AP - 111

OW-14 INVESTIGATION REPORT (1)

2019



Michelle Lujan Grisham Governor

> Howie C. Morales Lt. Governor

NEW MEXICO ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

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CERTIFIED MAIL - RETURN RECEIPT REQUESTED



James C. Kenney
Cabinet Secretary

Jennifer J. Pruett Deputy Secretary

January 30, 2020

John Moore Environmental Superintendent Western Refining, Southwest Inc., Gallup Refinery 92 Giant Crossing Road Gallup, New Mexico 87301

RE: RESPONSE TO APPROVAL WITH MODIFICATIONS
REVISED INVESTIGATION REPORT OW-14 SOURCE AREA
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-19-002

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has reviewed the *Response to Approval with Modifications Revised Investigation Report OW-14 Source Area* (Response), dated December 10, 2019 and submitted on behalf of Marathon Petroleum Company dba Western Refining Southwest Inc., Gallup Refinery (the Permittee). The Permittee must address the following comment.

In the response to NMED's *Approval with Modifications* Comment 3, the Permittee states, "[i]nstead of taking a somewhat "piecemeal" approach of attempting to extend select maps or cross sections from one area of investigation to include portions or all of the adjacent areas of investigation, it would be a significant improvement to have one report for SMWU No. 6 that includes all three of the areas discussed above, which are all impacted by releases at SWMU No. 6." The referenced investigation associated with SWMU No. 6 has three parts: (1) MTBE plume northeast of SWMU No. 6, (2) source area and hydrocarbon plume east side of SWMU No. 6, and (3) hydrocarbon plume in the vicinity of the north drainage ditch. Each investigation focuses on separate areas; therefore, it is more appropriate to conduct the investigations

Mr. Moore January 30, 2020 Page 2

separately. In addition, there are other potential releases associated with SWMU No. 6 (e.g., separate-phase hydrocarbons in the STP-1 French Drain). One report that covers all of the investigations associated with SWMU No. 6 is not likely to be practical or inclusive and will likely lack necessary details. The Permittee may submit a comprehensive SWMU No. 6 report that provides an analysis of subsurface and groundwater conditions within SWMU No. 6 and its adjacent areas and an overview of each investigation, if deemed appropriate. However, that report will not replace each separate investigation report. No response required.

This approval is based on the information presented in the document as it relates to the objectives of the work identified by NMED at the time of review. Approval of this document does not constitute agreement with all information or every statement presented in the document.

If you have questions regarding this letter, please contact Michiya Suzuki of my staff at 505-476-6059.

Sincerely,

Kevin Pierard

Month

Chief

Hazardous Waste Bureau

cc:

D. Cobrain, NMED HWB

M. Suzuki, NMED HWB

C. Chavez, OCD

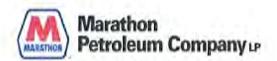
L. King, EPA Region 6 (6LCRRC)

B. Moore, WRG

File:

Reading File and WRG 2020 File

HWB-WRG-19-002



December 10, 2019

Mr. Dave Cobrain, Program Manager Hazardous Waste Bureau New Mexico Environmental Department 2905 Rodeo Park Drive East, Bldg. 1 Santa Fe, NM 87SOS-6303

RE: Response to Approval with Modifications

Revised Investigation Report OW-14 Source Area Marathon Petroleum Company LP, Gallup Refinery

(dba Western Refining Southwest, Inc.)
EPA ID# NMD000333211

HWB-WRG-19-002

Dear Mr. Cobrain:

Marathon Petroleum Company LP (dba Western Refining Southwest, Inc.) Gallup Refinery is submitting the enclosed responses to your Response to Approval with Modifications dated November 15, 2019 on the referenced Investigation Report. If there are any questions, please call Brain Moore at 505-726-9745.

Certification

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

Sincerely,

Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks

Refinery General Manager

Robert S. Hank

Enclosures

cc K. Van Horn NMED

C. Chavez NMOCD

B. Moore Marathon Gallup Refinery

RESPONSE TO APPROVAL WITH MODIFICATOINS November 15, 2019 Comments on the OW-14 Source Area Investigation Report (Dated September 2019)

NMED Comment 1:

In the response to NMED's *Approval with Modifications* Comment 7, the Permittee states, "Figures 6 and 9 are revised to extend cross section C-C' to OW-14 and a separate new cross section is enclosed that extends to STP-1." NMED's *Approval with Modifications* Comment 7 stated, "[s]ubmit a figure that depicts the likely subsurface conditions between Tank 570 to OW-14 and STP-1." Figure 9 (Cross Section C-C') depicts the subsurface conditions between RW-1 and OW-14, rather than the subsurface conditions between TK 570-1 and OW-14. In addition, the referenced separate new cross section extending to STP-1 is not included in the Response. Provide these figures.

MPC Response 1:

The missing figure (new Cross Section E-E'), which depicts the subsurface conditions across the tank farm to STP-1, is enclosed. Figure 6 that shows the locations of the cross sections is also revised to include new cross section E-E'. We believe that this figure and Figure 9 in combination depict the subsurface conditions "between Tank 570 to OW-14 and STP-1." Also see additional discussion below in response to Comment 3 regarding development of additional figures that span across areas separately investigated under different work plans with individual reports. We did note that your comment now refers specifically to "TK 570-1" and not just Tank 570 as originally requested. You will find that the original cross section B-B' includes TK 570-1 and also overlaps with cross section C-C', that was previously revised to extend to OW-14.

NMED Comment 2:

In the response to NMED's *Approval with Modifications* Comment 10, the Permittee states, "[t]here is a detailed discussion on the soil types present in Section 4.3.1, which is not repeated in the Conclusions Section. This discussion is provided below and as shown both intervals consist of sand with clayey sand in the 16 feet to 18 feet bgl interval and silty sand in the 24 feet to 26 feet bgl interval." To clarify, the direction of NMED's Comment 10 was to include the discussion regarding the correlation between the level of contamination associated with organic constituents and soil types where elevated contaminant concentrations were detected and further develop a discussion of potential contaminant pathways, rather than to repeat Section 4.3.1 in the Conclusion Section. No revision required.

MPC Response 2:

The comment is acknowledged.

NMED Comment 3:

In the response to NMED's *Approval with Modifications* Comment 11, the Permittee states, "[t]he requested figure is enclosed. This is Figure 22 from the Investigation Report North Drainage Ditch and OW-29 & OW-30 Areas, which is reported on separately as previously directed by NMED." The Permittee provided a figure that depicts wells downgradient from OW-14 but the figure does not depict any wells upgradient from OW-14, which was referenced in the Permittee's statement. All referenced upgradient wells from OW-14 (TK-568-1, TK 568-2, OW-58) and downgradient wells (OW-55 and OW-30) should have been depicted in the figure. NMED's Comment 11 also stated, "[p]rovide a figure that includes the other downgradient wells identified in this comment to provide further context to the MTBE plume migration." The Response does not include further context to the MTBE migration. Provide the appropriate figure.

MPC Response 3:

NMED states, "The Permittee provided a figure that depicts wells downgradient from OW-14 but the figure does not depict any wells upgradient from OW-14, which was referenced in the Permittee's statement." The response provided to original Comment 11 was as follows, "[t]he requested figure is enclosed. This is Figure 22 from the Investigation Report North Drainage Ditch and OW-29 & OW-30 Areas, which is reported on separately as previously directed by NMED." There is no reference to the wells up-gradient from OW-14 in our response, but of course those up-gradient wells were already depicted on Figure 20 included in the OW-14 Source Area Investigation Report.

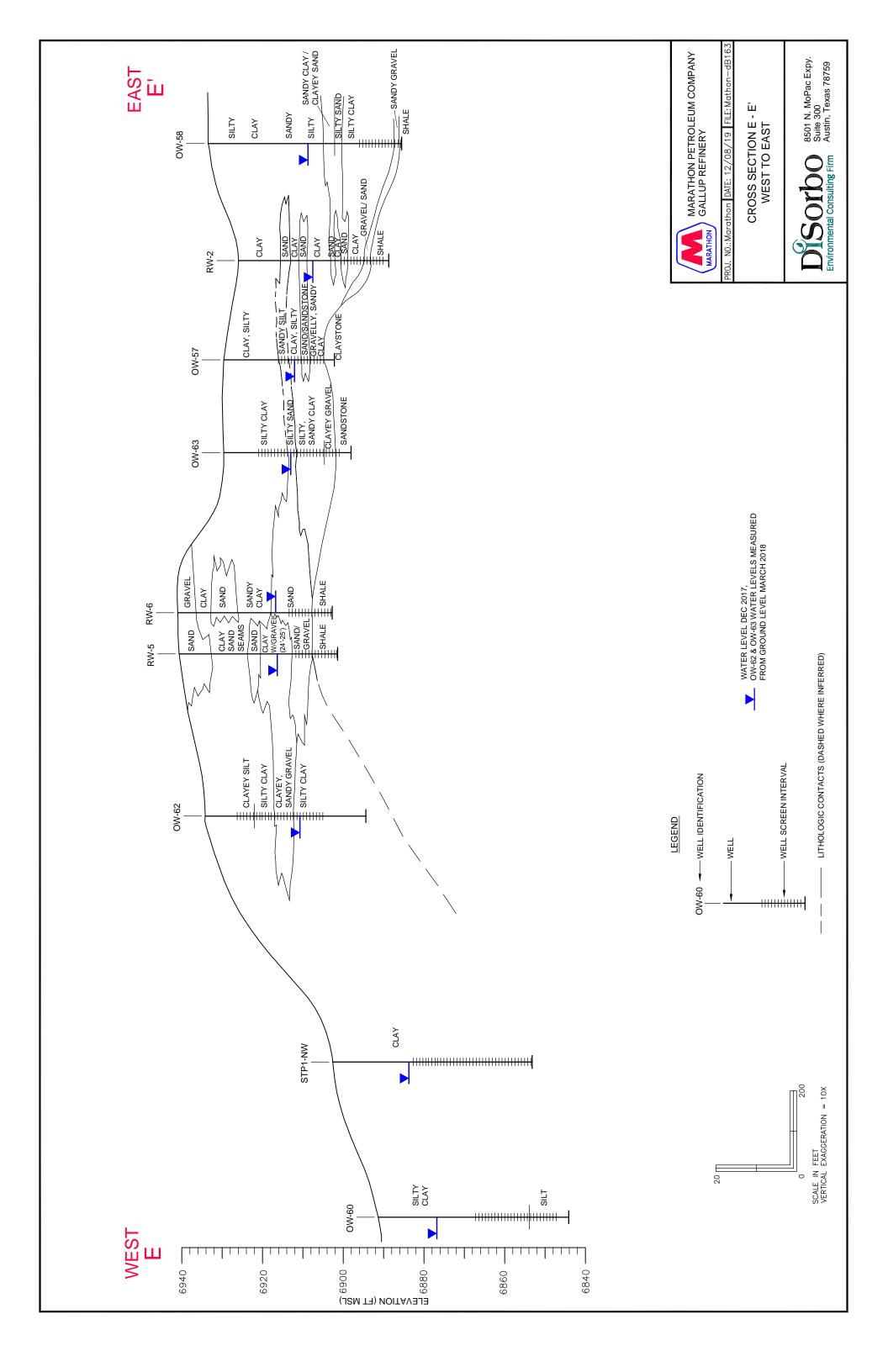
In the original Comment 11, NMED stated, "Provide a figure that includes the other downgradient wells identified in this comment to provide further context to the MTBE plume migration." The "other wells" that NMED discussed are OW-14, OW-30, and OW-55. Figure 22, which was provided, includes not only wells OW-14, OW-30, and OW-50, but also provides coverage much further down-gradient than specified by NMED. Figure 22 includes all existing down-gradient wells that have information available regarding MTBE migration in this area. Possibly NMED meant for us to revise the original Figure 20 to add the wells further down-gradient. Per NMED's previous comments, we have provided separate reports for the area focused on to identify the source of groundwater contamination observed in OW-14 and the down-gradient areas near wells OW-29 and OW-30 and the North Drainage Ditch. To start revising existing maps to include new wells / information (e.g., MTBE concentrations north of OW-14) that was not part of the original report, will result in a report (OW-14 Source Area Investigation Report) that does not contain the associated analytical reports, QA/QC review, and any related discussion. In an effort to be responsive to NMED's request, we have prepared a new figure for MTBE that essentially combines the original figure provided in the OW-14 Source Area Investigation Report and Figure 22 from the North Drainage Ditch Investigation Report.

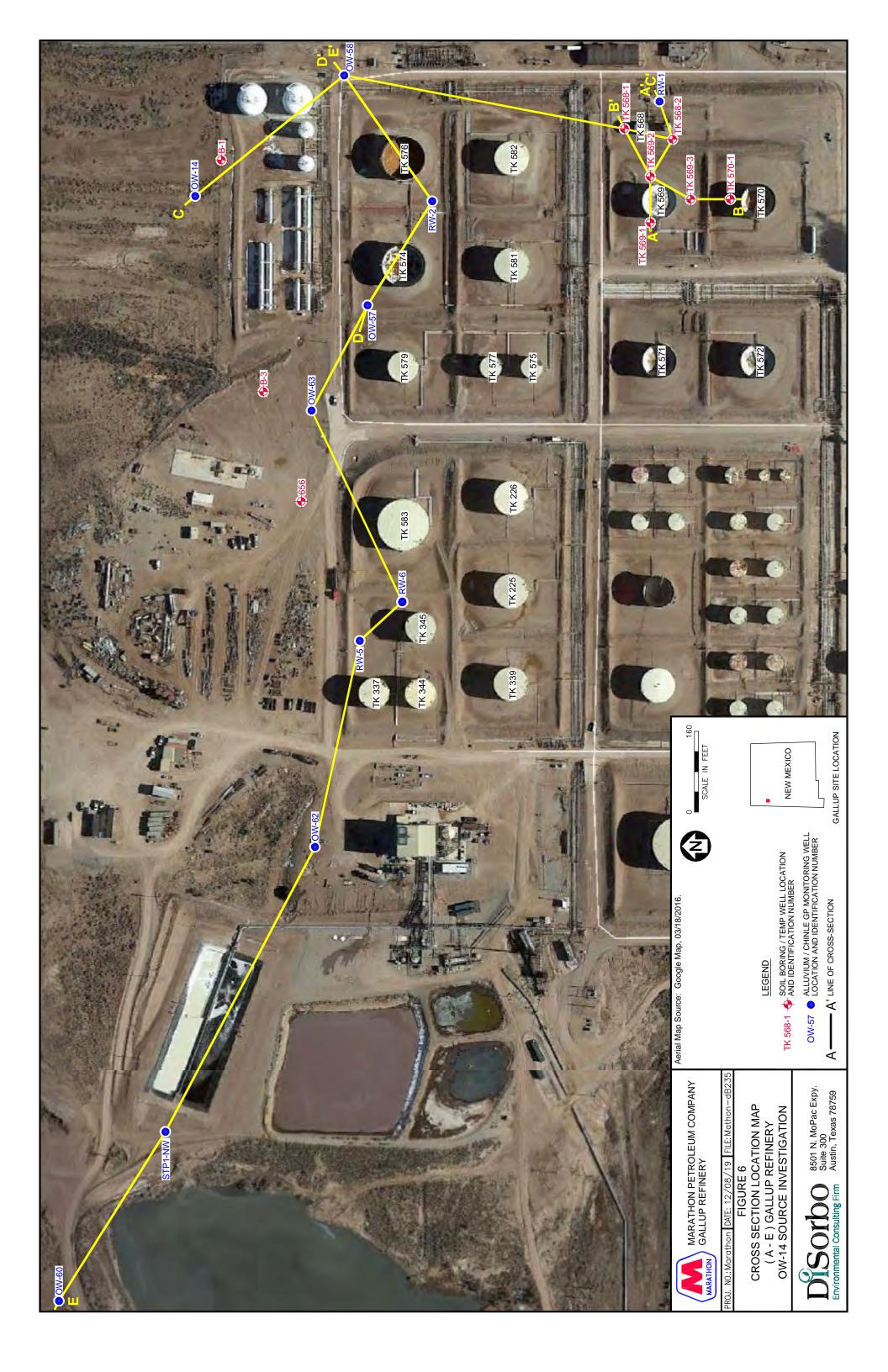
In correspondence dated May 11, 2015, NMED directed Western Refining Southwest, Inc. ("Western") to submit two separate investigation work plans for areas within or directly down-gradient of Solid Waste Management Unit (SWMU) No. 6 – Tank Farm. "The OW-series wells on the northeast side of the property have exhibited increasing concentrations of methyl tert-butyl ether (MTBE), benzene and other petroleum-related compounds over the last several years. Additionally, based on the data, there appear to be two separate contaminant plumes in the area. The Permittee <u>must submit two work plans</u> to: 1) further investigate the known MTBE plume at the Facility and, 2) investigate a suspected plume north of the Tank Farm (SWMU 6)." "A work plan proposing to install additional monitoring wells to define the extent of MTBE and other hydrocarbons down-gradient and to the north-northwest of existing groundwater monitoring wells OW-29 and OW-30 must be submitted no later than August 17, 2015. The Permittee must also submit a work plan to investigate the source of contaminants present in groundwater monitoring well OW-14. This work plan must be submitted no later than September 8, 2015."

