

AP - 111

**N DRAINAGE
DITCH (3)**

2019



**Marathon
Petroleum Company LP**

September 20, 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
Investigation Work Plan North Drainage Ditch Area
Marathon Petroleum Company LP, Gallup Refinery
(dba Western Refining Southwest, Inc.)
EPA ID# NMD000333211
HWB-WRG-19-009**

Dear Mr. Kieling:

Marathon Petroleum Company LP (dba Western Refining Southwest, Inc.) Gallup Refinery is submitting the enclosed responses to your comments dated June 24, 2019 on the referenced Work Plan. The 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

A handwritten signature in blue ink that reads 'Robert S. Hanks'.

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

June 24, 2019 Disapproval – Investigation Work Plan North Drainage Ditch Area (April 2019)

NMED Comment 1:

NMED's Disapproval Investigation Report North Drainage Ditch and OW-29 & OW-30 Areas (Report) Comment 28 stated, "[i]t does not appear that the location of the [six] temporary wells [along the landing strip] as depicted in Figure 25 makes sense based on the information provided in this Report. Explain the basis for the proposed location of temporary wells in the in the work plan proposing the additional work." Work Plan Section 4.1 (Investigation) provides the basis for the proposed temporary well locations: to determine the downgradient extent of groundwater impacts; however, the locations appear to be too far from the vicinity of the North Drainage Ditch. The proposed location must be revised to better accomplish the purpose of the investigation; the temporary wells must be installed within 200 feet downgradient of the North Drainage Ditch and well OW-54 (see also Comment 10). Revise the location of temporary wells in the revised Work Plan accordingly.

MPC Response 1:

The proposed locations are revised to be within 200 feet down-gradient of the North Drainage Ditch and OW-54. See revised Executive Summary, Section 4.1 (page 4-1) and Figure 5.

NMED Comment 2:

In the response to NMED's Disapproval Report Comment 31, the Permittee stated that historic boring logs for borings 01117-B1, 0117-B2, 548, 643, 0649, 651, 652, 0665, 656, 657, MP-4, MP-5, MP-9, B-1, and B-3 that were depicted in several figures in the Report would be provided in this Work Plan. The Permittee did not provide the boring logs. Provide the logs for these borings in the revised Work Plan.

MPC Response 2:

The missing historic borings are included in Appendix B with one exception. NMED references boring #548; however, a boring with this number could not be located and reviewing Figure 10 in the Investigation Report, it appears this should be boring #648. Boring #648 is included in Appendix B.

NMED Comment 3:

In the response to NMED's Disapproval Report Comment 33, the Permittee proposed to submit a work plan to investigate the area between the North Drainage Ditch and the Tank Farm. The Work Plan does not propose this investigation. The Permittee must propose to install a boring and/or a temporary well in the area between the North Drainage Ditch and the Tank Farm. Refer to Comment 14 for the location of the required boring (boring number 4 - within the ditch before the ditch crosses the road).

MPC Response 3:

Comment 14 below requests the installation of a soil boring and collection of soil samples from a boring located within the drainage ditch approximately 400 feet southeast of existing boring NDD-4. Boring NDD-4 was located in the center of the North Drainage Ditch and on the anticipated eastern extent of potential impacts that were observed in surface water further west along the ditch. This location was selected to help determine if contamination had been transported via surface water or was the result of impacted groundwater migrating and discharging to the land surface. Four soil samples were collected from boring NDD-4 (0-0.5', 1.5-2.0', 8-10', and 18-20') and none of these samples indicated the presence

of contamination. In addition, a groundwater sample was collected at NDD-4 and found not to have any individual organic constituents exceeding screening levels and only gasoline range organics detected at a very low concentration of 0.11 mg/l that exceeded the screening level. The soil and groundwater samples collected a short distance to the west had significantly higher concentrations of organic constituents indicating that NDD-4 was clearly up-gradient of the area of greatest impact and that the source was not the result of surface transport of contaminants along the drainage ditch. Based on these results, the purpose of the boring 400 feet away from the area currently under investigation is not apparent in relationship to defining the impacted area associated with the original observation of impacted surface water; however, the requested boring/temporary well has been added to the Work Plan in the Executive Summary, Section 4.1 and Figure 5.

NMED Comment 4:

In Section 2.1 (North Drainage Ditch), the Permittee states, "[i]t appears any flow of surface water beyond this point would flow a short distance to the north along the east side of a dirt road before crossing over the road (pipeline easement) and continuing west to southwest toward the area formerly known as the upper stormwater basin." The upper stormwater basin is former pond EP-10 which is now overlain by the OCD Landfarm. The surface runoff from the North Drainage Ditch that potentially contains contaminants must not be introduced to the OCD Landfarm.

MPC Response 4:

The comment is acknowledged.

NMED Comment 5:

In Section 2.1 (North Drainage Ditch) the Permittee discusses historical soil sampling results with detected concentrations that exceed cleanup levels but does not specify which soil borings or which area of the North Drainage Ditch the exceedances were located. For example, on page 2-3, the Permittee states, "Motor Oil Range Organics (MRO) exceeded the residential soil screening level in one sample near the North Drainage. The sample near the North Drainage Ditch also exceed the non-residential soil screening level for MRO." Provide more specific detail regarding the soil sample locations when discussing sample analytical results. The historic groundwater sample analytical discussion must also be revised to include more specific detail regarding the identity of the wells discussed.

MPC Response 5:

Additional discussion is added in Section 2.1 (pages 2-3 and 2-4), although we note that the *Investigation Report North Drainage Ditch and OW-29 & OW-30 Areas*, which is purposefully referenced, should be consulted when evaluating areas for additional investigation, as it is not practicable to repeat all of the assessment information in the Investigation Work Plan. Summary tables of the referenced soil and groundwater data is included as Table 2 and 3, showing the individual samples that exceed the screening levels.

NMED Comment 6:

In Section 4 (Scope of Services) the Permittee states, "[t]he site investigation of groundwater will be conducted to define the down-gradient extent of observed impacts to groundwater beneath the North Drainage Ditch and in the area up-gradient of the North Drainage Ditch to help identify potential sources. The site investigation of soils will be focused in the area of the North Drainage Ditch where previous sampling did not delineate vertical impacts." While the

focus can be on groundwater in one area and soils in another, data must be collected for both soil and groundwater for each boring or well installed during the investigation. Uncoupling the collection of soil and groundwater data may result in the requirement for additional investigation to collect the data appropriate to demonstrate that the extent of potential contaminants is defined.

MPC Response 6:

The comment is acknowledged.

NMED Comment 7:

Section 4 (Scope of Services) contains an error; it starts with page number 4-3. The page number should start with 4-1. Revise the Work Plan accordingly.

MPC Response 7:

The page numbering in Section 4 is revised.

NMED Comment 8:

In Section 4.1 (Investigation) the Permittee states, "[i]n particular, field screening using a photoionization detector (PIO) during completion of shallow borings completed with a hand auger indicated elevated PID readings in the deepest samples at borings NDD-5, NDD-8, and NDD-9 (Table 4)." In addition to the PID readings, soil analytical results must be examined for the borings that were installed to two feet below the ground surface (bgs). Boring NDD-5 soil chemical analytical results included 270,000 mg/kg diesel range organics (DRO) and 19,000 mg/kg motor oil range organics (ORO) at two feet bgs. Boring NDD-8 soil analytical results included 6800 mg/kg DRO. The DRO and ORO concentrations in the samples collected from boring NDD-9 were below the detection limits although the PID reading was recorded highest at 1,530 parts per million. Decisions of where to install the borings in this phase of investigation must be based on previous analytical results as well as field parameters.

MPC Response 8:

The comment is acknowledged and we note that all of the soil analytical results and PID readings were examined and are discussed in detail in the *Investigation Report North Drainage Ditch and OW-29 & OW-30 Areas*.

NMED Comment 9:

In Section 4.1 (Investigation) the Permittee states, "[a]s discussed below in Section 4.1.3, groundwater samples will be collected from temporary well completions if groundwater is encountered at these locations." Separate phase hydrocarbon (SPH) may potentially be present at the area where temporary wells are completed. Even if only groundwater enters the temporary wells initially, the temporary wells must be left open for at least 48 hours to confirm presence or absence of SPH.

MPC Response 9:

The discussion in Section 4.1.3 included a provision to allow time for SPH to enter the temporary wells, "Temporary wells will be left open for a minimum of two weeks to allow SPH to enter the wells prior to plugging. Based on NMED's, the timeframe is now revised to 48 hours instead of two weeks.

NMED Comment 10:

In Section 4.1 (Investigation) the Permittee states, "[t]o help define the down-gradient extent of impacted groundwater observed at temporary wells completions in borings NDD-6, NDD-11,

NDD-16, and OW-54, six new temporary wells are proposed to the west and northwest of the North Drainage Ditch (Figure 5). Two new permanent monitoring wells are proposed upgradient of the North Drainage Ditch to evaluate potential up-gradient sources." These proposed temporary and permanent wells are not differentiated from proposed soil borings in Figure 5 (Proposed Boring Location Map). Revise the figure to distinguish between the proposed borings, proposed temporary well locations, and proposed permanent well locations. Additionally, the proposed locations to the north and west of the ditch are located along the landing strip which is greater than 300 feet from known impacts. Locations closer to the known contamination will help to better define the area affected by contaminants. See also Comments 1 and 14.

MPC Response 10:

Figure 5 is revised to distinguish between the different sampling locations and also the sampling locations are revised pursuant to Comments 1 and 14.

NMED Comment 11:

In Section 4.1.1 (Soil Sample Field Screening and Logging) the Permittee differentiates between soil sample collection from proposed boring locations and proposed temporary and permanent well locations. The soil sample collection must be the same for all borings installed during the investigation whether they are installed as only soil borings or for the purpose of groundwater monitoring. Revise the Work Plan to remove the separate proposed sampling protocol.

MPC Response 11:

The discussion in Section 4.1.1 (page 4-3) is revised to have one common set of requirements for collection of soil samples at all boring/well locations.

NMED Comment 12:

In Section 4.1.7 (Chemical Analyses) the Permittee proposes that groundwater and soil samples will be analyzed using SW-846 Method 8260 for VOCs and SW-846 Method 8270 for SVOCs. Since the Permittee conducted an investigation in the area previously and knows which specific compounds are constituents of concern the Permittee may narrow the scope of the analytical sampling to specific compounds that were present above the detection limit based on the analytical results presented in the Report.

MPC Response 12:

We are retaining the requirement to analyze for VOCs by Method 8260 and SVOCs by Method 8270 as this is necessary to capture all of the subject constituents of concern, but we acknowledge the comment and will take this into consideration during report preparation as to which constituents are included in the data summary tables.

NMED Comment 13:

Provide a figure that shows the locations of newly installed wells OW-62 and OW-63 and provide the logs associated with those wells in the revised Work Plan. Include other relevant data from borings or wells installed within the tank farm as well.

MPC Response 13:

Wells OW-62 and OW-63 have been added to Figure 2 and the well logs are included in Appendix B, which is retitled to Boring/Well Completion Logs.

NMED Comment 14:

Based on NMED's review of the Report, the Permittee must examine the following areas as part of this next phase of investigation. Propose to install borings and collect soil samples at the following locations (see Attachment 1 for a figure depicting the approximate locations):

1. Between boring NDD-8 and NDD-11 and south of the drainage ditch [it appears that the soil contamination (other than manganese and cobalt) does not reach as far as the line of borings NDD-10/-11/-12 and it appears that the contaminants are located primarily on the south side of the ditch];
2. South of NDD-9 along the south side of the ditch;
3. On the south side of the ditch near NDD-6A; and
4. Within the ditch before it crosses the road.

MPC Response 14:

The discussion in the Executive Summary, Section 4.1 (page 4-1) and Figure 5 is revised to include additional sampling at the following locations:

1. Between borings NDD-8 and NDD-11 on the south side of the drainage ditch;
2. South of NDD-9 along the south side of the drainage ditch;
3. On the south side of the ditch near NDD-6A; and
4. Within the drainage ditch, approximately 400 feet to the southeast, before the ditch crosses beneath the dirt road.

NMED Comment 15:

Figure 2 (Investigation Area), depicts the location of pipelines that carry crude oil. However, the destination of these pipelines is incomplete, indicating the pipelines terminate in middle of the field. Revise the figure to indicate the destination of these pipelines or provide an explanation for where they are connected.

MPC Response 15:

Section 3.1 (page 3-1) and Figure 2 are revised. On site, the crude oil delivery pipelines terminate just east of the wastewater treatment plant and the pipelines extend to the north and east beyond the boundaries of Figure 2.

Investigation Work Plan North Drainage Ditch Area



**Marathon
Petroleum Company LP**

**Gallup Refinery
Marathon Petroleum Company
Gallup, New Mexico**

EPA ID# NMD000333211

APRIL 2019

(Revised September 2019)

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Appendix B Boring/Well Completion Logs

Appendix C Tank Content and Inspection Records

Appendix D Investigation Derived Waste Management Plan

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 on the north side of the refinery identified as the North Drainage Ditch.

Surface water samples and a groundwater sample collected in 2015 from a temporary well completion near the North Drainage Ditch demonstrated the presence of constituents of concern (e.g., benzene, toluene, ethylbenzene, xylenes (BTEX), methyl tert butyl ether (MTBE), and total petroleum hydrocarbons (TPH). An investigation of this area was subsequently conducted in 2016 through the collection of soil and groundwater samples along and beneath the North Drainage Ditch. The analyses of the samples further confirmed the petroleum hydrocarbon impacts in the area and the possibility that contaminated groundwater migrating to the location of the ditch is the primary source of the observed impacts.

The purpose of this investigation is to; (1) further characterize impacts to soils observed in and near the ditch, (2) characterize the area up-gradient of the ditch to help identify potential sources of the observed groundwater impacts, and (3) determine the down-gradient extent of groundwater impacts. The investigation activities proposed in this work plan include sampling of soils at six soil boring locations along the North Drainage Ditch with groundwater samples to be collected at temporary well completions if groundwater is encountered in the soil borings. Five temporary wells are proposed down-gradient of the North Drainage Ditch and two up-gradient permanent monitoring wells are also proposed.

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 is a crude oil refinery currently owned and operated by Marathon Petroleum Company, LP (dba Western Refining Southwest, Inc.). 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.

This investigation work plan addresses the area to the north and northwest of the refinery tank farm, identified herein as the North Drainage Ditch (Figure 2). The general purpose of the site investigation is to determine and evaluate the presence, nature, and extent of releases of contaminants in accordance with 20.4.1.500 New Mexico Administrative Code (NMAC) incorporating 40 Code of Federal Regulations (CFR) Section 264.101. The investigation activities will be conducted in accordance with Section IV.H.5 of the Post-Closure Care Permit and will focus on further characterization of impacts to soils and groundwater in the area of the North Drainage Ditch.

Section 2 Background

This section presents background information for the North Drainage Ditch, including a review of historical waste management activities for each location to identify 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 North Drainage Ditch

The area designated as the North Drainage Ditch is actually part of a larger drainage feature that begins on the north side of the tank farm, extends north approximately 200 feet west of Solid Waste Management Unit (SWMU) 9 – Drainage Ditch and Inactive Landfarm, and passes beneath a dirt road, where it bifurcates (Figures 2 and 4). One lesser segment extends to the northeast and the other turns to the west, where it extends westward for approximately 400 feet and then turns northwest through the area that is the focus of the investigation. There is an area along the ditch that is lower in elevation than the sections to the east or west and has the potential for standing water to be present at least during a portion of the year. At the western end of the North Drainage Ditch, as shown on Figures 2 and 4, the ditch basically ends and there is no clearly defined channel beyond this point. It appears any flow of surface water beyond this point would flow a short distance to the north along the east side of a dirt road before crossing over the road (pipeline easement) and continuing west to southwest toward the area formerly known as the upper stormwater basin. There is no record of waste or other contaminants being handled in the proposed area of investigation, nor is there a record of site operations in this area.

It appears this area was initially discovered as potentially being impacted by hydrocarbons in October 2009. During a routine inspection of site drainage features, a ditch was discovered to have “non-moving water” with possible hydrocarbon staining and an odor similar to diesel. A C-141 Form was submitted to the New Mexico Oil Conservation Division (NMOCD) and NMED on October 20, 2009 and a copy is included with the associated laboratory analysis in Appendix A. The potentially affected portion of the ditch was estimated to be 40 feet long with water depths of a few inches and up to

one foot in width. Subsequently, three soil and three water samples were collected and analyzed. The water samples were analyzed for TPH by method 418.1 and the soil samples were analyzed for semi-volatile organic compounds (SVOCs) by methods 8270, metals using the toxicity characteristic leaching procedure (TCLP) and TPH by method 418.1. The water samples indicated the presence of TPH using the 418.1 method (Table 1), but the soil results were mostly non-detect. Only soil sample DITCH-SS1 had reported concentrations of 2-methylnaphthalene at 1.1 mg/kg, naphthalene at 1.3 mg/kg, and TPH at 22 mg/kg. For comparison, the NMED 2014 screening level for naphthalene is 49.7 mg/kg residential soil and 0.0823 mg/kg for the soil-to-groundwater pathway assuming a dilution attenuation factor (DAF) 20. The TPH screening level for unknown oil is 1,000 mg/kg. NMED does not have a screen level for 2-methylnaphthalene, but the EPA Region VI screening level is 240 mg/kg residential soil and 0.19 mg/kg for protection of groundwater. Based on the fact that the water appeared to be ephemeral in nature and there were very few detections of only low concentrations of chemical constituents no further action was taken. The laboratory report is provided in Appendix A.

Water was observed in the ditch again in 2015 with potential hydrocarbon impacts and notification was provided to the NMED and NMOCD on April 22, 2015. Three surface water samples were collected from locations A-1, B-1, and C-1 on March 19, 2015 (Figure 3). The water samples were analyzed for BTEX, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, MTBE, TPH, and RCRA metals. The results are summarized in Table 1 and the laboratory report is provided in Appendix A. Benzene, xylenes, MTBE, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, arsenic, and barium were detected at concentrations above screening levels (NMED, 2019).

After the standing water in the ditch was removed with a vacuum truck, an additional water sample was collected from the ditch on April 23, 2015 and analyzed for VOCs (sample ID North Drainage Ditch). The detected results are summarized in Table 1 and the laboratory report is provided in Appendix A. Benzene, xylenes, 1,2,4-trimethylbenzene, and naphthalene were detected at concentrations above screening levels.

Based on the detections in the surface water samples collected in March 2015, three soil borings (NDD-1, NDD-2, and NDD-3) were completed in the area on May 11, 2015. Borings NDD-1 and NDD-2 were drilled into the bedrock but did not encounter saturation. Boring NDD-3 did encounter saturation and a groundwater sample was collected from a temporary well completion on May 14, 2015 and analyzed for VOCs, SVOCs, and TPH. The boring logs are included in Appendix B. The

detected compounds are summarized in Table 1 and the laboratory report is included in Appendix A. MTBE and 1,2-dichloroethane were detected at concentrations above screening levels.

A much larger investigation of the area was conducted in 2016 with the results summarized in the *Investigation Report North Drainage Ditch and OW-29 & OW-30 Area* (DiSorbo, 2019). The activities completed include sampling and analysis of soils and groundwater along the North Drainage Ditch, as well as to the east in the OW-29 & OW-30 Area. The following discussion focuses on the work completed near the North Drainage Ditch. This included the completion of 14 soil borings with 35 soil samples (excluding additional quality assurance samples) collected for analysis of potential site-related constituents (e.g., VOCs, SVOCs, TPH, and metals). The soil results are summarized in Table 2 and the groundwater results are presented in Table 3.

Manganese was detected in soils at concentrations above the non-residential (i.e., construction worker) soil screening level in 16 samples [NDD-6 (0-0.5') – (soil boring NDD-6A), NDD-6 (4-6'), NDD-6 (10-12'), NDD-7 (1.5-2'), NDD-8 (0-0.5'), NDD-11 (0.0-0.5'), NDD-11 (1.5-2'), NDD-11 (12-14'), NDD-12 (1.5-2'), NDD-14 (1.5-2'), NDD-15 (0-0.5'), NDD-15 (1.5-2'), NDD-16 (0-0.5'), NDD-16 (1.5-2'), NDD-16 (14-16'), and NDD-16 (22-24')] ; however, none of these exceeded the higher residential screening level. The analyses of soils for TPH indicated concentrations above screening levels in several samples. Gasoline Range Organics (GRO) exceeded the residential screening level in one sample [NDD-8 (1.5-2')]. Diesel Range Organics (DRO) was found to exceed the residential screening level in five soil samples [NDD-5 (1.5-2'), NDD-6 (1.5-2')-(soil boring NDD-6A), NDD-6 (4-6'), NDD-8 (1.5-2'), and NDD-9 (1.5-2')], with four of those [NDD-5 (1.5-2'), NDD-6 (1.5-2'), NDD-6 (4-6'), and NDD-8 (1.5-2')] also exceeding the non-residential soil screening level. Motor Oil Range Organics (MRO) exceeded the residential soil screening level in one sample [NDD-5 (1.5-2')] near the North Drainage. The sample near the North Drainage Ditch also exceed the non-residential soil screening level for MRO.

Temporary well completions were installed in 4 boreholes (NDD-4, NDD-6, NDD-11, and NDD-16) where saturation was encountered. A new permanent monitoring well (OW-56) was installed near the same location where temporary well NDD-3 was previously located. Five groundwater samples (excluding additional quality assurance samples) were collected for analysis of potential site-related constituents (e.g., VOCs, SVOCs, TPH, metals, and inorganic/general water quality parameters).

There were numerous metals in the totals analyses (arsenic, barium, beryllium, chromium, cobalt, iron, lead, manganese, nickel, and vanadium) and chloride detected at concentrations above

residential/tap water screening levels in groundwater samples collected from the temporary well completions and permanent well completion (Table 3). At least one of these exceedances of screening levels for inorganic constituents occurred in every groundwater sample analyzed. Arsenic, barium, cobalt, iron, manganese, and nickel were detected at concentrations above screening levels in the dissolved analyses. At least one dissolved metals analysis exceedance occurred in every groundwater sample collected except NDD-4-GW.

Ten organic constituents (1-methylnaphthalene, 2-methylnaphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,2-dichloroethane, benzene, ethylbenzene, MTBE, naphthalene, and xylenes) were detected at concentrations above screening levels in at least one of the groundwater samples collected from the temporary well completions and OW-56 (Table 3). TPH as GRO was detected above the screening level in all five groundwater samples and diesel range organics (DRO) was detected at concentrations above the screening level in three of the five groundwater samples.

Section 3

Site Conditions

3.1 Surface Conditions

A topographic map of the area near the North Drainage Ditch is included as Figure 4. Local site topographic features include high ground in the southeast gradually decreasing to a lowland fluvial plain the northwest. Elevations on the refinery property range from 7,040 feet to 6,860 feet. The area of the site near the North Drainage Ditch is at an approximate elevation of 6,920 feet above mean sea level (msl). The drainage feature identified herein as the North Drainage Ditch is shown as a clearly defined drainage feature throughout most of the area, but loses this characteristic to the west. It may have previously extended to the west before a pipeline was constructed through this area many years ago (Figure 2). Crude oil delivery pipelines enter the refinery property from the north and east and terminate on the east side of the wastewater treatment plan.

The soils in the vicinity of the North Drainage Ditch include two soil types. Surface soils within most of the area of investigation are primarily Rehobeth silty clay loam. To the north are the bordering Simitarq-Celavar sandy loams. 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). The Simitarq-Celavar soils are well drained with a conservative permeability of 0.20 inches/hour and minimal salinity. Simitarq soils have nearly neutral pH values ranging from 7.2 to 7.4 standard units.

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 tributaries of the Puerco River. The Puerco River flows 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 ft²/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.

Section 4

Scope of Services

The site investigation of groundwater will be conducted to define the down-gradient extent of observed impacts to groundwater beneath the North Drainage Ditch and in the area up-gradient of the North Drainage Ditch to help identify potential sources. The site investigation of soils will be focused in the area of the North Drainage Ditch where previous sampling did not delineate vertical impacts, but will also be completed at all soil borings. The investigation will commence upon approval of this Investigation Work Plan by NMED.

4.1 Investigation

An investigation of soils from within the North Drainage Ditch will be conducted to delineate vertical impacts to soils that were recently identified during a site investigation in 2016. In particular, field screening using a photoionization detector (PID) during completion of shallow borings completed with a hand auger indicated elevated PID readings in the deepest samples at borings NDD-5, NDD-8, and NDD-9 (Table 4). To address this and the results of chemical analyses indicating impacts, two new soil borings will be completed using the hollow-stem auger (HSA) method. One boring will be located near the location of boring NDD-5 and the second as close as possible to the location of NDD-8 (Figure 5). It is anticipated that the borings can be completed within or immediately adjacent to the narrow channel that passes through these locations. To provide additional delineation of soil impacts, soil borings will also be completed at the following locations:

- Between boring NDD-8 and NDD-11 and south of the drainage ditch;
- South of NDD-9 along the south side of the ditch; and
- On the south side of the ditch near NDD-6A (Figure 5).

One soil boring will be located within the drainage ditch approximately 400 feet southeast of NDD-4 (Figure 5). If rig access is limited, then NMED will be contacted to discuss any necessary field adjustments to the boring locations.

The borings, with the exception of the boring located southeast of NDD-4, will be drilled to the top of bedrock to fully define the vertical extent of impacts and the subsurface geology beneath the drainage ditch. The boring southeast of NDD-4 will be drilled to a minimum depth of 10 feet and will

be drilled deeper if there are any indications of impacts at 10 feet based on field screening as explained below in Section 4.1.1. As necessary, the boring will be extended vertically below 10 feet until there is no indication of potential impacts based on field observations or groundwater is encountered. As discussed below in Section 4.1.3, groundwater samples will be collected from temporary well completions if groundwater is encountered at these soil boring locations.

To help define the down-gradient extent of impacted groundwater observed at temporary wells completions in borings NDD-6, NDD-11, NDD-16, and OW-54, five new temporary wells are proposed to the north and northwest of the North Drainage Ditch and OW-54 (Figure 5). Two new permanent monitoring wells are proposed up-gradient of the North Drainage Ditch to evaluate potential up-gradient sources. Borings will be advanced to the top of bedrock, anticipated to be the Petrified Forest Formation.

As necessary, additional investigation of soils and groundwater will be conducted to define the lateral extent of any identified releases. If there are indications of lateral migration of constituents away from the proposed locations within soils and/or groundwater, then additional borings/ monitoring wells may be completed. Selection of additional sample locations will be coordinated with the NMED.

4.1.1 Soil Sample Field Screening and Logging

All borings will be continuously logged and samples field screened. 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 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. Additional screening for site- or release-specific characteristics such as pH or for specific compounds using field test kits may be conducted where appropriate.

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 PID equipped with a 10.6 or higher electron volt (eV) lamp or a combustible gas indicator will 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.

Discrete soil samples will be retained for laboratory analyses from within the following intervals at sampling locations at all of the soil borings, temporary well borings and permanent monitoring well borings:

- 0'-0.5' (at all borings);
- 1.5'-2.0' (at all borings);
- >2.0' (from the interval in each boring with the greatest apparent degree of contamination, based on field observations and field screening);
- from the bottom of each borehole (all borings);
- from the 6" interval at the top of saturation (applicable only to borings that reach saturation); and
- any additional intervals as determined based on field screening results.

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:

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- 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.

4.1.2 Drilling Activities

All 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. The borings, with the possible exception of the soil boring located within the drainage ditch approximately 400 feet southeast of NDD-4, will be drilled to the alluvium/Chinle Group contact. Slotted (0.01 inch) PVC well screen will be placed at the bottom of the wells and will extend for 10 to 15 feet to ensure that the well is screened across the water table, where water table conditions exist, and to the extent possible the entire saturated zone is open to the well, with approximately five feet of screen above the water table. A 10/20 sand filter pack will be installed to two feet over the top of the well screen.

4.1.3 Groundwater Sample Collection

After well development is completed, the wells will be allowed to stabilize for ten to 30 days before the initial groundwater samples are collected pursuant to Section IV.J. 2.h of the Permit. Temporary wells will be left open for a minimum of 48 hours to allow SPH to enter the wells prior to plugging. Groundwater samples will be collected 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 4.1.4.

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:

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- 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.

4.1.4 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
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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.

4.1.5 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 D.

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.

4.1.6 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.

4.1.7 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 inorganics and iron and manganese using the indicated analytical methods shown. Groundwater samples will also be analyzed for chloride, fluoride, and sulfate.

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

Groundwater field measurements will be obtained for pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, temperature, and turbidity.

4.1.8 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 projects 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.
- NMED, 2019, 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 North Drainage Ditch Water Analyses

Table 2 Soil Analytical Results Summary

Table 3 Groundwater Analytical Results Summary

Table 4 Soil Boring Samples – Vapor Screening Results

Table 1 - North Drainage Ditch Water Analyses
Western Refining Southwest, Inc. - Gallup Refinery

Analyte	WQCC 20NMAC 6.2.3103 (Oct 2006)	40 CFR 141.62 MCL	NMED Tap Water (Dec 2014)	EPA Tapwater (June 2015)												
Sample ID					DITCH - W1	DITCH - W2	DITCH - W3	A1	B1	C1	North Drainage Ditch	NDD-3-GW				
					Date Sampled											
Benzene	0.005	0.005	0.00455	NR	10/20/2009	NA	NA	10/20/2009	NA	3/19/2015	5.2	5.4	5.3	3/19/2015	4/23/2015	5/14/2015
Toluene	1	1	1.09	NR	NA	NA	NA	0.13	0.13	0.12	0.13	0.089	0.089	0.089	0.0011	<0.001
Ethyl Benzene	0.75	0.7	0.015	NR	NA	NA	NA	0.63	0.58	0.55	0.63	0.53	0.53	0.53	<0.001	<0.001
Total Xylenes	0.62	10	0.193	NR	NA	NA	NA	1.2	1.2	1.1	1.2	0.73	0.73	0.73	<0.0015	<0.0015
MTBE	NE	NE	0.143	NR	NA	NA	NA	0.2	<0.25	<0.25	0.2	0.098	0.098	0.098	0.26	0.26
1,2,4-trimethylbenzene	NE	NE	NE	0.015	NA	NA	NA	0.24	0.22	0.21	0.24	0.1	0.1	0.1	<0.001	<0.001
1,3,5-trimethylbenzene	NE	NE	NE	0.12	NA	NA	NA	0.78	<0.1	<0.1	0.78	0.035	0.035	0.035	<0.001	<0.001
naphthalene	NE	NE	0.00165	NR	NA	NA	NA	NA	NA	NA	NA	0.17	0.17	0.17	<0.01	<0.01
isopropylbenzene (cumene)	NE	NE	0.447	NR	NA	NA	NA	NA	NA	NA	NA	0.027	0.027	0.027	0.047	0.047
n-propylbenzene	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA	NA	0.047	0.047	0.047	<0.001	<0.001
1,2-dichloroethane	0.005	0.005		NR	NA	NA	NA	NA	NA	NA	NA	<0.01	<0.01	<0.01	0.0063	0.0063
GRO	NE	NE	NE	NE	NA	NA	NA	21	21	20	21	NA	20	NA	0.56	0.56
DRO	NE	NE	NE	NE	NA	NA	NA	6.4	6.5	8.9	6.4	NA	8.9	NA	1.1	1.1
MRO	NE	NE	NE	NE	NA	NA	NA	11	11	14	11	NA	14	NA	<5.0	<5.0
TPH (418.1)	NE	NE	NE	NE	27	6.9	5.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	0.000855	NR	NA	NA	NA	0.16	0.28	0.28	0.16	0.28	0.28	0.28	NA	NA
Barium	2.0	2.0	3.3	NR	NA	NA	NA	12	20	19	12	20	19	19	NA	NA
Cadmium	0.005	0.005	0.00624	NR	NA	NA	NA	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	NA	NA
Chromium (total)	0.05	0.1	0.0057	NR	NA	NA	NA	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NA	NA
Lead	0.015	0.015	NE	NR	NA	NA	NA	0.0058	0.012	0.014	0.0058	0.012	0.014	0.014	NA	NA
Selenium	0.05	0.05	0.0987	NR	NA	NA	NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA	NA
Silver	0.05	NE	0.0812	NR	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA
Mercury	0.002	0.002	0.000626	NR	NA	NA	NA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NA	NA
0.16	Bolded and highlighted value exceeds screening level				0.01				bolded value is applicable screening level							

All values are reported in milligrams per liter

GRO - gasoline range organics

DRO - diesel range organics

MRO - motor oil range organics

TPH - total petroleum hydrocarbons

NE = Not established

NR - Not required for determination of applicable screening level

NA = Not analyzed

Table 2
Soil Analytical Results Summary
Western Refining Southwest, Inc. - Gallup Refinery
Gallup, New Mexico

	Residential Soil Screening Level	Source	Non- Residential Soil Screening Level	Source	NDD-4 (0-0.5)	NDD-4 (1.5-2)	NDD-4 (8-10)	NDD-4 (18-20)	NDD-5 (0-0.5)	NDD-5 (1.5-2)	NDD-6 (0-0.5)	NDD-6 (1.5-2)	NDD-6 (4-6)	NDD-6 (10-12)	NDD-7 (0-0.5)	NDD-7 (1.5-2)	NDD-8 (0-0.5)	NDD-8 (1.5-2)	NDD-9 (0-0.5)	NDD-9 (1.5-2)	NDD-10 (0-0.5)	NDD-10 (1.5-2)
					1605B47-002 5/23/2016	1605B47-003 5/23/2016	1605B47-004 5/23/2016	1605B47-005 5/23/2016	1605999-021 5/19/2016	1605999-022 5/19/2016	1605B47-006 5/23/2016	1605B47-007 5/23/2016	1605B47-008 5/23/2016	1605B47-009 5/23/2016	1605999-015 5/19/2016	1605999-016 5/19/2016	1605999-017 5/19/2016	1605999-018 5/19/2016	1605999-019 5/19/2016	1605999-020 5/19/2016	1605999-011 5/19/2016	1605999-012 5/19/2016
Carbazole	-	-	-	-	<0.076 u	<0.074 u	<0.079 u	<0.083 u	<0.0799 u	<8.3647 u	<0.092 u	<0.086 u	<4.0532 u	<0.079 u	<0.0865 u	<0.0903 u	<0.0928 u	<0.0842 u	<0.0825 u	<0.0789 u	<0.0771 u	
Chrysene	1.53E+02	(1)	3.23E+03	(4)	<0.096 u	<0.094 u	<0.1 u	<0.1 u	<0.1007 u	<10.3476 u	<0.12 u	<0.11 u	<5.111 u	<0.099 u	<0.1091 u	<0.1139 u	<0.117 u	<0.1062 u	<0.104 u	<0.0995 u	<0.0972 u	
Dibenz(a,h)anthracene	1.53E-01	(4)	3.23E+00	(4)	<0.091 u	<0.089 u	<0.095 u	<0.099 u	<0.0956 u	<10.0159 u	<0.11 u	<0.1 u	<4.8534 u	<0.094 u	<0.1036 u	<0.1081 u	<0.1111 u	<0.1009 u	<0.0987 u	<0.0945 u	<0.0923 u	
Dibenzofuran	-	-	-	-	<0.11 u	<0.11 u	<0.12 u	<0.12 u	<0.1189 u	<12.4583 u	<0.14 u	<0.13 u	<6.0369 u	<0.12 u	<0.1288 u	<0.1345 u	<0.1382 u	<0.1255 u	<0.1228 u	<0.1176 u	<0.1148 u	
Diethyl phthalate	4.93E+04	(1)	2.15E+05	(5)	<0.11 u	<0.11 u	<0.12 u	<0.12 u	<0.1199 u	<12.561 u	<0.14 u	<0.13 u	<6.0866 u	<0.12 u	<0.1299 u	<0.1356 u	<0.1393 u	<0.1265 u	<0.1238 u	<0.1185 u	<0.1157 u	
Dimethyl phthalate	6.16E+04	(1)	2.69E+05	(5)	<0.11 u	<0.11 u	<0.11 u	<0.12 u	<0.1157 u	<12.1169 u	<0.13 u	<0.12 u	<5.8714 u	<0.12 u	<0.1253 u	<0.1308 u	<0.1344 u	<0.122 u	<0.1194 u	<0.1143 u	<0.1117 u	
Dn-n-octyl phthalate	6.16E+03	(1)	2.69E+04	(5)	<0.084 u	<0.082 u	<0.087 u	<0.092 u	<0.0884 u	<9.2626 u	<0.1 u	<0.095 u	<4.4884 u	<0.087 u	<0.0958 u	<0.1041 u	<0.1077 u	<0.0933 u	<0.0913 u	<0.0874 u	<0.0854 u	
Di-n-octyl phthalate	-	-	-	-	<0.096 u	<0.094 u	<0.1 u	<0.1 u	<0.1009 u	<10.5663 u	<0.12 u	<0.11 u	<5.1201 u	<0.099 u	<0.1092 u	<0.1141 u	<0.1172 u	<0.1064 u	<0.1042 u	<0.0997 u	<0.0974 u	
Fluoranthene	2.32E+03	(1)	1.00E+04	(5)	<0.065 u	<0.063 u	<0.067 u	<0.071 u	<0.0681 u	<7.1346 u	<0.079 u	<0.073 u	<3.4572 u	<0.067 u	<0.0738 u	<0.077 u	<0.0791 u	<0.0719 u	<0.0703 u	<0.0673 u	<0.0657 u	
Fluorene	2.32E+03	(1)	1.00E+04	(5)	<0.1 u	<0.1 u	<0.11 u	<0.11 u	<0.1082 u	<11.3378 u	<0.13 u	<0.12 u	<5.4939 u	<0.11 u	<0.1172 u	<0.1224 u	<0.1258 u	<0.1142 u	<0.1118 u	<0.107 u	<0.1045 u	
Hexachlorobenzene	1.53E+00	(1)	3.23E+01	(4)	<0.088 u	<0.086 u	<0.091 u	<0.096 u	<0.0923 u	<9.6729 u	<0.11 u	<0.099 u	<4.6872 u	<0.091 u	<0.1 u	<0.1149 u	<0.118 u	<0.1072 u	<0.1049 u	<0.1004 u	<0.0981 u	
Hexachlorobutadiene	6.16E+01	(1)	5.17E+01	(4)	<0.13 u	<0.12 u	<0.13 u	<0.14 u	<0.1333 u	<13.9588 u	<0.15 u	<0.14 u	<6.764 u	<0.13 u	<0.1443 u	<0.1507 u	<0.1548 u	<0.1406 u	<0.1376 u	<0.1317 u	<0.1286 u	
Hexachlorocyclopentadiene	2.28E+00	(1)	8.67E+02	(5)	<0.13 u	<0.13 u	<0.13 u	<0.14 u	<0.1352 u	<14.1619 u	<0.16 u	<0.15 u	<6.8624 u	<0.13 u	<0.1464 u	<0.1529 u	<0.1571 u	<0.1426 u	<0.1396 u	<0.1336 u	<0.1305 u	
Hexachloroethane	4.31E+01	(1)	1.88E+02	(5)	<0.096 u	<0.094 u	<0.1 u	<0.11 u	<0.1016 u	<10.6414 u	<0.12 u	<0.11 u	<5.1565 u	<0.1 u	<0.111 u	<0.1149 u	<0.118 u	<0.1072 u	<0.1049 u	<0.1004 u	<0.0981 u	
Indeno(1,2,3-cd)pyrene	1.53E+00	(1)	3.23E+01	(4)	<0.088 u	<0.086 u	<0.091 u	<0.096 u	<0.0923 u	<9.6729 u	<0.11 u	<0.099 u	<4.6872 u	<0.091 u	<0.1 u	<0.1149 u	<0.118 u	<0.1072 u	<0.1049 u	<0.1004 u	<0.0981 u	
Naphthalene	1.16E+03	(1)	5.02E+03	(5)	<0.11 u	<0.11 u	<0.11 u	<0.12 u	<0.1135 u	<11.8913 u	<0.13 u	<0.13 u	<5.7621 u	<0.11 u	<0.1229 u	<0.1284 u	<0.1319 u	<0.1198 u	<0.1172 u	<0.1122 u	<0.1096 u	
Nitrobenzene	5.99E+01	(1)	2.91E+02	(4)	<0.12 u	<0.11 u	<0.12 u	<0.13 u	<0.122 u	<12.7825 u	<0.14 u	<0.13 u	<6.194 u	<0.12 u	<0.1322 u	<0.138 u	<0.1418 u	<0.1287 u	<0.126 u	<0.1206 u	<0.1178 u	
N-Nitrosodi-n-propylamine	7.80E-01	(3)	3.30E+01	(7)	<0.11 u	<0.11 u	<0.11 u	<0.12 u	<0.1136 u	<11.9042 u	<0.13 u	<0.12 u	<5.7684 u	<0.11 u	<0.1231 u	<0.1285 u	<0.132 u	<0.1199 u	<0.1173 u	<0.1123 u	<0.1097 u	
N-Nitrosodiphenylamine	1.09E+03	(1)	5.24E+03	(4)	<0.11 u	<0.11 u	<0.11 u	<0.12 u	<0.1155 u	<12.0961 u	<0.13 u	<0.12 u	<5.8614 u	<0.11 u	<0.1251 u	<0.1306 u	<0.1342 u	<0.1218 u	<0.1192 u	<0.1141 u	<0.1115 u	
Pentaclorophenol	9.85E+00	(1)	4.45E+01	(4)	<0.072 u	<0.071 u	<0.075 u	<0.079 u	<0.076 u	<7.9609 u	<0.088 u	<0.082 u	<3.8576 u	<0.075 u	<0.0823 u	<0.0859 u	<0.0883 u	<0.0802 u	<0.0785 u	<0.0751 u	<0.0734 u	
Phenanthrene	1.74E+03	(1)	7.53E+03	(5)	<0.076 u	<0.075 u	<0.079 u	<0.083 u	<0.0803 u	<8.4146 u	<0.093 u	<0.088 u	<4.0774 u	<0.079 u	<0.087 u	<0.0908 u	<0.0933 u	<0.0847 u	<0.0829 u	<0.0794 u	<0.0775 u	
Phenol	1.85E+04	(1)	7.74E+04	(5)	<0.085 u	<0.083 u	<0.088 u	<0.092 u	<0.0891 u	<9.3293 u	<0.1 u	<0.096 u	<4.5207 u	<0.088 u	<0.0965 u	<0.1007 u	<0.1035 u	<0.094 u	<0.092 u	<0.088 u	<0.086 u	
Pyrene	1.74E+03	(1)	7.53E+03	(5)	<0.085 u	<0.083 u	<0.088 u	<0.093 u	<0.0894 u	<9.3605 u	<0.1 u	<0.096 u	<4.5358 u	<0.088 u	<0.0968 u	<0.1011 u	<0.1038 u	<0.0943 u	<0.0923 u	<0.0883 u	<0.0863 u	
Pyridine	7.80E+01	(2)	1.20E+03	(6)	<0.089 u	<0.087 u	<0.093 u	<0.097 u	<0.0937 u	<9.8188 u	<0.11 u	<0.1 u	<4.7578 u	<0.092 u	<0.1015 u	<0.106 u	<0.1089 u	<0.0989 u	<0.0927 u	<0.0905 u	<0.0905 u	
Total Petroleum Hydrocarbons (mg/kg)																						
Gasoline Range Organics (GRO)	1.00E+03	(8)	3.80E+03	(8)	<0.7 u	<0.87 u	<0.91 u	<0.76 u	3.3 J	110 u	<0.9 u	280 v	660 v	39 v	<0.6128 u	0.64 J	0.71 J	1.1 J	350 v	0.76 J	0.61 J	
Diesel Range Organics (DRO)	1.00E+03	(8)	3.80E+03	(8)	<3.9 u	<3.6 u	<3.9 u	<4.3 u	330 v	27000 v	27 v	16000 v	5000 v	18 v	<4.6 u	<4.5 u	<4.6 u	<4.4 u	3800 v	<4 u	<3.9 u	
Motor Oil Range Organics (MRO)	1.00E+03	(8)	3.80E+03	(8)	<54 u	<51 u	<55 u	<60 u	360 v	19000 v	<68 u	<6000 u	<620 u	<55 u	<64 u	<63 u	<64 u	<62 u	<610 u	<56 u	<54 u	

- No screening level or analytical result available
- NMED - Risk Assessment Guidance for Site Investigations and Remediation
(March 2017)
- EPA - Regional Screening Levels (June 2017)
- (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) NMED Table 6-2 TPH Soil Screening Levels "unknown oil" - see report Section 5 for use of screening levels

Bold represents value above Residential Screening Level

yellow highlight represents value above Leachate non-residential Screening Level

Bold with yellow highlight value exceeds residential screening level and non-residential screen level

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
Western Refining Southwest, Inc. - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	NDD-4-GW	NDD-6-GW	NDD-11-GW	NDD-16-GW	OW-56
Lab ID			1605C89-004	1605C89-001	1605C89-006	1605C89-008	1609A26-003
Sample Date			5/26/2016	5/26/2016	5/26/2016	5/26/2016	9/16/2016
Metals (ug/l) TOTAL							
Antimony	6.00E+00	(2)	< 0.472 u	< 0.472 u	< 2.362 u	< 0.472 u	-
Arsenic	1.00E+01	(2)	20 Z	8.7 v	23 Z	9.4 J	4.6 J
Barium	2.00E+03	(2)	5300 Z	5400 Z	4800 Z	370 v	370 v
Beryllium	4.00E+00	(2)	19 Z	1.1 J	2.6 v	0.55 J	-
Cadmium	5.00E+00	(2)	< 0.746 u	< 0.746 u	< 0.746 u	< 0.746 u	< 1.484 u
Chromium	5.00E+01	(3)	60 v	6.5 v	7.8 v	5 J	< 2.656 u
Cobalt	6.00E+00	(1)	86 v	15 v	8.6 v	26 v	-
Iron	1.38E+04	(4)	45000 Z	6300 Z	14000 Z	3000 Z	330 Z
Lead	1.50E+01	(2)	160 Z	8.4 v	24 Z	7.9 v	1 v
Manganese	2.02E+03	(4)	15000 Z	3200 Z	2700 Z	3200 Z	420 Z
Mercury	2.00E+00	(3)	0.24 v	0.061 J	< 0.053 u	< 0.053 u	0.1 J
Nickel	3.72E+02	(4)	300 Z	65 v	32 v	88 v	-
Selenium	5.00E+01	(3)	21 J	14 J	10 J	15 J	4.6 J
Silver	5.00E+01	(3)	< 2.751 u	< 2.751 u	< 2.751 u	< 2.751 u	< 1.548 u
Vanadium	6.31E+01	(4)	77 J	18 J	30 J	8.7 J	-
Zinc	1.00E+04	(3)	210 v	24 v	26 v	34 v	12 v
General Chemistry (ug/l) TOTAL							
Chloride	2.50E+05	(3)	950000 v	560000 v	350000 v	670000 v	-
Fluoride	1.60E+03	(3)	550 v	1500 v	1200 v	270 v	-
Sulfate	6.00E+05	(3)	110000 v	1100 v	400 J	42000 v	-
Cyanide	2.00E+02	(3)	17.6 v	15.6 v	7.58 J	< 6 u	-
Metals (ug/l) DISSOLVED							
Antimony (D)	6.00E+00	(2)	< 0.472 u	0.77 J	1 J	< 0.472 u	-
Arsenic (D)	1.00E+01	(2)	6.4 J	8.3 v	23 Z	7.1 J	4.9 J
Barium (D)	1.00E+03	(3)	83 v	5600 Z	3500 Z	270 v	360 v
Beryllium (D)	4.00E+00	(2)	< 0.313 u	0.44 J	< 0.313 u	<0.00031 u	-
Cadmium (D)	5.00E+00	(2)	< 0.746 u	< 0.746 u	< 0.746 u	< 0.746 u	< 0.746 u
Chromium (D)	5.00E+01	(3)	< 1.754 u	< 1.754 u	< 1.754 u	< 1.754 u	< 1.754 u
Cobalt (D)	5.00E+01	(3)	8.7 v	13 v	2.2 J	24 v	-
Cyanide (D)	2.00E+02	(3)	-	-	-	-	-
Iron (D)	1.00E+03	(3)	44 v	260 v	5600 Z	43 v	78 v
Lead (D)	1.50E+01	(2)	0.4 J	<0.00013 v	<0.00013 J	2.1 v	0.46 J
Manganese (D)	2.00E+02	(3)	18 v	3000 Z	1900 Z	2900 Z	390 Z
Nickel (D)	3.72E+02	(4)	190 Z	60 v	23 v	86 v	-
Selenium (D)	5.00E+01	(3)	16 v	11 v	6 J	15 v	4.6 J
Silver (D)	5.00E+01	(3)	< 2.751 u	< 2.751 u	< 2.751 u	< 2.751 u	< 2.751 u
Vanadium (D)	6.31E+01	(4)	4.1 J	4.2 J	3.1 J	4.8 J	-
Zinc (D)	1.00E+04	(3)	< 2.783 u	6.9 J	6.6 J	23 v	11 v
Volatiles (ug/l)							
1,1,1,2-Tetrachloroethane	5.74E+00	(4)	< 0.223 u	< 11.146 u	< 11.146 u	< 0.223 u	< 0.557 u
1,1,1-Trichloroethane	6.00E+01	(3)	< 0.183 u	< 9.15 u	< 9.15 u	< 0.183 u	< 0.457 u
1,1,2,2-Tetrachloroethane	1.00E+01	(3)	< 0.256 u	< 12.823 u	< 12.823 u	< 0.256 u	< 0.641 u
1,1,2-Trichloroethane	5.00E+00	(2)	< 0.255 u	< 12.731 u	< 12.731 u	< 0.255 u	< 0.637 u
1,1-Dichloroethane	2.50E+01	(3)	< 0.216 u	< 10.805 u	< 10.805 u	< 0.216 u	< 0.54 u
1,1-Dichloroethene	5.00E+00	(3)	< 0.214 u	< 10.722 u	< 10.722 u	< 0.214 u	< 0.536 u
1,1-Dichloropropene	-		< 0.266 u	< 13.312 u	< 13.312 u	< 0.266 u	< 0.666 u
1,2,3-Trichlorobenzene	7.00E+00	(1)	< 0.226 u	< 11.286 u	< 11.286 u	< 0.226 u	< 0.564 u

Table 3
Groundwater Analytical Results Summary
Western Refining Southwest, Inc. - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	NDD-4-GW		NDD-6-GW		NDD-11-GW		NDD-16-GW		OW-56	
Lab ID			1605C89-004		1605C89-001		1605C89-006		1605C89-008		1609A26-003	
Sample Date			5/26/2016		5/26/2016		5/26/2016		5/26/2016		9/16/2016	
1,2,3-Trichloropropane	1.00E-02	(4)	< 0.404	u	< 20.2	u	< 20.2	u	< 0.404	u	< 1.01	u
1,2,4-Trichlorobenzene (V)	7.00E+01	(2)	< 0.266	u	< 13.277	u	< 13.277	u	< 0.266	u	< 0.664	u
1,2,4-Trimethylbenzene	5.60E+01	(1)	< 0.22	u	820	v	1500	v	2.7	v	1.1	J
1,2-Dibromo-3-chloropropane	2.00E-01	(2)	< 0.469	u	< 23.433	u	< 23.433	u	< 0.469	u	< 1.172	u
1,2-Dibromoethane (EDB)	5.00E-02	(2)	< 0.224	u	< 11.177	u	< 11.177	u	< 0.224	u	< 0.559	u
1,2-Dichlorobenzene (V)	6.00E+02	(2)	< 0.8	u	< 40	u	< 40	u	< 0.8	u	< 2	u
1,2-Dichloroethane (EDC)	5.00E+00	(2)	< 0.23	u	< 11.502	u	< 11.502	u	< 0.23	u	16	Z
1,2-Dichloropropane	5.00E+00	(2)	< 0.22	u	< 10.983	u	< 10.983	u	< 0.22	u	< 0.549	u
1,3,5-Trimethylbenzene	6.00E+01	(1)	< 0.231	u	200	v	400	v	< 0.231	u	< 0.577	u
1,3-Dichlorobenzene (V)	-		< 0.286	u	< 14.319	u	< 14.319	u	< 0.286	u	< 0.716	u
1,3-Dichloropropane	3.70E+02	(1)	< 0.311	u	< 15.572	u	< 15.572	u	< 0.311	u	< 0.779	u
1,4-Dichlorobenzene (V)	7.50E+01	(2)	< 0.285	u	< 14.266	u	< 14.266	u	< 0.285	u	< 0.713	u
1-Methylnaphthalene (V)	1.10E+01	(5)	0.55	J	130	J	97	J	0.87	J	< 1.022	u
2,2-Dichloropropane	-		< 0.333	u	< 16.664	u	< 16.664	u	< 0.333	u	< 0.833	u
2-Butanone	5.56E+03	(4)	< 1.474	u	< 73.699	u	< 73.699	u	< 1.474	u	< 3.685	u
2-Chlorotoluene	2.40E+02	(1)	< 0.8	u	< 40	u	< 40	u	< 0.8	u	< 2	u
2-Hexanone	-		< 1.68	u	< 83.987	u	< 83.987	u	< 1.68	u	< 4.199	u
2-Methylnaphthalene (V)	3.60E+01	(1)	0.71	J	160	J	130	J	0.77	J	< 0.791	u
4-Chlorotoluene	2.50E+02	(1)	< 0.256	u	< 12.814	u	< 12.814	u	< 0.256	u	< 0.641	u
4-Isopropyltoluene	-		< 0.281	u	< 14.061	u	< 14.061	u	< 0.281	u	< 0.703	u
4-Methyl-2-pentanone	-		< 0.855	u	< 42.764	u	< 42.764	u	< 0.855	u	< 2.138	u
Acetone	1.41E+04	(4)	13	J	< 490.874	u	< 490.874	u	19	J	< 24.544	u
Benzene	5.00E+00	(2)	< 0.191	u	5300	v	8200	v	47	v	2.5	J
Bromobenzene	6.20E+01	(1)	< 0.195	u	< 9.771	u	< 9.771	u	< 0.195	u	< 0.489	u
Bromodichloromethane	1.34E+00	(4)	< 0.28	u	< 13.978	u	< 13.978	u	< 0.28	u	< 0.699	u
Bromoform	3.30E+01	(5)	< 0.204	u	< 10.213	u	< 10.213	u	< 0.204	u	< 0.511	u
Bromomethane	7.54E+00	(4)	< 1.56	u	< 77.989	u	< 77.989	u	< 1.56	u	< 3.899	u
Carbon disulfide	8.10E+02	(4)	< 1.195	u	< 59.749	u	< 59.749	u	< 1.195	u	< 2.987	u
Carbon Tetrachloride	5.00E+00	(2)	< 0.216	u	< 10.82	u	< 10.82	u	< 0.216	u	< 0.541	u
Chlorobenzene	1.00E+02	(2)	< 0.229	u	< 11.445	u	< 11.445	u	< 0.229	u	< 0.572	u
Chloroethane	2.09E+04	(4)	< 0.382	u	< 19.102	u	< 19.102	u	< 0.382	u	< 0.955	u
Chloroform	1.00E+02	(3)	< 0.178	u	< 8.877	u	< 8.877	u	< 0.178	u	< 0.444	u
Chloromethane	2.03E+01	(4)	< 0.426	u	< 21.281	u	< 21.281	u	< 0.426	u	< 1.064	u
cis-1,2-DCE	7.00E+01	(2)	< 0.248	u	< 12.416	u	< 12.416	u	< 0.248	u	< 0.621	u
cis-1,3-Dichloropropene	4.71E+00	(4)	< 0.213	u	< 10.653	u	< 10.653	u	< 0.213	u	< 0.533	u
Dibromochloromethane	1.68E+00	(4)	< 0.173	u	< 8.673	u	< 8.673	u	< 0.173	u	< 0.434	u
Dibromomethane	8.30E+00	(1)	< 0.238	u	< 11.914	u	< 11.914	u	< 0.238	u	< 0.596	u
Dichlorodifluoromethane	1.97E+02	(4)	< 0.715	u	< 35.732	u	< 35.732	u	< 0.715	u	< 1.787	u
Ethylbenzene	7.00E+02	(2)	< 0.224	u	370	v	1400	v	67	v	< 0.561	u
Hexachlorobutadiene (V)	1.39E+00	(4)	< 0.397	u	< 19.86	u	< 19.86	u	< 0.397	u	< 0.993	u
Isopropylbenzene	4.47E+02	(4)	< 0.209	u	64	J	87	J	8.4	v	1.1	J
Methyl tert-butyl ether (MTBE)	1.43E+02	(4)	71	v	160	v	180	v	75	v	150	Z
Methylene Chloride	5.00E+00	(2)	< 0.375	u	< 18.742	u	< 18.742	u	< 0.375	u	< 0.937	u
Naphthalene (V)	1.65E+00	(4)	0.22	J	280	v	390	v	0.4	J	< 0.463	u
n-Butylbenzene	-		< 0.321	u	36	J	57	J	1.1	J	< 0.802	u
n-Propylbenzene	-		< 0.264	u	120	v	250	v	8.4	v	< 0.661	u
sec-Butylbenzene	-		< 0.246	u	< 12.301	u	< 12.301	u	1.1	J	< 0.615	u
Styrene	1.00E+02	(2)	< 0.22	u	< 11	u	< 11	u	< 0.22	u	< 0.55	u

Table 3
Groundwater Analytical Results Summary
Western Refining Southwest, Inc. - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	NDD-4-GW		NDD-6-GW		NDD-11-GW		NDD-16-GW		OW-56	
Lab ID			1605C89-004		1605C89-001		1605C89-006		1605C89-008		1609A26-003	
Sample Date			5/26/2016		5/26/2016		5/26/2016		5/26/2016		9/16/2016	
tert-Butylbenzene	-		< 0.23	u	< 11.501	u	< 11.501	u	< 0.23	u	< 0.575	u
Tetrachloroethene (PCE)	5.00E+00	(2)	< 0.304	u	< 15.202	u	< 15.202	u	< 0.304	u	< 0.76	u
Toluene	7.50E+02	(3)	< 0.236	u	130	v	330	v	0.34	J	0.92	J
trans-1,2-DCE	1.00E+02	(2)	< 0.8	u	< 40	u	< 40	u	< 0.8	u	< 2	u
trans-1,3-Dichloropropene	4.71E+00	(4)	< 0.207	u	< 10.327	u	< 10.327	u	< 0.207	u	< 0.516	u
Trichloroethene (TCE)	5.00E+00	(2)	< 0.35	u	< 17.509	u	< 17.509	u	< 0.35	u	< 0.875	u
Trichlorofluoromethane	1.14E+03	(4)	< 0.409	u	< 20.437	u	< 20.437	u	< 0.409	u	< 1.022	u
Vinyl chloride	1.00E+00	(3)	< 0.391	u	< 19.538	u	< 19.538	u	< 0.391	u	< 0.977	u
Xylenes, Total	6.20E+02	(3)	< 0.734	u	2100	v	5700	v	< 0.734	u	< 1.835	u
Semivolatiles (ug/l)												
1,2,4-Trichlorobenzene	7.00E+01	(2)	< 2.62	u	< 2.62	u	< 2.62	u	< 2.62	u	-	
1,2-Dichlorobenzene	6.00E+02	(2)	< 2.285	u	< 2.285	u	< 2.285	u	< 2.285	u	-	
1,3-Dichlorobenzene	-		< 2.257	u	< 2.257	u	< 2.257	u	< 2.257	u	-	
1,4-Dichlorobenzene	7.50E+01	(2)	< 2.388	u	< 2.388	u	< 2.388	u	< 2.388	u	-	
1-Methylnaphthalene	1.10E+01	(5)	< 2.918	u	110	v	110	v	< 2.918	u	-	
2,4,5-Trichlorophenol	1.17E+03	(4)	< 2.18	u	< 2.18	u	< 2.18	u	< 2.18	u	-	
2,4,6-Trichlorophenol	1.19E+01	(4)	< 2.446	u	< 2.446	u	< 2.446	u	< 2.446	u	-	
2,4-Dichlorophenol	4.53E+01	(4)	< 2.33	u	< 2.33	u	< 2.33	u	< 2.33	u	-	
2,4-Dimethylphenol	3.54E+02	(4)	< 3.01	u	< 3.01	u	37	v	< 3.01	u	-	
2,4-Dinitrophenol	3.87E+01	(4)	< 2.753	u	< 2.753	u	< 2.753	u	< 2.753	u	-	
2,4-Dinitrotoluene	2.37E+00	(4)	< 3.129	u	< 3.129	u	< 3.129	u	< 3.129	u	-	
2,6-Dinitrotoluene	4.85E-01	(4)	< 2.734	u	< 2.734	u	< 2.734	u	< 2.734	u	-	
2-Chloronaphthalene	7.33E+02	(4)	< 2.251	u	< 2.251	u	< 2.251	u	< 2.251	u	-	
2-Chlorophenol	9.10E+01	(4)	< 2.184	u	< 2.184	u	< 2.184	u	< 2.184	u	-	
2-Methylnaphthalene	3.60E+01	(1)	< 2.89	u	130	v	120	v	< 2.89	u	-	
2-Methylphenol	9.30E+02	(1)	< 2.539	u	< 2.539	u	< 2.539	u	< 2.539	u	-	
2-Nitroaniline	1.90E+02	(1)	< 2.758	u	< 2.758	u	< 2.758	u	< 2.758	u	-	
2-Nitrophenol	-		< 2.378	u	< 2.378	u	< 2.378	u	< 2.378	u	-	
3,3'-Dichlorobenzidine	1.25E+00	(4)	< 2.396	u	< 2.396	u	< 2.396	u	< 2.396	u	-	
3+4-Methylphenol	1.40E+03	(1)	< 2.298	u	2.4	J	5.7	J	< 2.298	u	-	
3-Nitroaniline	-		< 2.948	u	< 2.948	u	< 2.948	u	< 2.948	u	-	
4,6-Dinitro-2-methylphenol	1.52E+00	(4)	< 1.797	u	< 1.797	u	< 1.797	u	< 1.797	u	-	
4-Bromophenyl phenyl ether	-		< 2.637	u	< 2.637	u	< 2.637	u	< 2.637	u	-	
4-Chloro-3-methylphenol	-		< 2.559	u	< 2.559	u	< 2.559	u	< 2.559	u	-	
4-Chloroaniline	3.70E+00	(5)	< 2.712	u	< 2.712	u	< 2.712	u	< 2.712	u	-	
4-Chlorophenyl phenyl ether	-		< 2.556	u	< 2.556	u	< 2.556	u	< 2.556	u	-	
4-Nitroaniline	3.80E+01	(5)	< 2.559	u	< 2.559	u	< 2.559	u	< 2.559	u	-	
4-Nitrophenol	-		< 2.553	u	< 2.553	u	< 2.553	u	< 2.553	u	-	
Acenaphthene	5.35E+02	(4)	< 2.553	u	< 2.553	u	< 2.553	u	< 2.553	u	-	
Acenaphthylene	-		< 2.357	u	< 2.357	u	< 2.357	u	< 2.357	u	-	
Aniline	1.30E+02	(5)	< 2.441	u	< 2.441	u	< 2.441	u	< 2.441	u	-	
Anthracene	1.72E+03	(4)	< 2.486	u	< 2.486	u	< 2.486	u	< 2.486	u	-	
Azobenzene	1.20E+00	(5)	< 2.668	u	< 2.668	u	< 2.668	u	< 2.668	u	-	
Benz(a)anthracene	1.20E-01	(4)	< 2.639	u	< 2.639	u	< 2.639	u	< 2.639	u	-	
Benzo(a)pyrene	2.00E-01	(2)	< 2.718	u	< 2.718	u	< 2.718	u	< 2.718	u	-	
Benzo(b)fluoranthene	3.43E-01	(4)	< 2.88	u	< 2.88	u	< 2.88	u	< 2.88	u	-	
Benzo(g,h,i)perylene	-		< 2.643	u	< 2.643	u	< 2.643	u	< 2.643	u	-	
Benzo(k)fluoranthene	3.43E+00	(4)	< 2.998	u	< 2.998	u	< 2.998	u	< 2.998	u	-	

Table 3
Groundwater Analytical Results Summary
Western Refining Southwest, Inc. - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	NDD-4-GW	NDD-6-GW	NDD-11-GW	NDD-16-GW	OW-56
Lab ID			1605C89-004	1605C89-001	1605C89-006	1605C89-008	1609A26-003
Sample Date			5/26/2016	5/26/2016	5/26/2016	5/26/2016	9/16/2016
Benzoic acid	7.50E+04	(1)	< 2.606 u	< 2.606 u	< 2.606 u	< 2.606 u	-
Benzyl alcohol	2.00E+03	(1)	< 3.012 u	< 3.012 u	< 3.012 u	< 3.012 u	-
Bis(2-chloroethoxy)methane	5.90E+01	(1)	< 2.814 u	< 2.814 u	< 2.814 u	< 2.814 u	-
Bis(2-chloroethyl)ether	1.40E-01	(4)	< 2.674 u	< 2.674 u	< 2.674 u	< 2.674 u	-
Bis(2-chloroisopropyl)ether	9.81E+00	(4)	< 1.909 u	< 1.909 u	< 1.909 u	< 1.909 u	-
Bis(2-ethylhexyl)phthalate	6.00E+00	(2)	< 2.616 u	3.4 J	3.4 J	4.7 J	-
Butyl benzyl phthalate	1.60E+02	(5)	< 2.478 u	< 2.478 u	< 2.478 u	< 2.478 u	-
Carbazole	-		< 2.287 u	3.4 J	2.3 J	< 2.287 u	-
Chrysene	3.43E+01	(4)	< 2.779 u	< 2.779 u	< 2.779 u	< 2.779 u	-
Dibenz(a,h)anthracene	3.43E-02	(4)	< 2.661 u	< 2.661 u	< 2.661 u	< 2.661 u	-
Dibenzofuran	-		< 2.493 u	< 2.493 u	< 2.493 u	< 2.493 u	-
Diethyl phthalate	1.48E+04	(4)	< 2.715 u	< 2.715 u	< 2.715 u	< 2.715 u	-
Dimethyl phthalate	-		< 2.429 u	< 2.429 u	< 2.429 u	< 2.429 u	-
Di-n-butyl phthalate	8.85E+02	(4)	< 2.444 u	< 2.444 u	< 2.444 u	< 2.444 u	-
Di-n-octyl phthalate	-		5 J	5 J	6.2 J	5.2 J	-
Fluoranthene	8.02E+02	(4)	< 2.607 u	< 2.607 u	< 2.607 u	< 2.607 u	-
Fluorene	2.88E+02	(4)	< 2.724 u	< 2.724 u	< 2.724 u	< 2.724 u	-
Hexachlorobenzene	1.00E+00	(2)	< 2.633 u	< 2.633 u	< 2.633 u	< 2.633 u	-
Hexachlorobutadiene	1.39E+00	(4)	< 2.184 u	< 2.184 u	< 2.184 u	< 2.184 u	-
Hexachlorocyclopentadiene	5.00E+01	(2)	< 2.284 u	< 2.284 u	< 2.284 u	< 2.284 u	-
Hexachloroethane	3.28E+00	(4)	< 2.368 u	< 2.368 u	< 2.368 u	< 2.368 u	-
Indeno(1,2,3-cd)pyrene	3.43E-01	(4)	< 2.964 u	< 2.964 u	< 2.964 u	< 2.964 u	-
Isophorone	7.81E+02	(4)	< 2.615 u	< 2.615 u	< 2.615 u	< 2.615 u	-
Naphthalene	1.65E+00	(4)	< 2.598 u	200 v	280 v	< 2.598 u	-
Nitrobenzene	1.40E+00	(4)	< 2.753 u	< 2.753 u	< 2.753 u	< 2.753 u	-
N-Nitrosodimethylamine	1.70E-03	(4)	< 2.158 u	< 2.158 u	< 2.158 u	< 2.158 u	-
N-Nitrosodi-n-propylamine	1.10E-01	(5)	< 2.389 u	< 2.389 u	< 2.389 u	< 2.389 u	-
N-Nitrosodiphenylamine	4.90E-03	(4)	< 2.32 u	< 2.32 u	< 2.32 u	< 2.32 u	-
Phenanthrene	1.70E+02	(4)	< 2.587 u	< 2.587 u	< 2.587 u	< 2.587 u	-
Pentachlorophenol	1.00E+00	(2)	< 2.342 u	< 2.342 u	< 2.342 u	< 2.342 u	-
Phenol	5.76E+03	(4)	< 1.985 u	11 v	14 v	< 1.985 u	-
Pyrene	1.17E+02	(4)	< 3.094 u	< 3.094 u	< 3.094 u	< 3.094 u	-
Pyridine	2.00E+01	(1)	< 2.161 u	< 2.161 u	< 2.161 u	< 2.161 u	-
TPH (mg/l)							
Gasoline Range Organics (GRO)	3.98E-02	(6)	0.11 v	27 v	53 v	0.54 v	1.2 v
Diesel Range Organics (DRO)	3.98E-02	(6)	< 0.69 u	4.3 v	7.3 v	< 0.69 u	0.77 J
Motor Oil Range Organics (MRO)	3.98E-02	(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 (June 2017) -Tap Water

(2) EPA - Regional Screening Levels (June 2017) - 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

(4) NMED Tap Water Screening Level - Risk Assessment Guidance for Site Investigations and Remediation (March 2017)

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

(6) NMED groundwater screening level for unknown oil

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

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

Table 3
Groundwater Analytical Results Summary
Western Refining Southwest, Inc. - Gallup Refinery
Gallup, New Mexico

			NDD-4-GW	NDD-6-GW	NDD-11-GW	NDD-16-GW	OW-56
	Screening Levels	Source					
Lab ID			1605C89-004	1605C89-001	1605C89-006	1605C89-008	1609A26-003
Sample Date			5/26/2016	5/26/2016	5/26/2016	5/26/2016	9/16/2016

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

z - concentration exceeds MCL

Table 4
Soil Boring Samples - Vapor Screening Results
Western Refining Southwest Inc. - Gallup Refinery
Gallup, New Mexico

Sample Interval Depth (ftbgl)	NDD-1 (ppm)	NDD-2 (ppm)	NDD-3 (ppm)	NDD-4 (ppm)	NDD-5 (ppm)	NDD-6 (ppm)	NDD-7 (ppm)	NDD-8 (ppm)	NDD-9 (ppm)	NDD-10 (ppm)	NDD-11 (ppm)	NDD-12 (ppm)	NDD-13 (ppm)	NDD-14 (ppm)	NDD-15 (ppm)	NDD-16 (ppm)	NDD-17 (ppm)	OW-53 (ppm)	OW-54 (ppm)	OW-55 (ppm)	OW-56 (ppm)
0 - 2 ¹	4.1	9.7	14.2	3.5/7.1	6.5/339	8.8/1639	3.3/9.4	11.3/904	18.5/1530	8.8/12.3	3.2/4.6	8.9/66.4	5.6/8.0	5.7/1.6	7.1/6.3	5.1/14.3	4.5/9.8	5.3	4.5	9.4	10.5
2 - 4	8.1	14.4	12.2	5.9	TD@2 ftbgl	129	TD@2 ftbgl	TD@2 ftbgl	TD@2 ftbgl	TD@2 ftbgl	SAT	TD@2 ftbgl	TD@2 ftbgl	TD@2 ftbgl	TD@2 ftbgl	5.3	TD@2 ftbgl	4.8	5.7	11.2	11.0
4 - 6	9.3	17.1	14.4	7.0		1780										5.6		2.4	10.2	16.8	11.4
6 - 8	10.1	18.0	9.9	3.2		SAT					SAT					12.1		5.5	7.3	13.3	8.3
8 - 10	9.9	14.8	10.7	4.9		SAT					SAT					12.3		2.3	8.3	19.2	13.6
10 - 12	8.2	16.3	11.9	7.8		17.9					29.3					12.6		2.3	13.6	18.5	16.7
12 - 14	6.1	13.5	13.9	7.9		TD@12.5 ftbgl					21.2					12.0		5.3	12.6	17.3	19.1
14 - 16	5.2	12.2	13.5	6.7							TD@14 ftbgl					12.9		2.1	216.0	14.9	13.6
16 - 18	5.1	12.4	TD@16 ftbgl	5.9												SAT		5.3	1538.0	2530.0	TD@16.5ftbgl
18 - 20	6.3	10.8		3.0												SAT		4.3	370.0	SAT	
20 - 22	TD@20 ftbgl	TD@20 ftbgl		TD@20 ftbgl												4.8		4.6	49.4	SAT	
22 - 24																4.2		9.9	SAT	SAT	
24 - 26																TD@24 ftbgl		5.6	SAT	185.0	
26 - 28																		7.5	SAT	SAT	
28 - 30																		2.6	SAT	125.9	
30 - 32																		3.3	TD@30 ftbgl	47.5	
32 - 34																		3.8		TD@32 ftbgl	
34 - 36																		TD@34 ftbgl			
36 - 38																					

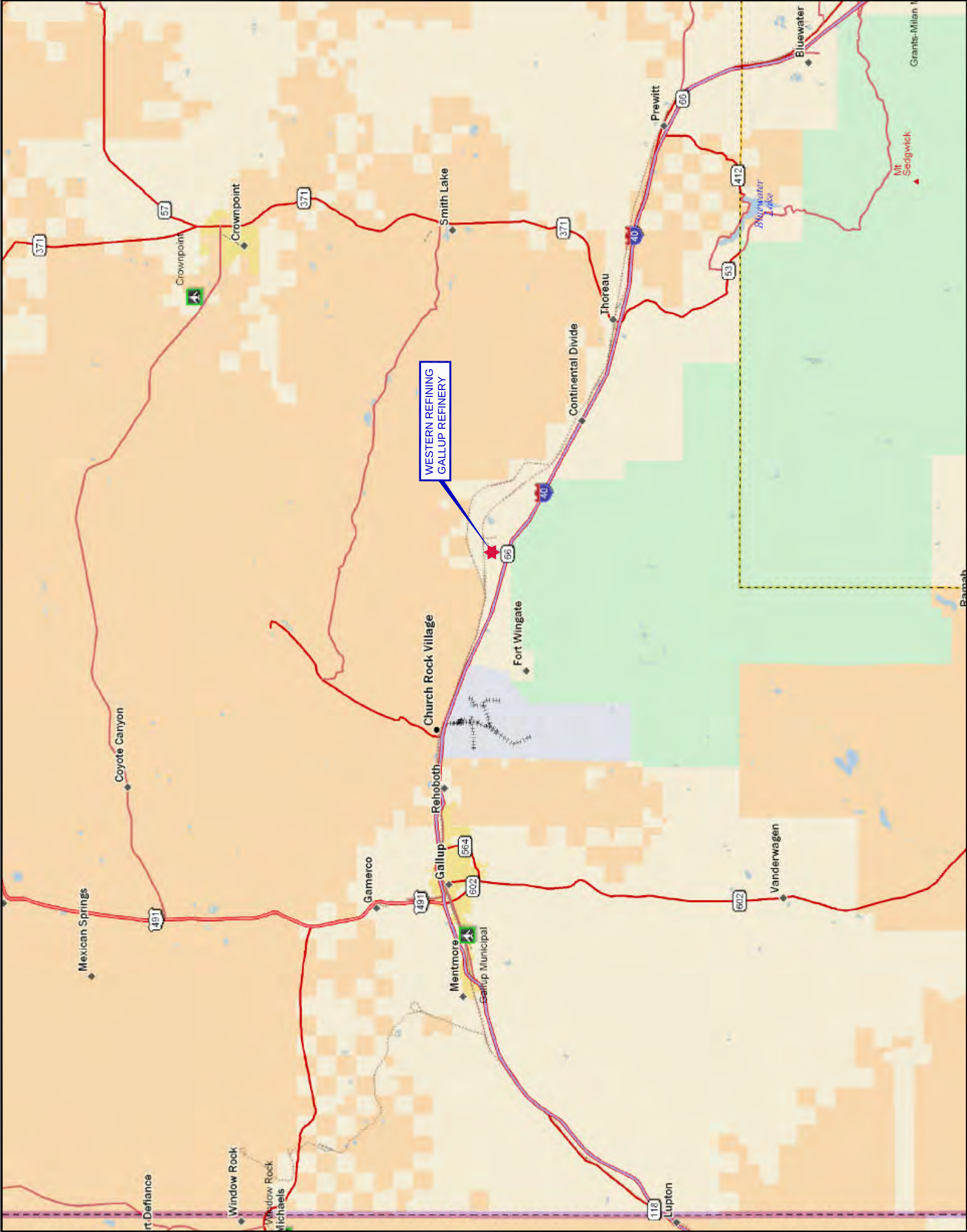
ftbgl - feet below ground level ppm - parts per million SAT - Interval was saturated. No reading was collected.

