/L	1	7/6/2017 5:41:00 PM	32644
Cobalt	0.021	0.00076	0.0060		mg/L	1	7/6/2017 5:41:00 PM	32644
Iron	28	0.51	1.0	*	mg/L	50	7/7/2017 1:25:13 PM	32644
Manganese	2.2	0.011	0.020	*	mg/L	10	7/6/2017 5:42:54 PM	32644

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-60
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 11:10:00 AM
Lab ID: 1706G62-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Nickel	0.047	0.0036	0.010		mg/L	1	7/6/2017 5:41:00 PM	32644
Silver	ND	0.00042	0.0050		mg/L	1	7/6/2017 5:41:00 PM	32644
Vanadium	0.070	0.00076	0.050		mg/L	1	7/6/2017 5:41:00 PM	32644
Zinc	0.071	0.0028	0.010		mg/L	1	7/6/2017 5:41:00 PM	32644
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Antimony	0.00028	0.00017	0.0010	J	mg/L	1	7/19/2017 7:14:45 PM	C44340
Arsenic	0.0044	0.00089	0.0050	J	mg/L	5	7/21/2017 7:52:57 PM	A44430
Lead	ND	0.00084	0.0025		mg/L	5	7/21/2017 7:52:57 PM	A44430
Selenium	0.014	0.0019	0.0050		mg/L	5	7/21/2017 7:52:57 PM	A44430
200.8 ICPMS METALS:TOTAL							Analyst: **JLF**	
Antimony	ND	0.0019	0.0050		mg/L	5	7/14/2017 1:06:08 PM	32644
Arsenic	0.0081	0.0015	0.0050		mg/L	5	7/14/2017 1:06:08 PM	32644
Lead	0.031	0.00048	0.0025	*	mg/L	5	7/14/2017 1:06:08 PM	32644
Selenium	0.013	0.0036	0.0050		mg/L	5	7/14/2017 1:06:08 PM	32644
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	0.000099	0.000037	0.00020	J	mg/L	1	7/14/2017 4:10:26 PM	32802
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Acenaphthylene	ND	3.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Aniline	ND	3.1	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Anthracene	ND	3.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Azobenzene	ND	4.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Benz(a)anthracene	ND	3.9	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Benzo(a)pyrene	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Benzoic acid	7.8	3.9	20	J	µg/L	1	7/6/2017 8:24:22 PM	32619
Benzyl alcohol	ND	4.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Bis(2-ethylhexyl)phthalate	5.1	4.8	10	J	µg/L	1	7/6/2017 8:24:22 PM	32619
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Carbazole	ND	4.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-60
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 11:10:00 AM
Lab ID: 1706G62-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Chloroaniline	ND	3.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2-Chloronaphthalene	ND	3.7	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2-Chlorophenol	ND	7.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Chrysene	ND	3.8	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Di-n-octyl phthalate	ND	4.7	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Dibenzofuran	ND	4.1	10		µg/L	1	7/6/2017 8:24:22 PM	32619
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	7/6/2017 8:24:22 PM	32619
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	7/6/2017 8:24:22 PM	32619
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Diethyl phthalate	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Dimethyl phthalate	ND	3.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	7/6/2017 8:24:22 PM	32619
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	7/6/2017 8:24:22 PM	32619
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	7/6/2017 8:24:22 PM	32619
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	7/6/2017 8:24:22 PM	32619
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Fluoranthene	ND	4.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Fluorene	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Hexachlorobenzene	ND	3.8	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Hexachlorobutadiene	ND	1.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Hexachloroethane	ND	1.2	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Isophorone	ND	4.4	10		µg/L	1	7/6/2017 8:24:22 PM	32619
1-Methylnaphthalene	ND	3.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2-Methylnaphthalene	ND	3.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2-Methylphenol	ND	3.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
3+4-Methylphenol	ND	3.2	10		µg/L	1	7/6/2017 8:24:22 PM	32619
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Naphthalene	ND	2.9	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2-Nitroaniline	ND	4.9	10		µg/L	1	7/6/2017 8:24:22 PM	32619
3-Nitroaniline	ND	4.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-60
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 11:10:00 AM
Lab ID: 1706G62-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	4.0	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Nitrobenzene	ND	3.6	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2-Nitrophenol	ND	5.2	10		µg/L	1	7/6/2017 8:24:22 PM	32619
4-Nitrophenol	ND	5.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Pentachlorophenol	ND	4.9	20		µg/L	1	7/6/2017 8:24:22 PM	32619
Phenanthrene	ND	4.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Phenol	ND	3.1	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Pyrene	ND	4.4	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Pyridine	ND	2.3	10		µg/L	1	7/6/2017 8:24:22 PM	32619
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	7/6/2017 8:24:22 PM	32619
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	7/6/2017 8:24:22 PM	32619
Surr: 2-Fluorophenol	19.2	0	15-98.1		%Rec	1	7/6/2017 8:24:22 PM	32619
Surr: Phenol-d5	34.8	0	15-80.7		%Rec	1	7/6/2017 8:24:22 PM	32619
Surr: 2,4,6-Tribromophenol	23.3	0	15-112		%Rec	1	7/6/2017 8:24:22 PM	32619
Surr: Nitrobenzene-d5	79.1	0	27.2-90.7		%Rec	1	7/6/2017 8:24:22 PM	32619
Surr: 2-Fluorobiphenyl	68.5	0	23.3-85.6		%Rec	1	7/6/2017 8:24:22 PM	32619
Surr: 4-Terphenyl-d14	64.8	0	27.6-107		%Rec	1	7/6/2017 8:24:22 PM	32619
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Toluene	0.24	0.064	1.0	J	µg/L	1	7/5/2017 6:12:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Methyl tert-butyl ether (MTBE)	0.86	0.24	1.0	J	µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Acetone	13	0.82	10		µg/L	1	7/5/2017 6:12:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 6:12:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 6:12:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-60
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 11:10:00 AM
Lab ID: 1706G62-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 6:12:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
4-Isopropyltoluene	0.21	0.096	1.0	J	µg/L	1	7/5/2017 6:12:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 6:12:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-60
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 11:10:00 AM
Lab ID: 1706G62-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 6:12:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 6:12:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	112	0	70-130		%Rec	1	7/5/2017 6:12:00 PM	R44015
Surr: 4-Bromofluorobenzene	112	0	70-130		%Rec	1	7/5/2017 6:12:00 PM	R44015
Surr: Dibromofluoromethane	112	0	70-130		%Rec	1	7/5/2017 6:12:00 PM	R44015
Surr: Toluene-d8	103	0	70-130		%Rec	1	7/5/2017 6:12:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GW DUP01
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017
Lab ID: 1706G62-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.36	1.0		mg/L	1	7/5/2017 11:34:25 AM	32608
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	7/5/2017 11:34:25 AM	32608
Surr: DNOP	111	0	72.4-157		%Rec	1	7/5/2017 11:34:25 AM	32608
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	0.035	0.025	0.050	J	mg/L	1	7/6/2017 2:16:13 PM	G44019
Surr: BFB	105	0	52.3-138		%Rec	1	7/6/2017 2:16:13 PM	G44019
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	ND	0.22	0.50		mg/L	5	7/3/2017 6:55:02 PM	R43973
Chloride	1300	25	50	*	mg/L	100	7/19/2017 1:44:51 PM	R44381
Bromide	1.2	0.072	0.50		mg/L	5	7/3/2017 6:55:02 PM	R43973
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/3/2017 6:55:02 PM	R43973
Sulfate	230	0.48	2.5		mg/L	5	7/3/2017 6:55:02 PM	R43973
Nitrate+Nitrite as N	ND	0.13	1.0		mg/L	5	7/3/2017 9:36:24 PM	R43973
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Barium	0.21	0.00085	0.0020		mg/L	1	7/18/2017 1:23:49 PM	A44298
Beryllium	0.00033	0.00029	0.0020	J	mg/L	1	7/18/2017 1:23:49 PM	A44298
Cadmium	ND	0.0010	0.0020		mg/L	1	7/18/2017 1:23:49 PM	A44298
Calcium	64	0.078	1.0		mg/L	1	7/18/2017 1:23:49 PM	A44298
Chromium	ND	0.0010	0.0060		mg/L	1	7/18/2017 1:23:49 PM	A44298
Cobalt	ND	0.0016	0.0060		mg/L	1	7/18/2017 1:23:49 PM	A44298
Iron	ND	0.016	0.020		mg/L	1	7/18/2017 1:23:49 PM	A44298
Magnesium	8.5	0.25	1.0		mg/L	1	7/18/2017 1:23:49 PM	A44298
Manganese	0.12	0.00038	0.0020	*	mg/L	1	7/18/2017 1:23:49 PM	A44298
Nickel	0.0028	0.0011	0.010	J	mg/L	1	7/18/2017 1:23:49 PM	A44298
Potassium	3.6	0.11	1.0		mg/L	1	7/18/2017 1:23:49 PM	A44298
Silver	ND	0.00088	0.0050		mg/L	1	7/18/2017 1:23:49 PM	A44298
Sodium	980	1.6	10		mg/L	10	7/18/2017 1:25:45 PM	A44298
Vanadium	ND	0.0019	0.050		mg/L	1	7/18/2017 1:23:49 PM	A44298
Zinc	0.012	0.0011	0.010		mg/L	1	7/18/2017 1:23:49 PM	A44298
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Barium	0.21	0.00093	0.0020		mg/L	1	7/6/2017 5:44:41 PM	32644
Beryllium	ND	0.00026	0.0020		mg/L	1	7/6/2017 5:44:41 PM	32644
Cadmium	ND	0.00058	0.0020		mg/L	1	7/6/2017 5:44:41 PM	32644
Chromium	ND	0.0011	0.0060		mg/L	1	7/6/2017 5:44:41 PM	32644
Cobalt	0.0010	0.00076	0.0060	J	mg/L	1	7/6/2017 5:44:41 PM	32644
Iron	0.81	0.010	0.020	*	mg/L	1	7/6/2017 5:44:41 PM	32644
Manganese	0.13	0.0011	0.0020	*	mg/L	1	7/6/2017 5:44:41 PM	32644