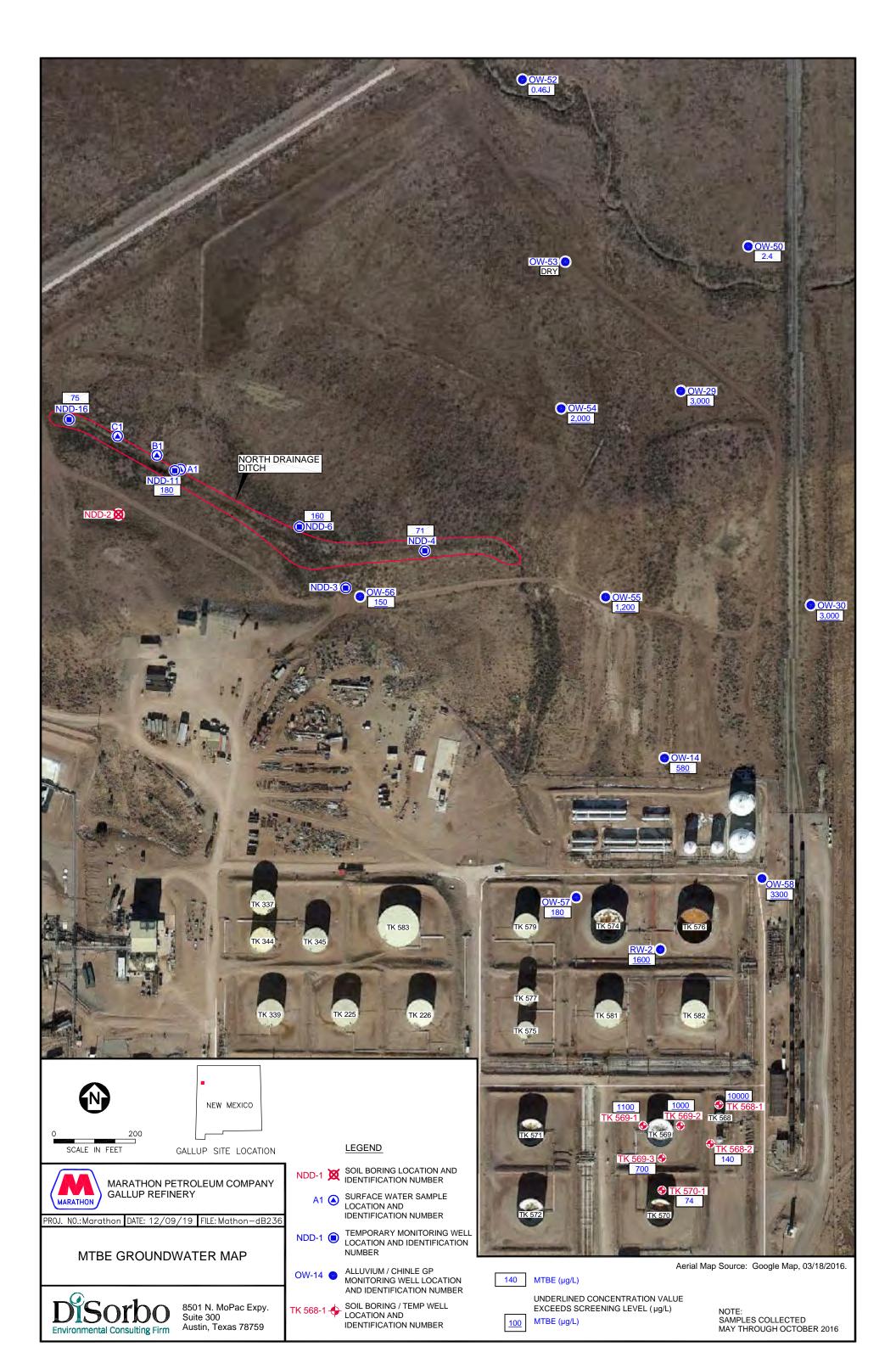
In correspondence dated May 12, 2015, NMED directed Western to submit a third separate investigation work plan for the discovery of hydrocarbon in the North Drainage Ditch, which is located due north of SMWU No. 6. "The Permittee must provide a Work Plan for NMED's review. The Permittee must provide information regarding any tanks located upgradient from the hydrocarbon discovery that could be potential sources of the release. Additionally, please provide information regarding tank contents and the tank inspection schedule for any potential upgradient tank sources. Finally, also provide additional information regarding the drainage ditch (e.g., depth of ditch, direction of flow, and drainage outlets)."

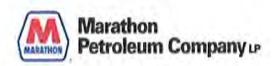
On August 13, 2015, Western submitted an investigation work plan that covered the areas down-gradient of wells OW-29 and OW-30, and the North Drainage Ditch. This larger area generally down-gradient of SWMU No. 6 was investigated separately, while the effort to identify the source of groundwater

contamination observed in OW-14 was conducted under a separate work plan and has been reported on separately from the down-gradient areas. Based on the investigations conducted to-date of the three areas, it appears the observed groundwater impacts are all associated with SWM No. 6. Instead of taking a somewhat "piecemeal" approach of attempting to extend select maps or cross sections from one area of investigation to include portions or all of the adjacent areas of investigation, it would be a significant improvement to have one report for SMWU No. 6 that includes all three of the areas discussed above, which are all impacted by releases at SWMU No. 6. We would welcome the opportunity to discuss this approach with NMED at upcoming project meetings and jointly develop a report outline, which could retain some of the individual discussions on different areas/field efforts, but at least present a more comprehensive presentation on the subsurface conditions (e.g., geology, hydrogeology, and contaminant distribution) across the larger area and better documentation of contamination migration within and away from SWMU No. 6.









October 24, 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 Approval with Modifications

Revised Investigation Report OW-14 Source Area Marathon Petroleum Company LP, Gallup Refinery (dba Western Refining Southwest, Inc.) EPA ID# NMD000333211 HWB-WRG-19-002

Dear Mr. Kieling:

Marathon Petroleum Company LP (dba Western Refining Southwest, Inc.) Gallup Refinery is submitting the enclosed responses to your comments dated August 19, 2019 on the referenced Report. If there are any questions, please call Brian Moore at 505-726-9745.

Certification

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

Sincerely,

Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks

Refinery General Manager

Robert S Hanks

Enclosure

cc K. Van Horn NMED

C. Chavez NMOCD

B. Moore Marathon Gallup Refinery

RESPONSE TO COMMENTS

August 19, 2019 Approval with Modifications – Revised Investigation Report OW-14 Source Area (July 2019)

NMED Comment 1:

In the responses to NMED's *Disapproval* Comments 1, 2, 11, 15 and 19, the Permittee states, "[n]one required ... " Although no revision is required to the Report to address these comments, these comments provide NMED's direction and still require the Permittee's compliance and a response. The Permittee's response does not clearly express concurrence, but NMED assumes as such. Respond to future comments appropriately.

MPC Response 1:

The comment is acknowledged.

NMED Comment 2:

In the response to NMED's *Disapproval* Comment 8, the Permittee states, "[n]ew Figure 21 has been added to show the identified underground pipelines in the investigation area." During the site visit conducted on June 6, 2019, NMED observed that many pipelines within the Facility were exposed to facilitate visual inspection for potential leaks. Explain whether the pipelines depicted in Figure 21 (Underground Pipelines) were also exposed or if they are buried. If the pipelines are buried, provide information regarding the dimensions and depths of the pipelines in a response letter.

MPC Response 2:

The historic site drawings indicate the "dirty oil drainage lines" from the storage tanks are 4" in diameter and the trunk lines into which they drain are 8" lines in the area depicted on Figure 21. The exact depth of these pipelines ranges from approximately 2 to 6 feet of the land surface in this area depending on local topography. The sewer pipeline is indicated to have a diameter of 8" and the depth is unknown.

NMED Comment 3:

NMED's Disapproval Comment 10 states, "[f]rom past investigations and general knowledge of the depositional environment, the thickness of transmissive materials is highly variable without any obvious trends. Remove the discussion regarding the thickness of transmissive materials from the revised Report or note that it is highly variable."

The Permittee's response states, "[t]he discussion regarding the thickness of transmissive materials on page 4-2 has been removed from the Report and a sentence added stating that the thickness of transmissive materials is highly variable. We have also noted that this is according to NMED. We are not arguing that the thickness is not variable, but neither DiSorbo nor MPC Refinery is of the opinion there are no trends to the distribution of the thickness of transmissive materials. Where NMED wants statements added that could be considered an interpretation the data, we think it important to clarify whose interpretation is being presented." The Permittee revised the Report to state, in Section 4.2.1 (Geology) that, "[a]n isopach map of the thickness of potentially transmissive material (e.g., sand, sandy gravel, clayey gravel, clayey sand, etc.) that are below the water table is included as Figure 11. The thickness of the transmissive materials is highly variable according to NMED."

The trends the Permittee references are not clear and not discussed in the response letter or within the text of the Report. The Permittee's presentation of the saturated lithology as a monolith of transmissive material is an overly broad characterization of the site's soils, which

was the basis of NMED's comment. As the Permittee states in the Report twice, in Section 4.2.1 (Geology) and Section 4.2.2 (Hydrogeology), the subsurface is characterized by "diverse properties and complex, irregular stratigraphy of the surface soils (Quaternary alluvium) ... " Contaminant migration occurs primarily within deposits of sands and gravels or clayey sands and gravels, such as the sand stringers that occur irregularly throughout the facility's subsurface. The presence of transmissive materials is variable. This is depicted in the boring logs as well, for instance the well log for boring TK569-3 depicts two separate saturated intervals in silty sand/sandy clayey gravel separated by a layer of silty clay. In the January 2019 version of the Report, the Permittee stated, "[t]here are two areas that show a thicker accumulation of saturated transmissive materials, with one being near RW-1 and TK 568-2. possibly extending northeast towards old boring 652. There is also an increased thickness of saturated transmissive sediments near OW-14, which may extend to the north towards old boring 643." In the same Geology section of the Report the Permittee discusses the top of the Chinle Group regarding troughs and highs in the top of the bedrock and refers to Figure 12 (Paleotopography Top of Chinle Group). The transmissive material lies atop the Chinle Group bedrock; where there are troughs in the bedrock, generally an accumulation of transmissive material is present, unless erosion or other reworking occurred post deposition. Contour maps of the top of the Chinle formation, the Chinle/Alluvium deposits, and the potentiometric surface should be roughly comparable. Treating the subsurface soils as a monolith presents a simplified version of potential migration pathways, which are more complicated. In the response letter, explain the more monolithic trends which the Permittee believes to be present in the subsurface.

MPC Response 3:

NMED introduces the term "monolith", but we have not identified its use within the Report. We find monolith defined in Merriam-Webster's dictionary as "a single great stone often in the form of an obelisk or column." This is certainly not what is represented on Figure 11 and we believe the report clearly describes the figure as simply showing the thickness of potentially transmissive saturated materials that may comprise different lithologies (e.g., sand, sandy gravel, clayey gravel, clayey sand, etc.). There is nothing to represent the contoured values represent a "single lithology", possibly what NMED is referring to as a "monolith." We understood NMED's previous comment to indicate you wanted any references to trends removed. In the revised Report, references to any potential trends that may or may not be depicted on Figure 11 were removed per NMED's comment. We do believe that with the increased geologic control as the result of installing additional borings, that some gross trends of the saturated thickness of transmissive materials, particularly immediately overlying the bedrock surface, may be more apparent.

NMED Comment 4:

In the response to NMED's *Disapproval* Comment 12, the Permittee states, "[a]s noted by NMED, the slope of the potentiometric surface and that of the contact between the Chinle Formation and the overlying Alluvial deposits do not correlate [in the area of RW-2 and OW-58]." In Section 4.2.2 (Hydrogeology) the Permittee states" ... the groundwater elevations in RW-2 and OW-58 were similar in September 2016 (0.84 feet higher at OW-58) but the gradient increased to 1.59 feet in August 2018 with the flow direction to the southwest from OW-58 towards RW-2. This is in contrast to the elevation change of the top of the Chinle, which is 8 feet higher at RW-2 than OW-58. Generally, the shallow groundwater potentiometric surface reflects the topography of the top of the Chinle Formation, but not in this particular location." It seems unlikely that groundwater flows in the opposite direction between these two wells from the rest of the shallow groundwater flow to the north and northeast in this area of the facility. Either there is an ongoing leak contributing to the increase in the groundwater gradient or the measurements were not recorded correctly; either way these data appear to be

anomalous. No revision required.

MPC Response 4:

The comment is acknowledged.

NMED Comment 5:

In the response to NMED's *Disapproval* Comment 16, the Permittee states, "[i]n reviewing the referenced well log [TK569-3], we note that the 2-foot interval above the 14' - 16' interval consisted of a silty clay with a trace of fine sand but was otherwise similar to the interval above, which was logged as silty clay, low, firm, damp, brown, odor. The overlying silty clay that extends to the land surface is also noted as being damp. In this case, following NMED's recommendation, the well screen would extend from the land surface to the total depth of 39 feet. We would respectfully suggest that an indication of being damp does not mean it is likely the water table would rise to the upper levels. Also, consideration must be given to the presence of confined intervals, where the potentiometric surface may rise in a cased [well] when above the screened interval, but not be reflective of "water table" conditions at a given location. MPC will employ longer screen intervals where appropriate based on NMED's direction above and attempt to consult with NMED regarding well screen placement when conditions arise that could potentially result in "submerged" well screens and/or cross-contamination between otherwise vertically isolated intervals."

Signs of saturation in tight formations (e.g., silty clay) are often difficult to identify. According to the boring log for TK569-3, the presence of fine sand and odor is first noted at the depth of 14 feet below ground surface (bgs) and the soil description is clearly different from that of the shallower subsurface. Nevertheless, the screened interval of temporary well TK569-3 intersected the water table and the well was appropriately installed according to Table 4 (Groundwater Field Measurements). No revision required.

MPC Response 5:

The comment is acknowledged.

NMED Comment 6:

In the response to NMED's *Disapproval* Comment 17, the Permittee states, "[y]es, the groundwater samples collected at TK569-2 and TK570-1 were collected from beneath the layer SPH. The text on pages 4-11 and 4-14 is revised to reflect collection of the water samples from beneath the SPH." The response partially addresses Comment 17. Comment 17 also states, "[i]n the future, when SPH is present in any temporary wells after purging, the wells must be converted to permanent groundwater monitoring or recovery wells or the Permittee must contact NMED to discuss the circumstances." Acknowledge the provision in the response letter.

MPC Response 6:

The comment and requirement to complete temporary wells with SPH as permanent monitoring wells is acknowledged.

NMED Comment 7:

In Section 2 (Background), page 2-2, the Permittee states, "[t]he most recent inspection of Tank 570 was conducted in March 2015. During the internal inspection, two ¼" diameter through holes were found in the floor. It was noted in the report that these holes were apparently in the same areas that were drilled and repaired with epoxy back in August of 1994. Based on these inspection reports, it appears that recent leaks have been occurring through the bottom of Tank 570 and may have been present in the past with earlier repairs dating back to 1994." According to a conversation with the Permittee at the end of July

2019 the leaks in Tank 570 may have also contributed to the product discovered in the French drain by pond STP-1. The Permittee provided cross-sections of the subsurface but no cross sections that depict the subsurface from Tank 570 to OW-14 or towards STP-1. The cross-sections focused on the area around recovery well RW-1 and none of the cross-sections depict the subsurface towards well OW-14. Submit a figure that depicts the likely subsurface conditions between Tank 570 to OW-14 and STP-1.

MPC Response 7:

Figures 6 and 9 are revised to extend cross section C-C' to OW-14 and a separate new cross section is enclosed that extends to STP-1.

NMED Comment 8:

In Section 2 (Background), page 2-1, the Permittee states, "The three leaded gasoline storage tanks (TK-568, TK-569, and TK-570) closest to OW-14 were investigated as part of SWMU No. 6 in the early to mid-1990s. Tanks TK-569 and TK-570 are still used to store gasoline, while TK-568 was switched to store MTBE sometime after 1996 and later switched to ammonium thiosulfate in 1986." Note that NMED considers SWMU 6 to include the entire tank farm, not just the leaded tanks. Also, it seems that the dates are incorrect regarding the history of tank TK-568. No revision required.

MPC Response 8:

The comment is acknowledged and NMED is correct regarding the dates describing the history of Tank TK-568 are incorrect. Any future revision to the report will correct the discussion to note that the switch to ammonium thiosulfate occurred in 2005.

NMED Comment 9:

The Permittee notes several times in Section 6.1 (Soil Analytical Results) that since soil samples with analytical results *above* residential levels that were collected below 10 feet that, "[t]his sample was collected at a depth below 10 feet and thus the residential screening level does not apply." At this point in the investigative process, the soil screening levels are being used for comparison and to develop a better understanding of site conditions to see where contaminants are present *above* screening levels to guide the investigation. Once an investigation is complete, appropriate risk-based screening levels may be used to direct corrective action decisions.

MPC Response 9:

The comment is acknowledged.

NMED Comment 10:

In Section 7.1 (Conclusions) the Permittee discusses that, "[t]he presence of soil samples with elevated concentrations of constituents does help to better understand potential transport pathways. The greatest number of detections of organic constituents with the highest concentrations occurred in the soil sample collected at a depth of 24 feet to 26 feet bgl in boring TK 569-3. This boring is located up-gradient of Tank 569 and down-gradient of Tank 570. There were much lower concentrations of organic constituents detected in a shallower (16 feet to 18 feet bgl) soil sample in the same boring, potentially indicating the deeper impacts are the result of lateral transport to this location." The Permittee does not discuss the soil type(s) present at these intervals, which is an even better way to understand potential contaminant pathways. Include the discussion in the response letter.

MPC Response 10:

There is a detailed discussion on the soil types present in Section 4.3.1, which is not repeated in the Conclusions Section. This discussion is provide below and as shown both intervals consist of sand with clayey sand in the 16 feet to 18 feet bgl interval and silty sand in the 24 feet to 26 feet bgl interval.