NR - NR - No sample recovery. No reading was collected.

1. - borings with two values indicate results for the 0-0.5' and 0.5-2.0' intervals

Figures

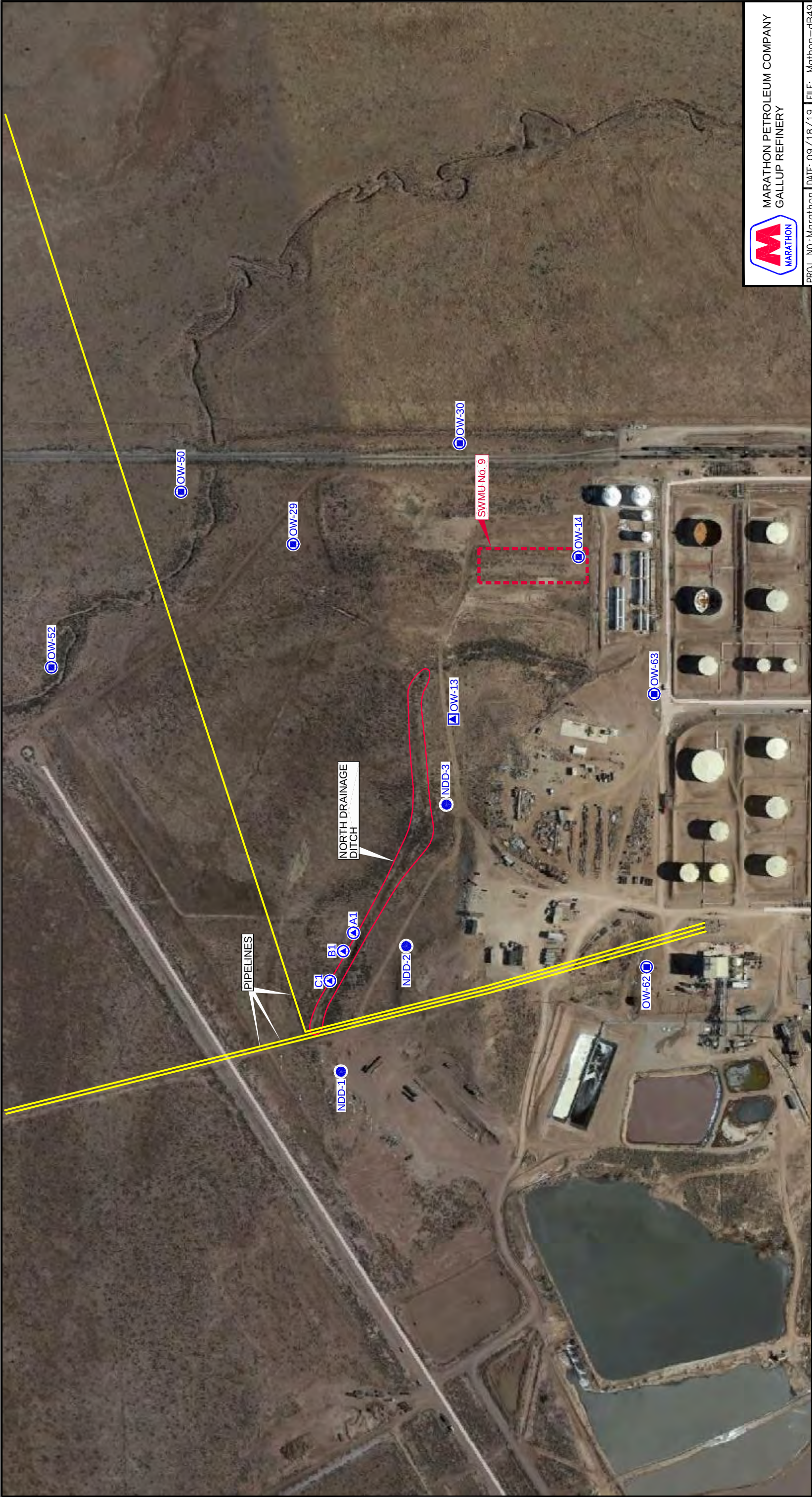
- Figure 1 Site Location Map**
- Figure 2 Investigation Area**
- Figure 3 North Drainage Ditch**
- Figure 4 Topographic Map**
- Figure 5 Proposed Boring Location Map**
-
-



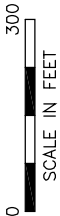
PROJ. NO.: Western Refining DATE: 07/13/14 FILE: WestRef-B198

FIGURE 1
SITE LOCATION MAP
GALLUP REFINERY

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

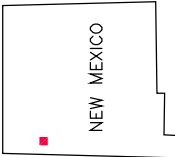


Aerial Map Source: Google Map, 02/19/2014.



LEGEND

- A1 SURFACE WATER SAMPLE LOCATION AND IDENTIFICATION NUMBER
- NDD-1 TEMPORARY MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
- OW-13 SONSELA MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
- OW-14 ALLUVIUM/CHINLE GP MONITORING WELL LOCATION AND IDENTIFICATION NUMBER



GALLUP SITE LOCATION



MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 09/18/19 | FILE: Mathon-dB49

FIGURE 2
INVESTIGATION AREA



8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



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



MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 4/16/19 | FILE: Mathon-dB152

FIGURE 3

NORTH DRAINAGE DITCH



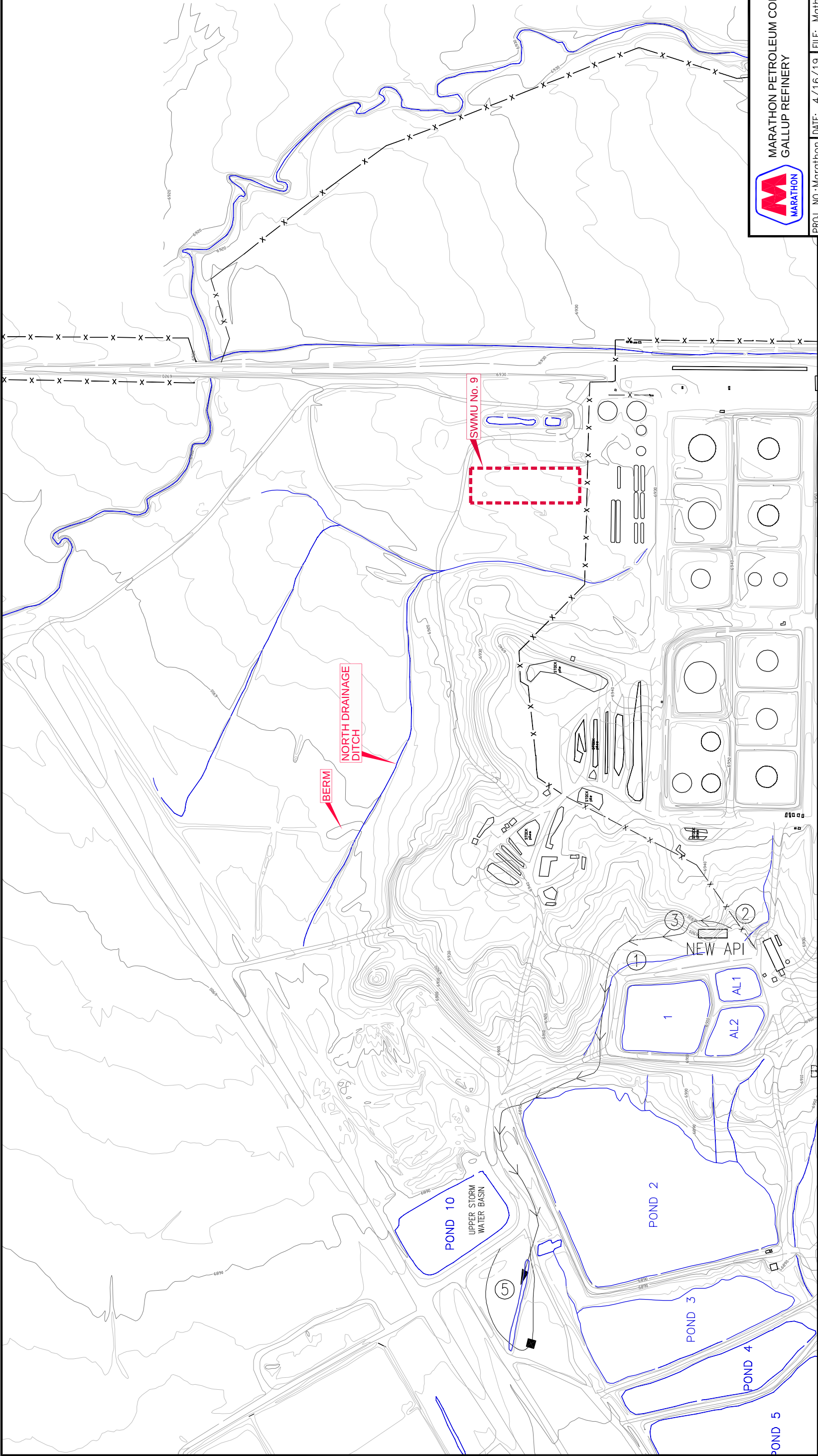
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



GALLUP SITE LOCATION

LEGEND

-  NDD-1
- SOIL BORING LOCATION AND IDENTIFICATION NUMBER
-  NDD-5
- SURFACE SOIL (0-2') LOCATION AND IDENTIFICATION NUMBER
-  NDD-4
- SOIL BORING / TEMP. WELL LOCATION AND IDENTIFICATION NUMBER
-  A1
- SURFACE WATER SAMPLE LOCATION AND IDENTIFICATION NUMBER





MARATHON PETROLEUM COMPANY
GALLUP REFINERY

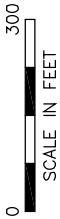
PROJ. NO.: Marathon | DATE: 4/16/19 | FILE: Mathon-dB52

FIGURE 4

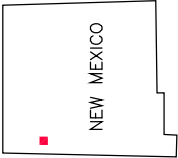
TOPOGRAPHIC MAP



8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



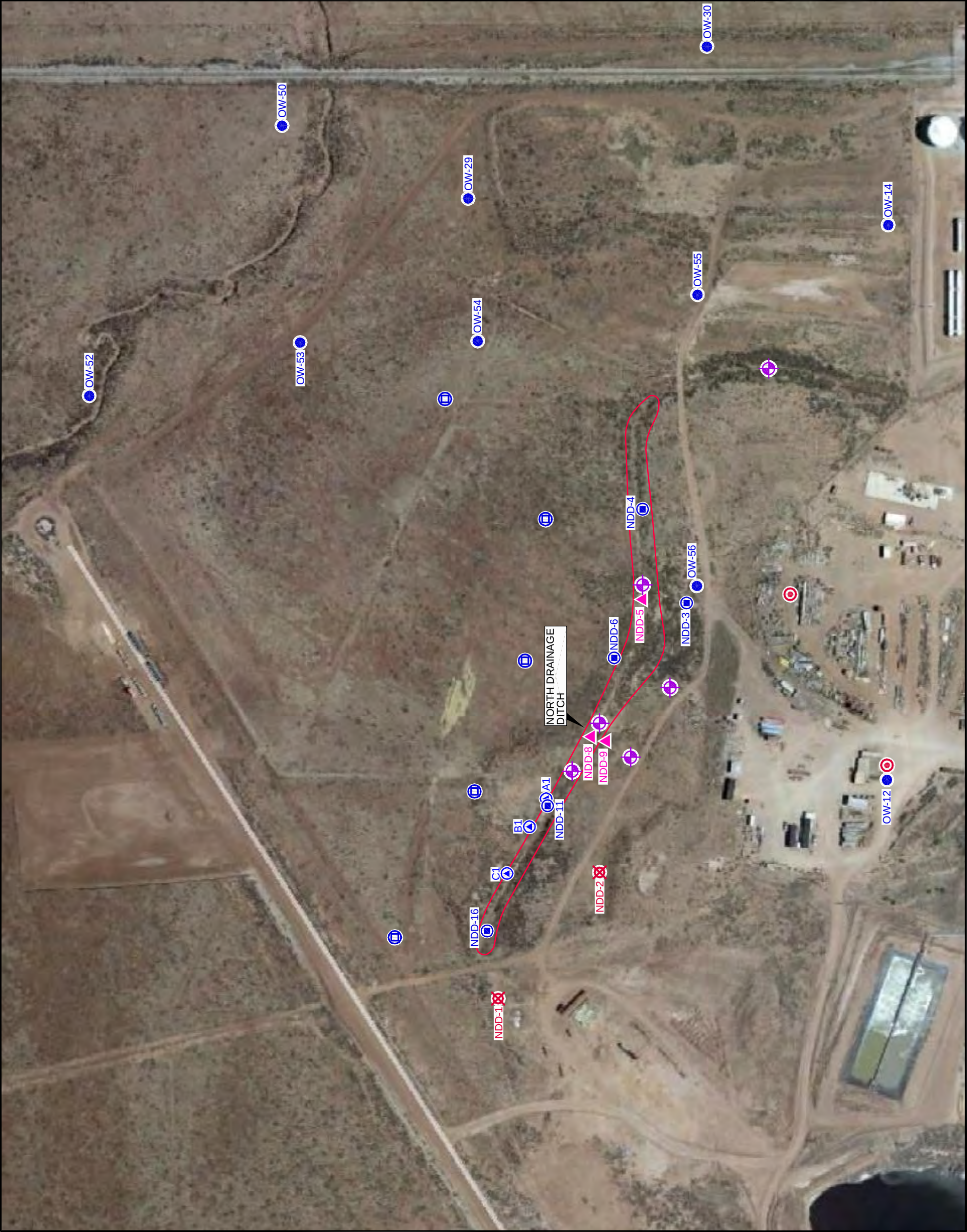
NOTE:
CONTOUR INTERVAL = 2.0 FEET



GALLUP SITE LOCATION

LEGEND

- PROPOSED PERMANENT MONITORING WELL LOCATION
- PROPOSED SOIL BORING LOCATION
- PROPOSED TEMPORARY MONITORING WELL LOCATION
- SOIL BORING LOCATION AND IDENTIFICATION NUMBER
- SURFACE WATER SAMPLE LOCATION AND IDENTIFICATION NUMBER
- TEMPORARY MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
- ALLUVIUM / CHINLE GP MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
- HAND AUGER LOCATION AND IDENTIFICATION NUMBER



MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 09/18/19 | FILE: Mathon-dB213

FIGURE 5
PROPOSED
BORING LOCATION MAP



8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Appendix A

Analytical Data Reports



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

May 22, 2015

Cheryl Johnson

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-0231
FAX (505) 722-0210

RE: North Drainage Ditch

OrderNo.: 1505702

Dear Cheryl Johnson:

Hall Environmental Analysis Laboratory received 2 sample(s) on 5/15/2015 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1505702

Date Reported: 5/22/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: NDD-3-GW

Project: North Drainage Ditch

Collection Date: 5/14/2015 8:30:00 AM

Lab ID: 1505702-001

Matrix: AQUEOUS

Received Date: 5/15/2015 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: GASOLINE RANGE							Analyst: cadg
Gasoline Range Organics (GRO)	0.56	0.050		mg/L	1	5/20/2015 6:42:22 PM	R26322
Surr: BFB	86.6	70-130		%REC	1	5/20/2015 6:42:22 PM	R26322
EPA METHOD 8015D: DIESEL RANGE							Analyst: KJH
Diesel Range Organics (DRO)	1.1	1.0		mg/L	1	5/15/2015 8:38:14 PM	19246
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	5/15/2015 8:38:14 PM	19246
Surr: DNOP	129	76.5-150		%REC	1	5/15/2015 8:38:14 PM	19246
EPA METHOD 8270C: SEMIVOLATILES							Analyst: JDC
Acenaphthene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Acenaphthylene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Aniline	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Anthracene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Azobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Benz(a)anthracene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Benzo(a)pyrene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Benzo(b)fluoranthene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Benzo(g,h,i)perylene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Benzo(k)fluoranthene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Benzoic acid	ND	20		µg/L	1	5/19/2015 6:03:06 PM	19289
Benzyl alcohol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Bis(2-chloroethyl)ether	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Bis(2-chloroisopropyl)ether	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Bis(2-ethylhexyl)phthalate	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4-Bromophenyl phenyl ether	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Butyl benzyl phthalate	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Carbazole	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4-Chloro-3-methylphenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4-Chloroaniline	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2-Chloronaphthalene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2-Chlorophenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4-Chlorophenyl phenyl ether	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Chrysene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Di-n-butyl phthalate	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Di-n-octyl phthalate	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Dibenz(a,h)anthracene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Dibenzofuran	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
1,2-Dichlorobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
1,3-Dichlorobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289

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

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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1505702

Date Reported: 5/22/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: NDD-3-GW

Project: North Drainage Ditch

Collection Date: 5/14/2015 8:30:00 AM

Lab ID: 1505702-001

Matrix: AQUEOUS

Received Date: 5/15/2015 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES							Analyst: JDC
1,4-Dichlorobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
3,3'-Dichlorobenzidine	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Diethyl phthalate	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Dimethyl phthalate	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2,4-Dichlorophenol	ND	20		µg/L	1	5/19/2015 6:03:06 PM	19289
2,4-Dimethylphenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4,6-Dinitro-2-methylphenol	ND	20		µg/L	1	5/19/2015 6:03:06 PM	19289
2,4-Dinitrophenol	ND	20		µg/L	1	5/19/2015 6:03:06 PM	19289
2,4-Dinitrotoluene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2,6-Dinitrotoluene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Fluoranthene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Fluorene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Hexachlorobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Hexachlorobutadiene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Hexachlorocyclopentadiene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Hexachloroethane	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Isophorone	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
1-Methylnaphthalene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2-Methylnaphthalene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2-Methylphenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
3+4-Methylphenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
N-Nitrosodimethylamine	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
N-Nitrosodiphenylamine	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Naphthalene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2-Nitroaniline	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
3-Nitroaniline	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4-Nitroaniline	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Nitrobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2-Nitrophenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4-Nitrophenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Pentachlorophenol	ND	20		µg/L	1	5/19/2015 6:03:06 PM	19289
Phenanthrene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Phenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Pyrene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Pyridine	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
1,2,4-Trichlorobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2,4,5-Trichlorophenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289

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

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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1505702

Date Reported: 5/22/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: NDD-3-GW

Project: North Drainage Ditch

Collection Date: 5/14/2015 8:30:00 AM

Lab ID: 1505702-001

Matrix: AQUEOUS

Received Date: 5/15/2015 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES							Analyst: JDC
2,4,6-Trichlorophenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Surr: 2-Fluorophenol	67.9	14.9-111		%REC	1	5/19/2015 6:03:06 PM	19289
Surr: Phenol-d5	77.2	11.3-108		%REC	1	5/19/2015 6:03:06 PM	19289
Surr: 2,4,6-Tribromophenol	81.2	15.7-154		%REC	1	5/19/2015 6:03:06 PM	19289
Surr: Nitrobenzene-d5	103	47.8-106		%REC	1	5/19/2015 6:03:06 PM	19289
Surr: 2-Fluorobiphenyl	105	21.3-123		%REC	1	5/19/2015 6:03:06 PM	19289
Surr: 4-Terphenyl-d14	101	14.3-135		%REC	1	5/19/2015 6:03:06 PM	19289
EPA METHOD 8260B: VOLATILES							Analyst: cadg
Benzene	1.1	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Toluene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Ethylbenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Methyl tert-butyl ether (MTBE)	260	10		µg/L	10	5/19/2015 1:54:07 PM	R26299
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2-Dichloroethane (EDC)	6.3	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Naphthalene	ND	2.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1-Methylnaphthalene	ND	4.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
2-Methylnaphthalene	ND	4.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Acetone	ND	10		µg/L	1	5/19/2015 6:10:15 AM	R26263
Bromobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Bromodichloromethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Bromoform	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Bromomethane	ND	3.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
2-Butanone	ND	10		µg/L	1	5/19/2015 6:10:15 AM	R26263
Carbon disulfide	ND	10		µg/L	1	5/19/2015 6:10:15 AM	R26263
Carbon Tetrachloride	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Chlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Chloroethane	ND	2.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Chloroform	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Chloromethane	ND	3.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
2-Chlorotoluene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
4-Chlorotoluene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
cis-1,2-DCE	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Dibromochloromethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Dibromomethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2-Dichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263

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

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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1505702

Date Reported: 5/22/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: NDD-3-GW

Project: North Drainage Ditch

Collection Date: 5/14/2015 8:30:00 AM

Lab ID: 1505702-001

Matrix: AQUEOUS

Received Date: 5/15/2015 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: cadg
1,3-Dichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,4-Dichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Dichlorodifluoromethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1-Dichloroethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1-Dichloroethene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2-Dichloropropane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,3-Dichloropropane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
2,2-Dichloropropane	ND	2.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1-Dichloropropene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Hexachlorobutadiene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
2-Hexanone	ND	10		µg/L	1	5/19/2015 6:10:15 AM	R26263
Isopropylbenzene	47	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
4-Isopropyltoluene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
4-Methyl-2-pentanone	ND	10		µg/L	1	5/19/2015 6:10:15 AM	R26263
Methylene Chloride	ND	3.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
n-Butylbenzene	ND	3.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
n-Propylbenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
sec-Butylbenzene	9.5	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Styrene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
tert-Butylbenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
trans-1,2-DCE	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1,1-Trichloroethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1,2-Trichloroethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Trichloroethene (TCE)	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Trichlorofluoromethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2,3-Trichloropropane	ND	2.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Vinyl chloride	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Xylenes, Total	ND	1.5		µg/L	1	5/19/2015 6:10:15 AM	R26263
Surr: 1,2-Dichloroethane-d4	103	70-130		%REC	1	5/19/2015 6:10:15 AM	R26263
Surr: 4-Bromofluorobenzene	94.8	70-130		%REC	1	5/19/2015 6:10:15 AM	R26263
Surr: Dibromofluoromethane	108	70-130		%REC	1	5/19/2015 6:10:15 AM	R26263
Surr: Toluene-d8	101	70-130		%REC	1	5/19/2015 6:10:15 AM	R26263

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

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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1505702

Date Reported: 5/22/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: Trip Blank

Project: North Drainage Ditch

Collection Date:

Lab ID: 1505702-002

Matrix: TRIP BLANK

Received Date: 5/15/2015 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: GASOLINE RANGE							Analyst: cadg
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	5/20/2015 7:11:07 PM	R26322
Surr: BFB	99.7	70-130		%REC	1	5/20/2015 7:11:07 PM	R26322
EPA METHOD 8260B: VOLATILES							Analyst: cadg
Benzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Toluene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Ethylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Naphthalene	ND	2.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1-Methylnaphthalene	ND	4.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
2-Methylnaphthalene	ND	4.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Acetone	ND	10		µg/L	1	5/19/2015 6:38:54 AM	R26263
Bromobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Bromodichloromethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Bromoform	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Bromomethane	ND	3.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
2-Butanone	ND	10		µg/L	1	5/19/2015 6:38:54 AM	R26263
Carbon disulfide	ND	10		µg/L	1	5/19/2015 6:38:54 AM	R26263
Carbon Tetrachloride	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Chlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Chloroethane	ND	2.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Chloroform	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Chloromethane	ND	3.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
2-Chlorotoluene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
4-Chlorotoluene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
cis-1,2-DCE	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Dibromochloromethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Dibromomethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2-Dichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,3-Dichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,4-Dichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Dichlorodifluoromethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1-Dichloroethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1-Dichloroethene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263

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

Qualifiers:	* Value exceeds Maximum Contaminant Level.
	E Value above quantitation range
	J Analyte detected below quantitation limits
	O RSD is greater than RSDlimit
	R RPD outside accepted recovery limits
	S Spike Recovery outside accepted recovery limits

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1505702

Date Reported: 5/22/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: Trip Blank

Project: North Drainage Ditch

Collection Date:

Lab ID: 1505702-002

Matrix: TRIP BLANK

Received Date: 5/15/2015 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: cadg
1,2-Dichloropropane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,3-Dichloropropane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
2,2-Dichloropropane	ND	2.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1-Dichloropropene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Hexachlorobutadiene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
2-Hexanone	ND	10		µg/L	1	5/19/2015 6:38:54 AM	R26263
Isopropylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
4-Isopropyltoluene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
4-Methyl-2-pentanone	ND	10		µg/L	1	5/19/2015 6:38:54 AM	R26263
Methylene Chloride	ND	3.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
n-Butylbenzene	ND	3.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
n-Propylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
sec-Butylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Styrene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
tert-Butylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
trans-1,2-DCE	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1,1-Trichloroethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1,2-Trichloroethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Trichloroethene (TCE)	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Trichlorofluoromethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2,3-Trichloropropane	ND	2.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Vinyl chloride	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Xylenes, Total	ND	1.5		µg/L	1	5/19/2015 6:38:54 AM	R26263
Surr: 1,2-Dichloroethane-d4	104	70-130		%REC	1	5/19/2015 6:38:54 AM	R26263
Surr: 4-Bromofluorobenzene	104	70-130		%REC	1	5/19/2015 6:38:54 AM	R26263
Surr: Dibromofluoromethane	106	70-130		%REC	1	5/19/2015 6:38:54 AM	R26263
Surr: Toluene-d8	97.3	70-130		%REC	1	5/19/2015 6:38:54 AM	R26263

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	Page 6 of 16
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	
	J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit	
	O	RSD is greater than RSDlimit	P	Sample pH Not In Range	
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	
	S	Spike Recovery outside accepted recovery limits			

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	MB-19246	SampType: MBLK			TestCode: EPA Method 8015D: Diesel Range					
Client ID:	PBW	Batch ID: 19246			RunNo: 26216					
Prep Date:	5/15/2015	Analysis Date: 5/15/2015			SeqNo: 778433		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	1.4		1.000		137	76.5	150			

Sample ID	LCS-19246		SampType: LCS		TestCode: EPA Method 8015D: Diesel Range					
Client ID:	LCSW		Batch ID: 19246		RunNo: 26216					
Prep Date:	5/15/2015		Analysis Date: 5/15/2015		SeqNo: 778434		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	117	60.1	156			
Surr: DNOP	0.62		0.5000		124	76.5	150			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup**Project:** North Drainage Ditch

Sample ID	5mL rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID: R26263			RunNo: 26263					
Prep Date:		Analysis Date: 5/18/2015			SeqNo: 779854	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.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	5mL rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID: R26263			RunNo: 26263					
Prep Date:		Analysis Date: 5/18/2015			SeqNo: 779854		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	9.8		10.00		98.3	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID	100ng lcs	SampType: LCS			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID: R26263			RunNo: 26263					
Prep Date:		Analysis Date: 5/18/2015			SeqNo: 779856		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	20	1.0	20.00	0	101	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
E Value above quantitation range	H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits	ND Not Detected at the Reporting Limit
O RSD is greater than RSDlimit	P Sample pH Not In Range
R RPD outside accepted recovery limits	RL Reporting Detection Limit
S Spike Recovery outside accepted recovery limits	

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID 100ng lcs	SampType: LCS			TestCode: EPA Method 8260B: VOLATILES						
Client ID: LCSW	Batch ID: R26263			RunNo: 26263						
Prep Date:	Analysis Date: 5/18/2015			SeqNo: 779856		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	24	1.0	20.00	0	118	75.6	144			
Trichloroethene (TCE)	19	1.0	20.00	0	95.4	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	9.8		10.00		98.0	70	130			

Sample ID 5mL rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES						
Client ID: PBW	Batch ID: R26299			RunNo: 26299						
Prep Date:	Analysis Date: 5/19/2015			SeqNo: 781268		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								
Surr: 1,2-Dichloroethane-d4	10		10.00		102	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		104	70	130			
Surr: Dibromofluoromethane	10		10.00		102	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: R26299			RunNo: 26299						
Prep Date:	Analysis Date: 5/19/2015			SeqNo: 781270		Units: %REC				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		102	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.7	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	10		10.00		99.6	70	130			

Sample ID 5mL rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES						
Client ID: PBW	Batch ID: R26322			RunNo: 26322						
Prep Date:	Analysis Date: 5/20/2015			SeqNo: 782101		Units: %REC				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	11		10.00		107	70	130			
Surr: 4-Bromofluorobenzene	12		10.00		116	70	130			
Surr: Dibromofluoromethane	11		10.00		107	70	130			
Surr: Toluene-d8	9.4		10.00		93.8	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	100ng lcs	SampType:	LCS	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID:	R26322	RunNo:	26322					
Prep Date:		Analysis Date:	5/20/2015	SeqNo:	782103	Units:	%REC			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		102	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		98.7	70	130			
Surr: Dibromofluoromethane	9.8		10.00		98.1	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Qualifiers:

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E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	mb-19289		SampType: MBLK		TestCode: EPA Method 8270C: Semivolatiles					
Client ID:	PBW		Batch ID: 19289		RunNo: 26300					
Prep Date:	5/19/2015		Analysis Date: 5/19/2015		SeqNo: 781333		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	ND	20								
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:

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R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	mb-19289	SampType:	MBLK	TestCode:	EPA Method 8270C: Semivolatiles					
Client ID:	PBW	Batch ID:	19289	RunNo:	26300					
Prep Date:	5/19/2015	Analysis Date:	5/19/2015	SeqNo:	781333	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	150		200.0		76.8	14.9	111			
Surr: Phenol-d5	160		200.0		80.8	11.3	108			
Surr: 2,4,6-Tribromophenol	160		200.0		80.2	15.7	154			
Surr: Nitrobenzene-d5	76		100.0		76.1	47.8	106			
Surr: 2-Fluorobiphenyl	78		100.0		78.4	21.3	123			
Surr: 4-Terphenyl-d14	110		100.0		105	14.3	135			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	lcs-19289		SampType: LCS		TestCode: EPA Method 8270C: Semivolatiles					
Client ID:	LCSW		Batch ID: 19289		RunNo: 26300					
Prep Date:	5/19/2015		Analysis Date: 5/19/2015		SeqNo: 781334		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	76	10	100.0	0	75.9	47.8	99.7			
4-Chloro-3-methylphenol	160	10	200.0	0	79.9	58.1	103			
2-Chlorophenol	140	10	200.0	0	70.4	49.5	96.8			
1,4-Dichlorobenzene	73	10	100.0	0	72.6	40.4	89.4			
2,4-Dinitrotoluene	70	10	100.0	0	69.6	38.6	91.3			
N-Nitrosodi-n-propylamine	80	10	100.0	0	80.1	53.9	95.6			
4-Nitrophenol	140	10	200.0	0	71.9	26.4	108			
Pentachlorophenol	120	20	200.0	0	61.8	36.5	86.6			
Phenol	160	10	200.0	0	77.8	29.3	108			
Pyrene	74	10	100.0	0	73.9	45.7	100			
1,2,4-Trichlorobenzene	81	10	100.0	0	80.7	39.3	94.5			
Surr: 2-Fluorophenol	150		200.0		74.2	14.9	111			
Surr: Phenol-d5	170		200.0		83.5	11.3	108			
Surr: 2,4,6-Tribromophenol	170		200.0		86.1	15.7	154			
Surr: Nitrobenzene-d5	82		100.0		81.8	47.8	106			
Surr: 2-Fluorobiphenyl	86		100.0		86.4	21.3	123			
Surr: 4-Terphenyl-d14	79		100.0		78.7	14.3	135			

Sample ID	1505702-001Dms		SampType: MS		TestCode: EPA Method 8270C: Semivolatiles					
Client ID:	NDD-3-GW		Batch ID: 19289		RunNo: 26300					
Prep Date:	5/19/2015		Analysis Date: 5/19/2015		SeqNo: 781339		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	80	10	100.0	0	80.4	46.4	121			
4-Chloro-3-methylphenol	170	10	200.0	0	85.8	45.3	135			
2-Chlorophenol	170	10	200.0	0	83.5	28.7	129			
1,4-Dichlorobenzene	81	10	100.0	0	80.8	42.6	104			
2,4-Dinitrotoluene	70	10	100.0	0	70.5	28.9	126			
N-Nitrosodi-n-propylamine	89	10	100.0	0	89.4	49.2	117			
4-Nitrophenol	130	10	200.0	0	62.8	18.1	97.2			
Pentachlorophenol	150	20	200.0	4.440	73.9	24.8	127			
Phenol	140	10	200.0	0	68.1	17.9	93.6			
Pyrene	79	10	100.0	0	79.4	29.6	142			
1,2,4-Trichlorobenzene	90	10	100.0	0	90.3	39.5	109			
Surr: 2-Fluorophenol	160		200.0		80.0	14.9	111			
Surr: Phenol-d5	150		200.0		73.7	11.3	108			
Surr: 2,4,6-Tribromophenol	190		200.0		96.1	15.7	154			
Surr: Nitrobenzene-d5	92		100.0		92.3	47.8	106			
Surr: 2-Fluorobiphenyl	94		100.0		93.6	21.3	123			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 E Value above quantitation range
 J Analyte detected below quantitation limits
 O RSD is greater than RSDlimit
 R RPD outside accepted recovery limits
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 P Sample pH Not In Range
 RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	1505702-001Dms	SampType:	MS	TestCode:	EPA Method 8270C: Semivolatiles					
Client ID:	NDD-3-GW	Batch ID:	19289	RunNo:	26300					
Prep Date:	5/19/2015	Analysis Date:	5/19/2015	SeqNo:	781339	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	89		100.0		89.2	14.3	135			

Sample ID	1505702-001Dmsd	SampType:	MSD	TestCode:	EPA Method 8270C: Semivolatiles					
Client ID:	NDD-3-GW	Batch ID:	19289	RunNo:	26300					
Prep Date:	5/19/2015	Analysis Date:	5/19/2015	SeqNo:	781340	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	89	10	100.0	0	88.6	46.4	121	9.73	31.3	
4-Chloro-3-methylphenol	180	10	200.0	0	88.9	45.3	135	3.54	29	
2-Chlorophenol	180	10	200.0	0	90.5	28.7	129	8.09	28.4	
1,4-Dichlorobenzene	92	10	100.0	0	91.9	42.6	104	12.8	28.2	
2,4-Dinitrotoluene	72	10	100.0	0	71.5	28.9	126	1.49	22.9	
N-Nitrosodi-n-propylamine	99	10	100.0	0	99.5	49.2	117	10.7	28.8	
4-Nitrophenol	130	10	200.0	0	63.3	18.1	97.2	0.714	41.5	
Pentachlorophenol	170	20	200.0	4.440	83.1	24.8	127	11.4	45.1	
Phenol	130	10	200.0	0	66.3	17.9	93.6	2.80	33.9	
Pyrene	88	10	100.0	0	88.5	29.6	142	10.8	33.6	
1,2,4-Trichlorobenzene	96	10	100.0	0	95.8	39.5	109	5.95	28.2	
Surr: 2-Fluorophenol	160		200.0		78.3	14.9	111	0	0	
Surr: Phenol-d5	140		200.0		71.3	11.3	108	0	0	
Surr: 2,4,6-Tribromophenol	200		200.0		99.2	15.7	154	0	0	
Surr: Nitrobenzene-d5	95		100.0		95.1	47.8	106	0	0	
Surr: 2-Fluorobiphenyl	99		100.0		99.4	21.3	123	0	0	
Surr: 4-Terphenyl-d14	89		100.0		89.2	14.3	135	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	5mL rb	SampType:	MBLK	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	PBW	Batch ID:	R26322	RunNo:	26322					
Prep Date:		Analysis Date:	5/20/2015	SeqNo:	782177	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	10		10.00		102	70	130			

Sample ID	2.5ug gro lcs	SampType:	LCS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	LCSW	Batch ID:	R26322	RunNo:	26322					
Prep Date:		Analysis Date:	5/20/2015	SeqNo:	782181	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.46	0.050	0.5000	0	91.6	80.6	122			
Surr: BFB	9.8		10.00		97.7	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

Sample Log-In Check List

Client Name: **Western Refining Gallup**

Work Order Number: **1505702**

RcptNo: 1

Received by/date:

[Signature]

05/15/15

Logged By: **Lindsay Mangin**

5/15/2015 8:55:00 AM

[Signature]

Completed By: **Lindsay Mangin**

5/15/2015 9:45:48 AM

[Signature]

Reviewed By:

[Signature]

05/19/15

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?

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: *Poured off for 8015 DR20 analysis from a 1L Amber into a 250 ml Am*

CS 05/15/15

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.1	Good	Yes			

Chain-of-Custody Record		Turn-Around Time:
Client:	WESTERN REFINING SW, INC.	☒ Standard ☐ Rush
	GALLUP REFINERY	Project Name:
Mailing Address:	92 GIANT CROSSING ROAD	Project #:
	GALLUP, NEW MEXICO 87901	
Phone #:	505-772-0231	

☒ Standard ☐ Rush _____

Project Name: _____

Client: WESTERN REFINING SW, INC.

mailing Address: GIANT CROSSING ROAD

GALLUP, NEW MEXICO 874301

hone #: 505-772-0231

mail or Fax#: CHERYL JOHNSON @ WNR.COM

A/QC Package:

☐ Level 4 (Full Validation)

ccreditation

☐ NELAP ☐ Other

KEDD (Type) EXCEL

[illegible]

Date	Time	Matrix	Sample Request ID
------	------	--------	-------------------

[illegible]

14-190830	WATER	NDD-3-GW
-----------	-------	----------

	Tire	Blank
--	------	-------

		17.8	Orange
		18	05/15/16

01/2/2023			
-----------	--	--	--

[illegible][illegible][illegible][illegible][illegible][illegible][illegible]

Date: 1/11	Time:	Relinquished by:
------------	-------	------------------

14.15 13.15 12.15 11.15 10.15 9.15 8.15 7.15 6.15 5.15 4.15 3.15 2.15 1.15 12.15 11.15 10.15 9.15 8.15 7.15 6.15 5.15 4.15 3.15 2.15 1.15

Date: 11/11/11	Time: 11:11	Relinquished by: 11/11/11
---------------------------	------------------------	--------------------------------------

50

7-5	855	<i>[Signature]</i>
-----	-----	--------------------

If necessary, samples submitted for Hall Environmental may be submitted

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

[illegible]

Remarks:

Date	Time	Relinquished by:	Received by:	Date	Time
14.13	1316	A7	[Signature]	5-14-15	1315
14.15	8:53	[Signature]	[Signature]	05/15/15	0855

Any sub-contracted data will be clearly notated on the analytical report. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate
District Office in accordance
with Rule 116 on back
side of form

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Western Refining Southwest Inc.	Contact Gaurav Rajen	
Address I-40 Exit 39, Jamestown, NM 87347	Telephone No. 505-722-0227	
Facility Name Gallup Refinery	Facility Type Oil refinery	
Surface Owner Western Refining	Mineral Owner Western Refining	Lease No.

LOCATION OF RELEASE

Unit Letter	Section 23&33	Township 15N	Range 15W	Feet from the	North/South Line	Feet from the	East/West Line	County McKinley
-------------	------------------	-----------------	--------------	---------------	------------------	---------------	----------------	--------------------

Latitude 35°29'22" Longitude 108°25'24"

NATURE OF RELEASE

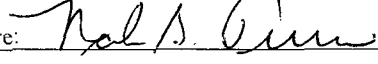
Type of Release Suspected historical release of hydrocarbons recently washed into a ditch by rainfall – based on smell of diesel, possible oil sheen on liquids	Volume of Release 30 barrels (1,200 gallons) estimated of oily water – the hydrocarbon content is much lesser	Volume Recovered 0 barrels
Source of Release It appears that a rain event may have picked up hydrocarbons absorbed onto surface/ subsurface soils from historical spills and collected in a ditch running east to west at the north-west end of the hill on which the refinery is located	Date and Hour of Occurrence Within past 10 - 15 days (approximately)	Date and Hour of Discovery 10/19/2009; 1:30 pm
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Carl J. Chavez, NMEMNRD, Oil Conservation Division; Hope Monzeglio, NMED Hazardous Waste Bureau (via telephone)	
By Whom? Gaurav Rajen	Date and Hour 10/20/2009 (approximately) 11:00 am	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. Not applicable	

If a Watercourse was Impacted, Describe Fully.* Not applicable

Describe Cause of Problem and Remedial Action Taken.* At approximately 1:30 pm on 10/19/2009, during a routine walk-through of arroyos and ditches in a field that lies immediately north of the hill on which the refinery is located, a ditch containing non-moving water was found to have some possible hydrocarbon staining – suspected from color of the water and smell of diesel.

Describe Area Affected and Cleanup Action Taken.* The affected area has a surface area less than approximately 150 square feet with some vertical penetration of the (possible) hydrocarbons to an as yet unknown depth. We plan to collect water and sludge samples, then pick up the water using a truck with a vacuum pump. We will then wait to see if the water reappears and is a continuous seep, or an occurrence caused by a rain event. In further cleanup actions, contaminated soils will be excavated, confirmatory environmental samples will be collected and analyzed, and all contaminated materials will be disposed off in accordance with applicable regulations.

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

Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Mark B. Turri	Approved by District Supervisor:	
Title: Refinery Manager – Gallup	Approval Date:	Expiration Date:
E-mail Address: mturri@wnr.com	Conditions of Approval:	Attached ☐
Date: 10-20-2009	Phone: 505-722-3833	

• Attach Additional Sheets If Necessary

Chavez, Carl J, EMNRD

From: Rajen, Gaurav [Gaurav.Rajen@wnr.com]
Sent: Thursday, October 22, 2009 1:18 PM
To: Monzeglio, Hope, NMENV
Cc: Riege, Ed; Turri, Mark; Chavez, Carl J, EMNRD; Cobrain, Dave, NMENV; Kieling, John, NMENV; Larsen, Thurman
Subject: RE: C-141 for possible release of hydrocarbons - October 20, 2009

Dear Hope:

Many thanks for your recent e-mail. In response to your request for more information –

- 1) We have collected water and sludge samples from three locations in the ditch (that runs generally southeast-northwest) on Tuesday morning, October 20, 2009 – a) at the southeast end, b) mid-way along the ditch, and c) at the northwest end. The samples are being analyzed for – water: TPH, method 418.1; sludge: Semi-volatile Organic Compounds (SVOCs), method 8270C, metals (TCLP); and TPH (method 418.1). These are screening samples. Based on our test results, we will plan additional analyses as needed.
- 2) We collected grab samples using dedicated augers for each of the three sludge samples, and dedicated booms with cups and/or bottles for the water samples. There were no field investigation-derived wastes generated. The sample containers, preservatives, cooling requirements and holding times were as required by the test methods and the testing laboratory.
- 3) A figure showing the approximate location of the ditch is attached below. (For your reference, the ditch is somewhat west and south of OW-13. For ease of location on the larger map we have drawn it much bigger than it actually is – the length must be about 40 feet or so, and a few feet wide and deep, with the water depth being a few inches and a foot or so wide.)

Best regards,

Raj



Approximate location of ditch – not to scale



From: Monzeglio, Hope, NMENV [mailto:hope.monzeglio@state.nm.us]

Sent: Wednesday, October 21, 2009 7:54 AM

To: Rajen, Gaurav

Cc: Riege, Ed; Turri, Mark; Chavez, Carl J, EMNRD; Cobrain, Dave, NMENV; Kielling, John, NMENV

Subject: RE: C-141 for possible release of hydrocarbons - October 20, 2009

Raj

NMED would like some additional information from review of the C-141 form: 1) what analytical methods will be run on the water and sludge samples; 2) provide me with a description of how Gallup will collect the water and sludge samples; 3) provide a figure showing the location of the ditch with the stagnant water. This information can be sent via email. Let me know if you have any questions.

COVER LETTER

Wednesday, November 04, 2009

Gaurav Rajen
Western Refining Southwest, Gallup
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-0227
FAX (505) 722-0210

RE: Ditch N of Hill-NW

Order No.: 0910423

Dear Gaurav Rajen:

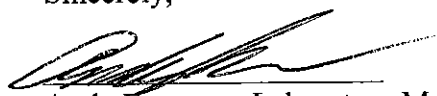
Hall Environmental Analysis Laboratory, Inc. received 6 sample(s) on 10/22/2009 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. Below is a list of our accreditations. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

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

Sincerely,



Andy Freeman, Laboratory Manager

NM Lab # NM9425
AZ license # AZ0682
ORELAP Lab # NM100001
Texas Lab# T104704424-08-TX



Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup**Client Sample ID:** DITCH - W1**Lab Order:** 0910423**Collection Date:** 10/20/2009 2:40:00 PM**Project:** Ditch N of Hill-NW**Date Received:** 10/22/2009**Lab ID:** 0910423-01**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 418.1: TPH						Analyst: JB
Petroleum Hydrocarbons, TR	27	1.0		mg/L	1	10/26/2009

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-02

Client Sample ID: DITCH -SS1
Collection Date: 10/20/2009 2:10:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY, TCLP						
Mercury	ND	0.020		mg/L	1	Analyst: IC 10/29/2009 2:36:05 PM
EPA METHOD 6010B: TCLP METALS						
Arsenic	ND	5.0		mg/L	1	Analyst: RAGS 10/29/2009 10:31:10 AM
Barium	ND	100		mg/L	10	10/29/2009 11:56:02 AM
Cadmium	ND	1.0		mg/L	1	10/29/2009 10:31:10 AM
Chromium	ND	5.0		mg/L	1	10/29/2009 10:31:10 AM
Lead	ND	5.0		mg/L	1	10/29/2009 10:31:10 AM
Selenium	ND	1.0		mg/L	1	10/29/2009 10:31:10 AM
Silver	ND	5.0		mg/L	1	10/29/2009 10:31:10 AM
EPA METHOD 8270C: SEMIVOLATILES						
Acenaphthene	ND	0.20		mg/Kg	1	Analyst: JDC 11/3/2009 1:37:00 PM
Acenaphthylene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Aniline	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Anthracene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Azobenzene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Benz(a)anthracene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Benzo(a)pyrene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Benzo(b)fluoranthene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Benzo(g,h,i)perylene	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
Benzo(k)fluoranthene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Benzoic acid	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
Benzyl alcohol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Bis(2-chloroethoxy)methane	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Bis(2-chloroethyl)ether	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Bis(2-chloroisopropyl)ether	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Bis(2-ethylhexyl)phthalate	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
4-Bromophenyl phenyl ether	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Butyl benzyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Carbazole	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
4-Chloro-3-methylphenol	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
4-Chloroaniline	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
2-Chloronaphthalene	ND	0.25		mg/Kg	1	11/3/2009 1:37:00 PM
2-Chlorophenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
4-Chlorophenyl phenyl ether	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Chrysene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Di-n-butyl phthalate	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
Di-n-octyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Dibenz(a,h)anthracene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Dibenzofuran	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
1,2-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-02

Client Sample ID: DITCH -SS1
Collection Date: 10/20/2009 2:10:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
1,3-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
1,4-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
3,3'-Dichlorobenzidine	ND	0.25		mg/Kg	1	11/3/2009 1:37:00 PM
Diethyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Dimethyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
2,4-Dichlorophenol	ND	0.40		mg/Kg	1	11/3/2009 1:37:00 PM
2,4-Dimethylphenol	ND	0.30		mg/Kg	1	11/3/2009 1:37:00 PM
4,6-Dinitro-2-methylphenol	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
2,4-Dinitrophenol	ND	0.40		mg/Kg	1	11/3/2009 1:37:00 PM
2,4-Dinitrotoluene	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
2,6-Dinitrotoluene	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
Fluoranthene	ND	0.25		mg/Kg	1	11/3/2009 1:37:00 PM
Fluorene	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
Hexachlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Hexachlorobutadiene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Hexachlorocyclopentadiene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Hexachloroethane	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.25		mg/Kg	1	11/3/2009 1:37:00 PM
Isophorone	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
2-Methylnaphthalene	1.1	0.25		mg/Kg	1	11/3/2009 1:37:00 PM
2-Methylphenol	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
3+4-Methylphenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
N-Nitrosodi-n-propylamine	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
N-Nitrosodiphenylamine	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Naphthalene	1.3	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
2-Nitroaniline	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
3-Nitroaniline	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
4-Nitroaniline	ND	0.25		mg/Kg	1	11/3/2009 1:37:00 PM
Nitrobenzene	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
2-Nitrophenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
4-Nitrophenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Pentachlorophenol	ND	0.40		mg/Kg	1	11/3/2009 1:37:00 PM
Phenanthrene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Phenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Pyrene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Pyridine	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
1,2,4-Trichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
2,4,5-Trichlorophenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
2,4,6-Trichlorophenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Surr: 2,4,6-Tribromophenol	75.0	35.5-141		%REC	1	11/3/2009 1:37:00 PM
Surr: 2-Fluorobiphenyl	53.9	30.4-128		%REC	1	11/3/2009 1:37:00 PM
Surr: 2-Fluorophenol	69.5	28.1-129		%REC	1	11/3/2009 1:37:00 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-02

Client Sample ID: DITCH -SS1
Collection Date: 10/20/2009 2:10:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
Surr: 4-Terphenyl-d14	43.0	34.6-151		%REC	1	11/3/2009 1:37:00 PM
Surr: Nitrobenzene-d5	55.0	26.5-122		%REC	1	11/3/2009 1:37:00 PM
Surr: Phenol-d5	66.0	37.6-118		%REC	1	11/3/2009 1:37:00 PM
EPA METHOD 418.1: TPH						Analyst: JB
Petroleum Hydrocarbons, TR	22	20		mg/Kg	1	10/26/2009

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-03

Client Sample ID: DITCH - W2
Collection Date: 10/20/2009 2:40:00 PM
Date Received: 10/22/2009
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 418.1: TPH						Analyst: JB
Petroleum Hydrocarbons, TR	6.9	1.0		mg/L	1	10/26/2009

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-04

Client Sample ID: DITCH - SS2
Collection Date: 10/20/2009 2:15:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY, TCLP						Analyst: IC
Mercury	ND	0.020		mg/L	1	10/29/2009 2:41:25 PM
EPA METHOD 6010B: TCLP METALS						Analyst: RAGS
Arsenic	ND	5.0		mg/L	1	10/29/2009 10:33:38 AM
Barium	ND	100		mg/L	20	10/29/2009 12:00:29 PM
Cadmium	ND	1.0		mg/L	1	10/29/2009 10:33:38 AM
Chromium	ND	5.0		mg/L	1	10/29/2009 10:33:38 AM
Lead	ND	5.0		mg/L	1	10/29/2009 10:33:38 AM
Selenium	ND	1.0		mg/L	1	10/29/2009 10:33:38 AM
Silver	ND	5.0		mg/L	1	10/29/2009 10:33:38 AM
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
Acenaphthene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Acenaphthylene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Aniline	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Anthracene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Azobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Benz(a)anthracene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Benzo(a)pyrene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Benzo(b)fluoranthene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Benzo(g,h,i)perylene	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
Benzo(k)fluoranthene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Benzoic acid	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
Benzyl alcohol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Bis(2-chloroethoxy)methane	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Bis(2-chloroethyl)ether	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Bis(2-chloroisopropyl)ether	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Bis(2-ethylhexyl)phthalate	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
4-Bromophenyl phenyl ether	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Butyl benzyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Carbazole	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
4-Chloro-3-methylphenol	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
4-Chloroaniline	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
2-Chloronaphthalene	ND	0.25		mg/Kg	1	11/3/2009 3:06:41 PM
2-Chlorophenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
4-Chlorophenyl phenyl ether	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Chrysene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Di-n-butyl phthalate	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
Di-n-octyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Dibenz(a,h)anthracene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Dibenzofuran	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
1,2-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-04

Client Sample ID: DITCH - SS2
Collection Date: 10/20/2009 2:15:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
1,3-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
1,4-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
3,3'-Dichlorobenzidine	ND	0.25		mg/Kg	1	11/3/2009 3:06:41 PM
Diethyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Dimethyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
2,4-Dichlorophenol	ND	0.40		mg/Kg	1	11/3/2009 3:06:41 PM
2,4-Dimethylphenol	ND	0.30		mg/Kg	1	11/3/2009 3:06:41 PM
4,6-Dinitro-2-methylphenol	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
2,4-Dinitrophenol	ND	0.40		mg/Kg	1	11/3/2009 3:06:41 PM
2,4-Dinitrotoluene	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
2,6-Dinitrotoluene	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
Fluoranthene	ND	0.25		mg/Kg	1	11/3/2009 3:06:41 PM
Fluorene	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
Hexachlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Hexachlorobutadiene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Hexachlorocyclopentadiene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Hexachloroethane	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Indeno(1,2,3-cd)pyrene	ND	0.25		mg/Kg	1	11/3/2009 3:06:41 PM
Isophorone	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
2-Methylnaphthalene	ND	0.25		mg/Kg	1	11/3/2009 3:06:41 PM
2-Methylphenol	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
3+4-Methylphenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
N-Nitrosodi-n-propylamine	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
N-Nitrosodiphenylamine	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Naphthalene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
2-Nitroaniline	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
3-Nitroaniline	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
4-Nitroaniline	ND	0.25		mg/Kg	1	11/3/2009 3:06:41 PM
Nitrobenzene	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
2-Nitrophenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
4-Nitrophenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Pentachlorophenol	ND	0.40		mg/Kg	1	11/3/2009 3:06:41 PM
Phenanthrene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Phenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Pyrene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Pyridine	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
1,2,4-Trichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
2,4,5-Trichlorophenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
2,4,6-Trichlorophenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Surr: 2,4,6-Tribromophenol	85.8	35.5-141		%REC	1	11/3/2009 3:06:41 PM
Surr: 2-Fluorobiphenyl	51.5	30.4-128		%REC	1	11/3/2009 3:06:41 PM
Surr: 2-Fluorophenol	46.2	28.1-129		%REC	1	11/3/2009 3:06:41 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-04

Client Sample ID: DITCH - SS2
Collection Date: 10/20/2009 2:15:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
Surr: 4-Terphenyl-d14	45.6	34.6-151		%REC	1	11/3/2009 3:06:41 PM
Surr: Nitrobenzene-d5	46.9	26.5-122		%REC	1	11/3/2009 3:06:41 PM
Surr: Phenol-d5	51.5	37.6-118		%REC	1	11/3/2009 3:06:41 PM
EPA METHOD 418.1: TPH						Analyst: JB
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	10/26/2009

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-05

Client Sample ID: DITCH - W3
Collection Date: 10/20/2009 2:45:00 PM
Date Received: 10/22/2009
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 418.1: TPH						Analyst: JB
Petroleum Hydrocarbons, TR	5.4	1.0		mg/L	1	10/26/2009

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
 Lab Order: 0910423
 Project: Ditch N of Hill-NW
 Lab ID: 0910423-06

Client Sample ID: DITCH - SS3
 Collection Date: 10/20/2009 2:25:00 PM
 Date Received: 10/22/2009
 Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY, TCLP						Analyst: IC
Mercury	ND	0.020		mg/L	1	10/29/2009 2:43:13 PM
EPA METHOD 6010B: TCLP METALS						Analyst: RAGS
Arsenic	ND	5.0		mg/L	1	10/29/2009 10:38:44 AM
Barium	ND	100		mg/L	10	10/29/2009 12:02:56 PM
Cadmium	ND	1.0		mg/L	1	10/29/2009 10:38:44 AM
Chromium	ND	5.0		mg/L	1	10/29/2009 10:38:44 AM
Lead	ND	5.0		mg/L	1	10/29/2009 10:38:44 AM
Selenium	ND	1.0		mg/L	1	10/29/2009 10:38:44 AM
Silver	ND	5.0		mg/L	1	10/29/2009 10:38:44 AM
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
Acenaphthene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Acenaphthylene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Aniline	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Anthracene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Azobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Benz(a)anthracene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Benzo(a)pyrene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Benzo(b)fluoranthene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Benzo(g,h,i)perylene	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
Benzo(k)fluoranthene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Benzoic acid	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
Benzyl alcohol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Bis(2-chloroethoxy)methane	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Bis(2-chloroethyl)ether	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Bis(2-chloroisopropyl)ether	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Bis(2-ethylhexyl)phthalate	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
4-Bromophenyl phenyl ether	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Butyl benzyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Carbazole	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
4-Chloro-3-methylphenol	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
4-Chloroaniline	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
2-Chloronaphthalene	ND	0.25		mg/Kg	1	11/3/2009 3:36:50 PM
2-Chlorophenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
4-Chlorophenyl phenyl ether	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Chrysene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Di-n-butyl phthalate	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
Di-n-octyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Dibenz(a,h)anthracene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Dibenzofuran	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
1,2-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM

Qualifiers: * Value exceeds Maximum Contaminant Level
 E Estimated value
 J Analyte detected below quantitation limits
 ND Not Detected at the Reporting Limit
 S Spike recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
 H Holding times for preparation or analysis exceeded
 MCL Maximum Contaminant Level
 RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-06

Client Sample ID: DITCH - SS3
Collection Date: 10/20/2009 2:25:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
1,3-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
1,4-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
3,3'-Dichlorobenzidine	ND	0.25		mg/Kg	1	11/3/2009 3:36:50 PM
Diethyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Dimethyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
2,4-Dichlorophenol	ND	0.40		mg/Kg	1	11/3/2009 3:36:50 PM
2,4-Dimethylphenol	ND	0.30		mg/Kg	1	11/3/2009 3:36:50 PM
4,6-Dinitro-2-methylphenol	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
2,4-Dinitrophenol	ND	0.40		mg/Kg	1	11/3/2009 3:36:50 PM
2,4-Dinitrotoluene	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
2,6-Dinitrotoluene	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
Fluoranthene	ND	0.25		mg/Kg	1	11/3/2009 3:36:50 PM
Fluorene	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
Hexachlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Hexachlorobutadiene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Hexachlorocyclopentadiene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Hexachloroethane	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Indeno(1,2,3-cd)pyrene	ND	0.25		mg/Kg	1	11/3/2009 3:36:50 PM
Isophorone	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
2-Methylnaphthalene	ND	0.25		mg/Kg	1	11/3/2009 3:36:50 PM
2-Methylphenol	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
3+4-Methylphenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
N-Nitrosodi-n-propylamine	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
N-Nitrosodiphenylamine	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Naphthalene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
2-Nitroaniline	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
3-Nitroaniline	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
4-Nitroaniline	ND	0.25		mg/Kg	1	11/3/2009 3:36:50 PM
Nitrobenzene	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
2-Nitrophenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
4-Nitrophenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Pentachlorophenol	ND	0.40		mg/Kg	1	11/3/2009 3:36:50 PM
Phenanthrene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Phenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Pyrene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Pyridine	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
1,2,4-Trichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
2,4,5-Trichlorophenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
2,4,6-Trichlorophenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Surr: 2,4,6-Tribromophenol	88.6	35.5-141		%REC	1	11/3/2009 3:36:50 PM
Surr: 2-Fluorobiphenyl	54.4	30.4-128		%REC	1	11/3/2009 3:36:50 PM
Surr: 2-Fluorophenol	52.3	28.1-129		%REC	1	11/3/2009 3:36:50 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-06

Client Sample ID: DITCH - SS3
Collection Date: 10/20/2009 2:25:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
Surr: 4-Terphenyl-d14	50.8	34.6-151	%REC		1	11/3/2009 3:36:50 PM
Surr: Nitrobenzene-d5	51.9	26.5-122	%REC		1	11/3/2009 3:36:50 PM
Surr: Phenol-d5	55.4	37.6-118	%REC		1	11/3/2009 3:36:50 PM
EPA METHOD 418.1: TPH						Analyst: JB
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	10/26/2009

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

QA/QC SUMMARY REPORT

Client: Western Refining Southwest, Gallup
 Project: Ditch N of Hill-NW

Work Order: 0910423

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 418.1: TPH											
Sample ID: MB-20407		MBLK									
Petroleum Hydrocarbons, TR	ND	mg/Kg	20								
Sample ID: LCS-20407		LCS									
Petroleum Hydrocarbons, TR	108.1	mg/Kg	20	100	0	108	82	114			
Method: EPA Method 418.1: TPH											
Sample ID: MB-20406		MBLK									
Petroleum Hydrocarbons, TR	ND	mg/L	1.0								
Sample ID: LCS-20406		LCS									
Petroleum Hydrocarbons, TR	4.610	mg/L	1.0	5	0	92.2	78.5	120			

Qualifiers:

E Estimated value
 J Analyte detected below quantitation limits
 R RPD outside accepted recovery limits

H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 S Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Western Refining Southwest, Gallup

Project: Ditch N of Hill-NW

Work Order: 0910423

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Method: EPA Method 8270C: Semivolatiles

Sample ID: mb-20469

MBLK

Batch ID: 20469 Analysis Date: 11/3/2009 11:51:27 AM

Acenaphthene	ND	mg/Kg	0.20
Acenaphthylene	ND	mg/Kg	0.20
Aniline	ND	mg/Kg	0.20
Anthracene	ND	mg/Kg	0.20
Azobenzene	ND	mg/Kg	0.20
Benz(a)anthracene	ND	mg/Kg	0.20
Benzo(a)pyrene	ND	mg/Kg	0.20
Benzo(b)fluoranthene	ND	mg/Kg	0.20
Benzo(g,h,i)perylene	ND	mg/Kg	0.50
Benzo(k)fluoranthene	ND	mg/Kg	0.20
Benzoic acid	ND	mg/Kg	0.50
Benzyl alcohol	ND	mg/Kg	0.20
Bis(2-chloroethoxy)methane	ND	mg/Kg	0.20
Bis(2-chloroethyl)ether	ND	mg/Kg	0.20
Bis(2-chloroisopropyl)ether	ND	mg/Kg	0.20
Bis(2-ethylhexyl)phthalate	ND	mg/Kg	0.50
4-Bromophenyl phenyl ether	ND	mg/Kg	0.20
Butyl benzyl phthalate	ND	mg/Kg	0.20
Carbazole	ND	mg/Kg	0.20
4-Chloro-3-methylphenol	ND	mg/Kg	0.50
4-Chloroaniline	ND	mg/Kg	0.50
2-Chloronaphthalene	ND	mg/Kg	0.25
2-Chlorophenol	ND	mg/Kg	0.20
4-Chlorophenyl phenyl ether	ND	mg/Kg	0.20
Chrysene	ND	mg/Kg	0.20
Di-n-butyl phthalate	ND	mg/Kg	0.50
Di-n-octyl phthalate	ND	mg/Kg	0.20
Dibenz(a,h)anthracene	ND	mg/Kg	0.20
Dibenzofuran	ND	mg/Kg	0.20
1,2-Dichlorobenzene	ND	mg/Kg	0.20
1,3-Dichlorobenzene	ND	mg/Kg	0.20
1,4-Dichlorobenzene	ND	mg/Kg	0.20
3,3'-Dichlorobenzidine	ND	mg/Kg	0.25
Diethyl phthalate	ND	mg/Kg	0.20
Dimethyl phthalate	ND	mg/Kg	0.20
2,4-Dichlorophenol	ND	mg/Kg	0.40
2,4-Dimethylphenol	ND	mg/Kg	0.30
4,6-Dinitro-2-methylphenol	ND	mg/Kg	0.50
2,4-Dinitrophenol	ND	mg/Kg	0.40
2,4-Dinitrotoluene	ND	mg/Kg	0.50
2,6-Dinitrotoluene	ND	mg/Kg	0.50
Fluoranthene	ND	mg/Kg	0.25
Fluorene	ND	mg/Kg	0.50
Hexachlorobenzene	ND	mg/Kg	0.20

Qualifiers:

E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Western Refining Southwest, Gallup
 Project: Ditch N of Hill-NW

Work Order: 0910423

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Method: EPA Method 8270C: Semivolatiles

Sample ID: mb-20469

MBLK

Batch ID: 20469 Analysis Date: 11/3/2009 11:51:27 AM

Hexachlorobutadiene	ND	mg/Kg	0.20
Hexachlorocyclopentadiene	ND	mg/Kg	0.20
Hexachloroethane	ND	mg/Kg	0.20
Indeno(1,2,3-cd)pyrene	ND	mg/Kg	0.25
Isophorone	ND	mg/Kg	0.50
2-Methylnaphthalene	ND	mg/Kg	0.25
2-Methylphenol	ND	mg/Kg	0.50
3+4-Methylphenol	ND	mg/Kg	0.20
N-Nitrosodi-n-propylamine	ND	mg/Kg	0.20
N-Nitrosodiphenylamine	ND	mg/Kg	0.20
Naphthalene	ND	mg/Kg	0.20
2-Nitroaniline	ND	mg/Kg	0.20
3-Nitroaniline	ND	mg/Kg	0.20
4-Nitroaniline	ND	mg/Kg	0.25
Nitrobenzene	ND	mg/Kg	0.50
2-Nitrophenol	ND	mg/Kg	0.20
4-Nitrophenol	ND	mg/Kg	0.20
Pentachlorophenol	ND	mg/Kg	0.40
Phenanthrene	ND	mg/Kg	0.20
Phenol	ND	mg/Kg	0.20
Pyrene	ND	mg/Kg	0.20
Pyridine	ND	mg/Kg	0.50
1,2,4-Trichlorobenzene	ND	mg/Kg	0.20
2,4,5-Trichlorophenol	ND	mg/Kg	0.20
2,4,6-Trichlorophenol	ND	mg/Kg	0.20

Sample ID: lcs-20469

LCS

Batch ID: 20469 Analysis Date: 11/3/2009 1:07:17 PM

Acenaphthene	1.200	mg/Kg	0.20	1.67	0	71.8	42.5	90
4-Chloro-3-methylphenol	2.642	mg/Kg	0.50	3.33	0	79.3	39.6	101
2-Chlorophenol	2.403	mg/Kg	0.20	3.33	0	72.2	40.1	96.7
1,4-Dichlorobenzene	1.191	mg/Kg	0.20	1.67	0	71.3	34.6	95.3
2,4-Dinitrotoluene	1.453	mg/Kg	0.50	1.67	0	87.0	37.1	101
N-Nitrosodi-n-propylamine	1.181	mg/Kg	0.20	1.67	0	70.7	33.3	103
4-Nitrophenol	2.636	mg/Kg	0.20	3.33	0	79.2	32.7	125
Pentachlorophenol	2.670	mg/Kg	0.40	3.33	0	80.2	35.5	99.3
Phenol	2.348	mg/Kg	0.20	3.33	0	70.5	35.5	104
Pyrene	1.061	mg/Kg	0.20	1.67	0	63.5	34.4	90.6
1,2,4-Trichlorobenzene	1.217	mg/Kg	0.20	1.67	0	72.9	38.5	95

Qualifiers:

E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Western Refining Southwest, Gallup
 Project: Ditch N of Hill-NW

Work Order: 0910423

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: MERCURY, TCLP											
Sample ID: MB-20461		MBLK				Batch ID: 20461	Analysis Date: 10/29/2009 2:30:49 PM				
Mercury	ND	mg/L	0.020								
Sample ID: Fluid #1 Check #305		MBLK				Batch ID: 20461	Analysis Date: 10/29/2009 2:57:49 PM				
Mercury	ND	mg/L	0.020								
Sample ID: LCS-20461		LCS				Batch ID: 20461	Analysis Date: 10/29/2009 2:32:34 PM				
Mercury	ND	mg/L	0.020	0.005	0	102	80	120			
Method: EPA Method 6010B: TCLP Metals											
Sample ID: MB-20451		MBLK				Batch ID: 20451	Analysis Date: 10/29/2009 9:54:41 AM				
Arsenic	ND	mg/L	5.0								
Barium	ND	mg/L	100								
Cadmium	ND	mg/L	1.0								
Chromium	ND	mg/L	5.0								
Lead	ND	mg/L	5.0								
Selenium	ND	mg/L	1.0								
Silver	ND	mg/L	5.0								
Sample ID: LCS-20451		LCS				Batch ID: 20451	Analysis Date: 10/29/2009 9:59:31 AM				
Arsenic	ND	mg/L	5.0	0.5	0	106	80	120			
Barium	ND	mg/L	100	0.5	0.0013	99.4	80	120			
Cadmium	ND	mg/L	1.0	0.5	0	105	80	120			
Chromium	ND	mg/L	5.0	0.5	0	99.1	80	120			
Lead	ND	mg/L	5.0	0.5	0	98.1	80	120			
Selenium	ND	mg/L	1.0	0.5	0	109	80	120			
Silver	ND	mg/L	5.0	0.5	0.0018	106	80	120			

Qualifiers:

E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name WESTERN REFINING GALLU

Date Received:

10/22/2009

Work Order Number 0910423

Received by: TLS

Checklist completed by:

Signature

Date

Sample ID labels checked by:

Initials

Matrix:

Carrier name FedEx

Shipping container/cooler in good condition?

Yes ☒

No ☐

Not Present ☐

Custody seals intact on shipping container/cooler?

Yes ☒

No ☐

Not Present ☐

Not Shipped ☐

Custody seals intact on sample bottles?

Yes ☒

No ☐

N/A ☐

Chain of custody present?

Yes ☒

No ☐

Chain of custody signed when relinquished and received?

Yes ☒

No ☐

Chain of custody agrees with sample labels?

Yes ☒

No ☐

Samples in proper container/bottle?

Yes ☒

No ☐

Sample containers intact?

Yes ☒

No ☐

Sufficient sample volume for indicated test?

Yes ☒

No ☐

All samples received within holding time?

Yes ☒

No ☐

Water - VOA vials have zero headspace?

No VOA vials submitted ☒

Yes ☐

No ☐

Water - Preservation labels on bottle and cap match?

Yes ☒

No ☐

N/A ☐

Water - pH acceptable upon receipt?

Yes ☒

No ☐

N/A ☐

Number of preserved
bottles checked for
pH:

3
<2 > 12 unless noted
below.