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GW DUP01
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017
Lab ID: 1706G62-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Nickel	ND	0.0036	0.010		mg/L	1	7/6/2017 5:44:41 PM	32644
Silver	ND	0.00042	0.0050		mg/L	1	7/6/2017 5:44:41 PM	32644
Vanadium	0.0025	0.00076	0.050	J	mg/L	1	7/6/2017 5:44:41 PM	32644
Zinc	ND	0.0028	0.010		mg/L	1	7/6/2017 5:44:41 PM	32644
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Antimony	ND	0.00017	0.0010		mg/L	1	7/19/2017 7:19:54 PM	C44340
Arsenic	0.0019	0.00089	0.0050	J	mg/L	5	7/21/2017 8:13:34 PM	A44430
Lead	ND	0.00084	0.0025		mg/L	5	7/21/2017 8:13:34 PM	A44430
Selenium	0.0067	0.0019	0.0050		mg/L	5	7/21/2017 8:13:34 PM	A44430
200.8 ICPMS METALS:TOTAL							Analyst: **JLF**	
Antimony	ND	0.0019	0.0050		mg/L	5	7/14/2017 1:11:16 PM	32644
Arsenic	0.0017	0.0015	0.0050	J	mg/L	5	7/14/2017 1:11:16 PM	32644
Lead	ND	0.00048	0.0025		mg/L	5	7/14/2017 1:11:16 PM	32644
Selenium	0.0065	0.0036	0.0050		mg/L	5	7/14/2017 1:11:16 PM	32644
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	0.00018	0.000037	0.00020	J	mg/L	1	7/14/2017 4:12:25 PM	32802
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Acenaphthylene	ND	3.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Aniline	ND	3.1	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Anthracene	ND	3.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Azobenzene	ND	4.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Benz(a)anthracene	ND	3.9	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Benzo(a)pyrene	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Benzoic acid	22	3.9	20		µg/L	1	7/6/2017 8:52:57 PM	32619
Benzyl alcohol	ND	4.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Bis(2-ethylhexyl)phthalate	ND	4.8	10		µg/L	1	7/6/2017 8:52:57 PM	32619
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Carbazole	ND	4.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GW DUP01
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017
Lab ID: 1706G62-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Chloroaniline	ND	3.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2-Chloronaphthalene	ND	3.7	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2-Chlorophenol	ND	7.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Chrysene	ND	3.8	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Di-n-octyl phthalate	5.0	4.7	10	J	µg/L	1	7/6/2017 8:52:57 PM	32619
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Dibenzofuran	ND	4.1	10		µg/L	1	7/6/2017 8:52:57 PM	32619
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	7/6/2017 8:52:57 PM	32619
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	7/6/2017 8:52:57 PM	32619
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Diethyl phthalate	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Dimethyl phthalate	ND	3.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	7/6/2017 8:52:57 PM	32619
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	7/6/2017 8:52:57 PM	32619
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	7/6/2017 8:52:57 PM	32619
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	7/6/2017 8:52:57 PM	32619
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Fluoranthene	ND	4.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Fluorene	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Hexachlorobenzene	ND	3.8	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Hexachlorobutadiene	ND	1.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Hexachloroethane	ND	1.2	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Isophorone	ND	4.4	10		µg/L	1	7/6/2017 8:52:57 PM	32619
1-Methylnaphthalene	ND	3.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2-Methylnaphthalene	ND	3.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2-Methylphenol	ND	3.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
3+4-Methylphenol	ND	3.2	10		µg/L	1	7/6/2017 8:52:57 PM	32619
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Naphthalene	ND	2.9	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2-Nitroaniline	ND	4.9	10		µg/L	1	7/6/2017 8:52:57 PM	32619
3-Nitroaniline	ND	4.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GW DUP01
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017
Lab ID: 1706G62-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	4.0	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Nitrobenzene	ND	3.6	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2-Nitrophenol	ND	5.2	10		µg/L	1	7/6/2017 8:52:57 PM	32619
4-Nitrophenol	ND	5.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Pentachlorophenol	ND	4.9	20		µg/L	1	7/6/2017 8:52:57 PM	32619
Phenanthrene	ND	4.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Phenol	ND	3.1	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Pyrene	ND	4.4	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Pyridine	ND	2.3	10		µg/L	1	7/6/2017 8:52:57 PM	32619
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	7/6/2017 8:52:57 PM	32619
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	7/6/2017 8:52:57 PM	32619
Surr: 2-Fluorophenol	53.9	0	15-98.1		%Rec	1	7/6/2017 8:52:57 PM	32619
Surr: Phenol-d5	56.5	0	15-80.7		%Rec	1	7/6/2017 8:52:57 PM	32619
Surr: 2,4,6-Tribromophenol	71.7	0	15-112		%Rec	1	7/6/2017 8:52:57 PM	32619
Surr: Nitrobenzene-d5	83.9	0	27.2-90.7		%Rec	1	7/6/2017 8:52:57 PM	32619
Surr: 2-Fluorobiphenyl	75.2	0	23.3-85.6		%Rec	1	7/6/2017 8:52:57 PM	32619
Surr: 4-Terphenyl-d14	65.2	0	27.6-107		%Rec	1	7/6/2017 8:52:57 PM	32619
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Toluene	ND	0.064	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Methyl tert-butyl ether (MTBE)	37	0.24	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2-Dichloroethane (EDC)	0.54	0.40	1.0	J	µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Acetone	15	0.82	10		µg/L	1	7/5/2017 6:36:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 6:36:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 6:36:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GW DUP01
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017
Lab ID: 1706G62-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,1-Dichloroethane	0.61	0.40	1.0	J	µg/L	1	7/5/2017 6:36:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 6:36:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 6:36:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: GW DUP01
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017
Lab ID: 1706G62-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 6:36:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 6:36:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	110	0	70-130		%Rec	1	7/5/2017 6:36:00 PM	R44015
Surr: 4-Bromofluorobenzene	107	0	70-130		%Rec	1	7/5/2017 6:36:00 PM	R44015
Surr: Dibromofluoromethane	115	0	70-130		%Rec	1	7/5/2017 6:36:00 PM	R44015
Surr: Toluene-d8	104	0	70-130		%Rec	1	7/5/2017 6:36:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-4B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 10:30:00 AM
Lab ID: 1706G62-003
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	0.47	0.36	1.0	J	mg/L	1	7/5/2017 12:02:35 PM	32608
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	7/5/2017 12:02:35 PM	32608
Surr: DNOP	113	0	72.4-157		%Rec	1	7/5/2017 12:02:35 PM	32608
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050	0.10	D	mg/L	2	7/6/2017 2:41:39 PM	G44019
Surr: BFB	114	0	52.3-138	D	%Rec	2	7/6/2017 2:41:39 PM	G44019
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	1.3	0.22	0.50		mg/L	5	7/3/2017 7:19:51 PM	R43973
Chloride	73	1.2	2.5		mg/L	5	7/3/2017 7:19:51 PM	R43973
Bromide	0.33	0.072	0.50	J	mg/L	5	7/3/2017 7:19:51 PM	R43973
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/3/2017 7:19:51 PM	R43973
Sulfate	230	0.48	2.5		mg/L	5	7/3/2017 7:19:51 PM	R43973
Nitrate+Nitrite as N	ND	0.13	1.0		mg/L	5	7/3/2017 9:48:48 PM	R43973
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Barium	4.7	0.0047	0.010	*	mg/L	5	7/18/2017 3:30:19 PM	32644
Beryllium	0.048	0.0013	0.010	*	mg/L	5	7/18/2017 3:30:19 PM	32644
Cadmium	ND	0.0029	0.010		mg/L	5	7/18/2017 3:30:19 PM	32644
Chromium	0.17	0.0055	0.030	*	mg/L	5	7/18/2017 3:30:19 PM	32644
Cobalt	0.079	0.0038	0.030		mg/L	5	7/18/2017 3:30:19 PM	32644
Iron	82	1.0	2.0	*	mg/L	100	7/7/2017 1:33:40 PM	32644
Manganese	5.6	0.055	0.10	*	mg/L	50	7/18/2017 3:32:08 PM	32644
Nickel	0.54	0.018	0.050	*	mg/L	5	7/18/2017 3:30:19 PM	32644
Silver	ND	0.0021	0.025		mg/L	5	7/18/2017 3:30:19 PM	32644
Vanadium	0.14	0.0038	0.25	J	mg/L	5	7/18/2017 3:30:19 PM	32644
Zinc	3.4	0.014	0.050		mg/L	5	7/18/2017 3:30:19 PM	32644
200.8 ICPMS METALS:TOTAL							Analyst: **JLF**	
Antimony	ND	0.0019	0.0050		mg/L	5	7/14/2017 1:26:41 PM	32644
Arsenic	0.012	0.0030	0.010	*	mg/L	10	7/14/2017 1:31:50 PM	32644
Lead	0.20	0.00095	0.0050	*	mg/L	10	7/14/2017 1:31:50 PM	32644
Selenium	ND	0.0071	0.010		mg/L	10	7/14/2017 1:31:50 PM	32644
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	0.00024	0.000037	0.00020		mg/L	1	7/14/2017 4:14:24 PM	32802
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	36	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Acenaphthylene	ND	35	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Aniline	ND	31	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix
W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-4B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 10:30:00 AM
Lab ID: 1706G62-003
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Anthracene	ND	35	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Azobenzene	ND	45	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Benz(a)anthracene	ND	39	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Benzo(a)pyrene	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Benzo(b)fluoranthene	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Benzo(g,h,i)perylene	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Benzo(k)fluoranthene	ND	44	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Benzoic acid	93	39	200	JD	µg/L	1	7/7/2017 1:52:19 PM	32619
Benzyl alcohol	ND	46	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Bis(2-chloroethoxy)methane	ND	43	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Bis(2-chloroethyl)ether	ND	43	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Bis(2-chloroisopropyl)ether	ND	39	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Bis(2-ethylhexyl)phthalate	ND	48	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4-Bromophenyl phenyl ether	ND	46	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Butyl benzyl phthalate	ND	46	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Carbazole	ND	46	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4-Chloro-3-methylphenol	ND	63	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4-Chloroaniline	ND	35	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2-Chloronaphthalene	ND	37	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2-Chlorophenol	ND	75	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4-Chlorophenyl phenyl ether	ND	36	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Chrysene	ND	38	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Di-n-butyl phthalate	ND	50	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Di-n-octyl phthalate	ND	47	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Dibenz(a,h)anthracene	ND	46	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Dibenzofuran	ND	41	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
1,2-Dichlorobenzene	ND	20	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
1,3-Dichlorobenzene	ND	18	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
1,4-Dichlorobenzene	ND	21	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
3,3´-Dichlorobenzidine	ND	39	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Diethyl phthalate	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Dimethyl phthalate	ND	36	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,4-Dichlorophenol	ND	57	200	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,4-Dimethylphenol	ND	28	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4,6-Dinitro-2-methylphenol	ND	39	200	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,4-Dinitrophenol	ND	26	200	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,4-Dinitrotoluene	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,6-Dinitrotoluene	ND	45	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Fluoranthene	ND	43	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-4B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 10:30:00 AM
Lab ID: 1706G62-003
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Fluorene	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Hexachlorobenzene	ND	38	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Hexachlorobutadiene	ND	13	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Hexachlorocyclopentadiene	ND	13	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Hexachloroethane	ND	12	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Indeno(1,2,3-cd)pyrene	ND	42	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Isophorone	ND	44	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
1-Methylnaphthalene	ND	33	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2-Methylnaphthalene	ND	33	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2-Methylphenol	ND	33	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
3+4-Methylphenol	ND	32	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
N-Nitrosodi-n-propylamine	ND	46	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
N-Nitrosodimethylamine	ND	35	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
N-Nitrosodiphenylamine	ND	39	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Naphthalene	ND	29	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2-Nitroaniline	ND	49	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
3-Nitroaniline	ND	43	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4-Nitroaniline	ND	40	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Nitrobenzene	ND	36	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2-Nitrophenol	ND	52	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
4-Nitrophenol	ND	55	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Pentachlorophenol	ND	49	200	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Phenanthrene	ND	43	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Phenol	ND	31	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Pyrene	ND	44	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Pyridine	ND	23	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
1,2,4-Trichlorobenzene	ND	21	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,4,5-Trichlorophenol	ND	51	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
2,4,6-Trichlorophenol	ND	55	100	D	µg/L	1	7/7/2017 1:52:19 PM	32619
Surr: 2-Fluorophenol	57.6	0	15-98.1	D	%Rec	1	7/7/2017 1:52:19 PM	32619
Surr: Phenol-d5	47.6	0	15-80.7	D	%Rec	1	7/7/2017 1:52:19 PM	32619
Surr: 2,4,6-Tribromophenol	76.5	0	15-112	D	%Rec	1	7/7/2017 1:52:19 PM	32619
Surr: Nitrobenzene-d5	87.2	0	27.2-90.7	D	%Rec	1	7/7/2017 1:52:19 PM	32619
Surr: 2-Fluorobiphenyl	76.1	0	23.3-85.6	D	%Rec	1	7/7/2017 1:52:19 PM	32619
Surr: 4-Terphenyl-d14	75.7	0	27.6-107	D	%Rec	1	7/7/2017 1:52:19 PM	32619
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.12	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Toluene	ND	0.13	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Ethylbenzene	ND	0.19	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-4B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 10:30:00 AM
Lab ID: 1706G62-003
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Methyl tert-butyl ether (MTBE)	ND	0.48	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.23	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.17	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2-Dichloroethane (EDC)	ND	0.80	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.26	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Naphthalene	ND	0.23	4.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1-Methylnaphthalene	ND	0.32	8.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
2-Methylnaphthalene	ND	0.30	8.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Acetone	10	1.6	20	JD	µg/L	2	7/5/2017 7:00:00 PM	R44015
Bromobenzene	ND	0.28	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Bromodichloromethane	ND	0.35	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Bromoform	ND	0.42	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Bromomethane	ND	0.51	6.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
2-Butanone	ND	2.3	20	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Carbon disulfide	ND	0.80	20	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Carbon Tetrachloride	ND	0.22	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Chlorobenzene	ND	0.21	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Chloroethane	ND	0.47	4.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Chloroform	ND	0.80	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Chloromethane	ND	0.59	6.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
2-Chlorotoluene	ND	0.80	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
4-Chlorotoluene	ND	0.80	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
cis-1,2-DCE	ND	0.41	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.16	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	2.8	4.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Dibromochloromethane	ND	0.14	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Dibromomethane	ND	0.18	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2-Dichlorobenzene	ND	0.18	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,3-Dichlorobenzene	ND	0.30	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,4-Dichlorobenzene	ND	0.80	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Dichlorodifluoromethane	ND	2.0	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1-Dichloroethane	ND	0.80	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1-Dichloroethene	ND	0.16	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2-Dichloropropane	ND	0.20	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,3-Dichloropropane	ND	0.33	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
2,2-Dichloropropane	ND	0.31	4.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1-Dichloropropene	ND	0.19	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Hexachlorobutadiene	ND	1.6	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
2-Hexanone	ND	1.3	20	D	µg/L	2	7/5/2017 7:00:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-4B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 10:30:00 AM
Lab ID: 1706G62-003
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Isopropylbenzene	ND	0.10	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
4-Isopropyltoluene	ND	0.19	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
4-Methyl-2-pentanone	ND	1.4	20	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Methylene Chloride	ND	0.22	6.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
n-Butylbenzene	ND	0.26	6.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
n-Propylbenzene	ND	0.15	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
sec-Butylbenzene	ND	0.22	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Styrene	ND	0.31	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
tert-Butylbenzene	ND	0.21	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.21	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.27	4.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.26	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
trans-1,2-DCE	ND	0.37	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.44	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.23	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.28	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1,1-Trichloroethane	ND	0.15	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,1,2-Trichloroethane	ND	0.28	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Trichloroethene (TCE)	ND	0.22	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Trichlorofluoromethane	ND	0.37	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
1,2,3-Trichloropropane	ND	0.78	4.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Vinyl chloride	ND	0.36	2.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Xylenes, Total	ND	0.64	3.0	D	µg/L	2	7/5/2017 7:00:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	108	0	70-130	D	%Rec	2	7/5/2017 7:00:00 PM	R44015
Surr: 4-Bromofluorobenzene	109	0	70-130	D	%Rec	2	7/5/2017 7:00:00 PM	R44015
Surr: Dibromofluoromethane	110	0	70-130	D	%Rec	2	7/5/2017 7:00:00 PM	R44015
Surr: Toluene-d8	104	0	70-130	D	%Rec	2	7/5/2017 7:00:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5C
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:10:00 AM
Lab ID: 1706G62-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.36	1.0		mg/L	1	7/5/2017 12:30:40 PM	32608
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	7/5/2017 12:30:40 PM	32608
Surr: DNOP	114	0	72.4-157		%Rec	1	7/5/2017 12:30:40 PM	32608
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	0.039	0.025	0.050	J	mg/L	1	7/6/2017 3:07:27 PM	G44019
Surr: BFB	115	0	52.3-138		%Rec	1	7/6/2017 3:07:27 PM	G44019
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	ND	0.22	0.50		mg/L	5	7/3/2017 7:44:41 PM	R43973
Chloride	1400	25	50	*	mg/L	100	7/19/2017 1:57:16 PM	R44381
Bromide	1.7	0.072	0.50		mg/L	5	7/3/2017 7:44:41 PM	R43973
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/3/2017 7:44:41 PM	R43973
Sulfate	220	0.48	2.5		mg/L	5	7/3/2017 7:44:41 PM	R43973
Nitrate+Nitrite as N	ND	0.13	1.0		mg/L	5	7/3/2017 10:01:12 PM	R43973
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Barium	0.21	0.00085	0.0020		mg/L	1	7/18/2017 1:27:39 PM	A44298
Beryllium	ND	0.00029	0.0020		mg/L	1	7/18/2017 1:27:39 PM	A44298
Cadmium	ND	0.0010	0.0020		mg/L	1	7/18/2017 1:27:39 PM	A44298
Calcium	64	0.078	1.0		mg/L	1	7/18/2017 1:27:39 PM	A44298
Chromium	0.0016	0.0010	0.0060	J	mg/L	1	7/18/2017 1:27:39 PM	A44298
Cobalt	ND	0.0016	0.0060		mg/L	1	7/18/2017 1:27:39 PM	A44298
Iron	ND	0.016	0.020		mg/L	1	7/18/2017 1:27:39 PM	A44298
Magnesium	8.3	0.25	1.0		mg/L	1	7/18/2017 1:27:39 PM	A44298
Manganese	0.12	0.00038	0.0020	*	mg/L	1	7/18/2017 1:27:39 PM	A44298
Nickel	0.0049	0.0011	0.010	J	mg/L	1	7/18/2017 1:27:39 PM	A44298
Potassium	3.5	0.11	1.0		mg/L	1	7/18/2017 1:27:39 PM	A44298
Silver	ND	0.00088	0.0050		mg/L	1	7/18/2017 1:27:39 PM	A44298
Sodium	950	1.6	10		mg/L	10	7/18/2017 1:29:36 PM	A44298
Vanadium	ND	0.0019	0.050		mg/L	1	7/18/2017 1:27:39 PM	A44298
Zinc	0.011	0.0011	0.010		mg/L	1	7/18/2017 1:27:39 PM	A44298
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Barium	0.21	0.00093	0.0020		mg/L	1	7/6/2017 6:04:03 PM	32644
Beryllium	ND	0.00026	0.0020		mg/L	1	7/6/2017 6:04:03 PM	32644
Cadmium	ND	0.00058	0.0020		mg/L	1	7/6/2017 6:04:03 PM	32644
Chromium	ND	0.0011	0.0060		mg/L	1	7/6/2017 6:04:03 PM	32644
Cobalt	0.0012	0.00076	0.0060	J	mg/L	1	7/6/2017 6:04:03 PM	32644
Iron	0.74	0.010	0.020	*	mg/L	1	7/6/2017 6:04:03 PM	32644
Manganese	0.13	0.0011	0.0020	*	mg/L	1	7/6/2017 6:04:03 PM	32644