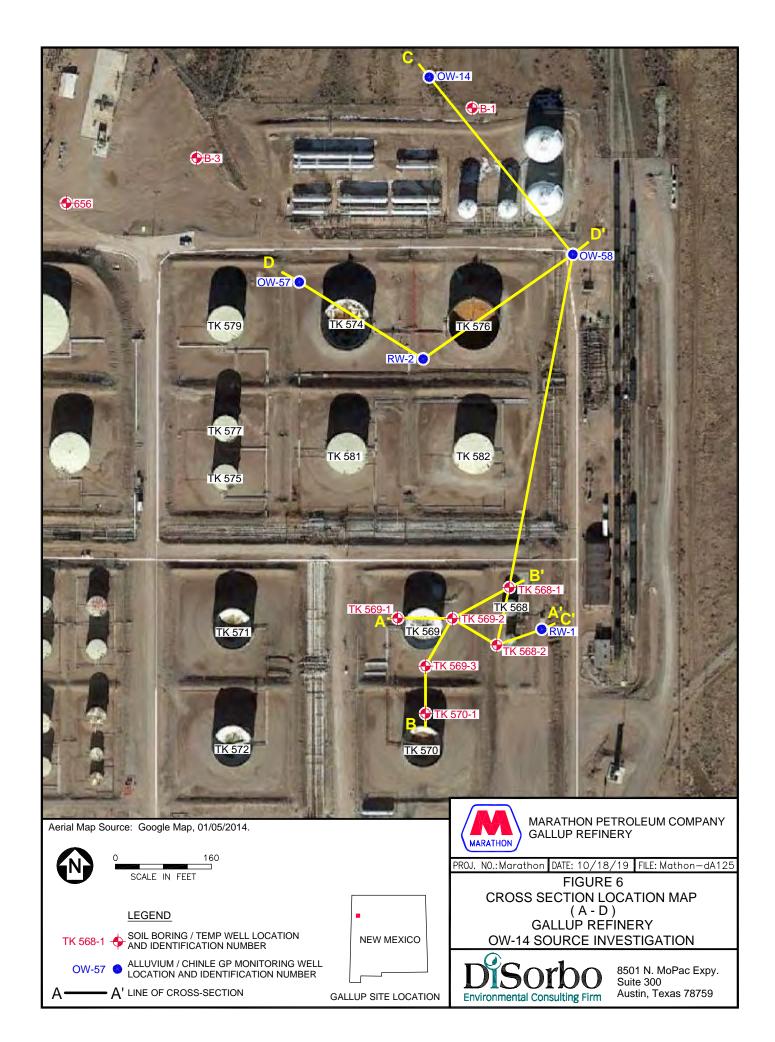
The lithology encountered consisted of the following:

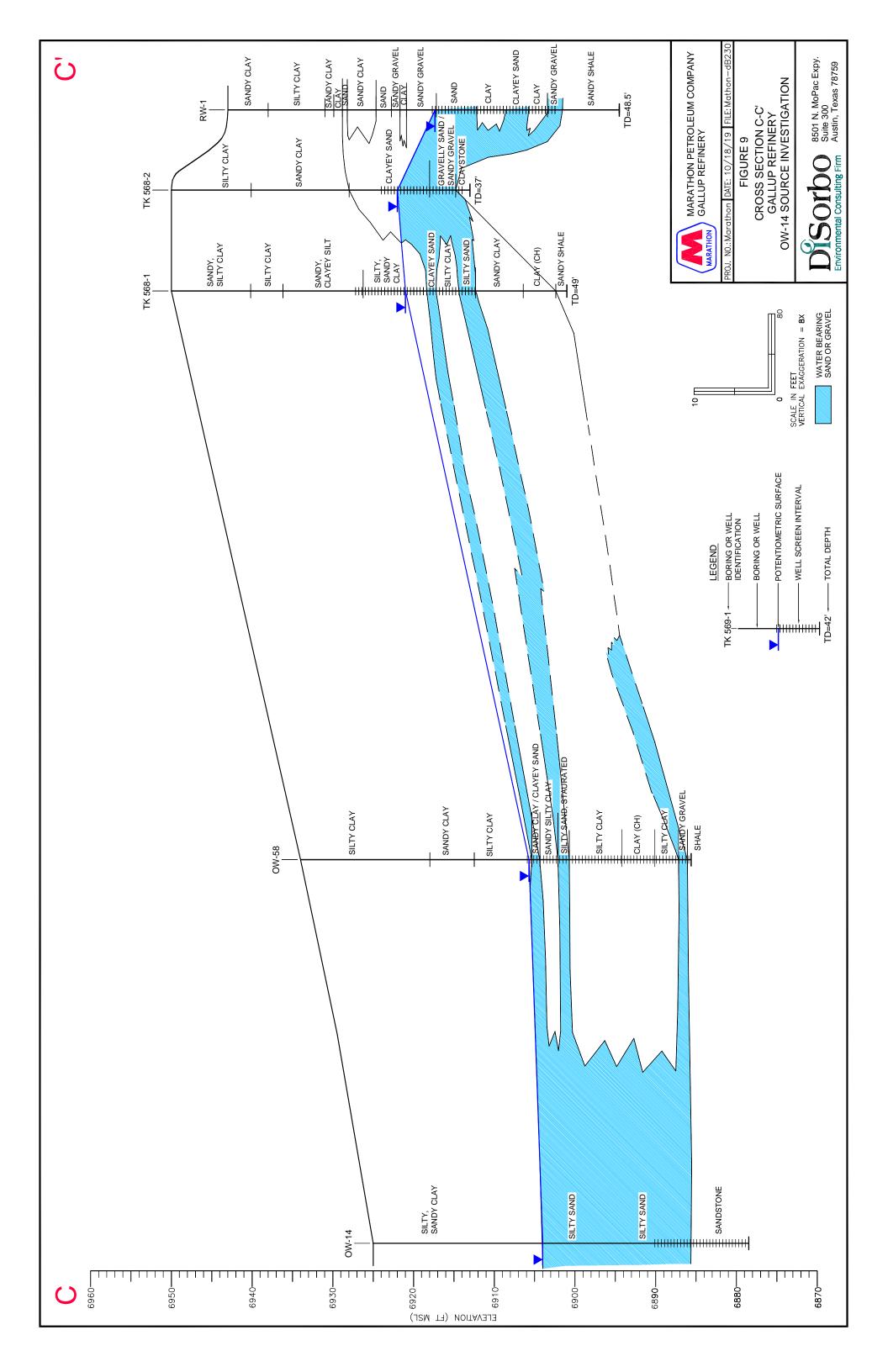
- Silty Clay: 0 14 feet bgl (low plasticity, firm, damp, brown, no odor, odor detected from 10 feet bgl to 14 feet bgl, trace very fine grain sand from 12 feet bgl to 14 feet bgl);
- Clayey Sand: 14 feet bgl 18 feet bgl (very fine grain, compact, damp, brown, odor);
- Clayey Sand/Sandy Clay: 18 feet bgl 20 feet bgl (very fine grain, compact, damp, brown, odor);
- Sandy Clay: 20 feet bgl 24 feet bgl (low plasticity, firm, damp, brown, odor);
- Silty Sand: 24 feet bgl 27 feet bgl (fine grain, loose, very moist, brown, odor, phase separated hydrocarbon present, saturated from 26 feet bgl to 27 feet bgl);
- Sandy Gravel: 27 feet bgl 28 feet bgl (compact, 0.5 inch to 1 inch gravel, medium to coarse grain sand, saturated, phase separated hydrocarbon present, odor);
- Sandy Clayey Gravel: 28 feet bgl 31.5 feet bgl (compact, 0.5 inch to 1 inch gravel, medium to coarse grain sand, clay present, very moist to saturated in seams/pockets, white sandstone present, strong odor, greenish gray sandstone at 30 feet bgl, very dense);
- Silty Clay: 31.5 feet bgl 34 feet bgl (low to moderate plasticity, firm, damp, brown, odor, grey streaks present);
- Sandy Gravel: 34 feet bgl 36 feet bgl (compact, 0.25 inch to 0.5 inch gravel, coarse sand, saturated, odor);
- Sandy Clayey Gravel: 36 feet bgl 38 feet bgl (very hard 0.25 inch gravel with clay and sand, damp, grey and brown, odor); and
- Claystone (Chinle Group Painted Desert Member): 38 feet bgl 39 feet bgl (very hard, dry, reddish purple and grey, odor).

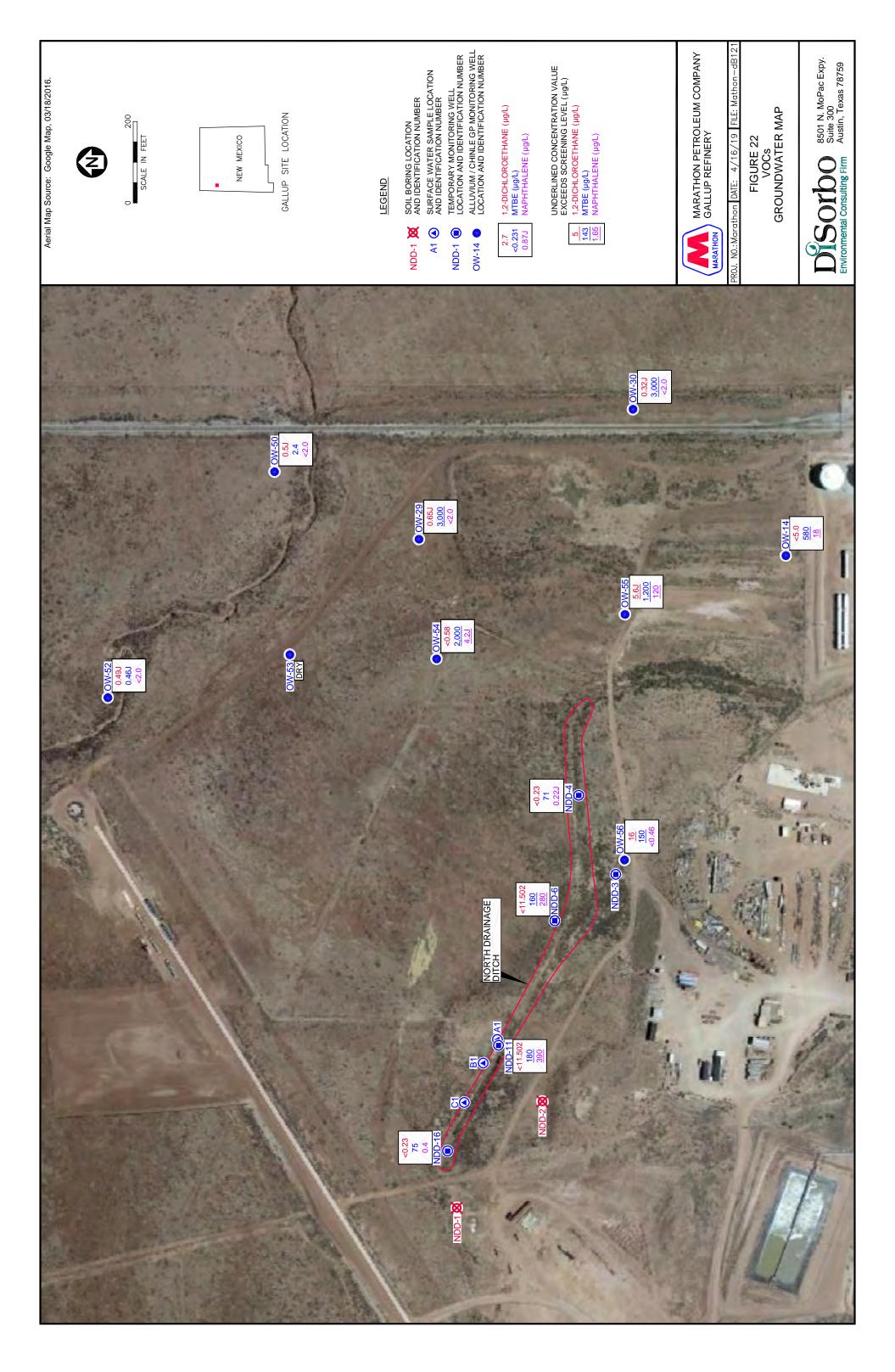
NMED Comment 11:

In Section 7.1 (Conclusions) the Permittee states, "[t]he highest MTBE concentration was found in a groundwater sample from TK568-1 (10,000 ug/L), which is located north (downgradient) of Tank 568. The groundwater sample collected from the temporary well TK 568-2, which is upgradient of Tank 568, was reported to have a MTBE concentration of 140 ug/L. The second highest MTBE concentration was found in groundwater collected from OW-58 (3,300 ug/L), which is located approximately 560 feet north (down-gradient) of TK 568-1." Other downgradient wells contain concentrations of MTBE: well OW-14 0.60 mg/L (600 ug/L) in 2018, well OW-30 contains concentrations of MTBE at 4,000 ug/L, and well OW-55 at a concentration of 2,000 ug/L in 2017. It appears that the Permittee may be able to better delineate the migration of MTBE in groundwater from Tank 568 using additional data points. Figure 20 (Benzene, Ethylbenzene, Toluene, Total Xylenes, and MTBE Groundwater Map) depicts wells only as far north as well OW-14. Provide a figure that includes the other downgradient wells identified in this comment to provide further context to the MTBE plume migration.

MPC Response 11:
The requested figure is enclosed. This is Figure 22 from the Investigation Report North Drainage Ditch and OW-29 & OW-30 Areas, which is reported on separately as previously directed by NMED.







Appendix A Historical Boring Logs

 i_{ζ}

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

FILE #:

95-018

LOGGED BY: WHK

					- -
PROJECT:	Tank 569			ELEVATION:	6943.7
LOCATION:	See Boring	Pla	n	LOG OF TEST BORINGS TOTAL DEPTH:	48.5
				LOGGED BY:	WHK
			s	DATE:	3-28-95
	ĺ	s	A	STATIC WATER:	28.0
	P	i c	м	BORING ID:	BG4
	L	A	P		1
	- 0	:	L	MATERIAL CHARACTERISTICS	PID
DEPTH	T	E	E	(MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	(ppm)
0.0-0.3	******			Sand, fine, dry, brown, loose	1 APPENIA
0.3-0.4				Asphalt Cement Concrete	11.0
0.4-5.0	///***///	:		Clay, sandy, wet, brown, firm, (fill), odor below 3.9', water saturated @ 4.8'	>1438
014-310	///***///	:	:	bottom of fill is at 4.8'	71430
	///***///	!	:	Docton of fiff is at 4.6	i
	•	,	C		
	///***///	:	C		!
	///***///	•	C		ļ
	///***///	•	C		ļ
	///***///		C		<u> </u>
5.0-11.8	•		:	Clay, silty, blocky, wet, brown, firm, scattered carbonate filaments, some	0.0
	///+///	•	:	nodules, native, no odor, redder >10'	!
	///+///		C		
	///+///		C		
	///+///	İ	C		
	///+///		c		
	///+///	1	C		
	///+///	1	C		İ
	///+///	İ	C		Ì
	///+///	İ	c		İ
	1///+///	i	c		i
	///+///	i	c		i
	///+///	:	С		i
	1//+///		c		ĺ
11.8-13.0	///***///		С	Clay, sandy, very fine, wet, red brown to brown, soft	0.0
	///***///	:	С		i
13.0-14.1	////+++//		C	Clay, stiff, fissured, wet, brown, some carbonate nodules	0.0
	////+++//		С		i
14.1-14.6	******			Sand, fine, clean, damp, white, loose	1 00
					1 0.0
14.6-15.0	1///**0*//	1	C	Claw, sandy, slightly gravelly, wet, brown, very stiff to hard	0.0
	///**0*//	:	:	Clay, sandy, slightly gravelly, wet, brown, very stiff to hard	0.0
	///**////	15	С	Clay, sandy, slightly gravelly, wet, brown, very stiff to hard Clay, very fine sandy, laminar bedded, wet, brown, soft	1
	///**///	15	c c		0.0
	///**/// ///**///	15	C C		0.0
15.0-16.9	///**/// ///**/// ///**///	15	с с с	Clay, very fine sandy, laminar bedded, wet, brown, soft 	0.0
15.0-16.9	///**/// ///**//// ///**//// ///*////	15 17	с с с		0.0
15.0-16.9	//**/// ///**/// ///**//// ///*////	15	C C C C	Clay, very fine sandy, laminar bedded, wet, brown, soft 	0.0
5.0-16.9	//**/// //**/// //**/// //*//// //*////	15 17 18	C C C C C	Clay, very fine sandy, laminar bedded, wet, brown, soft	0.0
5.0-16.9	//**/// //**/// //**/// //*//// //*//// //*/////	15 17 18	C C C C C	Clay, very fine sandy, laminar bedded, wet, brown, soft Clay, very fine sandy, slightly less than above, slightly blocky, wet, brown, firm Sand, some clay, sandy in bands, moist to wet, brown, moderately dense to soft	0.0
.5.0-16.9 .6.9-18.1 .8.1-19.8	//**/// //**/// //**/// //*//// //*//// //*//// ****//***	15	0 0 0 0 0 0	Clay, very fine sandy, laminar bedded, wet, brown, soft Clay, very fine sandy, slightly less than above, slightly blocky, wet, brown, firm Sand, some clay, sandy in bands, moist to wet, brown, moderately dense to soft interbedded with finer soil	0.0
15.0-16.9	///**/// ///**/// ///**/// ///*//// ///*//// ****//***	15	C C C C C C	Clay, very fine sandy, laminar bedded, wet, brown, soft Clay, very fine sandy, slightly less than above, slightly blocky, wet, brown, firm Sand, some clay, sandy in bands, moist to wet, brown, moderately dense to soft	0.0
15.0-16.9	///**/// ///**/// ///**/// ///**/// ///*//// ///*//// ///*//// ****//***	15	C C C C C C	Clay, very fine sandy, laminar bedded, wet, brown, soft Clay, very fine sandy, slightly less than above, slightly blocky, wet, brown, firm Sand, some clay, sandy in bands, moist to wet, brown, moderately dense to soft interbedded with finer soil	0.0
15.0-16.9 16.9-18.1 18.1-19.8	///**/// ///**/// ///**/// ///**/// ///*//// ///*//// ****//** 000**000 000***000	15		Clay, very fine sandy, laminar bedded, wet, brown, soft Clay, very fine sandy, slightly less than above, slightly blocky, wet, brown, firm Sand, some clay, sandy in bands, moist to wet, brown, moderately dense to soft interbedded with finer soil	0.0
14.6-15.0 15.0-16.9 16.9-18.1 18.1-19.8	///**/// ///**/// ///**/// ///**/// ///*//// ///*//// ****//** 000**000 000**000	15 17 18 20 21		Clay, very fine sandy, laminar bedded, wet, brown, soft Clay, very fine sandy, slightly less than above, slightly blocky, wet, brown, firm Sand, some clay, sandy in bands, moist to wet, brown, moderately dense to soft interbedded with finer soil Gravel, sandy, moist, light grey to white, dense, subrounded	0.0
15.0-16.9 16.9-18.1 18.1-19.8 19.8-21.3	///**/// ///**/// ///**/// ///*//// ///*//// ///*//// ****//** 000**000 000**000 1//***///	15 17 18 20 21		Clay, very fine sandy, laminar bedded, wet, brown, soft Clay, very fine sandy, slightly less than above, slightly blocky, wet, brown, firm Sand, some clay, sandy in bands, moist to wet, brown, moderately dense to soft interbedded with finer soil Gravel, sandy, moist, light grey to white, dense, subrounded Clay, sandy, wet, brown, soft	0.0
15.0-16.9 16.9-18.1 18.1-19.8	///**/// ///**/// ///**//// ///*//// ///*//// ****//** ****/*** ****/*** ****/*** ****/*** ****/*** ****//*** ****//** ****//** ****//** ****//** ****//** ****//** ****//** ****/*** ****//** ****//** ****//** ****//** ****//** ****/**** ****/***** ****/***** ****/***** ****/***** ****/***** ****/***** ****/***** ****/***** ****/***** ****/******	15 17 18 20 21 22		Clay, very fine sandy, laminar bedded, wet, brown, soft Clay, very fine sandy, slightly less than above, slightly blocky, wet, brown, firm Sand, some clay, sandy in bands, moist to wet, brown, moderately dense to soft interbedded with finer soil Gravel, sandy, moist, light grey to white, dense, subrounded Clay, sandy, wet, brown, soft Gravel, slightly sandy, some clay as binder, moist, grey to brown, dense	0.0
15.0-16.9 16.9-18.1 18.1-19.8 19.8-21.3	///**/// ///**/// ///**/// ///*//// ///*//// ///*//// ****//** 000**000 000**000 1//***///	15 17 18 20 21		Clay, very fine sandy, laminar bedded, wet, brown, soft Clay, very fine sandy, slightly less than above, slightly blocky, wet, brown, firm Sand, some clay, sandy in bands, moist to wet, brown, moderately dense to soft interbedded with finer soil Gravel, sandy, moist, light grey to white, dense, subrounded Clay, sandy, wet, brown, soft	0.0

FILE #:

95-018

PROJECT: Tank 569 6943.7 ELEVATION: LOCATION: See Boring Plan LOG OF TEST BORINGS TOTAL DEPTH: 48.5 LOGGED BY: WHK

				LOGGED BY:	WHK
	!	ļ	S	DATE:	3-28-95
	!	s	A	STATIC WATER:	28.0
	P	С	М	BORING ID:	BG4
	_ L	A	P	PAGE:	2
	. •	L	L	MATERIAL CHARACTERISTICS	PID
DEPTH	T	E	E	(MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	(ppm)
	000++/000		С	continued from page 1	
	000++/000	24	c		I
	000++/000		C		160 @ 24.
	000++/000	25	<u> </u>		
25.5-29.4			C	Sand, fine, clean of silt and clay, moist, brown, loose	45.0
	******	26	C		
		ĺ	С		}
	******	ĺ	С		İ
		i	С		İ
	İ	i	c		i
		i	С		i
	******	29	c		i
29.4-30.5			!	Sand as above but very weakly water bearing @ 29.4', grey to black, strong odor	1100
20.4 30.0	******	30	c	l state and the state state of the state of	
30.5-31.2	///***///			Clay, sandy, wet, brown, soft, odor	770
50.551.12	///***///	!	l c	CLAY, Ballay, Wee, Brown, Bore, Guor	,,,,
31.2-34.0	1///+++///			Clay, blocky, wet, very stiff, numerous carbonate filaments, brown, slightly	770
31.2-34.0	:	!	:		1 //0
	1///+++///		:	fissured, odor	1
	///+++///	!	C		1
	///+++///	!	C		!
	1///+++///	:	С		
34.0-35.0	******	!	:	Sand, silty, very fine, does not appear water bearing, but sample covered with	700
	*****	•	:	water from above, very dark brown to black, soft, strong odor	
35.0-37.3	***///***	!	:	Sand, very fine, clayey, saturated, water bearing zones2" thick, gradational to	1000
	///	!	:	clay below, brown, strong odor	1
	///	!	С		!
	///		C		!
	///	37	C		ļ
37.3-39.2	///+++///		С	Clay, wet, brown, stiff, carbonate filaments, soft to firm, not blocky or fissured	320
	///+++///		c		
	1///+++///	1	C		1
	1//+++///	39	c		1
39.2-40.9	000++/000			Gravel, sandy, slightly clayey, water bearing, brown, dense, rounded to subrounded	800
	000++/000	i	•	odor	j
	000++/000	:	С		<u> </u>
40.9-45.0	*	:	С	CHINLE PORMATION	
	+	i	!	Shale, slightly sandy, fissle, fissured, slightly blocky, moist, red brown, hard	2.0
		i	c	some grey green banding, no odor	Ì
] +	1	!		
	*	i	ור	1	!
	1	İ	C	i	ŀ
	1	<u> </u> 	С		1
	1		c c		
	*	 	с с с		
	*		с с с		
45.0-48.5		45	c c c	Shale, sandy, fissle, moist to damp, hard, water from above runs into fissle	
45.0-48.5	*	45	c c c	Shale, sandy, fissle, moist to damp, hard, water from above runs into fissle partings (dry on interior of sample) difficult to obtain uncontaminated sample	

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

FILE #:

95-018

PROJECT: Tank 569 ELEVATION: 6943.7 LOCATION: See Boring Plan LOG OF TEST BORINGS TOTAL DEPTH: 48.5 LOGGED BY: WHK | s | DATE: 3-28-95 STATIC WATER: 28'-7" S A CM BORING ID: BG4 PAGE: A P PID LLL MATERIAL CHARACTERISTICS DEPTH (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.) (mgg) ----* | C | continued from page 2 ----++---|<u>47</u> | C | 23 @ 47.0 ----++---| c | ----++---|48 | C | 12 @ 48.5 stop drilling 11:05a | water € 18.8' € 11:30a -- 8" of hydrocarbon on water € 2:00p water level € 28'-7" completed 4" well, acreened from 25' to 40' (see attached completion diagram)

LOGGED BY: WHK

INSTALLATION DATE: 03 2895 INSTALLATION DIAGRAM MONITORING WELL NO. B6-4 TOP OF PROTECTIVE WELL COVER: FΤ INNER WELL CUP MEKSUREMENT NOTOH TOP OF PVC CONCRETE PAD-(HT43a) BOTTOM OF COVENT: 2 FT. PROTECTIVE WELL COVER: FT BOTTON OF CENENT: 2.0 FT CROUT: 12 FT. TOP OF BENTONITE SENT: 14.0 FT BENTONITE SEN: 2.5 FT. TOP OF SWED PLACK: 16.5 ध 25.0 TOP OF SCREEN: FT SCREENS SAND PACK: 15 FT. 26.5 FT. FT BOTTON OF SCREEN: 40.0 40.3 PIEZONETER TIP: FΤ Bentonite Plug BOTTON OF BORING: 43.0 FT 🕏 PORTHALE DUMETTER 8- 5/8 HONES WATERWLS USED: Bottom Cap Used? YES SUND TYPE AND QUANTITY: 20-40

BENTONITE PELLETS (5-CULON BUCKETS): 1 Screen Lengths: 15'
BAGS OF CROUT: 1
AMOUNT OF CELLENT: 8-94# Bags+75#Gel
AMOUNT OF WATER USED: 8 gal.

OTHER:

Well Size: 44" Directory

Well Size: 44" Directory

Well Size: 44" Directory

Well Size: 44" Directory

Well Size: 44" Directory

Well Size: 44" Directory

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Well Size: 44" Directory

Well Size: 44" Director OTHER:

Well Size: 4 " Dia.

J-Plug Used? YES Flush Mount Vault Avove Ground Vault VES Bollards, No. & Size:

TASK: Tank 569

CECLOCIST/ENGNEER: WHK

FILE #: ELEVATION: 95-018

				PRECISION ENGINEERING, INC. FILE #:	95-018
PROJECT:				ELEVATION:	6927.3
LOCATION:	See Boring	Plar	n	LOG OF TEST BORINGS TOTAL DEPTH:	38.0
	Tank 576			LOGGED BY:	WHK
			s	DATE:	3-29-95
	1	s	A	STATIC WATER:	24'-3"
	P	С	м	BORING ID:	B2
	_ r	A	P	PAGE:	1
	0	L	L	MATERIAL CHARACTERISTICS	PID
DEPTH	Ţ	E	E	(MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	(mqq)
0.0-5.0	1///-+////	i	C	start at 10:00a	I
	1//-+////	:	j c	Clay, slightly silty, little sand, wet, brown, soft to firm, no odor	0.0
	1//-+////	į,	C		j
	1//-+///	i	c		1
	1//-+////		c	İ	İ
	///-+////	•	c		i
	1//-+////	: .	C		i
	///-*///	:	c		i
	1//-*///		c		
	1//-+///	•	1		
	1//-+///		c	(
	1///-+////		:	 	1
	1///-+////		C	! !	1
	:	•	C		1
	1//-+////	•	C		
	///-+////	•	C		ļ
	1/////		-		
8.4-10.6	///***///	:	:	Clay, fine sandy, gradational fine above and to below, wet, brown, firm, no odor	0.0
	1///***///	: :	C		ļ
	///***///	:	C		!
	///***///				
0.6-12.0	******	: :	:	Sand, silty, fine, moist, light red brown, loose, no odor	0.0
	******	:	С		
	*****		c		1
2.0-12.5	+++000+++	12	С	Sand, very gravelly, to 2°, moist, light red brown, dense, slightly rounded rock	0.0
2.5-13.1	***000***	12	c c	Sand, silty, moist, light red brown, loose, no odor	0.0
	000 ****** ///**//	12	c c	Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments	
2.5-13.1	***000*** ****** ///**//	12	C C C	Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments	0.0
2.5-13.1	***000*** ****** //**// ///**//	12 13	C C C	Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments	0.0
2.5-13.1 3.1-15.0	***000*** ****** ///**// ///**//	13	c c c c	Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments	0.0
2.5-13.1	***000*** ***** ///**// ///**// ***///***	12 13 15	C C C C C	Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments	0.0
2.5-13.1 3.1-15.0	**************************************	13	C C C C C C C C C C	Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments	0.0
2.5-13.1 3.1-15.0	**************************************	12 13 15	C C C C C C	Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments	0.0
2.5-13.1 3.1-15.0 5.0-16.8	**************************************	13	C C C C C C	Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments Sand, clayey, fine, moist, red brown, moderately dense, no odor	0.0
2.5-13.1 3.1-15.0 5.0-16.8	**************************************	13	C C C C C C	Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments	0.0
2.5-13.1 3.1-15.0 5.0-16.8	**************************************	12 13 15 17	c c c c c c c	Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments Sand, clayey, fine, moist, red brown, moderately dense, no odor	0.0
2.5-13.1 3.1-15.0 5.0-16.8	**************************************	12 13 15 17		Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments Sand, clayey, fine, moist, red brown, moderately dense, no odor Clay, silty grading to very fine sandy, moist to wet, red brown, stiff, no odor	0.0
2.5-13.1 3.1-15.0	**************************************	13		Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments Sand, clayey, fine, moist, red brown, moderately dense, no odor Clay, silty grading to very fine sandy, moist to wet, red brown, stiff, no odor	0.0
2.5-13.1 3.1-15.0 5.0-16.8 6.8-19.1	**************************************	12 13 15 17 19		Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments Sand, clayey, fine, moist, red brown, moderately dense, no odor Clay, silty grading to very fine sandy, moist to wet, red brown, stiff, no odor	0.0
2.5-13.1 3.1-15.0 5.0-16.8	***000*** ///**// ///**// ///**// ***///** ***///** //*+-/// //*+-/// //*+-/// //*+-///	12 13 15 17 19		Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments Sand, clayey, fine, moist, red brown, moderately dense, no odor Clay, silty grading to very fine sandy, moist to wet, red brown, stiff, no odor	0.0
2.5-13.1 3.1-15.0 5.0-16.8 6.8-19.1	**************************************	12 13 15 17 19		Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments Sand, clayey, fine, moist, red brown, moderately dense, no odor Clay, silty grading to very fine sandy, moist to wet, red brown, stiff, no odor carbonate filaments common Clay, silty, large gravel present (2*), wet, dark brown, hard, no odor	0.0
2.5-13.1 3.1-15.0 5.0-16.8 6.8-19.1	***000*** ///**// ///**// ///**// ***///** ***///** //*+-/// //*+-/// //*+-/// //*+-///	12 13 15 17 19		Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments Sand, clayey, fine, moist, red brown, moderately dense, no odor Clay, silty grading to very fine sandy, moist to wet, red brown, stiff, no odor carbonate filaments common Clay, silty, large gravel present (2*), wet, dark brown, hard, no odor	0.0
2.5-13.1 3.1-15.0 5.0-16.8 6.8-19.1	**************************************	112 13 15 17 19 20		Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments Sand, clayey, fine, moist, red brown, moderately dense, no odor Clay, silty grading to very fine sandy, moist to wet, red brown, stiff, no odor carbonate filaments common Clay, silty, large gravel present (2*), wet, dark brown, hard, no odor numerous carbonate filaments	0.0
2.5-13.1 3.1-15.0 5.0-16.8 6.8-19.1	**************************************	112 13 15 17 19 20		Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments Sand, clayey, fine, moist, red brown, moderately dense, no odor Clay, silty grading to very fine sandy, moist to wet, red brown, stiff, no odor carbonate filaments common Clay, silty, large gravel present (2*), wet, dark brown, hard, no odor numerous carbonate filaments	0.0
2.5-13.1 3.1-15.0 5.0-16.8 6.8-19.1	**************************************	15 15 17 19		Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments Sand, clayey, fine, moist, red brown, moderately dense, no odor Clay, silty grading to very fine sandy, moist to wet, red brown, stiff, no odor carbonate filaments common Clay, silty, large gravel present (2*), wet, dark brown, hard, no odor numerous carbonate filaments	0.0
2.5-13.1 3.1-15.0 5.0-16.8 6.8-19.1	**************************************	15 15 17 19		Sand, silty, moist, light red brown, loose, no odor Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments Sand, clayey, fine, moist, red brown, moderately dense, no odor Clay, silty grading to very fine sandy, moist to wet, red brown, stiff, no odor carbonate filaments common Clay, silty, large gravel present (2*), wet, dark brown, hard, no odor numerous carbonate filaments	0.0

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

FILE #:

95-018

LOGGED BY: WHK

PROJECT: Tank 569

LOCATION: See Boring Plan

LOG OF TEST BORINGS

LOGGED BY: WHK

	I	ì	s	DATE:	3-29-95
	j	s	A		24'-3"
	 P	c	n	!	B2
	L	A	P	PAGE:	2
		L	L	MATERIAL CHARACTERISTICS	PID
DEPTH	, ב	l E	E	(MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	(mgg)
23.6-24.2	***00****	!	:	Sand, coarse, some fine gravel, saturated but does not appear water bearing, brown dense, hydrocarbon odor	1000
24.2-25.5	1///////			Clay, wet, not water bearing, brown, stiff, hydrocarbon odor	1060
24.2-25.5	111111111	!	:	CLAY, WEE, NOT WATER BEATING, BIOWN, BUTTE, NYOTOGRIBON OUD	1
25.5-27.1	***///***	-	-	Sand, clayey, water bearing, brown, odor	610
	 ///	:	c		
	///	! .	c] 	İ
27.1-28.5	111111111		•	Clay, some sand @ 28'-28.5', wet, brown, soft, slightly blocky, hydrocarbon odor	l
	111111111	:	:	saturated but not water bearing	i
	111111111	•	!		
28.5-30.9	///***///	: -	:	Clay, sandy, some laminations, wet, brown, stiff	60
2012 0013	///***///	•	c	Stray, Stray, Some Imminations, week, Stown, Strive	
	1///***///	:	c	 	1
	1///***///	:	l c		1
	///***///	!	l c		1
30.9-32.9	000*+0000		•	Crown and william work among begins brown dance younded to subvounded	1030
30.9-32.9	:	:	:	Gravel, some sand, silica rock, water bearing, brown, dense, rounded to subrounded	1 1030
	000**0000	: :	C		1
	!	:	C		1
20 0 20 0	000++0000		C	1	
32.9-35.0		:	:	CHINIE FORMATION	
			:	Shale, weathered, wet to moist, some green mottling, red brown overall, stiff	20
		 	:	weak odor	
35.0-38.0		25	<u></u>	Challe as above alighble and blocked deals and business and be asign	
33.0-36.0	*		:	Shale, as above, slightly more sand, blocky, dark red brown, wet to moist	57
] 	:	suspect contamination by water flowing from gravel abovegravel produces more	} !
	*		:	water at this location than previous drilling	1
			C		1
			C	 	ļ.
	*	1 20	C		1
		38	С		
TD	1		!	stop drilling 11:25a	1
	ļ		!	completed 4" well - see attached well completion diagram	1
	!	!	!	24'-3" to water	Į
	ļ	1	ļ	2° product on water	ļ
	1	<u> </u>			!
			!		!
	ļ		į		
	!	!	!		1
]	! !			!
	<u> </u>				ļ
					1
	1	1			1
]				1
	1				
	J				1
					<u> </u>

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

INSTALLATION DATE: 032995 INSTALLATION DIAGRAM HEIGHT TOP OF PROTECTIVE WELL COVER: FT INNER WELL CUP WELSUREMENT NOTOH-TOP OF PVC (DEPTH) (FT) BOTTOM OF PROTECTIVE WELL COVER: CEVENT: 2 FT. FT FT BOTTON OF CENENT: 2 CROUT: 14.9 FT. TOP OF BENTONITE SELL: 16.9 FT SEN: 4.7 FT. TOP OF SAND PACK: 21.6 FT TOP OF SCREEN: 26.1 FΤ SCREEN 10 FT. BOTTOM OF SCREEN: 36,1 FT 36.4 FT PIEZOMETER TIP: Bentonite Plug. BOTTONI OF BORING: 38.0 FΤ BOREHOLE DUNETURS " FIX NOISE

MATERIALS USED: SAND TYPE AND QUANTITY: 20-40

MONITORING WELL NO.

CONCRETE PAD-

BENTONITE

SAND PACK: 16,4 FT.

BENTONITE PELLETS (5-CULON BUCKETS): 2 Screen Lengths: 10'
BACS OF CROUT: 8-94# 8a 95+75# Riser Used: 30'
AMOUNT OF CENENT: 8-94# 8a 95+75#
COLTOP Cap Used?

OTHER:

Well Size: 4" 0:= OTHER:

Bottom Cap Used? VES Well Size: 4 " Pia.