Container/Temp Blank temperature?

3.5°

<6° C Acceptable

If given sufficient time to cool.

COMMENTS:

Client contacted

Date contacted:

Person contacted

Contacted by:

Regarding:

Comments:

Corrective Action

Chain-of-Custody Record

Client: WESTERN REFINING

Mailing Address: GALLUP REFINERY

Phone #: 505 722 3833

email or Fax#:

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other

☐ EDD (Type)

Date	Time	Matrix	Sample Request ID
10/20	2:40	WATER	DITCH - W1
10/20	2:10	SOIL	DITCH - SS1
10/20	2:40	WATER	DITCH - W2
10/20	2:15	SOIL	DITCH - SS2
10/20	2:45	WATER	DITCH - W3
10/20	2:25	SOIL	DITCH - SS3

Date: 10-21-09 Time: 1200

Relinquished by: Alvin

Date: 10-21-09 Time: 1200

Relinquished by: Alvin

Turn-Around Time:

☒ Standard ☐ Rush

Project Name: DITCH NOF

HILL - NW

Project #:

Project Manager:

GAUVAU LAJEN

Sampler: RAD ALVIN

On-site: 2009-10-20 12:30

Sample Temperature: 33°

Container Type and #	Preservative Type	HEATING
1x500mL	HCL	-1
3x402		-2
1x500mL	HCL	-3
3x402		-4
1x500mL	HCL	-5
3x402		-6

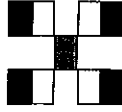
Received by:

AD 10/21/09 919

Received by:

AD 10/21/09 919

Remarks:



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

BTEX + MTBE + TMBs (8021)	
BTEX + MTBE + TPH (Gas only)	
TPH Method 8015B (Gas/Diesel)	
TPH (Method 418.1)	X
EDB (Method 504.1)	
8310 (PNA or PAH)	
RCRA 8 Metals	
Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	
8081 Pesticides / 8082 PCB's	
8260B (VOA)	
8270 (Semi-VOA)	
8270C SVOC	X
TCLP (METALS)	X
Air Bubbles (Y or N)	



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

April 29, 2015

Beck Larsen

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-0258
FAX (505) 722-0210

RE: North Drainage Ditch

OrderNo.: 1504B27

Dear Beck Larsen:

Hall Environmental Analysis Laboratory received 1 sample(s) on 4/24/2015 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1504B27

Date Reported: 4/29/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: North Drainage Ditch

Project: North Drainage Ditch

Collection Date: 4/23/2015 10:15:00 AM

Lab ID: 1504B27-001

Matrix: AQUEOUS

Received Date: 4/24/2015 3:33:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: cadg
Benzene	3600	100		µg/L	100	4/29/2015 3:08:52 AM	R25817
Toluene	89	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Ethylbenzene	530	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Methyl tert-butyl ether (MTBE)	98	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2,4-Trimethylbenzene	100	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,3,5-Trimethylbenzene	35	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2-Dichloroethane (EDC)	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2-Dibromoethane (EDB)	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Naphthalene	140	20		µg/L	10	4/28/2015 1:15:41 PM	R25817
1-Methylnaphthalene	ND	40		µg/L	10	4/28/2015 1:15:41 PM	R25817
2-Methylnaphthalene	ND	40		µg/L	10	4/28/2015 1:15:41 PM	R25817
Acetone	ND	100		µg/L	10	4/28/2015 1:15:41 PM	R25817
Bromobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Bromodichloromethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Bromoform	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Bromomethane	ND	30		µg/L	10	4/28/2015 1:15:41 PM	R25817
2-Butanone	ND	100		µg/L	10	4/28/2015 1:15:41 PM	R25817
Carbon disulfide	ND	100		µg/L	10	4/28/2015 1:15:41 PM	R25817
Carbon Tetrachloride	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Chlorobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Chloroethane	ND	20		µg/L	10	4/28/2015 1:15:41 PM	R25817
Chloroform	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Chloromethane	ND	30		µg/L	10	4/28/2015 1:15:41 PM	R25817
2-Chlorotoluene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
4-Chlorotoluene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
cis-1,2-DCE	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
cis-1,3-Dichloropropene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2-Dibromo-3-chloropropane	ND	20		µg/L	10	4/28/2015 1:15:41 PM	R25817
Dibromochloromethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Dibromomethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2-Dichlorobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,3-Dichlorobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,4-Dichlorobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Dichlorodifluoromethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,1-Dichloroethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,1-Dichloroethene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2-Dichloropropane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,3-Dichloropropane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
2,2-Dichloropropane	ND	20		µg/L	10	4/28/2015 1:15:41 PM	R25817

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	Page 1 of 5
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	
	J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit	
	O	RSD is greater than RSDlimit	P	Sample pH Not In Range	
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	
	S	Spike Recovery outside accepted recovery limits			

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1504B27

Date Reported: 4/29/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: North Drainage Ditch

Project: North Drainage Ditch

Collection Date: 4/23/2015 10:15:00 AM

Lab ID: 1504B27-001

Matrix: AQUEOUS

Received Date: 4/24/2015 3:33:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: cadg
1,1-Dichloropropene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Hexachlorobutadiene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
2-Hexanone	ND	100		µg/L	10	4/28/2015 1:15:41 PM	R25817
Isopropylbenzene	27	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
4-Isopropyltoluene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
4-Methyl-2-pentanone	ND	100		µg/L	10	4/28/2015 1:15:41 PM	R25817
Methylene Chloride	ND	30		µg/L	10	4/28/2015 1:15:41 PM	R25817
n-Butylbenzene	ND	30		µg/L	10	4/28/2015 1:15:41 PM	R25817
n-Propylbenzene	47	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
sec-Butylbenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Styrene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
tert-Butylbenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,1,1,2-Tetrachloroethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,1,2,2-Tetrachloroethane	ND	20		µg/L	10	4/28/2015 1:15:41 PM	R25817
Tetrachloroethene (PCE)	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
trans-1,2-DCE	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
trans-1,3-Dichloropropene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2,3-Trichlorobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2,4-Trichlorobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,1,1-Trichloroethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,1,2-Trichloroethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Trichloroethene (TCE)	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Trichlorofluoromethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2,3-Trichloropropane	ND	20		µg/L	10	4/28/2015 1:15:41 PM	R25817
Vinyl chloride	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Xylenes, Total	730	15		µg/L	10	4/28/2015 1:15:41 PM	R25817
Surr: 1,2-Dichloroethane-d4	99.3	70-130		%REC	10	4/28/2015 1:15:41 PM	R25817
Surr: 4-Bromofluorobenzene	92.8	70-130		%REC	10	4/28/2015 1:15:41 PM	R25817
Surr: Dibromofluoromethane	105	70-130		%REC	10	4/28/2015 1:15:41 PM	R25817
Surr: Toluene-d8	104	70-130		%REC	10	4/28/2015 1:15:41 PM	R25817

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

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1504B27

29-Apr-15

Client: Western Refining Southwest, Gallup**Project:** North Drainage Ditch

Sample ID	5mL rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID: R25817			RunNo: 25817					
Prep Date:		Analysis Date: 4/28/2015			SeqNo: 765170		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.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1504B27

29-Apr-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	5mL rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID: R25817			RunNo: 25817					
Prep Date:		Analysis Date: 4/28/2015			SeqNo: 765170		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	9.9		10.00		99.2	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		104	70	130			
Surr: Dibromofluoromethane	10		10.00		104	70	130			
Surr: Toluene-d8	10		10.00		105	70	130			

Sample ID	100ng lcs1	SampType: LCS			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID: R25817			RunNo: 25817					
Prep Date:		Analysis Date: 4/28/2015			SeqNo: 765172		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	107	70	130			
Toluene	21	1.0	20.00	0	104	70	130			
Chlorobenzene	21	1.0	20.00	0	105	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1504B27

29-Apr-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	100ng lcs1	SampType: LCS			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID: R25817			RunNo: 25817					
Prep Date:		Analysis Date: 4/28/2015			SeqNo: 765172		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	24	1.0	20.00	0	121	75.6	144			
Trichloroethene (TCE)	21	1.0	20.00	0	105	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		112	70	130			
Surr: Dibromofluoromethane	11		10.00		113	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit



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

Sample Log-In Check List

Client Name: **Western Refining Gallup**

Work Order Number: **1504B27**

RcptNo: 1

Received by/date:

A.T.

04/24/15

Logged By: **Ashley Gallegos**

4/24/2015 3:33:00 PM

Aj

Completed By: **Ashley Gallegos**

4/27/2015 9:40:50 AM

Aj

Reviewed By:

gn

04/29/15

Chain of Custody

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

Log In

4. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
5. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☒ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
9. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
10. VOA vials have zero headspace? Yes ☒ No ☐ No VOA Vials ☐
11. Were any sample containers received broken? Yes ☐ No ☒
12. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐ # 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 $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.3	Good	Yes			

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Chain-of-Custody Record					
Client:		Western - Refining			
		Gallup Refinery			
Mailing Address:		32 GIANT CROSSING ROAD			
Gallup NIM 87301					
Phone #:	505	722	3833		
Email or Fax#:	505	863	0930		
QA/QC Package:					
☐ Standard	☐ Level 4 (Full Validation)				
☐ Other _____					
☐ EDD (Type) _____					
Turn-Around Time: ☐ Standard ☒ Rush					
Project Name: _____					
North Drainage Ditch					
Project #:					
Project Manager:					
Beck Larsen					
Sampler: ACT					
On Ice: ☒ Yes ☐ No					
Sample Temperature: 23					
Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type
4/23/2015	10:15	Water	North Drainage Ditch	40ml-3	HCL
Date: 4-24-15	Time: 11:50	Relinquished by: [Signature]	Date: 4/24/15	Time: 11:50	Date: 4/24/15
Date: 4/24/15	Time: 15:33	Relinquished by: [Signature]	Date: 4/24/15	Time: 15:33	Date: 4/24/15

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



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

April 07, 2015

Beck Larsen

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-0258
FAX (505) 722-0210

RE: N. Drainage Ditch

OrderNo.: 1503979

Dear Beck Larsen:

Hall Environmental Analysis Laboratory received 3 sample(s) on 3/20/2015 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1503979

Date Reported: 4/7/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: A1

Project: N. Drainage Ditch

Collection Date: 3/19/2015 11:45:00 AM

Lab ID: 1503979-001

Matrix: AQUEOUS

Received Date: 3/20/2015 4:25:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE							Analyst: JME
Diesel Range Organics (DRO)	6.4	1.0		mg/L	1	3/24/2015 7:35:03 PM	18263
Motor Oil Range Organics (MRO)	11	5.0		mg/L	1	3/24/2015 7:35:03 PM	18263
Surr: DNOP	118	76.5-150		%REC	1	3/24/2015 7:35:03 PM	18263
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	21	2.5		mg/L	50	3/25/2015 11:04:58 AM	R25071
Surr: BFB	94.1	80-120		%REC	50	3/25/2015 11:04:58 AM	R25071
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Methyl tert-butyl ether (MTBE)	200	120		µg/L	50	3/25/2015 11:04:58 AM	R25071
Benzene	5200	100		µg/L	100	3/25/2015 6:50:12 PM	R25071
Toluene	130	50		µg/L	50	3/25/2015 11:04:58 AM	R25071
Ethylbenzene	630	50		µg/L	50	3/25/2015 11:04:58 AM	R25071
Xylenes, Total	1200	100		µg/L	50	3/25/2015 11:04:58 AM	R25071
1,2,4-Trimethylbenzene	240	50		µg/L	50	3/25/2015 11:04:58 AM	R25071
1,3,5-Trimethylbenzene	78	50		µg/L	50	3/25/2015 11:04:58 AM	R25071
Surr: 4-Bromofluorobenzene	113	80-120		%REC	50	3/25/2015 11:04:58 AM	R25071
EPA METHOD 7470: MERCURY							Analyst: MED
Mercury	ND	0.00020		mg/L	1	3/27/2015 12:45:07 PM	18373
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: JLF
Arsenic	0.16	0.020		mg/L	1	3/27/2015 3:46:49 PM	18333
Barium	12	0.40		mg/L	20	3/27/2015 4:00:54 PM	18333
Cadmium	ND	0.0020		mg/L	1	3/27/2015 3:46:49 PM	18333
Chromium	ND	0.0060		mg/L	1	3/27/2015 3:46:49 PM	18333
Lead	0.0058	0.0050		mg/L	1	3/27/2015 3:46:49 PM	18333
Selenium	ND	0.050		mg/L	1	3/27/2015 3:46:49 PM	18333
Silver	ND	0.0050		mg/L	1	3/27/2015 3:46:49 PM	18333

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	E	Value above quantitation range
	J	Analyte detected below quantitation limits
	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits
	S	Spike Recovery outside accepted recovery limits

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1503979

Date Reported: 4/7/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: B1

Project: N. Drainage Ditch

Collection Date: 3/19/2015 11:55:00 AM

Lab ID: 1503979-002

Matrix: AQUEOUS

Received Date: 3/20/2015 4:25:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE							Analyst: JME
Diesel Range Organics (DRO)	6.5	1.0		mg/L	1	3/24/2015 8:02:46 PM	18263
Motor Oil Range Organics (MRO)	11	5.0		mg/L	1	3/24/2015 8:02:46 PM	18263
Surr: DNOP	119	76.5-150		%REC	1	3/24/2015 8:02:46 PM	18263
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	21	5.0		mg/L	100	3/25/2015 1:57:29 PM	R25071
Surr: BFB	96.8	80-120		%REC	100	3/25/2015 1:57:29 PM	R25071
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	250		µg/L	100	3/25/2015 1:57:29 PM	R25071
Benzene	5400	100		µg/L	100	3/25/2015 1:57:29 PM	R25071
Toluene	130	100		µg/L	100	3/25/2015 1:57:29 PM	R25071
Ethylbenzene	580	100		µg/L	100	3/25/2015 1:57:29 PM	R25071
Xylenes, Total	1200	200		µg/L	100	3/25/2015 1:57:29 PM	R25071
1,2,4-Trimethylbenzene	220	100		µg/L	100	3/25/2015 1:57:29 PM	R25071
1,3,5-Trimethylbenzene	ND	100		µg/L	100	3/25/2015 1:57:29 PM	R25071
Surr: 4-Bromofluorobenzene	115	80-120		%REC	100	3/25/2015 1:57:29 PM	R25071
EPA METHOD 7470: MERCURY							Analyst: MED
Mercury	ND	0.00020		mg/L	1	3/27/2015 12:46:58 PM	18373
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: JLF
Arsenic	0.28	0.020		mg/L	1	3/27/2015 3:48:18 PM	18333
Barium	20	0.40		mg/L	20	3/27/2015 4:07:11 PM	18333
Cadmium	ND	0.0020		mg/L	1	3/27/2015 3:48:18 PM	18333
Chromium	ND	0.0060		mg/L	1	3/27/2015 3:48:18 PM	18333
Lead	0.012	0.0050		mg/L	1	3/27/2015 3:48:18 PM	18333
Selenium	ND	0.050		mg/L	1	3/27/2015 3:48:18 PM	18333
Silver	ND	0.0050		mg/L	1	3/27/2015 3:48:18 PM	18333

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

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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1503979

Date Reported: 4/7/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: C1

Project: N. Drainage Ditch

Collection Date: 3/19/2015 12:08:00 PM

Lab ID: 1503979-003

Matrix: AQUEOUS

Received Date: 3/20/2015 4:25:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE							Analyst: JME
Diesel Range Organics (DRO)	8.9	1.0		mg/L	1	3/24/2015 8:30:24 PM	18263
Motor Oil Range Organics (MRO)	14	5.0		mg/L	1	3/24/2015 8:30:24 PM	18263
Surr: DNOP	131	76.5-150		%REC	1	3/24/2015 8:30:24 PM	18263
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	20	5.0		mg/L	100	3/25/2015 2:26:50 PM	R25071
Surr: BFB	94.2	80-120		%REC	100	3/25/2015 2:26:50 PM	R25071
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	250		µg/L	100	3/25/2015 2:26:50 PM	R25071
Benzene	5300	100		µg/L	100	3/25/2015 2:26:50 PM	R25071
Toluene	120	100		µg/L	100	3/25/2015 2:26:50 PM	R25071
Ethylbenzene	550	100		µg/L	100	3/25/2015 2:26:50 PM	R25071
Xylenes, Total	1100	200		µg/L	100	3/25/2015 2:26:50 PM	R25071
1,2,4-Trimethylbenzene	210	100		µg/L	100	3/25/2015 2:26:50 PM	R25071
1,3,5-Trimethylbenzene	ND	100		µg/L	100	3/25/2015 2:26:50 PM	R25071
Surr: 4-Bromofluorobenzene	109	80-120		%REC	100	3/25/2015 2:26:50 PM	R25071
EPA METHOD 7470: MERCURY							Analyst: MED
Mercury	ND	0.00020		mg/L	1	3/27/2015 12:48:50 PM	18373
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: JLF
Arsenic	0.28	0.020		mg/L	1	3/27/2015 3:49:56 PM	18333
Barium	19	0.40		mg/L	20	3/27/2015 4:08:38 PM	18333
Cadmium	ND	0.0020		mg/L	1	3/27/2015 3:49:56 PM	18333
Chromium	ND	0.0060		mg/L	1	3/27/2015 3:49:56 PM	18333
Lead	0.014	0.0050		mg/L	1	3/27/2015 3:49:56 PM	18333
Selenium	ND	0.050		mg/L	1	3/27/2015 3:49:56 PM	18333
Silver	ND	0.0050		mg/L	1	3/27/2015 3:49:56 PM	18333

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	Page 3 of 9
	E Value above quantitation range	H Holding times for preparation or analysis exceeded	
	J Analyte detected below quantitation limits	ND Not Detected at the Reporting Limit	
	O RSD is greater than RSDlimit	P Sample pH Not In Range	
	R RPD outside accepted recovery limits	RL Reporting Detection Limit	
	S Spike Recovery outside accepted recovery limits		



Wet Chemistry by Method 9012B/SW846 7.3.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Reactive CN (SW846 7.3.3.2)	ND		0.125	1	03/27/2015 10:33	WG777819

Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Wet Chemistry by Method 9034/9030B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Reactive Sulf.(SW846 7.3.4.1)	ND		25.0	1	03/25/2015 16:16	WG777821

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Corrosivity	Non-Corrosive		1	03/31/2015 10:04	WG778771

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Flashpoint	154		1	03/27/2015 08:41	WG778443

Wet Chemistry by Method 9012B/SW846 7.3.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Reactive CN (SW846 7.3.3.2)	ND		0.125	1	03/27/2015 10:34	WG777819

Wet Chemistry by Method 9034/9030B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Reactive Sulf.(SW846 7.3.4.1)	ND		25.0	1	03/25/2015 16:16	WG777821

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Corrosivity	Non-Corrosive		1	03/31/2015 10:04	WG778771

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Flashpoint	DNF AT 170 F		1	03/27/2015 08:41	WG778443

Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Wet Chemistry by Method 9012B/SW846 7.3.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Reactive CN (SW846 7.3.3.2)	ND		0.125	1	03/27/2015 10:35	WG777819

Wet Chemistry by Method 9034/9030B

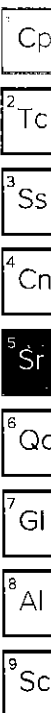
Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Reactive Sulf. (SW846 7.3.4.1)	ND		25.0	1	03/25/2015 16:16	WG777821

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
				date / time	
Corrosivity	Non-Corrosive		1	03/31/2015 10:04	WG778771

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	deg F			date / time	
Flashpoint	125		1	03/27/2015 08:41	WG778443



Method Blank (MB)

(MB) 03/27/15 10:29

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Reactive CN (SW846 7.3.3.2)	ND		0.125

L754785-02 Original Sample (OS) • Duplicate (DUP)

(OS) 03/27/15 10:30 • (DUP) 03/27/15 10:31

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive CN (SW846 7.3.3.2)	ND	ND	1	0.00		20

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

(LCS) 03/27/15 09:45 • (LCSD) 03/27/15 09:46

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 %
Reactive CN (SW846 7.3.3.2)	0.100	0.105	0.102	105	102	90.0-110			2.90	20

Method Blank (MB)

(MB) 03/25/15 16:16

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Reactive Sulf.(SW846 7.3.4.1)	ND		25.0

L754785-02 Original Sample (OS) • Duplicate (DUP)

(OS) 03/25/15 16:16 • (DUP) 03/25/15 16:16

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Sulf.(SW846 7.3.4.1)	ND	ND	1	0.00		20

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

(LCS) 03/25/15 16:16 • (LCSD) 03/25/15 16:16

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 %
Reactive Sulf.(SW846 7.3.4.1)	100	89.4	99.3	89.4	99.0	70.0-130			10.5	20

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

L755335-01 Original Sample (OS) • Duplicate (DUP)

(OS) 03/31/15 10:04 • (DUP) 03/31/15 10:04

Analyte	Original Result		DUP Result	Dilution	DUP RPD %	<u>DUP Qualifier</u> %	DUP RPD Limits	
	Non-Corrosiv e	Non-Corrosiv e					%	10
Corrosivity					0.00			

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

(LCS) 03/31/15 10:04 • (LCSD) 03/31/15 10:04

Analyte	Spike Amount		LCS Result		LCSD Result		LCS Rec. %		LCSD Rec. %		Rec. Limits %		<u>LCS Qualifier</u> %		<u>LCSD Qualifier</u> %		RPD		RPD Limits	
	7.84		7.81		7.83		99.6		99.9		98.3-102		0.256		0.256		10		10	
Corrosivity																				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L755335-01 Original Sample (OS) • Duplicate (DUP)

(OS) 03/27/15 08:41 • (DUP) 03/27/15 08:41						
Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	deg F	deg F		%		%
Flashpoint	150	154	1	0.00		20

L755335-02 Original Sample (OS) • Duplicate (DUP)

(OS) 03/27/15 08:41 • (DUP) 03/27/15 08:41						
Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	deg F	deg F		%		%
Flashpoint	DNF AT 170 F	DNF AT 170 F		0.00		20

L755335-03 Original Sample (OS) • Duplicate (DUP)

(OS) 03/27/15 08:41 • (DUP) 03/27/15 08:41						
Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	deg F	deg F		%		%
Flashpoint	130	126	1	0.80		20

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

(LCS) 03/27/15 08:41 • (LCSD) 03/27/15 08:41									
Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD
	deg F	deg F	deg F	%	%	%			%
Flashpoint	82.0	82.80	83.80	101	102	96.0-104			120
									7

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503979

07-Apr-15

Client: Western Refining Southwest, Gallup

Project: N. Drainage Ditch

Sample ID	MB-18263		SampType: MBLK		TestCode: EPA Method 8015D: Diesel Range					
Client ID:	PBW		Batch ID: 18263		RunNo: 24993					
Prep Date:	3/20/2015		Analysis Date: 3/23/2015		SeqNo: 737414		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	0.96		1.000		95.9	76.5	150			

Sample ID	LCS-18263		SampType: LCS		TestCode: EPA Method 8015D: Diesel Range					
Client ID:	LCSW		Batch ID: 18263		RunNo: 25014					
Prep Date:	3/20/2015		Analysis Date: 3/24/2015		SeqNo: 738573		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.1	1.0	5.000	0	102	60.1	156			
Surr: DNOP	0.52		0.5000		105	76.5	150			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503979

07-Apr-15

Client: Western Refining Southwest, Gallup

Project: N. Drainage Ditch

Sample ID	5ML RB		SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	PBW		Batch ID: R25071		RunNo: 25071					
Prep Date:			Analysis Date: 3/25/2015		SeqNo: 739716		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		89.6	80	120			

Sample ID	2.5UG GRO LCS	SampType: LCS			TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	LCSW	Batch ID: R25071			RunNo: 25071					
Prep Date:		Analysis Date: 3/25/2015			SeqNo: 739717		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	97.4	80	120			
Surr: BFB	20		20.00		102	80	120			

Sample ID	1503979-002AMS		SampType: MS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	B1		Batch ID: R25071		RunNo: 25071					
Prep Date:			Analysis Date: 3/25/2015		SeqNo: 739875		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	72	5.0	50.00	20.62	103	51	131			
Surr: BFB	2100		2000		107	80	120			

Sample ID	1503979-002AMSD		SampType: MSD		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	B1		Batch ID: R25071		RunNo: 25071					
Prep Date:			Analysis Date: 3/25/2015		SeqNo: 739877		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	69	5.0	50.00	20.62	95.8	51	131	4.95	20	
Surr: BFB	2200		2000		108	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503979

07-Apr-15

Client: Western Refining Southwest, Gallup

Project: N. Drainage Ditch

Sample ID	5ML RB	SampType: MBLK			TestCode: EPA Method 8021B: Volatiles					
Client ID:	PBW	Batch ID: R25071			RunNo: 25071					
Prep Date:		Analysis Date: 3/25/2015			SeqNo: 740176		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	2.5								
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
Surr: 4-Bromofluorobenzene	20		20.00		101	80	120			

Sample ID	100NG BTEX LCS	SampType: LCS			TestCode: EPA Method 8021B: Volatiles					
Client ID:	LCSW	Batch ID: R25071			RunNo: 25071					
Prep Date:		Analysis Date: 3/25/2015			SeqNo: 740177		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	23	2.5	20.00	0	117	72.5	125			
Benzene	23	1.0	20.00	0	114	80	120			
Toluene	22	1.0	20.00	0	109	80	120			
Ethylbenzene	21	1.0	20.00	0	105	80	120			
Xylenes, Total	64	2.0	60.00	0	106	80	120			
1,2,4-Trimethylbenzene	22	1.0	20.00	0	109	80	120			
1,3,5-Trimethylbenzene	22	1.0	20.00	0	109	80	120			
Surr: 4-Bromofluorobenzene	24		20.00		119	80	120			

Sample ID	1503979-001AMS		SampType: MS		TestCode: EPA Method 8021B: Volatiles					
Client ID:	A1		Batch ID: R25071		RunNo: 25071					
Prep Date:			Analysis Date: 3/25/2015		SeqNo: 740186		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	1400	120	1000	195.9	118	64.7	132			
Benzene	6100	50	1000	5124	102	77.5	121			E
Toluene	1200	50	1000	131.2	112	78.6	122			
Ethylbenzene	1700	50	1000	630.5	108	78.1	128			
Xylenes, Total	4500	100	3000	1249	108	80	120			
1,2,4-Trimethylbenzene	1300	50	1000	242.2	109	79.1	128			
1,3,5-Trimethylbenzene	1200	50	1000	77.50	108	80	120			
Surr: 4-Bromofluorobenzene	1200		1000		124	80	120			S

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503979

07-Apr-15

Client: Western Refining Southwest, Gallup

Project: N. Drainage Ditch

Sample ID	1503979-001AMSD		SampType: MSD		TestCode: EPA Method 8021B: Volatiles					
Client ID:	A1		Batch ID: R25071		RunNo: 25071					
Prep Date:			Analysis Date: 3/25/2015		SeqNo: 740187		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	1300	120	1000	195.9	108	64.7	132	7.98	20	ES
Benzene	5700	50	1000	5124	57.9	77.5	121	7.48	20	
Toluene	1200	50	1000	131.2	102	78.6	122	7.92	20	
Ethylbenzene	1600	50	1000	630.5	94.9	78.1	128	7.90	20	
Xylenes, Total	4200	100	3000	1249	97.0	80	120	7.35	20	
1,2,4-Trimethylbenzene	1300	50	1000	242.2	103	79.1	128	4.57	20	
1,3,5-Trimethylbenzene	1100	50	1000	77.50	103	80	120	4.83	20	
Surr: 4-Bromofluorobenzene	1200		1000		117	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503979

07-Apr-15

Client: Western Refining Southwest, Gallup

Project: N. Drainage Ditch

Sample ID	MB-18373		SampType: MBLK		TestCode: EPA Method 7470: Mercury					
Client ID:	PBW		Batch ID: 18373		RunNo: 25119					
Prep Date:	3/27/2015		Analysis Date: 3/27/2015		SeqNo: 741758		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercurv	ND	0.00020								

Sample ID	LCS-18373		SampType: LCS		TestCode: EPA Method 7470: Mercury					
Client ID:	LCSW		Batch ID: 18373		RunNo: 25119					
Prep Date:	3/27/2015		Analysis Date: 3/27/2015		SeqNo: 741759		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0048	0.00020	0.005000	0	96.5	80	120			

Sample ID	LCSD-18373			SampType:	LCSD		TestCode:	EPA Method 7470: Mercury			
Client ID:	LCSS02			Batch ID:	18373		RunNo:	25119			
Prep Date:	3/27/2015			Analysis Date:	3/27/2015		SeqNo:	741760		Units:	mg/L
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	0.0050	0.00020	0.005000	0	99.1	80	120	2.60	20		

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503979

07-Apr-15

Client: Western Refining Southwest, Gallup

Project: N. Drainage Ditch

Sample ID	MB-18333	SampType: MBLK			TestCode: EPA 6010B: Total Recoverable Metals					
Client ID:	PBW	Batch ID: 18333			RunNo: 25123					
Prep Date:	3/25/2015	Analysis Date: 3/27/2015			SeqNo: 742830		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.020								
Barium	ND	0.020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Lead	ND	0.0050								
Selenium	ND	0.050								
Silver	0.010	0.0050								

Sample ID	LCS-18333		SampType: LCS		TestCode: EPA 6010B: Total Recoverable Metals					
Client ID:	LCSW		Batch ID: 18333		RunNo: 25123					
Prep Date:	3/25/2015		Analysis Date: 3/27/2015		SeqNo: 742831		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.53	0.020	0.5000	0	106	80	120			
Barium	0.49	0.020	0.5000	0	97.3	80	120			
Cadmium	0.50	0.0020	0.5000	0	99.3	80	120			
Chromium	0.49	0.0060	0.5000	0	98.5	80	120			
Lead	0.51	0.0050	0.5000	0	101	80	120			
Selenium	0.50	0.050	0.5000	0	99.8	80	120			
Silver	0.11	0.0050	0.1000	0	107	80	120			B

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit



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

Sample Log-In Check List

Client Name: Western Refining Gallup

Work Order Number: 1503979

RcptNo: 1

Received by/date:

CS

03/20/15

Logged By: Ashley Gallegos

3/20/2015 4:25:00 PM

Completed By: Ashley Gallegos

3/23/2015 11:08:48 AM

Reviewed By:

JA

03/23/15

Chain of Custody

1. Custody seals intact on sample bottles?
2. Is Chain of Custody complete?
3. How was the sample delivered?

Yes ☐

No ☐

Not Present ☒

Yes ☒

No ☐

Not Present ☐

Courier

Log In

4. Was an attempt made to cool the samples?
5. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ?
6. Sample(s) in proper container(s)?
7. Sufficient sample volume for indicated test(s)?
8. Are samples (except VOA and ONG) properly preserved?
9. Was preservative added to bottles?
For Metals Analysis: Added 1 mL HNO_3
10. VOA vials have zero headspace?
11. Were any sample containers received broken?

Yes ☒

No ☐

NA ☐

Yes ☒

No ☐

NA ☐

Yes ☒

No ☐

Yes ☒

No ☐

Yes ☒

No ☒

NA ☐

Yes ☒

No ☒

Yes ☒

No ☐

No VOA Vials ☐

Yes ☐

No ☒

Yes ☒

No ☐

of preserved bottles checked for pH:

12. Does paperwork match bottle labels?
(Note discrepancies on chain of custody)

Yes ☒

No ☐

Adjusted?

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 ☐

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 $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: Western Refining
Gallup Refinery
 Mailing Address: 92 Giant Crossing Rd
Gallup, NM 87301
 Phone #: (505) 722-3833
 email or Fax#: (505) 863-0930

QA/QC Package: ☐ Level 4 (Full Validation)

Accreditation ☒ NELAP ☐ Other _____

☐ EDD (Type) _____

Date	Time	Matrix	Sample Request ID
3/19/15	1150	W	A1 water
	1150	W	A1 surface
	1150	W	A1 water
	1145	W	A1 surface
3/19/15	1145	W	A1 water
	1206	W	B1 water
	1206	W	B1 surface
	1206	W	B1 water
	1155	W	B1 surface
3/19/15	1155	W	B1 water

Date: 3/19/15 Time: 1400
 Relinquished by: [Signature]
 Date: 3/20/15 Time: 1625
 Relinquished by: [Signature]

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

N. Drainage Ditch

Project #:

Project Manager:

Beck Larsen

Sampler: ACT (K. Sanchez)

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.0°C

Container Type and #	Preservative Type	HEAL No.
g-3	HCL	1503079
pl-1	HNO3	-001
g-1	NONE	
pl-1	2% A24	
pl-1	NaOH	
g-3	HCL	-002
pl-1	HNO3	
g-1	NONE	
pl-1	2% A24	
pl-1	NaOH	

Received by: [Signature] Date: 3/20/15 Time: 10:00
 Received by: [Signature] Date: 03/20/15 Time: 1625

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

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)	RCA 8 Metals	Anions (F, Cl, NO3, NO2, PO4, SO4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	RCI	Air Bubbles (Y or N)
X		X				X					X	
											X	
											X	
											X	
											X	
											X	
											X	
											X	

Remarks: Refer To Attached MAP

Appendix B

Boring/Well Completion Logs

PROJECT: Giant Refinery
Ciniza

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 96-133
ELEVATION: 6920.1
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 8/22/96
STATIC WATER: 31.4
BORING ID: 0643
PAGE: 1

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-1.0	//////		C	CLAY, LOOSE, DRY, SOFT, RED BROWN	
1.0-1.6	***//***		C	SAND, CLAYEY, DARK BROWN, MOIST, SOFT, APPEARS CONTAMINATED	
1.6-6.3	//////		C	CLAY, RED BROWN, FIRM, SOME ROOT MATTER, MOIST	
	//////		C		
	//////		C		
	//////		C		
	//////	5.0	C		
	//////		C		
6.3-8.5	///***//		C	CLAY, SANDY, VERY FINE, MOIST, FIRM, RED BROWN, SOME ROOT MATTER	
	///***//		C		
	///***//		C		
	///***//		C		
8.5-12.3	//////		C	CLAY, FIRM, RED BROWN, MOIST	
	//////		C		
	//////	10	C		
	//////		C		
	//////		C		
12.3-12.5	///**-/		C	CLAY, SANDY, SILTY, GRADES TO SILT @ 12.5	
12.5-13.3	-----		C	SILT, DRY, FIRM, MOIST, LIGHT BROWN	
13.3-13.5	///---//		C	CLAY, SILTY	
13.5-13.75	*****		C	SAND, LOOSE, DRY, FINE, BROWN	
13.75-15.8	///*/		C	CLAY, WEAKLY SANDY, BROWN, STIFF, MOIST	
	///*/		C		
	///*/	15	C		
15.8-16.7	///***//		C	CLAY, VERY SANDY (COARSE), WET (NOT WATER BEARING), FIRM, RED BROWN	
	///***//		C		
16.7-17.75	///---//		C	CLAY, SILTY, STIFF, MOIST, RED BROWN	
	///---//		C		
17.75-21.8	//////		C	CLAY, WET, RED BROWN, STIFF, SOME ROOT MATTER	
	//////		C		
	//////		C		
	//////		C		
	//////	20	C		
	//////		C		
21.8-25.3	///***//		C	CLAY, FINE SANDY, WET, HYDROCARBON ODOR, GREY BROWN, SOME BLACK MOTTILING, NOT WATER BEARING, SOFT	22'-20 ppm
	///***//		C		
	///***//		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

FILE #:	96-133
ELEVATION:	6920.1
TOTAL DEPTH:	50.0
LOGGED BY:	WHK
DATE:	8-22-96
STATIC WATER:	31.4
BORING ID:	0643
PAGE:	2

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

FILE #: 96-133
ELEVATION: 6920.1
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 8-22-96
STATIC WATER: 31.4
BORING ID: 0643
PAGE: 3

41081	2	BID
-------	---	-----

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

FILE #: 96-133
ELEVATION: 6917.6
TOTAL DEPTH: 36.5
LOGGED BY: WHK
DATE: 9-4-96
STATIC WATER: 19' @ 27 HRS
BORING ID: 0648
PAGE: 1

	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-6.2	////-		C	<u>CLAY</u> , SLIGHTLY SILTY, ROOT MATTER, RED, BROWN, STIFF, MOIST	PID-0ppm ALL SAMPLES
6.2	////-	5.0	C		
6.2-7.1	***///		C	<u>SAND</u> , CLAYEY, GRADATIONALLY CONTACTS TOP, LOOSE, DRY, RED BROWN	
7.1	***///		C		
7.1-8.3	///---		C	<u>CLAY</u> , VERY SILTY, LAMINAR SILT, DRY-DAMP, FIRM, RED BROWN	
8.3	///---		C		
8.3-12.3	---///	10	C	<u>SILT</u> , CLAYEY, LAMINAR, DAMP-DRY, LIGHT BROWN, FIRM, ROOT MATTER	
12.3	---///		C		
12.3-12.8	***----		C	<u>SAND</u> , SILTY, FINE, LOOSE, DRY, RED BROWN	
12.8-14.3	///---		C	<u>CLAY</u> , SILTY, STIFF, DAMP, ROOT MATTER, RED BROWN, SILT LAMINAR	
14.3	///---		C		
14.3-16.5	***00****	15	C	<u>SAND</u> , FINE, SCATTERED GRAVEL TO 2", SILTY, RED BROWN, MODERATELY DENSE, DRY-DAMP	
16.5	***00****		C		
16.5-21.5	***SS****	20	C	<u>SAND</u> , COARSE-FINE, WET, SOME SANDSTONE GRAVEL TO 3", RED BROWN, SOME CLAY @ 19.5-20.0, WATER BEARING @ 20.0	
21.5	***SS****		C		
21.5-25.0	//////////		C	LOST SAMPLE-POSSIBLE SOFT, WET, CLAY BASED ON LEFTOVERS IN SAMPLER	
	//////////		C		
	//////////		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PROJECT: Giant Refinery
Ciniza

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 96-133
ELEVATION: 6917.6
TOTAL DEPTH: 36.5
LOGGED BY: WHK
DATE: 9-4-96
STATIC WATER: 19.0 @ 27 HRS
BORING ID: 0648
PAGE: 2

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
21.5-25.0	//////		C	LOST SAMPLE-POSSIBLE SOFT, WET, CLAY BASED ON LEFTOVERS IN SAMPLER	PID-0ppm ALL SAMPLES
25.0	//////	25	C		
25.0-28.0	//////		C	CLAY, WET, SOFT, RED BROWN	
28.0	//////		C		
28.0-30.0	*O*SS*O*O		C	SAND & GRAVEL, 4" SANDSTONE, CHERT, WATER BEARING, HYDROCARBON ODOR, LOOSE, MULTICOLORED	
30.0	*O*SS*O*O	30	C		
30.0-32.0	S=S=S=S=S		C	CHINLE FORMATION	
32.0	S=S=S=S=S		C	SAMPLER REFUSAL-POSSIBLE "SWEET" ODOR, SANDSTONE & SHALE > 30', NO ODOR, DRILL WITHOUT SAMPLER TO 35', MATRIX > 30' GREYGREEN, CEMENTED VERY DENSE ROCK @ 32'	
32.0-36.5	S=S=S=S=S		C	SANDSTONE & SHALE, HARD, CALCARIOUS CEMENTATION, FINE TO COARSE, SHALE, GREEN-RED B	
36.5	S=S=S=S=S	35	C		
TOTAL DEPTH		40	C	NOTE: HYDROCARBON ODOR APPEARS TO BE CONCENTRATED IN WATER LYING ON CHINLE FORMATION	
		45			

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

LOGGED BY: WHK

FILE #:	96-133
ELEVATION:	6913.4
TOTAL DEPTH:	30.0
LOGGED BY:	WHK
DATE:	9-4-96
STATIC WATER:	20.0
BORING ID:	0649
<u>PAGE:</u>	1

LOGGED BY: WHK

[illegible]

PROJECT: Giant Refinery
Ciniza

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 96-133
ELEVATION: 6913.4
TOTAL DEPTH: 30.0
LOGGED BY: WHK
DATE: 9-4-96
STATIC WATER: 20.0
BORING ID: 0649
PAGE: 2

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
23.2-25.0	000***00 000***00 000***00		C C C	<u>GRAVEL</u> , SANDY, CHERT, SANDSTONE, SLIGHTLY CLAYEY, RED BROWN, DENSE, <u>WATER BEARING</u>	PID-0ppm ALL SAMPLES
25.0	000***00	25	C		
25.0-30.0	===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***===		C C C C C C C C C C C	<u>CHINLE FORMATION</u> <u>SHALE</u> , SANDY, RED BROWN/GREEN INTERBEDS, DENSE, MOIST, NOT WATER BEARING	
30.0	===***===	30	C		
TOTAL DEPTH					
		35			
		40			
		45			

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

FILE #: 97-032
 ELEVATION: 6923.04
 TOTAL DEPTH: 47.5'
 LOGGED BY: WHK
 DATE: 3-22-97
 STATIC WATER: 38.0' @ 30 MIN
 BORING ID: 0651
 PAGE: 1

LOCATION: SEE SITE PLAN

LOG OF TEST BORINGS

DEPTH	T	E	E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-2.2	///***///		C	CLAY, SANDY, WET, SOFT, RED BROWN	ALL SAMPLES
	///***///		C		0
	///***///		C		
2.2	///***///		C		
2.2-3.5	***--***		C	SAND, FINE, SILTY, LOOSE, DRY, RED BROWN, SOME ROOT MATTER	
	--		C		
3.5	***--***		C		
3.5-9.3	///---///		C	CLAY, SILTY, FIRM, RED BROWN, DAMP-MOIST	
	///---///		C		
	///---///	5.0	C		
	///---///		C		
	///---///		C	VERY STIFF, SOME ROOT MATTER GREATER THAN 6.0 FEET	
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
9.3	///---///		C		
9.3-10.2	*****	10	C	SAND, FINE, DRY, LOOSE, RED BROWN, LIGHT COLOR	
10.2-10.9	-----		C	SILT, DRY, LIGHT RED BROWN, FIRM	
10.9	-----		C		
10.9-14.5	///---///		C	CLAY, SILTY, SOME ROOT MATTER, RED BROWN, FIRM, CHARCOAL	
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
14.5	///---///		C		
14.5-15.5	///***///	15	C	CLAY, SANDY, RED BROWN, STIFF, MOIST, CHARCOAL	
15.5	///***///		C		
15.5-17.5	***//***		C	SAND, CLAYEY, DAMP, LOOSE, RED BROWN	
	//		C		
	//		C		
17.5	***//***		C		
17.5-20.0	///***///		C	CLAY, VERY FINE, SANDY, RED BROWN, STIFF, DAMP-MOIST, SAND STREAKS AND SOME LAMINAR	
	///***///		C	BANDING ESPECIALLY IN SANDIER ZONES	
	///***///		C		
	///***///		C		
20.0	///***///	20	C		
20.0-22.0	*****		C	SAND, FINE, VERY MOIST-WET, NOT WATER BEARING, LOOSE, RED BROWN	
	*****		C		
	*****		C		
22.0	*****		C		
22.0-23.5	///***///		C	CLAY, VERY SANDY, WET, FIRM, RED BROWN	
	///***///		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

LOCATION: SEE SITE PLAN

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-032
 ELEVATION: 6923.04
 TOTAL DEPTH: 47.5'
 LOGGED BY: WHK
 DATE: 3-22-97
 STATIC WATER: 38.0' @ 30 MIN
 BORING ID: 0651
 PAGE: 2

DEPTH	T	E	E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (pdm)
23.5	////****//		C	CLAY, VERY SANDY, WET FIRM, RED BROWN	
23.5-25.0	****//***		C	SAND, CLAYEY, SOME PURE ZONES APPROXIMATELY 3" THICK, LAMINAR BANDED, WET, NOT	ALL SAMPLES
	****//***		C	WATER BEARING, RED BROWN	0
25.0	****//***	25	C		
25.0-28.5	//////////		C	CLAY, SOFT, WET, NOT WATER BEARING, RED BROWN	
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
28.5	//////////		C		
28.5-30.4	////****//		C	CLAY, SLIGHTLY SANDY, SOME CARBONATE NODULES, RED BROWN, HARD, MOIST-DAMP	
	////****//		C	HARD TO DRILL	
	////****//	30	C		
30.4	////****//		C		
30.4-34.0	//////////		C	CLAY, DENSE, RED BROWN TO DARK BROWN, MOIST, HARD	
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
34.0	//////////		C		
34.0-34.3	////****//		C	CLAY, SANDY, BROWN, MOIST, STIFF	
34.3-36.0	//////////	35	C	CLAY, HARD, DARK BROWN, MOIST	
	//////////		C	SOFT	
36.0	//////////		C		
36.0-37.8	///00*///		C	CLAY, SOME SCATTERED GRAVEL TO 1" IN SIZE, SOFT, WET, NOT WATER BEARING, DARK BROWN	
	///00*///		C	SOME COARSE SAND	
	///00*///		C		
37.8	///00*///		C		
37.8-39.5	****//**		C	SAND, VERY CLAYEY, MORE SAND AT 39.0 FEET, LOOSE, SATURATED, MAY BE VERY WEAKLY	
	****//**		C	WATER BEARING, RED BROWN	
39.5	****//**		C		
39.5-41.0	//////////	40	C	CLAY, BROWN, STIFF, WET, NOT WATER BEARING	
	//////////		C		
41.0	//////////		C		
41.0-44.6	*****		C	SAND GRADING TO GRAVEL, SANDSTONE AND CHERT, SOME PETRIFIED WOOD, WATER BEARING	
	00**0		C	DENSE, RED BROWN, SLIGHTLY CLAYEY	
	*0*0*0*0*		C		
	*00*00*00		C		
	*00*00*00		C		
	*0S*0S*0S		C		
44.6	*0S/*0S/*		C		
44.6-47.5	=====	45	C	CHINLE FORMATION	
	=====		C	SHALE, RED BROWN, DENSE, DAMP, NO WATER, FISSLE	
	=====		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

FILE #: 97-032
ELEVATION: 6923.04
TOTAL DEPTH: 47.5'
LOGGED BY: WHK
DATE: 3-22-97
STATIC WATER: 38.0'@30 MIN
BORING ID: 0651
PAGE: 3

LOG OF TEST BORINGS

[illegible]

FILE #: 97-032
ELEVATION: 6929.56
TOTAL DEPTH: 45.0'
LOGGED BY: WHK
DATE: 3-22-97
STATIC WATER: 27.0'@30 MIN
BORING ID: 0652
PAGE: 1

LOG OF TEST BORINGS

						DATE:	3-22-97
						STATIC WATER:	27.0'@30 MIN
						BORING ID:	0652
						PAGE:	1
	S	A	M	P	L	MATERIAL CHARACTERISTICS	
	P	C				(MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)	PID
DEPTH	T	E	E				(ppm)
0.0-5.5	///---//		C			<u>CLAY</u> , SILTY, SOFT, RED BROWN, WET, NOT WATER BEARING, SOME ROOT MATTER	0.0-26.0
	///---//		C				0
	///---//		C				
	///---//		C				
	///---//		C				
	////*/		C			<u>CLAY</u> , STIFF, MOIST, SOME SANDY STRINGERS, RED BROWN	
	////*/		C				
	////*/		C				
	////*/		C				
	////*/	5.0	C				
5.5	////*/		C				
5.5-8.0	////**//		C			<u>CLAY</u> , FINE, SANDY, RED BROWN, MOIST-DAMP, STIFF	
	////**//		C				
	////**//		C				
	////**//		C				
8.0	////**//		C				
8.0-9.6	////**//		C			<u>CLAY</u> , SANDY, SOME SAND STRINGERS, FINE, GRADES SANDIER DESCENDING, RED BROWN, STIFF	
	////**//		C				
9.6	////**//		C				
9.6-10.8	*****	10	C			<u>SAND</u> , LOOSE, RED BROWN, DAMP, FINE-MEDIUM	
	*****		C				
10.8	*****		C				
10.8-12.5	////**//		C			<u>CLAY</u> , HARD, SANDY, SOME SLICKENSIDED SURFACES FORM JOINTS, RED BROWN, MOIST-DAMP	
	////**//		C				
12.5	////**//		C				
12.5-12.8	*****		C			<u>SAND</u> , FINE, DRY, LOOSE, RED BROWN	
12.8-13.9	////**//		C			<u>CLAY</u> , SANDY, MOIST-DAMP, RED BROWN, HARD	
13.9	////**//		C				
13.9-17.5	///---//		C			<u>CLAY</u> , SILTY, SILT IN LAMINATIONS, SOME CHARCOAL, DAMP, HARD, RED BROWN	
	///---//	15	C			SOME SANDY ZONES GREATER THAN 16.0 FEET	
	///---//		C				
	///---//		C				
	///--**//		C				
	///--**//		C				
17.5	///--**//		C				
17.5-18.1	***//***		C			<u>SAND</u> , CLAYEY, DENSE, DAMP, RED BROWN	
18.1-19.5	///---//		C			<u>CLAY</u> , SILTY, SOME SILT IN LAMINATIONS, DAMP-MOIST, BROWN-RED BROWN, HARD	
	///---//		C				
19.5	///---//		C				
19.5-25.0	////////	20	C			<u>CLAY</u> , MOIST-WET, SOME ROOT MATTER, BROWN-RED BROWN, HARD, FEW FINE ROOT MATTER,	
	////////		C			SOME FINE BLOCKY FRACTURING (FORMER SHRINKAGE) BUT NO INFILLING WITH SAND	
	////////		C			WET, NOT WATER BEARING GREATER THAN 23.5 FEET, SOME CHARCOAL OBSERVED, GRADING	
	////////		C			SANDY AT 24.8 FEET	
	////////		C				
	////////		C				
	////////		C				

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

PRECISION ENGINEERING, INC.

FILE #: 97-032
 ELEVATION: 6929.56
 TOTAL DEPTH: 45.0'
 LOGGED BY: WHK
 DATE: 3-22-97
 STATIC WATER: 27.0' @ 30 MIN
 BORING ID: 0652
 PAGE: 2

LOCATION: SEE SITE PLAN

LOG OF TEST BORINGS

DEPTH					MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
				S		
				S		
	P			C		
	L			A		
	O			L		
	T			E		
25.0	//////	25	C		CLAY, MOIST-WET, SOME ROOT MATTER, BROWN-RED BROWN, HARD, FEW FINE ROOT MATTER, SOME FINE BLOCKY FRACTURING (FORMER SHRINKAGE) BUT NO INFILLING WITH SAND	0.0-26.0
	//////		C		WET, NOT WATER BEARING GREATER THAN 23.5 FEET, SOME CHARCOAL OBSERVED, GRADING	0
	//////		C		SANDY AT 24.8 FEET	
25.0-32.0	///*-///		C		CLAY, VERY SLIGHTLY SANDY, SILTY, SOME CHARCOAL, WET, NOT WATER BEARING, SOFT-FIRM	
	///*-///		C		RED BROWN	
	///*-///		C			150
	///*-///		C			
	///*-///		C			
	///*-///		C			20
	///*-///		C			
	///*-///		C			
	///*-///	30	C			
	///*-///		C			10
	///*-///		C			
	///*-///		C			
32.0	///*-///		C			
32.0-34.0	***///***		C		SAND, CLAYEY, PURE SAND IN 2" SEAMS, <u>WATER BEARING BUT WEAK</u> , LOOSE, BROWN	32.0-45.0
	///		C			0
	///		C			
34.0	***///***		C			
34.0-37.1	///---///	35	C		CLAY, SILTY, BROWN, SOFT, WET, NOT WATER BEARING	
	///---///		C			
	///---///		C			
	///---///		C			
37.1	///---///		C			
37.1-39.5	***000***		C		SAND, VERY GRAVELLY, SANDSTONE, CHERT, PETRIFIED WOOD, PEBBLES/GRAVEL TO 3" IN SIZE	
	000		C		<u>WATER BEARING</u> , MULTICOLORED	
	000		C			
	000		C			
39.5	***000***		C			
39.5-40.0	///---///	40	C		CLAY, SILTY, LIGHT RED BROWN, SOFT, WET, NOT WATER BEARING	
40.0-42.0	***000***		C		SAND, VERY GRAVELLY, SANDSTONE, CHERT, <u>WATER BEARING</u> , DENSE	
	000		C			
	000		C			
42.0	***000***		C			
42.0-45.0	====*		C		CHINLE FORMATION	
	====*		C		SHALE, VERY SANDY, DAMP, NOT WATER BEARING, GREEN GREY	
	====*		C			
	====*		C			
45.0	====*	45	C			
TOTAL DEPTH						

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

LOCATION: SEE SITE PLAN
CINIZA REFINERY

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-070
ELEVATION: 6929.2
TOTAL DEPTH: 35.0'
LOGGED BY: TM
DATE: 6-10-97
STATIC WATER: 21.2'
BORING ID: 0656
PAGE: 1

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-1.0 1.0	***//00**		C	<u>SAND</u> , FINE, CLAYEY, FINE GRAVEL, BROWN, MOIST	0.0-23.0
1.0-4.5 4.5	///**00// ///**00// ///**00// ///**00// ///**00// ///**00// ///**00//		C C C C C C C	<u>CLAY</u> , SLIGHTLY SANDY, SOME FINE GRAVEL, MOIST, RED BROWN, FIRM TO SOFT, NO ODOR, SOME CHARCOALING MORE GRAVELLY AT 3.5' TO 3.8'	0
4.5-4.8	****//***	5.0	C	<u>SAND</u> , FINE, DAMP, SLIGHTLY CLAYEY, PURPLISH BROWN, NO ODOR	
4.8-6.0 6.0	///***-// ///***-//		C C	<u>CLAY</u> , VERY SANDY, FINE, SILTY, NO ODOR, PURPLISH BROWN	
6.0-6.2	****//***		C	<u>SAND</u> , FINE TO MEDIUM, CLAYEY, SLIGHTLY SILTY, MOIST, PURPLE RED, NO ODOR	
6.2-7.8 7.8	///***+// ///***+// ///***+//		C C C	<u>CLAY</u> , VERY SANDY, FINE, SILTY, SOME CALCAREOUSLY INDURATED APPEARING NODULES, FINE GRAVEL, SOME VEGETATION IN SAMPLE, DAMP TO MOIST, PURPLISH BROWN	
7.8-8.5	****//***		C	<u>SAND</u> , VERY FINE TO FINE, CLAYEY, SILTY, SOME CEMENTED SAND, MOIST, PURPLISH BROWN,	
8.5-8.8	///***//		C	<u>CLAY</u> , SAND, FINE, SAND APPEARS TO BE IN BANDS, NO ODOR, FIRM, MOIST	
8.8-9.2	****//***		C	<u>SAND</u> , FINE, CLAYEY, MOIST, PURPLISH BROWN, SLIGHT ORANGE TINT AT 8.8'	
9.2-11.5 11.5-12.2 12.2	///***// ///***// ///***// ///***// ///***//	10	C C C C C	<u>CLAY</u> , SANDY, FINE, SOME CHARCOALING AND GYPSUM SPOTS IN SAMPLE, MOIST, SOME ROOT MATTER, HARD, NO ODOR <u>CLAY</u> , MOIST, HARD, SLIGHTLY SILTY, HEAVY CHARCOALING, VEGETATION, CALCAREOUS INDURATION OR GYPSUM NODULES, NO ODOR, PURPLISH BROWN	
12.2-14.2 14.2	****//*** ****//***		C C	INTERBEDDED SAND AND CLAY	
14.2-17.0 17.0	///****// ///****// ///****// ///****// ///****// ///****//	15	C C C C C C	<u>CLAY</u> , MOIST, PURPLISH-BROWN, VERY SANDY, ORANGE-SANDY BANDS IN CLAY, VERY THIN- LAYERS TO 15', NO ODOR, SOME CHARCOALING	
17.0-17.5	****//***		C	<u>SAND</u> , CLAYEY, SILTY, FINE, PURPLISH BROWN WITH ORANGE TINT, NO ODOR	
17.5-18.2 18.2	///--*// ///--*//		C C	<u>CLAY</u> , SILTY, SANDY, WET, PURPLISH BROWN, SOFT TO FIRM, SOME VEINING, POSSIBLE ROOTS DARK GREEN, NO ODOR	
18.2-18.8 18.8	****-//*** ****-//***		C C	<u>SAND</u> , FINE TO MEDIUM, PURPLISH WITH ORANGE BANDS, SOME BLACK BANDING, SILTY, SLIGHTLY CLAYEY, NO ODOR	
18.8-19.7	///*-///	20	C	<u>CLAY</u> , MOIST, ROOT MATTER, PURPLISH BROWN, SLIGHTLY SANDY, SOME SILT, NO ODOR	
19.7-19.9	****-***		C	<u>SAND</u> , FINE, MOIST, ORANGE BROWN, SLIGHTLY SILTY, SOME PURPLING, NO ODOR	
19.9-21.2	///-**//		C	<u>CLAY</u> , WET, SLIGHTLY SILTY, SANDY, REDDISH PURPLE, FIRM, NO ODOR	
21.2-22.0 22.0	****-//*** ****-//***		C C	<u>SAND</u> , FINE, WET, <u>SLIGHTLY WATER BEARING</u> , ORANGE BROWN TO PURPLE, NO ODOR, SLIGHTLY SILTY, CLAYEY, MODERATELY DENSE	
22.0-22.4	/*/*/*/*		C	INTERBEDDED CLAY AND SAND	
22.4-27.2	///*00//		C	<u>CLAY</u> , MOIST, SLIGHTLY SANDY, SOME GYPSUM NODULES OR CEMENTED SAND, COARSE GRAVEL,	

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

LOGGED BY: TM

LOCATION: SEE SITE PLAN
CINIZA REFINERY

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-070
ELEVATION: 6929.2
TOTAL DEPTH: 35.0'
LOGGED BY: TM
DATE: 6-10-97
STATIC WATER: 21.2'
BORING ID: 0656
PAGE: 2

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
22.4-27.2	/// *00///		C	CLAY, MOIST, SLIGHTLY SANDY, SOME GYPSUM NODULES OR CEMENTED SAND, COARSE GRAVEL, WHITE, FINE, NO ODOR, REDDISH BROWN	23.0-32.0 0
27.2	/// *00///	25	C		
27.2-27.7	*** /00***		C	SAND, FINE TO MEDIUM, <u>SLIGHTLY WATER BEARING</u> , SLIGHTLY CLAYEY, FINE GRAVEL, REDDISH BROWN WITH PURPLE TINT, NO ODOR	
27.7	*** /00***		C		
27.7-28.0	/// --*///		C	CLAY, SILTY, MOIST TO WET, SLIGHTLY SANDY, RED BROWN, FIRM, NO ODOR	
28.0-28.8	00// --*0		C	GRAVEL, FINE TO COARSE, CLAYEY, SILTY, SANDY, FINE, WET, SOME SANDSTONE NODULES, BONE WHITE, NO ODOR	
28.8	00// --*0		C		
28.8-29.0	/// **00//	30	C	CLAY, MOIST, SANDY, FINE GRAVEL, RED BROWN, STIFF, NO ODOR	
29.0-32.0	000***000		C	GRAVEL, FINE TO COARSE, SANDY, FINE TO COARSE, PURPLE BROWN, <u>WATER BEARING</u> , CLAYEY, NO ODOR, 30.0'-32.0' MORE COARSE SAND, FINE GRAVEL, <u>WATER BEARING</u>	3.0
32.0	000***000		C		
32.0-35.0	===// *===		C	<u>CHINLE FORMATION</u>	
	===// *===		C	PURPLISH WITH LIGHT GREEN BANDING, CLAYEY, SOME SAND, FINE, SOME CEMENTED SAND AT 35.0', DRY	
	===// *===		C		
	===// *===		C		
35.0	===// *===	35	C		
TOTAL DEPTH					

LOGGED BY: TM

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

LOCATION: SEE SITE PLAN
CINIZA REFINERY

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-070
ELEVATION: 6938.4
TOTAL DEPTH: 40.0'
LOGGED BY: TM
DATE: 6-10-97
STATIC WATER: 34.5'
BORING ID: 0657
PAGE: 1

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-1.8	///*o*o//		C	<u>CLAY</u> , DAMP, FIRM, SANDY, FINE, SOME FINE GRAVEL, RED BROWN, NO ODOR	0.0-31.0
1.8	///*o*o//		C		0
1.8-4.5	///*o*o//		C		
4.5	///*o*o//		C	<u>SAND</u> , FINE TO COARSE, SILTY, SLIGHTLY CLAYEY, SOME FINE GRAVEL, RED BROWN, SOME GYPSUM SPOTS, MORE COARSE SAND AT 4.0' TO 4.5', DAMP, NO ODOR	
4.5-5.0	///*o*o//		C		
5.0-5.9	///*o*o//	5.0	C	INTERBEDDED CLAY AND SAND	
5.9	///*o*o//		C	<u>CLAY</u> , MOIST, SLIGHTLY BLOCKY, WHITE GYPSUM SPOTS, CHARCOALING, SOME ROOTS IN SAMPLE	
5.9-6.2	///*o*o//		C	REDISH BROWN, VERY DARK TO PURPLE CHARCOALING, NO ODOR, VERY STIFF	
6.2-8.5	///*o*o//		C	<u>SAND</u> , FINE, SOME COARSE, RED BROWN WITH ORANGE TINT	
8.5-10.0	///*o*o//		C	<u>CLAY</u> , MOIST, SLIGHTLY BLOCKY, WHITE GYPSUM SPOTS, CHARCOALING, SOME ROOTS IN SAMPLE	
10.0-11.2	///*o*o//	10	C	REDISH BROWN, VERY DARK TO PURPLE CHARCOALING, NO ODOR, VERY STIFF, SLIGHTLY SILTY	
11.2	///*o*o//		C	<u>CLAY</u> , SILTY, SANDY, FINE, SOME GYPSUM SPOTTING, DAMP TO MOIST, REDDISH BROWN WITH PURPLE TINT, VERY STIFF TO HARD, MORE FISSLE, NO ODOR, SOME CHARCOALING	
11.2-12.5	///*o*o//		C	<u>CLAY</u> , MOIST, HARD, SLIGHTLY SILTY, SOME CHARCOAL, PURPLISH BROWN, DAMP TO MOIST, NO ODOR	
12.5	///*o*o//		C	<u>SAND</u> , FINE, SILTY, SLIGHTLY CLAYEY, PURPLISH BROWN, DAMP, NO ODOR	
12.5-13.2	///*o*o//		C	SILTY AT 12.0'	
13.2-13.8	///*o*o//		C	<u>CLAY</u> , SILTY, SLIGHTLY SANDY, FINE, SLIGHTLY FISSLE, DAMP, VERY STIFF, REDDISH BROWN	
13.8	///*o*o//		C	<u>SAND</u> , VERY FINE TO FINE, SILTY, CLAYEY, DAMP TO MOIST, RED BROWN, NO ODOR	
13.8-14.5	///*o*o//		C	<u>CLAY</u> , SANDY, VERY FINE, SILTY, DAMP TO MOIST, NO ODOR	
14.5-15.0	///*o*o//	15	C	<u>CLAY</u> , SANDY, FINE, PURPLISH BROWN WITH ORANGE TINT, VERY STIFF, NO ODOR, SILTY, DAMP	
15.0-15.2	///*o*o//		C	<u>SAND</u> , FINE, SILTY, SLIGHTLY CLAYEY, REDDISH PURPLE WITH ORANGE TINT, NO ODOR	
15.2-15.7	///*o*o//		C	<u>CLAY</u> , SILTY, SANDY, FINE, ORANGE BANDS OF SAND IN CLAY, DAMP TO MOIST, NO ODOR, RED BROWN CLAY	
15.7-18.2	///*o*o//		C	<u>CLAY</u> , HARD, MOIST, REDDISH BROWN, CHARCOALING, BLOCKY, SOME CEMENTED SAND AT 17.0', NO ODOR	
18.2	///*o*o//		C		
18.2-18.7	///*o*o//		C	<u>SAND</u> , FINE, SLIGHTLY SILTY AND CLAYEY, PURPLISH BROWN WITH ORANGE TINT, SOME BLACK SAND IN BAND FORM	
18.7	///*o*o//		C		
18.7-20.0	///*o*o//	20	C	<u>CLAY</u> , SILTY, VERY SANDY, SAND IN ORANGE BANDS, PURPLE BROWN, DAMP TO MOIST, VERY STIFF, NO ODOR	
20.0-21.0	///*o*o//		C	<u>CLAY</u> , VERY SILTY, SANDY, FINE, DAMP TO MOIST, PURPLISH BROWN, NO ODOR	
21.0-22.2	///*o*o//		C	<u>CLAY</u> , VERY SANDY, SILTY, SAND IN ORANGE COLOR, PURPLE BROWN, VERY STIFF, NO ODOR	
22.2-23.5	///*o*o//		C	LESS SILTY, MORE WHITE GYPSUM SPOTS, SOME CHARCOALING	

LOGGED BY: TM

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

LOCATION: SEE SITE PLAN
CINIZA REFINERY

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-070
ELEVATION: 6938.4
TOTAL DEPTH: 40.0'
LOGGED BY: TM
DATE: 6-10-97
STATIC WATER: 34.5'
BORING ID: 0657
PAGE: 2

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)	PID (ppm)
22.2-23.5	///+/-		C	LESS SILTY, MORE WHITE GYPSUM SPOTS, SOME CHARCOALING	
23.5-24.5	///+/-		C	MORE SANDY, FINE, SILTY, ORANGE SAND, PURPLE BROWN CLAY	
24.5	///+/-		C		
24.5-25.0	+++/-	25	C	SAND, FINE, SILTY, CLAYEY, ORANGISH PURPLE, DAMP, NO ODOR	
25.0-26.2	///+/-		C	CLAY, MOIST, REDDISH BROWN WITH PURPLE TINT, SLIGHTLY SANDY, SOME CHARCOALING,	
26.2	///+/-		C	SLIGHTLY SILTY, HARD, NO ODOR	
26.2-26.7	+++/-		C	SAND, FINE, CLAYEY, SILTY, MOIST, ORANGISH BROWN, NO ODOR	
26.7-27.5	///+/-		C	CLAY, VERY SANDY, VERY FINE TO FINE, SILTY, ORANGE PURPLE, MOIST, HARD, NO ODOR	
27.5	///+/-		C		
27.5-28.5	+++/-		C	SAND, VERY FINE TO FINE, SILTY, CLAYEY, ORANGISH PURPLE, MOIST, NO ODOR	
28.5	+++/-		C		
28.5-28.8	///+/-		C	CLAY, SILTY MOIST, VERY STIFF, SANDY, FINE, PURPLISH BROWN WITH ORANGE TINT, DAMP	
28.8-29.7	+++/-		C	SAND, FINE, SILTY, CLAYEY, SOME COARSE, DAMP, NO ODOR (FINE AND COARSE GRAVEL ZONE	
29.7	++-0-0	30	C	AT 29.2-29.5)	
29.7-30.5	///+/-		C	CLAY, VERY SANDY, SILTY, DAMP TO MOIST, FISSLE, PURPLE BROWN WITH SOME ORANGE AND	
30.5	///+/-		C	BLACK SAND, NO ODOR	
30.5-31.0	+++--		C	SAND, VERY FINE TO FINE, SILTY, MOIST, ORANGISH RED TO PURPLISH BROWN, NO ODOR	
31.0-33.8	///+/-		C	CLAY, SLIGHTLY SANDY, SILTY, WET, SOME CHARCOAL VEINS, STIFF, REDDISH BROWN	30.0
	///+/-		C		170.0
33.8	///+/-		C		
33.8-35.9	00//*Soo		C	GRAVEL, VERY CLAYEY, SANDY, FINE TO COARSE, SILTY GRAVEL IS FINE TO COARSE, SOME	
	00//*Soo		C	SOFT SANDSTONE NODULES, SLIGHTLY WATER BEARING AT 34.5'	
	00//*Soo	35	C	SLIGHTLY WATER BEARING AT 35.2'	200.0
35.9	00//*Soo		C		
35.9-40.0	===//		C	CHINLE FORMATION	
	===//		C	CLAYEY, PURPLISH BROWN WITH LIGHT GREEN SPOTS, MOIST, BLOCKY	
	===//		C		
	===//		C		
	===//		C		
	===//		C		
40.0	===//	40	C		
TOTAL DEPTH					

LOGGED BY: TM

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

FILE #: 97-070
ELEVATION: 6934.9
TOTAL DEPTH: 45.0'
LOGGED BY: WHK
DATE: 6-12-97
STATIC WATER: 32.0'
BORING ID: 0665
PAGE: 1

[illegible]

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

LOGGED BY: WHK

LOCATION: SEE SITE PLAN
CINIZA REFINERY

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-070
ELEVATION: 6934.9
TOTAL DEPTH: 45.0'
LOGGED BY: WHK
DATE: 6-12-97
STATIC WATER: 32.0'
BORING ID: 0665
PAGE: 2

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
17.0-24.5	////**//		C	<u>CLAY</u> , SLIGHTLY SANDY, WET, FIRM, BROWN-	
24.5	////**//		C		
24.5-28.0	*****	25	C	<u>SAND</u> , FINE, DAMP TO MOIST, RED BROWN, "SWEET" ODOR (POSSIBLE ADDITIVE OR LIGHT END)	
	*****		C		
	*****		C		
	*****		C		
	*****		C		
	*****		C		
28.0	*****		C		
28.0-34.3	000*S*S00		C	<u>GRAVEL</u> , SANDY (SANDSTONE, CHERT), STRONG GASOLINE ODOR (OLD), MOIST TO WET, NOT	
	000*S*S00		C	WATER BEARING, BROWN	
	000*S*S00		C		
	000*S*S00	30	C		
	000*S*S00		C		
	000*S*S00		C		
	000*S*S00		C		
	000*S*S00		C		
	000*S*S00		C	<u>WATER BEARING AT 32.0' - 33.5'</u>	
	000*S*S00		C		
	000*S*S00		C		
34.3	000*S*S00		C		
34.3-34.5	////////		C	<u>CLAY</u> , WET, SOFT, BROWN, NO ODOR	
34.5-35.0	*****	35	C	<u>SAND</u> , FINE, WET, BROWN, NO ODOR, MODERATELY DENSE	
35.0-41.0	000***000		C	<u>GRAVEL</u> , SANDY, BROWN, WET, NOT WATER BEARING, POSSIBLE WEAK "SWEET" ODOR	
	000***000		C		
	000***000		C		
	000***000		C		
	000***000		C		
	000***000		C		
	000***000		C		
	000***000		C		
	000***000		C		
	000***000	40	C		
	000***000		C		
41.0	000***000		C		
41.0-45.0	=====		C	<u>CHINLE FORMATION</u>	
	=====		C	<u>SHALE</u> , SANDY, RED, SOME RED SPOTS, DRY, HARD	
	=====		C		
	=====		C		
	=====		C		
	=====		C		
	=====		C		
45.0	=====	45	C		
TOTAL DEPTH					

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

Site: Giant Refining-Ciniza

Date: August 30, 2001

			O	L	L	MATERIAL CHARACTERISTICS				
LAB #	DEPTH	BLOW COUNT	T	E	E	(MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	L	PI	CLASS.
40161	0.0-1.0	CONTINUOUS	//////			CLAY, MOIST, FIRM, RED BROWN				
	1.0-2.1	CONTINUOUS	-/*/--			SILT, CLAYEY, SLIGHTLY SANDY (VERY FINE), LOOSE	9.7			
	2.1-5.0	CONTINUOUS	//////			DAMP, ROOT MATTER ABUNDANT				
			//////			CLAY, VERY FIRM TO HARD, MOIST, RED BROWN				
40162	5.0-5.2	CONTINUOUS	//////	5.0		CLAY, VERY FIRM TO HARD, MOIST, RED BROWN	15.1	49	31	CL/A-7-6
			//////							
			//////							
			/**/			VERY FINE SAND SEAM FROM 7.5' TO 7.7'				
40163	10.0-11.5	12-21-23	//////	10		SLIGHTLY BLOCKY STRUCTURE THROUGHOUT	14.2	56	33	CH/A-7-6
	11.8		//////							
	11.8-12.5	CONTINUOUS	/***/			CLAY, SANDY VERY FINE, MOIST, VERY FIRM, RED BROWN				
40164	12.5-15.0	CONTINUOUS	//////			CLAY, VERY STIFF, DARK RED BROWN, MOIST- WET,				
	15.0-16.5	7-11-17	//////	15		CHARCOAL PRESENT, DIFFICULT TO BREAKUP IN HAND	18.6			
			//////							
			//////							
40165	18.5-20.0	CONTINUOUS	/***/			CLAY, VERY SLIGHTLY SANDY, WET, SOFT, RED				
	20.0-20.5	2-	/***/	20		BROWN	24.0			
			/***/							
			/***/			CLAY, VERY SANDY VERY FINE, WET, RED BROWN, SOFT				
			/***/			CLAY, WET, FIRM, RED BROWN				
40166	22.5-24.5	CONTINUOUS	/***/			CLAY, SANDY VERY FINE, WET, SOFT- FIRM, RED-BROWN	24.8			
40167	24.5-25.0	CONTINUOUS	//////	25		CLAY, WET, FIRM, RED BROWN				
	26.2		//////							
	26.2-29.0	CONTINUOUS	-----			SILTSTONE, THIN MUDSTONE PARTINGS, SLIGHTLY	7.7			
			-----			SANDY, GREEN-GREY, DARK RED BROWN PARTINGS,				
Total Depth			-----			DAMP HARD, CHINLE FORMATION				
			30			WATER BEARING IN THE SILTSTONE FROM 26.2'-27.0'				
						BACKFILL TO SURFACE WITH BENTONITE GEL				
						(300 LBS)				
			35							
40										

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

Bore Point: West Boring

LOG OF TEST BORINGS

Site: Giant Refining-Ciniza

Water Elev: Not Encountered

Elevation: Existing

Boring No.: 01-0117-B2

Date: August 31, 2001

LAB #	DEPTH	BLOW COUNT	O L L			MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	L	PI	CLASS.
			T	E	E					
40168	0.0-2.0	CONTINUOUS	///-//			CLAY, SLIGHTLY SILTY, FIRM, WET, RED BROWN				
			***//							
	2.0-2.6	CONTINUOUS	//////			CLAY, SANDY (VERY FINE), MOIST, SOFT, RED-BROWN				
	2.6-5.0	CONTINUOUS	//////			CLAY, HARD, MOIST-WET, RED BROWN, SOME ROOT MATTER	13.3	49	31	CL/A-7-6
			//////	5.0						
40169	5.0-7.0	SHELBY	//////			CLAY AS ABOVE, PUSHED 2' RECOVERED 1'-11"				
			//////							
	7.0-10.0	CONTINUOUS	//////			SOME SLICKENSIDED SURFACES > 7'				
			//////							
			//////	10						
40170	10.0-11.5	11-19-21	///-//			CLAY, VERY SLIGHTLY SANDY, MOIST TO WET, RED	12.4	46	27	CL/A-7-6
	11.5-12.2	CONTINUOUS	//////			BROWN, BRITTLE				
	12.2-13.0	CONTINUOUS	**//**			SAND, CLAYEY, DAMP, RED BROWN, MODERATELY DENSE				
	13.0-15.0	CONTINUOUS	//////			CLAY, VERY STIFF, DIFFICULT TO CRUMBLE, MOIST-WET, RED BROWN,				
			//////	15		SOME ROOT MATTER, SOME SLICKENSIDED SURFACES WHEN BROKEN				
40171	15.0-16.5	8-10-11	//////				17.3			
			//////							
	17.5-19.0	CONTINUOUS	///-**			INTERBEDDED, VERY FINE SAND, SILT, CLAY,				
			//////			CLAY APPROXIMATELY 50% OF THE TOTAL SAMPLE				
	19.0-20.0	CONTINUOUS	//////	20		WET TO MOIST, HARD TO FIRM, RED BROWN	16.8			
40172	20.0-21.5	8-10-27	///-//			CLAY, VERY SILTY, CRUMBLES EASILY, GREY BROWN	12.6			
			///-//							
			///-//							
	22.0		//////			MORE DENSE > 21.5				
			//////							
40188	22.0-22.9	CONTINUOUS	-----			MUD STONE/ SILT STONE, MOIST, HARD, RED BROWN,	10.4			
			-----	25		GREEN REDUCTION SPOTS				

	22.9		-----							
	Total Depth			30						
						BACKFILL TO SURFACE WITH BENTONITE GEL				
						(600 LBS)				
				35						
				40						

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger
Logged By: WHK

PROJECT: Tank 569
LOCATION: See Boring Plan

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 95-018
ELEVATION: 6918.6
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 3-30-95
STATIC WATER: 28.0
BORING ID: B1
PAGE: 1

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)	PID (ppm)
0.0-1.2	****//	1.0	C	<u>Sand</u> , clayey, damp, brown, soft/loose, some fine gravel	0.0
1.2-5.0	///+---//		C	<u>Clay</u> , sandy, silty, moist to wet, brown, stiff, some root fibers in upper 3'	0.0
	///+---//		C	no odor	
	///+---//		C		
	///+---//		C		
	///+---//		C		
	///+---//		C		
5.0-8.8	///---//	5.0	C	<u>Clay</u> , silty, moist, brown, hard, scattered root fibers	0.0
	///---//		C		
	///---//		C		
	///---//		C		
	///---//		C		
	///---//		C		
8.8-9.1	000///000		C	<u>Gravel</u> , fine, clayey, damp, brown, dense, silica gravel to 1/2", no odor	0.0
9.1-10.0	///+---//	9.0	C	<u>Clay</u> , sandy, damp, brown, hard, some root matter, no odor	0.0
	///+---//		C		
10.0-12.4	////////	10	C	<u>Clay</u> , blocky, moist to wet, brown, hard, root matter, gradational above and below	0.0
	////////		C		
	////////		C		
	////////		C		
	////////	12	C		
12.4-16.4	///+---//		C	<u>Clay</u> , silty, sandy, sandier @ 14' but gradational, moist to wet, brown, stiff to	0.0
	///+---//		C	hard, does not appear weathered in-situ, slightly fissured, pieces (2-3 mm) of	
	///+---//		C	clay in sandy matrix, root matter	
	///+---//		C		
	///+---//		C		
	///+---//	15	C		
	///+---//		C		
	///+---//	16	C		
16.4-16.7	*****		C	<u>Sand</u> , fine, moist, red brown, loose	0.0
16.7-17.4	///+---//	17	C	<u>Clay</u> , sandy, wet, brown, very stiff	
17.4-22.9	///+---//		C	<u>Clay</u> , slightly fissured but not as much as above, some 4" slightly sandy zones	0.0
	///+---//		C	some carbonate nodules, wet, dark brown, hard	
	///+---//		C		
	///+---//		C		
	///+---//		C		
	///+---//		C		
	///+---//		C		
	///+---//		C		
22.9-30.0	///+---//		C	<u>Clay</u> , slightly sandy, some carbonate filaments, occasional individual coarse sand	0.0
	///+---//		C	grains of silica rock, wet, dark brown, soft, no odor, free water on tip of sample	
	///+---//	23	C	but not in samples	

SIZE AND TYPE OF BORING: 4'-1/4" HSA

LOGGED BY: WHK

PROJECT: Tank 569
LOCATION: See Boring Plan

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 95-018
ELEVATION: 6918.6
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 3-30-95
STATIC WATER: 28.0
BORING ID: B1
PAGE: 2

		S	S
	P	C	A
	L	A	M
	O	L	P
DEPTH	T	E	L

DEPTH				MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
	////**+/		C	continued from page 1	
	////**+/	24	C		
	////**+/		C		
	////**+/		C		
	////**+/		C		
	////**+/		C		
	////**+/		C		
	////**+/		C		
	////**+/		C		
	////**+/		C		
	////**+/		C		
	////**+/		C		
	////**+/		C		
30.0-32.5	***O****	30	C	<u>Sand</u> , slightly clayey, occasional pebbles, <u>weakly water bearing</u> , brown, very soft/loose	0.0
	O*		C		
	O*		C		
	O*		C		
	O*	32	C		
32.5-39.5	///---+/		C	<u>Clay</u> , silty, some carbonate filaments and staining, more carbonate filaments below 32', wet, saturated but not water bearing, light brown, soft to firm	0.0
	///---+/		C		
	///---+/		C		
	///---+/		C		
	///---+/		C		
	///---+/		C		
	///---+/		C		
	///---+/		C		
	///---+/		C		
	///---+/		C		
	///---+/		C		
	///---+/		C		
	///---+/	39	C		
39.5-41.1	///OOO///		C	<u>Clay</u> , gravelly, wet, saturated but not water bearing, light brown, soft	0.0
	///OOO///		C		
	///OOO///		C		
	///OOO///	41	C		
41.1-47.1	***OO****		C	<u>Sand</u> , coarse, fine to medium gravelly, <u>water bearing</u> , brown, dense, subrounded to rounded silica rock, some sandstone pieces	0.0
	OO*		C		
	OO*		C		
	OO*		C		
	OO*		C		
	OO*		C		
	OO*		C		
	OO*		C		
	OO*		C		
	OO*		C		

SIZE AND TYPE OF BORING: 4'-1/4" HSA

LOGGED BY: WHK

PROJECT: Tank 569
LOCATION: See Boring Plan

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 95-018
ELEVATION: 6918.6
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 3-30-95
STATIC WATER: 28.0
BORING ID: B1
PAGE: 3

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
	000		C	continued from page 2	
	000	47	C		
47.1-50.0	-----		C	<u>CHINLE FORMATION</u>	
	-----		C	<u>Shale</u> , some green mottling, fissile, moist, hard, slightly blocky, no odor	0.0
	-----		C		
	-----		C		
	-----		C		
	-----	50	C		
TD				end 11:00a -- depth to water @ 12:15p 28.0' grout hole with bentonite/cement/8% grout to surface time end 1:15p -- water depth affected by hole collapse	
LOGGED BY: WHK					
SIZE AND TYPE OF BORING: 4'-1/4" HSA					

PRECISION ENGINEERING, INC.