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5C
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:10:00 AM
Lab ID: 1706G62-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Nickel	ND	0.0036	0.010		mg/L	1	7/6/2017 6:04:03 PM	32644
Silver	ND	0.00042	0.0050		mg/L	1	7/6/2017 6:04:03 PM	32644
Vanadium	0.0029	0.00076	0.050	J	mg/L	1	7/6/2017 6:04:03 PM	32644
Zinc	0.0036	0.0028	0.010	J	mg/L	1	7/6/2017 6:04:03 PM	32644
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Antimony	ND	0.00017	0.0010		mg/L	1	7/19/2017 7:25:02 PM	C44340
Arsenic	0.0019	0.00089	0.0050	J	mg/L	5	7/21/2017 8:18:42 PM	A44430
Lead	ND	0.00084	0.0025		mg/L	5	7/21/2017 8:18:42 PM	A44430
Selenium	0.0068	0.0019	0.0050		mg/L	5	7/21/2017 8:18:42 PM	A44430
200.8 ICPMS METALS:TOTAL							Analyst: **JLF**	
Antimony	ND	0.0019	0.0050		mg/L	5	7/14/2017 1:47:18 PM	32644
Arsenic	ND	0.0015	0.0050		mg/L	5	7/14/2017 1:47:18 PM	32644
Lead	ND	0.00048	0.0025		mg/L	5	7/14/2017 1:47:18 PM	32644
Selenium	0.0049	0.0036	0.0050	J	mg/L	5	7/14/2017 1:47:18 PM	32644
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	0.00018	0.000037	0.00020	J	mg/L	1	7/14/2017 4:16:25 PM	32802
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Acenaphthylene	ND	3.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Aniline	ND	3.1	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Anthracene	ND	3.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Azobenzene	ND	4.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Benz(a)anthracene	ND	3.9	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Benzo(a)pyrene	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Benzoic acid	7.9	3.9	20	J	µg/L	1	7/7/2017 2:20:13 PM	32619
Benzyl alcohol	ND	4.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Bis(2-ethylhexyl)phthalate	ND	4.8	10		µg/L	1	7/7/2017 2:20:13 PM	32619
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Carbazole	ND	4.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5C
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:10:00 AM
Lab ID: 1706G62-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Chloroaniline	ND	3.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2-Chloronaphthalene	ND	3.7	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2-Chlorophenol	ND	7.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Chrysene	ND	3.8	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Di-n-octyl phthalate	5.0	4.7	10	J	µg/L	1	7/7/2017 2:20:13 PM	32619
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Dibenzofuran	ND	4.1	10		µg/L	1	7/7/2017 2:20:13 PM	32619
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	7/7/2017 2:20:13 PM	32619
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	7/7/2017 2:20:13 PM	32619
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Diethyl phthalate	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Dimethyl phthalate	ND	3.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	7/7/2017 2:20:13 PM	32619
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	7/7/2017 2:20:13 PM	32619
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	7/7/2017 2:20:13 PM	32619
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	7/7/2017 2:20:13 PM	32619
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Fluoranthene	ND	4.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Fluorene	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Hexachlorobenzene	ND	3.8	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Hexachlorobutadiene	ND	1.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Hexachloroethane	ND	1.2	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Isophorone	ND	4.4	10		µg/L	1	7/7/2017 2:20:13 PM	32619
1-Methylnaphthalene	ND	3.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2-Methylnaphthalene	ND	3.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2-Methylphenol	ND	3.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
3+4-Methylphenol	ND	3.2	10		µg/L	1	7/7/2017 2:20:13 PM	32619
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Naphthalene	ND	2.9	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2-Nitroaniline	ND	4.9	10		µg/L	1	7/7/2017 2:20:13 PM	32619
3-Nitroaniline	ND	4.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5C
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:10:00 AM
Lab ID: 1706G62-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	4.0	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Nitrobenzene	ND	3.6	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2-Nitrophenol	ND	5.2	10		µg/L	1	7/7/2017 2:20:13 PM	32619
4-Nitrophenol	ND	5.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Pentachlorophenol	ND	4.9	20		µg/L	1	7/7/2017 2:20:13 PM	32619
Phenanthrene	ND	4.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Phenol	ND	3.1	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Pyrene	ND	4.4	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Pyridine	ND	2.3	10		µg/L	1	7/7/2017 2:20:13 PM	32619
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	7/7/2017 2:20:13 PM	32619
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	7/7/2017 2:20:13 PM	32619
Surr: 2-Fluorophenol	66.2	0	15-98.1		%Rec	1	7/7/2017 2:20:13 PM	32619
Surr: Phenol-d5	51.2	0	15-80.7		%Rec	1	7/7/2017 2:20:13 PM	32619
Surr: 2,4,6-Tribromophenol	84.6	0	15-112		%Rec	1	7/7/2017 2:20:13 PM	32619
Surr: Nitrobenzene-d5	97.0	0	27.2-90.7	S	%Rec	1	7/7/2017 2:20:13 PM	32619
Surr: 2-Fluorobiphenyl	88.8	0	23.3-85.6	S	%Rec	1	7/7/2017 2:20:13 PM	32619
Surr: 4-Terphenyl-d14	78.7	0	27.6-107		%Rec	1	7/7/2017 2:20:13 PM	32619
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Toluene	ND	0.064	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Methyl tert-butyl ether (MTBE)	38	0.24	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2-Dichloroethane (EDC)	0.57	0.40	1.0	J	µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Acetone	5.4	0.82	10	J	µg/L	1	7/5/2017 7:24:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 7:24:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 7:24:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5C
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:10:00 AM
Lab ID: 1706G62-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,1-Dichloroethane	0.61	0.40	1.0	J	µg/L	1	7/5/2017 7:24:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 7:24:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 7:24:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5C
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:10:00 AM
Lab ID: 1706G62-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 7:24:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 7:24:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	113	0	70-130		%Rec	1	7/5/2017 7:24:00 PM	R44015
Surr: 4-Bromofluorobenzene	107	0	70-130		%Rec	1	7/5/2017 7:24:00 PM	R44015
Surr: Dibromofluoromethane	113	0	70-130		%Rec	1	7/5/2017 7:24:00 PM	R44015
Surr: Toluene-d8	103	0	70-130		%Rec	1	7/5/2017 7:24:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:40:00 AM
Lab ID: 1706G62-005
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	0.74	0.36	1.0	J	mg/L	1	7/5/2017 12:58:49 PM	32608
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	7/5/2017 12:58:49 PM	32608
Surr: DNOP	112	0	72.4-157		%Rec	1	7/5/2017 12:58:49 PM	32608
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	7/6/2017 3:33:25 PM	G44019
Surr: BFB	117	0	52.3-138		%Rec	1	7/6/2017 3:33:25 PM	G44019
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	0.28	0.22	0.50	J	mg/L	5	7/3/2017 8:09:30 PM	R43973
Chloride	50	1.2	2.5		mg/L	5	7/3/2017 8:09:30 PM	R43973
Bromide	0.43	0.072	0.50	J	mg/L	5	7/3/2017 8:09:30 PM	R43973
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/3/2017 8:09:30 PM	R43973
Sulfate	100	0.48	2.5		mg/L	5	7/3/2017 8:09:30 PM	R43973
Nitrate+Nitrite as N	0.20	0.13	1.0	J	mg/L	5	7/3/2017 10:13:37 PM	R43973
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Barium	0.052	0.00085	0.0020		mg/L	1	7/18/2017 1:31:31 PM	A44298
Beryllium	ND	0.00029	0.0020		mg/L	1	7/18/2017 1:31:31 PM	A44298
Cadmium	ND	0.0010	0.0020		mg/L	1	7/18/2017 1:31:31 PM	A44298
Calcium	2.8	0.078	1.0		mg/L	1	7/18/2017 1:31:31 PM	A44298
Chromium	0.0018	0.0010	0.0060	J	mg/L	1	7/18/2017 1:31:31 PM	A44298
Cobalt	ND	0.0016	0.0060		mg/L	1	7/18/2017 1:31:31 PM	A44298
Iron	0.11	0.016	0.020		mg/L	1	7/18/2017 1:31:31 PM	A44298
Magnesium	0.35	0.25	1.0	J	mg/L	1	7/18/2017 1:31:31 PM	A44298
Manganese	0.0082	0.00038	0.0020		mg/L	1	7/18/2017 1:31:31 PM	A44298
Nickel	ND	0.0011	0.010		mg/L	1	7/18/2017 1:31:31 PM	A44298
Potassium	0.85	0.11	1.0	J	mg/L	1	7/18/2017 1:31:31 PM	A44298
Silver	ND	0.00088	0.0050		mg/L	1	7/18/2017 1:31:31 PM	A44298
Sodium	260	1.6	10		mg/L	10	7/18/2017 1:33:34 PM	A44298
Vanadium	0.018	0.0019	0.050	J	mg/L	1	7/18/2017 1:31:31 PM	A44298
Zinc	0.012	0.0011	0.010		mg/L	1	7/18/2017 1:31:31 PM	A44298
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Barium	0.073	0.00093	0.0020		mg/L	1	7/6/2017 6:07:46 PM	32644
Beryllium	ND	0.00026	0.0020		mg/L	1	7/6/2017 6:07:46 PM	32644
Cadmium	ND	0.00058	0.0020		mg/L	1	7/6/2017 6:07:46 PM	32644
Chromium	0.0030	0.0011	0.0060	J	mg/L	1	7/6/2017 6:07:46 PM	32644
Cobalt	0.0010	0.00076	0.0060	J	mg/L	1	7/6/2017 6:07:46 PM	32644
Iron	1.5	0.10	0.20	*	mg/L	10	7/6/2017 6:09:43 PM	32644
Manganese	0.026	0.0011	0.0020		mg/L	1	7/6/2017 6:07:46 PM	32644