J-Plug Used? <u>YE 5</u> Flush Mount Vault_ Avove Ground Vault VE5 Bollards, No.& Size:

TASK: Tank 569

GEOLOGIST/ENGNEER: WHK

Appendix B Fluid Level Measurements

Appendix B - Fluid Level Measurements Western Refining Southwest, Inc. - Gallup Refinery

Ol IIA				2011 Survey 1				SPH 2			Corrected Water Table	Screened Interval		
Number &		Casing	2011 Survey ¹		Stick up		Depth to	Column			Elevation	Depth Top to		
Date of	Inspection or	Diameter	Ground Level	Rim Elevations	length	Total Well	SPH	Thickness	Depth to	Ground water	(factor 0.8)	Bottom		
Installation	Sample Date	(luch)	Elevations (ft)	(ft)	(ft)	Depth (ft)	(£t)	(£)	Water (ft)	Elevation 3 (ft)	(ft)	(ft)	Stratigraphic unit screened	
	03/19/13	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	22.54	6,897.53	N/A	78.2 98.2	Sonsela	_
	06/13/13	4.00	6,918.95	6,920.07	1.12	99.15	ddN	ddN	22.74	6,897.33	N/A	78.2 98.2	Sonsela	
	03/09/13	4.00	6,918.95	6,920.07	1.12	99.15	ddN	ddN	22.80	6,897.27	N/A	78.2 98.2	Sonsela	
	11/11/13	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	22.38	6,897.69	N/A	78.2 98.2	Sonsela	
	03/07/14	4.00	6,918.95	6,920.07	1.12	99.15	ddN	ddN	21.77	6,898.30	A/N	78.2 - 98.2	Sonsela	
	06/03/14	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	21.95	6,898.12	N/A	78.2 - 98.2	Sonsela	
	09/15/14	4.00	6,918.95	6,920.07	1.12	99.15	ddN	ddN	22.61	6,897.46	A/N	78.2 - 98.2	Sonsela	
	11/10/14	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	22.45	6,897.62	N/A	78.2 - 98.2	Sonsela	
	03/09/15	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	21.92	6,898.15	N/A	78.2 - 98.2	Sonsela	
	06/01/15	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	21.76	6,898.31	N/A	78.2 - 98.2	Sonsela	
	08/10/15	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	22.14	6,897.93	N/A	78.2 - 98.2	Sonsela	
OW-13	10/27/15	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	22.10	6,897.97	N/A	78.2 - 98.2	Sonsela	
12/10/80	03/04/16	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	21.43	6,898.64	N/A	78.2 - 98.2	Sonsela	
	06/06/16	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	21.45	6,898.62	N/A	78.2 - 98.2	Sonsela	
	08/31/16	4.00	6,918.95	6,920.07	1.12	99.15	ddN	ddN	21.94	6,898.13	A/N	78.2 - 98.2	Sonsela	
	11/15/16	4.00	6,918.95	6,920.07	1.12	99.15	ddN	ddN	21.68	6,898.39	A/N	78.2 - 98.2	Sonsela	
	02/27/17	4.00	6,918.95	6,920.07	1.12	99.15	ddN	ddN	21.11	6,898.96	N/A	78.2 - 98.2	Sonsela	
	05/31/17	4.00	6,918.95	6,920.07	1.12	99.15	ddN	ddN	21.45	6,898.62	A/N	78.2 - 98.2	Sonsela	
	09/06/17	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	21.41	6,898.66	N/A	78.2 - 98.2	Sonsela	
	12/11/17	4.00	6,918.95	6,920.07	1.12	99.15	ddN	ddN	21.00	6,899.07	A/N	78.2 - 98.2	Sonsela	
	02/28/18	4.00	6,918.95	6,920.07	1.12	99.15	ddN	ddN	20.50	6,899.57	A/N	78.2 - 98.2	Sonsela	
	04/26/18	4.00	6,918.95	6,920.07	1.12	00'66	ddN	ddN	20.41	99.668'9	A/N	78.2 - 98.2	Sonsela	
	08/14/18	4.00	6,918.95	6,920.07	1.12	102.00	NPP	NPP	20.70	6,899.37	N/A	78.2 - 98.2	Sonsela	_
	11/06/18	4.00	6,918.95	6,920.07	1.12	99.15	ddN	ddN	20.70	6,899.37	A/N	78.2 - 98.2	Sonsela	

Appendix B - Fluid Level Measurements Western Refining Southwest, Inc. - Gallup Refinery

											Corrected			_
Well ID				2011 Survey ¹				SPH ²			Water Table	Screened Interval		
Number &		Casing	2011 Survey ¹	Well Casing	Stick up		Depth to	Column			Elevation	Depth Top to		
Date of	Inspection or	Diameter	Ground Level	Rim Elevations	length	Total Well	SPH	Thickness	Depth to	Ground water	(factor 0.8)	Bottom		
Installation	Sample Date	(luch)	Elevations (ft)	(ft)	(ft)	Depth (ft)	(ft)	(ft)	Water (ft)	Elevation 3 (ft)	(ft)	(ft)	Stratigraphic unit screened	
	03/19/13	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	24.79	6,901.86	N/A	35 45	Chinle/Alluvium Interface	
	06/13/13	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	24.89	6,901.76	N/A	35 45	Chinle/Alluvium Interface	
	03/09/13	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	24.92	6,901.73	N/A	35 45	Chinle/Alluvium Interface	
	11/11/13	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	24.59	6,902.06	N/A	35 45	Chinle/Alluvium Interface	
	03/07/14	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	24.12	6,902.53	N/A	35 - 45	Chinle/Alluvium Interface	
	06/03/14	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	24.15	6,902.50	N/A	35 - 45	Chinle/Alluvium Interface	
	09/15/14	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	24.40	6,902.25	N/A	35 - 45	Chinle/Alluvium Interface	
	11/10/14	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	24.25	6,902.40	N/A	35 - 45	Chinle/Alluvium Interface	
	03/09/15	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	23.95	6,902.70	N/A	35 - 45	Chinle/Alluvium Interface	
	06/01/15	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	23.88	6,902.77	N/A	35 - 45	Chinle/Alluvium Interface	_
	08/10/15	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	23.96	6,902.69	N/A	35 - 45	Chinle/Alluvium Interface	
0W-14	10/27/15	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	23.69	6,902.96	N/A	35 - 45	Chinle/Alluvium Interface	
2/11/80	03/04/16	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	23.20	6,903.45	N/A	35 - 45	Chinle/Alluvium Interface	
	06/06/16	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	23.18	6,903.47	N/A	35 - 45	Chinle/Alluvium Interface	
	08/31/16	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	23.50	6,903.15	N/A	35 - 45	Chinle/Alluvium Interface	
	11/15/16	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	23.28	6,903.37	N/A	35 - 45	Chinle/Alluvium Interface	
	02/27/17	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	22.83	6,903.82	N/A	35 - 45	Chinle/Alluvium Interface	
	05/30/17	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	23.18	6,903.47	N/A	35 - 45	Chinle/Alluvium Interface	
	09/06/17	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	22.56	6,904.09	N/A	35 - 45	Chinle/Alluvium Interface	
	12/11/17	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	22.20	6,904.45	N/A	35 - 45	Chinle/Alluvium Interface	
	02/27/18	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	21.80	6,904.85	N/A	35 - 45	Chinle/Alluvium Interface	
	04/26/18	4.00	6,924.55	6,926.65	2.10	46.75	NPP	NPP	21.75	6,904.90	N/A	35 - 45	Chinle/Alluvium Interface	
	08/14/18	4.00	6,924.55	6,926.65	2.10	46.78	NPP	NPP	21.95	6,904.70	N/A	35 - 45	Chinle/Alluvium Interface	
	11/06/18	4.00	6,924.55	6,926.65	2.10	46.52	NPP	NPP	21.82	6,904.83	N/A	35 - 45	Chinle/Alluvium Interface	_

Appendix B - Fluid Level Measurements Western Refining Southwest, Inc. - Gallup Refinery

							_			P0001100#	_	
	Casing	2011 Survey ¹	2011 Survey ¹ Well Casing	Stick up		Depth to	SPH ² Column			Water Table Elevation	Screened Interval Depth Top to	
Inspection or Sample Date	Diameter (Inch)	Ground Level Elevations (ft)	Rim Elevations (ft)	length (ft)	Total Well Depth (ft)	SPH (f)	Thickness (ft)	Depth to Water (ft)	Ground water Elevation ³ (ft)	(factor 0.8) (ft)	Bottom (ft)	Stratigraphic unit screened
03/26/13	4.00	6,942.86	6,946.06	3.20	43.04	29.11	3.49	32.60	6,913.46	6916.25	25 40	Chinle/Alluvium Interface
06/17/13	4.00	6,942.86	6,946.06	3.20	43.04	29.37	3.73	33.10	6,912.96	6915.94	25 40	Chinle/Alluvium Interface
09/16/13	4.00	6,942.86	6,946.06	3.20	43.04	28.75	4.34	33.09	6,912.97	6916.44	25 40	Chinle/Alluvium Interface
12/11/13	4.00	6,942.86	6,946.06	3.20	43.04	28.73	4.38	33.11	6,912.95	6916.45	25 40	Chinle/Alluvium Interface
03/14/14	4.00	6,942.86	6,946.06	3.20	43.04	28.11	3.54	31.65	6,914.41	6917.24	25 - 40	Chinle/Alluvium Interface
06/09/14	4.00	6,942.86	6,946.06	3.20	43.04	28.05	5.01	33.06	6,913.00	6917.01	25 - 40	Chinle/Alluvium Interface
09/18/14	4.00	6,942.86	6,946.06	3.20	43.04	28.31	NR	NR	NR	∀\N	25 - 40	Chinle/Alluvium Interface
11/13/14	4.00	6,942.86	6,946.06	3.20	43.04	28.15	4.89	33.04	6,913.02	6916.93	25 - 40	Chinle/Alluvium Interface
03/23/15	4.00	6,942.86	6,946.06	3.20	43.04	28.10	4.70	32.80	6,913.26	6917.02	25 - 40	Chinle/Alluvium Interface
06/09/15	4.00	6,942.86	6,946.06	3.20	43.04	27.70	4.40	32.10	6,913.96	6917.48	25 - 40	Chinle/Alluvium Interface
08/23/15	4.00	6,942.86	6,946.06	3.20	43.04	28.08	1.94	30.02	6,916.04	6917.59	25 - 40	Chinle/Alluvium Interface
10/29/15	4.00	6,942.86	6,946.06	3.20	43.04	27.65	2.45	30.10	6,915.96	6917.92	25 - 40	Chinle/Alluvium Interface
03/04/16	4.00	6,942.86	6,946.06	3.20	43.04	28.05	2.50	30.55	6,915.51	6917.51	25 - 40	Chinle/Alluvium Interface
06/08/16	4.00	6,942.86	6,946.06	3.20	43.04	27.98	3.82	31.80	6,914.26	6917.32	25 - 40	Chinle/Alluvium Interface
09/13/16	4.00	6,942.86	6,946.06	3.20	43.04	27.90	4.14	32.04	6,914.02	6917.33	25 - 40	Chinle/Alluvium Interface
11/16/16	4.00	6,942.86	6,946.06	3.20	43.04	27.80	3.10	30.90	6,915.16	6917.64	25 - 40	Chinle/Alluvium Interface
03/16/17	4.00	6,942.86	6,946.06	3.20	43.04	27.05	3.50	30.55	6,915.51	6918.31	25 - 40	Chinle/Alluvium Interface
06/20/17	4.00	6,942.86	6,946.06	3.20	43.04	26.77	1.65	28.42	6,917.64	6918.96	25 - 40	Chinle/Alluvium Interface
09/19/17	4.00	6,942.86	6,946.06	3.20	43.04	26.52	1.08	27.60	6,918.46	6919.32	25 - 40	Chinle/Alluvium Interface
12/12/17	4.00	6,942.86	6,946.06	3.20	43.04	26.50	1.00	27.50	6,918.56	6919.36	25 - 40	Chinle/Alluvium Interface
02/14/18	4.00	6,942.86	6,946.06	3.20	43.04	26.94	0.28	27.22	6,918.84	6919.06	25 - 40	Chinle/Alluvium Interface
04/25/18	4.00	6,942.86	6,946.06	3.20	43.35	26.94	0.27	27.21	6,918.85	6919.07	25 - 40	Chinle/Alluvium Interface
08/16/18	4.00	6,942.86	6,946.06	3.20	43.45	27.44	0.26	27.70	6,918.36	6918.57	25 - 40	Chinle/Alluvium Interface
4th Qtr 2018	4.00	6,942.86	6,946.06	3.20	MN	ΜN	WN	MN	VΑ	V/N	25 - 40	Chinle/Alluvium Interface

Appendix B - Fluid Level Measurements Western Refining Southwest, Inc. - Gallup Refinery

	Stratigraphic unit screened	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface
Screened Interval Depth Top to Bottom	(1)	26.1 36.1	26.1 36.1	26.1 36.1	26.1 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1	26.1 - 36.1
♣Corrected Water Table Elevation (factor 0.8)	(ft)	N/A																							
Ground water	Elevation 3 (ft)	6,903.79	6,903.73	6,903.89	6,903.87	6,903.94	6,904.74	6,904.58	6,904.63	6,905.01	6,905.51	6,905.16	6,905.73	6,906.08	6,906.22	6,906.06	6,906.31	6,906.88	6,907.34	6,907.82	6,908.19	6,908.53	6,908.50	6,908.43	NA
Depth to		24.74	24.80	24.64	24.66	24.59	23.79	23.95	23.90	23.52	23.02	23.37	22.80	22.45	22.31	22.47	22.22	21.65	21.19	20.71	20.34	20.00	20.03	20.10	WN
SPH ² Column Thickness	(ft)	NPP	ddN	NPP	NPP	MPP	MPP	ddN	MPP	ddN	NPP	ddN	MPP	ddN	ddN	NPP	NPP	MPP	NPP	MPP	NPP	NPP	NPP	NPP	ΜN
Depth to SPH	(£)	NPP	ddN	NPP	NPP	ddN	ddN	ddN	ddN	ddN	NPP	ddN	ΣN												
Total Well	Depth (ft)	39.80	39.80	39.80	39.80	08'68	08'68	39.80	08'68	39.80	39.80	08'68	08'68	08'68	08'68	08'68	08'68	08'68	08'68	08'68	40.00	40.00	66'68	40.00	WN
- Stick up length	(L)	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13
2011 Survey ¹ Well Casing Rim Elevations	(ft)	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53	6,928.53
2011 Survey ¹ Ground Level	Elevations (ft)	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40	6,926.40
Casing	(luch)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Inspection or	Sample Date	03/26/13	06/17/13	09/16/13	12/11/13	03/17/14	06/09/14	09/18/14	11/13/14	03/23/15	06/09/15	08/23/15	10/29/15	03/04/16	06/08/16	09/13/16	11/16/16	03/16/17	06/20/17	21/61/60	12/02/17	02/19/18	04/25/18	81/91/80	4th Qtr 2018
Well ID Number & Date of	Installation												RW-2	3/29/95											

Appendix B - Fluid Level Measurements Western Refining Southwest, Inc. - Gallup Refinery

	Stratigraphic unit screened	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface	Chinle/Alluvium Interface
Screened Interval Depth Top to Bottom	(ft)	29.5 39.5	29.5 39.5	29.5 39.5	29.5 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5	29.5 - 39.5
♣Corrected Water Table Elevation (factor 0.8)	(ft)	N/A	6916.67	6916.87	6916.97	6916.45	6915.81	6915.29	N/A																
Ground water	Elevation 3 (ft)	6,914.12	6,914.13	6,914.59	6,914.61	6,915.65	6,914.77	6,914.76	6,914.87	6,914.47	6,914.77	6,914.49	6,915.60	6,915.35	6,915.35	6,915.87	6,916.17	6,916.04	6,910.27	6,911.92	6,909.57	6,909.97	6,911.23	6,910.99	NA
Depth to	Water (ft)	29.45	29.44	28.98	28.96	27.92	28.80	28.81	28.70	29.10	28.80	29.08	27.97	28.22	28.22	27.70	27.40	27.53	33.30	31.65	34.00	33.60	32.34	32.58	WΝ
SPH ² Column Thickness	(ft)	NPP	ddN	NPP	MPP	NPP	MPP	MPP	ddN	ddN	ddN	NPP	ddN	ddN	ddN	NPP	NPP	NPP	8.00	6.19	9.25	8.10	5.72	5.38	MN
Depth to SPH	(ft)	NPP	ddN	NPP	MPP	ddN	ddN	ddN	ddN	NPP	25.30	25.46	24.75	25.50	26.62	27.20	MΝ								
Total Well	Depth (ft)	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.59	39.51	WΝ
- Stick up length	(ft)	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04
2011 Survey ¹ Well Casing Rim Elevations	(ft)	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57	6,943.57
2011 Survey ¹ Ground Level	Elevations (ft)	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53	6,941.53
Casing Diameter	(Inch)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Inspection or	Sample Date	03/26/13	06/17/13	09/16/13	12/11/13	03/14/14	06/09/14	09/18/14	11/13/14	03/23/15	06/09/15	08/23/15	10/29/15	03/04/16	06/07/16	09/13/16	11/16/16	03/16/17	06/20/17	09/19/17	12/12/17	02/09/18	04/25/18	08/16/18	4th Qtr 2018
Well ID Number & Date of	Installation												RW-5	8/27/97											

Appendix B - Fluid Level Measurements Western Refining Southwest, Inc. - Gallup Refinery

	•	•		· nd3	c DR3	, nas	, ndo				Corrected	Corocad Internal	
Casing 2011 Survey Well Casing Stick up Depth to Column	2011 Survey ¹ Well Casing Stick up Depth to	Well Casing Stick up Depth to	Stick up Depth to	Depth to			SPH 2 Column				water lable Elevation	Screened Interval Depth Top to	
Inspection or Diameter Ground Level Rim Elevations length Total Well SPH Thickness D	Ground Level Rim Elevations length Total Well SPH Thickness	Rim Elevations length Total Well SPH Thickness	length Total Well SPH Thickness	Total Well SPH Thickness	SPH Thickness	Thickness		□ <u>}</u>	Depth to	Ground water	(factor 0.8)	Bottom (#)	Stronting of decorping to
4.00 6,941.96 6,944.01 2.05 40.90 NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	2.05 40.90 NPP	40.90 NPP	NPP	+	NPP		29.59	6,914.42	N/A	28.5 38.5	Chinle/Alluvium Interface
06/17/13 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	2.05 40.90 NPP	40.90 NPP	NPP		NPP	_	29.52	6,914.49	N/A	28.5 38.5	Chinle/Alluvium Interface
09/16/13 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	2.05 40.90 NPP	40.90 NPP	NPP		NPP		29.13	6,914.88	N/A	28.5 38.5	Chinle/Alluvium Interface
12/11/13 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	2.05 40.90 NPP	40.90 NPP	NPP		NPP		29.10	6,914.91	N/A	28.5 38.5	Chinle/Alluvium Interface
03/17/14 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	2.05 40.90 NPP	40.90 NPP	ddN		NPP		28.04	6,915.97	N/A	28.5 - 38.5	Chinle/Alluvium Interface
06/23/14 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	. 2.05 40.90 NPP	40.90 NPP	NPP		NPP		28.85	6,915.16	N/A	28.5 - 38.5	Chinle/Alluvium Interface
09/18/14 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	2.05 40.90 NPP	40.90 NPP	MPP		NPP		28.89	6,915.12	N/A	28.5 - 38.5	Chinle/Alluvium Interface
11/13/14 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	2.05 40.90 NPP	40.90 NPP	NPP		NPP		28.83	6,915.18	N/A	28.5 - 38.5	Chinle/Alluvium Interface
03/23/15 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	2.05 40.90 NPP	40.90 NPP	NPP		NPF		29.18	6,914.83	N/A	28.5 - 38.5	Chinle/Alluvium Interface
06/09/15 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	2.05 40.90 NPP	40.90 NPP	NPP		NPF	٠	28.68	6,915.33	N/A	28.5 - 38.5	Chinle/Alluvium Interface
08/23/15 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	2.05 40.90 NPP	40.90 NPP	NPP		NPF	•	29.06	6,914.95	N/A	28.5 - 38.5	Chinle/Alluvium Interface
10/29/15 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	. 2.05 40.90 NPP	40.90 NPP	MPP		NP	Ь	27.97	6,916.04	N/A	28.5 - 38.5	Chinle/Alluvium Interface
03/04/16 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	. 2.05 40.90 NPP	40.90 NPP	ddN		N	ф	28.25	6,915.76	N/A	28.5 - 38.5	Chinle/Alluvium Interface
06/07/16 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	2.05 40.90 NPP	40.90 NPP	NPP		N	do	28.24	6,915.77	N/A	28.5 - 38.5	Chinle/Alluvium Interface
09/13/16 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	. 2.05 40.90 NPP	40.90 NPP	NPP		NP	Ь	27.99	6,916.02	N/A	28.5 - 38.5	Chinle/Alluvium Interface
11/16/16 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	. 2.05 40.90 NPP	40.90 NPP	NPP		NPF	۰	27.72	6,916.29	N/A	28.5 - 38.5	Chinle/Alluvium Interface
03/16/17 4.00 6,941.96 6,944.01 2.05 40.90 NPP NPP	6,941.96 6,944.01 2.05 40.90 NPP	6,944.01 2.05 40.90 NPP	2.05 40.90 NPP	40.90 NPP	NPP		NPF	۰	27.57	6,916.44	6,916.44	28.5 - 38.5	Chinle/Alluvium Interface
06/20/17 4.00 6,941.96 6,944.01 2.05 40.90 25.50 8.12	6,941.96 6,944.01 2.05 40.90 25.50	6,944.01 2.05 40.90 25.50	2.05 40.90 25.50	40.90 25.50	25.50		8.17	7	33.62	6,910.39	6,916.89	28.5 - 38.5	Chinle/Alluvium Interface
09/19/17 4.00 6,941.96 6,944.01 2.05 40.90 25.89 5.08	6,941.96 6,944.01 2.05 40.90 25.89	6,944.01 2.05 40.90 25.89	2.05 40.90 25.89	40.90 25.89	25.89		2.08	8	30.97	6,913.04	6,917.10	28.5 - 38.5	Chinle/Alluvium Interface
12/12/17 4.00 6,941.96 6,944.01 2.05 40.90 24.83 9.0 <mark>2</mark>	6,941.96 6,944.01 2.05 40.90 24.83	6,944.01 2.05 40.90 24.83	2.05 40.90 24.83	40.90 24.83	24.83		9.02		33.85	6,910.16	6,917.38	28.5 - 38.5	Chinle/Alluvium Interface
02/09/18 4.00 6,941.96 6,944.01 2.05 40.90 25.65 7.40	6,941.96 6,944.01 2.05 40.90 25.65	6,944.01 2.05 40.90 25.65	2.05 40.90 25.65	40.90 25.65	25.65		7.40		33.05	6,910.96	6,916.88	28.5 - 38.5	Chinle/Alluvium Interface
04/25/18 4.00 6,941.96 6,944.01 2.05 40.83 26.93 4.76	6,941.96 6,944.01 2.05 40.83 26.93	6,944.01 2.05 40.83 26.93	2.05 40.83 26.93	40.83 26.93	26.93		4.76		31.69	6,912.32	6,916.13	28.5 - 38.5	Chinle/Alluvium Interface
08/16/18 4.00 6,941.96 6,944.01 2.05 40.85 <mark>27.43 4.35</mark>	6,941.96 6,944.01 2.05 40.85 27.43	6,944.01 2.05 40.85 27.43	2.05 40.85 27.43	40.85 27.43	27.43		4.35		31.78	6,912.23	6,915.71	28.5 - 38.5	Chinle/Alluvium Interface
4th 0tr 2018 4.00 6.941.96 6.944.01 2.05 NM NM NM	6.941.96 6.944.01 2.05 NM NM	6,944.01 2.05 NM NM NM	2.05 NM NM	NN NN	MN		NN	1	MN	NA	N/A	28.5 - 38.5	Chinle/Alluvium Interface