FILE #: 95-018
 ELEVATION: 6917.6
 TOTAL DEPTH: 30.0
 LOGGED BY: WHK
 DATE: 3-30-95
 STATIC WATER: 22.3
 BORING ID: B3
 PAGE: 1

PROJECT: Tank 569

LOCATION: See Boring Plan

LOG OF TEST BORINGS

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-1.3	***OO//		C	Clay, sandy, gravelly, wet, brown, soft, no odor	0.0
	***OO//	1.0	C		
1.3-2.7	***//		C	Clay, fine sandy, wet, brown to red brown, soft, no odor	0.0
	***//	2.0	C		
2.7-5.0	////		C	Clay, wet, very soft, some root matter	0.0
	////	3.0	C		
	////		C		
	////		C		
	////		C		
5.0-8.4	////	5.0	C	Clay, wet, dark brown, stiff, no odor, some root matter	0.0
	////		C		
	////		C		
	////		C		
	////		C		
	////	8.0	C		
8.4-10.3	////		C	Clay, carbonate filaments common, some carbonate nodules scattered, wet, stiff	0.0
	////	9.0	C	red brown, no odor	
	////		C		
	////	10	C		
10.3-10.6	////		C	Clay, gravelly, wet, red brown, stiff, no odor	0.0
10.6-12.9	////+--/	11	C	Clay, fine sandy, silty, wet, light red brown, firm, no odor, scattered fine	0.0
	////+--/		C	gravel, some root matter, some carbonate filaments, slightly blocky	
	////+--/		C		
12.9-14.1	////+++/		C	Clay, slightly sandy, carbonate filaments abundant, wet, brown, firm, carbonate	0.0
	////+++/	13	C	filaments stain sample, white CCI2, no odor, root matter abundant	
	////+++/		C		
14.1-14.4	*****	14	C	Sand, fine, moist, light brown, loose, no odor	0.0
14.4-15.3	////+--/		C	Clay as at 12.9'-14.1' but slightly more fine sand, no odor	0.0
	////+--/	15	C		
15.3-16.7	***//		C	Sand, fine, slightly clayey, moist to wet, brown, loose, no odor	0.0
	***//	16	C		
16.7-18.3	***//		C	Clay, fine sandy in laminations, wet, dull brown, soft, root matter common, no odor	0.0
	***//	17	C		
	***//		C		
	***//	18	C		
18.3-18.9	////		C	Clay, blocky, slabby, wet, dull brown, firm, no odor	0.0
18.9-20.0	////	19	C	Clay, very sandy, wet, brown, soft	0.0
	////		C		
20.0-24.4	***OOO***	20	C	Sand, very gravelly, rounded to subrounded silica rock, some sandstone white, some	5 (upper 6")
	OOO		C	odor in upper 5", stained black to dark grey, water bearing, dense, multicolored	
	OOO		C	red brown matrix	
	OOO		C		
	OOO		C		
	OOO		C		
	OOO		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4'-1/4" HSA

PRECISION ENGINEERING, INC.

FILE #: 95-018
 ELEVATION: 6917.6
 TOTAL DEPTH: 30.0
 LOGGED BY: WHK
 DATE: 3-30-95
 STATIC WATER: 22.3
 BORING ID: B3
 PAGE: 2

PROJECT: Tank 569

LOCATION: See Boring Plan

LOG OF TEST BORINGS

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
	****000***		C		
	****000***	24	C		
24.4-25.0	-----		C	<u>CHINLE FORMATION</u>	
	-----	25	C	<u>Shale</u> , very sandy, weathered, grey, green, no odor, hard	0.0
25.0-30.0	-----		C	<u>Shale</u> , sandy, fissle, some green grey streaks, moist, hard	0.0
	-----		C		
	-----		C		
	-----		C		
	-----		C		
	-----		C		
	-----		C		
	-----		C		
	-----		C		
	-----		C		
	-----	30	C		
TD				stop drilling @ 4:05p water @ 4:20p -- 22.3' grout to surface with bentonite/cement	

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4'-1/4" HSA

FILE #:	97-032
ELEVATION:	6901.38
TOTAL DEPTH:	30.1'
LOGGED BY:	WHK
DATE:	3-23-97
STATIC WATER:	NOT FOUND
BORING ID:	MP-4
PAGE:	1

PAGE: 1

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

FILE #:	97-032
ELEVATION:	6901.38
TOTAL DEPTH:	30.0'
LOGGED BY:	WHK
DATE:	3-23-97
STATIC WATER:	NOT FOUND
BORING ID:	MP-4
PAGE:	2

LOG OF TEST BORINGS

[illegible]

FILE #:	97-032
ELEVATION:	6898.39
TOTAL DEPTH:	41.2'
LOGGED BY:	WHK
DATE:	3-23-97
STATIC WATER:	24.0'
BORING ID:	MP-5
PAGE:	1

PAGE: 1

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

FILE #:	97-032
ELEVATION:	6898.39
TOTAL DEPTH:	41.2'
LOGGED BY:	WHK
DATE:	3-23-97
STATIC WATER:	24.0'
BORING ID:	MP-5
PAGE:	2

LOG OF TEST BORINGS

[illegible]

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

Site: CINIZA REFINERY

GALLUP, NM

6916.0

Date: 4-3-96

Logged By: WHK

Bore Point: TWO

LOG OF TEST BORINGS

Site: CINIZA REFINERY

Water Elev: 25.2'

GALLUP, NM

Elevation: 6916.0

Boring No.: MP-9

Date: 4-3-96

LAB #	DEPTH	BLOW COUNT	0		L	E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	M	L	PI	CLASS
			T	E							
	22.5-25.2		///**/ ///**/ ///**/ ///**/	25	C	CLAY, BROWN, FIRM, WET (NOT WATER BEARING), WHITE FILIMENTS, CALCAREOUS OR SULPATE, SOME VERY THIN SANDS THAT ARE NOT WATER BEARING					
	25.2-25.8		***** *****		C	SAND, FINE, WATER BEARING, BROWN, SOFT					
	25.8-26.7		//////		C	CLAY, WET, FIRM, BROWN					
	26.7-28.3		***** ***** *****		C	SAND, FINE TO MEDIUM, WATER BEARING, (POOR), LOOSE TO MEDIUM DENSE, BROWN					
	28.3-30.0		////// ////// ////// /////	30	C	CLAY, BROWN, FIRM, WET, (NOT WATER BEARING)					
	30.0-30.9		***//* ***//*		E	SAND, FINE, MEDIUM, CLAYBY, BROWN, WATER BEARING					
	30.9-31.2		000000 000000		E	GRAVEL, TO 4", WATER BEARING, BROWN, DENSE, MAINLY SANDSTONE GRAVEL					
	31.2-33.3		SSS**S SSS**S SSS**S		E	CHINLE FORMATION SHALE, GREEN BROWN, SANDY, SOME RED BROWN PARTINGS, WET, DENSE					
	TD				C						
				35	C						
				40	C						
				45	C						

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Aguirre
Drilling Rig : CME75
Drilling Method : 7.25" Hollow-Stem Auger
Sampling Method : 2" Diameter Split Spoon
Comments : 2' Long
Total Depth : 20'
Ground Water : Not Encountered
Start Date : 5-11-2015
Finish Date : 5-11-2015

WELL NO. NDD-1

(Sheet 1 of 1)

Elev., TOC (ft.msl) :
Elev., PAD (ft. msl) :
Elev., GL (ft. msl) :
Site Coordinates :
N : N35°29.679'
E : W108°25.772'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
-2								
-1								
0								
1	4.1			ML	90		CLAYEY SILT, low,soft, dry to damp, reddish brown, no odor,	
2				CL	90		SILTY CLAY, low, very stiff, dry, reddish brown, no odor,	
3	8.1			CL	50		SILTY CLAY, SIMILAR TO ABOVE (STA), trace calcareous,	
4								
5	9.3			CL	50		SILTY CLAY, STA,	
6								
7	10.1			CL	60		SILTY CLAY, STA,	
8								
9	9.9			CL	40		SILTY CLAY, STA,	
10				CL	60		SILTY CLAY, STA,	
11	8.2			CL	60		SANDY CLAY, low, stiff, damp to dry, dark brown, no odor,	
12				CL	60		SILTY CLAY, low, stiff, dry to damp, brown, no odor, calcareous,	
13	6.1			CL	60			
14								
15	5.2			CLST	60		CLAYSTONE, low, very stiff, damp to dry, reddish purple, no odor, trace grey,	
16								
17	5.1			CLST	60		CLAYSTONE, STA, increase in grey, no odor,	
18								
19	6.3			CLST	60		CLAYSTONE, STA, no odor, darker purple.	
20								

1010 Travis Street
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713-955-1230

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



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Aguirre
Drilling Rig : CME75
Drilling Method : 7.25" Hollow-Stem Auger
Sampling Method : 2" Diameter Split Spoon
Comments : 2' Long
Total Depth : 20'
Ground Water : Not Encountered
Start Date : 5-11-2015
Finish Date : 5-11-2015

WELL NO. NDD-2
(Sheet 1 of 1)

Elev., TOC (ft.msl) :
Elev., PAD (ft. msl) :
Elev., GL (ft. msl) :
Site Coordinates :
N : N35°29.469'
E : W108°25.724'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
-2								
-1								
0								
1	9.7			CL	50		SILTY CLAY, low, soft to very stiff, damp to dry, reddish brown, no odor,	
2								
3	14.4			CL	50		SILTY CLAY, SIMILAR TO ABOVE (STA), very stiff, no odor,	
4								
5	17.1			CLST	50		CLAYSTONE, low, very stiff, dry, reddish purple, no odor, trace grey,	
6								
7	18.0			CLST	50		CLAYSTONE, STA, purple, no odor, very dense,	
8								
9	14.8			CLST	50		CLAYSTONE, STA, no odor,	
10								
11	16.3			CLST	50		CLAYSTONE, STA, purple and grey, no odor,	
12								
13	13.5			CLST	50		CLAYSTONE, STA, no odor,	
14								
15	12.2			CLST	50		CLAYSTONE, STA, no odor,	
16								
17	12.4			CLST	50		CLAYSTONE, STA, no odor,	
18								
19	10.8			CLST	50		CLAYSTONE, STA, no odor.	
20								

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512-693-4190

Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Aguirre
Drilling Rig : CME75
Drilling Method : 7.25" Hollow-Stem Auger
Sampling Method : 2" Diameter Split Spoon
Comments : 2' Long
Total Depth : 16'
Ground Water : 10.52' BTOC on 5-14-2015
Start Date : 5-11-2015
Finish Date : 5-11-2015

WELL NO. NDD-3

(Sheet 1 of 1)

Elev., TOC (ft.msl) :
Elev., PAD (ft. msl) :
Elev., GL (ft. msl) :
Site Coordinates :
N : N35°29.612'
E : W108°25.612'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
-3								NDD-3 Top of Casing 2.83' Above Ground Level 2" Sch 40 PVC w/Threaded Joints Bentonite Pellets 10/20 Sieve Sand Filter Pack 2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints 2" Flush Threaded Sch 40 PVC Cap
-2								
-1								
0								
1	14.2			CL	60		SILTY CLAY, low, soft, damp, brown, no odor,	
2								
3	12.2			CL	80		SILTY CLAY, SIMILAR TO ABOVE (STA), firm, no odor,	
4								
5	14.4			CL	70		SILTY CLAY, STA, no odor,	
6								
7	9.9			CH	90		SILTY CLAY, high, firm, damp, light tan and brown, black organics, no odor,	
8								
9	10.7			CH	80		CLAY, high, firm, damp, brown trace light tan, no odor,	
10								
11	11.9	▼		CH	80		CLAY, STA,	
12				SC	80		CLAYEY GRAVELLY SAND, fine grain sand with sandstone gravel and low plastic clay, firm, moist to saturated, brown, no odor,	
13	13.9			CLST	50		CLAYSTONE, very stiff, damp to dry, purple grey, no odor,	
14								
15	13.5			CLST	50		CLAYSTONE, STA, no odor.	
16								
17								
18								
19								
20								

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713-955-1230

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Austin, Texas 78759
512-693-4190



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : CME 75
Drilling Method : Hollow-Stem Auger 7.25"
Sampling Method : Split Spoon
Comments :
Total Depth : 20'
Ground Water : 10'
Start Date : 05/23/2016
Finish Date : 05/23/2016

BORING NO. NDD-4

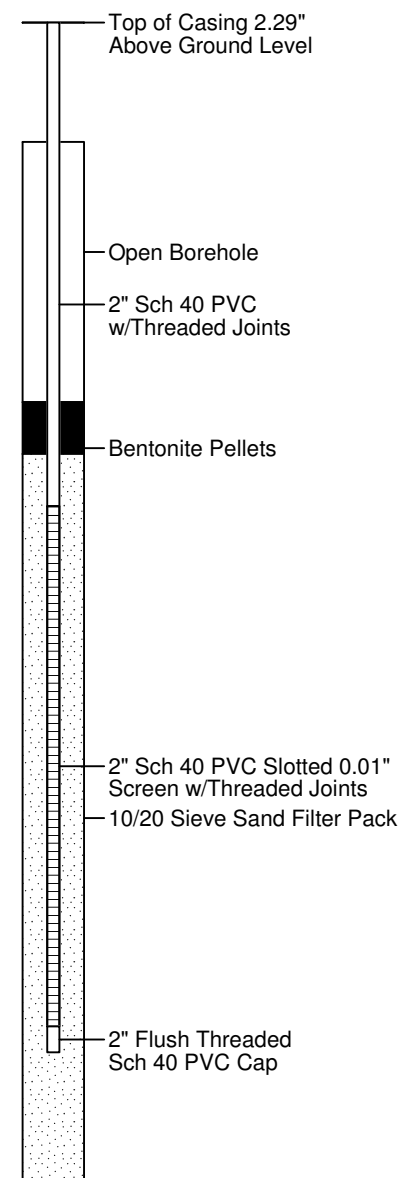
(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6913.02
Site Coordinates :
N : N 1635587.47
E : E 2546592.11

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation
							DESCRIPTION
-3							
-2							
-1							
0	3.5						SILTY CLAY, low, firm, damp, brown, no odor,
1							
2	7.1						
3	5.9			CL	100		
4							
5	7.0						
6							SANDY SILTY CLAY, SIMILAR TO ABOVE (STA), no odor, increase in sand with depth,
7	3.2			CL	90		
8							
9	4.9			CL	90		SANDY CLAY, low, soft, fine to medium grain sand in clay, sand seam 9.5-9.75', damp, brown, no odor,
10							
11	7.8			CL	90		SANDY CLAY, low, soft, medium to coarse grain sand, moist to saturated, brown, no odor,
12							
13	7.9			GW	50		SANDY GRAVEL, very coarse grain sand & 1/4" gravel, saturated, brown, no odor,
14							
15	6.7			GW	90		SANDY GRAVEL, STA, saturated, no odor,
16				CLST	90		CLAYSTONE, stiff, dry, reddish purple and grey, no odor,
17	5.9			CLST	50		CLAYSTONE, STA, brown, no odor,
18							
19	3.0			CLST	50		CLAYSTONE, STA, very stiff, no odor.
20							

Temporary Well Settings

TEMP WELL NO. NDD-4



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Austin, Texas 78759
512-693-4190



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-5

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6913.91
Site Coordinates :
N : N 1635583.59
E : E 2546416.63

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	6.5							SILT, low, soft, damp, odor at base.	
1				ML	100				
2	339								
3									
4									
5									
6									
7									
8									
9									
10									

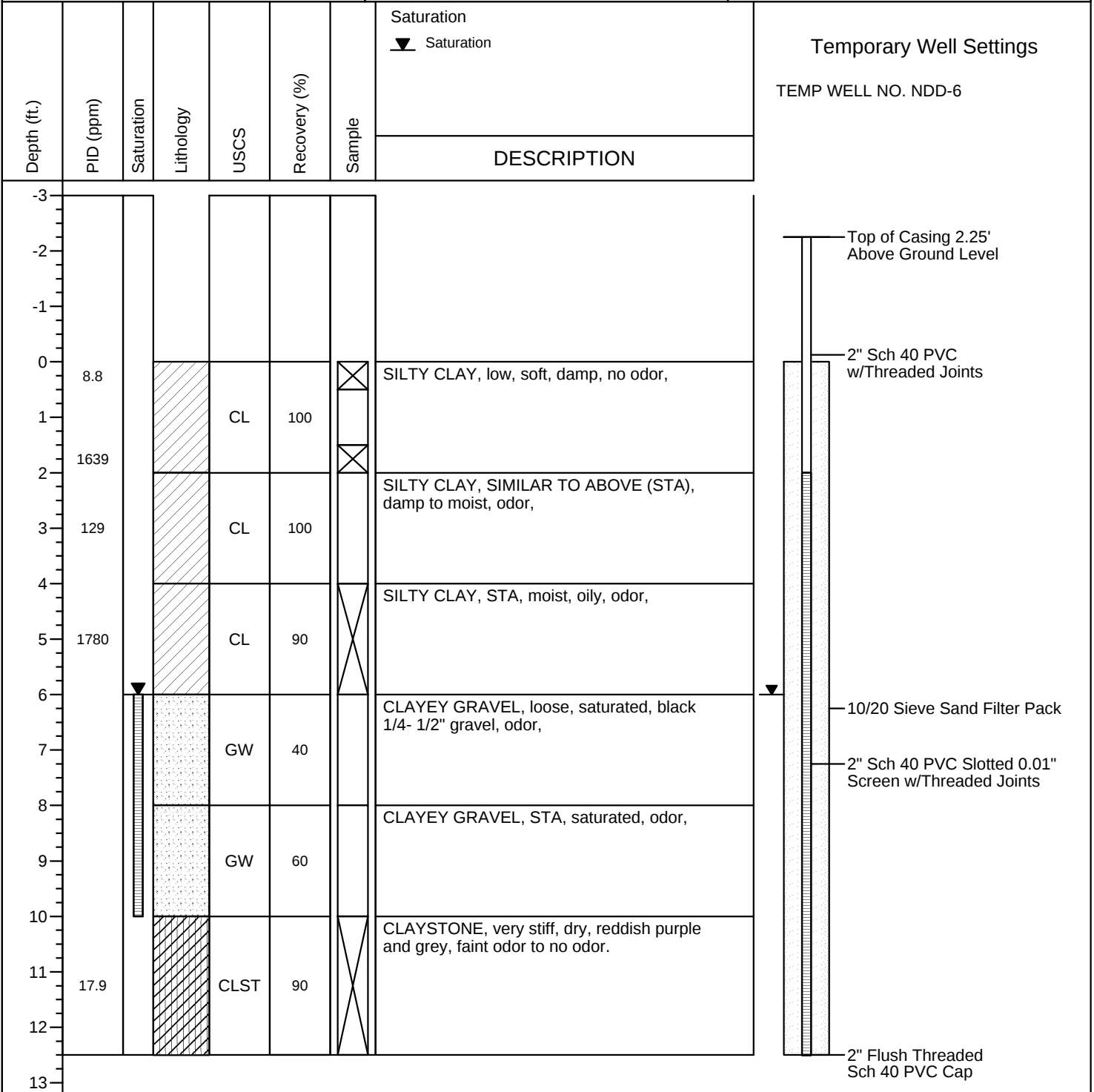
Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST16006

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : 7.25" Hollow Stem Auger
Sampling Method : Split Spoon
Comments : Hand Auger to 5' BGL
Total Depth : 12.5'
Ground Water : 6'
Start Date : 05/23/2016
Finish Date : 05/23/2016

BORING NO. NDD-6

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6912.97
Site Coordinates :
N : N 1635617.26
E : E 2546257.76





Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/23/2016
Finish Date : 05/23/2016

BORING NO. NDD-6A
(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6911.18
Site Coordinates :
N : N 35° 29.638'
E : W 108° 25.635'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
0	8.8							
1				CL	100			
2	1639							
3								
4								
5								
6								
7								
8								
9								
10								

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Austin, Texas 78759
512-693-4190



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-7

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6911.38
Site Coordinates :
N : N 1635691.31
E : E 2546173.94

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
0	3.3			CL	100		SILTY CLAY, low, soft, damp, no odor.	
1								
2	9.4							
3								
4								
5								
6								
7								
8								
9								
10								



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-8

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6910.42
Site Coordinates :
N : N 1635677.68
E : E 2546167.50

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	11.3							SILTY CLAY, low, soft, damp to moist, oily, odor at base.	
1				CL	100				
2	904								
3									
4									
5									
6									
7									
8									
9									
10									



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-9

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6912.09
Site Coordinates :
N : N 1635667.33
E : E 2546160.89

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION
0	18.5			CL	100			SILTY CLAY, low, soft, damp to moist, oily, odor at base.
1								
2	1530							
3								
4								
5								
6								
7								
8								
9								
10								



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-10

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6908.74
Site Coordinates :
N : N 1635765.48
E : E 2546031.06

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	8.8			CL	100			SILTY CLAY, low, soft, damp, brown, no odor.	
1									
2	12.3								
3									
4									
5									
6									
7									
8									
9									
10									

Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST16006

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : 7.25" Hollow Stem Auger
Sampling Method : 2' Split Spoon
Comments : Hand Auger to 2' BGL
Total Depth : 14' - Gravelly
Ground Water : 2'
Start Date : 05/23/2016
Finish Date : 05/23/2016

BORING NO. NDD-11

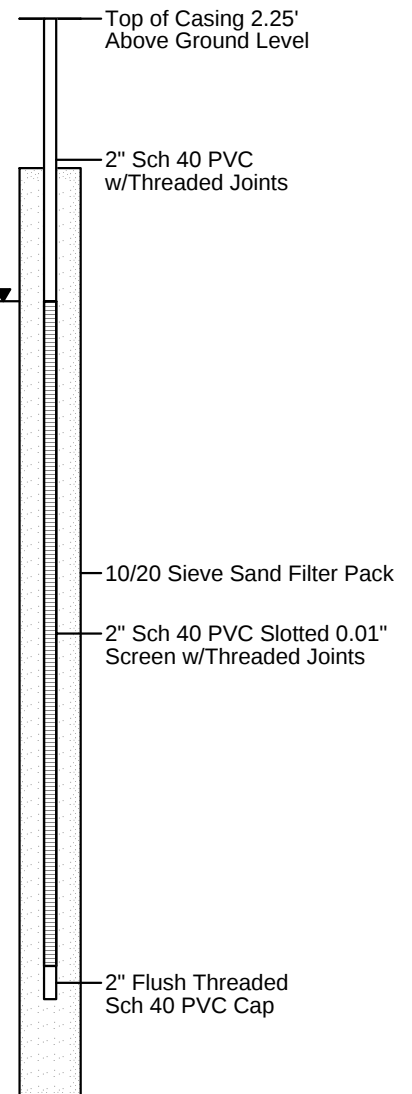
(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6908.54
Site Coordinates :
N : N 1635757.61
E : E 2546024.94

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation
							DESCRIPTION
-3							
-2							
-1							
0	3.2						
1				CL	100		GRAVELLY SILTY CLAY, low, soft, damp, brown, no odor,
2	4.6						
3				CL	100		SANDY CLAY, low, soft, very moist to saturated, brown, odor,
4							
5				SC	10		CLAYEY SAND, fine to medium, loose, saturated, black, odor,
6							
7				SC	90		CLAYEY SAND, SIMILAR TO ABOVE (STA), saturated, brown, odor,
8							
9				SM	50		SILTY SAND, fine to medium, loose, saturated, clay at base, brown, odor,
10							
11	29.3			CLST	20		CLAYSTONE, very stiff, reddish purple and grey, no odor,
12							
13	21.2			CLST	50		CLAYSTONE, STA, dry, no odor.
14							
15							

Completion Results

TEMP WELL NO. NDD-11





Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-12

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6910.72
Site Coordinates :
N : N 1635747.93
E : E 2546018.74

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION
0	8.9							SILT, low, soft, damp, no odor, odor at base.
1				ML	100			
2	66.4							
3								
4								
5								
6								
7								
8								
9								
10								



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-13

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6905.14
Site Coordinates :
N : N 1635872.71
E : E 2545854.34

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	5.6							SILTY CLAY, low, soft, damp, brown, no odor.	
1				CL	100				
2	8.0								
3									
4									
5									
6									
7									
8									
9									
10									



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-14

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6904.11
Site Coordinates :
N : N 1635858.65
E : E 2545847.68

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	5.7							SILTY CLAY, low, soft, damp to moist, brown, no odor.	
1				CL	100				
2	1.6								
3									
4									
5									
6									
7									
8									
9									
10									



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-15

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6905.27
Site Coordinates :
N : N 1635844.18
E : E 2545841.55

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	7.1							SILTY CLAY, low, firm, damp to moist, brown, no odor.	
1				CL	100				
2	6.3								
3									
4									
5									
6									
7									
8									
9									
10									

Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST16006

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : Hollow Stem Auger
Sampling Method : Split Spoon
Comments : Hand Auger to 5' BGL
Total Depth : 24' BGL
Ground Water : 16' BGL
Start Date : 05/24/2016
Finish Date : 05/24/2016

BORING NO. NDD-16

(Sheet 1 of 2)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6902.29
Site Coordinates :
N : N 1635916.92
E : E 2545737.03

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Temporary Well Settings		
									Temp Well No. NDD-16		
-3											
-2											
-1											
0	5.1					⊗		CLAY, high, stiff, damp, brown, no odor,			
1											
2	14.3					⊗					
3	5.3			CH	100						
4											
5	5.6										
6								CLAY, SIMILAR TO ABOVE (STA), no odor,			
7	12.1			CH	100						
8								CLAY, STA, no odor,			
9	12.3			CH	90						
10								CLAY, STA, no odor,			
11	12.6			CH							

Top of Casing 2.25'
Above Ground Level

Open Borehole

2" Sch 40 PVC
w/Threaded Joints

Bentonite Pellets

10/20 Sieve Sand Filter Pack



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST16006

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : Hollow Stem Auger
Sampling Method : Split Spoon
Comments : Hand Auger to 5' BGL
Total Depth : 24' BGL
Ground Water : 16' BGL
Start Date : 05/24/2016
Finish Date : 05/24/2016

BORING NO. NDD-16

(Sheet 2 of 2)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6902.29
Site Coordinates :
N : N 35° 29' 41.01"
E : W 108° 25' 45.02"

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Temporary Well Settings Temp Well No. NDD-16
11	12.6			CH	90				
12				CH	80			CLAY, STA, no odor,	
13	12.0			CH	80				
14				CL	60			SILTY CLAY, low, soft, damp, brown, no odor,	
15	12.9			CL	60				
16				CL	90			GRAVELLY SANDY CLAY, low, firm, very moist to saturated in sand seams, brown, no odor,	
17				CL	90				
18				CL	60			GRAVELLY SANDY CLAY, STA, no odor,	
19				CL	60				
20	4.5			CLST	60			CLAYSTONE, very dense, trace fine grain sand, damp to dry, brown and grey, no odor, CLAYSTONE, STA,	
21	4.8			CLST	50				
22				CLST	60			CLAYSTONE, STA.	
23	4.2			CLST	60				
24									
25									



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-17

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6903.49
Site Coordinates :
N : N 1635917.01
E : E 2545737.01

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	4.5							SILTY CLAY, low, firm, damp, brown, no odor.	
1				CL	100				
2	9.8								
3									
4									
5									
6									
7									
8									
9									
10									

Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Augers
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 40'
Ground Water : Not Encountered
Start Date : 03/15/2018
Finish Date : 03/15/2018

WELL NO. OW-62

(Sheet 1 of 3)

Elev., TOC (ft.msl) : 6937.36
Elev., PAD (ft. msl) : 6934.73
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634866.14
E : 2545914.00

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Rec overy (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
-2									
-1									
0								Hydroexcavated to 10' - Collapsed to 9' - no fluid,	
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11	0			ML	50			CLAYEY SILT, very fine, stiff, dry, crumbly, no odor, light brown,	
12									
13	0.1			CL	50			SILTY CLAY, SIMILAR TO ABOVE (STA), , increase in clay content,	
14									
15	0.3			CL	60			SANDY SILTY CLAY, low, firm, damp, very fine grain sand seams, brown, no odor,	
16									
17	0.3			CL	80			SANDY CLAY, low, firm, damp,brown, no odor,	
18				GW	80			SANDY GRAVEL, 20 to10 mm gravel with coarse grain sand, loose, damp,brown, no odor,	

Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Augers
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 40'
Ground Water : Not Encountered
Start Date : 03/15/2018
Finish Date : 03/15/2018

WELL NO. OW-62

(Sheet 2 of 3)

Elev., TOC (ft.msl) : 6937.36
Elev., PAD (ft. msl) : 6934.73
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634866.14
E : 2545914.00

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Rec overy (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results OW-62
18								CLAYEY SANDY GRAVEL, STA except clay present, very moist, hydrocarbon (HC) odor, ,	
19	3380			GC	80				
20								CLAYEY SANDY GRAVEL, STA, damp to moist, HC odor,	
21	82.9			GC	70				
22								SILTY CLAY, low, soft, trace sand,calcareous, damp to moist, reddish brown, HC odor,	
23	33			CL	60				
24								SILTY CLAY, low, stiff, damp,reddish brown, HC odor,	
25	800			CL	70				
26								SILTY CLAY, STA, calcareous, odor,	
27	555			CL	80				
28								CLAY, high, very stiff, damp,reddish brown, faint odor,	
29	56			CH	90				
30								SILTY CLAY, low, firm/crumbly, damp,reddish brown, trace grey, no odor,	
31	351			CL	90				
32								SILTY CLAY, STA,	
33	125			CL	90				
34								SILTY CLAY, STA,	
35	159			CL	90				
36								SILTY CLAY, STA,	
37	91			CL	90				
38									

4" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints

10/20 Sieve Sand Filter Pack

4" Flush Threaded Sch 40 PVC Cap

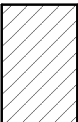
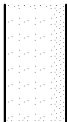
Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Augers
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 40'
Ground Water : Not Encountered
Start Date : 03/15/2018
Finish Date : 03/15/2018

WELL NO. OW-62

(Sheet 3 of 3)

Elev., TOC (ft.msl) : 6937.36
Elev., PAD (ft. msl) : 6934.73
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634866.14
E : 2545914.00

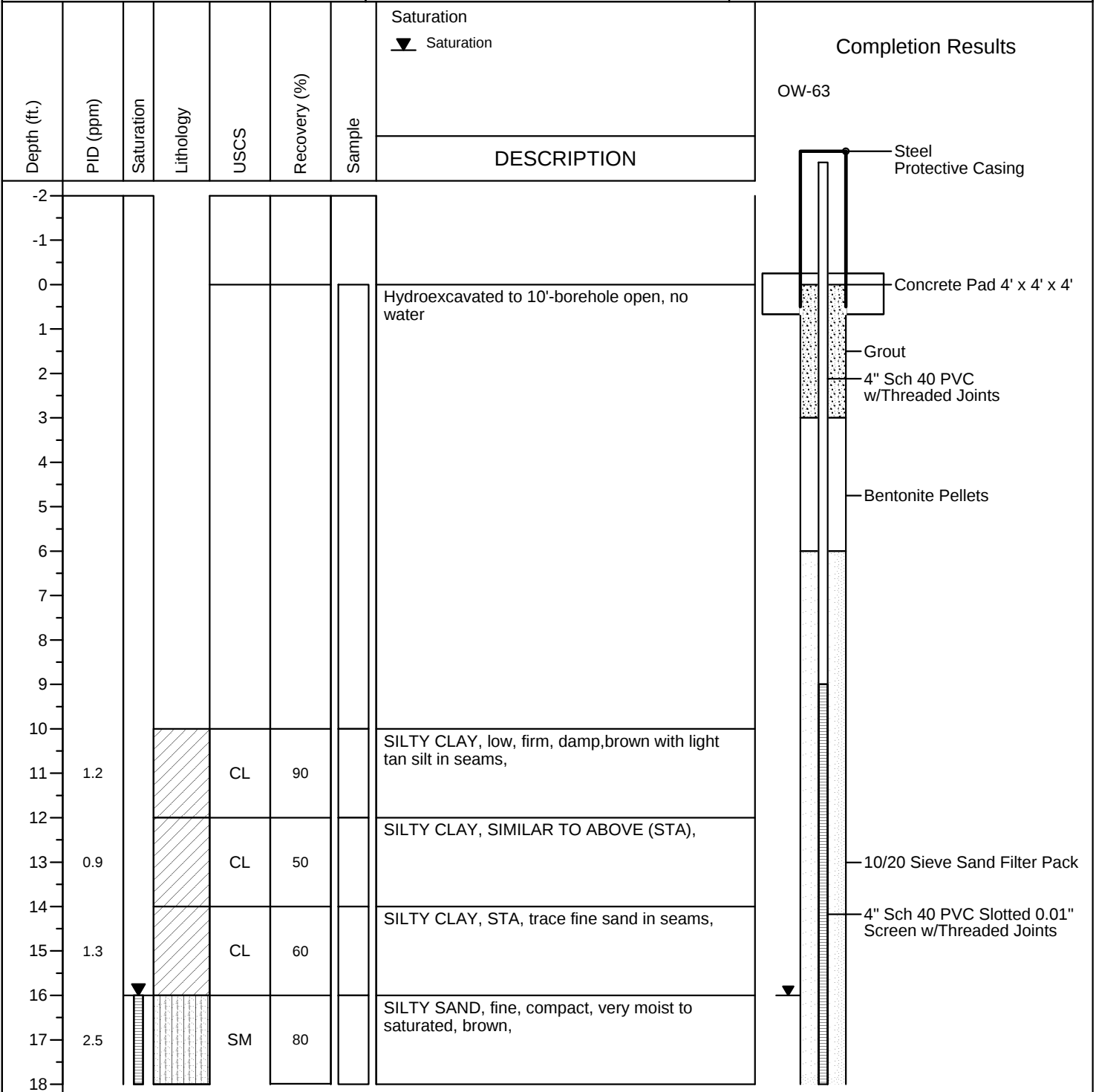
Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Rec overy (%)	Sample	Saturation ▼ Saturation	Completion Results OW-62
							DESCRIPTION	
38	44			CL	90		SILTY CLAY, STA.	 10/20 Sieve Sand Filter Pack
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								

Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Auger
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 32
Ground Water : 16'/25'
Start Date : 03/14/2018
Finish Date : 03/14/2018

WELL NO. OW-63
(Sheet 1 of 2)

Elev., TOC (ft.msl) : 6935.06
Elev., PAD (ft. msl) : 6932.34
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634859.73
E : 2546756.41



Andeavor
Gallup Refinery - French Drain Release
WEST18012

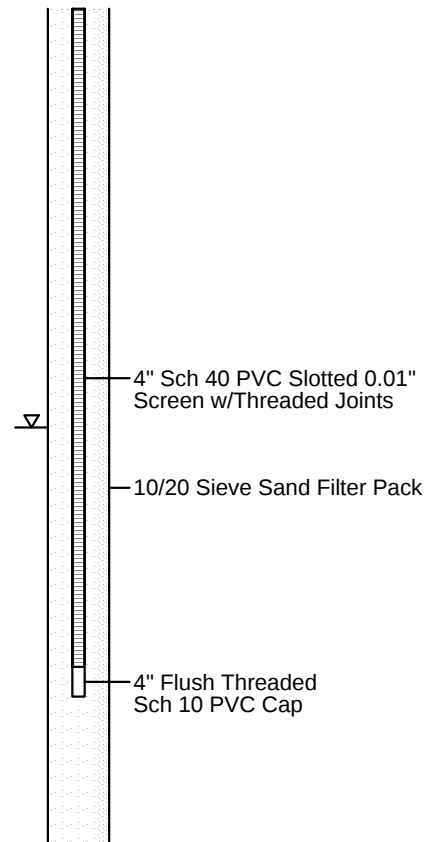
Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Auger
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 32
Ground Water : 16'/25'
Start Date : 03/14/2018
Finish Date : 03/14/2018

WELL NO. OW-63

(Sheet 2 of 2)

Elev., TOC (ft.msl) : 6935.06
Elev., PAD (ft. msl) : 6932.34
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634859.73
E : 2546756.41

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results OW-63
18								SANDY SILTY CLAY, low, firm, damp, occasional gravel, brown, odor,	
19	428			CL	80				
20								SILTY SANDY CLAY, STA, moist in sand seams at base, odor,	
21	652			CL	80				
22								SILTY SANDY CLAY, STA, odor,	
23	275			CL	70				
24				CH	70			CLAY, high, soft to firm,damp,brown, odor,	
25	39			CH	90			CLAY, STA, odor,	
26	28			GC	90			CLAYEY GRAVEL, sandstone gravel in pink/brown/olive green clay and silt, coarse sand present, saturated, odor,	
27	150			GC	90			CLAYEY GRAVEL, STA, saturated, odor,	
28								WEATHERED SANDSTONE, very dense, dry, grey to light purple, faint odor,	
29	40				90				
30								WEATHERED SANDSTONE, STA, grey and light purple.	
31	10.9				50				
32									
33									
34									
35									
36									
37									
38									



Appendix C

Tank Content and Inspection Records

GALLUP TANK CAPACITY LIMITS

Updated 11/30/12

TANK	PRODUCT	SAFE FILL HEIGHT	BBLs TOTAL CAPACITY	APPROXIMATE LOW GAUGE	HEEL BBLs	OUTAGE GAUGE	BBL/FT	ROOF TYPE	SAFE LOW GAUGE
101	CRUDE	44-0	74,360	10-0	2,419	48-7 1/2	1690	INTERNAL FLOATING	15-0
102	CRUDE	44-0	74,360	1-7	2,678	53-10 1/2	1690	EXTERNAL FLOATING	6-0
105	RERUN OIL	13-6	216	0-8	13	15-6 1/4	16	CONE	
106	DHT FEED	30-0	4,680	0-8 5/8	100	32-8 1/2	156	CONE	
107	RERUN OIL	30-0	4,680	6-0	229	32-8 3/4	156	CONE	
108	RERUN OIL	27-0	4,368	1-4 5/8	216	32-8 3/4	156	INTERNAL FLOATING	4-0
111	DIESEL-RUNDOWN	30-0	4,680	0-11 3/8	137	32-9 1/8	156	CONE	
112	DIESEL-RUNDOWN	30-0	4,680	0-3 1/4	137	32-8 3/4	156	CONE	
115	DIESEL-RUNDOWN	30-0	4,680	3-9 1/4	582	32-8 1/4	156	CONE	
116	DIESEL-RUNDOWN	30-0	4,680	3-8 3/8	569	32-8 7/8	156	CONE	
225	DHT FEED	38-0	23,788	2-0 3/8	1,166	40-1 3/4	626	CONE	
226	DHT FEED	38-0	23,788	2-1 5/8	1,217	40-5	626	CONE	
227	DHT FEED	30-0	4,680	1-1 3/4	176	32-11 5/8	156	CONE	
228	DHT FEED	30-0	4,680	1-6 7/8	229	33-3 1/2	156	CONE	
231	TRANSMIX	30-0	4,680	0-8 1/2	98	32-8 1/4	156	CONE	
232	TRANSMIX	30-0	4,680	0-8	98	32-9	156	CONE	
235	SOUR NAPHTHA	30-0	4,680	1-1	107	32-8 1/4	156	CONE	
337	SOUR NAPHTHA	36-0	19,000	2-6	923	42-0	500	INTERNAL FLOATING	5-0
338	SWEET NAPHTHA	38-0	23,788	1-3 7/8	778	40-8 3/4	626	CONE	
339	SOUR NAPHTHA	38-0	23,826	0-11 3/4	567	41-1 7/8	627	CONE	
342	ETHANOL	30-0	4,680	1-1 3/4	176	32-8 3/8	156	CONE	
343	ETHANOL	30-0	4,680	1-2 3/8	176	32-8 3/4	156	CONE	
344	OUT-OF-SERVICE	38-0	19,000	2-4	1,167	42-7 1/2	500	INTERNAL FLOATING	5-0
345	REFORMATE BLENDSTOCK	36-0	19,000	2-1 3/4	1,295	42-5 5/8	500	INTERNAL FLOATING	5-0
451	OUT-OF-SERVICE	14-0	882	4-0	81	16-8 1/4	63	CONE	
452	OUT-OF-SERVICE	14-0	882	4-0	61	16-9 1/4	63	CONE	
453	OUT-OF-SERVICE	30-0	4,680	4-0		32-9 1/4	156	CONE	
567	83.0 UNLEADED REGULAR	35-0	17,500	1-4 1/2	629	40-0	500	EXTERNAL FLOATING	5-0
569	LT CAT GASOLINE BLENDSTOCK	37-0	22,977	1-1	619	40-0	621	EXTERNAL FLOATING	5-0
570	83.0 UNLEADED REGULAR	37-0	22,977	1-1	619	40-0	621	EXTERNAL FLOATING	5-0
571	89.0 UNLEADED REGULAR	37-0	22,977	1-1	619	40-0	621	EXTERNAL FLOATING	5-0
572	89.0 UNLEADED REGULAR	37-0	22,977	1-1	619	40-0	621	EXTERNAL FLOATING	5-0
573	OUT-OF-SERVICE	12-0	168	0-9		40-0	14	CONE	
574	STRAIGHT RUN GASOLINE	37-5	37,304	3-1	1,108	40-0	997	EXTERNAL FLOATING	6-0
575	DIESEL-ULSD	38-0	9,576	4-0	1,012	40-9 5/8	252	CONE	
576	OUT-OF-SERVICE	37-5	37,304	3-1	2,118	40-0	997	EXTERNAL FLOATING	6-0
577	DIESEL-ULSD	38-0	9,576	0-11 3/4	216	40-9	252	CONE	
579	DIESEL-ULSD	38-0	19,114	1-8	796	40-8 7/8	503	CONE	
581	DHT FEED	35-0	23,788	2-5	1,531	40-9 1/8	626	INTERNAL FLOATING	5-0
582	83.0 UNLEADED REGULAR	35-0	21,910	1-8	955	40-9 5/8	626	INTERNAL FLOATING	5-0

GALLUP TANK CAPACITY LIMITS

Updated 11/30/12

TANK	PRODUCT	SAFE FILL HEIGHT	BBLs TOTAL CAPACITY	APPROXIMATE LOW GAUGE	HEEL BBLs	OUTAGE GAUGE	BBL/FT	ROOF TYPE	SAFE LOW GAUGE
583	DIESEL-JULSD	34-0	47,430	3-7	3,334	42-1 1/4	1400	INTERNAL FLOATING	
554	OLEFINS	9-9	2,033	0-5 1/2	30	10-10	-	BULLET	6-0
555	ISO-BUTANE	9-9	2,033	0-5	26	10-10	-	BULLET	
556	PROPANE	8-2	673	0-8	21	9-3	-	BULLET	
557	PROPANE	8-2	673	0-8	21	9-3	-	BULLET	
560	BUTANE	10-0	1,367	0-8	31	11-9	-	BULLET	
561	BUTANE	10-0	1,367	0-9	38	11-9	-	BULLET	
562	ALKYLATE BLENDSTOCK	46-0	20,241	1-8	395	52-1 3/4	500 *	ELLIPSOID	
563	REFORMATE BLENDSTOCK	46-0	20,277	3-6	422	51-7 1/2	500 *	ELLIPSOID	7-0
564	NATURAL GASOLINE	38-0	4,967	0-9 7/8	277	48-6 1/4	126	ELLIPSOID	
565	REFORMATE BLENDSTOCK	38-0	4,963	1-4	339	48-6 1/4	126	ELLIPSOID	
446	OLEFINS	8-0	678	0	0	8-10	-	BULLET	
447	ISO BUTANE	10-0	1,367	0-2 1/2	3	11-9	-	BULLET	1-0
448	ISO BUTANE	10-0	1,367	0-4	11	11-9	-	BULLET	1-0
701	FCC FEED	31-0	33,821	0-11 1/2	971	34-11 1/4	1091	CONE	
702	OUT-OF-SERVICE	39-0	24,492	0-11	568	41-1	628	CONE	
703	FCC FEED	38-0	23,902	0-9 1/4	570	40-3 1/4	629	CONE	
704	FCC FEED	30-0	9,420	0-9 1/2	215	31-0 1/2	314	CONE	
705	FCC FEED	30-0	9,375	0-11 1/2	591	32-3	312-5	CONE	
706	FUEL OIL	30-0	9,450	2-6	593	32-4 5/8	315	CONE	
707	OUT-OF-SERVICE	16-0	944	1-2	55	17-10 1/2	59	CONE	
708	OUT-OF-SERVICE	13-0	910	1-2	66	15-2	70	CONE	
709	OUT-OF-SERVICE	13-0	936	0-11 3/4	66	15-1 1/4	72	CONE	
713	OUT-OF-SERVICE	15-0	-	-	-	17-8	-	CONE	
714	FCC FEED	38-0	28,500	0-9 1/8	673	40-9 1/2	750	CONE	
1	DIESEL-JULSD	22-3	2,803	1-2	252	24-9 5/8	126	INTERNAL FLOATING	6-0
2	83.0 UNLEADED REGULAR	29-11	3,769	2-8	257	35-1 3/4	126	INTERNAL FLOATING	6-0
3	89.0 UNLEADED REGULAR	29-11	3,769	1-2	256	35-1 1/8	126	INTERNAL FLOATING	6-0
4	83.0 UNLEADED REGULAR	28-9	3,507	6-5 7/8	253	35-2 1/4	122	INTERNAL FLOATING	6-0
5	ETHANOL	24-0	1,536	1-2	129	28-7	64	CONE	6-0
6	ETHANOL	22-0	1,419	0-10 1/4	53	28-5	64	INTERNAL FLOATING	4-0
7	ISOMERATE	4-10	274	1-4	0	6-3	-	BULLET	
568	OUT-OF-SERVICE	19-0	1659	2-0	77	24-8 3/4	86	INTERNAL FLOATING	5-0
117	JP-8 DEICER	14-0	196	0-6	-	16-9	14	CONE	

* BBL/FT IN THE STRAIGHT SIDEWALL SECTION

** AVOID LOW GAUGE BELOW THIS LEVEL WITHOUT APPROVAL

*** LPG TANKS THAT CAN'T BE GAUGED FOR AUDITING PURPOSES

TANK NUMBER	TYPE OF TANK	YEAR BUILT	ROOF TYPE	ACTUAL CAPACITY	TANK DIAMETER	TANK HEIGHT/ LENGTH	PRODUCT	LAST EXTERNAL INSPEC.	INSPEC. INTERVAL (YEARS)	NEXT EXTERNAL INSPEC.	Next Shell UT Inspection	LAST INTERNAL INSPEC.	INSPEC. INTERVAL (YEARS)	NEXT INTERNAL INSPEC.	COMMENTS
MKT-TK-01	VERT. STEEL	1965	CFRT	3,000	30'-0"	24'-0"	ULSD	Dec-14	5	Dec-19	Dec-25	Feb-06	0.5	Sep-06	
MKT-TK-02	VERT. STEEL	1965	IFRT	4,000	30'-0"	32'-0"	83 OCTANE	Dec-14	5	Dec-19	Apr-23	May-08	10	May-18	
MKT-TK-03	VERT. STEEL	1965	IFRT	4,000	30'-0"	32'-0"	89 OCTANE	Dec-14	5	Dec-19	Nov-25	Aug-13	12	Aug-25	NNP; Dome fixed roof. 7/2005; new vapor seal (primary only). 8/2013: internal inspection with MFE no indications found, new internal coating (add 2 years to next internal inspection); records indicate that a new seal was installed by TANCO.
MKT-TK-04	VERT. STEEL	1970	IFRT	3,800	30'-0"	32'-0"	83 OCTANE	Dec-14	5	Dec-19	Jul-23	Aug-08	12	Aug-20	Dome fixed roof. 9/2008: new mechanical shoe seal (primary only). 9/2008: new internal coating Phenicon HS tested per NACE, extends internal inspection 2 years
MKT-TK-05	VERT. STEEL	1963	CFRT	1,800	25'-0"	28'-0"	ETHANOL	Dec-14	5	Dec-19	Aug-24	Sep-09	12	Aug-21	NNP; 10/2009; repairs by SunFab, internally coated with Phenicon HS tested per NACE, new external coating on lower shell course, added radar gauge, new cleanout MW
MKT-TK-06	VERT. STEEL	1963	IFRT	1,800	21'-6"	28'-0"	ETHANOL	Oct-14	5	Oct-19	Oct-29	Oct-14	19.5	Apr-34	Repairs and new internal roof made in 1998; 2014 repairs-roof nozzle gaskets changed on internal roof penelrations, bearing pad installed under center column, repairs to secondary wiper seal, reloaded roof to ensure it would not get stuck
MKT-TK-07	VERT. STEEL	2011	IFRT	91392 g	24'-0"	32'-0"	EMPTY TANK		5	5 yrs after initial service	5 yrs after initial service		25 or 20	Pending initial service date	Hydrotested in April 2012. Never been in service as of 11/2014. Dome fixed roof. Tank has a double bottom with leak detection, HDPE liner, and cathodic protection. This allows for the next interval to be set 25 years after the tank goes into service, but CP system must be maintained and inspected per API 651 in order to use 2040 as the next inspection interval date. All inspection intervals to be set from the date the tank goes into service.
MKT-TK-08	VERT. STEEL	2011	IFRT	91392 g	24'-0"	32'-0"	EMPTY TANK		5	5 yrs after initial service	5 years after initial service		25 or 20	Pending initial service date	Hydrotested in April 2012. Never been in service as of 11/2014. Dome fixed roof. Tank has a double bottom with leak detection, HDPE liner, and cathodic protection. This allows for the next interval to be set 25 years after the tank goes into service, but CP system must be maintained and inspected per API 651 in order to use 2040 as the next inspection interval date. All inspection intervals to be set from the date the tank goes into service.
MKT-TK-09	HORIZONTAL	1998	FLATHEAD	12,000 g	7'-11"	32'-0"	BIDIESEL	NO DATA	1	Jan-99	Jan-13	NO DATA		See STI Code	Horizontal Tank-Double W all containment (TK-1); Category 1 tank per STI SP001, follow inspection schedule from this standard;
MKT-TK-10	HORIZONTAL	1998	FLATHEAD	12,000 g	7'-11"	32'-0"	BIDIESEL	NO DATA	1	Jan-99	Jan-13	NO DATA		See STI Code	Horizontal Tank-Double W all containment (TK-2); Category 1 tank per STI SP001, follow inspection schedule from this standard;
Q-T2	VERT. STEEL	1956	FRT	149	10'-0"	8'-0"	CAUSTIC MIX (NaOH	Dec-13	5	Dec-18	Dec-18	NO DATA	10	ASAP	NNP; no record of any internal inspection; see Ultrapipe for UT data; manway present, inside concrete containment with sewer drain
Q-T3.1	VERT. STEEL	2012	FRT	210	10'-0"	15'-0"	CAUSTIC (50%	Jul-13	2.6	Feb-16	Feb-16	Jul-13	10	Jul-23	Repairs made in 7/2013, new stainless steel heating coils; replaced Q-T3; see Ultrapipe for UT readings; inside concrete containment
Q-T6	VERT. STEEL	1969	FRT	18	5'-0"	4'-3/4"	NIS (CAUSTIC (NaOH <50%)	May-10	5	May-15	ASAP	NO DATA	10	ASAP	NNP. Caustic mix tank for Kero Merco Reactor Vessel Recharge; no inspection history on record; manway present, inside a concrete containment with a sewer drain
Q-T8	VERT. STEEL	1963	FRT	149	10'-0"	8'-0"	CAUSTIC (NaOH	May-10	5	May-15	May-15		10	ASAP	
SR-T10	PLASTIC	1993	FRT	775 g	4'-0"	8'-10"	NIS	NO DATA	1	Mar-94		NO DATA		See STI Code	Fiberglass Tank. Old XUS 43850 (CA299) Chemical tank; product store was Unit chelate deinventory storage. Code: ASME/ANSI Standard RTP-1, ASTM D-3299, or D-4097; no manway, inside a concrete containment with sewer drain
SR-T4	PLASTIC	1992	FRT	4000 g	10'-4"	7'-1"	IRON CHELATE	Apr-10	1	Apr-11		NO DATA		See STI Code	Fiberglass Tank. Iron Chelate Solution Surge Tank; specific gravity 1.3; no manway, inside a concrete containment with sewer drain
SR-T5	PLASTIC	1992	FRT	3000 g	6'-0"	15'-2"	IC-110 STORAGE	May-10	1	May-11		NO DATA		See STI Code	Fiberglass Tank; no manway, inside a concrete containment with sewer drain
SR-T6	PLASTIC	1992	FRT	3000 g	6'-0"	15'-2"	IC-210 STORAGE	May-10	1	May-11		NO DATA		See STI Code	Fiberglass Tank; no manway, inside a concrete containment with sewer drain
SR-T7	PLASTIC	1993	FRT	110 g	2'-6"	4'-6"	CAUSTIC DAY STORAGE	May-10	1	May-11		NO DATA		See STI Code	NNP; Polyethylene tank; no manway, inside a concrete containment with sewer drain
SR-T8	PLASTIC	1993	FRT	775 g	4'-0"	8'-10"	NIS	NO DATA	1	Feb-94		NO DATA		See STI Code	Plastic Tank. Old CA100 chemical tank. Material: derakane 411; no inspection history; no manway; inside a concrete containment with sewer drain
SR-T9	PLASTIC	1993	FRT	775 g	4'-0"	8'-10"	NIS	NO DATA	1	Feb-94		NO DATA		See STI Code	Plastic Tank. Old CA200 (2102) chemical tank. Material: derakane 411; no inspection history; no manway; inside a concrete containment with sewer drain
S-T1	HORIZONTAL		FLATHEAD	18	4'-0"	6'-4"	ETHYLENE GLYCOL/WATER	Oct-10	4.8	Aug-15	Aug-15	NO DATA	10	See STI Code	SATS Unit. 50/50 (antifreeze); see Ultrapipe for UT data; shell heads damaged and never repaired; manway present; concrete containment present with sewer drain
SW S-TK1 TK-1001	VERT. STEEL HORIZONTAL	2006	IFRT FLATHEAD	1,000 3,000 g	156" 5'-4"	30'-0" 18'-0"	SOUR WATER FEED DIESEL	Dec-14 Jun-10	1 5	Dec-15 Jun-15	Dec-29 Jun-15	Aug-06 NO DATA	10	Aug-16 See STI Code	SW AATS AREA; insulated; records indicate that an internal roof was installed; MANDATORY annual external inspection required NNP; for W estern consumption; NO MANW AY, no containment, on skid plate; Category 3 tank per STI SP001 code
TK-1002	HORIZONTAL		FLATHEAD	3,000 g	5'-4"	18'-0"	GASOLINE	Jun-10	5	Jun-15	Jun-10	NO DATA		See STI Code	NNP; for W estern consumption; NO MANW AY, no containment; Category 3 tank per STI SP001 code
TK-1003	HORIZONTAL		FLATHEAD	2,300 g	5'-9"	12'-3 1/2"	DIESEL POUR POINT ADD.	Jun-10	5	Jun-15	Jun-15	NO DATA		See STI Code	Insulated; no manway, on skids, inside a concrete containment which has a drain routed to the oily water sewer; Category 1 tank per STI SP001 code
TK-1004	HORIZONTAL		FLATHEAD	4,000 g	7'-0"	14'-0"	DIESEL LUBRICITY	Jun-10	5	Jun-15	Jun-15	NO DATA		See STI Code	Insulated; 18" manway present, on skids, inside a concrete containment with a drain valve; Category 1 tank per STI SP001 code
TK-101	VERT. STEEL	1957	IFRT	80,000	110'-0"	48'-0"	CRUDE	Aug-14	5	Aug-19	Mar-28	May-06	10	May-16	2019 inspection: take UT's on shell
TK-102	VERT. STEEL	1991	EFRT	80,000	110'-0"	51'-0"	CRUDE	Aug-14	2.4	Jan-17	May-19	Jun-05	10	Jun-15	NNP
TK-105	VERT. STEEL	2001	CFRT	400	12'-0"	20'-0"	SLOP	Dec-10	5	Dec-15		Jun-01	10	Jun-11	API 12F; previously labeled Tank 157, Due for internal inspection in 2015
TK-106	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	DISTILLATE	Nov-14	5	Dec-19	Nov-29	Nov-14	22	Nov-36	1/2010 repairs: change of service to Sour Naphtha, new 6" and 8" nozzle with shell insert, new external Phenicon coating on shell and roof, new 8" roof nozzle for radar gauge, and tank was hydrotested. 11/2014: internal inspection with MFE, by ITI, no indications found or leaks; MFE repair threshold was set for a 20 year inspection interval; new internal Phenicon epoxy coating, added 2 years to next inspection interval because of new internal coating.
TK-107	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	SLOP	Nov-14	5	Nov-19	Nov-29	Feb-02	12	Feb-14	2002: last internal inspection with MFE by Conam, no indications found. 2004: repairs performed were new bottom annular ring, new 1st course 30" height, new 24" sump, part of the top shell replaced (32' x 8') north side, new 24" MW with mixer, new roof plates and rafters, new external coating Macropoxy/Acrolon, and new internal coating Phenicon HS epoxy Novolac. New internal coating adds 2 yrs to next internal inspection.
TK-108	VERT. STEEL	1957	IFRT	5,000	33'-6"	32'-0"	SLOP	Nov-14	1.6	Jun-16	Jan-18	May-11	12	May-23	2001: repairs by TANCO, new internal steel roof, gauge pole/ladder, primary/secondary seals. (2) overflows. 5/2011; last internal inspection with MFE, new internal coating Phenicon, and new external coating. Take shell UT's at the June 2016 inspection.
TK-111	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	ULSD RUNDOW N	Dec-14	5	Dec-19	Dec-29	May-06	10	May-16	2000: internal inspection, MFE found indication and repairs were made; new internal coating. 2006: BLD performed MFE
TK-112	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	ULSD RUNDOW N	Dec-14	5	Dec-19	Dec-29	Mar-06	12	Mar-18	2006: internal inspection with MFE, no indications found, new internal coating and roof repairs. New coating adds 2 year to next internal inspection
TK-115	VERT. STEEL	2008	CFRT	5,000	33'-6"	32'-0"	ULSD RUNDOW N	Dec-14	5	Dec-19	Dec-29	NO DATA	22	Jan-30	2008: new tank built as a double bottom over the existing tank bottom, HDPE liner with sand, sacrificial anodes installed inside tank, internal Phenicon HS coating, external coating. Double bottom secondary containment adds 10 year, plus 2 years for internal coating, plus the 10 years for the initial inspection-next internal interval 22 years.
TK-116	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	ULSD RUNDOW N	Dec-14	5	Dec-19	Dec-29	Mar-06	5	May-11	3/2006: MFE by BLD- no indications found, new first shell course, reveleled tank, 1/3 of roof replaced, replaced center column, new bottom sump, new internal/external coating. Thomas D'Souza and Tim Evans set the next internal inspection for May 2011, per the report (does not give a reason)
TK-225	VERT. STEEL	1957	CFRT	25,000	67'-0"	39'-8"	SOUR NAPHTHA	Sep-14	5	Sep-19	Sep-29	JUN-'06	22	Jun-28	2006: new 3/16" roof, new double bottom with HDPE liner, leak detection, sand, and coating
TK-226	VERT. STEEL	1957	CFRT	25,000	67'-0"	39'-8"	KERSENE	Sep-14	5	Sep-19	Sep-29	JUN-'06	22	Jun-28	2006: new double bottom with HDPE liner, leak detection, and coating
TK-227	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	ULSD	Oct-14	3.4	Mar-18	Aug-21	Oct-14	19	Oct-33	

TK-918	HORIZONTAL	2001	FLATHEAD	2,000 g	5'-4"	12'-8"	DIESEL ADD.	Oct-14	5	Oct-19	Sep-16	NO DATA		See STI Code	UL#973020/A61092; Horizontal Tank; Built to UL 142, double wall shell, skid mounted, NO MANWAY, inside a concrete containment with drain valve. Category 1 tank per STI SP001 code
Z81-T1	PLASTIC	1998	FRT	1,000	21'-6"	16'-0"	TREATED WATER	Dec-14	1	Dec-15		Apr-12		See STI Code	FIBERGLASS; built to ASTM 3299-88; previous tank that was demo-ed was a steel API tank; 2012: repair recommendations were deferred; Category 1 tank per STI SP001 code and it has water
Z81-T10	VERT. STEEL	1957	CFRT	63	10'-0"	17'-0"	CAUSTIC SODA LIQUID	Oct-10	5	Aug-15	Aug-25	NO DATA	10	ASAP	NNP; this tank has no records of any internal inspection or original tank information; manway present; inside a concrete containment with sewer drain
Z81-T14	CUBE TANK	1989	FLATHEAD	585 g	5' x 4'	3'-11"	DIESEL	Dec-14	1	Dec-15	Sabrina	NO DATA		See STI Code	Insulated Cube tank; Diesel generator day tank; built to UL standard; on skid plate on top of concrete pad; no containment; 16" manway present; Category 3 tank per STI SP001 code
Z81-T15	HORIZONTAL	1989	FLATHEAD	4,000 g	6'-0"	18'-0"	DIESEL	Dec-14	1	Dec-15	Jul-15	NO DATA		See STI Code	NNP;Elevated Tank on concrete pillars; no containment present; manway present; no record of internal inspection; see Ultrapipe for UT data; Category 3 tank per STI SP001 code
Z81-T5	CFRT	1979	IFRT	5,000	33'-6"	32'-0"	TREATED WATER	Dec-14	5	Dec-19	Dec-29	Apr-91	10	Apr-01	formerly known as tank 31 which was reconstructed at the Boiler unit, but no records of reconstruction; tank has never had a formal internal inspection; DA Makeup water storage tank
Z81-T6	PLASTIC	1998	FRT	1,000	21'-6"	16'-0"	CHLORINATED WATER	Dec-14	1	Dec-15		Jul-09		See STI Code	Fiberglass tank/ Palmer Standards; domestic (potable) water tank; 2009: internal inspection was done while the tank was in service, a dive team entered and video recorded the inspection and vacuumed cleaned all sediment. Category 1 tank per STI SP001 code and because it stores water
Z81-T7	PLASTIC	1998	FRT	1,000	21'-6"	16'-0"	BRINE WATER	Dec-14	1	Dec-15		NO DATA		See STI Code	Fiberglass/ASTM 3299-88; Category 1 tank per STI SP001 code
Z81-T9	HORIZONTAL		FLATHEAD	1700 g	6'-0"	12'-0"	DIESEL	Dec-14	1	Jul-15	Dec-08	NO DATA		See STI Code	NNP; Elevated Tank on concrete pillars; inside a concrete containment; manway present; Quincy Diesel Tank; Category 1 tank per STI SP001 code
Z83-T3	VERT. STEEL	1975	FRT	4,000 g	8'-0"	12'-0"	SULFURIC ACID (95%)	NO DATA	5	ASAP	ASAP	NO DATA	10	ASAP	located next to cooling towers; elevated vertical steel tank; inside a concrete containment (double containment) with sewer drain; insulated shell
Z84-TK-27	VERT. STEEL	1979	IFRT	5,000	33'-6"	31'-6"	WASTE WATER	Dec-14	5	Dec-19	Dec-29	Mar-08	20 or 25	3/2026 or 3/2033	July 2010 Repairs: new double bottom with leak detection, HDPE, and CP, new internal floating roof. Next internal inspection: new bottom 10 yrs + double bottom containment 10 yrs + cathodic protection maintained per API 651 15 yrs= 25 year to next internal inspection
Z84-TK-28	VERT. STEEL	1979	IFRT	5,000	33'-6"	31'-6"	WASTE WATER	Dec-14	5	Dec-19	Dec-29	Mar-08	20 or 25	3/2028 or 3/2033	July 2010 Repairs: new double bottom with leak detection, HDPE, and CP, new internal floating roof. Next internal inspection: new bottom 10 yrs + double bottom containment 10 yrs + cathodic protection maintained per API 651 15 yrs= 25 year to next internal inspection
Z84-TK-35	VERT. STEEL	2010	IFRT	976920 g	78'-0"	32'-0"	WASTE WATER	Dec-14	5	Dec-19	Dec-29	Jan-10	20	Jan-30	2010: double bottom with leak detection, HDPE liner, sand cushion, sacrificial anodes product side, possible CP between bottoms. double bottom adds 10 years to next internal inspection + 10 years for the initial= 20 years to next internal inspection
Z84-V11	VERT. STEEL	2011	FRT	9030 g	16'-0"	6'-0"	DGF FEED	Mar-12	5	Mar-17	Mar-17		12	Mar-24	near API Separators; internal coating add 2 yrs to next internal inspection
Z84-V15	VERT. STEEL	2011	CFRT	31794 g	26'-0"	8'-6"	DGF FLOAT	Mar-12	5	Mar-17	Mar-17		22 or 27	3/2034 or 3/2039	located at API Building area, Double Bottom, primary 5/16" bottom, leak detection, HDPE, cathodic protection, sand; double bottom S126containment 10 yrs + initial internal inspection 10 yrs + internal coating 2 yrs + cathodic protection maintained per API 651 yrs = 25 yrs.
Z84-V22	PLASTIC	2011	FRT	2000 g	7'-1"	7'-0"	COAGULANT	Sep-11	1	Aug-12		Sep-11		See STI Code	plastic/fiberglass tank; inside API Building; Category 1 tank per STI SP001 code
Z84-V24	VERT. STEEL	2011	CFRT	3500 g	7'-9"	10'-0"	SULFURIC ACID	Dec-11	5	Dec-16	Dec-16	Dec-11	10	Dec-21	UL 142; 1/2" roof, shell, and bottom, inside a concrete containment, design gravity=1.84, joint efficiency=0.70, allow stress=23760, UL tmin= .167"; near API Separators, next to Z84-V11
Z86-T1	VERT. STEEL	1966	OPEN	5,000	30'-0"	40'-0"	WELL WATER	Oct-10	5	Aug-12	Jun-14	NOV-02	10	Nov-12	Reconstructed 11/2002: new 1/4" shell courses 1 thru 4
Z86-T2	VERT. STEEL	2002	OPEN	440,000 g	44'-0"	40'-0"	WELL WATER	Oct-10	5	Oct-15	Aug-25		10	Apr-12	Design Code: AW W A D-100, 96-Section 3; inspection intervals were based on API 653 calculations and allowable stresses of A-36 material
Housing South	VERT. STEEL		FRT				WATER	NO DATA	5	ASAP	ASAP	NO DATA	10	ASAP	Located up the hill at the housing complex
Housing North	VERT. STEEL		FRT				WATER	NO DATA	5	ASAP	ASAP	NO DATA	10	ASAP	Located up the hill at the housing complex
TK-117	VERT. STEEL	1983	CFRT	250	10'-0"	17'-9"	NOT IN SERVICE (De-icer)	MAY-96	5	May-01		JUL-83	10	JUL-93	
TK-18570	AST		CFRT	NO DATA	8'-0"	6'-0"	NALCO-7369	NO DATA	5	ASAP		NO DATA	10	ASAP	Removed September 2012, per Michael Spolar & Maint.; PVC/ASTM/NNP
TK-18674	AST		CFRT	NO DATA	8'-0"	6'-0"	NALCO-7369	NO DATA	5	ASAP		NO DATA	10	ASAP	Removed September 2012, per Michael Spolar & Maint.; PVC/ASTM/NNP
TK-334															According to Joel Quinones, this tank never existed.
TK-451	VERT. STEEL	1957	CFRT	1,000	21'-3"	16'-0"	OUT OF SERVICE	MAY-96	5	May-01		OCT-90	10	OCT-00	NNP; schedule for DEMO per WR
TK-452	VERT. STEEL	1957	CFRT	1,000	21'-3"	16'-0"	OUT OF SERVICE	MAY-96	5	May-01		AUG-88	10	AUG-98	NNP; schedule for DEMO per WR
TK-453	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	OUT OF SERVICE								schedule for DEMO per WR
TK-573	VERT-STEEL	1957	CR	250	40'-0"	18'-0"	KEROSENE (N.I.S)	OCT-94	5	Oct-99		NO DATA	10	ASAP	Tank was demolished, per Joel Quinones email on 9/17/14
TK-702	VERT. STEEL	1963	CFRT	25,000	67'-0"	40'-5"	FCC FEED	FEB-95	5	Feb-00		FEB-83	10	FEB-93	NNP; schedule for DEMO per WR
TK-708	VERT. STEEL	1963	CFRT	1,000	22'-6"	14'-11"	RESIDUE	MAY-06	5	May-11		MAY-06	10	MAY-16	NNP; schedule for DEMO per WR
TK-709	VERT. STEEL	1963	CR	1,000	22'-6"	14'-9"	RESIDUE	FEB-95	5	Feb-00		NO DATA	10	ASAP	NNP; schedule for DEMO per WR
TK-713	VERT-STEEL		CFRT	NO DATA	NO DATA	NO DATA	NOT IN SERVICE	NO DATA	5	ASAP		NO DATA	10	ASAP	Tank was demolished, per Joel Quinones email on 9/17/14
TK-7435															Tank is not present in Crude Unit; Michael Spolar could not find any records of this tank. May have been removed prior to 1996
Z81-T14							HCL								Removed sometimes in the 2000's, per Michael Spolar Jr.
Z81-T13	AST		CFRT	N	4'-0"	4'-0"	DIESEL	DEC-03	5	Dec-08		NO DATA	10	ASAP	NNP; Has been removed from the site, per boiler operator
Z81-T17	AST		CFRT	NO DATA	8g"	16'-0"	WATER-SOFTNER (N.I.S)	NO DATA	5	ASAP		NO DATA	10	ASAP	FG/ASTM/NNP; Has been removed from the site, per boiler operator
Z81-T8	AST		CFRT	250	44'-0"	16'-0"	FUEL-OIL (N.I.S)	FEB-98	5	Feb-03		NO DATA	10	ASAP	Has been removed from the site, per boiler operator
Z81-V11	AST		FRT				NIS								Possibly a plastic tank @ Boiler Plant; abandoned chemical (transport plus) tank per Michael Spolar

NNP=No Nameplate
EFRT=External Floating Roof Tank NIS=Not In Service
CFRT=Cone Fixed Roof Tank
IFRT=Internal Floating Roof Tank
FRT=Fixed Roof Tank
AST=Atmospheric Storage Tank

Appendix D

Investigation Derived Waste Management Plan

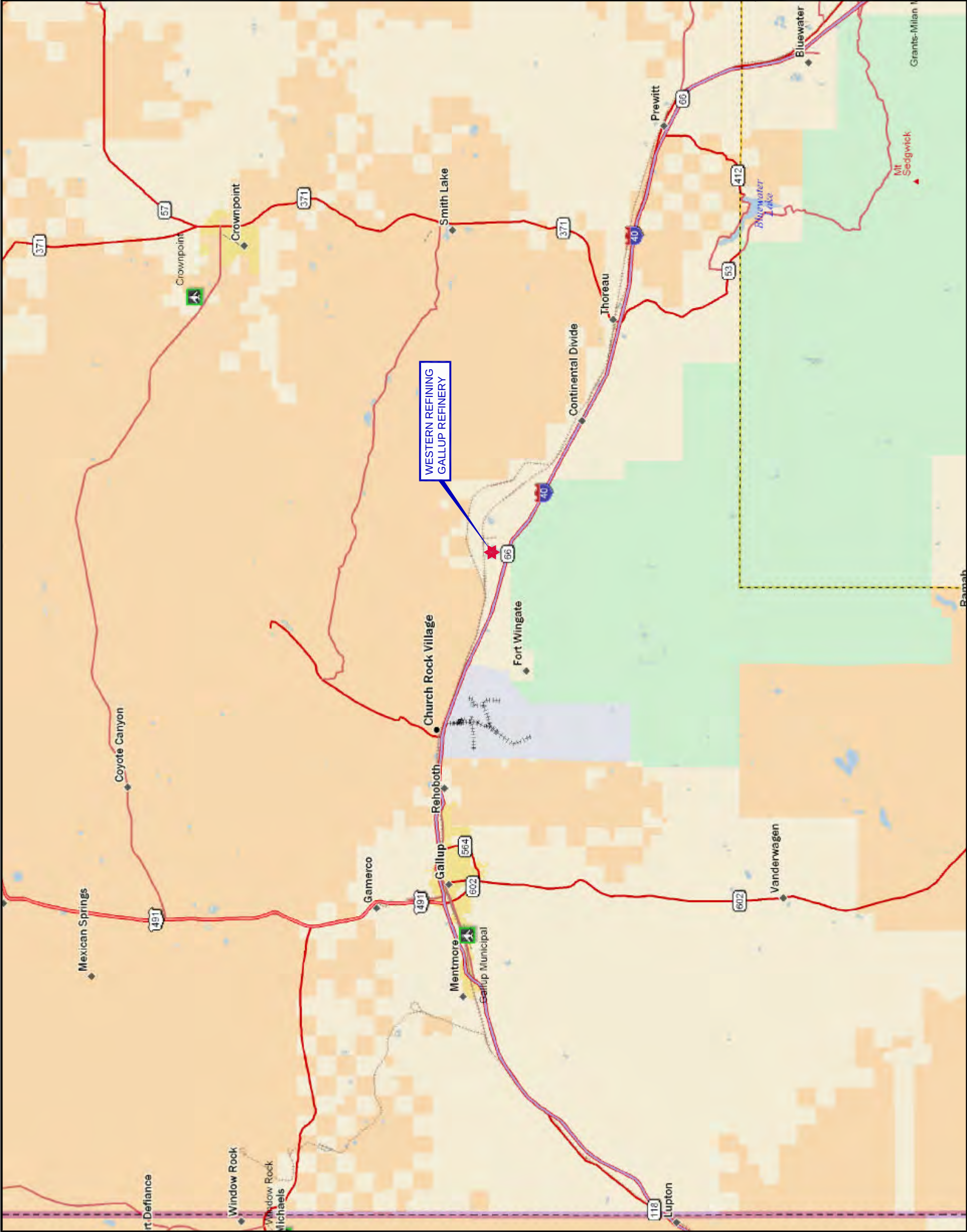
Investigation Derived Waste (IDW) Management Plan

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.