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:40:00 AM
Lab ID: 1706G62-005
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Nickel	ND	0.0036	0.010		mg/L	1	7/6/2017 6:07:46 PM	32644
Silver	ND	0.00042	0.0050		mg/L	1	7/6/2017 6:07:46 PM	32644
Vanadium	0.022	0.00076	0.050	J	mg/L	1	7/6/2017 6:07:46 PM	32644
Zinc	0.0038	0.0028	0.010	J	mg/L	1	7/6/2017 6:07:46 PM	32644
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Antimony	ND	0.00017	0.0010		mg/L	1	7/19/2017 7:30:11 PM	C44340
Arsenic	0.0024	0.00018	0.0010		mg/L	1	7/19/2017 7:30:11 PM	C44340
Lead	0.00023	0.00017	0.00050	J	mg/L	1	7/19/2017 7:30:11 PM	C44340
Selenium	0.0053	0.00039	0.0010		mg/L	1	7/19/2017 7:30:11 PM	C44340
200.8 ICPMS METALS:TOTAL							Analyst: **JLF**	
Antimony	ND	0.0019	0.0050		mg/L	5	7/14/2017 1:52:27 PM	32644
Arsenic	0.0028	0.0015	0.0050	J	mg/L	5	7/14/2017 1:52:27 PM	32644
Lead	0.00093	0.00048	0.0025	J	mg/L	5	7/14/2017 1:52:27 PM	32644
Selenium	0.0044	0.0036	0.0050	J	mg/L	5	7/14/2017 1:52:27 PM	32644
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	0.000074	0.000037	0.00020	J	mg/L	1	7/14/2017 4:22:28 PM	32802
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Acenaphthylene	ND	3.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Aniline	ND	3.1	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Anthracene	ND	3.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Azobenzene	ND	4.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Benz(a)anthracene	ND	3.9	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Benzo(a)pyrene	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Benzoic acid	8.2	3.9	20	J	µg/L	1	7/7/2017 2:48:15 PM	32619
Benzyl alcohol	ND	4.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Bis(2-ethylhexyl)phthalate	ND	4.8	10		µg/L	1	7/7/2017 2:48:15 PM	32619
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Carbazole	ND	4.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:40:00 AM
Lab ID: 1706G62-005
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Chloroaniline	ND	3.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2-Chloronaphthalene	ND	3.7	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2-Chlorophenol	ND	7.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Chrysene	ND	3.8	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Di-n-octyl phthalate	ND	4.7	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Dibenzofuran	ND	4.1	10		µg/L	1	7/7/2017 2:48:15 PM	32619
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	7/7/2017 2:48:15 PM	32619
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	7/7/2017 2:48:15 PM	32619
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Diethyl phthalate	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Dimethyl phthalate	ND	3.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	7/7/2017 2:48:15 PM	32619
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	7/7/2017 2:48:15 PM	32619
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	7/7/2017 2:48:15 PM	32619
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	7/7/2017 2:48:15 PM	32619
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Fluoranthene	ND	4.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Fluorene	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Hexachlorobenzene	ND	3.8	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Hexachlorobutadiene	ND	1.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Hexachloroethane	ND	1.2	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Isophorone	ND	4.4	10		µg/L	1	7/7/2017 2:48:15 PM	32619
1-Methylnaphthalene	ND	3.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2-Methylnaphthalene	ND	3.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2-Methylphenol	ND	3.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
3+4-Methylphenol	ND	3.2	10		µg/L	1	7/7/2017 2:48:15 PM	32619
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Naphthalene	ND	2.9	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2-Nitroaniline	ND	4.9	10		µg/L	1	7/7/2017 2:48:15 PM	32619
3-Nitroaniline	ND	4.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:40:00 AM
Lab ID: 1706G62-005
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	4.0	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Nitrobenzene	ND	3.6	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2-Nitrophenol	ND	5.2	10		µg/L	1	7/7/2017 2:48:15 PM	32619
4-Nitrophenol	ND	5.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Pentachlorophenol	ND	4.9	20		µg/L	1	7/7/2017 2:48:15 PM	32619
Phenanthrene	ND	4.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Phenol	ND	3.1	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Pyrene	ND	4.4	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Pyridine	ND	2.3	10		µg/L	1	7/7/2017 2:48:15 PM	32619
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	7/7/2017 2:48:15 PM	32619
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	7/7/2017 2:48:15 PM	32619
Surr: 2-Fluorophenol	56.7	0	15-98.1		%Rec	1	7/7/2017 2:48:15 PM	32619
Surr: Phenol-d5	43.8	0	15-80.7		%Rec	1	7/7/2017 2:48:15 PM	32619
Surr: 2,4,6-Tribromophenol	77.5	0	15-112		%Rec	1	7/7/2017 2:48:15 PM	32619
Surr: Nitrobenzene-d5	95.0	0	27.2-90.7	S	%Rec	1	7/7/2017 2:48:15 PM	32619
Surr: 2-Fluorobiphenyl	82.5	0	23.3-85.6		%Rec	1	7/7/2017 2:48:15 PM	32619
Surr: 4-Terphenyl-d14	64.3	0	27.6-107		%Rec	1	7/7/2017 2:48:15 PM	32619
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Toluene	0.23	0.064	1.0	J	µg/L	1	7/5/2017 7:48:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Methyl tert-butyl ether (MTBE)	ND	0.24	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Acetone	3.1	0.82	10	J	µg/L	1	7/5/2017 7:48:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 7:48:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 7:48:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:40:00 AM
Lab ID: 1706G62-005
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 7:48:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 7:48:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: BW-5B
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 9:40:00 AM
Lab ID: 1706G62-005
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 7:48:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 7:48:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	109	0	70-130		%Rec	1	7/5/2017 7:48:00 PM	R44015
Surr: 4-Bromofluorobenzene	105	0	70-130		%Rec	1	7/5/2017 7:48:00 PM	R44015
Surr: Dibromofluoromethane	113	0	70-130		%Rec	1	7/5/2017 7:48:00 PM	R44015
Surr: Toluene-d8	102	0	70-130		%Rec	1	7/5/2017 7:48:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: TRIP BLANK
Project: SMW 2 and Boundary Wells
Collection Date:
Lab ID: 1706G62-006
Matrix: TRIP BLANK
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	7/6/2017 3:59:34 PM	G44019
Surr: BFB	118	0	52.3-138		%Rec	1	7/6/2017 3:59:34 PM	G44019
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Toluene	ND	0.064	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Methyl tert-butyl ether (MTBE)	ND	0.24	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Acetone	2.7	0.82	10	J	µg/L	1	7/5/2017 8:12:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 8:12:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 8:12:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: TRIP BLANK
Project: SMW 2 and Boundary Wells
Collection Date:
Lab ID: 1706G62-006
Matrix: TRIP BLANK
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 8:12:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 8:12:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 8:12:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 8:12:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	111	0	70-130		%Rec	1	7/5/2017 8:12:00 PM	R44015
Surr: 4-Bromofluorobenzene	108	0	70-130		%Rec	1	7/5/2017 8:12:00 PM	R44015
Surr: Dibromofluoromethane	115	0	70-130		%Rec	1	7/5/2017 8:12:00 PM	R44015
Surr: Toluene-d8	103	0	70-130		%Rec	1	7/5/2017 8:12:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-59
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 12:40:00 PM
Lab ID: 1706G62-007
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **TOM**	
Diesel Range Organics (DRO)	0.56	0.36	1.0	J	mg/L	1	7/5/2017 1:27:11 PM	32608
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	7/5/2017 1:27:11 PM	32608
Surr: DNOP	115	0	72.4-157		%Rec	1	7/5/2017 1:27:11 PM	32608
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	0.23	0.025	0.050		mg/L	1	7/6/2017 4:26:01 PM	G44019
Surr: BFB	3950	0	52.3-138	S	%Rec	1	7/6/2017 4:26:01 PM	G44019
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	ND	0.22	0.50		mg/L	5	7/3/2017 8:59:09 PM	R43973
Chloride	2000	50	100	*	mg/L	200	7/19/2017 2:09:41 PM	R44381
Bromide	3.6	0.072	0.50		mg/L	5	7/3/2017 8:59:09 PM	R43973
Phosphorus, Orthophosphate (As P)	ND	5.0	10	H	mg/L	20	7/3/2017 9:11:34 PM	R43973
Sulfate	3000	19	100	*	mg/L	200	7/19/2017 2:09:41 PM	R44381
Nitrate+Nitrite as N	ND	0.26	2.0		mg/L	10	7/26/2017 3:44:57 PM	R44528
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Barium	0.014	0.00085	0.0020		mg/L	1	7/18/2017 1:35:22 PM	A44298
Beryllium	0.00039	0.00029	0.0020	J	mg/L	1	7/18/2017 1:35:22 PM	A44298
Cadmium	ND	0.0010	0.0020		mg/L	1	7/18/2017 1:35:22 PM	A44298
Calcium	210	0.78	10		mg/L	10	7/18/2017 1:37:23 PM	A44298
Chromium	ND	0.0010	0.0060		mg/L	1	7/18/2017 1:35:22 PM	A44298
Cobalt	0.0035	0.0016	0.0060	J	mg/L	1	7/18/2017 1:35:22 PM	A44298
Iron	0.030	0.016	0.020		mg/L	1	7/18/2017 1:35:22 PM	A44298
Magnesium	65	0.25	1.0		mg/L	1	7/18/2017 1:35:22 PM	A44298
Manganese	0.67	0.00038	0.0020	*	mg/L	1	7/18/2017 1:35:22 PM	A44298
Nickel	0.010	0.0011	0.010		mg/L	1	7/18/2017 1:35:22 PM	A44298
Potassium	1.7	0.11	1.0		mg/L	1	7/18/2017 1:35:22 PM	A44298
Silver	ND	0.00088	0.0050		mg/L	1	7/18/2017 1:35:22 PM	A44298
Sodium	2400	8.2	50		mg/L	50	7/18/2017 1:47:36 PM	A44298
Vanadium	0.0042	0.0019	0.050	J	mg/L	1	7/18/2017 1:35:22 PM	A44298
Zinc	0.013	0.0011	0.010		mg/L	1	7/18/2017 1:35:22 PM	A44298
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Barium	0.35	0.00093	0.0020		mg/L	1	7/6/2017 6:11:30 PM	32644
Beryllium	0.0015	0.00026	0.0020	J	mg/L	1	7/6/2017 6:11:30 PM	32644
Cadmium	ND	0.00058	0.0020		mg/L	1	7/6/2017 6:11:30 PM	32644
Chromium	0.014	0.0011	0.0060		mg/L	1	7/6/2017 6:11:30 PM	32644
Cobalt	0.0080	0.00076	0.0060		mg/L	1	7/6/2017 6:11:30 PM	32644
Iron	9.7	0.20	0.40	*	mg/L	20	7/7/2017 1:35:46 PM	32644
Manganese	1.2	0.011	0.020	*	mg/L	10	7/6/2017 6:13:16 PM	32644