Western Refining Southwest, Inc. - Gallup Refinery Appendix B - Fluid Level Measurements

											Corrected		
Well ID				2011 Survey ¹				SPH 2			Water Table	Screened Interval	
Number &		Casing	2011 Survey ¹	Well Casing	Stick up		Depth to	Column			Elevation	Depth Top to	
Date of	Inspection or	Diameter	Ground Level	Rim Elevations	length	Total Well	SPH	Thickness	Depth to	Ground water	(factor 0.8)	Bottom	
Installation	Sample Date	(luch)	Elevations (ft)	(£)	(£)	Depth (ft)	(ft)	(L)	Water (ft)	Elevation 3 (ft)	(t t)	(¥)	Stratigraphic unit screened
	11/07/16	2.00	6,930.64	6,933.10	2.46	28.35	ddN	NPP	21.58	6,911.52	N/A	15 - 25	Chinle/Alluvium Interface
	03/29/17	2.00	6,930.64	6,933.10	2.46	28.35	ddN	ddN	20.75	6,912.35	A/N	15 - 25	Chinle/Alluvium Interface
	06/20/17	2.00	6,930.64	6,933.10	2.46	28.35	ddN	MPP	20.52	6,912.58	N/A	15 - 25	Chinle/Alluvium Interface
7.8	09/19/17	2.00	6,930.64	6,933.10	2.46	28.35	ddN	NPP	20.15	6,912.95	N/A	15 - 25	Chinle/Alluvium Interface
10/E/16	12/05/17	2.00	6,930.64	6,933.10	2.46	28.35	ddN	ddN	20.11	6,912.99	A/N	15 - 25	Chinle/Alluvium Interface
01 /0 /01	02/19/18	2.00	6,930.64	6,933.10	2.46	28.35	ddN	ddN	19.88	6,913.22	A/N	15 - 25	Chinle/Alluvium Interface
	04/25/18	2.00	6,930.64	6,933.10	2.46	28.06	ddN	ddN	20.02	6,913.08	A/N	15 - 25	Chinle/Alluvium Interface
	08/16/18	2.00	6,930.64	6,933.10	2.46	28.07	ddN	NPP	20.16	6,912.94	N/A	15 - 25	Chinle/Alluvium Interface
	11/29/18	2.00	6,930.64	6,933.10	2.46	28.10	ddN	NPP	20.30	6,912.80	N/A	15 - 25	Chinle/Alluvium Interface
	11/07/16	2.00	6,934.71	6,934.50	-0.21	47.55	ddN	ddN	26.00	6,908.50	N/A	38 - 48	Chinle/Alluvium Interface
	03/29/17	2.00	6,934.71	6,934.50	-0.21	47.55	ddN	ddN	26.00	6,908.50	A/N	38 - 48	Chinle/Alluvium Interface
	06/21/17	2.00	6,934.71	6,934.50	-0.21	47.55	ddN	ddN	25.14	98.606,9	A/N	38 - 48	Chinle/Alluvium Interface
0 14 / 10	09/19/17	2.00	6,934.71	6,934.50	-0.21	47.55	ddN	ddN	25.04	6,909.46	A/N	38 - 48	Chinle/Alluvium Interface
10/3/16	12/06/17	2.00	6,934.71	6,934.50	-0.21	47.50	ddN	ddN	24.67	6,909.83	A/N	38 - 48	Chinle/Alluvium Interface
01 /0 /01	02/20/18	2.00	6,934.71	6,934.50	-0.21	47.62	ddN	ddN	24.52	86'606'9	N/A	38 - 48	Chinle/Alluvium Interface
	04/25/18	2.00	6,934.71	6,934.50	-0.21	47.50	ddN	ddN	24.25	6,910.25	A/N	38 - 48	Chinle/Alluvium Interface
	08/16/18	2.00	6,934.71	6,934.50	-0.21	47.49	ddN	ddN	24.48	6,910.02	A/N	38 - 48	Chinle/Alluvium Interface
	11/29/18	2.00	6,934.71	6,934.50	-0.21	47.30	ddN	ddN	24.27	6,910.23	N/A	38 - 48	Chinle/Alluvium Interface

DEFINITIONS:

N\A - Not applicable SPH = Separate Phase Hydrocarbons NPP - No Product Present NR - Not recorded

- NOTES:

 1. Elevation data from NMED's "Approval with Modifications, Requirement to Resurvey Ground water Monitoring Wells and Recovery Wells", dated 9/26/12.

 2. Ground water elevation Depth to SPH = SPH Column Thickness.

 3. 2011 Survey well casing rim elevation depth to water measurement.

 4. Corrected Water Table Elevation applies only if SPH thickness column measurement exists. (0.8 X SPH thickness + Ground Water Elevation)

Appendix C Waste Manifests



6133 Edith Blvd, NE Albuquerque, NM 87107 Phone: (505) 349-5220

Fax: (505) 344-7986

GENERATOR WASTE PROFILE SHEET

A. GENERATOR INFORMATION

Generator Name:

WESTERN REFINING SOUTHWEST GALLUP REFINING

Mailing Address:

I-40 exit 39 Route 3 Box 7 Jamestown, NM 87347

Site Pick-up Address:

1-40 exit 39

Jamestown, NM 87347 Thurman (Beck) Larson

Technical Contact: Name of Waste Process Generating

SOIL - DRILL CUTTINGS

MAIN CONTACT

Profile Number: ACT14825 Generator US EPA ID: NMD000333211

Phone:

Fax: Email:

SOIL SAMPLING

NAICS CODE: 211111

Form Code:W301

Source Code: G39

B. PHYSICAL CHARACTERISTICS OF WASTE AT 25C OF 77F

Physical State:

SOLID

Color: BROWN

Clarity: CLOUDY

Phase Separation Number of Layers: SINGLE

Odor: SOIL

PH: SOLID

Specific > 1 SP.GR.

100

Flash Point > 200 F

BTU Value: N/A

Gravity:

(F):

C. Chemical Composition / UHC's BASED UPON: ANALYTICAL (INCLUDED)

SOIL - DRILL CUTTINGS

Range

GENERATOR KNOWLEDGE X

100

D. METALS

Total (PPM)

EP Toxicity (mg/l)

Silver:

Copper:

Nickel:

Arsenic:

Barium: Cadmium: Chromium: Lead:

Mercury:

Zinc: Thallium:

Chromium, Hexavalent Selenium:

E OTHER COMPONENTS

OXIDIZER: N EXPLOSIVE: SHOCK SENSITIVE: N TIRES: N

PYROPHORIC: N RADIOACTIVE: N EXEMPT RAD: N REACTIVE SULFIDES PPM N REACTIVE CYANIDES PPM N

WATER/AIR REACTIVE THERMALLY UNSTABLE N TSCA REG PCB WASTE: N COMPRESSED GASSES: N

CERCLA/SUPERFUND: PESTICIDE MAUFACTURING WASTE:

F. Shipping Information:

DOT Hazardous Material Proper Shipping Name:

CUTTINGS)

4 DM

Exempted NO

Non-RCRA/Non-DOT Regulated Material Solid (SOIL - DRILL

HALOGENATED ORGANIC COMPOUNDS PER 40 CFR 268, APPENDIX III

DEBRIS N

N

<500 PPM VOC as generated

N

Subject to NESHAP Regulations N US EPA Hazardous Waste

Codes:

ETHIOLOGICAL:

US EPA Hazardous Waste

; NONE

PG:

Anticipated Volume (Units): Per: YEAR

Hazard Class:

ID #:

G. Special Handiling Instructions:

H. GENERATOR'S CERTIFICATION:

I hereby certify that all information in this and all the attached documents is complete and accurate, and that all known or suspected hazards have been disclosed. I further certify that any samples submitted with this profile are representative of the waste to be shipped and are taken in accordance with SW 846 or other approved procedures. I agree to notify Aday anced Chemical Treatment in writing when the process generating this waste stream changes or when I have reason to believe the data contained herein is not complete and accurate.

Signature

THE ENVIN Specialist DOING 11-

	- 44	_		, 1						7	200 12	etas az
Ple	UNI	IFC	nt or type. (Form designed for use on elite (12-pitch) typewrit ORM HAZARDOUS ASTE MANIFEST 1. Generator ID Number NMD000333211	er.)	2. Page 1 of	3. Emergency Res	ponse Phone 0-424-9300	4. Manifest		n Approved umber 599		ELE
	92 G/	Al	GIANT CROSSING ROAD LLUP, NM 87301 505 722 0258	Contraction		Generator's Site Ad	dress (if different	than mailing addres	ss)	* I		-
			ator's Phone: isporter 1 Company Name ances Chemical Transport Inc. (SV)	K				U.S. EPA ID I	Number	AR000	070540)
	7. Tr	an	nsporter 2 Company Name	HH	APR 1	1 2017	U	U.S. EPAID	Number	1 1/2	mg.v 1. i	AL C
	61 All	3:	ignated Facility Nama and Sile Address 3 Editin Blvd NE uquerque, NM 87107 /s Phone:					U.S. EPAID I		MD002	208627	Y
	9a. HM		9b. U.S. DOT Description (including Proper Shipping Name, Hazard and Packing Group (if any))	7.2.1.2.2.2.		No.	Containers - Type	11. Total Quantity	12. Unit Wt./Vol.	13.	Waste Coo	ies
GENERATOR -	×		(VA3077, Hazardous waste, solid, n.o.s.	(chromium), 9 , PGI	03	DM	400	b.	DOO?		
- GENE	×	- 10	NA 1993, Combustible liquid, n.o.s., Co IN VIALS)	mb liq , PGli	I (DIESE	01	DM	3 00	þ	NONE		
	Х		RQ, NA3077, Hazardous waste, solid, o PCID (RQ=K050)	i.o.s. (oil, sli	idge), 9	05	DM	1500	P	K050		
	Х		RQ:UN3175, Waste Solids containing n.o.s. (acetone: methanol), 4:1, PGI	lammable l	iquid,	03	Cr	900	P	D001	F003	F005
	2) E 24 15.	GE ma Ex I co	ENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare tha arked and labeled/placarded, and are in all respects in proper condit yporter, I certify that the contents of this consignment conform to the certify that the waste minimization statement identified in 40 CFR 262 tor's/Offeror's Printed/Typed Name.	4-9300 t the contents of this ion for transport acc terms of the attache	consignment a ording to applic d EPA Acknowl ge quantity gene	able international an ledgment of Consent	ely described abord national govern	ve by the proper sh	C.F.	e, and are cla ipment and l		mary
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- DESIG	19. Ha	aze	ardous Waste Report Management Method Codes (i.e., codes for ha	zardous waste treat	ment, disposal	, and recycling system	ms) -	4.	H	41	141	
*			Ignated Facility Owner or Operator: Certification of receipt of hazardor Typed Name	ous materials covere		est except as noted inature	n Item 18a	4	/	Mo	onth Da	y Year

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Generator's Name	FINING SOUTHV	VEST GALLUP REFININ	IG .			İ	Å			· v
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Appendix D Survey Data

MONITORING WELL DATA

OW-57

N: 1634751.52

E: 2546961.79 TOP CENTER OF METAL LID ON SQUARE TUBING

Z: 6933.54 CENTER OF METAL LID

Z: 6933.10 TOP OF PVC

Z: 6930.64 TOP OF CONCRETE PAD

Distance from ground to the top of inside of square tubing with lid open 4.06'.

OW-58

N: 1634800.15

E: 2547414.91 TOP CENTER OF METAL LID ON ROUND CAN

Z: 6934.72 CENTER OF METAL LID

Z: 6934.50 TOP OF PVC

Z: 6934.71 TOP OF CONCRETE PAD

Distance from ground to the top of inside of round can with lid open 0.70'.

Coordinates are N.M. STATE PLANE WEST

Elevations are NAVD 88.

TANK ELEVATIONS

TK 568
Elev. 6950.66
N.W. corner of square concrete pad on the north side of the tank.
TK 569
Elev. 6952.00
Bottom lip on the north side of tank.
TK 570
Elev. 6958.88
Bottom lip on the north side of tank.
Elevations are NAVD 88.

Appendix E Field Methods

Field Methods

Pursuant to the Investigation Work Plan for the OW-14 Source Area Investigation, an investigation of soils and groundwater was conducted to determine and evaluate the presence, nature, extent, fate, and transport of contaminants. To accomplish this objective, soil borings and temporary monitoring wells were installed at the tank farm and adjacent to the rail loading rack. The field methods are described below and individual discussions are presented for the following activities:

- Drilling procedures;
- Soil screening;
- Decontamination procedures;
- Monitoring well development;
- Fluid level measurements;
- Purging of temporary monitoring wells/groundwater sample collection;
- Sample collection and handling procedures;
- Vadose zone vapor sampling;
- Equipment calibration; and
- Management of investigation derived waste.

Drilling Procedures

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

Soil Screening

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

Visual screening included examining the soil samples for evidence of staining caused by petroleum-related compounds or other substances that may have caused staining of soils such as elemental sulfur or cyanide compounds. Headspace vapor screening was conducted and involved placing a soil sample in a plastic sealable bag allowing space for ambient air. The bag was sealed, labeled and then shaken gently to expose the soil to the air trapped in the container. The sealed bag was allowed to rest for a minimum of 5 minutes while the vapors equilibrated. Vapors present within the sample bag's headspace were then measured by inserting the probe of a MiniRae 3000 portable volatile organic constituent (VOC) monitor in a small opening in the bag. The maximum value and the ambient air temperature were recorded on the field boring log for each sample. Field screening results and any conditions that were considered to be capable of influencing the results of the field screening were recorded on the field logs.

Decontamination Procedures

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

Fluid Level Measurements

The depth to separate phase hydrocarbon, if present, and groundwater was measured prior to purging the wells of potentially stagnant groundwater. A Geotech Interface Probe was used to measure fluid levels to 0.01 foot.

Well Development/Purging

The following wells were developed/purged using a new disposable bailer attached to the end of the clean rope.

- Temporary Wells TK 568-1, TK 568-2, TK 569-1, TK-569-2, TK569-3, TK570-1; and
- Permanent Well OW-57.

The following wells were developed/purged using a pump. The pump was decontaminated between wells. New tubing was used at each well.

Permanent Wells - OW-58.

The groundwater and sediment removed from the wells were transported to the bundle cleaning pad in sealed 5-gallon buckets.

The purge volumes are calculated as follows:

Volume (gallons) = water column thickness (ft) x 3.14 x radius of well casing² (ft) x 7.48 (gals/ft). The calculated purge volumes and actual volumes removed from each well are presented below.

Well (Date)	Water Column Thickness (ft)	Calculated Purge Volume (gallons) – 3 well volumes	Actual Purge Volume (gallons)
TK 568-1 (10-1-16)	5.87	3.00	Bailed dry at 1.5
TK 568-2 (10-1-16)	10.34	5.25	Bailed dry at 2
TK 569-1 (10-5-16)	12.15	6.21	25
TK 569-2 (10-5-16)	8.75	4.47	Bailed dry at 7.5
TK 569-3 (10-5-16)	9.79	4.98	Bailed dry at 2
TK 570-1 (9-30-16)	8.72	4.44	20
OW-57 (9-30-16)	6.72	3.42	Bailed dry at 2.5
OW-58 (9-30-16)	18.82	9.60	50

NA - not applicable

Field measurements of groundwater stabilization parameters included pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature and the readings are presented in Table 4.

Sample Collection and Handling Procedures

Soil samples were collected using split-spoon samplers or directly from the auger bucket for borings completed with a hand auger. The selected portion of the sample interval was placed in pre-cleaned, laboratory-prepared sample containers for laboratory chemical analysis. Three soil samples were collected for VOC analysis in the following manner:

- Two sample aliquots were collected using a syringe for low-level VOC analysis pursuant to EPA method 5035. For these "Terracore" kits, 4-5 grams (4cc) of soil was injected into each vial using the syringe. The syringes were disposed after soil collection.
- Two sample aliquots were collected using a syringe for preservation with methanol. For the
 methanol preserved kits, 10 grams (10 cc) of soil was injected into each methanol vial using
 the syringe. The syringes were disposed after soil collection.