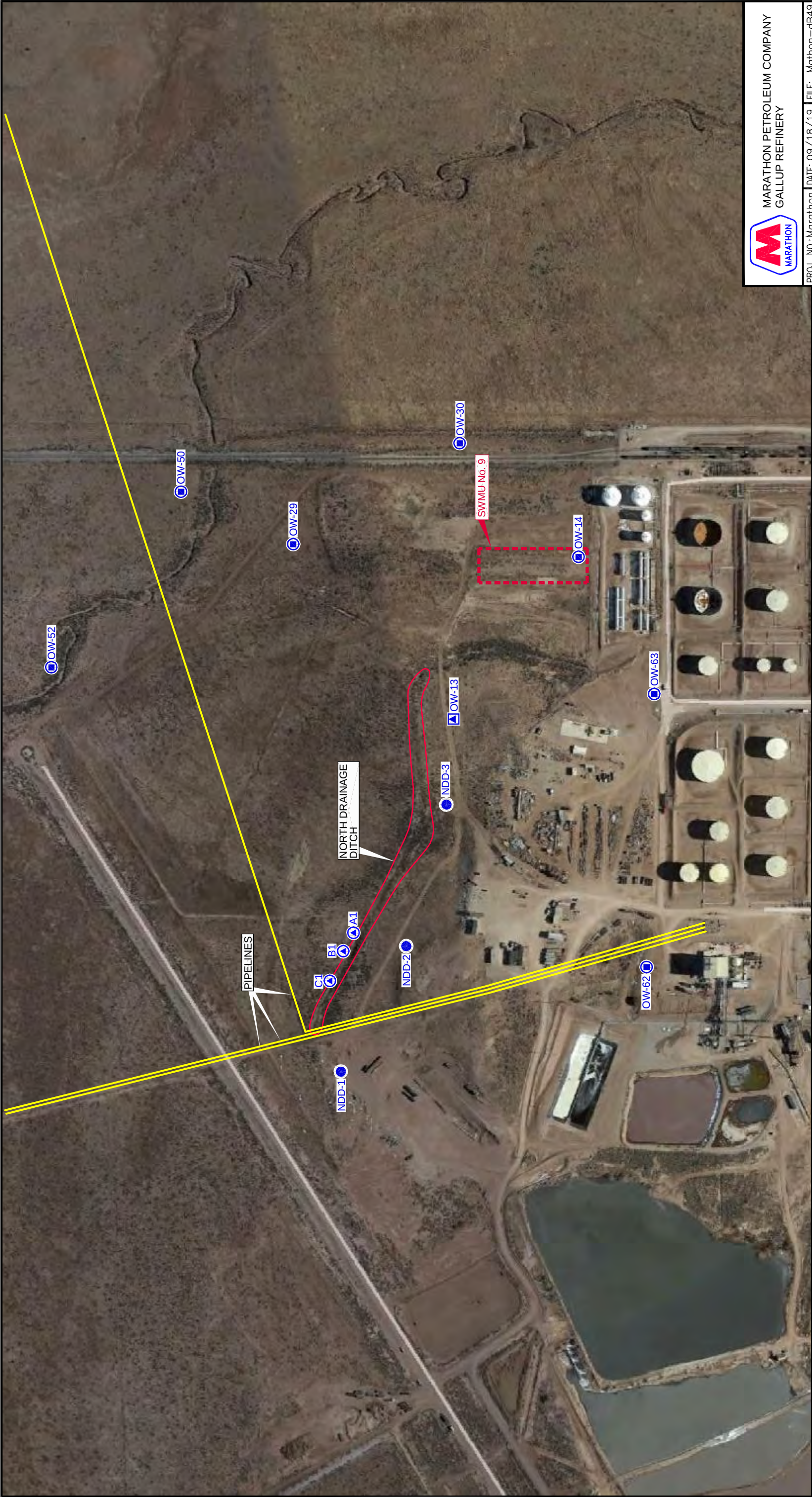
The solids (e.g., drill cuttings and used soil cores) will be characterized by testing to determine if there are any hazardous characteristics in accordance with 40 Code of Federal Regulations (CFR) Part 261. This includes tests for ignitability, corrosivity, reactivity, and toxicity. If the materials 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).



PROJ. NO.: Western Refining DATE:07/13/14 FILE:WestRef-B198

FIGURE 1
SITE LOCATION MAP
GALLUP REFINERY

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





MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 09/18/19 | FILE: Mathon-dB49

FIGURE 2

INVESTIGATION AREA



Disorbo
Environmental Consulting Firm

8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



0 300
SCALE IN FEET

Aerial Map Source: Google Map, 02/19/2014.



NEW MEXICO

GALLUP SITE LOCATION

LEGEND

A1 

NDD-1 

OW-13 

OW-14 

SURFACE WATER SAMPLE LOCATION AND IDENTIFICATION NUMBER

TEMPORARY MONITORING WELL LOCATION AND IDENTIFICATION NUMBER

SONSELA MONITORING WELL LOCATION AND IDENTIFICATION NUMBER

ALLUVIUM/CHINLE GP MONITORING WELL LOCATION AND IDENTIFICATION NUMBER



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



MARATHON PETROLEUM COMPANY
GALLUP REFINERY

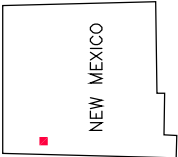
PROJ. NO.: Marathon | DATE: 4/16/19 | FILE: Mathon-dB152

FIGURE 3

NORTH DRAINAGE DITCH



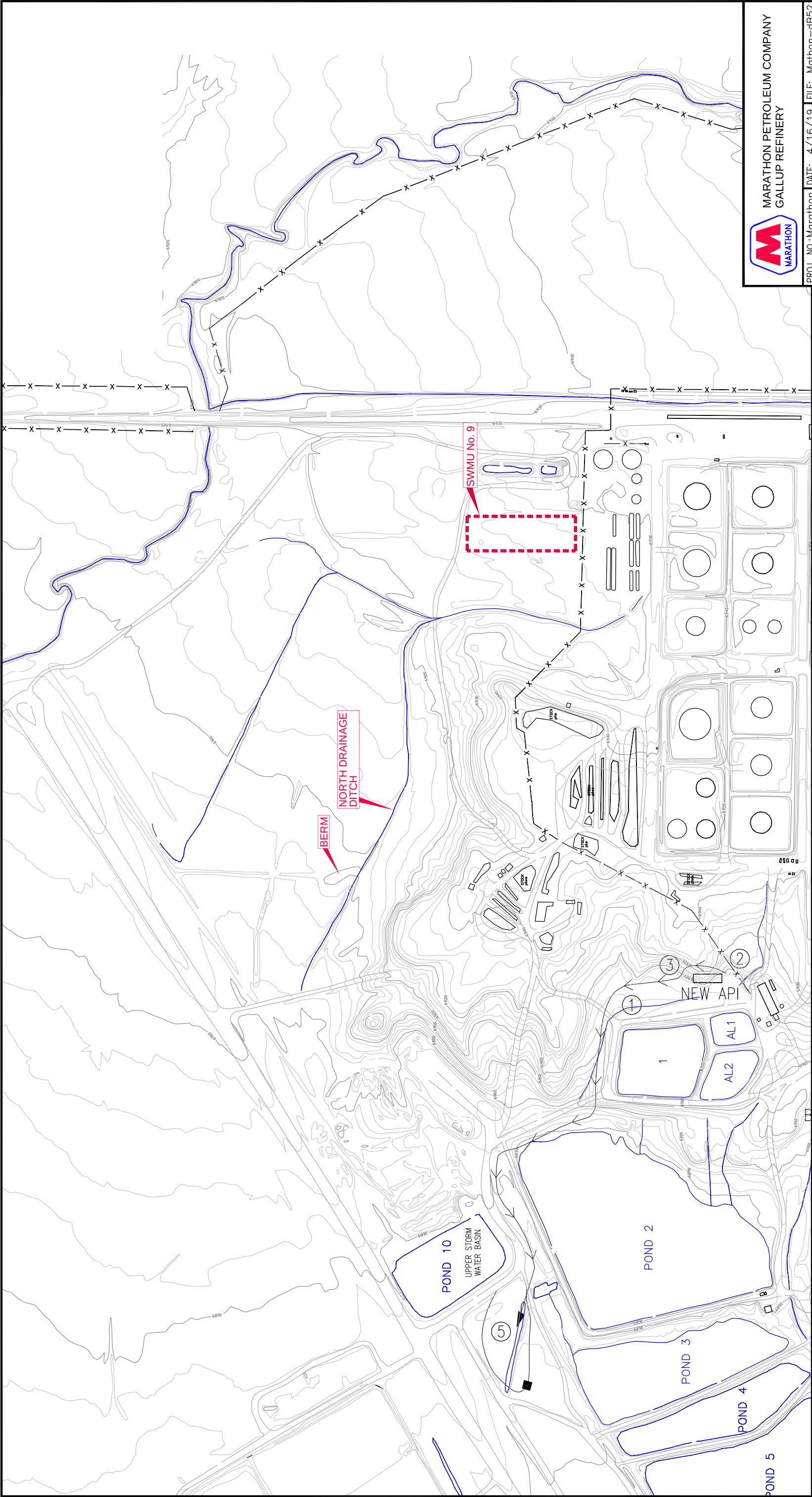
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759



GALLUP SITE LOCATION

LEGEND

-  NDD-1
- SOIL BORING LOCATION AND IDENTIFICATION NUMBER
-  NDD-5
- SURFACE SOIL (0-2') LOCATION AND IDENTIFICATION NUMBER
-  NDD-4
- SOIL BORING / TEMP. WELL LOCATION AND IDENTIFICATION NUMBER
-  A1
- SURFACE WATER SAMPLE LOCATION AND IDENTIFICATION NUMBER





MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 4/16/19 | FILE: Mathon-dB52

FIGURE 4

TOPOGRAPHIC MAP

Table 1 - North Drainage Ditch Water Analyses
Western Refining Southwest, Inc. - Gallup Refinery

Analyte	WQCC 20NMAC 6.2.3103 (Oct 2006)	40 CFR 141.62 MCL	NMED Tap Water (Dec 2014)	EPA Tapwater (June 2015)												
Sample ID					DITCH - W1	DITCH - W2	DITCH - W3	A1	B1	C1	North Drainage Ditch	NDD-3-GW				
					Date Sampled											
Benzene	0.005	0.005	0.00455	NR	10/20/2009	NA	NA	10/20/2009	NA	3/19/2015	5.2	5.4	5.3	3/19/2015	4/23/2015	5/14/2015
Toluene	1	1	1.09	NR	NA	NA	NA	0.13	0.13	0.12	0.13	0.089	0.089	0.089	0.0011	<0.001
Ethyl Benzene	0.75	0.7	0.015	NR	NA	NA	NA	0.63	0.58	0.55	0.63	0.53	0.53	0.53	<0.001	<0.001
Total Xylenes	0.62	10	0.193	NR	NA	NA	NA	1.2	1.2	1.1	1.2	0.73	0.73	0.73	<0.0015	<0.0015
MTBE	NE	NE	0.143	NR	NA	NA	NA	0.2	<0.25	<0.25	0.2	0.098	0.098	0.098	0.26	0.26
1,2,4-trimethylbenzene	NE	NE	NE	0.015	NA	NA	NA	0.24	0.22	0.21	0.24	0.1	0.1	0.1	<0.001	<0.001
1,3,5-trimethylbenzene	NE	NE	NE	0.12	NA	NA	NA	0.78	<0.1	<0.1	0.78	0.035	0.035	0.035	<0.001	<0.001
naphthalene	NE	NE	0.00165	NR	NA	NA	NA	NA	NA	NA	NA	0.17	0.17	0.17	<0.01	<0.01
isopropylbenzene (cumene)	NE	NE	0.447	NR	NA	NA	NA	NA	NA	NA	NA	0.027	0.027	0.027	0.047	0.047
n-propylbenzene	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA	NA	0.047	0.047	0.047	<0.001	<0.001
1,2-dichloroethane	0.005	0.005		NR	NA	NA	NA	NA	NA	NA	NA	<0.01	<0.01	<0.01	0.0063	0.0063
GRO	NE	NE	NE	NE	NA	NA	NA	21	21	20	21	NA	20	NA	0.56	0.56
DRO	NE	NE	NE	NE	NA	NA	NA	6.4	6.5	8.9	6.4	NA	8.9	NA	1.1	1.1
MRO	NE	NE	NE	NE	NA	NA	NA	11	11	14	11	NA	14	NA	<5.0	<5.0
TPH (418.1)	NE	NE	NE	NE	27	6.9	5.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	0.000855	NR	NA	NA	NA	0.16	0.28	0.28	0.16	0.28	0.28	0.28	NA	NA
Barium	2.0	2.0	3.3	NR	NA	NA	NA	12	20	19	12	20	19	19	NA	NA
Cadmium	0.005	0.005	0.00624	NR	NA	NA	NA	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	NA	NA
Chromium (total)	0.05	0.1	0.0057	NR	NA	NA	NA	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NA	NA
Lead	0.015	0.015	NE	NR	NA	NA	NA	0.0058	0.012	0.014	0.0058	0.012	0.014	0.014	NA	NA
Selenium	0.05	0.05	0.0987	NR	NA	NA	NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA	NA
Silver	0.05	NE	0.0812	NR	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA
Mercury	0.002	0.002	0.000626	NR	NA	NA	NA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NA	NA
0.16	Bolded and highlighted value exceeds screening level				0.01				bolded value is applicable screening level							

All values are reported in milligrams per liter

GRO - gasoline range organics

DRO - diesel range organics

MRO - motor oil range organics

TPH - total petroleum hydrocarbons

NE = Not established

NR - Not required for determination of applicable screening level

NA = Not analyzed

Table 3
Groundwater Analytical Results Summary
Western Refining Southwest, Inc. - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	NDD-4-GW	NDD-6-GW	NDD-11-GW	NDD-16-GW	OW-56
Lab ID			1605C89-004	1605C89-001	1605C89-006	1605C89-008	1609A26-003
Sample Date			5/26/2016	5/26/2016	5/26/2016	5/26/2016	9/16/2016
Metals (ug/l) TOTAL							
Antimony	6.00E+00	(2)	< 0.472 u	< 0.472 u	< 2.362 u	< 0.472 u	-
Arsenic	1.00E+01	(2)	20 Z	8.7 v	23 Z	9.4 J	4.6 J
Barium	2.00E+03	(2)	5300 Z	5400 Z	4800 Z	370 v	370 v
Beryllium	4.00E+00	(2)	19 Z	1.1 J	2.6 v	0.55 J	-
Cadmium	5.00E+00	(2)	< 0.746 u	< 0.746 u	< 0.746 u	< 0.746 u	< 1.484 u
Chromium	5.00E+01	(3)	60 v	6.5 v	7.8 v	5 J	< 2.656 u
Cobalt	6.00E+00	(1)	86 v	15 v	8.6 v	26 v	-
Iron	1.38E+04	(4)	45000 Z	6300 Z	14000 Z	3000 Z	330 Z
Lead	1.50E+01	(2)	160 Z	8.4 v	24 Z	7.9 v	1 v
Manganese	2.02E+03	(4)	15000 Z	3200 Z	2700 Z	3200 Z	420 Z
Mercury	2.00E+00	(3)	0.24 v	0.061 J	< 0.053 u	< 0.053 u	0.1 J
Nickel	3.72E+02	(4)	300 Z	65 v	32 v	88 v	-
Selenium	5.00E+01	(3)	21 J	14 J	10 J	15 J	4.6 J
Silver	5.00E+01	(3)	< 2.751 u	< 2.751 u	< 2.751 u	< 2.751 u	< 1.548 u
Vanadium	6.31E+01	(4)	77 J	18 J	30 J	8.7 J	-
Zinc	1.00E+04	(3)	210 v	24 v	26 v	34 v	12 v
General Chemistry (ug/l) TOTAL							
Chloride	2.50E+05	(3)	950000 v	560000 v	350000 v	670000 v	-
Fluoride	1.60E+03	(3)	550 v	1500 v	1200 v	270 v	-
Sulfate	6.00E+05	(3)	110000 v	1100 v	400 J	42000 v	-
Cyanide	2.00E+02	(3)	17.6 v	15.6 v	7.58 J	< 6 u	-
Metals (ug/l) DISSOLVED							
Antimony (D)	6.00E+00	(2)	< 0.472 u	0.77 J	1 J	< 0.472 u	-
Arsenic (D)	1.00E+01	(2)	6.4 J	8.3 v	23 Z	7.1 J	4.9 J
Barium (D)	1.00E+03	(3)	83 v	5600 Z	3500 Z	270 v	360 v
Beryllium (D)	4.00E+00	(2)	< 0.313 u	0.44 J	< 0.313 u	<0.00031 u	-
Cadmium (D)	5.00E+00	(2)	< 0.746 u	< 0.746 u	< 0.746 u	< 0.746 u	< 0.746 u
Chromium (D)	5.00E+01	(3)	< 1.754 u	< 1.754 u	< 1.754 u	< 1.754 u	< 1.754 u
Cobalt (D)	5.00E+01	(3)	8.7 v	13 v	2.2 J	24 v	-
Cyanide (D)	2.00E+02	(3)	-	-	-	-	-
Iron (D)	1.00E+03	(3)	44 v	260 v	5600 Z	43 v	78 v
Lead (D)	1.50E+01	(2)	0.4 J	<0.00013 v	<0.00013 J	2.1 v	0.46 J
Manganese (D)	2.00E+02	(3)	18 v	3000 Z	1900 Z	2900 Z	390 Z
Nickel (D)	3.72E+02	(4)	190 Z	60 v	23 v	86 v	-
Selenium (D)	5.00E+01	(3)	16 v	11 v	6 J	15 v	4.6 J
Silver (D)	5.00E+01	(3)	< 2.751 u	< 2.751 u	< 2.751 u	< 2.751 u	< 2.751 u
Vanadium (D)	6.31E+01	(4)	4.1 J	4.2 J	3.1 J	4.8 J	-
Zinc (D)	1.00E+04	(3)	< 2.783 u	6.9 J	6.6 J	23 v	11 v
Volatiles (ug/l)							
1,1,1,2-Tetrachloroethane	5.74E+00	(4)	< 0.223 u	< 11.146 u	< 11.146 u	< 0.223 u	< 0.557 u
1,1,1-Trichloroethane	6.00E+01	(3)	< 0.183 u	< 9.15 u	< 9.15 u	< 0.183 u	< 0.457 u
1,1,1,2,2-Tetrachloroethane	1.00E+01	(3)	< 0.256 u	< 12.823 u	< 12.823 u	< 0.256 u	< 0.641 u
1,1,2-Trichloroethane	5.00E+00	(2)	< 0.255 u	< 12.731 u	< 12.731 u	< 0.255 u	< 0.637 u
1,1-Dichloroethane	2.50E+01	(3)	< 0.216 u	< 10.805 u	< 10.805 u	< 0.216 u	< 0.54 u
1,1-Dichloroethene	5.00E+00	(3)	< 0.214 u	< 10.722 u	< 10.722 u	< 0.214 u	< 0.536 u
1,1-Dichloropropene	-		< 0.266 u	< 13.312 u	< 13.312 u	< 0.266 u	< 0.666 u
1,2,3-Trichlorobenzene	7.00E+00	(1)	< 0.226 u	< 11.286 u	< 11.286 u	< 0.226 u	< 0.564 u

Table 3
Groundwater Analytical Results Summary
Western Refining Southwest, Inc. - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	NDD-4-GW		NDD-6-GW		NDD-11-GW		NDD-16-GW		OW-56	
Lab ID			1605C89-004		1605C89-001		1605C89-006		1605C89-008		1609A26-003	
Sample Date			5/26/2016		5/26/2016		5/26/2016		5/26/2016		9/16/2016	
1,2,3-Trichloropropane	1.00E-02	(4)	< 0.404	u	< 20.2	u	< 20.2	u	< 0.404	u	< 1.01	u
1,2,4-Trichlorobenzene (V)	7.00E+01	(2)	< 0.266	u	< 13.277	u	< 13.277	u	< 0.266	u	< 0.664	u
1,2,4-Trimethylbenzene	5.60E+01	(1)	< 0.22	u	820	v	1500	v	2.7	v	1.1	J
1,2-Dibromo-3-chloropropane	2.00E-01	(2)	< 0.469	u	< 23.433	u	< 23.433	u	< 0.469	u	< 1.172	u
1,2-Dibromoethane (EDB)	5.00E-02	(2)	< 0.224	u	< 11.177	u	< 11.177	u	< 0.224	u	< 0.559	u
1,2-Dichlorobenzene (V)	6.00E+02	(2)	< 0.8	u	< 40	u	< 40	u	< 0.8	u	< 2	u
1,2-Dichloroethane (EDC)	5.00E+00	(2)	< 0.23	u	< 11.502	u	< 11.502	u	< 0.23	u	16	Z
1,2-Dichloropropane	5.00E+00	(2)	< 0.22	u	< 10.983	u	< 10.983	u	< 0.22	u	< 0.549	u
1,3,5-Trimethylbenzene	6.00E+01	(1)	< 0.231	u	200	v	400	v	< 0.231	u	< 0.577	u
1,3-Dichlorobenzene (V)	-		< 0.286	u	< 14.319	u	< 14.319	u	< 0.286	u	< 0.716	u
1,3-Dichloropropane	3.70E+02	(1)	< 0.311	u	< 15.572	u	< 15.572	u	< 0.311	u	< 0.779	u
1,4-Dichlorobenzene (V)	7.50E+01	(2)	< 0.285	u	< 14.266	u	< 14.266	u	< 0.285	u	< 0.713	u
1-Methylnaphthalene (V)	1.10E+01	(5)	0.55	J	130	J	97	J	0.87	J	< 1.022	u
2,2-Dichloropropane	-		< 0.333	u	< 16.664	u	< 16.664	u	< 0.333	u	< 0.833	u
2-Butanone	5.56E+03	(4)	< 1.474	u	< 73.699	u	< 73.699	u	< 1.474	u	< 3.685	u
2-Chlorotoluene	2.40E+02	(1)	< 0.8	u	< 40	u	< 40	u	< 0.8	u	< 2	u
2-Hexanone	-		< 1.68	u	< 83.987	u	< 83.987	u	< 1.68	u	< 4.199	u
2-Methylnaphthalene (V)	3.60E+01	(1)	0.71	J	160	J	130	J	0.77	J	< 0.791	u
4-Chlorotoluene	2.50E+02	(1)	< 0.256	u	< 12.814	u	< 12.814	u	< 0.256	u	< 0.641	u
4-Isopropyltoluene	-		< 0.281	u	< 14.061	u	< 14.061	u	< 0.281	u	< 0.703	u
4-Methyl-2-pentanone	-		< 0.855	u	< 42.764	u	< 42.764	u	< 0.855	u	< 2.138	u
Acetone	1.41E+04	(4)	13	J	< 490.874	u	< 490.874	u	19	J	< 24.544	u
Benzene	5.00E+00	(2)	< 0.191	u	5300	v	8200	v	47	v	2.5	J
Bromobenzene	6.20E+01	(1)	< 0.195	u	< 9.771	u	< 9.771	u	< 0.195	u	< 0.489	u
Bromodichloromethane	1.34E+00	(4)	< 0.28	u	< 13.978	u	< 13.978	u	< 0.28	u	< 0.699	u
Bromoform	3.30E+01	(5)	< 0.204	u	< 10.213	u	< 10.213	u	< 0.204	u	< 0.511	u
Bromomethane	7.54E+00	(4)	< 1.56	u	< 77.989	u	< 77.989	u	< 1.56	u	< 3.899	u
Carbon disulfide	8.10E+02	(4)	< 1.195	u	< 59.749	u	< 59.749	u	< 1.195	u	< 2.987	u
Carbon Tetrachloride	5.00E+00	(2)	< 0.216	u	< 10.82	u	< 10.82	u	< 0.216	u	< 0.541	u
Chlorobenzene	1.00E+02	(2)	< 0.229	u	< 11.445	u	< 11.445	u	< 0.229	u	< 0.572	u
Chloroethane	2.09E+04	(4)	< 0.382	u	< 19.102	u	< 19.102	u	< 0.382	u	< 0.955	u
Chloroform	1.00E+02	(3)	< 0.178	u	< 8.877	u	< 8.877	u	< 0.178	u	< 0.444	u
Chloromethane	2.03E+01	(4)	< 0.426	u	< 21.281	u	< 21.281	u	< 0.426	u	< 1.064	u
cis-1,2-DCE	7.00E+01	(2)	< 0.248	u	< 12.416	u	< 12.416	u	< 0.248	u	< 0.621	u
cis-1,3-Dichloropropene	4.71E+00	(4)	< 0.213	u	< 10.653	u	< 10.653	u	< 0.213	u	< 0.533	u
Dibromochloromethane	1.68E+00	(4)	< 0.173	u	< 8.673	u	< 8.673	u	< 0.173	u	< 0.434	u
Dibromomethane	8.30E+00	(1)	< 0.238	u	< 11.914	u	< 11.914	u	< 0.238	u	< 0.596	u
Dichlorodifluoromethane	1.97E+02	(4)	< 0.715	u	< 35.732	u	< 35.732	u	< 0.715	u	< 1.787	u
Ethylbenzene	7.00E+02	(2)	< 0.224	u	370	v	1400	v	67	v	< 0.561	u
Hexachlorobutadiene (V)	1.39E+00	(4)	< 0.397	u	< 19.86	u	< 19.86	u	< 0.397	u	< 0.993	u
Isopropylbenzene	4.47E+02	(4)	< 0.209	u	64	J	87	J	8.4	v	1.1	J
Methyl tert-butyl ether (MTBE)	1.43E+02	(4)	71	v	160	v	180	v	75	v	150	Z
Methylene Chloride	5.00E+00	(2)	< 0.375	u	< 18.742	u	< 18.742	u	< 0.375	u	< 0.937	u
Naphthalene (V)	1.65E+00	(4)	0.22	J	280	v	390	v	0.4	J	< 0.463	u
n-Butylbenzene	-		< 0.321	u	36	J	57	J	1.1	J	< 0.802	u
n-Propylbenzene	-		< 0.264	u	120	v	250	v	8.4	v	< 0.661	u
sec-Butylbenzene	-		< 0.246	u	< 12.301	u	< 12.301	u	1.1	J	< 0.615	u
Styrene	1.00E+02	(2)	< 0.22	u	< 11	u	< 11	u	< 0.22	u	< 0.55	u

Table 3
Groundwater Analytical Results Summary
Western Refining Southwest, Inc. - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	NDD-4-GW		NDD-6-GW		NDD-11-GW		NDD-16-GW		OW-56	
Lab ID			1605C89-004		1605C89-001		1605C89-006		1605C89-008		1609A26-003	
Sample Date			5/26/2016		5/26/2016		5/26/2016		5/26/2016		9/16/2016	
tert-Butylbenzene	-		< 0.23	u	< 11.501	u	< 11.501	u	< 0.23	u	< 0.575	u
Tetrachloroethene (PCE)	5.00E+00	(2)	< 0.304	u	< 15.202	u	< 15.202	u	< 0.304	u	< 0.76	u
Toluene	7.50E+02	(3)	< 0.236	u	130	v	330	v	0.34	J	0.92	J
trans-1,2-DCE	1.00E+02	(2)	< 0.8	u	< 40	u	< 40	u	< 0.8	u	< 2	u
trans-1,3-Dichloropropene	4.71E+00	(4)	< 0.207	u	< 10.327	u	< 10.327	u	< 0.207	u	< 0.516	u
Trichloroethene (TCE)	5.00E+00	(2)	< 0.35	u	< 17.509	u	< 17.509	u	< 0.35	u	< 0.875	u
Trichlorofluoromethane	1.14E+03	(4)	< 0.409	u	< 20.437	u	< 20.437	u	< 0.409	u	< 1.022	u
Vinyl chloride	1.00E+00	(3)	< 0.391	u	< 19.538	u	< 19.538	u	< 0.391	u	< 0.977	u
Xylenes, Total	6.20E+02	(3)	< 0.734	u	2100	v	5700	v	< 0.734	u	< 1.835	u
Semivolatiles (ug/l)												
1,2,4-Trichlorobenzene	7.00E+01	(2)	< 2.62	u	< 2.62	u	< 2.62	u	< 2.62	u	-	
1,2-Dichlorobenzene	6.00E+02	(2)	< 2.285	u	< 2.285	u	< 2.285	u	< 2.285	u	-	
1,3-Dichlorobenzene	-		< 2.257	u	< 2.257	u	< 2.257	u	< 2.257	u	-	
1,4-Dichlorobenzene	7.50E+01	(2)	< 2.388	u	< 2.388	u	< 2.388	u	< 2.388	u	-	
1-Methylnaphthalene	1.10E+01	(5)	< 2.918	u	110	v	110	v	< 2.918	u	-	
2,4,5-Trichlorophenol	1.17E+03	(4)	< 2.18	u	< 2.18	u	< 2.18	u	< 2.18	u	-	
2,4,6-Trichlorophenol	1.19E+01	(4)	< 2.446	u	< 2.446	u	< 2.446	u	< 2.446	u	-	
2,4-Dichlorophenol	4.53E+01	(4)	< 2.33	u	< 2.33	u	< 2.33	u	< 2.33	u	-	
2,4-Dimethylphenol	3.54E+02	(4)	< 3.01	u	< 3.01	u	37	v	< 3.01	u	-	
2,4-Dinitrophenol	3.87E+01	(4)	< 2.753	u	< 2.753	u	< 2.753	u	< 2.753	u	-	
2,4-Dinitrotoluene	2.37E+00	(4)	< 3.129	u	< 3.129	u	< 3.129	u	< 3.129	u	-	
2,6-Dinitrotoluene	4.85E-01	(4)	< 2.734	u	< 2.734	u	< 2.734	u	< 2.734	u	-	
2-Chloronaphthalene	7.33E+02	(4)	< 2.251	u	< 2.251	u	< 2.251	u	< 2.251	u	-	
2-Chlorophenol	9.10E+01	(4)	< 2.184	u	< 2.184	u	< 2.184	u	< 2.184	u	-	
2-Methylnaphthalene	3.60E+01	(1)	< 2.89	u	130	v	120	v	< 2.89	u	-	
2-Methylphenol	9.30E+02	(1)	< 2.539	u	< 2.539	u	< 2.539	u	< 2.539	u	-	
2-Nitroaniline	1.90E+02	(1)	< 2.758	u	< 2.758	u	< 2.758	u	< 2.758	u	-	
2-Nitrophenol	-		< 2.378	u	< 2.378	u	< 2.378	u	< 2.378	u	-	
3,3'-Dichlorobenzidine	1.25E+00	(4)	< 2.396	u	< 2.396	u	< 2.396	u	< 2.396	u	-	
3+4-Methylphenol	1.40E+03	(1)	< 2.298	u	2.4	J	5.7	J	< 2.298	u	-	
3-Nitroaniline	-		< 2.948	u	< 2.948	u	< 2.948	u	< 2.948	u	-	
4,6-Dinitro-2-methylphenol	1.52E+00	(4)	< 1.797	u	< 1.797	u	< 1.797	u	< 1.797	u	-	
4-Bromophenyl phenyl ether	-		< 2.637	u	< 2.637	u	< 2.637	u	< 2.637	u	-	
4-Chloro-3-methylphenol	-		< 2.559	u	< 2.559	u	< 2.559	u	< 2.559	u	-	
4-Chloroaniline	3.70E+00	(5)	< 2.712	u	< 2.712	u	< 2.712	u	< 2.712	u	-	
4-Chlorophenyl phenyl ether	-		< 2.556	u	< 2.556	u	< 2.556	u	< 2.556	u	-	
4-Nitroaniline	3.80E+01	(5)	< 2.559	u	< 2.559	u	< 2.559	u	< 2.559	u	-	
4-Nitrophenol	-		< 2.553	u	< 2.553	u	< 2.553	u	< 2.553	u	-	
Acenaphthene	5.35E+02	(4)	< 2.553	u	< 2.553	u	< 2.553	u	< 2.553	u	-	
Acenaphthylene	-		< 2.357	u	< 2.357	u	< 2.357	u	< 2.357	u	-	
Aniline	1.30E+02	(5)	< 2.441	u	< 2.441	u	< 2.441	u	< 2.441	u	-	
Anthracene	1.72E+03	(4)	< 2.486	u	< 2.486	u	< 2.486	u	< 2.486	u	-	
Azobenzene	1.20E+00	(5)	< 2.668	u	< 2.668	u	< 2.668	u	< 2.668	u	-	
Benz(a)anthracene	1.20E-01	(4)	< 2.639	u	< 2.639	u	< 2.639	u	< 2.639	u	-	
Benzo(a)pyrene	2.00E-01	(2)	< 2.718	u	< 2.718	u	< 2.718	u	< 2.718	u	-	
Benzo(b)fluoranthene	3.43E-01	(4)	< 2.88	u	< 2.88	u	< 2.88	u	< 2.88	u	-	
Benzo(g,h,i)perylene	-		< 2.643	u	< 2.643	u	< 2.643	u	< 2.643	u	-	
Benzo(k)fluoranthene	3.43E+00	(4)	< 2.998	u	< 2.998	u	< 2.998	u	< 2.998	u	-	

Table 3
Groundwater Analytical Results Summary
Western Refining Southwest, Inc. - Gallup Refinery
Gallup, New Mexico

	Screening Levels	Source	NDD-4-GW	NDD-6-GW	NDD-11-GW	NDD-16-GW	OW-56
Lab ID			1605C89-004	1605C89-001	1605C89-006	1605C89-008	1609A26-003
Sample Date			5/26/2016	5/26/2016	5/26/2016	5/26/2016	9/16/2016
Benzoic acid	7.50E+04	(1)	< 2.606 u	< 2.606 u	< 2.606 u	< 2.606 u	-
Benzyl alcohol	2.00E+03	(1)	< 3.012 u	< 3.012 u	< 3.012 u	< 3.012 u	-
Bis(2-chloroethoxy)methane	5.90E+01	(1)	< 2.814 u	< 2.814 u	< 2.814 u	< 2.814 u	-
Bis(2-chloroethyl)ether	1.40E-01	(4)	< 2.674 u	< 2.674 u	< 2.674 u	< 2.674 u	-
Bis(2-chloroisopropyl)ether	9.81E+00	(4)	< 1.909 u	< 1.909 u	< 1.909 u	< 1.909 u	-
Bis(2-ethylhexyl)phthalate	6.00E+00	(2)	< 2.616 u	3.4 J	3.4 J	4.7 J	-
Butyl benzyl phthalate	1.60E+02	(5)	< 2.478 u	< 2.478 u	< 2.478 u	< 2.478 u	-
Carbazole	-		< 2.287 u	3.4 J	2.3 J	< 2.287 u	-
Chrysene	3.43E+01	(4)	< 2.779 u	< 2.779 u	< 2.779 u	< 2.779 u	-
Dibenz(a,h)anthracene	3.43E-02	(4)	< 2.661 u	< 2.661 u	< 2.661 u	< 2.661 u	-
Dibenzofuran	-		< 2.493 u	< 2.493 u	< 2.493 u	< 2.493 u	-
Diethyl phthalate	1.48E+04	(4)	< 2.715 u	< 2.715 u	< 2.715 u	< 2.715 u	-
Dimethyl phthalate	-		< 2.429 u	< 2.429 u	< 2.429 u	< 2.429 u	-
Di-n-butyl phthalate	8.85E+02	(4)	< 2.444 u	< 2.444 u	< 2.444 u	< 2.444 u	-
Di-n-octyl phthalate	-		5 J	5 J	6.2 J	5.2 J	-
Fluoranthene	8.02E+02	(4)	< 2.607 u	< 2.607 u	< 2.607 u	< 2.607 u	-
Fluorene	2.88E+02	(4)	< 2.724 u	< 2.724 u	< 2.724 u	< 2.724 u	-
Hexachlorobenzene	1.00E+00	(2)	< 2.633 u	< 2.633 u	< 2.633 u	< 2.633 u	-
Hexachlorobutadiene	1.39E+00	(4)	< 2.184 u	< 2.184 u	< 2.184 u	< 2.184 u	-
Hexachlorocyclopentadiene	5.00E+01	(2)	< 2.284 u	< 2.284 u	< 2.284 u	< 2.284 u	-
Hexachloroethane	3.28E+00	(4)	< 2.368 u	< 2.368 u	< 2.368 u	< 2.368 u	-
Indeno(1,2,3-cd)pyrene	3.43E-01	(4)	< 2.964 u	< 2.964 u	< 2.964 u	< 2.964 u	-
Isophorone	7.81E+02	(4)	< 2.615 u	< 2.615 u	< 2.615 u	< 2.615 u	-
Naphthalene	1.65E+00	(4)	< 2.598 u	200 v	280 v	< 2.598 u	-
Nitrobenzene	1.40E+00	(4)	< 2.753 u	< 2.753 u	< 2.753 u	< 2.753 u	-
N-Nitrosodimethylamine	1.70E-03	(4)	< 2.158 u	< 2.158 u	< 2.158 u	< 2.158 u	-
N-Nitrosodi-n-propylamine	1.10E-01	(5)	< 2.389 u	< 2.389 u	< 2.389 u	< 2.389 u	-
N-Nitrosodiphenylamine	4.90E-03	(4)	< 2.32 u	< 2.32 u	< 2.32 u	< 2.32 u	-
Phenanthrene	1.70E+02	(4)	< 2.587 u	< 2.587 u	< 2.587 u	< 2.587 u	-
Pentachlorophenol	1.00E+00	(2)	< 2.342 u	< 2.342 u	< 2.342 u	< 2.342 u	-
Phenol	5.76E+03	(4)	< 1.985 u	11 v	14 v	< 1.985 u	-
Pyrene	1.17E+02	(4)	< 3.094 u	< 3.094 u	< 3.094 u	< 3.094 u	-
Pyridine	2.00E+01	(1)	< 2.161 u	< 2.161 u	< 2.161 u	< 2.161 u	-
TPH (mg/l)							
Gasoline Range Organics (GRO)	3.98E-02	(6)	0.11 v	27 v	53 v	0.54 v	1.2 v
Diesel Range Organics (DRO)	3.98E-02	(6)	< 0.69 u	4.3 v	7.3 v	< 0.69 u	0.77 J
Motor Oil Range Organics (MRO)	3.98E-02	(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 (June 2017) -Tap Water

(2) EPA - Regional Screening Levels (June 2017) - 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

(4) NMED Tap Water Screening Level - Risk Assessment Guidance for Site Investigations and Remediation (March 2017)

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

(6) NMED groundwater screening level for unknown oil

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

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

Table 3
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Western Refining Southwest, Inc. - Gallup Refinery
Gallup, New Mexico

			NDD-4-GW	NDD-6-GW	NDD-11-GW	NDD-16-GW	OW-56
	Screening Levels	Source					
Lab ID			1605C89-004	1605C89-001	1605C89-006	1605C89-008	1609A26-003
Sample Date			5/26/2016	5/26/2016	5/26/2016	5/26/2016	9/16/2016

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

z - concentration exceeds MCL

Table 4
Soil Boring Samples - Vapor Screening Results
Western Refining Southwest Inc. - Gallup Refinery
Gallup, New Mexico

Sample Interval Depth (ftbgl)	NDD-1 (ppm)	NDD-2 (ppm)	NDD-3 (ppm)	NDD-4 (ppm)	NDD-5 (ppm)	NDD-6 (ppm)	NDD-7 (ppm)	NDD-8 (ppm)	NDD-9 (ppm)	NDD-10 (ppm)	NDD-11 (ppm)	NDD-12 (ppm)	NDD-13 (ppm)	NDD-14 (ppm)	NDD-15 (ppm)	NDD-16 (ppm)	NDD-17 (ppm)	OW-53 (ppm)	OW-54 (ppm)	OW-55 (ppm)	OW-56 (ppm)
0 - 2 ¹	4.1	9.7	14.2	3.5/7.1	6.5/339	8.8/1639	3.3/9.4	11.3/904	18.5/1530	8.8/12.3	3.2/4.6	8.9/66.4	5.6/8.0	5.7/1.6	7.1/6.3	5.1/14.3	4.5/9.8	5.3	4.5	9.4	10.5
2 - 4	8.1	14.4	12.2	5.9	TD@2 ftbgl	129	TD@2 ftbgl	TD@2 ftbgl	TD@2 ftbgl	TD@2 ftbgl	SAT	TD@2 ftbgl	TD@2 ftbgl	TD@2 ftbgl	TD@2 ftbgl	5.3	TD@2 ftbgl	4.8	5.7	11.2	11.0
4 - 6	9.3	17.1	14.4	7.0		1780										5.6		2.4	10.2	16.8	11.4
6 - 8	10.1	18.0	9.9	3.2		SAT					SAT					12.1		5.5	7.3	13.3	8.3
8 - 10	9.9	14.8	10.7	4.9		SAT					SAT					12.3		2.3	8.3	19.2	13.6
10 - 12	8.2	16.3	11.9	7.8		17.9					29.3					12.6		2.3	13.6	18.5	16.7
12 - 14	6.1	13.5	13.9	7.9		TD@12.5 ftbgl					21.2					12.0		5.3	12.6	17.3	19.1
14 - 16	5.2	12.2	13.5	6.7							TD@14 ftbgl					12.9		2.1	216.0	14.9	13.6
16 - 18	5.1	12.4	TD@16 ftbgl	5.9												SAT		5.3	1538.0	2530.0	TD@16.5ftbgl
18 - 20	6.3	10.8		3.0												SAT		4.3	370.0	SAT	
20 - 22	TD@20 ftbgl	TD@20 ftbgl		TD@20 ftbgl												4.8		4.6	49.4	SAT	
22 - 24																4.2		9.9	SAT	SAT	
24 - 26																TD@24 ftbgl		5.6	SAT	185.0	
26 - 28																		7.5	SAT	SAT	
28 - 30																		2.6	SAT	125.9	
30 - 32																		3.3	TD@30 ftbgl	47.5	
32 - 34																		3.8		TD@32 ftbgl	
34 - 36																		TD@34 ftbgl			
36 - 38																					

ftbgl - feet below ground level ppm - parts per million SAT - Interval was saturated. No reading was collected.

NR - NR - No sample recovery. No reading was collected.

1. - borings with two values indicate results for the 0-0.5' and 0.5-2.0' intervals



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

May 22, 2015

Cheryl Johnson

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-0231
FAX (505) 722-0210

RE: North Drainage Ditch

OrderNo.: 1505702

Dear Cheryl Johnson:

Hall Environmental Analysis Laboratory received 2 sample(s) on 5/15/2015 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1505702

Date Reported: 5/22/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: NDD-3-GW

Project: North Drainage Ditch

Collection Date: 5/14/2015 8:30:00 AM

Lab ID: 1505702-001

Matrix: AQUEOUS

Received Date: 5/15/2015 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: GASOLINE RANGE							Analyst: cadg
Gasoline Range Organics (GRO)	0.56	0.050		mg/L	1	5/20/2015 6:42:22 PM	R26322
Surr: BFB	86.6	70-130		%REC	1	5/20/2015 6:42:22 PM	R26322
EPA METHOD 8015D: DIESEL RANGE							Analyst: KJH
Diesel Range Organics (DRO)	1.1	1.0		mg/L	1	5/15/2015 8:38:14 PM	19246
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	5/15/2015 8:38:14 PM	19246
Surr: DNOP	129	76.5-150		%REC	1	5/15/2015 8:38:14 PM	19246
EPA METHOD 8270C: SEMIVOLATILES							Analyst: JDC
Acenaphthene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Acenaphthylene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Aniline	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Anthracene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Azobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Benz(a)anthracene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Benzo(a)pyrene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Benzo(b)fluoranthene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Benzo(g,h,i)perylene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Benzo(k)fluoranthene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Benzoic acid	ND	20		µg/L	1	5/19/2015 6:03:06 PM	19289
Benzyl alcohol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Bis(2-chloroethyl)ether	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Bis(2-chloroisopropyl)ether	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Bis(2-ethylhexyl)phthalate	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4-Bromophenyl phenyl ether	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Butyl benzyl phthalate	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Carbazole	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4-Chloro-3-methylphenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4-Chloroaniline	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2-Chloronaphthalene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2-Chlorophenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4-Chlorophenyl phenyl ether	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Chrysene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Di-n-butyl phthalate	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Di-n-octyl phthalate	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Dibenz(a,h)anthracene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Dibenzofuran	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
1,2-Dichlorobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
1,3-Dichlorobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289

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

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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1505702

Date Reported: 5/22/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: NDD-3-GW

Project: North Drainage Ditch

Collection Date: 5/14/2015 8:30:00 AM

Lab ID: 1505702-001

Matrix: AQUEOUS

Received Date: 5/15/2015 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC	
1,4-Dichlorobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
3,3'-Dichlorobenzidine	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Diethyl phthalate	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Dimethyl phthalate	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2,4-Dichlorophenol	ND	20		µg/L	1	5/19/2015 6:03:06 PM	19289
2,4-Dimethylphenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4,6-Dinitro-2-methylphenol	ND	20		µg/L	1	5/19/2015 6:03:06 PM	19289
2,4-Dinitrophenol	ND	20		µg/L	1	5/19/2015 6:03:06 PM	19289
2,4-Dinitrotoluene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2,6-Dinitrotoluene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Fluoranthene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Fluorene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Hexachlorobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Hexachlorobutadiene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Hexachlorocyclopentadiene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Hexachloroethane	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Isophorone	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
1-Methylnaphthalene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2-Methylnaphthalene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2-Methylphenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
3+4-Methylphenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
N-Nitrosodimethylamine	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
N-Nitrosodiphenylamine	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Naphthalene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2-Nitroaniline	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
3-Nitroaniline	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4-Nitroaniline	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Nitrobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2-Nitrophenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
4-Nitrophenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Pentachlorophenol	ND	20		µg/L	1	5/19/2015 6:03:06 PM	19289
Phenanthrene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Phenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Pyrene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Pyridine	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
1,2,4-Trichlorobenzene	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
2,4,5-Trichlorophenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289

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

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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1505702

Date Reported: 5/22/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: NDD-3-GW

Project: North Drainage Ditch

Collection Date: 5/14/2015 8:30:00 AM

Lab ID: 1505702-001

Matrix: AQUEOUS

Received Date: 5/15/2015 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES							Analyst: JDC
2,4,6-Trichlorophenol	ND	10		µg/L	1	5/19/2015 6:03:06 PM	19289
Surr: 2-Fluorophenol	67.9	14.9-111		%REC	1	5/19/2015 6:03:06 PM	19289
Surr: Phenol-d5	77.2	11.3-108		%REC	1	5/19/2015 6:03:06 PM	19289
Surr: 2,4,6-Tribromophenol	81.2	15.7-154		%REC	1	5/19/2015 6:03:06 PM	19289
Surr: Nitrobenzene-d5	103	47.8-106		%REC	1	5/19/2015 6:03:06 PM	19289
Surr: 2-Fluorobiphenyl	105	21.3-123		%REC	1	5/19/2015 6:03:06 PM	19289
Surr: 4-Terphenyl-d14	101	14.3-135		%REC	1	5/19/2015 6:03:06 PM	19289
EPA METHOD 8260B: VOLATILES							Analyst: cadg
Benzene	1.1	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Toluene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Ethylbenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Methyl tert-butyl ether (MTBE)	260	10		µg/L	10	5/19/2015 1:54:07 PM	R26299
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2-Dichloroethane (EDC)	6.3	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Naphthalene	ND	2.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1-Methylnaphthalene	ND	4.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
2-Methylnaphthalene	ND	4.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Acetone	ND	10		µg/L	1	5/19/2015 6:10:15 AM	R26263
Bromobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Bromodichloromethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Bromoform	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Bromomethane	ND	3.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
2-Butanone	ND	10		µg/L	1	5/19/2015 6:10:15 AM	R26263
Carbon disulfide	ND	10		µg/L	1	5/19/2015 6:10:15 AM	R26263
Carbon Tetrachloride	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Chlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Chloroethane	ND	2.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Chloroform	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Chloromethane	ND	3.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
2-Chlorotoluene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
4-Chlorotoluene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
cis-1,2-DCE	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Dibromochloromethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Dibromomethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2-Dichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263

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

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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1505702

Date Reported: 5/22/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: NDD-3-GW

Project: North Drainage Ditch

Collection Date: 5/14/2015 8:30:00 AM

Lab ID: 1505702-001

Matrix: AQUEOUS

Received Date: 5/15/2015 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: cadg
1,3-Dichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,4-Dichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Dichlorodifluoromethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1-Dichloroethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1-Dichloroethene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2-Dichloropropane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,3-Dichloropropane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
2,2-Dichloropropane	ND	2.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1-Dichloropropene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Hexachlorobutadiene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
2-Hexanone	ND	10		µg/L	1	5/19/2015 6:10:15 AM	R26263
Isopropylbenzene	47	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
4-Isopropyltoluene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
4-Methyl-2-pentanone	ND	10		µg/L	1	5/19/2015 6:10:15 AM	R26263
Methylene Chloride	ND	3.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
n-Butylbenzene	ND	3.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
n-Propylbenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
sec-Butylbenzene	9.5	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Styrene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
tert-Butylbenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
trans-1,2-DCE	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1,1-Trichloroethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,1,2-Trichloroethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Trichloroethene (TCE)	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Trichlorofluoromethane	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
1,2,3-Trichloropropane	ND	2.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Vinyl chloride	ND	1.0		µg/L	1	5/19/2015 6:10:15 AM	R26263
Xylenes, Total	ND	1.5		µg/L	1	5/19/2015 6:10:15 AM	R26263
Surr: 1,2-Dichloroethane-d4	103	70-130		%REC	1	5/19/2015 6:10:15 AM	R26263
Surr: 4-Bromofluorobenzene	94.8	70-130		%REC	1	5/19/2015 6:10:15 AM	R26263
Surr: Dibromofluoromethane	108	70-130		%REC	1	5/19/2015 6:10:15 AM	R26263
Surr: Toluene-d8	101	70-130		%REC	1	5/19/2015 6:10:15 AM	R26263

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

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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1505702

Date Reported: 5/22/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: Trip Blank

Project: North Drainage Ditch

Collection Date:

Lab ID: 1505702-002

Matrix: TRIP BLANK

Received Date: 5/15/2015 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: GASOLINE RANGE							Analyst: cadg
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	5/20/2015 7:11:07 PM	R26322
Surr: BFB	99.7	70-130		%REC	1	5/20/2015 7:11:07 PM	R26322
EPA METHOD 8260B: VOLATILES							Analyst: cadg
Benzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Toluene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Ethylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Naphthalene	ND	2.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1-Methylnaphthalene	ND	4.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
2-Methylnaphthalene	ND	4.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Acetone	ND	10		µg/L	1	5/19/2015 6:38:54 AM	R26263
Bromobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Bromodichloromethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Bromoform	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Bromomethane	ND	3.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
2-Butanone	ND	10		µg/L	1	5/19/2015 6:38:54 AM	R26263
Carbon disulfide	ND	10		µg/L	1	5/19/2015 6:38:54 AM	R26263
Carbon Tetrachloride	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Chlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Chloroethane	ND	2.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Chloroform	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Chloromethane	ND	3.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
2-Chlorotoluene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
4-Chlorotoluene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
cis-1,2-DCE	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Dibromochloromethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Dibromomethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2-Dichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,3-Dichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,4-Dichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Dichlorodifluoromethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1-Dichloroethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1-Dichloroethene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263

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

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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1505702

Date Reported: 5/22/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: Trip Blank

Project: North Drainage Ditch

Collection Date:

Lab ID: 1505702-002

Matrix: TRIP BLANK

Received Date: 5/15/2015 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: cadg
1,2-Dichloropropane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,3-Dichloropropane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
2,2-Dichloropropane	ND	2.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1-Dichloropropene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Hexachlorobutadiene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
2-Hexanone	ND	10		µg/L	1	5/19/2015 6:38:54 AM	R26263
Isopropylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
4-Isopropyltoluene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
4-Methyl-2-pentanone	ND	10		µg/L	1	5/19/2015 6:38:54 AM	R26263
Methylene Chloride	ND	3.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
n-Butylbenzene	ND	3.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
n-Propylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
sec-Butylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Styrene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
tert-Butylbenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
trans-1,2-DCE	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1,1-Trichloroethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,1,2-Trichloroethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Trichloroethene (TCE)	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Trichlorofluoromethane	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
1,2,3-Trichloropropane	ND	2.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Vinyl chloride	ND	1.0		µg/L	1	5/19/2015 6:38:54 AM	R26263
Xylenes, Total	ND	1.5		µg/L	1	5/19/2015 6:38:54 AM	R26263
Surr: 1,2-Dichloroethane-d4	104	70-130		%REC	1	5/19/2015 6:38:54 AM	R26263
Surr: 4-Bromofluorobenzene	104	70-130		%REC	1	5/19/2015 6:38:54 AM	R26263
Surr: Dibromofluoromethane	106	70-130		%REC	1	5/19/2015 6:38:54 AM	R26263
Surr: Toluene-d8	97.3	70-130		%REC	1	5/19/2015 6:38:54 AM	R26263

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	Page 6 of 16
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	
	J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit	
	O	RSD is greater than RSDlimit	P	Sample pH Not In Range	
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	
	S	Spike Recovery outside accepted recovery limits			

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	MB-19246	SampType: MBLK			TestCode: EPA Method 8015D: Diesel Range					
Client ID:	PBW	Batch ID: 19246			RunNo: 26216					
Prep Date:	5/15/2015	Analysis Date: 5/15/2015			SeqNo: 778433		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	1.4		1.000		137	76.5	150			

Sample ID	LCS-19246		SampType: LCS		TestCode: EPA Method 8015D: Diesel Range					
Client ID:	LCSW		Batch ID: 19246		RunNo: 26216					
Prep Date:	5/15/2015		Analysis Date: 5/15/2015		SeqNo: 778434		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	117	60.1	156			
Surr: DNOP	0.62		0.5000		124	76.5	150			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	5mL rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID: R26263			RunNo: 26263					
Prep Date:		Analysis Date: 5/18/2015			SeqNo: 779854		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.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	5mL rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID: R26263			RunNo: 26263					
Prep Date:		Analysis Date: 5/18/2015			SeqNo: 779854		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	9.8		10.00		98.3	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID	100ng lcs	SampType: LCS			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID: R26263			RunNo: 26263					
Prep Date:		Analysis Date: 5/18/2015			SeqNo: 779856		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	20	1.0	20.00	0	101	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
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	100ng lcs		SampType: LCS			TestCode: EPA Method 8260B: VOLATILES				
Client ID:	LCSW		Batch ID: R26263			RunNo: 26263				
Prep Date:	Analysis Date: 5/18/2015			SeqNo: 779856		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	24	1.0	20.00	0	118	75.6	144			
Trichloroethene (TCE)	19	1.0	20.00	0	95.4	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	9.8		10.00		98.0	70	130			

Sample ID	5mL rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID: R26299			RunNo: 26299					
Prep Date:		Analysis Date: 5/19/2015			SeqNo: 781268		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								
Surr: 1,2-Dichloroethane-d4	10		10.00		102	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		104	70	130			
Surr: Dibromofluoromethane	10		10.00		102	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: R26299			RunNo: 26299					
Prep Date:		Analysis Date: 5/19/2015			SeqNo: 781270		Units: %REC			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		102	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.7	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	10		10.00		99.6	70	130			

Sample ID	5mL rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID: R26322			RunNo: 26322					
Prep Date:		Analysis Date: 5/20/2015			SeqNo: 782101		Units: %REC			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	11		10.00		107	70	130			
Surr: 4-Bromofluorobenzene	12		10.00		116	70	130			
Surr: Dibromofluoromethane	11		10.00		107	70	130			
Surr: Toluene-d8	9.4		10.00		93.8	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	100ng lcs	SampType: LCS			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID: R26322			RunNo: 26322					
Prep Date:		Analysis Date: 5/20/2015			SeqNo: 782103		Units: %REC			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		102	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		98.7	70	130			
Surr: Dibromofluoromethane	9.8		10.00		98.1	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	mb-19289		SampType: MBLK		TestCode: EPA Method 8270C: Semivolatiles					
Client ID:	PBW		Batch ID: 19289		RunNo: 26300					
Prep Date:	5/19/2015		Analysis Date: 5/19/2015		SeqNo: 781333		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	ND	20								
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.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	mb-19289	SampType:	MBLK	TestCode:	EPA Method 8270C: Semivolatiles					
Client ID:	PBW	Batch ID:	19289	RunNo:	26300					
Prep Date:	5/19/2015	Analysis Date:	5/19/2015	SeqNo:	781333	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	150		200.0		76.8	14.9	111			
Surr: Phenol-d5	160		200.0		80.8	11.3	108			
Surr: 2,4,6-Tribromophenol	160		200.0		80.2	15.7	154			
Surr: Nitrobenzene-d5	76		100.0		76.1	47.8	106			
Surr: 2-Fluorobiphenyl	78		100.0		78.4	21.3	123			
Surr: 4-Terphenyl-d14	110		100.0		105	14.3	135			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	lcs-19289		SampType: LCS		TestCode: EPA Method 8270C: Semivolatiles					
Client ID:	LCSW		Batch ID: 19289		RunNo: 26300					
Prep Date:	5/19/2015		Analysis Date: 5/19/2015		SeqNo: 781334		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	76	10	100.0	0	75.9	47.8	99.7			
4-Chloro-3-methylphenol	160	10	200.0	0	79.9	58.1	103			
2-Chlorophenol	140	10	200.0	0	70.4	49.5	96.8			
1,4-Dichlorobenzene	73	10	100.0	0	72.6	40.4	89.4			
2,4-Dinitrotoluene	70	10	100.0	0	69.6	38.6	91.3			
N-Nitrosodi-n-propylamine	80	10	100.0	0	80.1	53.9	95.6			
4-Nitrophenol	140	10	200.0	0	71.9	26.4	108			
Pentachlorophenol	120	20	200.0	0	61.8	36.5	86.6			
Phenol	160	10	200.0	0	77.8	29.3	108			
Pyrene	74	10	100.0	0	73.9	45.7	100			
1,2,4-Trichlorobenzene	81	10	100.0	0	80.7	39.3	94.5			
Surr: 2-Fluorophenol	150		200.0		74.2	14.9	111			
Surr: Phenol-d5	170		200.0		83.5	11.3	108			
Surr: 2,4,6-Tribromophenol	170		200.0		86.1	15.7	154			
Surr: Nitrobenzene-d5	82		100.0		81.8	47.8	106			
Surr: 2-Fluorobiphenyl	86		100.0		86.4	21.3	123			
Surr: 4-Terphenyl-d14	79		100.0		78.7	14.3	135			

Sample ID	1505702-001Dms	SampType: MS			TestCode: EPA Method 8270C: Semivolatiles					
Client ID:	NDD-3-GW	Batch ID: 19289			RunNo: 26300					
Prep Date:	5/19/2015	Analysis Date: 5/19/2015			SeqNo: 781339		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	80	10	100.0	0	80.4	46.4	121			
4-Chloro-3-methylphenol	170	10	200.0	0	85.8	45.3	135			
2-Chlorophenol	170	10	200.0	0	83.5	28.7	129			
1,4-Dichlorobenzene	81	10	100.0	0	80.8	42.6	104			
2,4-Dinitrotoluene	70	10	100.0	0	70.5	28.9	126			
N-Nitrosodi-n-propylamine	89	10	100.0	0	89.4	49.2	117			
4-Nitrophenol	130	10	200.0	0	62.8	18.1	97.2			
Pentachlorophenol	150	20	200.0	4.440	73.9	24.8	127			
Phenol	140	10	200.0	0	68.1	17.9	93.6			
Pyrene	79	10	100.0	0	79.4	29.6	142			
1,2,4-Trichlorobenzene	90	10	100.0	0	90.3	39.5	109			
Surr: 2-Fluorophenol	160		200.0		80.0	14.9	111			
Surr: Phenol-d5	150		200.0		73.7	11.3	108			
Surr: 2,4,6-Tribromophenol	190		200.0		96.1	15.7	154			
Surr: Nitrobenzene-d5	92		100.0		92.3	47.8	106			
Surr: 2-Fluorobiphenyl	94		100.0		93.6	21.3	123			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	1505702-001Dms	SampType:	MS	TestCode:	EPA Method 8270C: Semivolatiles					
Client ID:	NDD-3-GW	Batch ID:	19289	RunNo:	26300					
Prep Date:	5/19/2015	Analysis Date:	5/19/2015	SeqNo:	781339	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	89		100.0		89.2	14.3	135			

Sample ID	1505702-001Dmsd	SampType:	MSD	TestCode:	EPA Method 8270C: Semivolatiles					
Client ID:	NDD-3-GW	Batch ID:	19289	RunNo:	26300					
Prep Date:	5/19/2015	Analysis Date:	5/19/2015	SeqNo:	781340	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	89	10	100.0	0	88.6	46.4	121	9.73	31.3	
4-Chloro-3-methylphenol	180	10	200.0	0	88.9	45.3	135	3.54	29	
2-Chlorophenol	180	10	200.0	0	90.5	28.7	129	8.09	28.4	
1,4-Dichlorobenzene	92	10	100.0	0	91.9	42.6	104	12.8	28.2	
2,4-Dinitrotoluene	72	10	100.0	0	71.5	28.9	126	1.49	22.9	
N-Nitrosodi-n-propylamine	99	10	100.0	0	99.5	49.2	117	10.7	28.8	
4-Nitrophenol	130	10	200.0	0	63.3	18.1	97.2	0.714	41.5	
Pentachlorophenol	170	20	200.0	4.440	83.1	24.8	127	11.4	45.1	
Phenol	130	10	200.0	0	66.3	17.9	93.6	2.80	33.9	
Pyrene	88	10	100.0	0	88.5	29.6	142	10.8	33.6	
1,2,4-Trichlorobenzene	96	10	100.0	0	95.8	39.5	109	5.95	28.2	
Surr: 2-Fluorophenol	160		200.0		78.3	14.9	111	0	0	
Surr: Phenol-d5	140		200.0		71.3	11.3	108	0	0	
Surr: 2,4,6-Tribromophenol	200		200.0		99.2	15.7	154	0	0	
Surr: Nitrobenzene-d5	95		100.0		95.1	47.8	106	0	0	
Surr: 2-Fluorobiphenyl	99		100.0		99.4	21.3	123	0	0	
Surr: 4-Terphenyl-d14	89		100.0		89.2	14.3	135	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1505702

22-May-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	5mL rb	SampType:	MBLK	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	PBW	Batch ID:	R26322	RunNo:	26322					
Prep Date:		Analysis Date:	5/20/2015	SeqNo:	782177	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	10		10.00		102	70	130			

Sample ID	2.5ug gro lcs	SampType:	LCS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	LCSW	Batch ID:	R26322	RunNo:	26322					
Prep Date:		Analysis Date:	5/20/2015	SeqNo:	782181	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.46	0.050	0.5000	0	91.6	80.6	122			
Surr: BFB	9.8		10.00		97.7	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

Sample Log-In Check List

Client Name: **Western Refining Gallup**

Work Order Number: **1505702**

RcptNo: 1

Received by/date:

[Signature]

05/15/15

Logged By: **Lindsay Mangin**

5/15/2015 8:55:00 AM

[Signature]

Completed By: **Lindsay Mangin**

5/15/2015 9:45:48 AM

[Signature]

Reviewed By:

[Signature]

05/19/15

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?