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-59
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 12:40:00 PM
Lab ID: 1706G62-007
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: TOTAL METALS							Analyst: **pmf**	
Nickel	0.020	0.0036	0.010		mg/L	1	7/6/2017 6:11:30 PM	32644
Silver	ND	0.00042	0.0050		mg/L	1	7/6/2017 6:11:30 PM	32644
Vanadium	0.026	0.00076	0.050	J	mg/L	1	7/6/2017 6:11:30 PM	32644
Zinc	0.032	0.0028	0.010		mg/L	1	7/6/2017 6:11:30 PM	32644
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Antimony	0.0010	0.00084	0.0050	J	mg/L	5	7/21/2017 4:42:33 PM	A44430
Arsenic	0.0094	0.0018	0.010	J	mg/L	10	7/21/2017 4:47:42 PM	A44430
Lead	ND	0.00084	0.0025		mg/L	5	7/21/2017 4:42:33 PM	A44430
Selenium	0.023	0.0019	0.0050		mg/L	5	7/21/2017 4:42:33 PM	A44430
200.8 ICPMS METALS:TOTAL							Analyst: **JLF**	
Antimony	ND	0.0019	0.0050		mg/L	5	7/14/2017 1:57:35 PM	32644
Arsenic	0.011	0.0015	0.0050	*	mg/L	5	7/14/2017 1:57:35 PM	32644
Lead	0.0094	0.00095	0.0050		mg/L	10	7/14/2017 3:08:09 PM	32644
Selenium	0.015	0.0036	0.0050		mg/L	5	7/14/2017 1:57:35 PM	32644
EPA METHOD 245.1: MERCURY							Analyst: **MED**	
Mercury	0.000082	0.000037	0.00020	J	mg/L	1	7/14/2017 4:24:22 PM	32802
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
Acenaphthene	ND	3.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Acenaphthylene	ND	3.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Aniline	ND	3.1	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Anthracene	ND	3.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Azobenzene	ND	4.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Benz(a)anthracene	ND	3.9	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Benzo(a)pyrene	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Benzoic acid	8.3	3.9	20	J	µg/L	1	7/7/2017 3:16:16 PM	32619
Benzyl alcohol	ND	4.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Bis(2-chloroethoxy)methane	ND	4.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Bis(2-chloroethyl)ether	ND	4.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Bis(2-chloroisopropyl)ether	ND	3.9	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Bis(2-ethylhexyl)phthalate	ND	4.8	10		µg/L	1	7/7/2017 3:16:16 PM	32619
4-Bromophenyl phenyl ether	ND	4.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Butyl benzyl phthalate	ND	4.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Carbazole	ND	4.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
4-Chloro-3-methylphenol	ND	6.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-59
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 12:40:00 PM
Lab ID: 1706G62-007
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Chloroaniline	ND	3.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2-Chloronaphthalene	ND	3.7	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2-Chlorophenol	ND	7.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
4-Chlorophenyl phenyl ether	ND	3.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Chrysene	ND	3.8	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Di-n-butyl phthalate	ND	5.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Di-n-octyl phthalate	ND	4.7	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Dibenzofuran	ND	4.1	10		µg/L	1	7/7/2017 3:16:16 PM	32619
1,2-Dichlorobenzene	ND	2.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
1,3-Dichlorobenzene	ND	1.8	10		µg/L	1	7/7/2017 3:16:16 PM	32619
1,4-Dichlorobenzene	ND	2.1	10		µg/L	1	7/7/2017 3:16:16 PM	32619
3,3´-Dichlorobenzidine	ND	3.9	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Diethyl phthalate	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Dimethyl phthalate	ND	3.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2,4-Dichlorophenol	ND	5.7	20		µg/L	1	7/7/2017 3:16:16 PM	32619
2,4-Dimethylphenol	ND	2.8	10		µg/L	1	7/7/2017 3:16:16 PM	32619
4,6-Dinitro-2-methylphenol	ND	3.9	20		µg/L	1	7/7/2017 3:16:16 PM	32619
2,4-Dinitrophenol	ND	2.6	20		µg/L	1	7/7/2017 3:16:16 PM	32619
2,4-Dinitrotoluene	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2,6-Dinitrotoluene	ND	4.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Fluoranthene	ND	4.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Fluorene	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Hexachlorobenzene	ND	3.8	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Hexachlorobutadiene	ND	1.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Hexachlorocyclopentadiene	ND	1.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Hexachloroethane	ND	1.2	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Isophorone	ND	4.4	10		µg/L	1	7/7/2017 3:16:16 PM	32619
1-Methylnaphthalene	ND	3.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2-Methylnaphthalene	ND	3.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2-Methylphenol	ND	3.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
3+4-Methylphenol	ND	3.2	10		µg/L	1	7/7/2017 3:16:16 PM	32619
N-Nitrosodi-n-propylamine	ND	4.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
N-Nitrosodimethylamine	ND	3.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
N-Nitrosodiphenylamine	ND	3.9	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Naphthalene	ND	2.9	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2-Nitroaniline	ND	4.9	10		µg/L	1	7/7/2017 3:16:16 PM	32619
3-Nitroaniline	ND	4.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-59
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 12:40:00 PM
Lab ID: 1706G62-007
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **JDC**	
4-Nitroaniline	ND	4.0	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Nitrobenzene	ND	3.6	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2-Nitrophenol	ND	5.2	10		µg/L	1	7/7/2017 3:16:16 PM	32619
4-Nitrophenol	ND	5.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Pentachlorophenol	ND	4.9	20		µg/L	1	7/7/2017 3:16:16 PM	32619
Phenanthrene	ND	4.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Phenol	ND	3.1	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Pyrene	ND	4.4	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Pyridine	ND	2.3	10		µg/L	1	7/7/2017 3:16:16 PM	32619
1,2,4-Trichlorobenzene	ND	2.1	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2,4,5-Trichlorophenol	ND	5.1	10		µg/L	1	7/7/2017 3:16:16 PM	32619
2,4,6-Trichlorophenol	ND	5.5	10		µg/L	1	7/7/2017 3:16:16 PM	32619
Surr: 2-Fluorophenol	55.0	0	15-98.1		%Rec	1	7/7/2017 3:16:16 PM	32619
Surr: Phenol-d5	44.8	0	15-80.7		%Rec	1	7/7/2017 3:16:16 PM	32619
Surr: 2,4,6-Tribromophenol	70.3	0	15-112		%Rec	1	7/7/2017 3:16:16 PM	32619
Surr: Nitrobenzene-d5	90.7	0	27.2-90.7	S	%Rec	1	7/7/2017 3:16:16 PM	32619
Surr: 2-Fluorobiphenyl	85.7	0	23.3-85.6	S	%Rec	1	7/7/2017 3:16:16 PM	32619
Surr: 4-Terphenyl-d14	69.0	0	27.6-107		%Rec	1	7/7/2017 3:16:16 PM	32619
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Toluene	ND	0.064	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Methyl tert-butyl ether (MTBE)	6.8	0.24	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2,4-Trimethylbenzene	0.13	0.11	1.0	J	µg/L	1	7/5/2017 8:36:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Acetone	6.0	0.82	10	J	µg/L	1	7/5/2017 8:36:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 8:36:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 8:36:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-59
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 12:40:00 PM
Lab ID: 1706G62-007
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 8:36:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 8:36:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: OW-59
Project: SMW 2 and Boundary Wells
Collection Date: 6/28/2017 12:40:00 PM
Lab ID: 1706G62-007
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 8:36:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 8:36:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	109	0	70-130		%Rec	1	7/5/2017 8:36:00 PM	R44015
Surr: 4-Bromofluorobenzene	110	0	70-130		%Rec	1	7/5/2017 8:36:00 PM	R44015
Surr: Dibromofluoromethane	110	0	70-130		%Rec	1	7/5/2017 8:36:00 PM	R44015
Surr: Toluene-d8	101	0	70-130		%Rec	1	7/5/2017 8:36:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: TRIP BLANK
Project: SMW 2 and Boundary Wells
Collection Date:
Lab ID: 1706G62-008
Matrix: TRIP BLANK
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	7/10/2017 2:53:57 PM	WG440
Surr: BFB	116	0	52.3-138		%Rec	1	7/10/2017 2:53:57 PM	WG440
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
Benzene	ND	0.062	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Toluene	ND	0.064	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Ethylbenzene	ND	0.093	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Methyl tert-butyl ether (MTBE)	ND	0.24	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2,4-Trimethylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,3,5-Trimethylbenzene	ND	0.087	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2-Dichloroethane (EDC)	ND	0.40	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2-Dibromoethane (EDB)	ND	0.13	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Naphthalene	ND	0.11	2.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1-Methylnaphthalene	ND	0.16	4.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
2-Methylnaphthalene	ND	0.15	4.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Acetone	4.5	0.82	10	J	µg/L	1	7/5/2017 9:00:00 PM	R44015
Bromobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Bromodichloromethane	ND	0.18	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Bromoform	ND	0.21	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Bromomethane	ND	0.26	3.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
2-Butanone	ND	1.1	10		µg/L	1	7/5/2017 9:00:00 PM	R44015
Carbon disulfide	ND	0.40	10		µg/L	1	7/5/2017 9:00:00 PM	R44015
Carbon Tetrachloride	ND	0.11	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Chlorobenzene	ND	0.11	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Chloroethane	ND	0.23	2.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Chloroform	ND	0.40	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Chloromethane	ND	0.29	3.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
2-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
4-Chlorotoluene	ND	0.40	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
cis-1,2-DCE	ND	0.20	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
cis-1,3-Dichloropropene	ND	0.082	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2-Dibromo-3-chloropropane	ND	1.4	2.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Dibromochloromethane	ND	0.072	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Dibromomethane	ND	0.091	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2-Dichlorobenzene	ND	0.090	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,3-Dichlorobenzene	ND	0.15	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,4-Dichlorobenzene	ND	0.40	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Dichlorodifluoromethane	ND	1.0	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1-Dichloroethane	ND	0.40	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1-Dichloroethene	ND	0.081	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: TRIP BLANK
Project: SMW 2 and Boundary Wells
Collection Date:
Lab ID: 1706G62-008
Matrix: TRIP BLANK
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **RAA**	
1,2-Dichloropropane	ND	0.10	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,3-Dichloropropane	ND	0.17	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
2,2-Dichloropropane	ND	0.16	2.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1-Dichloropropene	ND	0.093	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Hexachlorobutadiene	ND	0.80	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
2-Hexanone	ND	0.66	10		µg/L	1	7/5/2017 9:00:00 PM	R44015
Isopropylbenzene	ND	0.051	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
4-Isopropyltoluene	ND	0.096	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
4-Methyl-2-pentanone	ND	0.71	10		µg/L	1	7/5/2017 9:00:00 PM	R44015
Methylene Chloride	ND	0.11	3.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
n-Butylbenzene	ND	0.13	3.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
n-Propylbenzene	ND	0.074	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
sec-Butylbenzene	ND	0.11	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Styrene	ND	0.16	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
tert-Butylbenzene	ND	0.10	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1,1,2-Tetrachloroethane	ND	0.10	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1,2,2-Tetrachloroethane	ND	0.14	2.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Tetrachloroethene (PCE)	ND	0.13	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
trans-1,3-Dichloropropene	ND	0.22	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2,3-Trichlorobenzene	ND	0.12	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2,4-Trichlorobenzene	ND	0.14	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1,1-Trichloroethane	ND	0.073	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,1,2-Trichloroethane	ND	0.14	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Trichloroethene (TCE)	ND	0.11	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Trichlorofluoromethane	ND	0.18	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
1,2,3-Trichloropropane	ND	0.39	2.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Vinyl chloride	ND	0.18	1.0		µg/L	1	7/5/2017 9:00:00 PM	R44015
Xylenes, Total	ND	0.32	1.5		µg/L	1	7/5/2017 9:00:00 PM	R44015
Surr: 1,2-Dichloroethane-d4	109	0	70-130		%Rec	1	7/5/2017 9:00:00 PM	R44015
Surr: 4-Bromofluorobenzene	109	0	70-130		%Rec	1	7/5/2017 9:00:00 PM	R44015
Surr: Dibromofluoromethane	114	0	70-130		%Rec	1	7/5/2017 9:00:00 PM	R44015
Surr: Toluene-d8	102	0	70-130		%Rec	1	7/5/2017 9:00:00 PM	R44015

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Wet Chemistry by Method 4500CN E-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Cyanide	ND		0.00500	1	07/11/2017 16:23	WG996538

Wet Chemistry by Method 4500CN E-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Cyanide	ND		0.00500	1	07/11/2017 16:25	WG996538

Wet Chemistry by Method 4500CN E-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Cyanide	ND		0.00500	1	07/11/2017 16:26	WG996538

Wet Chemistry by Method 4500CN E-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Cyanide	ND		0.00500	1	07/11/2017 16:27	WG996538

Wet Chemistry by Method 4500CN E-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Cyanide	ND		0.00500	1	07/11/2017 16:32	WG996538

Wet Chemistry by Method 4500CN E-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Cyanide	0.0268		0.00500	1	07/11/2017 16:33	WG996538

Method Blank (MB)

(MB) R3232467-1 07/11/17 16:06

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Cyanide	U		0.0018	0.00500

L920655-02 Original Sample (OS) • Duplicate (DUP)

(OS) L920655-02 07/11/17 16:23 • (DUP) R3232467-4 07/11/17 16:24

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Cyanide	ND	0.00343	1	0		20

L920655-07 Original Sample (OS) • Duplicate (DUP)

(OS) L920655-07 07/11/17 16:33 • (DUP) R3232467-7 07/11/17 16:34

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Cyanide	0.0268	0.0283	1	5		20

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

(LCS) R3232467-2 07/11/17 16:07 • (LCSD) R3232467-3 07/11/17 16:08

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cyanide	0.100	0.102	0.0969	102	97	85-115			5	20

L920655-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L920655-05 07/11/17 16:27 • (MS) R3232467-5 07/11/17 16:28 • (MSD) R3232467-6 07/11/17 16:31

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Cyanide	0.100	ND	0.0931	0.0959	93	96	1	75-125			3	20

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Rec.	Recovery.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID **MB-A**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **PBW**	Batch ID: **A44298**	RunNo: **44298**
Prep Date:	Analysis Date: **7/18/2017**	SeqNo: **1400233** Units: **mg/L**

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

Sample ID **LCSLL-A**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **A44298**	RunNo: **44298**
Prep Date:	Analysis Date: **7/18/2017**	SeqNo: **1400234** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0018	0.0020	0.002000	0	89.0	50	150			J
Beryllium	0.0021	0.0020	0.002000	0	106	50	150			
Cadmium	0.0020	0.0020	0.002000	0	98.5	50	150			J
Calcium	0.53	1.0	0.5000	0	106	50	150			J
Chromium	0.0063	0.0060	0.006000	0	105	50	150			
Cobalt	0.0060	0.0060	0.006000	0	99.7	50	150			J
Iron	0.020	0.020	0.02000	0	102	50	150			
Magnesium	0.53	1.0	0.5000	0	106	50	150			J
Manganese	0.0020	0.0020	0.002000	0	102	50	150			
Nickel	0.0051	0.010	0.005000	0	103	50	150			J
Potassium	0.53	1.0	0.5000	0	107	50	150			J
Silver	0.0049	0.0050	0.005000	0	97.4	50	150			J
Sodium	0.51	1.0	0.5000	0	102	50	150			J
Vanadium	0.010	0.050	0.01000	0	105	50	150			J
Zinc	0.0056	0.010	0.005000	0	113	50	150			J

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **LCS-A**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **A44298**	RunNo: **44298**
Prep Date:	Analysis Date: **7/18/2017**	SeqNo: **1400235** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	97.2	85	115			
Beryllium	0.49	0.0020	0.5000	0	98.0	85	115			
Cadmium	0.49	0.0020	0.5000	0	97.1	85	115			
Calcium	49	1.0	50.00	0	97.6	85	115			
Chromium	0.49	0.0060	0.5000	0	97.3	85	115			
Cobalt	0.47	0.0060	0.5000	0	93.6	85	115			
Iron	0.48	0.020	0.5000	0	95.1	85	115			
Magnesium	49	1.0	50.00	0	98.7	85	115			
Manganese	0.48	0.0020	0.5000	0	95.0	85	115			
Nickel	0.48	0.010	0.5000	0	95.0	85	115			
Potassium	47	1.0	50.00	0	94.7	85	115			
Silver	0.10	0.0050	0.1000	0	100	85	115			
Sodium	48	1.0	50.00	0	96.6	85	115			
Vanadium	0.50	0.050	0.5000	0	99.7	85	115			
Zinc	0.47	0.010	0.5000	0	94.2	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID **MB-32644**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Total Metals**
Client ID: **PBW**	Batch ID: **32644**	RunNo: **44032**
Prep Date: **7/5/2017**	Analysis Date: **7/6/2017**	SeqNo: **1388501** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Iron	ND	0.020								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Sample ID **LCSLL-32644**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Total Metals**
Client ID: **BatchQC**	Batch ID: **32644**	RunNo: **44032**
Prep Date:	Analysis Date: **7/6/2017**	SeqNo: **1388502** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0020	0.0020	0.002000	0	102	50	150			
Beryllium	0.0020	0.0020	0.002000	0	100	50	150			
Cadmium	0.0021	0.0020	0.002000	0	106	50	150			
Chromium	0.0062	0.0060	0.006000	0	104	50	150			
Cobalt	0.0061	0.0060	0.006000	0	101	50	150			
Iron	0.020	0.020	0.02000	0	99.8	50	150			J
Manganese	0.0020	0.0020	0.002000	0	100	50	150			
Nickel	0.0044	0.010	0.005000	0	88.0	50	150			J
Silver	0.0045	0.0050	0.005000	0	90.6	50	150			J
Vanadium	0.0097	0.050	0.01000	0	96.7	50	150			J
Zinc	0.0056	0.010	0.005000	0	112	50	150			J