 The third sample aliquot was placed in an 8-ounce glass jar, which was filled to the top to minimize any head space.

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

Groundwater samples were collected using disposable bailers and clean rope. The water was immediately poured directly into clean laboratory supplied sample containers with the exception of samples collected for dissolved metals analyses. Samples specified for dissolved metals analyses were filtered in the field using a disposable 0.45 micron filter. A new filter and syringe were used for each sample. All samples were immediately placed into an ice chest with ice. The samples were maintained in the custody of the sampler until the chain-of-custody form was completed and the ice chest was sealed for delivery to the laboratory.

Equipment Calibration

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

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

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

Management of Investigation Derived Waste

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

il cuttings were placed into open top 55-gallon drums and were sealed when not in use. Eac	h
um of soils was labeled and temporarily stored in a concrete curbed area pending waste	
aracterization and disposal.	

Appendix F Soil Boring/Well Logs



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc. / Cohagan

Drilling Rig : CME 75

Drilling Method : Hollw Stem Auger 7.5"

Sampling Method : 2' Split Spoon - 2" Diameter

Comments : N 35° 29.493' / W 108° 25.501'

Total Depth : 27'
Ground Water : 18'
Start Date : 09/21/2016
Finish Date : 09/21/2016

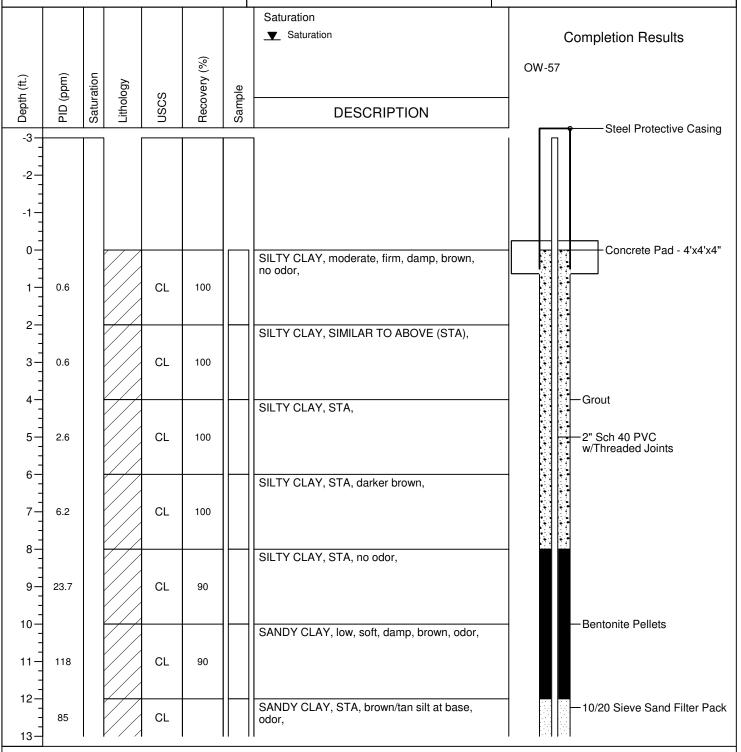
WELL NO. OW-57

(Sheet 1 of 2)

Elev., TOC (ft.msl): 6933.10 Elev., PAD (ft. msl): 6930.64

Elev., GL (ft. msl) : Site Coordinates :

N : N 163475.52 E : E 2546961.79





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc. / Cohagan

Drilling Rig : CME 75

Drilling Method : Hollw Stem Auger 7.5"

Sampling Method : 2' Split Spoon - 2" Diameter

Comments : N 35° 29.493' / W 108° 25.501'

Total Depth : 27'
Ground Water : 18'
Start Date : 09/21/2016
Finish Date : 09/21/2016

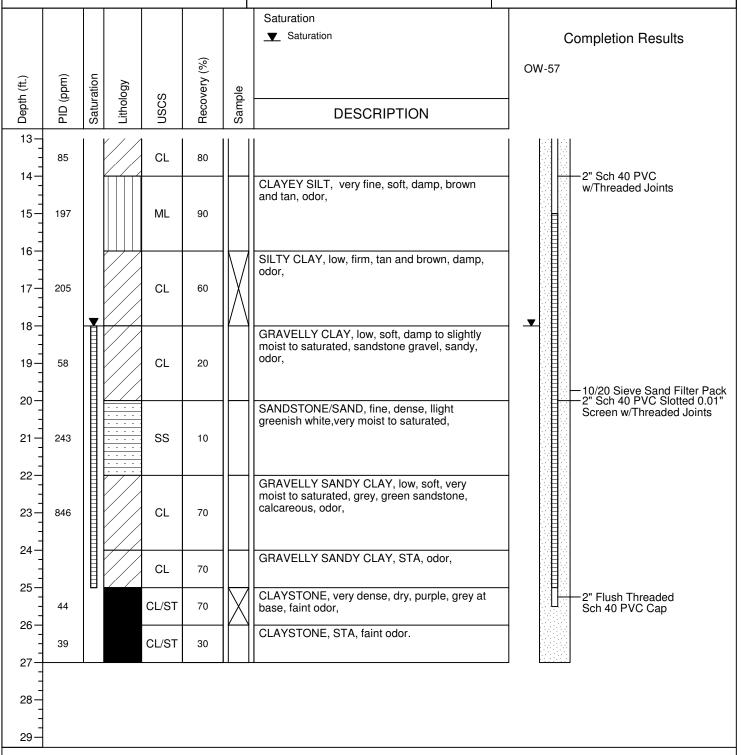
WELL NO. OW-57

(Sheet 2 of 2)

Elev., TOC (ft.msl): 6933.10 Elev., PAD (ft. msl): 6930.64

Elev., GL (ft. msl) : Site Coordinates :

N : N 163475.52 E : E 2546961.79





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc. / Cohagan

Drilling Rig : CME 75

Drilling Method : Hollw Stem Auger 7.5"

Sampling Method : 2' Split Spoon - 2" Diameter

Comments : N 35° 29.500' / W 108° 28.410'

Total Depth : 48.5'
Ground Water : 29'
Start Date : 09/22/2016
Finish Date : 09/22/2016

WELL NO. OW-58

(Sheet 1 of 4)

Elev., TOC (ft.msl): 6934.50 Elev., PAD (ft. msl): 6934.71

Elev., GL (ft. msl) : Site Coordinates :

N : N 1634800.15 E : E 2547414.91

						Finish Date : 09/22/2016	E : E 2547414.91
Depth (ft.)	PID (ppm)	Saturation Lithology	nscs	Recovery (%)	Sample	Saturation Saturation Saturation DESCRIPTION	Completion Results OW-58
-1 —					I	1	
-							Flush Mount
0-			AR	100		ASPHALT/BASE,	Concrete Pad - 4'x4'x4"
-			An	100		SILTY CLAY, moderate, firm to stiff, damp,	
1-	110		CL	100		brown, odor,	
3-	40		CL	100		SILTY CLAY, SIMILAR TO ABOVE (STA),	
5— 	11.2		CL	100		SILTY CLAY, STA, moist, faint odor,	—Grout
6 — - - 7 — - -	2.2		CL	90		SILTY CLAY, low, soft, damp, brown, faint odor,	2" Sch 40 PVC w/Threaded Joints
8 — - 9 — -	5.3		CL	60		SILTY CLAY, STA, no odor,	
10-	37		CL	80		SILTY CLAY, STA, sticky, black discoloration, odor,	
12— - - 13—	42		CL			SILTY CLAY, STA,	

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07-25-2018



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc. / Cohagan

Drilling Rig : CME 75

Drilling Method : Hollw Stem Auger 7.5"

Sampling Method : 2' Split Spoon - 2" Diameter

Comments : N 35° 29.500' / W 108° 28.410'

Total Depth : 48.5'
Ground Water : 29'
Start Date : 09/22/2016
Finish Date : 09/22/2016

WELL NO. OW-58

(Sheet 2 of 4)

Elev., TOC (ft.msl): 6934.50 Elev., PAD (ft. msl): 6934.71

Elev., GL (ft. msl) : Site Coordinates :

N : N 1634800.15 E : E 2547414.91

			Finish Date : 09/22/2016	E : E 2547414.91
Depth (ft.)	Saturation Lithology USCS	Recovery (%)	Saturation Saturation Saturation DESCRIPTION	Completion Results OW-58
13-	CL	70		
14— - - 15— 25	CL	60	SILTY CLAY, low, stiff, damp, brown with black discoloration, faint odor,	
16— - - 17— 226	CL	60	SANDY CLAY, low, stiff, very fine grain sand, damp, brown, odor,	
18 — 240	CL	50	SANDY CLAY, STA, odor,	——————————————————————————————————————
20 200	CL	60	SANDY CLAY, STA, odor,	2" Sch 40 PVC w/Threaded Joints
22 2020	CL	90	SILTY CLAY, low, very stiff, damp, brown, tan silt pockets/seams present, odor,	
24 — - - 25 — 1980	CL	90	SILTY CLAY, low, firm, soft/ crumbly, damp, brown, strong odor, outside of core is oily/phase separated hydrocarbon (PSH),	Proceedings of the control of the co
26 – 973 27 –	CL		SILTY CLAY, STA, firm to stiff, odor, outside of core is oily/PSH,	



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc. / Cohagan

Drilling Rig : CME 75

Drilling Method : Hollw Stem Auger 7.5" Sampling Method: 2' Split Spoon - 2" Diameter Comments : N 35° 29.500' / W 108° 28.410'

Total Depth : 48.5' **Ground Water** : 29' Start Date : 09/22/2016 Einich Data . 00/22/2016

WELL NO. OW-58

(Sheet 3 of 4)

Elev., TOC (ft.msl): 6934.50 Elev., PAD (ft. msl): 6934.71

Elev., GL (ft. msl) : Site Coordinates :

: N 1634800.15 · F 2547414 91

							Finish Date : 09/22/2016	E : E 2547414.91
							Saturation	
							<u>▼</u> Saturation	Completion Results
					(%		<u></u> ✓ Saturation	014.50
t.)	E	ر ا دا	_		ry (9			OW-58
th (f	PID (ppm)	Saturation	goic	SS	Recovery (%)	Jple		
Depth (ft.)	PID	Satu	Lithology	nscs	Rec	Sample	DESCRIPTION	
27 —		l V				l I	1	
-	973		//	CL	90			
28 -								
-				CL	00	IN A	SILTY CLAY, STA, damp to moist, odor,	Grout
		_/		CL	90	$ \bigvee $		
29 —	2784					\parallel $\!$ $\!$ $\!$ $\!$	SANDY CLAY/CLAYEY SAND, low, soft,	
-				CL/SC	90	/ \	very moist to saturated, dark brown, odor,	
30 –		$ P \neq $					SANDY SILTY CLAY, low, firm, damp,	
-							saturated sand at base, grey/brown, odor,	
31 —	2350			CL	90			
-								
32 —		1	4					젊 (축
							SILTY SAND, fine, loose, saturated, grey/brown, odor,	—2" Sch 40 PVC
-	4775			SM	90		g.oy/oromi, odor,	w/Threaded Joints
33 —	1775							
-				CL	90		SILTY CLAY, low, soft, damp, greyish brown,	—Bentonite Pellets
34 –			7				odor, SILTY CLAY, STA, damp to very moist, odor,	_ / ■ ■
-							SILTY CLAY, STA, damp to very moist, odor,	
35 —	575			CL	90			[X]X
-								
36-			4					
-							SILTY CLAY, low, firm, damp, greyish brown, odor,	
37 <i>-</i>	227			CL	80		,	10/20 Sieve Sand Filter Pack
-					00			
38 -			7				SILTY CLAY, STA, brown, odor,	
-								
39 —	545			CL	50			
-								2" Sch 40 PVC Slotted 0.01"
40 —			4			\parallel	CLAV high firm damp brown adar	Screen w/Threaded Joints
-	531			СН			CLAY, high, firm, damp, brown, odor,	
41 —								

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DiSorbo Consulting, LLC

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



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc. / Cohagan

Drilling Rig : CME 75

Drilling Method : Hollw Stem Auger 7.5"

Sampling Method : 2' Split Spoon - 2" Diameter

Comments : N 35° 29.500' / W 108° 28.410'

Total Depth : 48.5'
Ground Water : 29'
Start Date : 09/22/2016
Finish Date : 09/22/2016

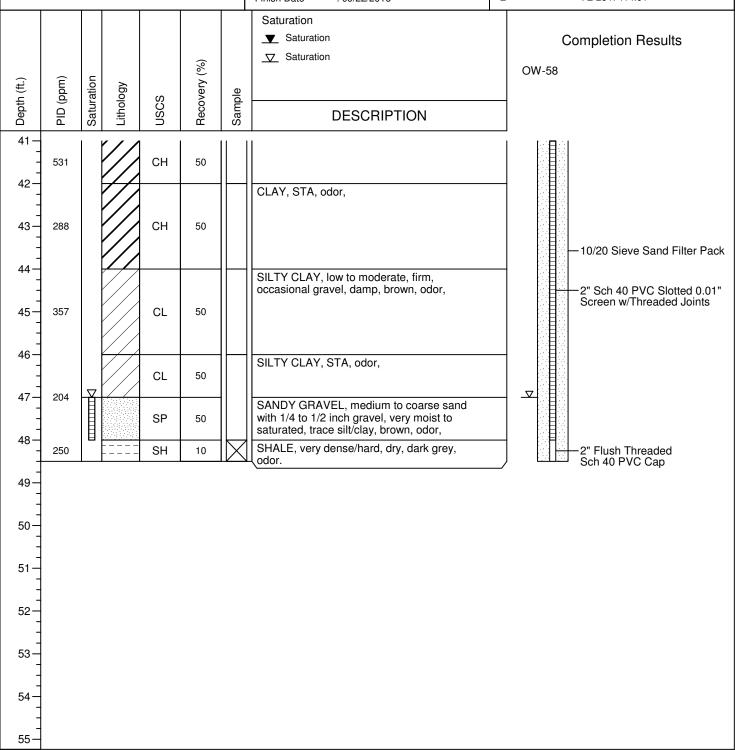
WELL NO. OW-58

(Sheet 4 of 4)

Elev., TOC (ft.msl): 6934.50 Elev., PAD (ft. msl): 6934.71

Elev., GL (ft. msl) : Site Coordinates :

N : N 1634800.15 E : E 2547414.91



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07-25-2018



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-S

Drilling Method : Hollow-Stem Auger Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet Total Depth : 49'

Ground Water : 32' BGL
Start Date : 9/23/2016
Finish Date : 9/23/2016

WELL NO. TK 568-1

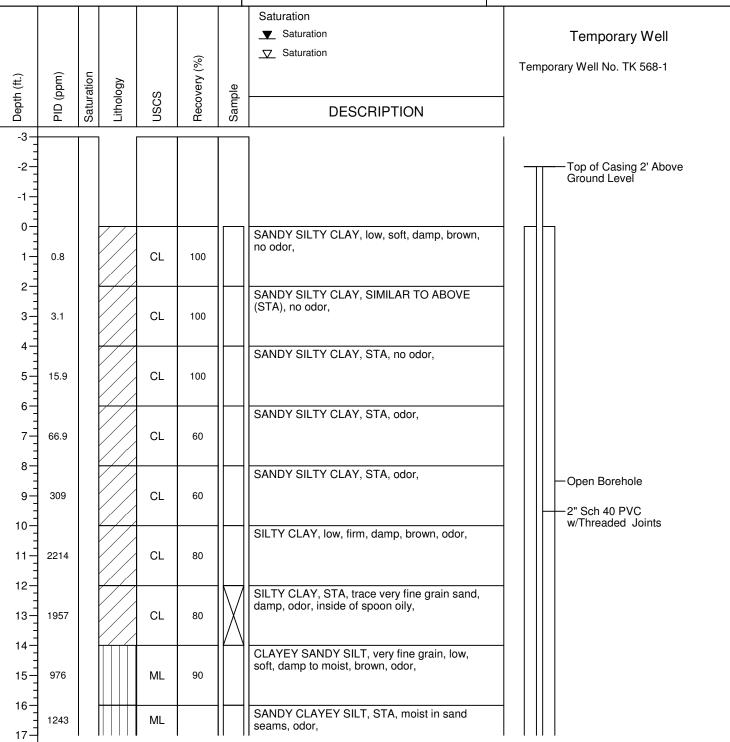
(Sheet 1 of 3)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6950.66

Site Coordinates

N : N 35° 29.412' E : W 108° 25.430





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter Comments : Hand Augered to 6 Feet

Total Depth : 49'
Ground Water : 32' BGL
Start Date : 9/23/2016
Finish Date : 9/23/2016

WELL NO. TK 568-1

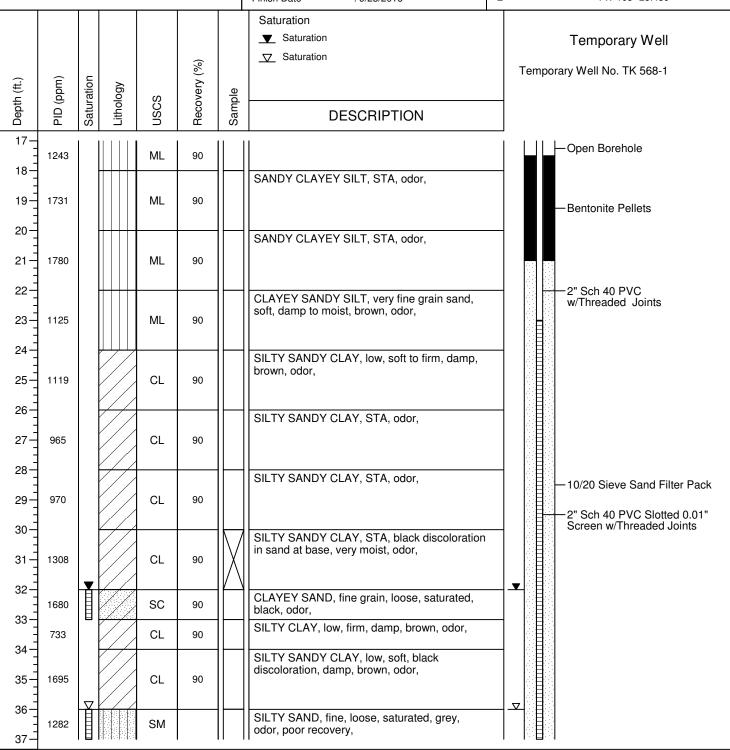
(Sheet 2 of 3)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6950.66