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: *Poured off for 8015 DR20 analysis from a 1L Amber into a 250 ml Am*

CS 05/15/15

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.1	Good	Yes			

Chain-of-Custody Record		Turn-Around Time:
Client:	WESTERN REFINING SW, INC.	☒ Standard ☐ Rush
	GALLUP REFINERY	Project Name:
Mailing Address:	92 GIANT CROSSING ROAD	Project #:
	GALLUP, NEW MEXICO 87901	
Phone #:	505-772-0231	

Client: WESTERN REFINING CO., INC.,
GALLUP REFINERY
Shipping Address: 92 GIANT CROSSING ROAD
GALLUP, NEW MEXICO 87901
Phone #: 505-772-0231

mail or Fax#: CHERYL JOHNSON @ WNR.COM

A/QC Package: ☐ Level 4 (Full Validation)

☐ Standard

ccreditation
NELAP ☐ Other _____
EDD (Type) EXCEL

Date	Time	Matrix	Sample Request ID
14-15	0830	WATER	NDD-3-GW
↓	↓	↓	↓
			Trip Blank
			CS 05/15/15

[illegible]

If necessary, samples submitted to Hall Environmental may be submitted to a different laboratory.

☒ Standard ☐ Rush

Project Name:

Project #: NORTH DRAINAGE DITCH

Project Manager:	
------------------	--

CHERYL JOHNSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 21

Container Type and #	Preservative Type	HEAL No.
40 ML VQA-6	HCL	1505702 -001
1 L AMBER-2	—	-001

[illegible]

contracted to other accredited laboratories. This serves as notice of this

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

[illegible]

Remarks:

Date	Time	Relinquished by:	Received by:	Date	Time
11/11/15	1316	A7	[Signature]	5-14-15	1315
11/11/15	1335	[Signature]	[Signature]	05/15/15	0855

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.

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate
District Office in accordance
with Rule 116 on back
side of form

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Western Refining Southwest Inc.	Contact Gaurav Rajen	
Address I-40 Exit 39, Jamestown, NM 87347	Telephone No. 505-722-0227	
Facility Name Gallup Refinery	Facility Type Oil refinery	
Surface Owner Western Refining	Mineral Owner Western Refining	Lease No.

LOCATION OF RELEASE

Unit Letter	Section 23&33	Township 15N	Range 15W	Feet from the	North/South Line	Feet from the	East/West Line	County McKinley
-------------	------------------	-----------------	--------------	---------------	------------------	---------------	----------------	--------------------

Latitude 35°29'22"

Longitude 108°25'24"

NATURE OF RELEASE

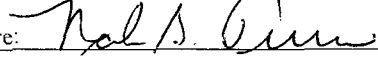
Type of Release Suspected historical release of hydrocarbons recently washed into a ditch by rainfall – based on smell of diesel, possible oil sheen on liquids	Volume of Release 30 barrels (1,200 gallons) estimated of oily water – the hydrocarbon content is much lesser	Volume Recovered 0 barrels
Source of Release It appears that a rain event may have picked up hydrocarbons absorbed onto surface/ subsurface soils from historical spills and collected in a ditch running east to west at the north-west end of the hill on which the refinery is located	Date and Hour of Occurrence Within past 10 - 15 days (approximately)	Date and Hour of Discovery 10/19/2009; 1:30 pm
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Carl J. Chavez, NMEMNRD, Oil Conservation Division; Hope Monzeglio, NMED Hazardous Waste Bureau (via telephone)	
By Whom? Gaurav Rajen	Date and Hour 10/20/2009 (approximately) 11:00 am	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. Not applicable	

If a Watercourse was Impacted, Describe Fully.* Not applicable

Describe Cause of Problem and Remedial Action Taken.* At approximately 1:30 pm on 10/19/2009, during a routine walk-through of arroyos and ditches in a field that lies immediately north of the hill on which the refinery is located, a ditch containing non-moving water was found to have some possible hydrocarbon staining – suspected from color of the water and smell of diesel.

Describe Area Affected and Cleanup Action Taken.* The affected area has a surface area less than approximately 150 square feet with some vertical penetration of the (possible) hydrocarbons to an as yet unknown depth. We plan to collect water and sludge samples, then pick up the water using a truck with a vacuum pump. We will then wait to see if the water reappears and is a continuous seep, or an occurrence caused by a rain event. In further cleanup actions, contaminated soils will be excavated, confirmatory environmental samples will be collected and analyzed, and all contaminated materials will be disposed off in accordance with applicable regulations.

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

Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Mark B. Turri	Approved by District Supervisor:	
Title: Refinery Manager – Gallup	Approval Date:	Expiration Date:
E-mail Address: mturri@wnr.com	Conditions of Approval:	Attached: ☐
Date: 10-20-2009	Phone: 505-722-3833	

• Attach Additional Sheets If Necessary

Chavez, Carl J, EMNRD

From: Rajen, Gaurav [Gaurav.Rajen@wnr.com]
Sent: Thursday, October 22, 2009 1:18 PM
To: Monzeglio, Hope, NMENV
Cc: Riege, Ed; Turri, Mark; Chavez, Carl J, EMNRD; Cobrain, Dave, NMENV; Kieling, John, NMENV; Larsen, Thurman
Subject: RE: C-141 for possible release of hydrocarbons - October 20, 2009

Dear Hope:

Many thanks for your recent e-mail. In response to your request for more information –

- 1) We have collected water and sludge samples from three locations in the ditch (that runs generally southeast-northwest) on Tuesday morning, October 20, 2009 – a) at the southeast end, b) mid-way along the ditch, and c) at the northwest end. The samples are being analyzed for – water: TPH, method 418.1; sludge: Semi-volatile Organic Compounds (SVOCs), method 8270C, metals (TCLP); and TPH (method 418.1). These are screening samples. Based on our test results, we will plan additional analyses as needed.
- 2) We collected grab samples using dedicated augers for each of the three sludge samples, and dedicated booms with cups and/or bottles for the water samples. There were no field investigation-derived wastes generated. The sample containers, preservatives, cooling requirements and holding times were as required by the test methods and the testing laboratory.
- 3) A figure showing the approximate location of the ditch is attached below. (For your reference, the ditch is somewhat west and south of OW-13. For ease of location on the larger map we have drawn it much bigger than it actually is – the length must be about 40 feet or so, and a few feet wide and deep, with the water depth being a few inches and a foot or so wide.)

Best regards,

Raj



Approximate location of ditch – not to scale



From: Monzeglio, Hope, NMENV [mailto:hope.monzeglio@state.nm.us]

Sent: Wednesday, October 21, 2009 7:54 AM

To: Rajen, Gaurav

Cc: Riege, Ed; Turri, Mark; Chavez, Carl J, EMNRD; Cobrain, Dave, NMENV; Kielling, John, NMENV

Subject: RE: C-141 for possible release of hydrocarbons - October 20, 2009

Raj

NMED would like some additional information from review of the C-141 form: 1) what analytical methods will be run on the water and sludge samples; 2) provide me with a description of how Gallup will collect the water and sludge samples; 3) provide a figure showing the location of the ditch with the stagnant water. This information can be sent via email. Let me know if you have any questions.

COVER LETTER

Wednesday, November 04, 2009

Gaurav Rajen
Western Refining Southwest, Gallup
Rt. 3 Box 7
Gallup, NM 87301
TEL: (505) 722-0227
FAX (505) 722-0210

RE: Ditch N of Hill-NW

Order No.: 0910423

Dear Gaurav Rajen:

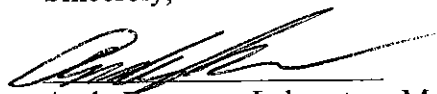
Hall Environmental Analysis Laboratory, Inc. received 6 sample(s) on 10/22/2009 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. Below is a list of our accreditations. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

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

Sincerely,



Andy Freeman, Laboratory Manager

NM Lab # NM9425
AZ license # AZ0682
ORELAP Lab # NM100001
Texas Lab# T104704424-08-TX



Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup**Client Sample ID:** DITCH - W1**Lab Order:** 0910423**Collection Date:** 10/20/2009 2:40:00 PM**Project:** Ditch N of Hill-NW**Date Received:** 10/22/2009**Lab ID:** 0910423-01**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 418.1: TPH						Analyst: JB
Petroleum Hydrocarbons, TR	27	1.0		mg/L	1	10/26/2009

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-02

Client Sample ID: DITCH -SS1
Collection Date: 10/20/2009 2:10:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY, TCLP						
Mercury	ND	0.020		mg/L	1	Analyst: IC 10/29/2009 2:36:05 PM
EPA METHOD 6010B: TCLP METALS						
Arsenic	ND	5.0		mg/L	1	Analyst: RAGS 10/29/2009 10:31:10 AM
Barium	ND	100		mg/L	10	10/29/2009 11:56:02 AM
Cadmium	ND	1.0		mg/L	1	10/29/2009 10:31:10 AM
Chromium	ND	5.0		mg/L	1	10/29/2009 10:31:10 AM
Lead	ND	5.0		mg/L	1	10/29/2009 10:31:10 AM
Selenium	ND	1.0		mg/L	1	10/29/2009 10:31:10 AM
Silver	ND	5.0		mg/L	1	10/29/2009 10:31:10 AM
EPA METHOD 8270C: SEMIVOLATILES						
Acenaphthene	ND	0.20		mg/Kg	1	Analyst: JDC 11/3/2009 1:37:00 PM
Acenaphthylene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Aniline	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Anthracene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Azobenzene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Benz(a)anthracene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Benzo(a)pyrene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Benzo(b)fluoranthene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Benzo(g,h,i)perylene	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
Benzo(k)fluoranthene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Benzoic acid	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
Benzyl alcohol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Bis(2-chloroethoxy)methane	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Bis(2-chloroethyl)ether	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Bis(2-chloroisopropyl)ether	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Bis(2-ethylhexyl)phthalate	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
4-Bromophenyl phenyl ether	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Butyl benzyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Carbazole	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
4-Chloro-3-methylphenol	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
4-Chloroaniline	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
2-Chloronaphthalene	ND	0.25		mg/Kg	1	11/3/2009 1:37:00 PM
2-Chlorophenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
4-Chlorophenyl phenyl ether	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Chrysene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Di-n-butyl phthalate	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
Di-n-octyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Dibenz(a,h)anthracene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Dibenzofuran	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
1,2-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-02

Client Sample ID: DITCH -SS1
Collection Date: 10/20/2009 2:10:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
1,3-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
1,4-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
3,3'-Dichlorobenzidine	ND	0.25		mg/Kg	1	11/3/2009 1:37:00 PM
Diethyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Dimethyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
2,4-Dichlorophenol	ND	0.40		mg/Kg	1	11/3/2009 1:37:00 PM
2,4-Dimethylphenol	ND	0.30		mg/Kg	1	11/3/2009 1:37:00 PM
4,6-Dinitro-2-methylphenol	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
2,4-Dinitrophenol	ND	0.40		mg/Kg	1	11/3/2009 1:37:00 PM
2,4-Dinitrotoluene	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
2,6-Dinitrotoluene	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
Fluoranthene	ND	0.25		mg/Kg	1	11/3/2009 1:37:00 PM
Fluorene	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
Hexachlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Hexachlorobutadiene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Hexachlorocyclopentadiene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Hexachloroethane	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.25		mg/Kg	1	11/3/2009 1:37:00 PM
Isophorone	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
2-Methylnaphthalene	1.1	0.25		mg/Kg	1	11/3/2009 1:37:00 PM
2-Methylphenol	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
3+4-Methylphenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
N-Nitrosodi-n-propylamine	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
N-Nitrosodiphenylamine	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Naphthalene	1.3	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
2-Nitroaniline	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
3-Nitroaniline	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
4-Nitroaniline	ND	0.25		mg/Kg	1	11/3/2009 1:37:00 PM
Nitrobenzene	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
2-Nitrophenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
4-Nitrophenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Pentachlorophenol	ND	0.40		mg/Kg	1	11/3/2009 1:37:00 PM
Phenanthrene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Phenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Pyrene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Pyridine	ND	0.50		mg/Kg	1	11/3/2009 1:37:00 PM
1,2,4-Trichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
2,4,5-Trichlorophenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
2,4,6-Trichlorophenol	ND	0.20		mg/Kg	1	11/3/2009 1:37:00 PM
Surr: 2,4,6-Tribromophenol	75.0	35.5-141		%REC	1	11/3/2009 1:37:00 PM
Surr: 2-Fluorobiphenyl	53.9	30.4-128		%REC	1	11/3/2009 1:37:00 PM
Surr: 2-Fluorophenol	69.5	28.1-129		%REC	1	11/3/2009 1:37:00 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-02

Client Sample ID: DITCH -SS1
Collection Date: 10/20/2009 2:10:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
Surr: 4-Terphenyl-d14	43.0	34.6-151		%REC	1	11/3/2009 1:37:00 PM
Surr: Nitrobenzene-d5	55.0	26.5-122		%REC	1	11/3/2009 1:37:00 PM
Surr: Phenol-d5	66.0	37.6-118		%REC	1	11/3/2009 1:37:00 PM
EPA METHOD 418.1: TPH						Analyst: JB
Petroleum Hydrocarbons, TR	22	20		mg/Kg	1	10/26/2009

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-03

Client Sample ID: DITCH - W2
Collection Date: 10/20/2009 2:40:00 PM
Date Received: 10/22/2009
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 418.1: TPH						Analyst: JB
Petroleum Hydrocarbons, TR	6.9	1.0		mg/L	1	10/26/2009

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-04

Client Sample ID: DITCH - SS2
Collection Date: 10/20/2009 2:15:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY, TCLP						Analyst: IC
Mercury	ND	0.020		mg/L	1	10/29/2009 2:41:25 PM
EPA METHOD 6010B: TCLP METALS						Analyst: RAGS
Arsenic	ND	5.0		mg/L	1	10/29/2009 10:33:38 AM
Barium	ND	100		mg/L	20	10/29/2009 12:00:29 PM
Cadmium	ND	1.0		mg/L	1	10/29/2009 10:33:38 AM
Chromium	ND	5.0		mg/L	1	10/29/2009 10:33:38 AM
Lead	ND	5.0		mg/L	1	10/29/2009 10:33:38 AM
Selenium	ND	1.0		mg/L	1	10/29/2009 10:33:38 AM
Silver	ND	5.0		mg/L	1	10/29/2009 10:33:38 AM
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
Acenaphthene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Acenaphthylene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Aniline	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Anthracene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Azobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Benz(a)anthracene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Benzo(a)pyrene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Benzo(b)fluoranthene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Benzo(g,h,i)perylene	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
Benzo(k)fluoranthene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Benzoic acid	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
Benzyl alcohol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Bis(2-chloroethoxy)methane	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Bis(2-chloroethyl)ether	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Bis(2-chloroisopropyl)ether	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Bis(2-ethylhexyl)phthalate	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
4-Bromophenyl phenyl ether	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Butyl benzyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Carbazole	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
4-Chloro-3-methylphenol	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
4-Chloroaniline	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
2-Chloronaphthalene	ND	0.25		mg/Kg	1	11/3/2009 3:06:41 PM
2-Chlorophenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
4-Chlorophenyl phenyl ether	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Chrysene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Di-n-butyl phthalate	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
Di-n-octyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Dibenz(a,h)anthracene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Dibenzofuran	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
1,2-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-04

Client Sample ID: DITCH - SS2
Collection Date: 10/20/2009 2:15:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
1,3-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
1,4-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
3,3'-Dichlorobenzidine	ND	0.25		mg/Kg	1	11/3/2009 3:06:41 PM
Diethyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Dimethyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
2,4-Dichlorophenol	ND	0.40		mg/Kg	1	11/3/2009 3:06:41 PM
2,4-Dimethylphenol	ND	0.30		mg/Kg	1	11/3/2009 3:06:41 PM
4,6-Dinitro-2-methylphenol	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
2,4-Dinitrophenol	ND	0.40		mg/Kg	1	11/3/2009 3:06:41 PM
2,4-Dinitrotoluene	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
2,6-Dinitrotoluene	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
Fluoranthene	ND	0.25		mg/Kg	1	11/3/2009 3:06:41 PM
Fluorene	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
Hexachlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Hexachlorobutadiene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Hexachlorocyclopentadiene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Hexachloroethane	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Indeno(1,2,3-cd)pyrene	ND	0.25		mg/Kg	1	11/3/2009 3:06:41 PM
Isophorone	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
2-Methylnaphthalene	ND	0.25		mg/Kg	1	11/3/2009 3:06:41 PM
2-Methylphenol	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
3+4-Methylphenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
N-Nitrosodi-n-propylamine	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
N-Nitrosodiphenylamine	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Naphthalene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
2-Nitroaniline	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
3-Nitroaniline	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
4-Nitroaniline	ND	0.25		mg/Kg	1	11/3/2009 3:06:41 PM
Nitrobenzene	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
2-Nitrophenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
4-Nitrophenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Pentachlorophenol	ND	0.40		mg/Kg	1	11/3/2009 3:06:41 PM
Phenanthrene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Phenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Pyrene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Pyridine	ND	0.50		mg/Kg	1	11/3/2009 3:06:41 PM
1,2,4-Trichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
2,4,5-Trichlorophenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
2,4,6-Trichlorophenol	ND	0.20		mg/Kg	1	11/3/2009 3:06:41 PM
Surr: 2,4,6-Tribromophenol	85.8	35.5-141		%REC	1	11/3/2009 3:06:41 PM
Surr: 2-Fluorobiphenyl	51.5	30.4-128		%REC	1	11/3/2009 3:06:41 PM
Surr: 2-Fluorophenol	46.2	28.1-129		%REC	1	11/3/2009 3:06:41 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-04

Client Sample ID: DITCH - SS2
Collection Date: 10/20/2009 2:15:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
Surr: 4-Terphenyl-d14	45.6	34.6-151		%REC	1	11/3/2009 3:06:41 PM
Surr: Nitrobenzene-d5	46.9	26.5-122		%REC	1	11/3/2009 3:06:41 PM
Surr: Phenol-d5	51.5	37.6-118		%REC	1	11/3/2009 3:06:41 PM
EPA METHOD 418.1: TPH						Analyst: JB
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	10/26/2009

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-05

Client Sample ID: DITCH - W3
Collection Date: 10/20/2009 2:45:00 PM
Date Received: 10/22/2009
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Analyst: JB						
EPA METHOD 418.1: TPH						
Petroleum Hydrocarbons, TR	5.4	1.0		mg/L	1	10/26/2009

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-06

Client Sample ID: DITCH - SS3
Collection Date: 10/20/2009 2:25:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY, TCLP						Analyst: IC
Mercury	ND	0.020		mg/L	1	10/29/2009 2:43:13 PM
EPA METHOD 6010B: TCLP METALS						Analyst: RAGS
Arsenic	ND	5.0		mg/L	1	10/29/2009 10:38:44 AM
Barium	ND	100		mg/L	10	10/29/2009 12:02:56 PM
Cadmium	ND	1.0		mg/L	1	10/29/2009 10:38:44 AM
Chromium	ND	5.0		mg/L	1	10/29/2009 10:38:44 AM
Lead	ND	5.0		mg/L	1	10/29/2009 10:38:44 AM
Selenium	ND	1.0		mg/L	1	10/29/2009 10:38:44 AM
Silver	ND	5.0		mg/L	1	10/29/2009 10:38:44 AM
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
Acenaphthene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Acenaphthylene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Aniline	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Anthracene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Azobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Benz(a)anthracene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Benzo(a)pyrene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Benzo(b)fluoranthene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Benzo(g,h,i)perylene	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
Benzo(k)fluoranthene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Benzoic acid	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
Benzyl alcohol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Bis(2-chloroethoxy)methane	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Bis(2-chloroethyl)ether	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Bis(2-chloroisopropyl)ether	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Bis(2-ethylhexyl)phthalate	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
4-Bromophenyl phenyl ether	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Butyl benzyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Carbazole	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
4-Chloro-3-methylphenol	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
4-Chloroaniline	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
2-Chloronaphthalene	ND	0.25		mg/Kg	1	11/3/2009 3:36:50 PM
2-Chlorophenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
4-Chlorophenyl phenyl ether	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Chrysene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Di-n-butyl phthalate	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
Di-n-octyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Dibenz(a,h)anthracene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Dibenzofuran	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
1,2-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM

Qualifiers: * Value exceeds Maximum Contaminant Level
E Estimated value
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
S Spike recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
MCL Maximum Contaminant Level
RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-06

Client Sample ID: DITCH - SS3
Collection Date: 10/20/2009 2:25:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
1,3-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
1,4-Dichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
3,3'-Dichlorobenzidine	ND	0.25		mg/Kg	1	11/3/2009 3:36:50 PM
Diethyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Dimethyl phthalate	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
2,4-Dichlorophenol	ND	0.40		mg/Kg	1	11/3/2009 3:36:50 PM
2,4-Dimethylphenol	ND	0.30		mg/Kg	1	11/3/2009 3:36:50 PM
4,6-Dinitro-2-methylphenol	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
2,4-Dinitrophenol	ND	0.40		mg/Kg	1	11/3/2009 3:36:50 PM
2,4-Dinitrotoluene	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
2,6-Dinitrotoluene	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
Fluoranthene	ND	0.25		mg/Kg	1	11/3/2009 3:36:50 PM
Fluorene	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
Hexachlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Hexachlorobutadiene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Hexachlorocyclopentadiene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Hexachloroethane	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Indeno(1,2,3-cd)pyrene	ND	0.25		mg/Kg	1	11/3/2009 3:36:50 PM
Isophorone	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
2-Methylnaphthalene	ND	0.25		mg/Kg	1	11/3/2009 3:36:50 PM
2-Methylphenol	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
3+4-Methylphenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
N-Nitrosodi-n-propylamine	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
N-Nitrosodiphenylamine	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Naphthalene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
2-Nitroaniline	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
3-Nitroaniline	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
4-Nitroaniline	ND	0.25		mg/Kg	1	11/3/2009 3:36:50 PM
Nitrobenzene	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
2-Nitrophenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
4-Nitrophenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Pentachlorophenol	ND	0.40		mg/Kg	1	11/3/2009 3:36:50 PM
Phenanthrene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Phenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Pyrene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Pyridine	ND	0.50		mg/Kg	1	11/3/2009 3:36:50 PM
1,2,4-Trichlorobenzene	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
2,4,5-Trichlorophenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
2,4,6-Trichlorophenol	ND	0.20		mg/Kg	1	11/3/2009 3:36:50 PM
Surr: 2,4,6-Tribromophenol	88.6	35.5-141		%REC	1	11/3/2009 3:36:50 PM
Surr: 2-Fluorobiphenyl	54.4	30.4-128		%REC	1	11/3/2009 3:36:50 PM
Surr: 2-Fluorophenol	52.3	28.1-129		%REC	1	11/3/2009 3:36:50 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: 04-Nov-09

CLIENT: Western Refining Southwest, Gallup
Lab Order: 0910423
Project: Ditch N of Hill-NW
Lab ID: 0910423-06

Client Sample ID: DITCH - SS3
Collection Date: 10/20/2009 2:25:00 PM
Date Received: 10/22/2009
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: JDC
Surr: 4-Terphenyl-d14	50.8	34.6-151		%REC	1	11/3/2009 3:36:50 PM
Surr: Nitrobenzene-d5	51.9	26.5-122		%REC	1	11/3/2009 3:36:50 PM
Surr: Phenol-d5	55.4	37.6-118		%REC	1	11/3/2009 3:36:50 PM
EPA METHOD 418.1: TPH						Analyst: JB
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	10/26/2009

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

QA/QC SUMMARY REPORT

Client: Western Refining Southwest, Gallup
 Project: Ditch N of Hill-NW

Work Order: 0910423

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 418.1: TPH											
Sample ID: MB-20407		MBLK									
Petroleum Hydrocarbons, TR	ND	mg/Kg	20								
Sample ID: LCS-20407		LCS									
Petroleum Hydrocarbons, TR	108.1	mg/Kg	20	100	0	108	82	114			
Method: EPA Method 418.1: TPH											
Sample ID: MB-20406		MBLK									
Petroleum Hydrocarbons, TR	ND	mg/L	1.0								
Sample ID: LCS-20406		LCS									
Petroleum Hydrocarbons, TR	4.610	mg/L	1.0	5	0	92.2	78.5	120			

Qualifiers:

E Estimated value

J Analyte detected below quantitation limits

R RPD outside accepted recovery limits

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

S Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Western Refining Southwest, Gallup

Project: Ditch N of Hill-NW

Work Order: 0910423

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Method: EPA Method 8270C: Semivolatiles

Sample ID: mb-20469

MBLK

Batch ID: 20469 Analysis Date: 11/3/2009 11:51:27 AM

Acenaphthene	ND	mg/Kg	0.20
Acenaphthylene	ND	mg/Kg	0.20
Aniline	ND	mg/Kg	0.20
Anthracene	ND	mg/Kg	0.20
Azobenzene	ND	mg/Kg	0.20
Benz(a)anthracene	ND	mg/Kg	0.20
Benzo(a)pyrene	ND	mg/Kg	0.20
Benzo(b)fluoranthene	ND	mg/Kg	0.20
Benzo(g,h,i)perylene	ND	mg/Kg	0.50
Benzo(k)fluoranthene	ND	mg/Kg	0.20
Benzoic acid	ND	mg/Kg	0.50
Benzyl alcohol	ND	mg/Kg	0.20
Bis(2-chloroethoxy)methane	ND	mg/Kg	0.20
Bis(2-chloroethyl)ether	ND	mg/Kg	0.20
Bis(2-chloroisopropyl)ether	ND	mg/Kg	0.20
Bis(2-ethylhexyl)phthalate	ND	mg/Kg	0.50
4-Bromophenyl phenyl ether	ND	mg/Kg	0.20
Butyl benzyl phthalate	ND	mg/Kg	0.20
Carbazole	ND	mg/Kg	0.20
4-Chloro-3-methylphenol	ND	mg/Kg	0.50
4-Chloroaniline	ND	mg/Kg	0.50
2-Chloronaphthalene	ND	mg/Kg	0.25
2-Chlorophenol	ND	mg/Kg	0.20
4-Chlorophenyl phenyl ether	ND	mg/Kg	0.20
Chrysene	ND	mg/Kg	0.20
Di-n-butyl phthalate	ND	mg/Kg	0.50
Di-n-octyl phthalate	ND	mg/Kg	0.20
Dibenz(a,h)anthracene	ND	mg/Kg	0.20
Dibenzofuran	ND	mg/Kg	0.20
1,2-Dichlorobenzene	ND	mg/Kg	0.20
1,3-Dichlorobenzene	ND	mg/Kg	0.20
1,4-Dichlorobenzene	ND	mg/Kg	0.20
3,3'-Dichlorobenzidine	ND	mg/Kg	0.25
Diethyl phthalate	ND	mg/Kg	0.20
Dimethyl phthalate	ND	mg/Kg	0.20
2,4-Dichlorophenol	ND	mg/Kg	0.40
2,4-Dimethylphenol	ND	mg/Kg	0.30
4,6-Dinitro-2-methylphenol	ND	mg/Kg	0.50
2,4-Dinitrophenol	ND	mg/Kg	0.40
2,4-Dinitrotoluene	ND	mg/Kg	0.50
2,6-Dinitrotoluene	ND	mg/Kg	0.50
Fluoranthene	ND	mg/Kg	0.25
Fluorene	ND	mg/Kg	0.50
Hexachlorobenzene	ND	mg/Kg	0.20

Qualifiers:

E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Western Refining Southwest, Gallup
 Project: Ditch N of Hill-NW

Work Order: 0910423

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Method: EPA Method 8270C: Semivolatiles

Sample ID: mb-20469

MBLK

Batch ID: 20469 Analysis Date: 11/3/2009 11:51:27 AM

Hexachlorobutadiene	ND	mg/Kg	0.20
Hexachlorocyclopentadiene	ND	mg/Kg	0.20
Hexachloroethane	ND	mg/Kg	0.20
Indeno(1,2,3-cd)pyrene	ND	mg/Kg	0.25
Isophorone	ND	mg/Kg	0.50
2-Methylnaphthalene	ND	mg/Kg	0.25
2-Methylphenol	ND	mg/Kg	0.50
3+4-Methylphenol	ND	mg/Kg	0.20
N-Nitrosodi-n-propylamine	ND	mg/Kg	0.20
N-Nitrosodiphenylamine	ND	mg/Kg	0.20
Naphthalene	ND	mg/Kg	0.20
2-Nitroaniline	ND	mg/Kg	0.20
3-Nitroaniline	ND	mg/Kg	0.20
4-Nitroaniline	ND	mg/Kg	0.25
Nitrobenzene	ND	mg/Kg	0.50
2-Nitrophenol	ND	mg/Kg	0.20
4-Nitrophenol	ND	mg/Kg	0.20
Pentachlorophenol	ND	mg/Kg	0.40
Phenanthrene	ND	mg/Kg	0.20
Phenol	ND	mg/Kg	0.20
Pyrene	ND	mg/Kg	0.20
Pyridine	ND	mg/Kg	0.50
1,2,4-Trichlorobenzene	ND	mg/Kg	0.20
2,4,5-Trichlorophenol	ND	mg/Kg	0.20
2,4,6-Trichlorophenol	ND	mg/Kg	0.20

Sample ID: lcs-20469

LCS

Batch ID: 20469 Analysis Date: 11/3/2009 1:07:17 PM

Acenaphthene	1.200	mg/Kg	0.20	1.67	0	71.8	42.5	90
4-Chloro-3-methylphenol	2.642	mg/Kg	0.50	3.33	0	79.3	39.6	101
2-Chlorophenol	2.403	mg/Kg	0.20	3.33	0	72.2	40.1	96.7
1,4-Dichlorobenzene	1.191	mg/Kg	0.20	1.67	0	71.3	34.6	95.3
2,4-Dinitrotoluene	1.453	mg/Kg	0.50	1.67	0	87.0	37.1	101
N-Nitrosodi-n-propylamine	1.181	mg/Kg	0.20	1.67	0	70.7	33.3	103
4-Nitrophenol	2.636	mg/Kg	0.20	3.33	0	79.2	32.7	125
Pentachlorophenol	2.670	mg/Kg	0.40	3.33	0	80.2	35.5	99.3
Phenol	2.348	mg/Kg	0.20	3.33	0	70.5	35.5	104
Pyrene	1.061	mg/Kg	0.20	1.67	0	63.5	34.4	90.6
1,2,4-Trichlorobenzene	1.217	mg/Kg	0.20	1.67	0	72.9	38.5	95

Qualifiers:

E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Western Refining Southwest, Gallup
 Project: Ditch N of Hill-NW

Work Order: 0910423

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: MERCURY, TCLP											
Sample ID: MB-20461		MBLK				Batch ID: 20461	Analysis Date: 10/29/2009 2:30:49 PM				
Mercury	ND	mg/L	0.020			Batch ID: 20461	Analysis Date: 10/29/2009 2:57:49 PM				
Sample ID: Fluid #1 Check #305		MBLK				Batch ID: 20461	Analysis Date: 10/29/2009 2:57:49 PM				
Mercury	ND	mg/L	0.020			Batch ID: 20461	Analysis Date: 10/29/2009 2:32:34 PM				
Sample ID: LCS-20461		LCS				Batch ID: 20461	Analysis Date: 10/29/2009 2:32:34 PM				
Mercury	ND	mg/L	0.020	0.005	0	102	80	120			
Method: EPA Method 6010B: TCLP Metals											
Sample ID: MB-20451		MBLK				Batch ID: 20451	Analysis Date: 10/29/2009 9:54:41 AM				
Arsenic	ND	mg/L	5.0								
Barium	ND	mg/L	100								
Cadmium	ND	mg/L	1.0								
Chromium	ND	mg/L	5.0								
Lead	ND	mg/L	5.0								
Selenium	ND	mg/L	1.0								
Silver	ND	mg/L	5.0								
Sample ID: LCS-20451		LCS				Batch ID: 20451	Analysis Date: 10/29/2009 9:59:31 AM				
Arsenic	ND	mg/L	5.0	0.5	0	106	80	120			
Barium	ND	mg/L	100	0.5	0.0013	99.4	80	120			
Cadmium	ND	mg/L	1.0	0.5	0	105	80	120			
Chromium	ND	mg/L	5.0	0.5	0	99.1	80	120			
Lead	ND	mg/L	5.0	0.5	0	98.1	80	120			
Selenium	ND	mg/L	1.0	0.5	0	109	80	120			
Silver	ND	mg/L	5.0	0.5	0.0018	106	80	120			

Qualifiers:

E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name WESTERN REFINING GALLU

Date Received:

10/22/2009

Work Order Number 0910423

Received by: TLS

Checklist completed by:

Signature

Date

Sample ID labels checked by:

Initials

Matrix:

Carrier name FedEx

Shipping container/cooler in good condition?

Yes ☒

No ☐

Not Present ☐

Custody seals intact on shipping container/cooler?

Yes ☒

No ☐

Not Present ☐

Not Shipped ☐

Custody seals intact on sample bottles?

Yes ☒

No ☐

N/A ☐

Chain of custody present?

Yes ☒

No ☐

Chain of custody signed when relinquished and received?

Yes ☒

No ☐

Chain of custody agrees with sample labels?

Yes ☒

No ☐

Samples in proper container/bottle?

Yes ☒

No ☐

Sample containers intact?

Yes ☒

No ☐

Sufficient sample volume for indicated test?

Yes ☒

No ☐

All samples received within holding time?

Yes ☒

No ☐

Water - VOA vials have zero headspace?

No VOA vials submitted ☒

Yes ☐

No ☐

Water - Preservation labels on bottle and cap match?

Yes ☒

No ☐

N/A ☐

Water - pH acceptable upon receipt?

Yes ☒

No ☐

N/A ☐

Number of preserved
bottles checked for
pH:

3
<2 > 12 unless noted
below.

Container/Temp Blank temperature?

3.5°

<6° C Acceptable

If given sufficient time to cool.

COMMENTS:

Client contacted

Date contacted:

Person contacted

Contacted by:

Regarding:

Comments:

Corrective Action



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

April 29, 2015

Beck Larsen

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-0258
FAX (505) 722-0210

RE: North Drainage Ditch

OrderNo.: 1504B27

Dear Beck Larsen:

Hall Environmental Analysis Laboratory received 1 sample(s) on 4/24/2015 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1504B27

Date Reported: 4/29/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: North Drainage Ditch

Project: North Drainage Ditch

Collection Date: 4/23/2015 10:15:00 AM

Lab ID: 1504B27-001

Matrix: AQUEOUS

Received Date: 4/24/2015 3:33:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: cadg
Benzene	3600	100		µg/L	100	4/29/2015 3:08:52 AM	R25817
Toluene	89	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Ethylbenzene	530	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Methyl tert-butyl ether (MTBE)	98	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2,4-Trimethylbenzene	100	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,3,5-Trimethylbenzene	35	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2-Dichloroethane (EDC)	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2-Dibromoethane (EDB)	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Naphthalene	140	20		µg/L	10	4/28/2015 1:15:41 PM	R25817
1-Methylnaphthalene	ND	40		µg/L	10	4/28/2015 1:15:41 PM	R25817
2-Methylnaphthalene	ND	40		µg/L	10	4/28/2015 1:15:41 PM	R25817
Acetone	ND	100		µg/L	10	4/28/2015 1:15:41 PM	R25817
Bromobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Bromodichloromethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Bromoform	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Bromomethane	ND	30		µg/L	10	4/28/2015 1:15:41 PM	R25817
2-Butanone	ND	100		µg/L	10	4/28/2015 1:15:41 PM	R25817
Carbon disulfide	ND	100		µg/L	10	4/28/2015 1:15:41 PM	R25817
Carbon Tetrachloride	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Chlorobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Chloroethane	ND	20		µg/L	10	4/28/2015 1:15:41 PM	R25817
Chloroform	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Chloromethane	ND	30		µg/L	10	4/28/2015 1:15:41 PM	R25817
2-Chlorotoluene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
4-Chlorotoluene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
cis-1,2-DCE	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
cis-1,3-Dichloropropene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2-Dibromo-3-chloropropane	ND	20		µg/L	10	4/28/2015 1:15:41 PM	R25817
Dibromochloromethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Dibromomethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2-Dichlorobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,3-Dichlorobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,4-Dichlorobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Dichlorodifluoromethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,1-Dichloroethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,1-Dichloroethene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2-Dichloropropane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,3-Dichloropropane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
2,2-Dichloropropane	ND	20		µg/L	10	4/28/2015 1:15:41 PM	R25817

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	Page 1 of 5
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	
	J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit	
	O	RSD is greater than RSDlimit	P	Sample pH Not In Range	
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	
	S	Spike Recovery outside accepted recovery limits			

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1504B27

Date Reported: 4/29/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: North Drainage Ditch

Project: North Drainage Ditch

Collection Date: 4/23/2015 10:15:00 AM

Lab ID: 1504B27-001

Matrix: AQUEOUS

Received Date: 4/24/2015 3:33:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: cadg
1,1-Dichloropropene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Hexachlorobutadiene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
2-Hexanone	ND	100		µg/L	10	4/28/2015 1:15:41 PM	R25817
Isopropylbenzene	27	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
4-Isopropyltoluene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
4-Methyl-2-pentanone	ND	100		µg/L	10	4/28/2015 1:15:41 PM	R25817
Methylene Chloride	ND	30		µg/L	10	4/28/2015 1:15:41 PM	R25817
n-Butylbenzene	ND	30		µg/L	10	4/28/2015 1:15:41 PM	R25817
n-Propylbenzene	47	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
sec-Butylbenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Styrene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
tert-Butylbenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,1,1,2-Tetrachloroethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,1,2,2-Tetrachloroethane	ND	20		µg/L	10	4/28/2015 1:15:41 PM	R25817
Tetrachloroethene (PCE)	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
trans-1,2-DCE	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
trans-1,3-Dichloropropene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2,3-Trichlorobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2,4-Trichlorobenzene	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,1,1-Trichloroethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,1,2-Trichloroethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Trichloroethene (TCE)	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Trichlorofluoromethane	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
1,2,3-Trichloropropane	ND	20		µg/L	10	4/28/2015 1:15:41 PM	R25817
Vinyl chloride	ND	10		µg/L	10	4/28/2015 1:15:41 PM	R25817
Xylenes, Total	730	15		µg/L	10	4/28/2015 1:15:41 PM	R25817
Surr: 1,2-Dichloroethane-d4	99.3	70-130		%REC	10	4/28/2015 1:15:41 PM	R25817
Surr: 4-Bromofluorobenzene	92.8	70-130		%REC	10	4/28/2015 1:15:41 PM	R25817
Surr: Dibromofluoromethane	105	70-130		%REC	10	4/28/2015 1:15:41 PM	R25817
Surr: Toluene-d8	104	70-130		%REC	10	4/28/2015 1:15:41 PM	R25817

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	Page 2 of 5
	E Value above quantitation range	H Holding times for preparation or analysis exceeded	
	J Analyte detected below quantitation limits	ND Not Detected at the Reporting Limit	
	O RSD is greater than RSDlimit	P Sample pH Not In Range	
	R RPD outside accepted recovery limits	RL Reporting Detection Limit	
	S Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1504B27

29-Apr-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	5mL rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID: R25817			RunNo: 25817					
Prep Date:		Analysis Date: 4/28/2015			SeqNo: 765170		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.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1504B27

29-Apr-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	5mL rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID: R25817			RunNo: 25817					
Prep Date:		Analysis Date: 4/28/2015			SeqNo: 765170		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	9.9		10.00		99.2	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		104	70	130			
Surr: Dibromofluoromethane	10		10.00		104	70	130			
Surr: Toluene-d8	10		10.00		105	70	130			

Sample ID	100ng lcs1	SampType: LCS			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID: R25817			RunNo: 25817					
Prep Date:		Analysis Date: 4/28/2015			SeqNo: 765172		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	107	70	130			
Toluene	21	1.0	20.00	0	104	70	130			
Chlorobenzene	21	1.0	20.00	0	105	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1504B27

29-Apr-15

Client: Western Refining Southwest, Gallup

Project: North Drainage Ditch

Sample ID	100ng lcs1	SampType: LCS			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID: R25817			RunNo: 25817					
Prep Date:		Analysis Date: 4/28/2015			SeqNo: 765172		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	24	1.0	20.00	0	121	75.6	144			
Trichloroethene (TCE)	21	1.0	20.00	0	105	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		112	70	130			
Surr: Dibromofluoromethane	11		10.00		113	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

Sample Log-In Check List

Client Name: **Western Refining Gallup**

Work Order Number: **1504B27**

RcptNo: 1

Received by/date:

AT

04/24/15

Logged By: **Ashley Gallegos**

4/24/2015 3:33:00 PM

Ag

Completed By: **Ashley Gallegos**

4/27/2015 9:40:50 AM

Ag

Reviewed By:

gn

04/29/15

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 ☒
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	2.3	Good	Yes			

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Chain-of-Custody Record									
Client:		Western - Refining							
		Gallup Refinery							
Mailing Address:		32 GIANT CROSSING ROAD							
Gallup NIM 87301									
Phone #:	505	722	3833						
Email or Fax#:	505	863	0930						
QA/QC Package:									
☐ Standard				☐ Level 4 (Full Validation)					
☐ Other									
☐ EDD (Type)									
Turn-Around Time:				☐ Standard ☒ Rush					
Project Name:				North Drainage Ditch					
Project #:									
Project Manager:									
Beck Larsen									
Sampler:				ACT					
On Ice:				☒ Yes ☐ No					
Sample Temperature:				23					
Container Type and #				Preservative Type		HEAL No.			
40ml-3				HCL		1504B27			
Sample Request ID									
Date		Time		Matrix					
4/23/2015		10:15		Water		North Drainage Ditch			
Date:		Time		Relinquished by:		Received by:			
04-24-15		11:50		Gallup		S. [Signature]			
Date:		Time		Relinquished by:		Received by:			
4/24/15		15:33		S. [Signature]		S. [Signature]			

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



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

April 07, 2015

Beck Larsen

Western Refining Southwest, Gallup
92 Giant Crossing Road
Gallup, NM 87301
TEL: (505) 722-0258
FAX (505) 722-0210

RE: N. Drainage Ditch

OrderNo.: 1503979

Dear Beck Larsen:

Hall Environmental Analysis Laboratory received 3 sample(s) on 3/20/2015 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1503979

Date Reported: 4/7/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: A1

Project: N. Drainage Ditch

Collection Date: 3/19/2015 11:45:00 AM

Lab ID: 1503979-001

Matrix: AQUEOUS

Received Date: 3/20/2015 4:25:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE							Analyst: JME
Diesel Range Organics (DRO)	6.4	1.0		mg/L	1	3/24/2015 7:35:03 PM	18263
Motor Oil Range Organics (MRO)	11	5.0		mg/L	1	3/24/2015 7:35:03 PM	18263
Surr: DNOP	118	76.5-150		%REC	1	3/24/2015 7:35:03 PM	18263
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	21	2.5		mg/L	50	3/25/2015 11:04:58 AM	R25071
Surr: BFB	94.1	80-120		%REC	50	3/25/2015 11:04:58 AM	R25071
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Methyl tert-butyl ether (MTBE)	200	120		µg/L	50	3/25/2015 11:04:58 AM	R25071
Benzene	5200	100		µg/L	100	3/25/2015 6:50:12 PM	R25071
Toluene	130	50		µg/L	50	3/25/2015 11:04:58 AM	R25071
Ethylbenzene	630	50		µg/L	50	3/25/2015 11:04:58 AM	R25071
Xylenes, Total	1200	100		µg/L	50	3/25/2015 11:04:58 AM	R25071
1,2,4-Trimethylbenzene	240	50		µg/L	50	3/25/2015 11:04:58 AM	R25071
1,3,5-Trimethylbenzene	78	50		µg/L	50	3/25/2015 11:04:58 AM	R25071
Surr: 4-Bromofluorobenzene	113	80-120		%REC	50	3/25/2015 11:04:58 AM	R25071
EPA METHOD 7470: MERCURY							Analyst: MED
Mercury	ND	0.00020		mg/L	1	3/27/2015 12:45:07 PM	18373
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: JLF
Arsenic	0.16	0.020		mg/L	1	3/27/2015 3:46:49 PM	18333
Barium	12	0.40		mg/L	20	3/27/2015 4:00:54 PM	18333
Cadmium	ND	0.0020		mg/L	1	3/27/2015 3:46:49 PM	18333
Chromium	ND	0.0060		mg/L	1	3/27/2015 3:46:49 PM	18333
Lead	0.0058	0.0050		mg/L	1	3/27/2015 3:46:49 PM	18333
Selenium	ND	0.050		mg/L	1	3/27/2015 3:46:49 PM	18333
Silver	ND	0.0050		mg/L	1	3/27/2015 3:46:49 PM	18333

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	E	Value above quantitation range
	J	Analyte detected below quantitation limits
	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits
	S	Spike Recovery outside accepted recovery limits

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1503979

Date Reported: 4/7/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: B1

Project: N. Drainage Ditch

Collection Date: 3/19/2015 11:55:00 AM

Lab ID: 1503979-002

Matrix: AQUEOUS

Received Date: 3/20/2015 4:25:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE							Analyst: JME
Diesel Range Organics (DRO)	6.5	1.0		mg/L	1	3/24/2015 8:02:46 PM	18263
Motor Oil Range Organics (MRO)	11	5.0		mg/L	1	3/24/2015 8:02:46 PM	18263
Surr: DNOP	119	76.5-150		%REC	1	3/24/2015 8:02:46 PM	18263
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	21	5.0		mg/L	100	3/25/2015 1:57:29 PM	R25071
Surr: BFB	96.8	80-120		%REC	100	3/25/2015 1:57:29 PM	R25071
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	250		µg/L	100	3/25/2015 1:57:29 PM	R25071
Benzene	5400	100		µg/L	100	3/25/2015 1:57:29 PM	R25071
Toluene	130	100		µg/L	100	3/25/2015 1:57:29 PM	R25071
Ethylbenzene	580	100		µg/L	100	3/25/2015 1:57:29 PM	R25071
Xylenes, Total	1200	200		µg/L	100	3/25/2015 1:57:29 PM	R25071
1,2,4-Trimethylbenzene	220	100		µg/L	100	3/25/2015 1:57:29 PM	R25071
1,3,5-Trimethylbenzene	ND	100		µg/L	100	3/25/2015 1:57:29 PM	R25071
Surr: 4-Bromofluorobenzene	115	80-120		%REC	100	3/25/2015 1:57:29 PM	R25071
EPA METHOD 7470: MERCURY							Analyst: MED
Mercury	ND	0.00020		mg/L	1	3/27/2015 12:46:58 PM	18373
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: JLF
Arsenic	0.28	0.020		mg/L	1	3/27/2015 3:48:18 PM	18333
Barium	20	0.40		mg/L	20	3/27/2015 4:07:11 PM	18333
Cadmium	ND	0.0020		mg/L	1	3/27/2015 3:48:18 PM	18333
Chromium	ND	0.0060		mg/L	1	3/27/2015 3:48:18 PM	18333
Lead	0.012	0.0050		mg/L	1	3/27/2015 3:48:18 PM	18333
Selenium	ND	0.050		mg/L	1	3/27/2015 3:48:18 PM	18333
Silver	ND	0.0050		mg/L	1	3/27/2015 3:48:18 PM	18333

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	E	Value above quantitation range
	J	Analyte detected below quantitation limits
	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits
	S	Spike Recovery outside accepted recovery limits

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1503979

Date Reported: 4/7/2015

CLIENT: Western Refining Southwest, Gallup

Client Sample ID: C1

Project: N. Drainage Ditch

Collection Date: 3/19/2015 12:08:00 PM

Lab ID: 1503979-003

Matrix: AQUEOUS

Received Date: 3/20/2015 4:25:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE							Analyst: JME
Diesel Range Organics (DRO)	8.9	1.0		mg/L	1	3/24/2015 8:30:24 PM	18263
Motor Oil Range Organics (MRO)	14	5.0		mg/L	1	3/24/2015 8:30:24 PM	18263
Surr: DNOP	131	76.5-150		%REC	1	3/24/2015 8:30:24 PM	18263
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	20	5.0		mg/L	100	3/25/2015 2:26:50 PM	R25071
Surr: BFB	94.2	80-120		%REC	100	3/25/2015 2:26:50 PM	R25071
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	250		µg/L	100	3/25/2015 2:26:50 PM	R25071
Benzene	5300	100		µg/L	100	3/25/2015 2:26:50 PM	R25071
Toluene	120	100		µg/L	100	3/25/2015 2:26:50 PM	R25071
Ethylbenzene	550	100		µg/L	100	3/25/2015 2:26:50 PM	R25071
Xylenes, Total	1100	200		µg/L	100	3/25/2015 2:26:50 PM	R25071
1,2,4-Trimethylbenzene	210	100		µg/L	100	3/25/2015 2:26:50 PM	R25071
1,3,5-Trimethylbenzene	ND	100		µg/L	100	3/25/2015 2:26:50 PM	R25071
Surr: 4-Bromofluorobenzene	109	80-120		%REC	100	3/25/2015 2:26:50 PM	R25071
EPA METHOD 7470: MERCURY							Analyst: MED
Mercury	ND	0.00020		mg/L	1	3/27/2015 12:48:50 PM	18373
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: JLF
Arsenic	0.28	0.020		mg/L	1	3/27/2015 3:49:56 PM	18333
Barium	19	0.40		mg/L	20	3/27/2015 4:08:38 PM	18333
Cadmium	ND	0.0020		mg/L	1	3/27/2015 3:49:56 PM	18333
Chromium	ND	0.0060		mg/L	1	3/27/2015 3:49:56 PM	18333
Lead	0.014	0.0050		mg/L	1	3/27/2015 3:49:56 PM	18333
Selenium	ND	0.050		mg/L	1	3/27/2015 3:49:56 PM	18333
Silver	ND	0.0050		mg/L	1	3/27/2015 3:49:56 PM	18333

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

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



Wet Chemistry by Method 9012B/SW846 7.3.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Reactive CN (SW846 7.3.3.2)	ND		0.125	1	03/27/2015 10:33	WG777819

Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Wet Chemistry by Method 9034/9030B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Reactive Sulf.(SW846 7.3.4.1)	ND		25.0	1	03/25/2015 16:16	WG777821

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Corrosivity	Non-Corrosive		1	03/31/2015 10:04	WG778771

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Flashpoint	154		1	03/27/2015 08:41	WG778443

Wet Chemistry by Method 9012B/SW846 7.3.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Reactive CN (SW846 7.3.3.2)	ND		0.125	1	03/27/2015 10:34	WG777819

Wet Chemistry by Method 9034/9030B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Reactive Sulf.(SW846 7.3.4.1)	ND		25.0	1	03/25/2015 16:16	WG777821

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Corrosivity	Non-Corrosive		1	03/31/2015 10:04	WG778771

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Flashpoint	DNF AT 170 F		1	03/27/2015 08:41	WG778443

Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Wet Chemistry by Method 9012B/SW846 7.3.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Reactive CN (SW846 7.3.3.2)	ND		0.125	1	03/27/2015 10:35	WG777819

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Wet Chemistry by Method 9034/9030B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Reactive Sulf. (SW846 7.3.4.1)	ND		25.0	1	03/25/2015 16:16	WG777821

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
				date / time	
Corrosivity	Non-Corrosive		1	03/31/2015 10:04	WG778771

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	deg F			date / time	
Flashpoint	125		1	03/27/2015 08:41	WG778443

Method Blank (MB)

(MB) 03/27/15 10:29

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Reactive CN (SW846 7.3.3.2)	ND		0.125

L754785-02 Original Sample (OS) • Duplicate (DUP)

(OS) 03/27/15 10:30 • (DUP) 03/27/15 10:31

Analyte	Original Result mg/l	DUP Result mg/l	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive CN (SW846 7.3.3.2)	ND	ND	0.00		20

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

(LCS) 03/27/15 09:45 • (LCSD) 03/27/15 09:46

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 %
Reactive CN (SW846 7.3.3.2)	0.100	0.105	0.102	105	102	90.0-110			2.90	20

Method Blank (MB)

(MB) 03/25/15 16:16

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Reactive Sulf.(SW846 7.3.4.1)	ND		25.0

L754785-02 Original Sample (OS) • Duplicate (DUP)

(OS) 03/25/15 16:16 • (DUP) 03/25/15 16:16

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Sulf.(SW846 7.3.4.1)	ND	ND	1	0.00		20

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

(LCS) 03/25/15 16:16 • (LCSD) 03/25/15 16:16

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 %
Reactive Sulf.(SW846 7.3.4.1)	100	89.4	99.3	89.4	99.0	70.0-130			10.5	20

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

L755335-01 Original Sample (OS) • Duplicate (DUP)

(OS) 03/31/15 10:04 • (DUP) 03/31/15 10:04

Analyte	Original Result		DUP Result	Dilution	DUP RPD		<u>DUP Qualifier</u>		DUP RPD Limits	
					%		%		%	
Corrosivity	Non-Corrosiv e		Non-Corrosiv e	1	0.00				10	

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

(LCS) 03/31/15 10:04 • (LCSD) 03/31/15 10:04

Analyte	Spike Amount		LCS Result		LCSD Result		LCS Rec.		LCSD Rec.		Rec. Limits		LCS Qualifier		LCSD Qualifier		RPD		RPD Limits	
							%		%		%		%		%		%		%	
Corrosivity	7.84		7.81		7.83		99.6		99.9		98.3-102						0.256		10	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L755335-01 Original Sample (OS) • Duplicate (DUP)

(OS) 03/27/15 08:41 • (DUP) 03/27/15 08:41						
Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	deg F	deg F		%		%
Flashpoint	150	154	1	0.00		20

L755335-02 Original Sample (OS) • Duplicate (DUP)

(OS) 03/27/15 08:41 • (DUP) 03/27/15 08:41						
Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	deg F	deg F		%		%
Flashpoint	DNF AT 170 F	DNF AT 170 F		0.00		20

L755335-03 Original Sample (OS) • Duplicate (DUP)

(OS) 03/27/15 08:41 • (DUP) 03/27/15 08:41						
Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	deg F	deg F		%		%
Flashpoint	130	126	1	0.80		20

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

(LCS) 03/27/15 08:41 • (LCSD) 03/27/15 08:41									
Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD
	deg F	deg F	deg F	%	%	%			%
Flashpoint	82.0	82.80	83.80	101	102	96.0-104			120
									7

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503979

07-Apr-15

Client: Western Refining Southwest, Gallup

Project: N. Drainage Ditch

Sample ID	MB-18263		SampType: MBLK		TestCode: EPA Method 8015D: Diesel Range					
Client ID:	PBW		Batch ID: 18263		RunNo: 24993					
Prep Date:	3/20/2015		Analysis Date: 3/23/2015		SeqNo: 737414		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	0.96		1.000		95.9	76.5	150			

Sample ID	LCS-18263		SampType: LCS		TestCode: EPA Method 8015D: Diesel Range					
Client ID:	LCSW		Batch ID: 18263		RunNo: 25014					
Prep Date:	3/20/2015		Analysis Date: 3/24/2015		SeqNo: 738573		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.1	1.0	5.000	0	102	60.1	156			
Surr: DNOP	0.52		0.5000		105	76.5	150			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503979

07-Apr-15

Client: Western Refining Southwest, Gallup

Project: N. Drainage Ditch

Sample ID	5ML RB		SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	PBW		Batch ID: R25071		RunNo: 25071					
Prep Date:			Analysis Date: 3/25/2015		SeqNo: 739716		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		89.6	80	120			

Sample ID	2.5UG GRO LCS	SampType: LCS			TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	LCSW	Batch ID: R25071			RunNo: 25071					
Prep Date:		Analysis Date: 3/25/2015			SeqNo: 739717		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	97.4	80	120			
Surr: BFB	20		20.00		102	80	120			

Sample ID	1503979-002AMS		SampType: MS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	B1		Batch ID: R25071		RunNo: 25071					
Prep Date:			Analysis Date: 3/25/2015		SeqNo: 739875		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	72	5.0	50.00	20.62	103	51	131			
Surr: BFB	2100		2000		107	80	120			

Sample ID	1503979-002AMSD		SampType: MSD		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	B1		Batch ID: R25071		RunNo: 25071					
Prep Date:			Analysis Date: 3/25/2015		SeqNo: 739877		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	69	5.0	50.00	20.62	95.8	51	131	4.95	20	
Surr: BFB	2200		2000		108	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503979

07-Apr-15

Client: Western Refining Southwest, Gallup

Project: N. Drainage Ditch

Sample ID	5ML RB	SampType: MBLK			TestCode: EPA Method 8021B: Volatiles					
Client ID:	PBW	Batch ID: R25071			RunNo: 25071					
Prep Date:		Analysis Date: 3/25/2015			SeqNo: 740176		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	2.5								
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
Surr: 4-Bromofluorobenzene	20		20.00		101	80	120			

Sample ID	100NG BTEX LCS	SampType: LCS			TestCode: EPA Method 8021B: Volatiles					
Client ID:	LCSW	Batch ID: R25071			RunNo: 25071					
Prep Date:		Analysis Date: 3/25/2015			SeqNo: 740177		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	23	2.5	20.00	0	117	72.5	125			
Benzene	23	1.0	20.00	0	114	80	120			
Toluene	22	1.0	20.00	0	109	80	120			
Ethylbenzene	21	1.0	20.00	0	105	80	120			
Xylenes, Total	64	2.0	60.00	0	106	80	120			
1,2,4-Trimethylbenzene	22	1.0	20.00	0	109	80	120			
1,3,5-Trimethylbenzene	22	1.0	20.00	0	109	80	120			
Surr: 4-Bromofluorobenzene	24		20.00		119	80	120			

Sample ID	1503979-001AMS		SampType: MS		TestCode: EPA Method 8021B: Volatiles					
Client ID:	A1		Batch ID: R25071		RunNo: 25071					
Prep Date:			Analysis Date: 3/25/2015		SeqNo: 740186		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	1400	120	1000	195.9	118	64.7	132			
Benzene	6100	50	1000	5124	102	77.5	121			E
Toluene	1200	50	1000	131.2	112	78.6	122			
Ethylbenzene	1700	50	1000	630.5	108	78.1	128			
Xylenes, Total	4500	100	3000	1249	108	80	120			
1,2,4-Trimethylbenzene	1300	50	1000	242.2	109	79.1	128			
1,3,5-Trimethylbenzene	1200	50	1000	77.50	108	80	120			
Surr: 4-Bromofluorobenzene	1200		1000		124	80	120			S

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503979

07-Apr-15

Client: Western Refining Southwest, Gallup

Project: N. Drainage Ditch

Sample ID	1503979-001AMSD		SampType: MSD		TestCode: EPA Method 8021B: Volatiles					
Client ID:	A1		Batch ID: R25071		RunNo: 25071					
Prep Date:			Analysis Date: 3/25/2015		SeqNo: 740187		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	1300	120	1000	195.9	108	64.7	132	7.98	20	ES
Benzene	5700	50	1000	5124	57.9	77.5	121	7.48	20	
Toluene	1200	50	1000	131.2	102	78.6	122	7.92	20	
Ethylbenzene	1600	50	1000	630.5	94.9	78.1	128	7.90	20	
Xylenes, Total	4200	100	3000	1249	97.0	80	120	7.35	20	
1,2,4-Trimethylbenzene	1300	50	1000	242.2	103	79.1	128	4.57	20	
1,3,5-Trimethylbenzene	1100	50	1000	77.50	103	80	120	4.83	20	
Surr: 4-Bromofluorobenzene	1200		1000		117	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503979

07-Apr-15

Client: Western Refining Southwest, Gallup

Project: N. Drainage Ditch

Sample ID	MB-18373		SampType: MBLK		TestCode: EPA Method 7470: Mercury					
Client ID:	PBW		Batch ID: 18373		RunNo: 25119					
Prep Date:	3/27/2015		Analysis Date: 3/27/2015		SeqNo: 741758		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercurv	ND	0.00020								

Sample ID	LCS-18373		SampType: LCS		TestCode: EPA Method 7470: Mercury					
Client ID:	LCSW		Batch ID: 18373		RunNo: 25119					
Prep Date:	3/27/2015		Analysis Date: 3/27/2015		SeqNo: 741759		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0048	0.00020	0.005000	0	96.5	80	120			

Sample ID	LCSD-18373			SampType:	LCSD		TestCode:	EPA Method 7470: Mercury			
Client ID:	LCSS02			Batch ID:	18373		RunNo:	25119			
Prep Date:	3/27/2015			Analysis Date:	3/27/2015		SeqNo:	741760		Units:	mg/L
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	0.0050	0.00020	0.005000	0	99.1	80	120	2.60	20		

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503979

07-Apr-15

Client: Western Refining Southwest, Gallup

Project: N. Drainage Ditch

Sample ID	MB-18333		SampType: MBLK		TestCode: EPA 6010B: Total Recoverable Metals					
Client ID:	PBW		Batch ID: 18333		RunNo: 25123					
Prep Date:	3/25/2015		Analysis Date: 3/27/2015		SeqNo: 742830		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.020								
Barium	ND	0.020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Lead	ND	0.0050								
Selenium	ND	0.050								
Silver	0.010	0.0050								

Sample ID	LCS-18333		SampType: LCS		TestCode: EPA 6010B: Total Recoverable Metals					
Client ID:	LCSW		Batch ID: 18333		RunNo: 25123					
Prep Date:	3/25/2015		Analysis Date: 3/27/2015		SeqNo: 742831		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.53	0.020	0.5000	0	106	80	120			
Barium	0.49	0.020	0.5000	0	97.3	80	120			
Cadmium	0.50	0.0020	0.5000	0	99.3	80	120			
Chromium	0.49	0.0060	0.5000	0	98.5	80	120			
Lead	0.51	0.0050	0.5000	0	101	80	120			
Selenium	0.50	0.050	0.5000	0	99.8	80	120			
Silver	0.11	0.0050	0.1000	0	107	80	120			B

Qualifiers:

* Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
O RSD is greater than RSDlimit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
P Sample pH Not In Range
RL Reporting Detection Limit



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

Sample Log-In Check List

Client Name: Western Refining Gallup

Work Order Number: 1503979

RcptNo: 1

Received by/date: CS 03/20/15

Logged By: Ashley Gallegos

3/20/2015 4:25:00 PM

Completed By: Ashley Gallegos

3/23/2015 11:08:48 AM

Reviewed By: JA 03/23/15

Chain of Custody

1. Custody seals intact on sample bottles?

Yes ☐

No ☐

Not Present ☒

2. Is Chain of Custody complete?

Yes ☒

No ☐

Not Present ☐

3. How was the sample delivered?

Courier

Log In

4. Was an attempt made to cool the samples?

Yes ☒

No ☐

NA ☐

5. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C

Yes ☒

No ☐

NA ☐

6. Sample(s) in proper container(s)?

Yes ☒

No ☐

7. Sufficient sample volume for indicated test(s)?

Yes ☒

No ☐

8. Are samples (except VOA and ONG) properly preserved?

Yes ☒

No ☒

9. Was preservative added to bottles?

Yes ☒

No ☒

NA ☐

10. VOA vials have zero headspace?

Yes ☒

No ☐

No VOA Vials ☐

11. Were any sample containers received broken?

Yes ☐

No ☒

12. Does paperwork match bottle labels?

Yes ☒

No ☐

(Note discrepancies on chain of custody)

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?

Yes ☒

No ☐

(If no, notify customer for authorization.)

of preserved bottles checked for pH:

Adjusted?

Checked by: JAG

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order?

Yes ☐

No ☐

NA ☒

Person Notified:

Date:

By Whom:

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: Western Refining
Gallup Refinery
 Mailing Address: 92 Giant Crossing Rd
Gallup, NM 87301
 Phone #: (505) 722-3833
 email or Fax#: (505) 863-0930

QA/QC Package: ☐ Level 4 (Full Validation)

Accreditation ☒ NELAP ☐ Other _____

☐ EDD (Type) _____

Date	Time	Matrix	Sample Request ID
3/19/15	1150	W	A1 water
	1150	W	A1 surface
	1150	W	A1 water
	1145	W	A1 surface
3/19/15	1145	W	A1 water
	1206	W	B1 water
	1206	W	B1 surface
	1206	W	B1 water
	1155	W	B1 surface
3/19/15	1155	W	B1 water

Date: 3/19/15 Time: 1400
 Relinquished by: [Signature]
 Date: 3/20/15 Time: 1625
 Relinquished by: [Signature]

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

N. Drainage Ditch

Project #:

Project Manager:

Beck Larsen

Sampler: ACT (K. Sanchez)

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.0°C

Container Type and #	Preservative Type	HEAL No.
g-3	HCL	1503079
pl-1	HNO3	-001
g-1	NONE	
pl-1	2% A24	
pl-1	NaOH	
g-3	HCL	-002
pl-1	HNO3	
g-1	NONE	
pl-1	2% A24	
pl-1	NaOH	

Received by: [Signature] Date: 3/20/15 Time: 10:00
 Received by: [Signature] Date: 03/20/15 Time: 1625

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

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)	RORA 8 Metals	Anions (F, Cl, NO3, NO2, PO4, SO4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	RCI	Air Bubbles (Y or N)
X		X				X					X	
											X	
											X	
											X	
											X	
											X	
											X	
											X	
											X	

Remarks: Refer To Attached MAP

PROJECT: Giant Refinery
Ciniza

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 96-133
ELEVATION: 6920.1
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 8/22/96
STATIC WATER: 31.4
BORING ID: 0643
PAGE: 1

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-1.0	//////		C	CLAY, LOOSE, DRY, SOFT, RED BROWN	
1.0-1.6	***//***		C	SAND, CLAYEY, DARK BROWN, MOIST, SOFT, APPEARS CONTAMINATED	
1.6-6.3	//////		C	CLAY, RED BROWN, FIRM, SOME ROOT MATTER, MOIST	
	//////		C		
	//////		C		
	//////		C		
	//////	5.0	C		
	//////		C		
6.3-8.5	///***//		C	CLAY, SANDY, VERY FINE, MOIST, FIRM, RED BROWN, SOME ROOT MATTER	
	///***//		C		
	///***//		C		
	///***//		C		
8.5-12.3	//////		C	CLAY, FIRM, RED BROWN, MOIST	
	//////		C		
	//////	10	C		
	//////		C		
	//////		C		
12.3-12.5	///**-/		C	CLAY, SANDY, SILTY, GRADES TO SILT @ 12.5	
12.5-13.3	-----		C	SILT, DRY, FIRM, MOIST, LIGHT BROWN	
13.3-13.5	///---//		C	CLAY, SILTY	
13.5-13.75	*****		C	SAND, LOOSE, DRY, FINE, BROWN	
13.75-15.8	///*/		C	CLAY, WEAKLY SANDY, BROWN, STIFF, MOIST	
	///*/	15	C		
	///*/		C		
15.8-16.7	///***//		C	CLAY, VERY SANDY (COARSE), WET (NOT WATER BEARING), FIRM, RED BROWN	
	///***//		C		
16.7-17.75	///---//		C	CLAY, SILTY, STIFF, MOIST, RED BROWN	
	///---//		C		
17.75-21.8	//////		C	CLAY, WET, RED BROWN, STIFF, SOME ROOT MATTER	
	//////		C		
	//////		C		
	//////	20	C		
	//////		C		
	//////		C		
21.8-25.3	///***//		C	CLAY, FINE SANDY, WET, HYDROCARBON ODOR, GREY BROWN, SOME BLACK MOTTLING, NOT WATER BEARING, SOFT	22'-20 ppm
	///***//		C		
	///***//		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

FILE #:	96-133
ELEVATION:	6920.1
TOTAL DEPTH:	50.0
LOGGED BY:	WHK
DATE:	8-22-96
STATIC WATER:	31.4
BORING ID:	0643
PAGE:	2

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

FILE #: 96-133
ELEVATION: 6920.1
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 8-22-96
STATIC WATER: 31.4
BORING ID: 0643
PAGE: 3

41081	2	BID
-------	---	-----

		P L O T		S C A L E		S A M P L E		LOGGED BY: WHK DATE: 8-22-96 STATIC WATER: 31.4 BORING ID: 0643 PAGE: 3	
DEPTH								MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	
42.7-48.0		=====				C		SHALE, RED, DRY/MOIST/WET, DENSE CHINLE FORMATION	
		=====				C			
		=====				C			
		=====				C			
		=====				C			
48.0-50.0		=====				C		SHALE, DARK RED TO PURPLE RED, DRY, DENSE	
		=====				C			
		=====				C			
		=====				C			
TOTAL DEPTH				50		C		50'-0ppm	
				55					
				60					
				65					

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

LOGGED BY: WHK

FILE #: 96-133
ELEVATION: 6917.6
TOTAL DEPTH: 36.5
LOGGED BY: WHK
DATE: 9-4-96
STATIC WATER: 19' @ 27 HRS
BORING ID: 0648
PAGE: 1

LOG OF TEST BORINGS

						DATE:	9-4-96
						STATIC WATER:	19' @ 27 HRS
						BORING ID:	0648
						PAGE:	1
	P L O T	S C A L E	A M P L E	<u>MATERIAL CHARACTERISTICS</u> (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)		PID (ppm)	
DEPTH							
0.0-6.2	///--/// ///--/// ///--/// ///--/// ///--/// ///--/// ///--/// ///--/// ///--/// ///--/// ///--///		C C C C C C C C C C C	<u>CLAY</u> , SLIGHTLY SILTY, ROOT MATTER, RED, BROWN, STIFF, MOIST		PID-0ppm ALL SAMPLES	
6.2	///--///	5.0	C				
6.2-7.1	***///***		C	<u>SAND</u> , CLAYEY, GRADATIONALLY CONTACTS TOP, LOOSE, DRY, RED BROWN			
7.1	***///***		C				
7.1-8.3	///---/// ///---/// ///---///		C C C	<u>CLAY</u> , VERY SILTY, LAMINAR SILT, DRY-DAMP, FIRM, RED BROWN			
8.3	///---///		C				
8.3-12.3	---//--- ---//--- ---//--- ---//--- ---//--- ---//--- ---//--- ---//---	10	C C C C C C C C	<u>SILT</u> , CLAYEY, LAMINAR, DAMP-DRY, LIGHT BROWN, FIRM, ROOT MATTER			
12.3	---//---		C				
12.3-12.8	***---***		C	<u>SAND</u> , SILTY, FINE, LOOSE, DRY, RED BROWN			
12.8-14.3	///---/// ///---/// ///---///		C C C	<u>CLAY</u> , SILTY, STIFF, DAMP, ROOT MATTER, RED BROWN, SILT LAMINAR			
14.3	///---///		C				
14.3-16.5	***00**** ***00**** ***00**** ***00****	15	C C C C	<u>SAND</u> , FINE, SCATTERED GRAVEL TO 2", SILTY, RED BROWN, MODERATELY DENSE, DRY-DAMP			
16.5	***00****		C				
16.5-21.5	***SS**** ***SS**** ***SS**** ***SS**** ***SS**** ***SS**** ***SS**** ***SS**** ***SS**** ***SS****	20	C C C C C C C C C C	<u>SAND</u> , COARSE-FINE, WET, SOME SANDSTONE GRAVEL TO 3", RED BROWN, SOME CLAY @ 19.5-20.0, WATER BEARING @ 20.0			
21.5	***SS****		C				
21.5-25.0	///////// ///////// ///////// /////////		C C C	LOST SAMPLE-POSSIBLE SOFT, WET, CLAY BASED ON LEFTOVERS IN SAMPLER			

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PROJECT: Giant Refinery
Ciniza

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 96-133
ELEVATION: 6917.6
TOTAL DEPTH: 36.5
LOGGED BY: WHK
DATE: 9-4-96
STATIC WATER: 19.0 @ 27 HRS
BORING ID: 0648
PAGE: 2

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
21.5-25.0	//////		C	LOST SAMPLE-POSSIBLE SOFT, WET, CLAY BASED ON LEFTOVERS IN SAMPLER	PID-0ppm ALL SAMPLES
25.0	//////	25	C		
25.0-28.0	//////		C	CLAY, WET, SOFT, RED BROWN	
28.0	//////		C		
28.0-30.0	*O*SS*O*O		C	SAND & GRAVEL, 4" SANDSTONE, CHERT, WATER BEARING, HYDROCARBON ODOR, LOOSE, MULTICOLORED	
30.0	*O*SS*O*O	30	C		
30.0-32.0	S=S=S=S=S		C	CHINLE FORMATION	
32.0	S=S=S=S=S		C	SAMPLER REFUSAL-POSSIBLE "SWEET" ODOR, SANDSTONE & SHALE > 30', NO ODOR, DRILL WITHOUT SAMPLER TO 35', MATRIX > 30' GREYGREEN, CEMENTED VERY DENSE ROCK @ 32'	
32.0-36.5	S=S=S=S=S		C	SANDSTONE & SHALE, HARD, CALCARIOUS CEMENTATION, FINE TO COARSE, SHALE, GREEN-RED B	
36.5	S=S=S=S=S	35	C		
TOTAL DEPTH		40	C	NOTE: HYDROCARBON ODOR APPEARS TO BE CONCENTRATED IN WATER LYING ON CHINLE FORMATION	
		45			

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

LOGGED BY: WHK

FILE #:	96-133
ELEVATION:	6913.4
TOTAL DEPTH:	30.0
LOGGED BY:	WHK
DATE:	9-4-96
STATIC WATER:	20.0
BORING ID:	0649
<u>PAGE:</u>	1

PAGE: 1

[illegible]

PROJECT: Giant Refinery
Ciniza

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 96-133
ELEVATION: 6913.4
TOTAL DEPTH: 30.0
LOGGED BY: WHK
DATE: 9-4-96
STATIC WATER: 20.0
BORING ID: 0649
PAGE: 2

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)		PID (ppm)
						PID-0ppm ALL SAMPLES
23.2-25.0	000***00 000***00 000***00		C C C	<u>GRAVEL</u> , SANDY, CHERT, SANDSTONE, SLIGHTLY CLAYEY, RED BROWN, DENSE, <u>WATER BEARING</u>		
25.0	000***00	25	C			
25.0-30.0	===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***=== ===***===		C C C C C C C C C C	<u>CHINLE FORMATION</u> <u>SHALE</u> , SANDY, RED BROWN/GREEN INTERBEDS, DENSE, MOIST, NOT WATER BEARING		
30.0	===***===	30	C			
TOTAL DEPTH						
		35				
		40				
		45				

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID Hollow Stemmed Auger

PRECISION ENGINEERING, INC.