Sample ID **LCS-32644**	SampType: **LCS**	TestCode: **EPA Method 200.7: Total Metals**
Client ID: **LCSW**	Batch ID: **32644**	RunNo: **44032**
Prep Date: **7/5/2017**	Analysis Date: **7/6/2017**	SeqNo: **1389083** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	97.9	85	115			
Beryllium	0.50	0.0020	0.5000	0	100	85	115			
Cadmium	0.49	0.0020	0.5000	0	98.6	85	115			
Chromium	0.49	0.0060	0.5000	0	98.4	85	115			
Cobalt	0.48	0.0060	0.5000	0	95.4	85	115			
Iron	0.48	0.020	0.5000	0	96.4	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID	**LCS-32644**	SampType:	**LCS**	TestCode:	**EPA Method 200.7: Total Metals**
Client ID:	**LCSW**	Batch ID:	**32644**	RunNo:	**44032**
Prep Date:	**7/5/2017**	Analysis Date:	**7/6/2017**	SeqNo:	**1389083** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.48	0.0020	0.5000	0	95.7	85	115			
Nickel	0.48	0.010	0.5000	0	95.7	85	115			
Silver	0.094	0.0050	0.1000	0	94.0	85	115			
Vanadium	0.50	0.050	0.5000	0	99.8	85	115			
Zinc	0.48	0.010	0.5000	0	95.3	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **C44340**	RunNo: **44340**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1401304** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.023	0.0010	0.02500	0	90.8	85	115			
Arsenic	0.024	0.0010	0.02500	0	94.1	85	115			
Lead	0.012	0.00050	0.01250	0	95.1	85	115			
Selenium	0.023	0.0010	0.02500	0	93.8	85	115			
Uranium	0.012	0.00050	0.01250	0	94.1	85	115			

Sample ID **LLLCS**	SampType: **LCSLL**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **C44340**	RunNo: **44340**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1401305** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00053	0.0010	0.001000	0	52.7	50	150			J
Arsenic	0.00096	0.0010	0.001000	0	96.0	50	150			J
Lead	0.00047	0.00050	0.0005001	0	94.2	50	150			J
Selenium	0.0011	0.0010	0.001000	0	106	50	150			
Uranium	0.00047	0.00050	0.0005001	0	93.2	50	150			J

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW**	Batch ID: **C44340**	RunNo: **44340**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1401306** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								
Uranium	ND	0.00050								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **A44430**	RunNo: **44430**
Prep Date:	Analysis Date: **7/21/2017**	SeqNo: **1404397** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.024	0.0010	0.02500	0	94.5	85	115			
Arsenic	0.023	0.0010	0.02500	0	91.5	85	115			
Lead	0.012	0.00050	0.01250	0	95.3	85	115			
Selenium	0.023	0.0010	0.02500	0	91.7	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID	**LLLCS**	SampType: **LCSLL**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID:	**BatchQC**	Batch ID: **A44430**	RunNo: **44430**
Prep Date:		Analysis Date: **7/21/2017**	SeqNo: **1404398** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00097	0.0010	0.001000	0	96.6	50	150			J
Arsenic	0.00090	0.0010	0.001000	0	89.8	50	150			J
Lead	0.00048	0.00050	0.0005001	0	96.9	50	150			J
Selenium	0.00088	0.0010	0.001000	0	87.8	50	150			J

Sample ID	**MB**	SampType: **MBLK**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID:	**PBW**	Batch ID: **A44430**	RunNo: **44430**
Prep Date:		Analysis Date: **7/21/2017**	SeqNo: **1404399** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID	**MB-32644**	SampType:	**MBLK**	TestCode:	**200.8 ICPMS Metals:Total**					
Client ID:	**PBW**	Batch ID:	**32644**	RunNo:	**44075**					
Prep Date:	**7/5/2017**	Analysis Date:	**7/8/2017**	SeqNo:	**1390839**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								

Sample ID	**MSLCS-32644**	SampType:	**LCS**	TestCode:	**200.8 ICPMS Metals:Total**					
Client ID:	**LCSW**	Batch ID:	**32644**	RunNo:	**44075**					
Prep Date:	**7/5/2017**	Analysis Date:	**7/8/2017**	SeqNo:	**1390841**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.025	0.0010	0.02500	0	102	85	115			
Arsenic	0.023	0.0010	0.02500	0	92.5	85	115			
Lead	0.012	0.00050	0.01250	0	96.0	85	115			
Selenium	0.022	0.0010	0.02500	0	89.1	85	115			

Sample ID	**MSLLLCS-32644**	SampType:	**LCSLL**	TestCode:	**200.8 ICPMS Metals:Total**					
Client ID:	**BatchQC**	Batch ID:	**32644**	RunNo:	**44075**					
Prep Date:	**7/5/2017**	Analysis Date:	**7/8/2017**	SeqNo:	**1390843**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00095	0.0010	0.001000	0	94.9	50	150			J
Arsenic	0.0011	0.0010	0.001000	0	113	50	150			
Lead	0.00048	0.00050	0.0005001	0	96.1	50	150			J
Selenium	0.00085	0.0010	0.001000	0	84.9	50	150			J

Sample ID	**1706G62-002ELLMS**	SampType:	**MSDLL**	TestCode:	**200.8 ICPMS Metals:Total**					
Client ID:	**GW DUP01**	Batch ID:	**32644**	RunNo:	**44225**					
Prep Date:	**7/5/2017**	Analysis Date:	**7/14/2017**	SeqNo:	**1396853**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.027	0.0050	0.02500	0	108	70	130	0.216	20	
Arsenic	0.026	0.0050	0.02500	0.001656	99.1	70	130	1.76	20	
Lead	0.014	0.0025	0.01250	0	111	70	130	0.949	20	
Selenium	0.029	0.0050	0.02500	0.006456	92.1	70	130	7.46	20	

Sample ID	**1706G62-002ELLMS**	SampType:	**MSLL**	TestCode:	**200.8 ICPMS Metals:Total**					
Client ID:	**GW DUP01**	Batch ID:	**32644**	RunNo:	**44225**					
Prep Date:	**7/5/2017**	Analysis Date:	**7/14/2017**	SeqNo:	**1396854**	Units:	**mg/L**			

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID	**1706G62-002ELLMS**	SampType:	**MSLL**	TestCode:	**200.8 ICPMS Metals:Total**					
Client ID:	**GW DUP01**	Batch ID:	**32644**	RunNo:	**44225**					
Prep Date:	**7/5/2017**	Analysis Date:	**7/14/2017**	SeqNo:	**1396854**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.027	0.0050	0.02500	0	108	70	130			
Arsenic	0.027	0.0050	0.02500	0.001656	101	70	130			
Lead	0.014	0.0025	0.01250	0	110	70	130			
Selenium	0.027	0.0050	0.02500	0.006456	83.6	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID	**MB-32802**	SampType:	**MBLK**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**PBW**	Batch ID:	**32802**	RunNo:	**44238**					
Prep Date:	**7/14/2017**	Analysis Date:	**7/14/2017**	SeqNo:	**1396754**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.000079	0.00020								J

Sample ID	**LCS-32802**	SampType:	**LCS**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**LCSW**	Batch ID:	**32802**	RunNo:	**44238**					
Prep Date:	**7/14/2017**	Analysis Date:	**7/14/2017**	SeqNo:	**1396755**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0052	0.00020	0.005000	0	104	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R43973**	RunNo: **43973**
Prep Date:	Analysis Date: **7/3/2017**	SeqNo: **1387126** 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								
Bromide	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								
Sulfate	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R43973**	RunNo: **43973**
Prep Date:	Analysis Date: **7/3/2017**	SeqNo: **1387127** 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	4.8	0.50	5.000	0	96.6	90	110			
Bromide	2.4	0.10	2.500	0	97.7	90	110			
Phosphorus, Orthophosphate (As P	4.8	0.50	5.000	0	96.4	90	110			
Sulfate	9.8	0.50	10.00	0	98.1	90	110			
Nitrate+Nitrite as N	3.4	0.20	3.500	0	97.6	90	110			

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402926** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Sulfate	0.15	0.50								J

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402927** 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	92.7	90	110			
Sulfate	9.4	0.50	10.00	0	93.7	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R44528**	RunNo: **44528**
Prep Date:	Analysis Date: **7/26/2017**	SeqNo: **1408053** Units: **mg/L**

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R44528**	RunNo: **44528**
Prep Date:	Analysis Date: **7/26/2017**	SeqNo: **1408053** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	ND	0.20								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R44528**	RunNo: **44528**
Prep Date:	Analysis Date: **7/26/2017**	SeqNo: **1408054** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	3.4	0.20	3.500	0	97.0	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID **MB-32608**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **PBW**	Batch ID: **32608**	RunNo: **43984**
Prep Date: **7/3/2017**	Analysis Date: **7/5/2017**	SeqNo: **1386515** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	1.1		1.000		112	72.4	157			

Sample ID **LCS-32608**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **LCSW**	Batch ID: **32608**	RunNo: **43984**
Prep Date: **7/3/2017**	Analysis Date: **7/5/2017**	SeqNo: **1386736** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.0	1.0	5.000	0	121	82.8	146			
Surr: DNOP	0.54		0.5000		109	72.4	157			

Sample ID **1706G62-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **OW-60**	Batch ID: **32608**	RunNo: **43984**
Prep Date: **7/3/2017**	Analysis Date: **7/5/2017**	SeqNo: **1386854** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.5	1.0	5.000	0	129	87.2	145			
Surr: DNOP	0.56		0.5000		112	72.4	157			

Sample ID **1706G62-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **OW-60**	Batch ID: **32608**	RunNo: **43984**
Prep Date: **7/3/2017**	Analysis Date: **7/5/2017**	SeqNo: **1386861** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.6	1.0	5.000	0	131	87.2	145	1.51	20	
Surr: DNOP	0.56		0.5000		112	72.4	157	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G44019**	RunNo: **44019**
Prep Date:	Analysis Date: **7/6/2017**	SeqNo: **1388622** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	21		20.00		106	52.3	138			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G44019**	RunNo: **44019**
Prep Date:	Analysis Date: **7/6/2017**	SeqNo: **1388623** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.50	0.050	0.5000	0	99.7	75.8	123			
Surr: BFB	24		20.00		118	52.3	138			

Sample ID **1706G62-002AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GW DUP01**	Batch ID: **G44019**	RunNo: **44019**
Prep Date:	Analysis Date: **7/6/2017**	SeqNo: **1388626** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.49	0.050	0.5000	0.03520	90.7	53.2	134			
Surr: BFB	26		20.00		131	52.3	138			

Sample ID **1706G62-002AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GW DUP01**	Batch ID: **G44019**	RunNo: **44019**
Prep Date:	Analysis Date: **7/6/2017**	SeqNo: **1388627** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.48	0.050	0.5000	0.03520	90.0	53.2	134	0.740	20	
Surr: BFB	26		20.00		129	52.3	138	0	0	

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **WG44091**	RunNo: **44091**
Prep Date:	Analysis Date: **7/10/2017**	SeqNo: **1391577** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	23		20.00		114	52.3	138			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **WG44091**	RunNo: **44091**
Prep Date:	Analysis Date: **7/10/2017**	SeqNo: **1391578** Units: **mg/L**

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **WG44091**	RunNo: **44091**
Prep Date:	Analysis Date: **7/10/2017**	SeqNo: **1391578** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.48	0.050	0.5000	0	95.7	75.8	123			
Surr: BFB	25		20.00		125	52.3	138			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **100ng lcs**	SampType: **LCS4**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **BatchQC**	Batch ID: **R44015**	RunNo: **44015**
Prep Date:	Analysis Date: **7/5/2017**	SeqNo: **1387911** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	103	70	130			
Toluene	20	1.0	20.00	0	100	70	130			
Ethylbenzene	20	1.0	20.00	0	99.5	70	130			
Methyl tert-butyl ether (MTBE)	42	1.0	40.00	0	104	70	130			
1,2,4-Trimethylbenzene	21	1.0	20.00	0	103	70	130			
1,3,5-Trimethylbenzene	20	1.0	20.00	0	101	70	130			
1,2-Dichloroethane (EDC)	21	1.0	20.00	0	103	62.2	143			
1,2-Dibromoethane (EDB)	20	1.0	20.00	0	99.1	70	130			
Naphthalene	19	2.0	20.00	0	92.6	70	130			
1-Methylnaphthalene	19	4.0	20.00	0	95.0	60	140			
2-Methylnaphthalene	14	4.0	20.00	0	71.6	60	140			
Acetone	43	10	40.00	0	107	60	140			
Bromobenzene	21	1.0	20.00	0	104	70	130			
Bromodichloromethane	21	1.0	20.00	0	107	70	130			
Bromoform	20	1.0	20.00	0	99.3	70	130			
Bromomethane	17	3.0	20.00	0	87.2	60	140			
2-Butanone	47	10	40.00	0	117	60	140			
Carbon disulfide	38	10	40.00	0	94.3	60	140			
Carbon Tetrachloride	21	1.0	20.00	0	104	70	130			
Chlorobenzene	20	1.0	20.00	0	102	70	130			
Chloroethane	20	2.0	20.00	0	99.2	60	140			
Chloroform	21	1.0	20.00	0	107	70	130			
Chloromethane	17	3.0	20.00	0	87.0	60	140			
2-Chlorotoluene	20	1.0	20.00	0	102	70	130			
4-Chlorotoluene	20	1.0	20.00	0	102	70	130			
cis-1,2-DCE	21	1.0	20.00	0	107	70	130			
cis-1,3-Dichloropropene	19	1.0	20.00	0	96.8	70	130			
1,2-Dibromo-3-chloropropane	20	2.0	20.00	0	102	70	130			
Dibromochloromethane	19	1.0	20.00	0	95.4	70	130			
Dibromomethane	22	1.0	20.00	0	108	70	130			
1,2-Dichlorobenzene	20	1.0	20.00	0	101	70	130			
1,3-Dichlorobenzene	21	1.0	20.00	0	103	70	130			
1,4-Dichlorobenzene	21	1.0	20.00	0	103	67.2	141			
Dichlorodifluoromethane	17	1.0	20.00	0	85.6	60	140			
1,1-Dichloroethane	21	1.0	20.00	0	103	52.6	157			
1,1-Dichloroethene	20	1.0	20.00	0	101	70	130			
1,2-Dichloropropane	21	1.0	20.00	0	103	63.7	138			
1,3-Dichloropropane	20	1.0	20.00	0	98.1	70	130			
2,2-Dichloropropane	21	2.0	20.00	0	107	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **100ng lcs**	SampType: **LCS4**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **BatchQC**	Batch ID: **R44015**	RunNo: **44015**
Prep Date:	Analysis Date: **7/5/2017**	SeqNo: **1387911** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	20	1.0	20.00	0	102	70	130			
Hexachlorobutadiene	18	1.0	20.00	0	87.6	70	130			
2-Hexanone	38	10	40.00	0	95.4	60	140			
Isopropylbenzene	20	1.0	20.00	0	100	70	130			
4-Isopropyltoluene	21	1.0	20.00	0	104	70	130			
4-Methyl-2-pentanone	41	10	40.00	0	102	60	140			
Methylene Chloride	21	3.0	20.00	0	103	70	130			
n-Butylbenzene	19	3.0	20.00	0	97.4	70	130			
n-Propylbenzene	20	1.0	20.00	0	100	70	130			
sec-Butylbenzene	20	1.0	20.00	0	98.3	70	130			
Styrene	20	1.0	20.00	0	101	70	130			
tert-Butylbenzene	20	1.0	20.00	0	101	70	130			
1,1,1,2-Tetrachloroethane	20	1.0	20.00	0	98.5	70	130			
1,1,2,2-Tetrachloroethane	21	2.0	20.00	0	105	65.9	133			
Tetrachloroethene (PCE)	21	1.0	20.00	0	103	70	130			
trans-1,2-DCE	20	1.0	20.00	0	99.9	70	130			
trans-1,3-Dichloropropene	19	1.0	20.00	0	92.8	70	130			
1,2,3-Trichlorobenzene	19	1.0	20.00	0	92.9	70	130			
1,2,4-Trichlorobenzene	18	1.0	20.00	0	92.3	70	130			
1,1,1-Trichloroethane	21	1.0	20.00	0	104	70	130			
1,1,2-Trichloroethane	20	1.0	20.00	0	99.1	70	130			
Trichloroethene (TCE)	20	1.0	20.00	0	102	70	130			
Trichlorofluoromethane	20	1.0	20.00	0	102	70	130			
1,2,3-Trichloropropane	21	2.0	20.00	0	103	69.7	129			
Vinyl chloride	19	1.0	20.00	0	93.5	70	130			
Xylenes, Total	61	1.5	60.00	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		106	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	11		10.00		113	70	130			
Surr: Toluene-d8	11		10.00		107	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R44015**	RunNo: **44015**
Prep Date:	Analysis Date: **7/5/2017**	SeqNo: **1387914** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**	
Client ID: **PBW**	Batch ID: **R44015**	RunNo: **44015**	
Prep Date:	Analysis Date: **7/5/2017**	SeqNo: **1387914**	Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R44015**	RunNo: **44015**
Prep Date:	Analysis Date: **7/5/2017**	SeqNo: **1387914** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		108	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		108	70	130			
Surr: Dibromofluoromethane	11		10.00		114	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **mb-32619**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBW**	Batch ID: **32619**	RunNo: **44051**
Prep Date: **7/3/2017**	Analysis Date: **7/6/2017**	SeqNo: **1389536** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Aniline	ND	10								
Anthracene	ND	10								
Azobenzene	ND	10								
Benz(a)anthracene	ND	10								
Benzo(a)pyrene	ND	10								
Benzo(b)fluoranthene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Benzo(k)fluoranthene	ND	10								
Benzoic acid	8.5	20								J
Benzyl alcohol	ND	10								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	ND	10								
4-Bromophenyl phenyl ether	ND	10								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								
4-Chloro-3-methylphenol	ND	10								
4-Chloroaniline	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
Chrysene	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	10								
Dibenz(a,h)anthracene	ND	10								
Dibenzofuran	ND	10								
1,2-Dichlorobenzene	ND	10								
1,3-Dichlorobenzene	ND	10								
1,4-Dichlorobenzene	ND	10								
3,3´-Dichlorobenzidine	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
2,4-Dichlorophenol	ND	20								
2,4-Dimethylphenol	ND	10								
4,6-Dinitro-2-methylphenol	ND	20								
2,4-Dinitrophenol	ND	20								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID **mb-32619**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBW**	Batch ID: **32619**	RunNo: **44051**
Prep Date: **7/3/2017**	Analysis Date: **7/6/2017**	SeqNo: **1389536** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	10								
2,6-Dinitrotoluene	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Hexachlorobenzene	ND	10								
Hexachlorobutadiene	ND	10								
Hexachlorocyclopentadiene	ND	10								
Hexachloroethane	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
Isophorone	ND	10								
1-Methylnaphthalene	ND	10								
2-Methylnaphthalene	ND	10								
2-Methylphenol	ND	10								
3+4-Methylphenol	ND	10								
N-Nitrosodi-n-propylamine	ND	10								
N-Nitrosodimethylamine	ND	10								
N-Nitrosodiphenylamine	ND	10								
Naphthalene	ND	10								
2-Nitroaniline	ND	10								
3-Nitroaniline	ND	10								
4-Nitroaniline	ND	10								
Nitrobenzene	ND	10								
2-Nitrophenol	ND	10								
4-Nitrophenol	ND	10								
Pentachlorophenol	ND	20								
Phenanthrene	ND	10								
Phenol	ND	10								
Pyrene	ND	10								
Pyridine	ND	10								
1,2,4-Trichlorobenzene	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
Surr: 2-Fluorophenol	120		200.0		60.8	15	98.1			
Surr: Phenol-d5	100		200.0		51.7	15	80.7			
Surr: 2,4,6-Tribromophenol	160		200.0		78.6	15	112			
Surr: Nitrobenzene-d5	90		100.0		90.2	27.2	90.7			
Surr: 2-Fluorobiphenyl	86		100.0		85.7	23.3	85.6			S
Surr: 4-Terphenyl-d14	72		100.0		71.6	27.6	107			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**

03-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2 and Boundary Wells

Sample ID **lcs-32619**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSW**	Batch ID: **32619**	RunNo: **44051**
Prep Date: **7/3/2017**	Analysis Date: **7/6/2017**	SeqNo: **1389537** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	85	10	100.0	0	85.2	41.2	98.9			
4-Chloro-3-methylphenol	170	10	200.0	0	84.8	29.1	111			
2-Chlorophenol	150	10	200.0	0	77.3	23.3	108			
1,4-Dichlorobenzene	63	10	100.0	0	62.6	29.4	84.5			
2,4-Dinitrotoluene	75	10	100.0	0	74.7	36.6	88.7			
N-Nitrosodi-n-propylamine	90	10	100.0	0	89.5	46.9	106			
4-Nitrophenol	99	10	200.0	0	49.4	15	74.7			
Pentachlorophenol	140	20	200.0	0	68.0	28.1	85.4			
Phenol	100	10	200.0	0	50.4	15	78.2			
Pyrene	97	10	100.0	0	97.0	44.4	96.8			S
1,2,4-Trichlorobenzene	75	10	100.0	0	74.9	34.3	89			
Surr: 2-Fluorophenol	120		200.0		58.5	15	98.1			
Surr: Phenol-d5	110		200.0		52.8	15	80.7			
Surr: 2,4,6-Tribromophenol	160		200.0		80.4	15	112			
Surr: Nitrobenzene-d5	95		100.0		94.6	27.2	90.7			S
Surr: 2-Fluorobiphenyl	86		100.0		85.6	23.3	85.6			
Surr: 4-Terphenyl-d14	68		100.0		68.0	27.6	107			

Sample ID **LCSD-32619**	SampType: **LCSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS02**	Batch ID: **32619**	RunNo: **44051**
Prep Date: **7/3/2017**	Analysis Date: **7/6/2017**	SeqNo: **1389538** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	69	10	100.0	0	68.6	41.2	98.9	21.6	37.4	
4-Chloro-3-methylphenol	140	10	200.0	0	70.4	29.1	111	18.5	26.8	
2-Chlorophenol	140	10	200.0	0	69.0	23.3	108	11.4	30.3	
1,4-Dichlorobenzene	58	10	100.0	0	57.6	29.4	84.5	8.32	32	
2,4-Dinitrotoluene	63	10	100.0	0	63.1	36.6	88.7	16.7	36.7	
N-Nitrosodi-n-propylamine	75	10	100.0	0	74.9	46.9	106	17.7	29.9	
4-Nitrophenol	88	10	200.0	0	43.9	15	74.7	11.7	28.8	
Pentachlorophenol	110	20	200.0	0	54.7	28.1	85.4	21.6	38.2	
Phenol	89	10	200.0	0	44.7	15	78.2	12.0	39.8	
Pyrene	89	10	100.0	0	89.2	44.4	96.8	8.42	28.3	
1,2,4-Trichlorobenzene	69	10	100.0	0	69.3	34.3	89	7.71	39.8	
Surr: 2-Fluorophenol	110		200.0		54.0	15	98.1	0	0	
Surr: Phenol-d5	96		200.0		48.0	15	80.7	0	0	
Surr: 2,4,6-Tribromophenol	140		200.0		71.3	15	112	0	0	
Surr: Nitrobenzene-d5	84		100.0		83.9	27.2	90.7	0	0	
Surr: 2-Fluorobiphenyl	74		100.0		74.3	23.3	85.6	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G62**
03-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2 and Boundary Wells

Sample ID	**LCSD-32619**	SampType:	**LCSD**	TestCode:	**EPA Method 8270C: Semivolatiles**
Client ID:	**LCSS02**	Batch ID:	**32619**	RunNo:	**44051**
Prep Date:	**7/3/2017**	Analysis Date:	**7/6/2017**	SeqNo:	**1389538** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	60		100.0		60.5	27.6	107	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **Western Refining Gallup** Work Order Number: **1706G62** RcptNo: **1**

Received By: **Richie Eriacho** **6/30/2017 10:30:00 AM**

Completed By: **Ashley Gallegos** **6/30/2017 4:02:10 PM**

Reviewed By: 6 7/3/17

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 ☑ aj
9. Was preservative added to bottles? Yes ☑ ~~No~~ ☑ aj 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: 17 6 (<2 or >12 unless noted)
Adjusted? yes
Checked by: aj

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: For metals analysis: added 1mL HNO3 to ~0.05E for acceptable pH. Held 24 hours prior to analysis.
18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.2	Good	Not Present			

7/3@1032
aj

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.2°C

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. 1706G62	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL AND DISSOLVED)	GENERAL CHEMISTRY	CYANIDE	MAJOR CATIONS / ANIONS	Air Bubbles (Y or N)
6/28/17	1110	WATER	OW-60	40 ML VOA-5	HCL	-001			✓							✓						
				250 ML AMBER-1	NEAT				✓													
				1 LITER AMBER-1	NEAT												✓					
				125 ML PLASTIC-1	HNO_3													✓			✓	
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓		✓	
				500 ML PLASTIC-1	NEAT														✓		✓	
				500 ML PLASTIC-1	NaOH															✓		

Date	Time	Relinquished by	Received by	Date	Time
6/29/17	8:00			6/29/17	8:00
6-29-17	11:00			6/30/17	1030

Remarks:

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.

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL-JOHNSON@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.2°C

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. 1706G62	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL AND DISSOLVED)	GENERAL CHEMISTRY	CYANIDE		Air Bubbles (Y or N)
6/28/17	—	WATER	GW DUP01	40 ML VOA-5	HCL	-002			✓							✓						
				250 ML AMBER-1	NEAT				✓													
				1 LITER AMBER-1	NEAT												✓					
				125 ML PLASTIC-1	HNO_3													✓				
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓			
				500 ML PLASTIC-1	NEAT														✓			
				500 ML PLASTIC-1	NAOH															✓		

Date	Time	Relinquished by:	Received by:	Date	Time
6/29/17	8:00			6-29-17	8:00
6-29-17	11:00			6/30/17	1030

Remarks:

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.

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.2

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. 1701G62	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL AND DISSOLVED)	GENERAL CHEMISTRY	CYANIDE		Air Bubbles (Y or N)
6/28/17	1030	WATER	BW-4B	40 ML VOA-5	HCL	-003			✓							✓						
				250 ML AMBER-1	NEAT				✓													
				1 LITER AMBER-1	NEAT												✓					
				~~125 ML~~ PLASTIC-1	~~HNO3~~													X				
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓			
				500 ML PLASTIC-1	NEAT														✓			
↓	↓	↓	↓	500 ML PLASTIC-1	NAOH															✓		

Date	Time	Relinquished by	Received by	Date	Time
6/29/17	8:00			6/29/17	8:00
6/29/17	11:00			6/30/17	1030

Remarks:

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.

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.2°C

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.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL AND DISSOLVED)	GENERAL CHEMISTRY	CYANIDE		Air Bubbles (Y or N)
6/28/17	0910	WATER	BW-[illegible]5C	40 ML VOA-5	HCL	1706G62-004			✓							✓						
				250 ML AMBER-1	NEAT				✓													
				1 LITER AMBER-1	NEAT												✓					
				125 ML PLASTIC-1	HNO_3													✓				
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓			
				500 ML PLASTIC-1	NEAT														✓			
				500 ML PLASTIC-1	NAOH															✓		

Date	Time	Relinquished by:	Received by:	Date	Time
6/29/17	8:00	[signature]	[signature]	6-29-17	8:00
6-29-17	11:00	[signature]	[signature]	6/30/17	1030

Remarks:

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.