FILE #: 97-032
 ELEVATION: 6923.04
 TOTAL DEPTH: 47.5'
 LOGGED BY: WHK
 DATE: 3-22-97
 STATIC WATER: 38.0' @ 30 MIN
 BORING ID: 0651
 PAGE: 1

LOCATION: SEE SITE PLAN

LOG OF TEST BORINGS

DEPTH	T	E	E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-2.2	///***///		C	CLAY, SANDY, WET, SOFT, RED BROWN	ALL SAMPLES
	///***///		C		0
	///***///		C		
2.2	///***///		C		
2.2-3.5	***--***		C	SAND, FINE, SILTY, LOOSE, DRY, RED BROWN, SOME ROOT MATTER	
	--		C		
3.5	***--***		C		
3.5-9.3	///---///		C	CLAY, SILTY, FIRM, RED BROWN, DAMP-MOIST	
	///---///		C		
	///---///	5.0	C		
	///---///		C		
	///---///		C	VERY STIFF, SOME ROOT MATTER GREATER THAN 6.0 FEET	
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
9.3	///---///		C		
9.3-10.2	*****	10	C	SAND, FINE, DRY, LOOSE, RED BROWN, LIGHT COLOR	
10.2-10.9	-----		C	SILT, DRY, LIGHT RED BROWN, FIRM	
10.9	-----		C		
10.9-14.5	///---///		C	CLAY, SILTY, SOME ROOT MATTER, RED BROWN, FIRM, CHARCOAL	
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
	///---///		C		
14.5	///---///		C		
14.5-15.5	///***///	15	C	CLAY, SANDY, RED BROWN, STIFF, MOIST, CHARCOAL	
15.5	///***///		C		
15.5-17.5	***//***		C	SAND, CLAYEY, DAMP, LOOSE, RED BROWN	
	//		C		
	//		C		
17.5	***//***		C		
17.5-20.0	///***///		C	CLAY, VERY FINE, SANDY, RED BROWN, STIFF, DAMP-MOIST, SAND STREAKS AND SOME LAMINAR	
	///***///		C	BANDING ESPECIALLY IN SANDIER ZONES	
	///***///		C		
	///***///		C		
20.0	///***///	20	C		
20.0-22.0	*****		C	SAND, FINE, VERY MOIST-WET, NOT WATER BEARING, LOOSE, RED BROWN	
	*****		C		
	*****		C		
22.0	*****		C		
22.0-23.5	///***///		C	CLAY, VERY SANDY, WET, FIRM, RED BROWN	
	///***///		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

LOCATION: SEE SITE PLAN

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-032
 ELEVATION: 6923.04
 TOTAL DEPTH: 47.5'
 LOGGED BY: WHK
 DATE: 3-22-97
 STATIC WATER: 38.0' @ 30 MIN
 BORING ID: 0651
 PAGE: 2

DEPTH	T	E	E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (pdm)
23.5	////****//		C	CLAY, VERY SANDY, WET FIRM, RED BROWN	
23.5-25.0	****//***		C	SAND, CLAYEY, SOME PURE ZONES APPROXIMATELY 3" THICK, LAMINAR BANDED, WET, NOT	ALL SAMPLES
	****//***		C	WATER BEARING, RED BROWN	0
25.0	****//***	25	C		
25.0-28.5	//////////		C	CLAY, SOFT, WET, NOT WATER BEARING, RED BROWN	
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
28.5	//////////		C		
28.5-30.4	////****//		C	CLAY, SLIGHTLY SANDY, SOME CARBONATE NODULES, RED BROWN, HARD, MOIST-DAMP	
	////****//		C	HARD TO DRILL	
	////****//	30	C		
30.4	////****//		C		
30.4-34.0	//////////		C	CLAY, DENSE, RED BROWN TO DARK BROWN, MOIST, HARD	
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
	//////////		C		
34.0	//////////		C		
34.0-34.3	////****//		C	CLAY, SANDY, BROWN, MOIST, STIFF	
34.3-36.0	//////////	35	C	CLAY, HARD, DARK BROWN, MOIST	
	//////////		C	SOFT	
36.0	//////////		C		
36.0-37.8	///00*///		C	CLAY, SOME SCATTERED GRAVEL TO 1" IN SIZE, SOFT, WET, NOT WATER BEARING, DARK BROWN	
	///00*///		C	SOME COARSE SAND	
	///00*///		C		
37.8	///00*///		C		
37.8-39.5	****//**		C	SAND, VERY CLAYEY, MORE SAND AT 39.0 FEET, LOOSE, SATURATED, MAY BE VERY WEAKLY	
	****//**		C	WATER BEARING, RED BROWN	
39.5	****//**		C		
39.5-41.0	//////////	40	C	CLAY, BROWN, STIFF, WET, NOT WATER BEARING	
	//////////		C		
41.0	//////////		C		
41.0-44.6	*****		C	SAND GRADING TO GRAVEL, SANDSTONE AND CHERT, SOME PETRIFIED WOOD, WATER BEARING	
	00**0		C	DENSE, RED BROWN, SLIGHTLY CLAYEY	
	*0*0*0*0*		C		
	*00*00*00		C		
	*00*00*00		C		
	*0S*0S*0S		C		
44.6	*0S/*0S/*		C		
44.6-47.5	=====	45	C	CHINLE FORMATION	
	=====		C	SHALE, RED BROWN, DENSE, DAMP, NO WATER, FISSLE	
	=====		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

FILE #: 97-032
ELEVATION: 6923.04
TOTAL DEPTH: 47.5'
LOGGED BY: WHK
DATE: 3-22-97
STATIC WATER: 38.0'@30 MIN
BORING ID: 0651
PAGE: 3

LOG OF TEST BORINGS

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FILE #: 97-032
ELEVATION: 6929.56
TOTAL DEPTH: 45.0'
LOGGED BY: WHK
DATE: 3-22-97
STATIC WATER: 27.0'@30 MIN
BORING ID: 0652
PAGE: 1

LOG OF TEST BORINGS

						LOGGED BY:	DATE:
							3-22-97
							STATIC WATER:
							27.0'@30 MIN
						BORING ID:	0652
						PAGE:	1
						MATERIAL CHARACTERISTICS	PID
						(MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)	(ppm)
DEPTH	T	E	L	C	S		
0.0-5.5	///---///			C	<u>CLAY</u> , SILTY, SOFT, RED BROWN, WET, NOT WATER BEARING, SOME ROOT MATTER		0.0-26.0
	///---///			C			0
	///---///			C			
	///---///			C			
	///---///			C			
	////*////			C	<u>CLAY</u> , STIFF, MOIST, SOME SANDY STRINGERS, RED BROWN		
	////*////			C			
	////*////			C			
	////*////			C			
	////*////	5.0		C			
5.5	////*////			C			
5.5-8.0	///***////			C	<u>CLAY</u> , FINE, SANDY, RED BROWN, MOIST-DAMP, STIFF		
	///***////			C			
	///***////			C			
	///***////			C			
8.0	///***////			C			
8.0-9.6	///***////			C	<u>CLAY</u> , SANDY, SOME SAND STRINGERS, FINE, GRADES SANDIER DESCENDING, RED BROWN, STIFF		
	///***////			C			
9.6	///***////			C			
9.6-10.8	*****	10		C	<u>SAND</u> , LOOSE, RED BROWN, DAMP, FINE-MEDIUM		
	*****			C			
10.8	*****			C			
10.8-12.5	///***////			C	<u>CLAY</u> , HARD, SANDY, SOME SLICKENSIDED SURFACES FORM JOINTS, RED BROWN, MOIST-DAMP		
	///***////			C			
12.5	///***////			C			
12.5-12.8	*****			C	<u>SAND</u> , FINE, DRY, LOOSE, RED BROWN		
12.8-13.9	///***////			C	<u>CLAY</u> , SANDY, MOIST-DAMP, RED BROWN, HARD		
13.9	///***////			C			
13.9-17.5	///---///			C	<u>CLAY</u> , SILTY, SILT IN LAMINATIONS, SOME CHARCOAL, DAMP, HARD, RED BROWN		
	///---///	15		C	SOME SANDY ZONES GREATER THAN 16.0 FEET		
	///---///			C			
	///---///			C			
	///--**//			C			
	///--**//			C			
17.5	///--**//			C			
17.5-18.1	***///***			C	<u>SAND</u> , CLAYEY, DENSE, DAMP, RED BROWN		
18.1-19.5	///---///			C	<u>CLAY</u> , SILTY, SOME SILT IN LAMINATIONS, DAMP-MOIST, BROWN-RED BROWN, HARD		
	///---///			C			
19.5	///---///			C			
19.5-25.0	/////////	20		C	<u>CLAY</u> , MOIST-WET, SOME ROOT MATTER, BROWN-RED BROWN, HARD, FEW FINE ROOT MATTER,		
	/////////			C	SOME FINE BLOCKY FRACTURING (FORMER SHRINKAGE) BUT NO INFILLING WITH SAND		
	/////////			C	WET, NOT WATER BEARING GREATER THAN 23.5 FEET, SOME CHARCOAL OBSERVED, GRADING		
	/////////			C	SANDY AT 24.8 FEET		
	/////////			C			
	/////////			C			
	/////////			C			
	/////////			C			

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

PRECISION ENGINEERING, INC.

FILE #: 97-032
 ELEVATION: 6929.56
 TOTAL DEPTH: 45.0'
 LOGGED BY: WHK
 DATE: 3-22-97
 STATIC WATER: 27.0' @ 30 MIN
 BORING ID: 0652
 PAGE: 2

LOCATION: SEE SITE PLAN

LOG OF TEST BORINGS

DEPTH					MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
				S		
				S		
	P			C		
	L			A		
	O			L		
	T			E		
25.0	//////	25	C		CLAY, MOIST-WET, SOME ROOT MATTER, BROWN-RED BROWN, HARD, FEW FINE ROOT MATTER, SOME FINE BLOCKY FRACTURING (FORMER SHRINKAGE) BUT NO INFILLING WITH SAND	0.0-26.0
	//////		C		WET, NOT WATER BEARING GREATER THAN 23.5 FEET, SOME CHARCOAL OBSERVED, GRADING	0
	//////		C		SANDY AT 24.8 FEET	
25.0-32.0	///*-///		C		CLAY, VERY SLIGHTLY SANDY, SILTY, SOME CHARCOAL, WET, NOT WATER BEARING, SOFT-FIRM	
	///*-///		C		RED BROWN	
	///*-///		C			150
	///*-///		C			
	///*-///		C			
	///*-///		C			20
	///*-///		C			
	///*-///		C			
	///*-///	30	C			
	///*-///		C			10
	///*-///		C			
32.0	///*-///		C			
32.0-34.0	***///***		C		SAND, CLAYEY, PURE SAND IN 2" SEAMS, <u>WATER BEARING BUT WEAK</u> , LOOSE, BROWN	32.0-45.0
	///		C			0
	///		C			
34.0	***///***		C			
34.0-37.1	///---///	35	C		CLAY, SILTY, BROWN, SOFT, WET, NOT WATER BEARING	
	///---///		C			
	///---///		C			
	///---///		C			
37.1	///---///		C			
37.1-39.5	***000***		C		SAND, VERY GRAVELLY, SANDSTONE, CHERT, PETRIFIED WOOD, PEBBLES/GRAVEL TO 3" IN SIZE	
	000		C		<u>WATER BEARING</u> , MULTICOLORED	
	000		C			
	000		C			
39.5	***000***		C			
39.5-40.0	///---///	40	C		CLAY, SILTY, LIGHT RED BROWN, SOFT, WET, NOT WATER BEARING	
40.0-42.0	***000***		C		SAND, VERY GRAVELLY, SANDSTONE, CHERT, <u>WATER BEARING</u> , DENSE	
	000		C			
	000		C			
42.0	***000***		C			
42.0-45.0	====*		C		CHINLE FORMATION	
	====*		C		SHALE, VERY SANDY, DAMP, NOT WATER BEARING, GREEN GREY	
	====*		C			
	====*		C			
45.0	====*	45	C			
TOTAL DEPTH						

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

LOCATION: SEE SITE PLAN
CINIZA REFINERY

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-070
ELEVATION: 6929.2
TOTAL DEPTH: 35.0'
LOGGED BY: TM
DATE: 6-10-97
STATIC WATER: 21.2'
BORING ID: 0656
PAGE: 1

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-1.0 1.0	***//00**		C	<u>SAND</u> , FINE, CLAYEY, FINE GRAVEL, BROWN, MOIST	0.0-23.0
1.0-4.5 4.5	///**00// ///**00// ///**00// ///**00// ///**00// ///**00// ///**00//		C C C C C C C	<u>CLAY</u> , SLIGHTLY SANDY, SOME FINE GRAVEL, MOIST, RED BROWN, FIRM TO SOFT, NO ODOR, SOME CHARCOALING MORE GRAVELLY AT 3.5' TO 3.8'	0
4.5-4.8	****//***	5.0	C	<u>SAND</u> , FINE, DAMP, SLIGHTLY CLAYEY, PURPLISH BROWN, NO ODOR	
4.8-6.0 6.0	///***-// ///***-//		C C	<u>CLAY</u> , VERY SANDY, FINE, SILTY, NO ODOR, PURPLISH BROWN	
6.0-6.2	****//***		C	<u>SAND</u> , FINE TO MEDIUM, CLAYEY, SLIGHTLY SILTY, MOIST, PURPLE RED, NO ODOR	
6.2-7.8 7.8	///***+// ///***+// ///***+//		C C C	<u>CLAY</u> , VERY SANDY, FINE, SILTY, SOME CALCAREOUSLY INDURATED APPEARING NODULES, FINE GRAVEL, SOME VEGETATION IN SAMPLE, DAMP TO MOIST, PURPLISH BROWN	
7.8-8.5	****//***		C	<u>SAND</u> , VERY FINE TO FINE, CLAYEY, SILTY, SOME CEMENTED SAND, MOIST, PURPLISH BROWN,	
8.5-8.8	///***//		C	<u>CLAY</u> , SAND, FINE, SAND APPEARS TO BE IN BANDS, NO ODOR, FIRM, MOIST	
8.8-9.2	****//***		C	<u>SAND</u> , FINE, CLAYEY, MOIST, PURPLISH BROWN, SLIGHT ORANGE TINT AT 8.8'	
9.2-11.5 11.5-12.2 12.2	///***// ///***// ///***// ///***// ///***//	10	C C C C C	<u>CLAY</u> , SANDY, FINE, SOME CHARCOALING AND GYPSUM SPOTS IN SAMPLE, MOIST, SOME ROOT MATTER, HARD, NO ODOR <u>CLAY</u> , MOIST, HARD, SLIGHTLY SILTY, HEAVY CHARCOALING, VEGETATION, CALCAREOUS INDURATION OR GYPSUM NODULES, NO ODOR, PURPLISH BROWN	
12.2-14.2 14.2	****//*** ****//***		C C	INTERBEDDED SAND AND CLAY	
14.2-17.0 17.0	///****// ///****// ///****// ///****// ///****// ///****//	15	C C C C C C	<u>CLAY</u> , MOIST, PURPLISH-BROWN, VERY SANDY, ORANGE-SANDY BANDS IN CLAY, VERY THIN- LAYERS TO 15', NO ODOR, SOME CHARCOALING	
17.0-17.5	****//***		C	<u>SAND</u> , CLAYEY, SILTY, FINE, PURPLISH BROWN WITH ORANGE TINT, NO ODOR	
17.5-18.2 18.2	///--*// ///--*//		C C	<u>CLAY</u> , SILTY, SANDY, WET, PURPLISH BROWN, SOFT TO FIRM, SOME VEINING, POSSIBLE ROOTS DARK GREEN, NO ODOR	
18.2-18.8 18.8	****-//*** ****-//***		C C	<u>SAND</u> , FINE TO MEDIUM, PURPLISH WITH ORANGE BANDS, SOME BLACK BANDING, SILTY, SLIGHTLY CLAYEY, NO ODOR	
18.8-19.7	///*-///	20	C	<u>CLAY</u> , MOIST, ROOT MATTER, PURPLISH BROWN, SLIGHTLY SANDY, SOME SILT, NO ODOR	
19.7-19.9	****-***		C	<u>SAND</u> , FINE, MOIST, ORANGE BROWN, SLIGHTLY SILTY, SOME PURPLING, NO ODOR	
19.9-21.2	///-**//		C	<u>CLAY</u> , WET, SLIGHTLY SILTY, SANDY, REDDISH PURPLE, FIRM, NO ODOR	
21.2-22.0 22.0	****-//*** ****-//***		C C	<u>SAND</u> , FINE, WET, <u>SLIGHTLY WATER BEARING</u> , ORANGE BROWN TO PURPLE, NO ODOR, SLIGHTLY SILTY, CLAYEY, MODERATELY DENSE	
22.0-22.4	/*/*/*/*		C	INTERBEDDED CLAY AND SAND	
22.4-27.2	///*00//		C	<u>CLAY</u> , MOIST, SLIGHTLY SANDY, SOME GYPSUM NODULES OR CEMENTED SAND, COARSE GRAVEL,	

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

LOGGED BY: TM

LOCATION: SEE SITE PLAN
CINIZA REFINERY

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-070
ELEVATION: 6929.2
TOTAL DEPTH: 35.0'
LOGGED BY: TM
DATE: 6-10-97
STATIC WATER: 21.2'
BORING ID: 0656
PAGE: 2

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
22.4-27.2	/// *00///		C	CLAY, MOIST, SLIGHTLY SANDY, SOME GYPSUM NODULES OR CEMENTED SAND, COARSE GRAVEL, WHITE, FINE, NO ODOR, REDDISH BROWN	23.0-32.0 0
27.2	/// *00///	25	C		
27.2-27.7	*** /00***		C	SAND, FINE TO MEDIUM, <u>SLIGHTLY WATER BEARING</u> , SLIGHTLY CLAYEY, FINE GRAVEL, REDDISH BROWN WITH PURPLE TINT, NO ODOR	
27.7	*** /00***		C		
27.7-28.0	/// --*///		C	CLAY, SILTY, MOIST TO WET, SLIGHTLY SANDY, RED BROWN, FIRM, NO ODOR	
28.0-28.8	00// --**0		C	GRAVEL, FINE TO COARSE, CLAYEY, SILTY, SANDY, FINE, WET, SOME SANDSTONE NODULES, BONE WHITE, NO ODOR	
28.8	00// --**0		C		
28.8-29.0	/// **00//	30	C	CLAY, MOIST, SANDY, FINE GRAVEL, RED BROWN, STIFF, NO ODOR	
29.0-32.0	000***000		C	GRAVEL, FINE TO COARSE, SANDY, FINE TO COARSE, PURPLE BROWN, <u>WATER BEARING</u> , CLAYEY, NO ODOR, 30.0'-32.0' MORE COARSE SAND, FINE GRAVEL, <u>WATER BEARING</u>	3.0
32.0	000***000		C		
32.0-35.0	===// *===		C	<u>CHINLE FORMATION</u>	
	===// *===		C	PURPLISH WITH LIGHT GREEN BANDING, CLAYEY, SOME SAND, FINE, SOME CEMENTED SAND AT 35.0', DRY	
	===// *===		C		
	===// *===		C		
35.0	===// *===	35	C		
TOTAL DEPTH					

LOGGED BY: TM

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

LOCATION: SEE SITE PLAN
CINIZA REFINERY

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-070
ELEVATION: 6938.4
TOTAL DEPTH: 40.0'
LOGGED BY: TM
DATE: 6-10-97
STATIC WATER: 34.5'
BORING ID: 0657
PAGE: 1

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (DDM)
0.0-1.8	/// *o*o// /// *o*o// /// *o*o// 1.8 /// *o*o//		C C C C	<u>CLAY</u> , DAMP, FIRM, SANDY, FINE, SOME FINE GRAVEL, RED BROWN, NO ODOR	0.0-31.0 0
1.8-4.5	** -o- /o** ** -o- /o** ** -o- /o** 4.5 ** -o- /o**		C C C C C	<u>SAND</u> , FINE TO COARSE, SILTY, SLIGHTLY CLAYEY, SOME FINE GRAVEL, RED BROWN, SOME GYPSUM SPOTS, MORE COARSE SAND AT 4.0' TO 4.5', DAMP, NO ODOR	
4.5-5.0	/+*/+*/+*	5.0	C	INTERBEDDED CLAY AND SAND	
5.0-5.9	//////		C	<u>CLAY</u> , MOIST, SLIGHTLY BLOCKY, WHITE GYPSUM SPOTS, CHARCOALING, SOME ROOTS IN SAMPLE	
5.9	//////		C	REDISH BROWN, VERY DARK TO PURPLE CHARCOALING, NO ODOR, VERY STIFF	
5.9-6.2	*****		C	<u>SAND</u> , FINE, SOME COARSE, RED BROWN WITH ORANGE TINT	
6.2-8.5	////-//// ////-//// ////-//// 8.5-10.0 ////-//// ////-//// 10.0-11.2 ////-//// 11.2	10	C C C C C C C C C	<u>CLAY</u> , MOIST, SLIGHTLY BLOCKY, WHITE GYPSUM SPOTS, CHARCOALING, SOME ROOTS IN SAMPLE REDISH BROWN, VERY DARK TO PURPLE CHARCOALING, NO ODOR, VERY STIFF, SLIGHTLY SILTY <u>CLAY</u> , SILTY, SANDY, FINE, SOME GYPSUM SPOTTING, DAMP TO MOIST, REDDISH BROWN WITH PURPLE TINT, VERY STIFF TO HARD, MORE FISSLE, NO ODOR, SOME CHARCOALING <u>CLAY</u> , MOIST, HARD, SLIGHTLY SILTY, SOME CHARCOAL, PURPLISH BROWN, DAMP TO MOIST, NO ODOR	
11.2-12.5	+++--/+++ +++--/+++ 12.5 +++--/+++		C C C	<u>SAND</u> , FINE, SILTY, SLIGHTLY CLAYEY, PURPLISH BROWN, DAMP, NO ODOR SILTY AT 12.0'	
12.5-13.2	///--+////		C	<u>CLAY</u> , SILTY, SLIGHTY SANDY, FINE, SLIGHTLY FISSLE, DAMP, VERY STIFF, REDDISH BROWN	
13.2-13.8	+++--/++ 13.8 +++--/++		C C	<u>SAND</u> , VERY FINE TO FINE, SILTY, CLAYEY, DAMP TO MOIST, RED BROWN, NO ODOR	
13.8-14.5	///+---//		C	<u>CLAY</u> , SANDY, VERY FINE, SILTY, DAMP TO MOIST, NO ODOR	
14.5-15.0	///+---//	15	C	<u>CLAY</u> , SANDY, FINE, PURPLISH BROWN WITH ORANGE TINT, VERY STIFF, NO ODOR, SILTY, DAMP	
15.0-15.2	+++--/+++		C	<u>SAND</u> , FINE, SILTY, SLIGHTLY CLAYEY, REDDISH PURPLE WITH ORANGE TINT, NO ODOR	
15.2-15.7	///--+////		C	<u>CLAY</u> , SILTY, SANDY, FINE, ORANGE BANDS OF SAND IN CLAY, DAMP TO MOIST, NO ODOR, RED	
15.7-18.2	//////		C C C C	BROWN CLAY <u>CLAY</u> , HARD, MOIST, REDDISH BROWN, CHARCOALING, BLOCKY, SOME CEMENTED SAND AT 17.0', NO ODOR	
18.2	//////		C		
18.2-18.7	++++-/+++ 18.7 ++++-/+++		C C	<u>SAND</u> , FINE, SLIGHTLY SILTY AND CLAYEY, PURPLISH BROWN WITH ORANGE TINT, SOME BLACK SAND IN BAND FORM	
18.7-20.0	///--+////	20	C	<u>CLAY</u> , SILTY, VERY SANDY, SAND IN ORANGE BANDS, PURPLE BROWN, DAMP TO MOIST, VERY STIFF, NO ODOR	
20.0-21.0	///--+////		C	<u>CLAY</u> , VERY SILTY, SANDY, FINE, DAMP TO MOIST, PURPLISH BROWN, NO ODOR	
21.0-22.2	///--+////		C		
22.2-23.5	++++-/+++ ++++-/+++ ++++-/+++		C C C C	<u>CLAY</u> , VERY SANDY, SILTY, SAND IN ORANGE COLOR, PURPLE BROWN, VERY STIFF, NO ODOR LESS SILTY, MORE WHITE GYPSUM SPOTS, SOME CHARCOALING	

LOGGED BY: TM

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

LOCATION: SEE SITE PLAN
CINIZA REFINERY

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-070
ELEVATION: 6938.4
TOTAL DEPTH: 40.0'
LOGGED BY: TM
DATE: 6-10-97
STATIC WATER: 34.5'
BORING ID: 0657
PAGE: 2

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)	PID (ppm)
22.2-23.5	///+---//		C	LESS SILTY, MORE WHITE GYPSUM SPOTS, SOME CHARCOALING	
23.5-24.5	///+---//		C	MORE SANDY, FINE, SILTY, ORANGE SAND, PURPLE BROWN CLAY	
24.5	///+---//		C		
24.5-25.0	+++--//**	25	C	SAND, FINE, SILTY, CLAYEY, ORANGISH PURPLE, DAMP, NO ODOR	
25.0-26.2	////+---//		C	CLAY, MOIST, REDDISH BROWN WITH PURPLE TINT, SLIGHTLY SANDY, SOME CHARCOALING,	
26.2	////+---//		C	SLIGHTLY SILTY, HARD, NO ODOR	
26.2-26.7	+++//--**		C	SAND, FINE, CLAYEY, SILTY, MOIST, ORANGISH BROWN, NO ODOR	
26.7-27.5	///+---//		C	CLAY, VERY SANDY, VERY FINE TO FINE, SILTY, ORANGE PURPLE, MOIST, HARD, NO ODOR	
27.5	///+---//		C		
27.5-28.5	+++--//**		C	SAND, VERY FINE TO FINE, SILTY, CLAYEY, ORANGISH PURPLE, MOIST, NO ODOR	
28.5	+++--//**		C		
28.5-28.8	////+---//		C	CLAY, SILTY MOIST, VERY STIFF, SANDY, FINE, PURPLISH BROWN WITH ORANGE TINT, DAMP	
28.8-29.7	+++--//**		C	SAND, FINE, SILTY, CLAYEY, SOME COARSE, DAMP, NO ODOR (FINE AND COARSE GRAVEL ZONE	
29.7	**--0-/0**	30	C	AT 29.2-29.5)	
29.7-30.5	///+---//		C	CLAY, VERY SANDY, SILTY, DAMP TO MOIST, FISSLE, PURPLE BROWN WITH SOME ORANGE AND	
30.5	///+---//		C	BLACK SAND, NO ODOR	
30.5-31.0	+++---+++		C	SAND, VERY FINE TO FINE, SILTY, MOIST, ORANGISH RED TO PURPLISH BROWN, NO ODOR	
31.0-33.8	///+---//		C	CLAY, SLIGHTLY SANDY, SILTY, WET, SOME CHARCOAL VEINS, STIFF, REDDISH BROWN	30.0
	///+---//		C		170.0
33.8	///+---//		C		
33.8-35.9	00//*S00		C	GRAVEL, VERY CLAYEY, SANDY, FINE TO COARSE, SILTY GRAVEL IS FINE TO COARSE, SOME	
	00//*S00		C	SOFT SANDSTONE NODULES, SLIGHTLY WATER BEARING AT 34.5'	
	00//*S00	35	C	SLIGHTLY WATER BEARING AT 35.2'	200.0
35.9	00//*S00		C		
35.9-40.0	===//===		C	CHINLE FORMATION	
	===//===		C	CLAYEY, PURPLISH BROWN WITH LIGHT GREEN SPOTS, MOIST, BLOCKY	
	===//===		C		
	===//===		C		
	===//===		C		
	===//===		C		
40.0	===//===	40	C		
TOTAL DEPTH					

LOGGED BY: TM

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

FILE #: 97-070
ELEVATION: 6934.9
TOTAL DEPTH: 45.0'
LOGGED BY: WHK
DATE: 6-12-97
STATIC WATER: 32.0'
BORING ID: 0665
PAGE: 1

[illegible]

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

LOGGED BY: WHK

LOCATION: SEE SITE PLAN
CINIZA REFINERY

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-070
ELEVATION: 6934.9
TOTAL DEPTH: 45.0'
LOGGED BY: WHK
DATE: 6-12-97
STATIC WATER: 32.0'
BORING ID: 0665
PAGE: 2

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
17.0-24.5	////**//		C	<u>CLAY</u> , SLIGHTLY SANDY, WET, FIRM, BROWN-	
24.5	////**//		C		
24.5-28.0	*****	25	C	<u>SAND</u> , FINE, DAMP TO MOIST, RED BROWN, "SWEET" ODOR (POSSIBLE ADDITIVE OR LIGHT END)	
	*****		C		
	*****		C		
	*****		C		
	*****		C		
	*****		C		
28.0	*****		C		
28.0-34.3	000*S*S00		C	<u>GRAVEL</u> , SANDY (SANDSTONE, CHERT), STRONG GASOLINE ODOR (OLD), MOIST TO WET, NOT	
	000*S*S00		C	WATER BEARING, BROWN	
	000*S*S00		C		
	000*S*S00	30	C		
	000*S*S00		C		
	000*S*S00		C		
	000*S*S00		C		
	000*S*S00		C		
	000*S*S00		C	<u>WATER BEARING AT 32.0'- 33.5'</u>	
	000*S*S00		C		
	000*S*S00		C		
34.3	000*S*S00		C		
34.3-34.5	////////		C	<u>CLAY</u> , WET, SOFT, BROWN, NO ODOR	
34.5-35.0	*****	35	C	<u>SAND</u> , FINE, WET, BROWN, NO ODOR, MODERATELY DENSE	
35.0-41.0	000***000		C	<u>GRAVEL</u> , SANDY, BROWN, WET, NOT WATER BEARING, POSSIBLE WEAK "SWEET" ODOR	
	000***000		C		
	000***000		C		
	000***000		C		
	000***000		C		
	000***000		C		
	000***000		C		
	000***000		C		
	000***000	40	C		
	000***000		C		
41.0	000***000		C		
41.0-45.0	=====		C	<u>CHINLE FORMATION</u>	
	=====		C	<u>SHALE</u> , SANDY, RED, SOME RED SPOTS, DRY, HARD	
	=====		C		
	=====		C		
	=====		C		
	=====		C		
	=====		C		
45.0	=====	45	C		
TOTAL DEPTH					

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

Site: Giant Refining-Ciniza

Date: August 30, 2001

LAB #	DEPTH	BLOW COUNT	O L L			MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	L	PI	CLASS.
			T	E	E					
40161	0.0-1.0	CONTINUOUS	//////			CLAY, MOIST, FIRM, RED BROWN				
	1.0-2.1	CONTINUOUS	-/*/--			SILT, CLAYEY, SLIGHTLY SANDY (VERY FINE), LOOSE	9.7			
	2.1-5.0	CONTINUOUS	//////			DAMP, ROOT MATTER ABUNDANT				
40162			//////			CLAY, VERY FIRM TO HARD, MOIST, RED BROWN				
			//////	5.0						
	5.0-5.2	CONTINUOUS	//////			CLAY, VERY FIRM TO HARD, MOIST, RED BROWN	15.1	49	31	CL/A-7-6
40163	5.0-6.5	11-18-31	//////							
			//////							
			/**/			VERY FINE SAND SEAM FROM 7.5' TO 7.7'				
40164	10.0-11.5	12-21-23	//////	10		SLIGHTLY BLOCKY STRUCTURE THROUGHOUT	14.2	56	33	CH/A-7-6
	11.8		//////							
	11.8-12.5	CONTINUOUS	/**/			CLAY, SANDY VERY FINE, MOIST, VERY FIRM, RED BROWN				
40165	12.5-15.0	CONTINUOUS	//////			CLAY, VERY STIFF, DARK RED BROWN, MOIST- WET,				
			//////	15		CHARCOAL PRESENT, DIFFICULT TO BREAKUP IN HAND				
	15.0-16.5	7-11-17	//////				18.6			
40166	18.5		//////							
	18.5-20.0	CONTINUOUS	/**/			CLAY, VERY SLIGHTLY SANDY, WET, SOFT, RED				
			/**/	20		BROWN				
40167	20.0-20.5	2-	/**/				24.0			
	20.5-21.4	3-	/**/			CLAY, VERY SANDY VERY FINE, WET, RED BROWN, SOFT				
	21.4-21.5	2	//////			CLAY, WET, FIRM, RED BROWN				
40168	22.5-24.5	CONTINUOUS	/**/			CLAY, SANDY VERY FINE, WET, SOFT- FIRM, RED-BROWN	24.8			
	24.5-25.0	CONTINUOUS	//////	25		CLAY, WET, FIRM, RED BROWN				
	26.2		//////							
40169	26.2-29.0	CONTINUOUS	-----			SILTSTONE, THIN MUDSTONE PARTINGS, SLIGHTLY	7.7			
			-----			SANDY, GREEN-GREY, DARK RED BROWN PARTINGS,				
	29.0		-----			DAMP HARD, CHINLE FORMATION				
40170	Total Depth			30		WATER BEARING IN THE SILTSTONE FROM 26.2'-27.0'				
						BACKFILL TO SURFACE WITH BENTONITE GEL				
						(300 LBS)				
40171				35						
40172				40						

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger
Logged By: WHK

PROJECT: Tank 569
LOCATION: See Boring Plan

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 95-018
ELEVATION: 6918.6
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 3-30-95
STATIC WATER: 28.0
BORING ID: B1
PAGE: 1

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-1.2	****//	1.0	C	<u>Sand</u> , clayey, damp, brown, soft/loose, some fine gravel	0.0
1.2-5.0	///+---//		C	<u>Clay</u> , sandy, silty, moist to wet, brown, stiff, some root fibers in upper 3'	0.0
	///+---//		C	no odor	
	///+---//		C		
	///+---//		C		
	///+---//		C		
	///+---//		C		
5.0-8.8	///---//	5.0	C	<u>Clay</u> , silty, moist, brown, hard, scattered root fibers	0.0
	///---//		C		
	///---//		C		
	///---//		C		
	///---//		C		
	///---//		C		
8.8-9.1	000///000		C	<u>Gravel</u> , fine, clayey, damp, brown, dense, silica gravel to 1/2", no odor	0.0
9.1-10.0	///+---//	9.0	C	<u>Clay</u> , sandy, damp, brown, hard, some root matter, no odor	0.0
	///+---//		C		
10.0-12.4	////////	10	C	<u>Clay</u> , blocky, moist to wet, brown, hard, root matter, gradational above and below	0.0
	////////		C		
	////////		C		
	////////		C		
	////////	12	C		
12.4-16.4	///+---//		C	<u>Clay</u> , silty, sandy, sandier @ 14' but gradational, moist to wet, brown, stiff to	0.0
	///+---//		C	hard, does not appear weathered in-situ, slightly fissured, pieces (2-3 mm) of	
	///+---//		C	clay in sandy matrix, root matter	
	///+---//		C		
	///+---//		C		
	///+---//	15	C		
	///+---//		C		
	///+---//	16	C		
16.4-16.7	*****		C	<u>Sand</u> , fine, moist, red brown, loose	0.0
16.7-17.4	///+---//	17	C	<u>Clay</u> , sandy, wet, brown, very stiff	
17.4-22.9	///+---//		C	<u>Clay</u> , slightly fissured but not as much as above, some 4" slightly sandy zones	0.0
	///+---//		C	some carbonate nodules, wet, dark brown, hard	
	///+---//		C		
	///+---//		C		
	///+---//		C		
	///+---//		C		
	///+---//		C		
	///+---//		C		
22.9-30.0	///+---//		C	<u>Clay</u> , slightly sandy, some carbonate filaments, occasional individual coarse sand	0.0
	///+---//		C	grains of silica rock, wet, dark brown, soft, no odor, free water on tip of sample	
	///+---//	23	C	but not in samples	

SIZE AND TYPE OF BORING: 4'-1/4" HSA

LOGGED BY: WHK

PROJECT: Tank 569
LOCATION: See Boring Plan

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 95-018
ELEVATION: 6918.6
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 3-30-95
STATIC WATER: 28.0
BORING ID: B1
PAGE: 2

		S	S
	P	C	A
	L	A	M
	O	L	P
DEPTH	T	E	L

DEPTH				MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)		PID (ppm)
	///**+/		C	continued from page 1		
	///**+/	24	C			
	///**+/		C			
	///**+/		C			
	///**+/		C			
	///**+/		C			
	///**+/		C			
	///**+/		C			
	///**+/		C			
	///**+/		C			
	///**+/		C			
	///**+/		C			
30.0-32.5	***O****	30	C	<u>Sand</u> , slightly clayey, occasional pebbles, <u>weakly water bearing</u> , brown, very soft/loose		0.0
	O*		C			
	O*		C			
	O*		C			
	O*	32	C			
32.5-39.5	///---+/		C	<u>Clay</u> , silty, some carbonate filaments and staining, more carbonate filaments below 32', wet, saturated but not water bearing, light brown, soft to firm		0.0
	///---+/		C			
	///---+/		C			
	///---+/		C			
	///---+/		C			
	///---+/		C			
	///---+/		C			
	///---+/		C			
	///---+/		C			
	///---+/		C			
	///---+/		C			
	///---+/	39	C			
39.5-41.1	///OOO///		C	<u>Clay</u> , gravelly, wet, saturated but not water bearing, light brown, soft		0.0
	///OOO///		C			
	///OOO///		C			
	///OOO///	41	C			
41.1-47.1	***OO****		C	<u>Sand</u> , coarse, fine to medium gravelly, <u>water bearing</u> , brown, dense, subrounded to rounded silica rock, some sandstone pieces		0.0
	OO*		C			
	OO*		C			
	OO*		C			
	OO*		C			
	OO*		C			
	OO*		C			
	OO*		C			
	OO*		C			

SIZE AND TYPE OF BORING: 4'-1/4" HSA

LOGGED BY: WHK

PROJECT: Tank 569
LOCATION: See Boring Plan

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 95-018
ELEVATION: 6918.6
TOTAL DEPTH: 50.0
LOGGED BY: WHK
DATE: 3-30-95
STATIC WATER: 28.0
BORING ID: B1
PAGE: 3

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
	000		C	continued from page 2	
	000	47	C		
47.1-50.0	-----		C	<u>CHINLE FORMATION</u>	
	-----		C	<u>Shale</u> , some green mottling, fissile, moist, hard, slightly blocky, no odor	0.0
	-----		C		
	-----		C		
	-----		C		
	-----	50	C		
TD				end 11:00a -- depth to water @ 12:15p 28.0' grout hole with bentonite/cement/8% grout to surface time end 1:15p -- water depth affected by hole collapse	
LOGGED BY: WHK					
SIZE AND TYPE OF BORING: 4'-1/4" HSA					

PRECISION ENGINEERING, INC.

FILE #: 95-018
 ELEVATION: 6917.6
 TOTAL DEPTH: 30.0
 LOGGED BY: WHK
 DATE: 3-30-95
 STATIC WATER: 22.3
 BORING ID: B3
 PAGE: 1

PROJECT: Tank 569
 LOCATION: See Boring Plan

LOG OF TEST BORINGS

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-1.3	***OO//		C	Clay, sandy, gravelly, wet, brown, soft, no odor	0.0
	***OO//	1.0	C		
1.3-2.7	***//		C	Clay, fine sandy, wet, brown to red brown, soft, no odor	0.0
	***//	2.0	C		
2.7-5.0	//////		C	Clay, wet, very soft, some root matter	0.0
	//////	3.0	C		
	//////		C		
	//////		C		
	//////		C		
5.0-8.4	//////	5.0	C	Clay, wet, dark brown, stiff, no odor, some root matter	0.0
	//////		C		
	//////		C		
	//////		C		
	//////		C		
	//////	8.0	C		
8.4-10.3	////+//		C	Clay, carbonate filaments common, some carbonate nodules scattered, wet, stiff	0.0
	////+//	9.0	C	red brown, no odor	
	////+//		C		
	////+//	10	C		
10.3-10.6	////OO//		C	Clay, gravelly, wet, red brown, stiff, no odor	0.0
10.6-12.9	////+--//	11	C	Clay, fine sandy, silty, wet, light red brown, firm, no odor, scattered fine	0.0
	////+--//		C	gravel, some root matter, some carbonate filaments, slightly blocky	
	////+--//		C		
12.9-14.1	////++++//		C	Clay, slightly sandy, carbonate filaments abundant, wet, brown, firm, carbonate	0.0
	////++++//	13	C	filaments stain sample, white CCI2, no odor, root matter abundant	
	////++++//		C		
14.1-14.4	*****	14	C	Sand, fine, moist, light brown, loose, no odor	0.0
14.4-15.3	////+--//		C	Clay as at 12.9'-14.1' but slightly more fine sand, no odor	0.0
	////+--//	15	C		
15.3-16.7	***//		C	Sand, fine, slightly clayey, moist to wet, brown, loose, no odor	0.0
	***//	16	C		
16.7-18.3	***//		C	Clay, fine sandy in laminations, wet, dull brown, soft, root matter common, no odor	0.0
	***//	17	C		
	***//		C		
	***//	18	C		
18.3-18.9	//////		C	Clay, blocky, slabby, wet, dull brown, firm, no odor	0.0
18.9-20.0	***//	19	C	Clay, very sandy, wet, brown, soft	0.0
	***//		C		
20.0-24.4	***OOO***	20	C	Sand, very gravelly, rounded to subrounded silica rock, some sandstone white, some	5 (upper 6")
	OOO		C	odor in upper 5", stained black to dark grey, water bearing, dense, multicolored	
	OOO		C	red brown matrix	
	OOO		C		
	OOO		C		
	OOO		C		
	OOO		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4'-1/4" HSA

PRECISION ENGINEERING, INC.

FILE #: 95-018
 ELEVATION: 6917.6
 TOTAL DEPTH: 30.0
 LOGGED BY: WHK
 DATE: 3-30-95
 STATIC WATER: 22.3
 BORING ID: B3
 PAGE: 2

PROJECT: Tank 569

LOCATION: See Boring Plan

LOG OF TEST BORINGS

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
	****000***		C		
	****000***	24	C		
24.4-25.0	-----		C	<u>CHINLE FORMATION</u>	
	-----	25	C	Shale, very sandy, weathered, grey, green, no odor, hard	0.0
25.0-30.0	-----		C	Shale, sandy, fissle, some green grey streaks, moist, hard	0.0
	-----		C		
	-----		C		
	-----		C		
	-----		C		
	-----		C		
	-----		C		
	-----		C		
	-----		C		
	-----		C		
	-----	30	C		
TD				stop drilling @ 4:05p water @ 4:20p -- 22.3' grout to surface with bentonite/cement	

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4'-1/4" HSA

FILE #:	97-032
ELEVATION:	6901.38
TOTAL DEPTH:	30.1'
LOGGED BY:	WHK
DATE:	3-23-97
STATIC WATER:	NOT FOUND
BORING ID:	MP-4
PAGE:	1

LOG-OF TEST BORINGS

[illegible]

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

FILE #:	97-032
ELEVATION:	6901.38
TOTAL DEPTH:	30.0'
LOGGED BY:	WHK
DATE:	3-23-97
STATIC WATER:	NOT FOUND
BORING ID:	MP-4
PAGE:	2

LOG OF TEST BORINGS

[illegible]

FILE #:	97-032
ELEVATION:	6898.39
TOTAL DEPTH:	41.2'
LOGGED BY:	WHK
DATE:	3-23-97
STATIC WATER:	24.0'
BORING ID:	MP-5
PAGE:	1

PAGE: 1

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

FILE #:	97-032
ELEVATION:	6898.39
TOTAL DEPTH:	41.2'
LOGGED BY:	WHK
DATE:	3-23-97
STATIC WATER:	24.0'
BORING ID:	MP-5
PAGE:	2

[illegible]

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

Site: CINI ZA REFINERY

Elevation: 6916.0

Date: 4-3-96

Logged By: WHK

Bore Point: TWO

LOG OF TEST BORINGS

Site: CINIZA REFINERY

Water Elev: 25.2'

GALLUP, NM

Elevation: 6916.0

Boring No.: MP-9

Date: 4-3-96

[illegible]



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Aguirre
Drilling Rig : CME75
Drilling Method : 7.25" Hollow-Stem Auger
Sampling Method : 2" Diameter Split Spoon
Comments : 2' Long
Total Depth : 20'
Ground Water : Not Encountered
Start Date : 5-11-2015
Finish Date : 5-11-2015

WELL NO. NDD-1

(Sheet 1 of 1)

Elev., TOC (ft.msl) :
Elev., PAD (ft. msl) :
Elev., GL (ft. msl) :
Site Coordinates :
N : N35°29.679'
E : W108°25.772'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
-2								
-1								
0								
1	4.1			ML	90		CLAYEY SILT, low,soft, dry to damp, reddish brown, no odor,	
2				CL	90		SILTY CLAY, low, very stiff, dry, reddish brown, no odor,	
3	8.1			CL	50		SILTY CLAY, SIMILAR TO ABOVE (STA), trace calcareous,	
4								
5	9.3			CL	50		SILTY CLAY, STA,	
6								
7	10.1			CL	60		SILTY CLAY, STA,	
8								
9	9.9			CL	40		SILTY CLAY, STA,	
10				CL	60		SILTY CLAY, STA,	
11	8.2			CL	60		SANDY CLAY, low, stiff, damp to dry, dark brown, no odor,	
12								
13	6.1			CL	60		SILTY CLAY, low, stiff, dry to damp, brown, no odor, calcareous,	
14								
15	5.2			CLST	60		CLAYSTONE, low, very stiff, damp to dry, reddish purple, no odor, trace grey,	
16								
17	5.1			CLST	60		CLAYSTONE, STA, increase in grey, no odor,	
18								
19	6.3			CLST	60		CLAYSTONE, STA, no odor, darker purple.	
20								

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512-693-4190



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Aguirre
Drilling Rig : CME75
Drilling Method : 7.25" Hollow-Stem Auger
Sampling Method : 2" Diameter Split Spoon
Comments : 2' Long
Total Depth : 20'
Ground Water : Not Encountered
Start Date : 5-11-2015
Finish Date : 5-11-2015

WELL NO. NDD-2

(Sheet 1 of 1)

Elev., TOC (ft.msl) :
Elev., PAD (ft. msl) :
Elev., GL (ft. msl) :
Site Coordinates :
N : N35°29.469'
E : W108°25.724'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
-2								
-1								
0								
1	9.7			CL	50		SILTY CLAY, low, soft to very stiff, damp to dry, reddish brown, no odor,	
2								
3	14.4			CL	50		SILTY CLAY, SIMILAR TO ABOVE (STA), very stiff, no odor,	
4								
5	17.1			CLST	50		CLAYSTONE, low, very stiff, dry, reddish purple, no odor, trace grey,	
6								
7	18.0			CLST	50		CLAYSTONE, STA, purple, no odor, very dense,	
8								
9	14.8			CLST	50		CLAYSTONE, STA, no odor,	
10								
11	16.3			CLST	50		CLAYSTONE, STA, purple and grey, no odor,	
12								
13	13.5			CLST	50		CLAYSTONE, STA, no odor,	
14								
15	12.2			CLST	50		CLAYSTONE, STA, no odor,	
16								
17	12.4			CLST	50		CLAYSTONE, STA, no odor,	
18								
19	10.8			CLST	50		CLAYSTONE, STA, no odor.	
20								

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Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Aguirre
Drilling Rig : CME75
Drilling Method : 7.25" Hollow-Stem Auger
Sampling Method : 2" Diameter Split Spoon
Comments : 2' Long
Total Depth : 16'
Ground Water : 10.52' BTOC on 5-14-2015
Start Date : 5-11-2015
Finish Date : 5-11-2015

WELL NO. NDD-3

(Sheet 1 of 1)

Elev., TOC (ft.msl) :
Elev., PAD (ft. msl) :
Elev., GL (ft. msl) :
Site Coordinates :
N : N35°29.612'
E : W108°25.612'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
-3								NDD-3 Top of Casing 2.83' Above Ground Level 2" Sch 40 PVC w/Threaded Joints Bentonite Pellets 10/20 Sieve Sand Filter Pack 2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints 2" Flush Threaded Sch 40 PVC Cap
0							SILTY CLAY, low, soft, damp, brown, no odor,	
1	14.2			CL	60			
2							SILTY CLAY, SIMILAR TO ABOVE (STA), firm, no odor,	
3	12.2			CL	80			
4							SILTY CLAY, STA, no odor,	
5	14.4			CL	70			
6							SILTY CLAY, high, firm, damp, light tan and brown, black organics, no odor,	
7	9.9			CH	90			
8							CLAY, high, firm, damp, brown trace light tan, no odor,	
9	10.7			CH	80			
10							CLAY, STA,	
11	11.9	▼		CH	80			
12				SC	80		CLAYEY GRAVELLY SAND, fine grain sand with sandstone gravel and low plastic clay, firm, moist to saturated, brown, no odor,	
13	13.9			CLST	50		CLAYSTONE, very stiff, damp to dry, purple grey, no odor,	
14							CLAYSTONE, STA, no odor.	
15	13.5			CLST	50			
16								
17								
18								
19								
20								

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Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : CME 75
Drilling Method : Hollow-Stem Auger 7.25"
Sampling Method : Split Spoon
Comments :
Total Depth : 20'
Ground Water : 10'
Start Date : 05/23/2016
Finish Date : 05/23/2016

BORING NO. NDD-4

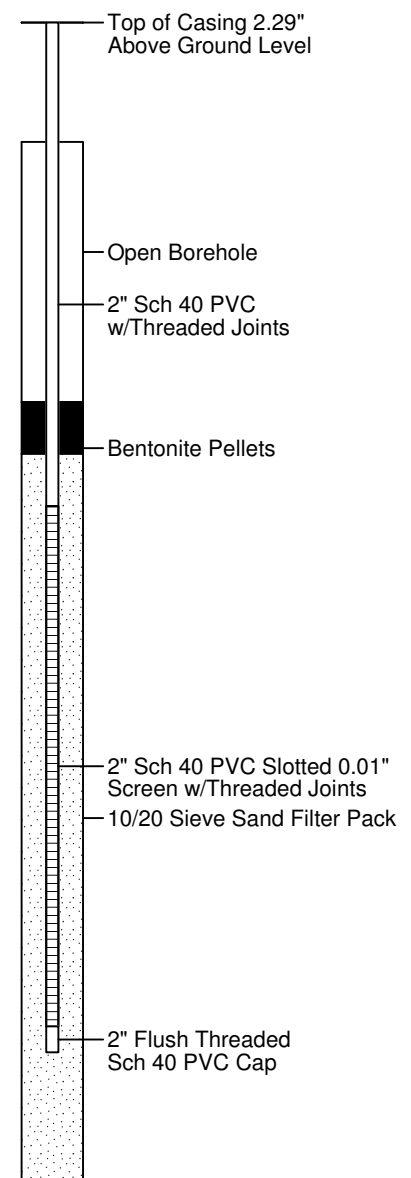
(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6913.02
Site Coordinates :
N : N 1635587.47
E : E 2546592.11

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation
							DESCRIPTION
-3							
-2							
-1							
0	3.5						SILTY CLAY, low, firm, damp, brown, no odor,
1							
2	7.1						
3	5.9			CL	100		
4							
5	7.0						
6							SANDY SILTY CLAY, SIMILAR TO ABOVE (STA), no odor, increase in sand with depth,
7	3.2			CL	90		
8							
9	4.9			CL	90		SANDY CLAY, low, soft, fine to medium grain sand in clay, sand seam 9.5-9.75', damp, brown, no odor,
10							
11	7.8			CL	90		SANDY CLAY, low, soft, medium to coarse grain sand, moist to saturated, brown, no odor,
12							
13	7.9			GW	50		SANDY GRAVEL, very coarse grain sand & 1/4" gravel, saturated, brown, no odor,
14							
15	6.7			GW	90		SANDY GRAVEL, STA, saturated, no odor,
16				CLST	90		CLAYSTONE, stiff, dry, reddish purple and grey, no odor,
17	5.9			CLST	50		CLAYSTONE, STA, brown, no odor,
18							
19	3.0			CLST	50		CLAYSTONE, STA, very stiff, no odor.
20							

Temporary Well Settings

TEMP WELL NO. NDD-4



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Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-5

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6913.91
Site Coordinates :
N : N 1635583.59
E : E 2546416.63

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION
0	6.5							SILT, low, soft, damp, odor at base.
1				ML	100			
2	339							
3								
4								
5								
6								
7								
8								
9								
10								

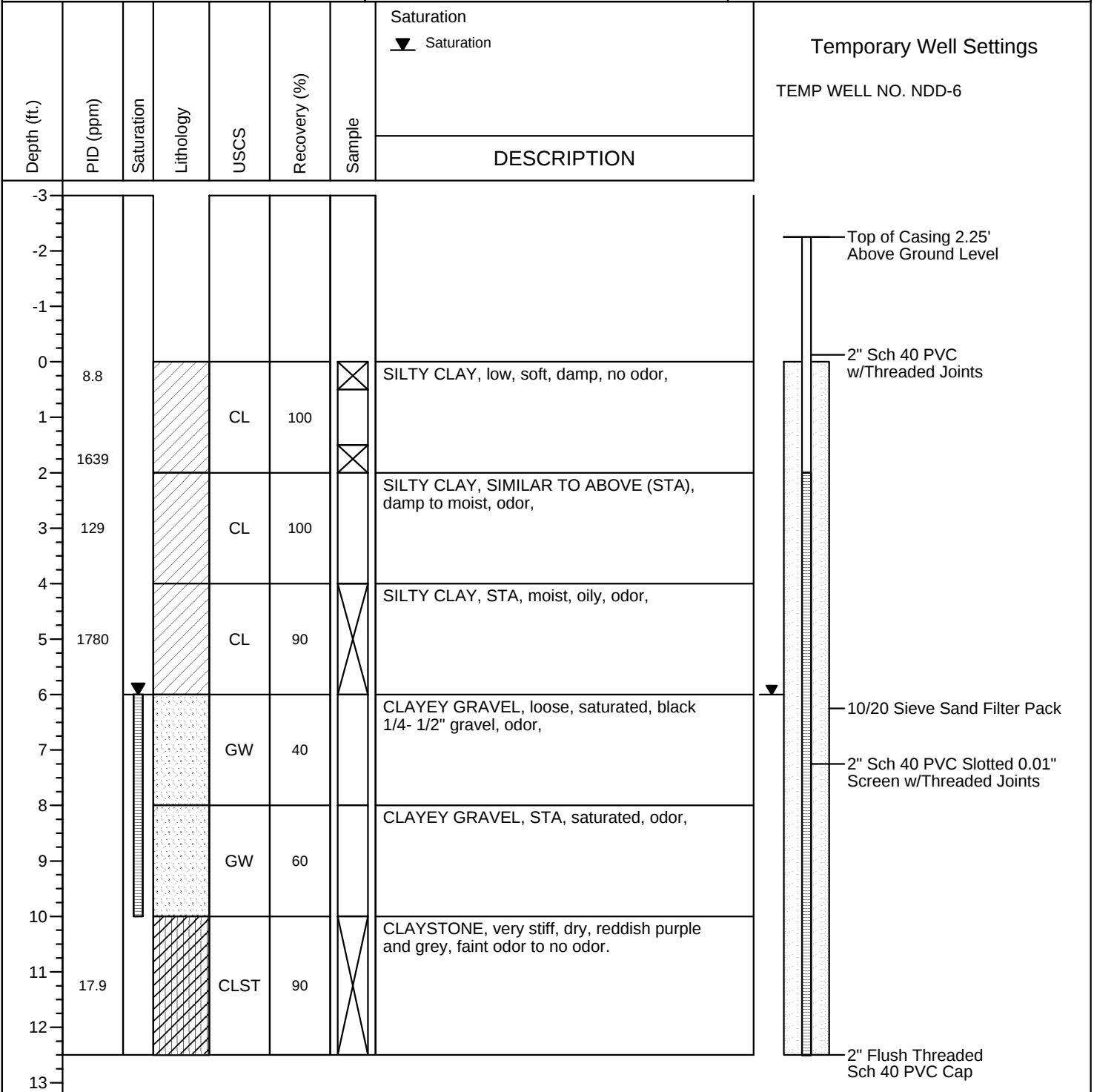
Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST16006

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : 7.25" Hollow Stem Auger
Sampling Method : Split Spoon
Comments : Hand Auger to 5' BGL
Total Depth : 12.5'
Ground Water : 6'
Start Date : 05/23/2016
Finish Date : 05/23/2016

BORING NO. NDD-6

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6912.97
Site Coordinates :
N : N 1635617.26
E : E 2546257.76





Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/23/2016
Finish Date : 05/23/2016

BORING NO. NDD-6A
(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6911.18
Site Coordinates :
N : N 35° 29.638'
E : W 108° 25.635'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
0	8.8			CL	100		SILTY CLAY, low, soft, damp to wet, odor.	
1								
2	1639							
3								
4								
5								
6								
7								
8								
9								
10								

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Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-7

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6911.38
Site Coordinates :
N : N 1635691.31
E : E 2546173.94

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
0	3.3			CL	100		SILTY CLAY, low, soft, damp, no odor.	
1								
2	9.4							
3								
4								
5								
6								
7								
8								
9								
10								



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-8

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6910.42
Site Coordinates :
N : N 1635677.68
E : E 2546167.50

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION
0	11.3							SILTY CLAY, low, soft, damp to moist, oily, odor at base.
1				CL	100			
2	904							
3								
4								
5								
6								
7								
8								
9								
10								



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-9

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6912.09
Site Coordinates :
N : N 1635667.33
E : E 2546160.89

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
0	18.5							
1				CL	100			
2	1530							
3								
4								
5								
6								
7								
8								
9								
10								



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-10

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6908.74
Site Coordinates :
N : N 1635765.48
E : E 2546031.06

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	8.8							SILTY CLAY, low, soft, damp, brown, no odor.	
1				CL	100				
2	12.3								
3									
4									
5									
6									
7									
8									
9									
10									

Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST16006

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : 7.25" Hollow Stem Auger
Sampling Method : 2' Split Spoon
Comments : Hand Auger to 2' BGL
Total Depth : 14' - Gravelly
Ground Water : 2'
Start Date : 05/23/2016
Finish Date : 05/23/2016

BORING NO. NDD-11

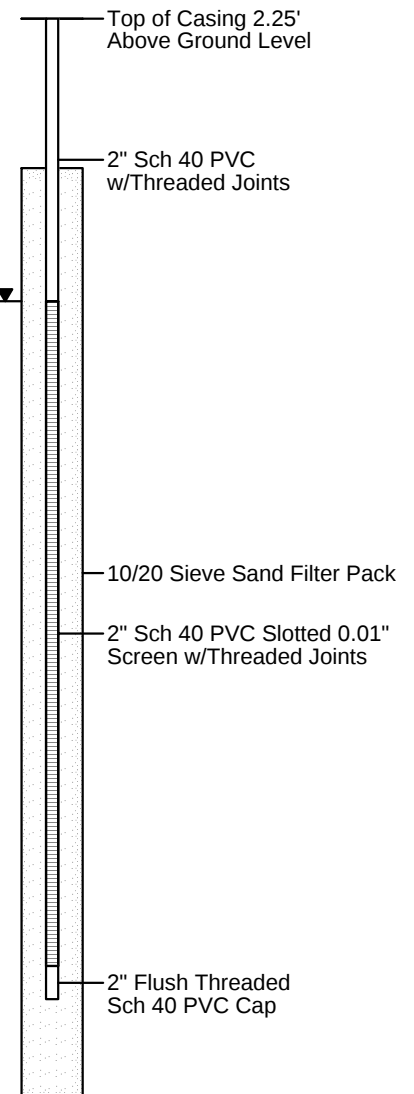
(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6908.54
Site Coordinates :
N : N 1635757.61
E : E 2546024.94

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation
							DESCRIPTION
-3							
-2							
-1							
0	3.2						
1				CL	100		GRAVELLY SILTY CLAY, low, soft, damp, brown, no odor,
2	4.6						
3				CL	100		SANDY CLAY, low, soft, very moist to saturated, brown, odor,
4							
5				SC	10		CLAYEY SAND, fine to medium, loose, saturated, black, odor,
6							
7				SC	90		CLAYEY SAND, SIMILAR TO ABOVE (STA), saturated, brown, odor,
8							
9				SM	50		SILTY SAND, fine to medium, loose, saturated, clay at base, brown, odor,
10							
11	29.3			CLST	20		CLAYSTONE, very stiff, reddish purple and grey, no odor,
12							
13	21.2			CLST	50		CLAYSTONE, STA, dry, no odor.
14							
15							

Completion Results

TEMP WELL NO. NDD-11





Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-12

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6910.72
Site Coordinates :
N : N 1635747.93
E : E 2546018.74

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	8.9							SILT, low, soft, damp, no odor, odor at base.	
1				ML	100				
2	66.4								
3									
4									
5									
6									
7									
8									
9									
10									



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-13

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6905.14
Site Coordinates :
N : N 1635872.71
E : E 2545854.34

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	5.6							SILTY CLAY, low, soft, damp, brown, no odor.	
1				CL	100				
2	8.0								
3									
4									
5									
6									
7									
8									
9									
10									



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-14

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6904.11
Site Coordinates :
N : N 1635858.65
E : E 2545847.68

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	5.7							SILTY CLAY, low, soft, damp to moist, brown, no odor.	
1				CL	100				
2	1.6								
3									
4									
5									
6									
7									
8									
9									
10									



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-15

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6905.27
Site Coordinates :
N : N 1635844.18
E : E 2545841.55

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	7.1			CL	100			SILTY CLAY, low, firm, damp to moist, brown, no odor.	
1									
2	6.3								
3									
4									
5									
6									
7									
8									
9									
10									



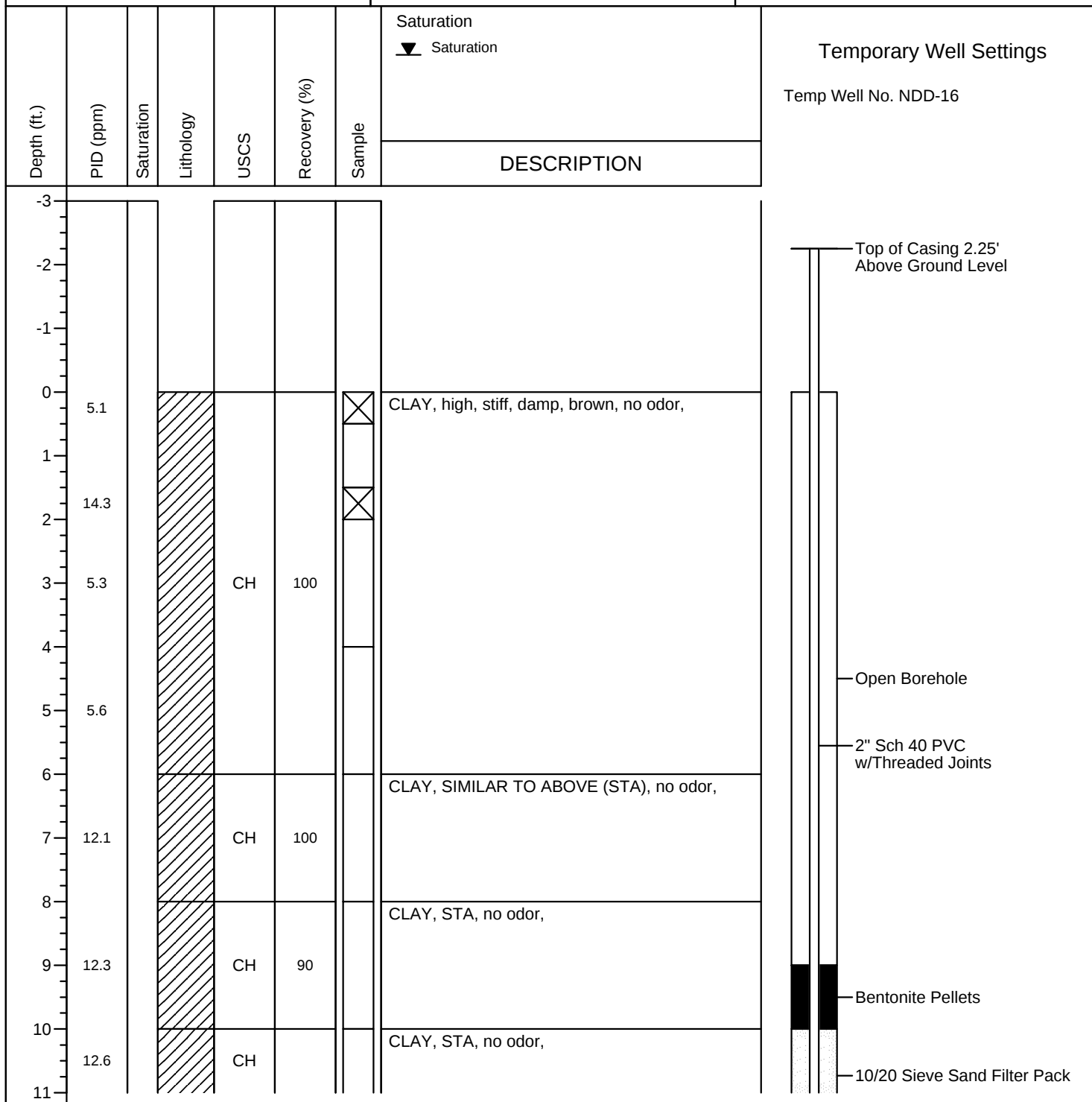
Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST16006

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : Hollow Stem Auger
Sampling Method : Split Spoon
Comments : Hand Auger to 5' BGL
Total Depth : 24' BGL
Ground Water : 16' BGL
Start Date : 05/24/2016
Finish Date : 05/24/2016

BORING NO. NDD-16

(Sheet 1 of 2)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6902.29
Site Coordinates :
N : N 1635916.92
E : E 2545737.03



1001 Louisiana Street, Suite 3250
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

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



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST16006

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : Hollow Stem Auger
Sampling Method : Split Spoon
Comments : Hand Auger to 5' BGL
Total Depth : 24' BGL
Ground Water : 16' BGL
Start Date : 05/24/2016
Finish Date : 05/24/2016

BORING NO. NDD-16

(Sheet 2 of 2)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6902.29
Site Coordinates :
N : N 35° 29' 41.01"
E : W 108° 25' 45.02"

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Temporary Well Settings Temp Well No. NDD-16
11	12.6			CH	90				
12				CH	80			CLAY, STA, no odor,	
13	12.0			CH	80				
14				CL	60			SILTY CLAY, low, soft, damp, brown, no odor,	
15	12.9			CL	60				
16				CL	90			GRAVELLY SANDY CLAY, low, firm, very moist to saturated in sand seams, brown, no odor,	
17				CL	90				
18				CL	60			GRAVELLY SANDY CLAY, STA, no odor,	
19				CL	60				
20	4.5			CLST	60			CLAYSTONE, very dense, trace fine grain sand, damp to dry, brown and grey, no odor, CLAYSTONE, STA,	
21	4.8			CLST	50				
22				CLST	60			CLAYSTONE, STA.	
23	4.2			CLST	60				
24									
25									

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Austin, Texas 78759
512-693-4190



Western Refining SW, Inc.
Gallup Refinery - North Drainage Ditch
Job No. WEST15005

Geologist : Tracy Payne
Driller : Enviro-Drill \ Cohagan
Drilling Rig : NA
Drilling Method : Hand Auger
Sampling Method : Auger Bucket
Comments :
Total Depth : 2'
Ground Water : Not Encountered
Start Date : 05/19/2016
Finish Date : 05/19/2016

BORING NO. NDD-17

(Sheet 1 of 1)

Elev., TOC (ft.msl) : NA
Elev., PAD (ft. msl) : NA
Elev., GL (ft. msl) : 6903.49
Site Coordinates :
N : N 1635917.01
E : E 2545737.01

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results
0	4.5							SILTY CLAY, low, firm, damp, brown, no odor.	
1				CL	100				
2	9.8								
3									
4									
5									
6									
7									
8									
9									
10									

Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Augers
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 40'
Ground Water : Not Encountered
Start Date : 03/15/2018
Finish Date : 03/15/2018

WELL NO. OW-62

(Sheet 1 of 3)

Elev., TOC (ft.msl) : 6937.36
Elev., PAD (ft. msl) : 6934.73
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634866.14
E : 2545914.00

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Rec overy (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
-2								OW-62 Steel Protective Casing Concrete Pad 4' x 4' x 4' Grout 4" Sch 40 PVC w/Threaded Joints Bentonite Pellets 10/20 Sieve Sand Filter Pack 4" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints
-1								
0							Hydroexcavated to 10' - Collapsed to 9' - no fluid,	
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11	0			ML	50		CLAYEY SILT, very fine, stiff, dry, crumbly, no odor, light brown,	
12								
13	0.1			CL	50		SILTY CLAY, SIMILAR TO ABOVE (STA), , increase in clay content,	
14								
15	0.3			CL	60		SANDY SILTY CLAY, low, firm, damp, very fine grain sand seams, brown, no odor,	
16								
17	0.3			CL	80		SANDY CLAY, low, firm, damp,brown, no odor,	
18				GW	80		SANDY GRAVEL, 20 to10 mm gravel with coarse grain sand, loose, damp,brown, no odor.	

Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Augers
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 40'
Ground Water : Not Encountered
Start Date : 03/15/2018
Finish Date : 03/15/2018

WELL NO. OW-62
(Sheet 2 of 3)

Elev., TOC (ft.msl) : 6937.36
Elev., PAD (ft. msl) : 6934.73
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634866.14
E : 2545914.00

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Rec overy (%)	Sample	Saturation ▼ Saturation	Completion Results OW-62
							DESCRIPTION	
18							CLAYEY SANDY GRAVEL, STA except clay present, very moist, hydrocarbon (HC) odor, ,	
19	3380			GC	80			
20							CLAYEY SANDY GRAVEL, STA, damp to moist, HC odor,	
21	82.9			GC	70			
22							SILTY CLAY, low, soft, trace sand,calcareous, damp to moist, reddish brown, HC odor,	
23	33			CL	60			
24							SILTY CLAY, low, stiff, damp,reddish brown, HC odor,	
25	800			CL	70			
26							SILTY CLAY, STA, calcareous, odor,	
27	555			CL	80			
28							CLAY, high, very stiff, damp,reddish brown, faint odor,	
29	56			CH	90			
30							SILTY CLAY, low, firm/crumbly, damp,reddish brown, trace grey, no odor,	
31	351			CL	90			
32							SILTY CLAY, STA,	
33	125			CL	90			
34							SILTY CLAY, STA,	
35	159			CL	90			
36							SILTY CLAY, STA,	
37	91			CL	90			
38								

4" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints

10/20 Sieve Sand Filter Pack

4" Flush Threaded Sch 40 PVC Cap

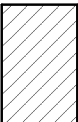
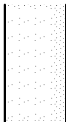
Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Augers
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 40'
Ground Water : Not Encountered
Start Date : 03/15/2018
Finish Date : 03/15/2018

WELL NO. OW-62

(Sheet 3 of 3)

Elev., TOC (ft.msl) : 6937.36
Elev., PAD (ft. msl) : 6934.73
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634866.14
E : 2545914.00

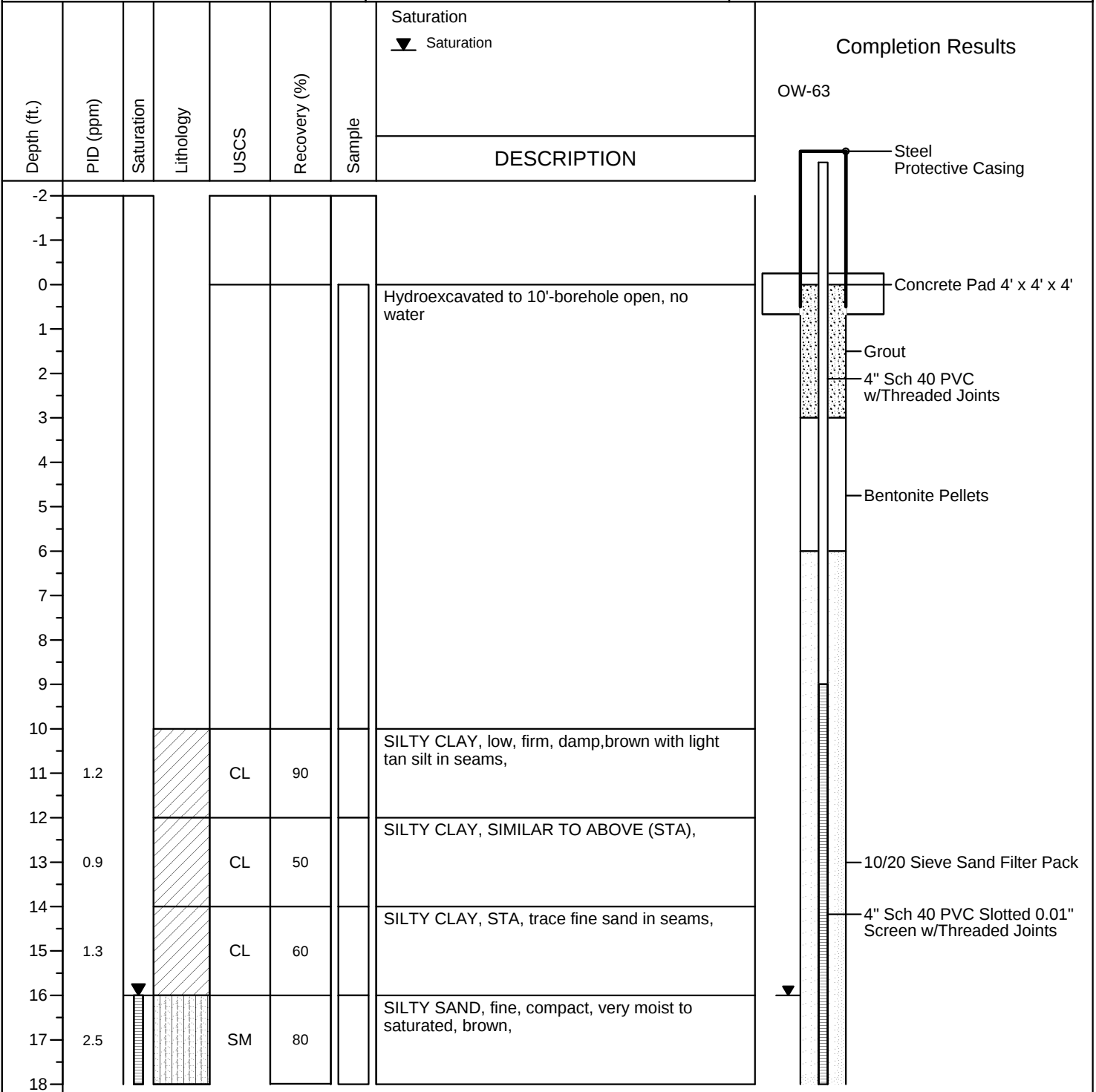
Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Rec overy (%)	Sample	Saturation ▼ Saturation	Completion Results OW-62
							DESCRIPTION	
38	44			CL	90		SILTY CLAY, STA.	 10/20 Sieve Sand Filter Pack
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								

Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Auger
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 32
Ground Water : 16'/25'
Start Date : 03/14/2018
Finish Date : 03/14/2018

WELL NO. OW-63
(Sheet 1 of 2)

Elev., TOC (ft.msl) : 6935.06
Elev., PAD (ft. msl) : 6932.34
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634859.73
E : 2546756.41



Andeavor
Gallup Refinery - French Drain Release
WEST18012

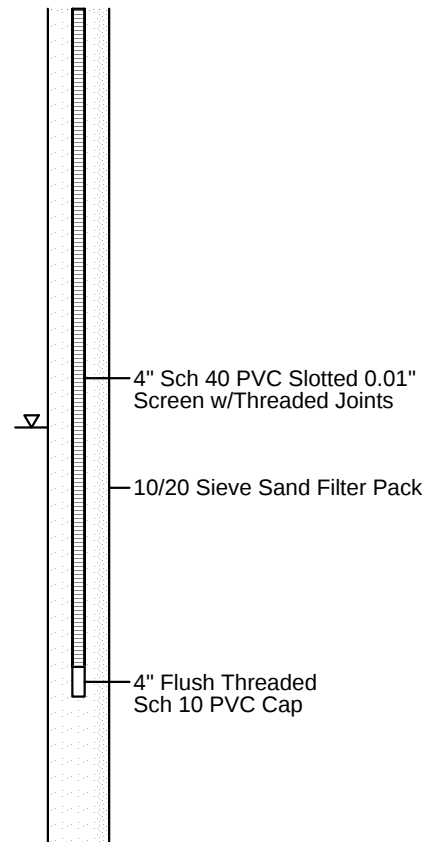
Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Auger
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 32
Ground Water : 16'/25'
Start Date : 03/14/2018
Finish Date : 03/14/2018

WELL NO. OW-63

(Sheet 2 of 2)

Elev., TOC (ft.msl) : 6935.06
Elev., PAD (ft. msl) : 6932.34
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634859.73
E : 2546756.41

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results OW-63
18								SANDY SILTY CLAY, low, firm, damp, occasional gravel, brown, odor,	
19	428			CL	80				
20								SILTY SANDY CLAY, STA, moist in sand seams at base, odor,	
21	652			CL	80				
22								SILTY SANDY CLAY, STA, odor,	
23	275			CL	70				
24				CH	70			CLAY, high, soft to firm,damp,brown, odor,	
25	39			CH	90			CLAY, STA, odor,	
26	28			GC	90			CLAYEY GRAVEL, sandstone gravel in pink/brown/olive green clay and silt, coarse sand present, saturated, odor,	
27	150			GC	90			CLAYEY GRAVEL, STA, saturated, odor,	
28								WEATHERED SANDSTONE, very dense, dry, grey to light purple, faint odor,	
29	40				90				
30								WEATHERED SANDSTONE, STA, grey and light purple.	
31	10.9				50				
32									
33									
34									
35									
36									
37									
38									



GALLUP TANK CAPACITY LIMITS

Updated 11/30/12

TANK	PRODUCT	SAFE FILL HEIGHT	BBLs TOTAL CAPACITY	APPROXIMATE LOW GAUGE	HEEL BBLs	OUTAGE GAUGE	BBL/FT	ROOF TYPE	SAFE LOW GAUGE
101	CRUDE	44-0	74,360	10-0	2,419	48-7 1/2	1690	INTERNAL FLOATING	15-0
102	CRUDE	44-0	74,360	1-7	2,678	53-10 1/2	1690	EXTERNAL FLOATING	6-0
105	RERUN OIL	13-6	216	0-8	13	15-6 1/4	16	CONE	
106	DHT FEED	30-0	4,680	0-8 5/8	100	32-8 1/2	156	CONE	
107	RERUN OIL	30-0	4,680	6-0	229	32-8 3/4	156	CONE	
108	RERUN OIL	27-0	4,368	1-4 5/8	216	32-8 3/4	156	INTERNAL FLOATING	4-0
111	DIESEL-RUNDOWN	30-0	4,680	0-11 3/8	137	32-9 1/8	156	CONE	
112	DIESEL-RUNDOWN	30-0	4,680	0-3 1/4	137	32-8 3/4	156	CONE	
115	DIESEL-RUNDOWN	30-0	4,680	3-9 1/4	582	32-8 1/4	156	CONE	
116	DIESEL-RUNDOWN	30-0	4,680	3-8 3/8	569	32-8 7/8	156	CONE	
225	DHT FEED	38-0	23,788	2-0 3/8	1,166	40-1 3/4	626	CONE	
226	DHT FEED	38-0	23,788	2-1 5/8	1,217	40-5	626	CONE	
227	DHT FEED	30-0	4,680	1-1 3/4	176	32-11 5/8	156	CONE	
228	DHT FEED	30-0	4,680	1-6 7/8	229	33-3 1/2	156	CONE	
231	TRANSMIX	30-0	4,680	0-8 1/2	98	32-8 1/4	156	CONE	
232	TRANSMIX	30-0	4,680	0-8	98	32-9	156	CONE	
235	SOUR NAPHTHA	30-0	4,680	1-1	107	32-8 1/4	156	CONE	
337	SOUR NAPHTHA	36-0	19,000	2-6	923	42-0	500	INTERNAL FLOATING	5-0
338	SWEET NAPHTHA	38-0	23,788	1-3 7/8	778	40-8 3/4	626	CONE	
339	SOUR NAPHTHA	38-0	23,826	0-11 3/4	567	41-1 7/8	627	CONE	
342	ETHANOL	30-0	4,680	1-1 3/4	176	32-8 3/8	156	CONE	
343	ETHANOL	30-0	4,680	1-2 3/8	176	32-8 3/4	156	CONE	
344	OUT-OF-SERVICE	38-0	19,000	2-4	1,167	42-7 1/2	500	INTERNAL FLOATING	5-0
345	REFORMATE BLENDSTOCK	36-0	19,000	2-1 3/4	1,295	42-5 5/8	500	INTERNAL FLOATING	5-0
451	OUT-OF-SERVICE	14-0	882	4-0	81	16-8 1/4	63	CONE	
452	OUT-OF-SERVICE	14-0	882	4-0	61	16-9 1/4	63	CONE	
453	OUT-OF-SERVICE	30-0	4,680	4-0		32-9 1/4	156	CONE	
567	83.0 UNLEADED REGULAR	35-0	17,500	1-4 1/2	629	40-0	500	EXTERNAL FLOATING	5-0
569	LT CAT GASOLINE BLENDSTOCK	37-0	22,977	1-1	619	40-0	621	EXTERNAL FLOATING	5-0
570	83.0 UNLEADED REGULAR	37-0	22,977	1-1	619	40-0	621	EXTERNAL FLOATING	5-0
571	89.0 UNLEADED REGULAR	37-0	22,977	1-1	619	40-0	621	EXTERNAL FLOATING	5-0
572	89.0 UNLEADED REGULAR	37-0	22,977	1-1	619	40-0	621	EXTERNAL FLOATING	5-0
573	OUT-OF-SERVICE	12-0	168	0-9		40-0	14	CONE	
574	STRAIGHT RUN GASOLINE	37-5	37,304	3-1	1,108	40-0	997	EXTERNAL FLOATING	6-0
575	DIESEL-ULSD	38-0	9,576	4-0	1,012	40-9 5/8	252	CONE	
576	OUT-OF-SERVICE	37-5	37,304	3-1	2,118	40-0	997	EXTERNAL FLOATING	6-0
577	DIESEL-ULSD	38-0	9,576	0-11 3/4	216	40-9	252	CONE	
579	DIESEL-ULSD	38-0	19,114	1-8	796	40-8 7/8	503	CONE	
581	DHT FEED	35-0	23,788	2-5	1,531	40-9 1/8	626	INTERNAL FLOATING	5-0
582	83.0 UNLEADED REGULAR	35-0	21,910	1-8	955	40-9 5/8	626	INTERNAL FLOATING	5-0

GALLUP TANK CAPACITY LIMITS

Updated 11/30/12

TANK	PRODUCT	SAFE FILL HEIGHT	BBLs TOTAL CAPACITY	APPROXIMATE LOW GAUGE	HEEL BBLs	OUTAGE GAUGE	BBL/FT	ROOF TYPE	SAFE LOW GAUGE
583	DIESEL-JULSD	34-0	47,430	3-7	3,334	42-1 1/4	1400	INTERNAL FLOATING	
554	OLEFINS	9-9	2,033	0-5 1/2	30	10-10	-	BULLET	6-0
555	ISO-BUTANE	9-9	2,033	0-5	26	10-10	-	BULLET	
556	PROPANE	8-2	673	0-8	21	9-3	-	BULLET	
557	PROPANE	8-2	673	0-8	21	9-3	-	BULLET	
560	BUTANE	10-0	1,367	0-8	31	11-9	-	BULLET	
561	BUTANE	10-0	1,367	0-9	38	11-9	-	BULLET	
562	ALKYLATE BLENDSTOCK	46-0	20,241	1-8	395	52-1 3/4	500 *	ELLIPSOID	
563	REFORMATE BLENDSTOCK	46-0	20,277	3-6	422	51-7 1/2	500 *	ELLIPSOID	7-0
564	NATURAL GASOLINE	38-0	4,967	0-9 7/8	277	48-6 1/4	126	ELLIPSOID	
565	REFORMATE BLENDSTOCK	38-0	4,963	1-4	339	48-6 1/4	126	ELLIPSOID	
446	OLEFINS	8-0	678	0	0	8-10	-	BULLET	
447	ISO BUTANE	10-0	1,367	0-2 1/2	3	11-9	-	BULLET	1-0
448	ISO BUTANE	10-0	1,367	0-4	11	11-9	-	BULLET	1-0
701	FCC FEED	31-0	33,821	0-11 1/2	971	34-11 1/4	1091	CONE	
702	OUT-OF-SERVICE	39-0	24,492	0-11	568	41-1	628	CONE	
703	FCC FEED	38-0	23,902	0-9 1/4	570	40-3 1/4	629	CONE	
704	FCC FEED	30-0	9,420	0-9 1/2	215	31-0 1/2	314	CONE	
705	FCC FEED	30-0	9,375	0-11 1/2	591	32-3	312-5	CONE	
706	FUEL OIL	30-0	9,450	2-6	593	32-4 5/8	315	CONE	
707	OUT-OF-SERVICE	16-0	944	1-2	55	17-10 1/2	59	CONE	
708	OUT-OF-SERVICE	13-0	910	1-2	66	15-2	70	CONE	
709	OUT-OF-SERVICE	13-0	936	0-11 3/4	66	15-1 1/4	72	CONE	
713	OUT-OF-SERVICE	15-0	-	-	-	17-8	-	CONE	
714	FCC FEED	38-0	28,500	0-9 1/8	673	40-9 1/2	750	CONE	
1	DIESEL-JULSD	22-3	2,803	1-2	252	24-9 5/8	126	INTERNAL FLOATING	6-0
2	83.0 UNLEADED REGULAR	29-11	3,769	2-8	257	35-1 3/4	126	INTERNAL FLOATING	6-0
3	89.0 UNLEADED REGULAR	29-11	3,769	1-2	256	35-1 1/8	126	INTERNAL FLOATING	6-0
4	83.0 UNLEADED REGULAR	28-9	3,507	6-5 7/8	253	35-2 1/4	122	INTERNAL FLOATING	6-0
5	ETHANOL	24-0	1,536	1-2	129	28-7	64	CONE	6-0
6	ETHANOL	22-0	1,419	0-10 1/4	53	28-5	64	INTERNAL FLOATING	4-0
7	ISOMERATE	4-10	274	1-4	0	6-3	-	BULLET	
568	OUT-OF-SERVICE	19-0	1659	2-0	77	24-8 3/4	86	INTERNAL FLOATING	5-0
117	JP-8 DEICER	14-0	196	0-6	-	16-9	14	CONE	

* BBL/FT IN THE STRAIGHT SIDEWALL SECTION

** AVOID LOW GAUGE BELOW THIS LEVEL WITHOUT APPROVAL

*** LPG TANKS THAT CAN'T BE GAUGED FOR AUDITING PURPOSES

TANK NUMBER	TYPE OF TANK	YEAR BUILT	ROOF TYPE	ACTUAL CAPACITY	TANK DIAMETER	TANK HEIGHT/ LENGTH	PRODUCT	LAST EXTERNAL INSPEC.	INSPEC. INTERVAL (YEARS)	NEXT EXTERNAL INSPEC.	Next Shell UT Inspection	LAST INTERNAL INSPEC.	INSPEC. INTERVAL (YEARS)	NEXT INTERNAL INSPEC.	COMMENTS
MKT-TK-01	VERT. STEEL	1965	CFRT	3,000	30'-0"	24'-0"	ULSD	Dec-14	5	Dec-19	Dec-25	Feb-06	0.5	Sep-06	
MKT-TK-02	VERT. STEEL	1965	IFRT	4,000	30'-0"	32'-0"	83 OCTANE	Dec-14	5	Dec-19	Apr-23	May-08	10	May-18	
MKT-TK-03	VERT. STEEL	1965	IFRT	4,000	30'-0"	32'-0"	89 OCTANE	Dec-14	5	Dec-19	Nov-25	Aug-13	12	Aug-25	NNP; Dome fixed roof. 7/2005; new vapor seal (primary only). 8/2013: internal inspection with MFE no indications found, new internal coating (add 2 years to next internal inspection); records indicate that a new seal was installed by TANCO.
MKT-TK-04	VERT. STEEL	1970	IFRT	3,800	30'-0"	32'-0"	83 OCTANE	Dec-14	5	Dec-19	Jul-23	Aug-08	12	Aug-20	Dome fixed roof. 9/2008: new mechanical shoe seal (primary only). 9/2008: new internal coating Phenicon HS tested per NACE, extends internal inspection 2 years
MKT-TK-05	VERT. STEEL	1963	CFRT	1,800	25'-0"	28'-0"	ETHANOL	Dec-14	5	Dec-19	Aug-24	Sep-09	12	Aug-21	NNP; 10/2009; repairs by SunFab, internally coated with Phenicon HS tested per NACE, new external coating on lower shell course, added radar gauge, new cleanout MW
MKT-TK-06	VERT. STEEL	1963	IFRT	1,800	21'-6"	28'-0"	ETHANOL	Oct-14	5	Oct-19	Oct-29	Oct-14	19.5	Apr-34	Repairs and new internal roof made in 1998; 2014 repairs-roof nozzle gaskets changed on internal roof penelrations, bearing pad installed under center column, repairs to secondary wiper seal, reloaded roof to ensure it would not get stuck
MKT-TK-07	VERT. STEEL	2011	IFRT	91392 g	24'-0"	32'-0"	EMPTY TANK		5	5 yrs after initial service	5 yrs after initial service		25 or 20	Pending initial service date	Hydrotested in April 2012. Never been in service as of 11/2014. Dome fixed roof. Tank has a double bottom with leak detection, HDPE liner, and cathodic protection. This allows for the next interval to be set 25 years after the tank goes into service, but CP system must be maintained and inspected per API 651 in order to use 2040 as the next inspection interval date. All inspection intervals to be set from the date the tank goes into service.
MKT-TK-08	VERT. STEEL	2011	IFRT	91392 g	24'-0"	32'-0"	EMPTY TANK		5	5 yrs after initial service	5 years after initial service		25 or 20	Pending initial service date	Hydrotested in April 2012. Never been in service as of 11/2014. Dome fixed roof. Tank has a double bottom with leak detection, HDPE liner, and cathodic protection. This allows for the next interval to be set 25 years after the tank goes into service, but CP system must be maintained and inspected per API 651 in order to use 2040 as the next inspection interval date. All inspection intervals to be set from the date the tank goes into service.
MKT-TK-09	HORIZONTAL	1998	FLATHEAD	12,000 g	7'-11"	32'-0"	BIDIESEL	NO DATA	1	Jan-99	Jan-13	NO DATA		See STI Code	Horizontal Tank-Double W all containment (TK-1); Category 1 tank per STI SP001, follow inspection schedule from this standard;
MKT-TK-10	HORIZONTAL	1998	FLATHEAD	12,000 g	7'-11"	32'-0"	BIDIESEL	NO DATA	1	Jan-99	Jan-13	NO DATA		See STI Code	Horizontal Tank-Double W all containment (TK-2); Category 1 tank per STI SP001, follow inspection schedule from this standard;
Q-T2	VERT. STEEL	1956	FRT	149	10'-0"	8'-0"	CAUSTIC MIX (NaOH	Dec-13	5	Dec-18	Dec-18	NO DATA	10	ASAP	NNP; no record of any internal inspection; see Ultrapipe for UT data; manway present, inside concrete containment with sewer drain
Q-T3.1	VERT. STEEL	2012	FRT	210	10'-0"	15'-0"	CAUSTIC (50%	Jul-13	2.6	Feb-16	Feb-16	Jul-13	10	Jul-23	Repairs made in 7/2013, new stainless steel heating coils; replaced Q-T3; see Ultrapipe for UT readings; inside concrete containment
Q-T6	VERT. STEEL	1969	FRT	18	5'-0"	4'-3/4"	NIS (CAUSTIC (NaOH <50%)	May-10	5	May-15	ASAP	NO DATA	10	ASAP	NNP. Caustic mix tank for Kero Merox Reactor Vessel Recharge; no inspection history on record; manway present, inside a concrete containment with a sewer drain
Q-T8	VERT. STEEL	1963	FRT	149	10'-0"	8'-0"	CAUSTIC (NaOH	May-10	5	May-15	May-15		10	ASAP	
SR-T10	PLASTIC	1993	FRT	775 g	4'-0"	8'-10"	NIS	NO DATA	1	Mar-94		NO DATA		See STI Code	Fiberglass Tank. Old XUS 43850 (CA299) Chemical tank; product store was Unit chelate deinventory storage. Code: ASME/ANSI Standard RTP-1, ASTM D-3299, or D-4097; no manway, inside a concrete containment with sewer drain
SR-T4	PLASTIC	1992	FRT	4000 g	10'-4"	7'-1"	IRON CHELATE	Apr-10	1	Apr-11		NO DATA		See STI Code	Fiberglass Tank. Iron Chelate Solution Surge Tank; specific gravity 1.3; no manway, inside a concrete containment with sewer drain
SR-T5	PLASTIC	1992	FRT	3000 g	6'-0"	15'-2"	IC-110 STORAGE	May-10	1	May-11		NO DATA		See STI Code	Fiberglass Tank; no manway, inside a concrete containment with sewer drain
SR-T6	PLASTIC	1992	FRT	3000 g	6'-0"	15'-2"	IC-210 STORAGE	May-10	1	May-11		NO DATA		See STI Code	Fiberglass Tank; no manway, inside a concrete containment with sewer drain
SR-T7	PLASTIC	1993	FRT	110 g	2'-6"	4'-6"	CAUSTIC DAY STORAGE	May-10	1	May-11		NO DATA		See STI Code	NNP; Polyethylene tank; no manway, inside a concrete containment with sewer drain
SR-T8	PLASTIC	1993	FRT	775 g	4'-0"	8'-10"	NIS	NO DATA	1	Feb-94		NO DATA		See STI Code	Plastic Tank. Old CA100 chemical tank. Material: derakane 411; no inspection history; no manway; inside a concrete containment with sewer drain
SR-T9	PLASTIC	1993	FRT	775 g	4'-0"	8'-10"	NIS	NO DATA	1	Feb-94		NO DATA		See STI Code	Plastic Tank. Old CA200 (2102) chemical tank. Material: derakane 411; no inspection history; no manway; inside a concrete containment with sewer drain
S-T1	HORIZONTAL		FLATHEAD	18	4'-0"	6'-4"	ETHYLENE GLYCOL/WATER	Oct-10	4.8	Aug-15	Aug-15	NO DATA	10	See STI Code	SATS Unit. 50/50 (antifreeze); see Ultrapipe for UT data; shell heads damaged and never repaired; manway present; concrete containment present with sewer drain
SW S-TK1 TK-1001	VERT. STEEL HORIZONTAL	2006	IFRT FLATHEAD	1,000 3,000 g	156" 5'-4"	30'-0" 18'-0"	SOUR WATER FEED DIESEL	Dec-14 Jun-10	1 5	Dec-15 Jun-15	Dec-29 Jun-15	Aug-06 NO DATA	10	Aug-16 See STI Code	SW AATS AREA; insulated; records indicate that an internal roof was installed; MANDATORY annual external inspection required NNP; for W estern consumption; NO MANW AY, no containment, on skid plate; Category 3 tank per STI SP001 code
TK-1002	HORIZONTAL		FLATHEAD	3,000 g	5'-4"	18'-0"	GASOLINE	Jun-10	5	Jun-15	Jun-10	NO DATA		See STI Code	NNP; for W estern consumption; NO MANW AY, no containment; Category 3 tank per STI SP001 code
TK-1003	HORIZONTAL		FLATHEAD	2,300 g	5'-9"	12'-3 1/2"	DIESEL POUR POINT ADD.	Jun-10	5	Jun-15	Jun-15	NO DATA		See STI Code	Insulated; no manway, on skids, inside a concrete containment which has a drain routed to the oily water sewer; Category 1 tank per STI SP001 code
TK-1004	HORIZONTAL		FLATHEAD	4,000 g	7'-0"	14'-0"	DIESEL LUBRICITY	Jun-10	5	Jun-15	Jun-15	NO DATA		See STI Code	Insulated; 18" manway present, on skids, inside a concrete containment with a drain valve; Category 1 tank per STI SP001 code
TK-101	VERT. STEEL	1957	IFRT	80,000	110'-0"	48'-0"	CRUDE	Aug-14	5	Aug-19	Mar-28	May-06	10	May-16	2019 inspection: take UT's on shell
TK-102	VERT. STEEL	1991	EFRT	80,000	110'-0"	51'-0"	CRUDE	Aug-14	2.4	Jan-17	May-19	Jun-05	10	Jun-15	NNP
TK-105	VERT. STEEL	2001	CFRT	400	12'-0"	20'-0"	SLOP	Dec-10	5	Dec-15		Jun-01	10	Jun-11	API 12F; previously labeled Tank 157, Due for internal inspection in 2015
TK-106	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	DISTILLATE	Nov-14	5	Dec-19	Nov-29	Nov-14	22	Nov-36	1/2010 repairs: change of service to Sour Naphtha, new 6" and 8" nozzle with shell insert, new external Phenicon coating on shell and roof, new 8" roof nozzle for radar gauge, and tank was hydrotested. 11/2014: internal inspection with MFE, by ITI, no indications found or leaks; MFE repair threshold was set for a 20 year inspection interval; new internal Phenicon epoxy coating, added 2 years to next inspection interval because of new internal coating.
TK-107	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	SLOP	Nov-14	5	Nov-19	Nov-29	Feb-02	12	Feb-14	2002: last internal inspection with MFE by Conam, no indications found. 2004: repairs performed were new bottom annular ring, new 1st course 30" height, new 24" sump, part of the top shell replaced (32' x 8') north side, new 24" MW with mixer, new roof plates and rafters, new external coating Macropoxy/Acrolon, and new internal coating Phenicon HS epoxy Novolac. New internal coating adds 2 yrs to next internal inspection.
TK-108	VERT. STEEL	1957	IFRT	5,000	33'-6"	32'-0"	SLOP	Nov-14	1.6	Jun-16	Jan-18	May-11	12	May-23	2001: repairs by TANCO, new internal steel roof, gauge pole/ladder, primary/secondary seals. (2) overflows. 5/2011; last internal inspection with MFE, new internal coating Phenicon, and new external coating. Take shell UT's at the June 2016 inspection.
TK-111	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	ULSD RUNDOW N	Dec-14	5	Dec-19	Dec-29	May-06	10	May-16	2000: internal inspection, MFE found indication and repairs were made; new internal coating. 2006: BLD performed MFE
TK-112	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	ULSD RUNDOW N	Dec-14	5	Dec-19	Dec-29	Mar-06	12	Mar-18	2006: internal inspection with MFE, no indications found, new internal coating and roof repairs. New coating adds 2 year to next internal inspection
TK-115	VERT. STEEL	2008	CFRT	5,000	33'-6"	32'-0"	ULSD RUNDOW N	Dec-14	5	Dec-19	Dec-29	NO DATA	22	Jan-30	2008: new tank built as a double bottom over the existing tank bottom, HDPE liner with sand, sacrificial anodes installed inside tank, internal Phenicon HS coating, external coating. Double bottom secondary containment adds 10 year, plus 2 years for internal coating, plus the 10 years for the initial inspection-next internal interval 22 years.
TK-116	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	ULSD RUNDOW N	Dec-14	5	Dec-19	Dec-29	Mar-06	5	May-11	3/2006: MFE by BLD- no indications found, new first shell course, reveleated tank, 1/3 of roof replaced, replaced center column, new bottom sump, new internal/external coating. Thomas D'Souza and Tim Evans set the next internal inspection for May 2011, per the report (does not give a reason)
TK-225	VERT. STEEL	1957	CFRT	25,000	67'-0"	39'-8"	SOUR NAPHTHA	Sep-14	5	Sep-19	Sep-29	JUN-'06	22	Jun-28	2006: new 3/16" roof, new double bottom with HDPE liner, leak detection, sand, and coating
TK-226	VERT. STEEL	1957	CFRT	25,000	67'-0"	39'-8"	KERSENE	Sep-14	5	Sep-19	Sep-29	JUN-'06	22	Jun-28	2006: new double bottom with HDPE liner, leak detection, and coating
TK-227	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	ULSD	Oct-14	3.4	Mar-18	Aug-21	Oct-14	19	Oct-33	

TK-228	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	DISTILLATE	14-Oct	5	Oct-19	Oct-28	Nov-08	12	Nov-20	2009 repairs: new internal liner, external coating, minor repairs on floor, 8" roof nozzle, new sump and swing line
TK-231	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	TRANSMIX	Nov-14	5	Nov-19	Nov-29	May-94	10	May-04	No record of a formal internal inspection. 1991: added pontoons to the suction line and (3) new sample nozzles on shell 1994: new internal coating
TK-232	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	TRANSMIX	Nov-14	5	Nov-19	Nov-29	Dec-93	10	Dec-03	Phenolic Epoxy
TK-235	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	SOUR NAPHTHA	Dec-14	5	Dec-19	Dec-29	Mar-11	12	Mar-23	2011: MFE found no indications greater than 0.04", new 8" roof nozzle for radar, new internal/external coating. Internal coating add 2 years to next internal inspection.
TK-337	VERT. STEEL	1977	IFRT	20,000	60'-0"	42'-0"	SOUR NAPHTHA	Dec-14	5	Dec-19	Dec-29	Jan-00	12	Jan-12	1990: new 1/4" floor installed; 2000: internal inspection with MFE, new internal steel roof with primary/secondary seals, repaired hole in bottom, new internal coating add 2 years to next internal inspection
TK-338	VERT. STEEL	1984	CFRT	25,000	67'-0"	40'-0"	SW EET NAPHTHA	Dec-14	5	Dec-19	Dec-29	DEC-83	10	Dec-83	
TK-339	VERT. STEEL	1957	CFRT	25,000	67'-0"	40'-0"	SOUR NAPHTHA	AUG-06	5	Aug-11	Aug-11	AUG-06	10	AUG-16	Scheduled for internal inspection early 2015
TK-342	VERT. STEEL	1957	IFRT	5,000	33'-6"	31'-3"	ETHANOL	Nov-14	5	Nov-19	Nov-29	Nov-11	22	Nov-33	2012 Repairs by RMF: new internal steel roof, gauge pole, 8" fixed roof nozzle, shell vents and overflow, new 8" & 3" shell nozzles, new 1/4" double bottom with leak detection and HDPE liner with concrete and sitch welded on the underside of new bottom, and a new internal liner (7/2012). Next external inspection gives credit for 10 yrs secondary containment + 2 yrs internal liner + 10 yrs next subsequent inspection.
TK-343	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	ETHANOL	Nov-14	5	Nov-19	Nov-29	Apr-08	12	Apr-20	2008: was the last internal inspection with MFE, no indications found. A new internal liner was installed, adds 2 years till next internal inspection.
TK-344.1	VERT. STEEL	2014	EFRT	20,000	60'-0"	48'-0"	REFORMATE/SOUR NAPHTHA	Dec-14	5	Dec-19	Dec-19	May-12	22	Dec-36	Original tank built in 1977, this tank was demo-ed. New tank built with double bottom (secondary containment) and internal liner. 10 year initial + 10 year for secondary containment + 2 years internal liner= 22 years to initial internal inspection
TK-345	VERT. STEEL	1977	IFRT	20,000	60'-0"	42'-0"	REFORMATE	Dec-14	5	Dec-19	Dec-29	May-10	12	May-22	2010: new wiper seal for internal roof, new internal liner adds 2 years to next inspection date; 2000: new internal steel roof
TK-562	VERT. STEEL	1986	ELLIPSOID	20,000	60'-0"	46'-6"	ALKYLATE	Dec-10	5	Dec-15	Dec-15	Dec-10	10	Dec-20	2010: Change of service to Alky; 12/2010: internal/external inspection by ITI, no MFE only bottom UT's taken, which were good, new internal coating. NOTE: in 2009 ITI contracted a 3rd party engineering firm to determine structural t-min" calculations per API 620 in order to determine if the UT readings taken at the time of inspection were good compared to those calculated by Pangburn, although they were done specifically for tank 563, the same t-min calculations apply for this tank since they were built to the same standard and dimensions. For all future inspection, use the t-min calculations located in the inspection folder which were generated by Pangburn Engineering.
TK-563	VERT. STEEL	1986	ELLIPSOID	20,000	60'-0"	46'-6"	REFORMATE	Apr-14	5	Apr-19	Dec-15	May-09	10	May-19	5/2009: internal/external inspection by ITI, MFE-no indications found, bottom UT-good, settlement survey-"okay"; 7/2009: new external coating. NOTE: in 2009 ITI contracted a 3rd party engineering firm to determine structural t-min" calculations per API 620 in order to determine if the UT readings taken at the time of inspection were good compared to those calculated by Pangburn. For all future inspection, use the t-min calculations located in the inspection folder which were generated by Pangburn Engineering.
TK-564	VERT. STEEL	1957	HEIMISPH.	5,000	30'-0"	40'-0"	TOLUENE	Jun-12	5	June-17	July-23	Aug-08	10	Aug-18	8/2008: internal/external inspection by ITI, MFE-no indications found; these tanks were built as low pressure tank (API 620)
TK-565	VERT. STEEL	1957	HEIMISPH.	5,000	30'-0"	40'-0"	TOLUENE	Jun-12	5	June-17	Aug-23	Oct-08	10	Oct-18	10/2008: internal/external inspection by ITI, MFE found no indications; these tanks were built as low pressure tank (API 620)
TK-567	VERT. STEEL	1969	EFRT	20,000	60'-0"	40'-0"	SOUR NAPHTHA	Dec-14	5	Dec-19	Dec-29	Feb-08	12	Feb-18	2006: MFE found several indication-repairs made, new roof seals, new internal coating add 2 years to next internal inspection
TK-568	VERT. STEEL	1957	IFRT	2,000	25'-0"	24'-0"	AMMONIUM	Dec-14	5	Dec-19	Dec-29	Feb-06	12	Feb-18	1998: new internal floating roof; 2005: service change to ATS; 2006: new internal coating
TK-569	VERT. STEEL	1957	EFRT	25,000	67'-0"	40'-0"	83.0 UNLD. REG.	Jul-14	5	Jul-19	Aug-26	Jun-10	10	Jun-20	2019 Inspection: lake UT's on shell
TK-570	VERT. STEEL	1957	EFRT	25,000	67'-0"	40'-0"	89.0 GASOLINE	Jul-14	3	Jul-17	Jun-20	OCT-95	10	OCT-05	2017 Inspection: lake UT's on shell
TK-571	VERT. STEEL	1957	EFRT	25,000	67'-0"	40'-0"	89.0 UNLD REG.	Jul-14	0.8	May-15	Feb-16	JUL-03	10	JUL-13	2015 Inspection: lake UT's on shell
TK-572	VERT. STEEL	1957	EFRT	25,000	67'-0"	40'-0"	89.0 UNLD REG.	Jul-14	2	Jul-16	Jul-18	JUN-04	10	JUN-14	2016 Inspection: lake UT's on shell
TK-574	VERT. STEEL	1968	EFRT	40,000	85'-0"	40'-0"	LIGHT STRAIGHT RUN	Jul-14	5	Jul-19	Jul-29	Jul-14	20	Jul-34	2014: bottom repairs, nozzle weld repairs, new CoFlexip roof drain system with sump; new CoFlexip foam system; new internal coating- Dura Plate
TK-575	VERT. STEEL	1957	CFRT	10,000	42'-6"	40'-0"	LIGHT CYCLE OIL	Aug-14	5	Aug-19	Aug-29	May-08	20	May-28	UHS with OAP by Riley Industrial
TK-576	VERT. STEEL	1988	EFRT	40,000	85'0"	39'-8"	LIGHT CATALYST GASOLINE	Sep-14	5	Sep-19	Sep-29	Apr-12	22 or 27	12/34 or 12/39	ITI performed last internal inspection
TK-577	VERT. STEEL	2006	CFRT	10,000	42'-6"	40'-0"	DIESEL	Aug-14	5	Aug-19	Aug-29	AUG-06	20	Aug-26	3/2012: 1/4" double bottom w/HDPE & CP; 12/2012: internal liner. CP system must be maintained and inspected per API 651 in order to use December 2039 as the next inspection interval.
TK-579	VERT. STEEL	1957	CFRT	20,000	60'-0"	40'-0"	DIESEL	Aug-14	3.1	Sep-17	Oct-20	Mar-06	10	Mar-16	Original tank built 1957; new tank built on top of existing original bottom and 4" of shell in 2006. New tank built as a double bottom with leak detection couplings. Sentinel inspector set the initial internal inspection for 20 years, giving credit for secondary containment (double bottom) with leak detection.
TK-581	VERT. STEEL	1957	IFRT	25,000	67'-0"	40'-0"	LIGHT CYCLE OIL	Aug-14	5	Aug-19	Aug-29	Jun-09	20	Jun-29	Internal MFE in 2006 by BLD
TK-582	VERT. STEEL	1957	IFRT	25,000	67'-0"	40'-0"	83 UNLEADED GAS	Aug-14	5	Aug-19	Aug-29	Feb-06	10	Feb-16	2008: new internal coating & MFE scan
TK-583	VERT. STEEL	1980	IFRT	55,000	100'-0"	40'-0"	DIESEL	Sep-14	5	Sep-19	Apr-27	AUG-07	10 or 20	9/2016 or 9/2026	Internal MFE in 2006 by BLD
TK-701	VERT. STEEL	1963	CFRT	37,000	88'-6"	33'-10"	FCC FEED	Dec-10	5	Dec-15	Dec-15	NO DATA	10	ASAP	Reconstructed in Gallup 1996; possible HDPE liner under tank bottom; no MFE or UT's were done in 2007; the tank has NOT had a formal internal inspection since it was reconstructed in 1996
TK-703	VERT. STEEL	1963	CFRT	25,000	67'-0"	39'-9"	FCC FEED	Dec-10	5	Dec-15	Dec-15	Nov-00	10	Nov-10	NNP: no record of internal inspection
TK-704	VERT. STEEL	1963	CFRT	10,000	47'-4"	32'-1"	FCC FEED	Dec-10	5	Dec-15	Dec-15	JUL-88	10	JUL-98	NNP: no record of internal inspection
TK-705	VERT. STEEL	1963	CFRT	10,000	47'-4"	32'-1"	FUEL OIL	Oct-10	5	Dec-15	Dec-15	Oct-10	10	Oct-20	NNP: no record of internal inspection; 12/2014: PENDING FURTHER INSPECTION AND/OR DEMOLITION AND REBUILD
TK-706	VERT. STEEL	1963	CFRT	10,000	47'-4"	32'-1"	FUEL OIL	Dec-10	5	Dec-15	Dec-15	NO DATA	10	ASAP	NNP: no record of internal inspection
TK-707	VERT. STEEL	1963	CFRT	1,000	26'-6"	17'-7"	HEAVY OIL SLOP	Dec-10	5	Dec-15	ASAP	NO DATA	10	ASAP	NNP: no record of internal inspection
TK-714	VERT. STEEL	1969	CFRT	30,000	73'-4"	40'-0"	FCC FEED	Dec-10	5	Dec-15	Dec-15	NO DATA	10	ASAP	Build by CIP; built to manufacturer standards (non-API); product gravity is 1.3244
TK-716	VERT. STEEL	2008	CFRT	1,000	15'6"	30'-0"	AMMONIUM	Dec-14	5	Dec-19	Dec-29	Aug-06	10	Aug-16	NNP: OGAY72040; owned by Chevron; Built to UL 142; next inspections were set by 2010 inspection report by DUA Inspection; manway present; inside a concrete containment w/ sewer drain
TK-901	VERT. STEEL	1978	CFRT	200	10'-0"	17'-0"	CHEVRON ADDITIVE	Jun-10	5	Jun-15	Jun-15	Jun-10	20	Jun-30	NNP: OGAY72040; owned by Chevron; Built to UL 142; next inspections were set by 2010 inspection report by DUA Inspection; manway present; inside a concrete containment w/ sewer drain
TK-902	VERT. STEEL	1978	CFRT	200	10'-0"	17'-0"	W ESTERN ADDITIVE	NO DATA	5	ASAP	ASAP	NO DATA	10	ASAP	UL#92702; owned by W estern; manway present; inside a concrete containment with a sewer drain
TK-903	HORIZONTAL		FLATHEAD	2,000 g	5'-4"	12'-0"	NOT IN SERVICE	Mar-10	5	Mar-15	Mar-15	NO DATA		See STI Code	NNP: 2010 report indicates that the tank is owned by Texaco; manway present; tank is on skids, no containment present; Category 3 tank per STI SP001 code
TK-905	HORIZONTAL		FLATHEAD	10,000 g	8'-0"	27'-2"	NOT IN SERVICE	NO DATA	5	ASAP	ASAP	NO DATA		See STI Code	NNP: labeled "EMPTY"; manway present; on skids; inside a concrete containment; Category 1 tank per STI SP001 code
TK-906	HORIZONTAL		FLATHEAD	6,000 g	8'-0"	16'-1"	EXXON SERVICE MOBILE ADDITIVE	Mar-10	5	Mar-10	ASAP	NO DATA		See STI Code	NNP: 2010 report indicates that the tank is owned by Exxon; manway present; on skid plate; inside a concrete containment with drain valve; Category 1 tank per STI SP001 code
TK-907	HORIZONTAL		FLATHEAD	1,000 g	4'-0"	11'-1"	NOT IN SERVICE	NO DATA	5	ASAP	ASAP	NO DATA		See STI Code	labeled "EMPTY"; manway present; on skid plate; inside a concrete containment with drain valve; Category 1 tank per STI SP001 code
TK-909	HORIZONTAL		FLATHEAD	580 g	4'-1"	6'-0"	POWER SERVICE	NO DATA	5	ASAP	ASAP	NO DATA		See STI Code	UL#756256; owned by W estern; no manway; on skid plate; double wall containment; inside a concrete containment with drain valve; Category 1 tank per STI SP001 code
TK-910	HORIZONTAL		FLATHEAD	600 g	4'-8"	4'9"	RED DYE DSL ADD.	NO DATA	5	ASAP	ASAP	NO DATA		See STI Code	NNP; owned by W estern; no manway, on skid plate, inside a concrete containment with drain valve
TK-911	HORIZONTAL		FLATHEAD	8,000 g	8'-0"	21'-0"	CONOCO PHILLIPS ADD.	Mar-10	5	Mar-10	ASAP	NO DATA		See STI Code	NNP; 2010 report indicates that the tank is owned by Conoco; manway present; on skid plate; inside a concrete containment with drain and bull plug; Category 1 tank per STI SP001 code
TK-912	HORIZONTAL		FLATHEAD	8,000 g	8'-0"	21'-0"	NOT IN SERVICE	Dec-10	5	Dec-15	Dec-15	NO DATA		See STI Code	NNP; owned by W estern; no manway, no containment, on skids; 12/2010: the tank was hydro-leak tested with a Glycol 15% mix and water and held for 24 hours; Category 3 tank per STI SP001 code
TK-913	HORIZONTAL		FLATHEAD	8,000 g	10'-0"	15'-0"	NOT IN SERVICE	Dec-10	5	Dec-15	Dec-15	NO DATA		See STI Code	NNP; owned by W estern; 18" manway present, on skids, no containment; 12/2010: the tank was hydro-leak tested with a Glycol 15% and water mix and held for 24 hours; Category 3 tank per STI SP001 code
TK-914	HORIZONTAL	2005	FLATHEAD	8,000 g	8'-0"	21'-6"	NOT IN SERVICE	Jul-05	5	Jul-10	Jul-10	NO DATA		See STI Code	owned by W estern; Built to UL 142, single wall, skid mounted, all steel 1/4", 20 manway present, tested to 5 psi when fabricated; inside concrete containment with drain valve; Category 1 tank per STI SP001 code

TK-918	HORIZONTAL	2001	FLATHEAD	2,000 g	5'-4"	12'-8"	DIESEL ADD.	Oct-14	5	Oct-19	Sep-16	NO DATA		See STI Code	UL#973020/A61092; Horizontal Tank; Built to UL 142, double wall shell, skid mounted, NO MANWAY, inside a concrete containment with drain valve. Category 1 tank per STI SP001 code
Z81-T1	PLASTIC	1998	FRT	1,000	21'-6"	16'-0"	TREATED WATER	Dec-14	1	Dec-15		Apr-12		See STI Code	FIBERGLASS; built to ASTM 3299-88; previous tank that was demo-ed was a steel API tank; 2012: repair recommendations were deferred; Category 1 tank per STI SP001 code and it has water
Z81-T10	VERT. STEEL	1957	CFRT	63	10'-0"	17'-0"	CAUSTIC SODA LIQUID	Oct-10	5	Aug-15	Aug-25	NO DATA	10	ASAP	NNP; this tank has no records of any internal inspection or original tank information; manway present; inside a concrete containment with sewer drain
Z81-T14	CUBE TANK	1989	FLATHEAD	585 g	5' x 4'	3'-11"	DIESEL	Dec-14	1	Dec-15	Sabrina	NO DATA		See STI Code	Insulated Cube tank; Diesel generator day tank; built to UL standard; on skid plate on top of concrete pad; no containment; 16" manway present; Category 3 tank per STI SP001 code
Z81-T15	HORIZONTAL	1989	FLATHEAD	4,000 g	6'-0"	18'-0"	DIESEL	Dec-14	1	Dec-15	Jul-15	NO DATA		See STI Code	NNP; Elevated Tank on concrete pillars; no containment present; manway present; no record of internal inspection; see Ultrapipe for UT data; Category 3 tank per STI SP001 code
Z81-T5	CFRT	1979	IFRT	5,000	33'-6"	32'-0"	TREATED WATER	Dec-14	5	Dec-19	Dec-29	Apr-91	10	Apr-01	formerly known as tank 31 which was reconstructed at the Boiler unit, but no records of reconstruction; tank has never had a formal internal inspection; DA Makeup water storage tank
Z81-T6	PLASTIC	1998	FRT	1,000	21'-6"	16'-0"	CHLORINATED WATER	Dec-14	1	Dec-15		Jul-09		See STI Code	Fiberglass tank/ Palmer Standards; domestic (potable) water tank; 2009: internal inspection was done while the tank was in service, a dive team entered and video recorded the inspection and vacuumed cleaned all sediment. Category 1 tank per STI SP001 code and because it stores water
Z81-T7	PLASTIC	1998	FRT	1,000	21'-6"	16'-0"	BRINE WATER	Dec-14	1	Dec-15		NO DATA		See STI Code	Fiberglass/ASTM 3299-88; Category 1 tank per STI SP001 code
Z81-T9	HORIZONTAL		FLATHEAD	1700 g	6'-0"	12'-0"	DIESEL	Dec-14	1	Jul-15	Dec-08	NO DATA		See STI Code	NNP; Elevated Tank on concrete pillars; inside a concrete containment; manway present; Quincy Diesel Tank; Category 1 tank per STI SP001 code
Z83-T3	VERT. STEEL	1975	FRT	4,000 g	8'-0"	12'-0"	SULFURIC ACID (95%)	NO DATA	5	ASAP	ASAP	NO DATA	10	ASAP	located next to cooling towers; elevated vertical steel tank; inside a concrete containment (double containment) with sewer drain; insulated shell
Z84-TK-27	VERT. STEEL	1979	IFRT	5,000	33'-6"	31'-6"	WASTE WATER	Dec-14	5	Dec-19	Dec-29	Mar-08	20 or 25	3/2026 or 3/2033	July 2010 Repairs: new double bottom with leak detection, HDPE, and CP, new internal floating roof. Next internal inspection: new bottom 10 yrs + double bottom containment 10 yrs + cathodic protection maintained per API 651 15 yrs= 25 year to next internal inspection
Z84-TK-28	VERT. STEEL	1979	IFRT	5,000	33'-6"	31'-6"	WASTE WATER	Dec-14	5	Dec-19	Dec-29	Mar-08	20 or 25	3/2028 or 3/2033	July 2010 Repairs: new double bottom with leak detection, HDPE, and CP, new internal floating roof. Next internal inspection: new bottom 10 yrs + double bottom containment 10 yrs + cathodic protection maintained per API 651 15 yrs= 25 year to next internal inspection
Z84-TK-35	VERT. STEEL	2010	IFRT	976920 g	78'-0"	32'-0"	WASTE WATER	Dec-14	5	Dec-19	Dec-29	Jan-10	20	Jan-30	2010: double bottom with leak detection, HDPE liner, sand cushion, sacrificial anodes product side, possible CP between bottoms. double bottom adds 10 years to next internal inspection + 10 years for the initial= 20 years to next internal inspection
Z84-V11	VERT. STEEL	2011	FRT	9030 g	16'-0"	6'-0"	DGF FEED	Mar-12	5	Mar-17	Mar-17		12	Mar-24	near API Separators; internal coating add 2 yrs to next internal inspection
Z84-V15	VERT. STEEL	2011	CFRT	31794 g	26'-0"	8'-6"	DGF FLOAT	Mar-12	5	Mar-17	Mar-17		22 or 27	3/2034 or 3/2039	located at API Building area, Double Bottom, primary 5/16" bottom, leak detection, HDPE, cathodic protection, sand; double bottom S126containment 10 yrs + initial internal inspection 10 yrs + internal coating 2 yrs + cathodic protection maintained per API 651 yrs = 25 yrs.
Z84-V22	PLASTIC	2011	FRT	2000 g	7'-1"	7'-0"	COAGULANT	Sep-11	1	Aug-12		Sep-11		See STI Code	plastic/fiberglass tank; inside API Building; Category 1 tank per STI SP001 code
Z84-V24	VERT. STEEL	2011	CFRT	3500 g	7'-9"	10'-0"	SULFURIC ACID	Dec-11	5	Dec-16	Dec-16	Dec-11	10	Dec-21	UL 142; 1/2" roof, shell, and bottom, inside a concrete containment, design gravity=1.84, joint efficiency=0.70, allow stress=23760, UL tmin= .167"; near API Separators, next to Z84-V11
Z86-T1	VERT. STEEL	1966	OPEN	5,000	30'-0"	40'-0"	WELL WATER	Oct-10	5	Aug-12	Jun-14	NOV-02	10	Nov-12	Reconstructed 11/2002: new 1/4" shell courses 1 thru 4
Z86-T2	VERT. STEEL	2002	OPEN	440,000 g	44'-0"	40'-0"	WELL WATER	Oct-10	5	Oct-15	Aug-25		10	Apr-12	Design Code: AW W A D-100, 96-Section 3; inspection intervals were based on API 653 calculations and allowable stresses of A-36 material
Housing South	VERT. STEEL		FRT				WATER	NO DATA	5	ASAP	ASAP	NO DATA	10	ASAP	Located up the hill at the housing complex
Housing North	VERT. STEEL		FRT				WATER	NO DATA	5	ASAP	ASAP	NO DATA	10	ASAP	Located up the hill at the housing complex
TK-117	VERT. STEEL	1983	CFRT	250	10'-0"	17'-9"	NOT IN SERVICE (De-icer)	MAY-96	5	May-01		JUL-83	10	JUL-93	
TK-18570	AST		CFRT	NO DATA	8'-0"	6'-0"	NALCO-7369	NO DATA	5	ASAP		NO DATA	10	ASAP	Removed September 2012, per Michael Spolar & Maint.; PVC/ASTM/NNP
TK-18674	AST		CFRT	NO DATA	8'-0"	6'-0"	NALCO-7369	NO DATA	5	ASAP		NO DATA	10	ASAP	Removed September 2012, per Michael Spolar & Maint.; PVC/ASTM/NNP
TK-334															According to Joel Quinones, this tank never existed.
TK-451	VERT. STEEL	1957	CFRT	1,000	21'-3"	16'-0"	OUT OF SERVICE	MAY-96	5	May-01		OCT-90	10	OCT-00	NNP; schedule for DEMO per WR
TK-452	VERT. STEEL	1957	CFRT	1,000	21'-3"	16'-0"	OUT OF SERVICE	MAY-96	5	May-01		AUG-98	10	AUG-98	NNP; schedule for DEMO per WR
TK-453	VERT. STEEL	1957	CFRT	5,000	33'-6"	32'-0"	OUT OF SERVICE								schedule for DEMO per WR
TK-573	VERT-STEEL	1957	CR	250	40'-0"	18'-0"	KEROSENE (N.I.S)	OCT-94	5	Oct-99		NO DATA	10	ASAP	Tank was demolished, per Joel Quinones email on 9/17/14
TK-702	VERT. STEEL	1963	CFRT	25,000	67'-0"	40'-5"	FCC FEED	FEB-95	5	Feb-00		FEB-83	10	FEB-83	NNP; schedule for DEMO per WR
TK-708	VERT. STEEL	1963	CFRT	1,000	22'-6"	14'-11"	RESIDUE	MAY-06	5	May-11		MAY-06	10	MAY-16	NNP; schedule for DEMO per WR
TK-709	VERT. STEEL	1963	CR	1,000	22'-6"	14'-9"	RESIDUE	FEB-95	5	Feb-00		NO DATA	10	ASAP	NNP; schedule for DEMO per WR
TK-713	VERT-STEEL		CFRT	NO DATA	NO DATA	NO DATA	NOT IN SERVICE	NO DATA	5	ASAP		NO DATA	10	ASAP	Tank was demolished, per Joel Quinones email on 9/17/14
TK-7435															Tank is not present in Crude Unit; Michael Spolar could not find any records of this tank. May have been removed prior to 1996
Z81-T14							HCL								Removed sometimes in the 2000's, per Michael Spolar Jr.
Z81-T13	AST		CFRT	N	4'-0"	4'-0"	DIESEL	DEC-03	5	Dec-08		NO DATA	10	ASAP	NNP; Has been removed from the site, per boiler operator
Z81-T17	AST		CFRT	NO DATA	8g"	16'-0"	WATER-SOFTNER (N.I.S)	NO DATA	5	ASAP		NO DATA	10	ASAP	FG/ASTM/NNP; Has been removed from the site, per boiler operator
Z81-T8	AST		CFRT	250	44'-0"	16'-0"	FUEL-OIL (N.I.S)	FEB-98	5	Feb-03		NO DATA	10	ASAP	Has been removed from the site, per boiler operator
Z81-V11	AST		FRT				NIS								Possibly a plastic tank @ Boiler Plant; abandoned chemical (transport plus) tank per Michael Spolar

NNP=No Nameplate

EFRT=External Floating Roof Tank NIS=Not In Service

CFRT=Cone Fixed Roof Tank

IFRT=Internal Floating Roof Tank

FRT=Fixed Roof Tank

AST=Atmospheric Storage Tank



GALLUP REFINERY STORAGE TANK INSPECTION CHART

TANK NUMBER	YEAR BUILT	ROOF TYPE	ACTUAL CAPACITY	TANK DIAMETER	TANK HEIGHT/LENGTH	PRODUCT	LAST EXTERNAL INSPEC.	INSP. INTERVAL (YEARS)	NEXT EXTERNAL INSPEC.	LAST INTERNAL INSPEC.	INSP. INTERVAL (YEARS)	NEXT INTERNAL INSPEC.	COMMENTS
P-V19A	1957	N/A	668.7 ft³	30"	LTH-147'-5"	HYDROGEN	NO DATA	5	ASAP	NO DATA	10	ASAP	BULLE/ASME
P-V19B	1957	N/A	668.7 ft³	30"	LTH-147'-5"	HYDROGEN	NO DATA	5	ASAP	NO DATA	10	ASAP	BULLE/ASME
P-V19C	1957	N/A	668.7 ft³	30"	LTH-147'-5"	HYDROGEN	NO DATA	5	ASAP	NO DATA	10	ASAP	BULLE/ASME
TK-27	1979	CR	5,000	33'-5"	32'-0"	SLOP OIL	NO DATA	5	ASAP	NO DATA	10	ASAP	
TK-28	1979	CR	5,000	33'-5"	32'-0"	SLOP OIL	NO DATA	5	ASAP	NO DATA	10	ASAP	
TK-101	1957	INT. FR	80,000	110'-0"	48'-0"	CRUDE	AUG-06	5	AUG-11	AUG-06	10	AUG-16	
TK-102	1991	EXT. FR	80,000	110'-0"	48'-0"	CRUDE	APR-96	5	APR-01	SEP-90	10	SEP-00	NNP
TK-106	1957	CR	5,000	33'-6"	32'-0"	TRANSMIX	APR-96	5	APR-01	MAY-94	10	MAY-04	
TK-107	1957	CR	5,000	33'-6"	32'-0"	SLOP OIL	JAN-04	5	JAN-09	JAN-04	10	JAN-14	
TK-108	1957	CR/INT. FR	5,000	33'-6"	32'-0"	ALKYLATE	SEPT-07	5	SEPT-12	JAN-01	10	JAN-11	NPP
TK-111	1957	CR	5,000	33'-6"	32'-0"	DHT PRODUCT	JUN-06	5	JUN-11	JUN-06	10	JUN-16	
TK-112	1957	CR	5,000	33'-6"	32'-0"	DHT PRODUCT	JUN-06	5	JUN-11	JUN-06	10	JUN-16	
TK-115	1957	CR	5,000	33'-6"	32'-0"	DHT PRODUCT (NLS)	DEC-07	5	DEC-12	DEC-07	10	DEC-17	NNP
TK-116	1957	CR	5,000	33'-6"	32'-0"	DHT PRODUCT	JUL-06	5	JUL-11	JUL-06	10	JUL-16	NNP
TK-117	1983	CR	250	12'-0"	17'-9"	DE-ICER (DEAD TK)	MAY-96	5	MAY-01	JUL-83	10	JUL-93	NNP
TK-167	2001	CR	400	10'-0"	20'-0"	SLOP OIL	JUN-01	5	JUN-06	NO DATA	10	ASAP	105 PREVIOUSLY
TK-225	1957	CR	25,000	67'-0"	40'-0"	STILLATE	JUN-06	5	JUN-11	JUN-06	10	JUN-16	
TK-226	1957	CR	25,000	67'-0"	40'-0"	KEROSENE	JUL-06	5	JUL-11	JUL-06	10	JUL-16	
TK-227	1957	CR	5,000	33'-6"	32'-0"	K-1	MAY-96	5	MAY-01	JUN-94	10	JUN-04	NNP
TK-228	1957	CR	5,000	33'-6"	32'-0"	K-1	MAY-96	5	MAY-01	APR-94	10	APR-04	
TK-231	1957	CR	5,000	33'-6"	32'-0"	TRANSMIX	MAY-96	5	MAY-01	MAY-94	10	MAY-04	
TK-232	1957	CR	5,000	33'-6"	32'-0"	TRANSMIX	MAY-96	5	MAY-01	DEC-93	10	DEC-03	
TK-235	1957	CR	5,000	33'-6"	32'-0"	TRANSMIX	MAY-96	5	MAY-01	MAR-94	10	MAR-04	
TK-337	1977	INT. FR	20,000	60'-0"	42'-0"	ETOH	MAY-96	5	MAY-01	MAR-00	10	MAR-10	
TK-338	1964	CR	25,000	67'-0"	40'-0"	SWEET NAPHTHA	NOV-94	5	NOV-99	DEC-93	10	DEC-93	
TK-339	1957	CR	25,000	67'-0"	40'-0"	SOUR NAPHTHA	AUG-06	5	AUG-11	AUG-06	10	AUG-16	NNP
TK-342	1957	CR	5,000	33'-6"	32'-0"	ETHANOL	MAY-96	5	MAY-01	JUN-91	10	JUN-01	
TK-343	1957	CR	5,000	33'-6"	32'-0"	ETHANOL	MAY-96	5	MAY-01	JUN-91	10	JUN-01	
TK-344	1977	INT. FR	20,000	60'-0"	42'-0"	REFORMATE	NOV-03	5	NOV-08	SEP-01	10	SEP-11	
TK-345	1977	INT. FR	20,000	60'-0"	42'-0"	REFORMATE/ETOH	MAY-00	5	MAY-05	MAR-00	10	MAR-10	
TK-446	1945	HPS	30,000	NO DATA	NO DATA	OLEFINS/ISO BUTANE	MAY-96	5	MAY-01	FEB-86	10	FEB-96	BULLE/ASME
TK-447	1957	HPS	30,000	11'-9"	LTH-45'-0"	ISO-BUTANE	MAY-96	5	MAY-01	FEB-96	10	FEB-06	BULLE/ASME
TK-448	1957	HPS	30,000	11'-9"	LTH-45'-0"	ISO-BUTANE	MAY-96	5	MAY-12	SEPT-07	10	SEPT-17	BULLE/ASME
TK-451	1957	CR	1,000	21'-3"	16'-0"	OUT OF SERVICE	MAY-96	5	MAY-01	OCT-90	10	OCT-00	NNP
TK-452	1957	CR	1,000	21'-3"	16'-0"	OUT OF SERVICE	MAY-96	5	MAY-01	AUG-98	10	AUG-98	NNP
TK-453	1957	CR	5,000	33'-6"	32'-0"	OUT OF SERVICE				OUT OF SERVICE			
TK-554	1974	HPS	89,715	131875'	LTH-133.4'	BUTANE/PROPANE	MAY-94	5	MAY-99	MAR-05	10	MAR-15	BULLE/ASME
TK-555	1974	HPS	89,715	131875'	LTH-133.4'	ISO-BUTANE	MAY-94	5	MAY-99	JAN-93	10	JAN-03	BULLE/ASME
TK-556	1957	HPS	30,000	9'-2 3/4'	LTH-53'-10"	PROPANE	MAY-96	5	MAY-01	MAR-93	10	MAR-03	BULLE/ASME
TK-557	1957	HPS	30,000	9'-2 3/4'	LTH-53'-10"	PROPANE	JAN-02	5	JAN-07	JAN-02	10	JAN-12	BULLE/ASME
TK-560	1957	HPS	30,000	11'-9"	LTH-69'-11"	BUTANE	OCT-96	5	OCT-01	OCT-96	10	OCT-06	BULLE/ASME
TK-561	1957	HPS	30,000	11'-9"	LTH-69'-11"	BUTANE	MAY-96	5	MAY-01	MAR-04	10	MAR-14	BULLE/ASME
TK-562	1986	ELLIPSOID	20,000	60'-0"	46'-6"	ISOMERATE	MAY-96	5	MAY-01	JAN-87	10	JAN-97	
TK-563	1986	ELLIPSOID	20,000	60'-0"	46'-6"	NAT. GAS	OCT-96	5	OCT-01	OCT-96	10	OCT-06	
TK-564	1957	HEMISP.	5,000	30'-0"	40'-0"	NAT. GAS/ISOM	JUN-96	5	JUN-01	NOV-90	10	NOV-00	
TK-565	1957	HEMISP.	5,000	30'-0"	40'-0"	ISOM/NAT GAS/ TOL	JUN-96	5	JUN-01	MAR-69	10	MAR-79	
TK-567	1969	EXT. FR	20,000	60'-0"	40'-0"	83.0 UNLD. REG.	MAY-06	5	MAY-11	MAY-06	10	MAY-16	
TK-568	1998	CR	2,000	25'-0"	24'-0"	AMMONIUM THIOSUL.	FEB-06	5	FEB-11	FEB-06	10	FEB-16	NNP
TK-569	1957	EXT. FR	25,000	67'-0"	40'-0"	83.0 UNLD. REG.	SEP-97	5	SEP-02	SEP-97	10	SEP-07	
TK-570	1957	EXT. FR	25,000	67'-0"	40'-0"	87.0 UNLD. REG.	JUL-96	5	JUL-01	OCT-95	10	OCT-05	
TK-571	1957	EXT. FR	25,000	67'-0"	40'-0"	87.0 UNLD. REG.	JUN-03	5	JUN-08	JUL-03	10	JUL-13	
TK-572	1957	EXT. FR	25,000	67'-0"	40'-0"	87.0 UNLD. REG.	JUN-03	5	JUN-08	JUN-04	10	JUN-14	
TK-573	1957	CR	250	10'-0"	18'-0"	KEROSENE (NLS)	OCT-94	5	OCT-99	NO DATA	10	ASAP	
TK-574	1968	EXT. FR	40,000	85'-0"	40'-0"	ST. RUN	SEP-04	5	SEP-09	NOV-94	10	NOV-04	
TK-575	1957	CR	10,000	42'-6"	40'-0"	SWT. JET-A/K1	OCT-94	5	OCT-99	MAY-83	10	MAY-93	
TK-576	1968	EXT. FR	40,000	85'-0"	40'-0"	PREMIUM BASE	OCT-97	5	OCT-02	OCT-97	10	OCT-07	
TK-577	1957	CR	10,000	42'-6"	40'-0"	DIESEL	AUG-06	5	AUG-11	AUG-06	10	AUG-16	NNP
TK-579	1957	CR	20,000	60'-0"	40'-0"	DIESEL	JUL-06	5	JUL-11	JUL-06	10	JUL-16	NNP
TK-581	1957	INT. FR	25,000	67'-0"	40'-0"	LCO	AUG-93	5	AUG-98	AUG-93	10	AUG-03	
TK-582	1957	INT. FR	25,000	67'-0"	40'-0"	UNLEADED PREMIUM	APR-06	5	APR-11	APR-06	10	APR-16	NNP
TK-583	1996	CR	55,000	100'-0"	40'-0"	DIESEL	SEPT-07	5	SEPT-12	AUG-07	10	AUG-17	
TK-701	1963	CR	37,000	88'-6"	33'-10"	FCC FEED	FEB-95	5	FEB-00	NO DATA	10	ASAP	NNP
TK-702	1963	CR	25,000	67'-0"	40'-5"	FCC FEED	FEB-95	5	FEB-00	FEB-83	10	FEB-93	NNP
TK-703	1963	CR	25,000	67'-0"	39'-8"	RESIDUE/FCC FEED	NOV-00P	5	ASAP	NOV-00P	10	ASAP	NNP
TK-704	1963	CR	10,000	47'-4"	32'-2"	FUEL OIL	FEB-95	5	FEB-00	JUL-88	10	JUL-98	NNP
TK-705	1963	CR	10,000	47'-4"	31'-1"	FUEL OIL	FEB-95	5	FEB-00	JAN-94	10	JAN-04	NNP
TK-706	1963	CR	10,000	47'-5"	32'-1"	FUEL OIL	JAN-95	5	JAN-00	NO DATA	10	ASAP	NNP
TK-707	1963	CR	1,000	26'-6"	17'-7"	SLOP	FEB-95	5	FEB-00	NO DATA	10	ASAP	NNP
TK-708	1963	CR	1,000	22'-6"	14'-11"	RESIDUE	MAY-06	5	MAY-11	MAY-06	10	MAY-16	NNP
TK-709	1963	CR	1,000	22'-6"	14'-9"	RESIDUE	FEB-95	5	FEB-00	NO DATA	10	ASAP	NNP
TK-713	NO DATA	CR	NO DATA	NO DATA	NO DATA	NOT IN SERVICE	NO DATA	5	ASAP	NO DATA	10	ASAP	NNP
TK-714	1969	CR	30,000	73'-4"	40'-0"	FCC FEED	JAN-95	5	JAN-00	NO DATA	10	ASAP	
TK-912	NO DATA	FLATHEAD	NO DATA	8'-0"	21'-0"	GASOLINE ADDITIVE	NO DATA	5	ASAP	NO DATA	10	ASAP	NNP
TK-913	NO DATA	FLATHEAD	NO DATA	9'-11"	15'-0"	GASOLINE ADDITIVE	NO DATA	5	ASAP	NO DATA	10	ASAP	NNP
TK-18570	NO DATA	CR	NO DATA	8'-0"	6'-0"	NALCO 7359	NO DATA	5	ASAP	NO DATA	10	ASAP	PVC/ASTM/NNP
TK-18571	NO DATA	CR	NO DATA	8'-0"	6'-0"	NALCO 7359	NO DATA	5	ASAP	NO DATA	10	ASAP	PVC/ASTM/NNP
MKT-TK-1	1965	CR	3,000	30'-0"	24'-0"	DIESEL	MAR-06	5	MAR-11	MAR-06	10	MAR-16	
MKT-TK-2	1965	CR/INT. FR	4,000	30'-0"	32'-0"	UNLEADED PREMIUM	OCT-94	5	OCT-99	APR-88	10	APR-98	
MKT-TK-3	1965	INT. FR	4,000	30'-0"	32'-0"	87.0 OCTANE	OCT-94	5	OCT-99	JUL-05	10	JUL-15	NNP
MKT-TK-4	1970	INT. FR	3,800	30'-5"	32'-0"	83.0 OCTANE	OCT-94	5	OCT-99	DEC-83	10	DEC-93	
MKT-TK-5	1963	CR	1,800	25'-0"	24'-0"	ETHANOL	OCT-94	5	OCT-99	FEB-89	10	FEB-99	NNP
MKT-TK-6	1963	CR/INT. FR	1,800	28'-0"	27'-11"	EMPTY TANK	JUN-07	5	JUN-12	JUN-07	10	JUN-17	
MKT-TK-7	1946	HPS	330	9'-0"	LTH-66'-0"	ISOMERATE	JUN-02	5	JUN-07	OCT-89	10	OCT-99	BULLE/ASME
O-T6	NO DATA	CR	NO DATA	63'-5"	53'-0"	DRAIN HOLDING TK	NO DATA	5	ASAP	NO DATA	10	ASAP	NNP
Z-71-V2	1987	HPS	NO DATA	94.4375'	LTH-52'-25"	ANHYDROUS AMMONIA	NO DATA	5	ASAP	NO DATA	10	ASAP	BULLE/ASME
Z-81-T1	1998	CR	1,000	21'-3"	16'-0"	TREATED WATER	OCT-94	5	OCT-99	NO DATA	10	ASAP	FG/ASTM
Z-81-T3	1979	CR	5,000	33'-5"	32'-0"	TREATED WATER	SEP-01	5	SEP-06	APR-97	10	APR-07	
Z-81-T6	1962	CR	880	20'-6"	17'-6"	DOMESTIC WATER	FEB-98	5	FEB-03	NO DATA	10	ASAP	FG/ASTM
Z-81-T7	1998	CR	920	20'-5"	15'-8"	BRINE WATER	OCT-90	5	OCT-95	AUG-95	10	AUG-05	FG/ASTM
Z-81-T8	NO DATA	CR	250	11'-0"	15'-0"	FUEL OIL (NLS)	FEB-98	5	FEB-03	NO DATA	10	ASAP	
Z-81-T9	NO DATA	FLATHEAD	UNKNOWN	6'-0"	12'-0"	DIESEL	DEC-03	5	DEC-08	NO DATA	10	ASAP	NNP
Z-81-T10	1957	CR	NO DATA	11'-0"	18'-0"	CAUSTIC	DEC-03	5	DEC-08	NO DATA	10	ASAP	NNP
Z-81-T13	NO DATA	CR	UNKNOWN	4'-0"	4'-0"	DIESEL	DEC-03	5	DEC-08	NO DATA	10	ASAP	NNP
Z-81-T15	NO DATA	FLATHEAD	UNKNOWN	5'-7.75'	18'-0"	DIESEL	DEC-03	5	DEC-08	NO DATA	10	ASAP	
Z-81-T16	1953	FLATHEAD	UNKNOWN	5'-7.75'	15'-8"	STARTING AIR	NOV-03	5	NOV-08	JAN-98	10	JAN-08	
Z-81-T17	NO DATA	CR	NO DATA	8'-9"	15'-0"	WATER SOFTNER (NLS)	NO DATA	5	ASAP	NO DATA	10	ASAP	FG/ASTM/NNP
Z-86-T1	1966	OPEN	5,000	30'-0"	40'-0"	FIREWATER	SEP-01	5	SEP-06	NOV-02	10	NOV-12	
Z-86-T2	2002	OPEN	444,000GW	44'-0"	40'-0"	WATER	NO DATA	5	NO DATA	NO DATA	10	ASAP	
O-T2	1956	CR	350 BBL	10'-0"	8'-0"	CAUSTIC	DEC-03	5	DEC-08	NO DATA	10	ASAP	NNP
O-T3	NO DATA	CR	NO DATA	20'-0"	12'-0"	CAUSTIC (NLS)	DEC-03	5	DEC-08	NO DATA	10	ASAP	NNP
O-T8	1963	CR	226	11'-9"	11'-8"	CAUSTIC	DEC-03	5	DEC-08	NO DATA	10	ASAP	NNP
SWS-TK1	2006	CR	NO DATA	15'-5"	30'-0"	SOUR WATER							

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).