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.2°C

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.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL AND DISSOLVED)	GENERAL CHEMISTRY	CYANIDE		Air Bubbles (Y or N)
6/29/17	0940	WATER	BW-5B	40 ML VOA-5	HCL	1706G62-005			✓							✓						
				250 ML AMBER-1	NEAT				✓													
				1 LITER AMBER-1	NEAT												✓					
				125 ML PLASTIC-1	HNO_3													✓				
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓			
				500 ML PLASTIC-1	NEAT														✓			
				500 ML PLASTIC-1	NAOH															✓		
↓	↓																					
6/28/17	—	WATER	TRIP BLANK	40 ML VOA-3	HCL	1706G62-006										✓						

Date: 6/29/17 Time: 8:00 Relinquished by: [signature]
Received by: [signature] Date: 6-29-17 Time: 8:00

Date: 6-29-17 Time: 11:00 Relinquished by: [signature]
Received by: [signature] Date: 6/30/17 Time: 1030

Remarks:

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.

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: SMW-2 AND BOUNDARY WELLS
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2-2°C

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. 1706662	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL AND DISSOLVED)	GENERAL CHEMISTRY	CYANIDE	MAJOR CATIONS / ANIONS	Air Bubbles (Y or N)
6/28/17	1240	WATER	OW-59	40 ML VOA-5	HCL	-005			✓							✓						
				250 ML AMBER-1	NEAT				✓													
				1 LITER AMBER-1	NEAT												✓					
				125 ML PLASTIC-1	HNO_3													✓			✓	
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓		✓	
				500 ML PLASTIC-1	NEAT														✓		✓	
↓	↓	↓	↓	500 ML PLASTIC-1	NAOH															✓		
6/28/17	—	WATER	TRIP BLANK	40 ML VOA-3	HCL	-008										✓						

Date	Time	Relinquished by	Received by	Date	Time
6/29/17	8:00			6-29-17	8:00
6/29/17	11:00			6/30/17	1030

Remarks:

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.

WESTERN REFINING SOUTHWEST, INC.

GALLUP REFINERY - GALLUP, NEW MEXICO

SMW-2 AND BOUNDARY WELLS - JUNE 2016

METALS AND CYANIDE ANALYSES FOR GROUNDWATER SAMPLES

AND WATER QA/QC SAMPLES

TOTAL METALS ANALYSIS AND DISSOLVED METALS ANALYSIS

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

GENERAL CHEMISTRY PARAMETERS FOR GROUNDWATER SAMPLES
AND WATER QA/QC SAMPLES

Analyte	Analytical Method
Chloride	EPA method 300.0
Fluoride	EPA method 300.0
Sulfate	EPA method 300.0

Appendix F

SMW-2 Area – Analytical Reports

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

August 01, 2017

Cheryl Johnson

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-0231
FAX

RE: SMW 2 OrderNo.: 1706G37

Dear Cheryl Johnson:

Hall Environmental Analysis Laboratory received 4 sample(s) on 6/30/2017 for the analyses presented in the following report.

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

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

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

Sincerely,



Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1706G37**
Date Reported: **8/1/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: SMW-2
Project: SMW 2
Collection Date: 6/28/2017 1:10:00 PM
Lab ID: 1706G37-001
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	ND	0.22	0.50		mg/L	5	7/3/2017 8:26:31 PM	R43998
Chloride	2600	120	250		mg/L	500	7/21/2017 4:18:01 PM	R44455
Bromide	2.8	0.073	0.50		mg/L	5	7/3/2017 8:26:31 PM	R43998
Phosphorus, Orthophosphate (As P)	ND	5.0	10	H	mg/L	20	7/19/2017 6:05:29 PM	R44381
Sulfate	1500	4.8	25		mg/L	50	7/19/2017 6:17:53 PM	R44381
Nitrate+Nitrite as N	ND	0.26	2.0		mg/L	10	7/19/2017 8:22:00 PM	A44381
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Calcium	300	1.6	20		mg/L	20	7/12/2017 8:09:43 PM	C44171
Magnesium	90	0.25	1.0		mg/L	1	7/12/2017 8:07:46 PM	C44171
Potassium	0.75	0.11	1.0	J	mg/L	1	7/12/2017 8:07:46 PM	C44171
Sodium	2300	8.2	50		mg/L	50	7/13/2017 5:56:50 PM	B44206

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: SMW-4
Project: SMW 2
Collection Date: 6/28/2017 2:25:00 PM
Lab ID: 1706G37-002
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	1.1	0.22	0.50		mg/L	5	7/3/2017 8:51:20 PM	R43998
Chloride	63	1.2	2.5		mg/L	5	7/3/2017 8:51:20 PM	R43998
Bromide	0.26	0.073	0.50	J	mg/L	5	7/3/2017 8:51:20 PM	R43998
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/19/2017 6:30:17 PM	R44381
Sulfate	180	0.48	2.5		mg/L	5	7/3/2017 8:51:20 PM	R43998
Nitrate+Nitrite as N	0.21	0.13	1.0	J	mg/L	5	7/3/2017 10:55:27 PM	R43998
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Calcium	4.5	0.078	1.0		mg/L	1	7/12/2017 8:11:40 PM	C44171
Magnesium	1.2	0.25	1.0		mg/L	1	7/12/2017 8:11:40 PM	C44171
Potassium	0.52	0.11	1.0	J	mg/L	1	7/12/2017 8:11:40 PM	C44171
Sodium	310	3.3	20		mg/L	20	7/12/2017 8:13:39 PM	C44171

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: Evaporation Pond #2
Project: SMW 2
Collection Date: 6/28/2017 2:45:00 PM
Lab ID: 1706G37-003
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	18	0.44	1.0	*	mg/L	10	7/3/2017 9:16:10 PM	R43998
Chloride	5000	120	250		mg/L	500	7/19/2017 7:19:55 PM	A44381
Bromide	1.9	0.15	1.0		mg/L	10	7/3/2017 9:16:10 PM	R43998
Phosphorus, Orthophosphate (As P)	ND	2.5	5.0	H	mg/L	10	7/19/2017 7:07:31 PM	A44381
Sulfate	1400	9.6	50		mg/L	100	7/3/2017 9:28:34 PM	R43998
Nitrate+Nitrite as N	1.1	0.52	4.0	J	mg/L	20	7/19/2017 8:34:25 PM	A44381
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Calcium	410	1.6	20		mg/L	20	7/12/2017 8:23:47 PM	C44171
Magnesium	100	5.0	20		mg/L	20	7/12/2017 8:23:47 PM	C44171
Potassium	140	2.3	20		mg/L	20	7/12/2017 8:23:47 PM	C44171
Sodium	3100	8.2	50		mg/L	50	7/13/2017 5:58:45 PM	B44206

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: Evaporation Pond #3
Project: SMW 2
Collection Date: 6/28/2017 3:05:00 PM
Lab ID: 1706G37-004
Matrix: AQUEOUS
Received Date: 6/30/2017 10:30:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Fluoride	16	0.44	1.0	*	mg/L	10	7/3/2017 9:41:00 PM	R43998
Chloride	7100	120	250		mg/L	500	7/19/2017 7:44:45 PM	A44381
Bromide	2.3	0.15	1.0		mg/L	10	7/3/2017 9:41:00 PM	R43998
Phosphorus, Orthophosphate (As P)	ND	2.5	5.0	H	mg/L	10	7/19/2017 7:32:20 PM	A44381
Sulfate	1800	9.6	50		mg/L	100	7/3/2017 9:53:25 PM	R43998
Nitrate+Nitrite as N	1.1	0.52	4.0	J	mg/L	20	7/19/2017 8:46:49 PM	A44381
EPA METHOD 200.7: DISSOLVED METALS							Analyst: **pmf**	
Calcium	540	1.6	20		mg/L	20	7/12/2017 8:27:42 PM	C44171
Magnesium	150	5.0	20		mg/L	20	7/12/2017 8:27:42 PM	C44171
Potassium	230	2.3	20		mg/L	20	7/12/2017 8:27:42 PM	C44171
Sodium	4300	8.2	50		mg/L	50	7/13/2017 6:00:52 PM	B44206

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G37**

01-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2

Sample ID	**MB-C**	SampType:	**MBLK**	TestCode:	**EPA Method 200.7: Dissolved Metals**					
Client ID:	**PBW**	Batch ID:	**C44171**	RunNo:	**44171**					
Prep Date:		Analysis Date:	**7/12/2017**	SeqNo:	**1394698**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID	**LCSLL-C**	SampType:	**LCSLL**	TestCode:	**EPA Method 200.7: Dissolved Metals**					
Client ID:	**BatchQC**	Batch ID:	**C44171**	RunNo:	**44171**					
Prep Date:		Analysis Date:	**7/12/2017**	SeqNo:	**1394700**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.59	1.0	0.5000	0	119	50	150			J
Magnesium	0.53	1.0	0.5000	0	106	50	150			J
Potassium	0.50	1.0	0.5000	0	99.3	50	150			J
Sodium	0.51	1.0	0.5000	0	101	50	150			J

Sample ID	**LCS-C**	SampType:	**LCS**	TestCode:	**EPA Method 200.7: Dissolved Metals**					
Client ID:	**LCSW**	Batch ID:	**C44171**	RunNo:	**44171**					
Prep Date:		Analysis Date:	**7/12/2017**	SeqNo:	**1394702**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	52	1.0	50.00	0	103	85	115			
Magnesium	52	1.0	50.00	0	104	85	115			
Potassium	50	1.0	50.00	0	100	85	115			
Sodium	51	1.0	50.00	0	102	85	115			

Sample ID	**MB-B**	SampType:	**MBLK**	TestCode:	**EPA Method 200.7: Dissolved Metals**					
Client ID:	**PBW**	Batch ID:	**B44206**	RunNo:	**44206**					
Prep Date:		Analysis Date:	**7/13/2017**	SeqNo:	**1395435**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0								

Sample ID	**LCSLL-B**	SampType:	**LCSLL**	TestCode:	**EPA Method 200.7: Dissolved Metals**					
Client ID:	**BatchQC**	Batch ID:	**B44206**	RunNo:	**44206**					
Prep Date:		Analysis Date:	**7/13/2017**	SeqNo:	**1395438**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	0.54	1.0	0.5000	0	109	50	150			J

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G37**
01-Aug-17

Client: Western Refining Southwest, Gallup
Project: SMW 2

Sample ID	**LCS-B**	SampType: **LCS**		TestCode: **EPA Method 200.7: Dissolved Metals**						
Client ID:	**LCSW**	Batch ID: **B44206**		RunNo: **44206**						
Prep Date:		Analysis Date: **7/13/2017**		SeqNo: **1395441**		Units: **mg/L**				
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium		50	1.0	50.00	0	101	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G37**

01-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R43998**	RunNo: **43998**
Prep Date:	Analysis Date: **7/3/2017**	SeqNo: **1387038** 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								
Bromide	ND	0.10								
Sulfate	0.13	0.50								J
Nitrate+Nitrite as N	ND	0.20								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R43998**	RunNo: **43998**
Prep Date:	Analysis Date: **7/3/2017**	SeqNo: **1387039** 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	95.7	90	110			
Chloride	4.8	0.50	5.000	0	95.8	90	110			
Bromide	2.4	0.10	2.500	0	94.6	90	110			
Sulfate	9.7	0.50	10.00	0	96.6	90	110			
Nitrate+Nitrite as N	3.4	0.20	3.500	0	98.2	90	110			

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402926** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Orthophosphate (As P	0.30	0.50								J
Sulfate	0.15	0.50								J

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402927** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Orthophosphate (As P	4.6	0.50	5.000	0	92.7	90	110			
Sulfate	9.4	0.50	10.00	0	93.7	90	110			

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **A44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402953** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Phosphorus, Orthophosphate (As P	0.32	0.50								J

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706G37**

01-Aug-17

Client: Western Refining Southwest, Gallup

Project: SMW 2

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **A44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402953** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	ND	0.20								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **A44381**	RunNo: **44381**
Prep Date:	Analysis Date: **7/19/2017**	SeqNo: **1402954** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.8	0.50	5.000	0	95.2	90	110			
Phosphorus, Orthophosphate (As P	4.8	0.50	5.000	0	96.4	90	110			
Nitrate+Nitrite as N	3.4	0.20	3.500	0	97.9	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R44455**	RunNo: **44455**
Prep Date:	Analysis Date: **7/21/2017**	SeqNo: **1405140** Units: **mg/L**

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

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R44455**	RunNo: **44455**
Prep Date:	Analysis Date: **7/21/2017**	SeqNo: **1405141** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	94.1	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **Western Refining Gallup** Work Order Number: **1706G37** RcptNo: **1**

Received By: **Richie Eriacho** **6/30/2017 10:30:00 AM**

Completed By: **Ashley Gallegos** **6/30/2017 1:43:58 PM**

Reviewed By: 6 7/3/17

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 ☐	# of preserved bottles checked for pH: 8 (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted? 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 ☐	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	2.2	Good	Yes			

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0231
email or Fax#: CHERYL.JOHNSON@WNR.COM
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: SMW-2
Project #:
Project Manager: CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.2°C

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. 1706G37	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F^-,Cl^-,NO_3^-,NO_2^-,PO_4^{3-},SO_4^{2-})	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Major Cations/Anions				Air Bubbles (Y or N)
6/28/17	1310	WATER	SMW-2	125 mL Plastic-1	HNO_3	-001												✓				
				125 mL Plastic-1	H_2SO_4													✓				
				500 mL Plastic-1	NEAT													✓				
	1425	WATER	SMW-4	125 mL Plastic-1	HNO_3	-002												✓				
				125 mL Plastic-1	H_2SO_4													✓				
				500 mL Plastic-1	NEAT													✓				
	1445	WATER	EVAPORATION POND #2	Plastic-1 125 mL	HNO_3	-003												✓				
				125 mL Plastic-1	H_2SO_4													✓				
				500 mL Plastic-1	NEAT													✓				
	1505	WATER	EVAPORATION POND #3	125 mL Plastic-1	HNO_3	-004												✓				
				125 mL Plastic-1	H_2SO_4													✓				
				500 mL Plastic-1	NEAT													✓				

Date:	Time:	Relinquished by:	Received by:	Date	Time
6/29/17	8:00			6-29-17	8:00
6-29-17	11:00			6/30/17	1030

Remarks:

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.