Site Coordinates

N : N 35° 29.412' E : W 108° 25.430





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan Drilling Rig

: CME 75

: Hollow-Stem Auger

: 2" Split Spoon - 2" Diameter : Hand Augered to 6 Feet

Comments Total Depth : 49' **Ground Water**

Drilling Method

Sampling Method

: 32' BGL Start Date : 9/23/2016 Finish Date : 9/23/2016

WELL NO. TK 568-1

(Sheet 3 of 3)

Elev., TOC (ft.msl) Elev., PAD (ft. msl)

Elev., GL (ft. msl) : 6950.66

Site Coordinates

: N 35° 29.412' Ε : W 108° 25.430

							Finish Date : 9/23/2	2016	E	: W 108° 25.430
							Saturation			
							▼ Saturation			Temporary Well
		_			(%)		∇ Saturation		Temp	orary Well No. TK 568-1
h (ft.)	mdd	atior	logy	S	very) Se				
Depth (ft.)	PID (ppm)	Saturation	Lithology	nscs	Recovery (%)	Sample	DESCRI	PTION		
37						 			—) -	2" Sch 40 PVC Slotted 0.01"
38	1282			SM	10					Screen w/Threaded Joints
]							SANDY CLAY, low, firm, obrown, odor, sheen on cor	amp to moist, e.		2" Flush Threaded Sch 40 PVC Cap
39	1078			CL	80		, , , , , , , , , , , , , , , , , , , ,	-,		
40			///				SANDY CLAY, STA, damp	o odor		
41 –	383			CL	20		57.115 1 OE711, O171, damp	, odor,		
]	000			OL.	==					
42-							SANDY CLAY, STA, white	clay at base, odor,		10/20 Sieve Sand Filter Pack
43	476			CL	20					
44										
l ∃				01			CLAY, low, dense/crumbly brown/grey, no odor,	, dry, dark reddish		
45-	144			CL	50					
46							CLAY, STA,			
47	80			CL	20					
48										
40]	41			SH	20		SANDY SHALE, very dens odor.	se, dry, grey, no		
49						IV V			<u> </u>	<u>⊴</u>
50										
51										
]										
52-										
53										
54										
-										
55										
56										
57										



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter Comments : Hand Augered to 6 Feet

Total Depth : 37'
Ground Water : 30'
Start Data : 9/27/20

Start Date : 9/27/2016 Finish Date : 9/27/2016

WELL NO. TK 568-2

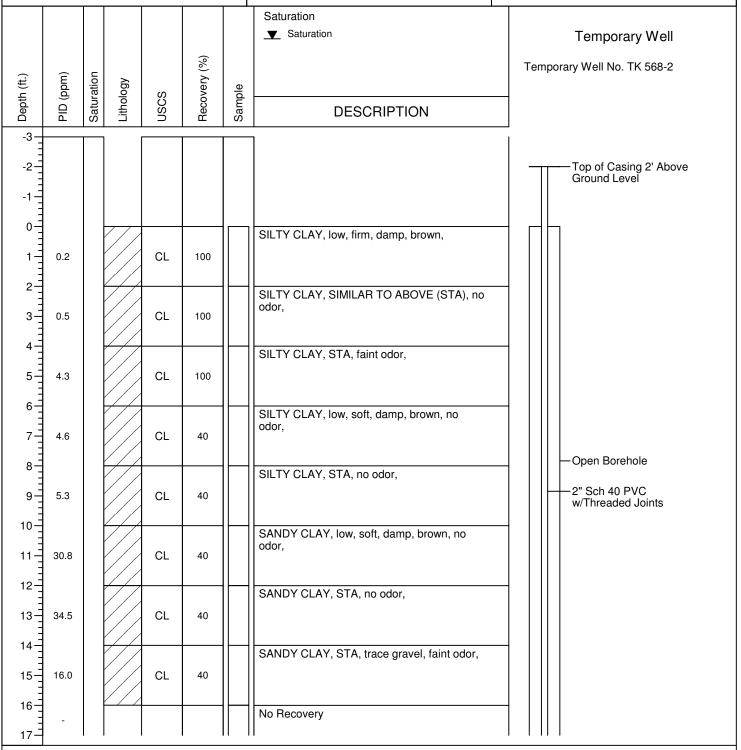
(Sheet 1 of 2)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6950.66

Site Coordinates

N : N 35° 29.396' E : W 108° 25.435'





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter
Comments : Hand Augered to 6 Feet

Total Depth : 37'
Ground Water : 30'
Start Date : 9/27/2016
Finish Date : 9/27/2016

WELL NO. TK 568-2

(Sheet 2 of 2)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6950.66

Site Coordinates

N : N 35° 29.396' E : W 108° 25.435'

							Finish Date : 9/27/2016	E : W 108° 25.435'
							Saturation	
							_▼ Saturation	Temporary Well
	<u> </u>	ے			(%)			Temporary Well No. TK 568-2
Depth (ft.)	PID (ppm)	Saturation	Lithology	δ	Recovery (%)	ble		
Depi	PID	Satu	Litho	nscs	Весс	Sample	DESCRIPTION	
17-					 		1	
18-	-		, , ,		-	Ш	CANDY OLAY OTA frietados	Open Borehole
19 - 3	36.5		///	CL	40		SANDY CLAY, STA, faint odor,	
3	30.3			OL	40			
20							SANDY CLAY, STA, trace gravel, faint odor,	
21 = 2	29.6			CL	40			
22-							CLAYEY SAND, fine grain, loose, trace	—Bentonite Pellets
23	82			SC	60	$ \bigvee $	gravel, damp, brown, odor,	—2" Sch 40 PVC
3	-	}				$\ /\ $		w/Threaded Joints
24							No Recovery - white sandstone lodged in shoe	
25 -	-				-		31106	
26 -						\vdash	No Recovery - very dense hard sandstone in	
27 – 27 –	_				-		shoe	
28						$ \nabla$	CLAYEY SAND, very fine to fine, compact, moist to saturated at 30', brown, odor,	
29 - 2	2803			SC	90	$\ X\ $		
30-		▼				H	CLAYEY SAND, STA, white sandstone	■ ■ 10/20 Sieve Sand Filter Pack
31 –	-			SC	90		lenses present, trace gravel, odor,	2" Sch 40 PVC Slotted 0.01"
32								Screen w/Threaded Joints
=							GRAVELLY SAND, fine to medium, compact, gravel 1/4 to 1/2", saturated, brown, odor,	
33-	-			SP	90		sheen on sampler,	
34 =				0.5	00	$\ - \ $	SANDY GRAVEL, well rounded, loose,	
35 -	-			GP	90		saturated, odor,	
36	53			CLST	90		CLAYSTONE, very hard/dense, dry, dark reddish brown,	
=	21			CLST	50		CLAYSTONE, STA, shaley at base.	2" Flush Threaded Sch 40 PVC Cap
37						IV V	l	



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME 75

Drilling Rig : CME 75
Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter Comments : Hand Augered to 6 Feet

: 10/4/2016

Total Depth : 42'
Ground Water : 24-26'
Start Date : 10/4/2016

Finish Date

WELL NO. TK 569-1

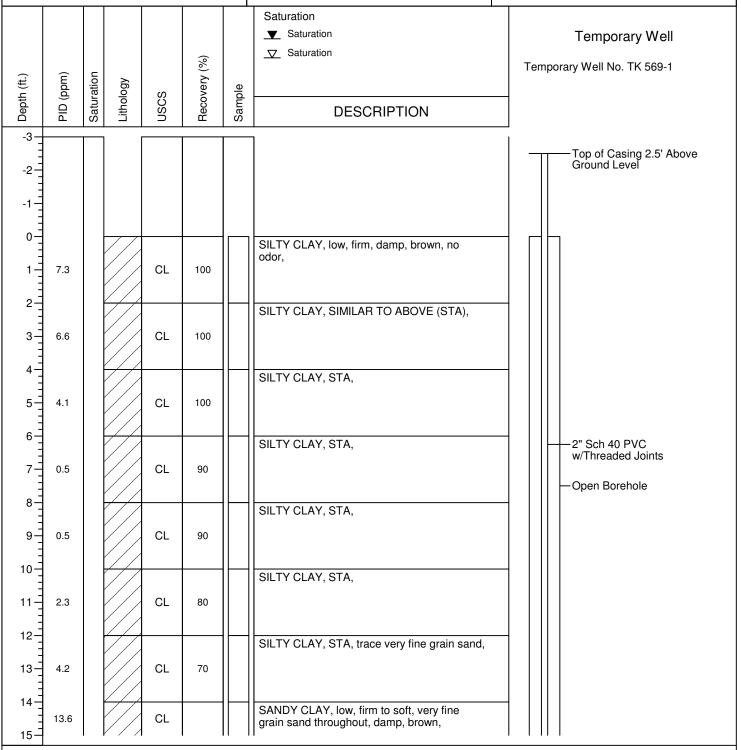
(Sheet 1 of 3)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.403' E : W 108° 25.469'





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter
Comments : Hand Augered to 6 Feet

Total Depth : 42'
Ground Water : 24-26'
Start Date : 10/4/2016
Finish Date : 10/4/2016

WELL NO. TK 569-1

(Sheet 2 of 3)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.403' E : W 108° 25.469'

							Finish Date : 10/4/2016	E : W 108° 25.469'
							Saturation	
							<u>▼</u> Saturation	Temporary Well
					<u>@</u>		<u></u> Saturation	Tarana arawa Mali Ma Tik 500 d
ft.)	Ê	on	>		Recovery (%)			Temporary Well No. TK 569-1
Depth (ft.)	dd)	Saturation	bolc	၂ တ္က	ove	l de		_
Dep	PID (ppm)	Satı	Lithology	nscs	Rec	Sample	DESCRIPTION	
15-				1 I		 	1	
,]	13.6		///	CL	70			Open Borehole
16-			///			H	SANDY CLAY, STA, odor,	
=	00.0				00		, , , , , , , , , , , , , , , , , , , ,	
17-	32.6			CL	60			
18			//			Щ		—Bentonite Pellets
			///			IN /I	SANDY CLAY, STA, odor,	
19	152		///	CL	70	X		—2" Sch 40 PVC
=			///			II/ \I		w/Threaded Joints
20							CLAYEY SILTY SAND, fine to medium grain,	
21	41.6			SC/SM	90		compact, becomes more silty with depth, gravel at base, damp, odor,	
	11.0			OO/OW	00		graver at succe, damp, oder,	
22						$H \rightarrow$	CLAYEY SILTY SAND, STA, medium to	
=							coarse sand, occasional gravel, damp,	
23	92.2			SC/SM	90			
24								
247						IN A	CLAYEY SILTY SAND, very fine grain, compact, moist to saturated in silty sand	
25	2158			SC/SM	90	$ \vee $	seams, brown, odor,	
=						/\		
26		ᄖ				H	SANDY CLAY, STA with greater clay content,	10/20 Sieve Sand Filter Pack
	4447		///		00		brown trace gravel at base, moist to	
27 - -	1147		///	CL	20		saturated in silty sand seams,	
28			<u>, , , , , , , , , , , , , , , , , , , </u>			Щ		2" Sch 40 PVC Slotted 0.01"
							GRAVELLY SILTY SAND, medium to coarse grain, compact, damp to moist in seams-not	Screen w/Threaded Joints
29	1060			SM	50		saturated throughtout core, brown, odor,	
							sandstone gravel present,	
30		悄				IH	CLAYEY SANDY GRAVEL, 1/8" to 1/2" gravel	
31 –	1353	圃		GW	60		with medium to coarse grain sand, compact to loose, saturated, brown, odor,	
317	1333	$ \mathbb{I} $.0 . 6 . 6 . 6			$\ \ \ $		
32				CL	60	Щ	SILTY CLAY, low, firm, damp, brown, odor,	
	1622		///	CL			SILTY CLAY, STA, odor,	
33				1			1	



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75

Drilling Method : Hollow-Stem Auger Sampling Method : 2" Split Spoon - 2" D

Sampling Method : 2" Split Spoon - 2" Diameter Comments : Hand Augered to 6 Feet

Total Depth : 42'

Ground Water : 24-26'

Start Date : 10/4/2016

WELL NO. TK 569-1

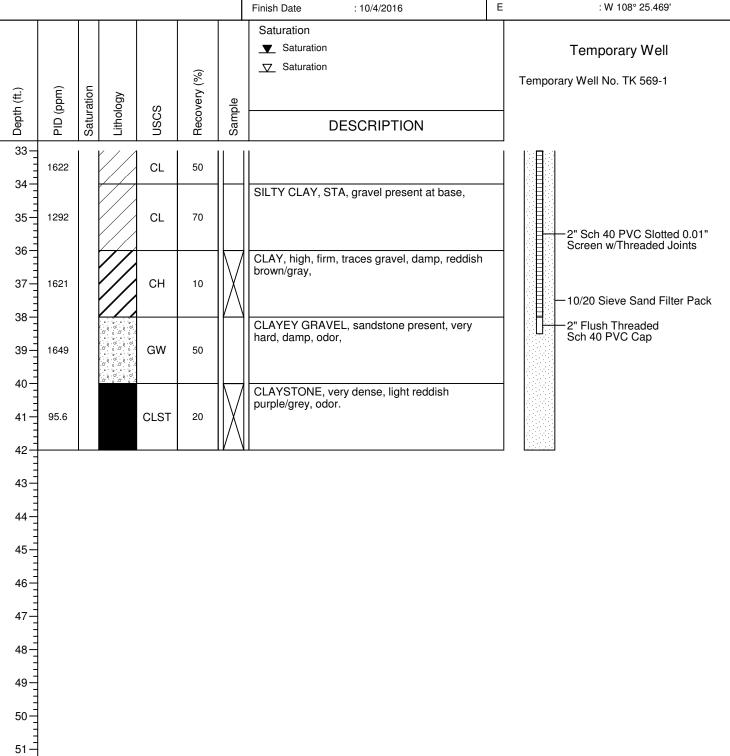
(Sheet 3 of 3)

Elev., TOC (ft.msl)

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.403' E : W 108° 25.469'





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-S

Drilling Method : Hollow-Stem Auger Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet
Total Depth : 38'
Ground Water : 31'

Start Date : 10/4/2016 Finish Date : 10/4/2016

WELL NO. TK 569-2

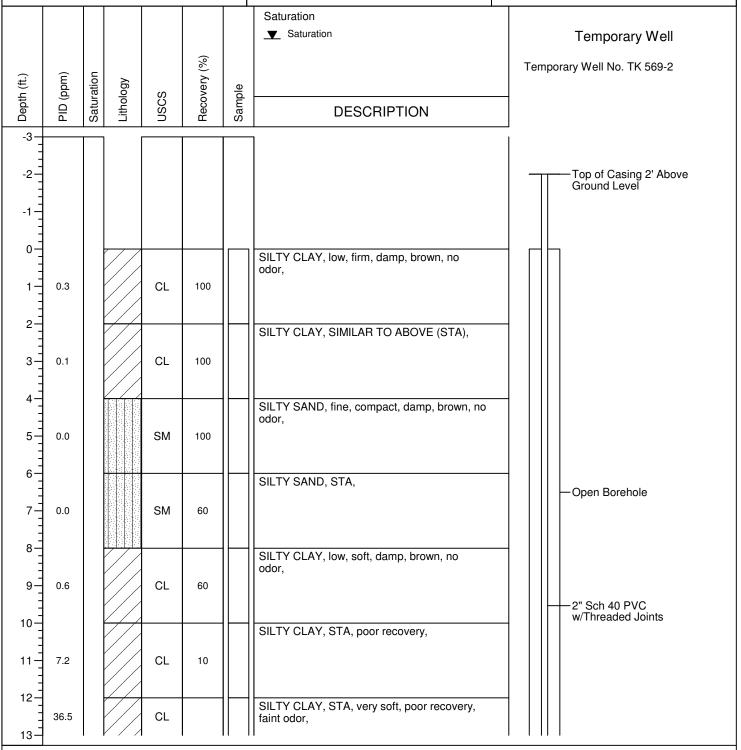
(Sheet 1 of 3)

Elev., TOC (ft.msl) ::
Elev., PAD (ft. msl) ::

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.403' E : W 108° 25.451'





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75

Drilling Method : Hollow-Stem Auger
Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet

Total Depth : 38'
Ground Water : 31'
Start Date : 10/4/2016
Finish Date : 10/4/2016

WELL NO. TK 569-2

(Sheet 2 of 3)

Elev., TOC (ft.msl) :
Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.403' E : W 108° 25.451'

Saturation Temporary Well Temporary Well No. TK 569-2 DESCRIPTION Temporary Well No. TK 569-2 DESCRIPTION Temporary Well No. TK 569-2 DESCRIPTION CLAYEY SAND, very fine grain, compact, damp, brown, odor, SC 70 CLAYEY SAND, STA, odor, CLAYEY SAND, STA, sand/gravel lense from 21-21.5, loose, damp, grey. CLAYEY SAND, STA, sand/gravel lense from 21-21.5, loose, damp, grey. Bentonite Pellets SM 90 GW 10 SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,								Finish Date : 10/4/2016	E	: W 108° 25.451'
Temporary Well No. Tk 569-2 Temp										
13								_ ▼ Saturation		Temporary Well
13	·	<u></u>	L			(%) k				Temporary Well No. TK 569-2
13	oth (ft	udd)	uratic	ology	SS	over	nple			
14	Dep	PD	Satı	Ę)SN	Rec	Sar	DESCRIPTION		
15 899 SC 70 CLAYEY SAND, very fine grain, compact, damp, brown, odor, 17 2332 SC 70 CLAYEY SAND, STA, odor, 18 SC/CL 90 CLAYEY SAND, STA, sand/gravel lense from 21-21.5, loose, damp, grey, 21 833 SC 60 SLTY SAND, STA, sand/gravel lense from 21-21.5, loose, damp, grey, 22 Sch 40 PVC w/Threaded Joints 23 998 SM 90 SANDY GRAVEL, STA, white sandstone present, 24 Sch 40 PVC w/Threaded Joints 26 SANDY GRAVEL, STA, white sandstone present, 27 1973 GW 10 SANDY GRAVEL, STA, white sandstone present, 28 Sch 40 PVC Sicted 0.01" Screen w/Threaded Joints	13-	00.5		Y //		40				
SC 70 CLAYEY SAND, Very line grain, compact, damp, brown, odor, CLAYEY SAND, STA, odor, Open Borehole	14 <i>-</i>	36.5			CL	10				
SC 70 CLAYEY SAND, STA, odor, CLAYEY SAND, STA, odor, CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND, STA, sand/gravel lense from 21-21.5′, loose, damp, grey, SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	-							damp, brown, odor,		
SC 70 CLAYEY SAND, STA, coor, SC/CL 90 CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/STA, sand/gravel lense from 21-21.5'; loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor. SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone	15	899			SC	70				
SC 70 CLAYEY SAND, STA, coor, SC/CL 90 CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/STA, sand/gravel lense from 21-21.5'; loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor. SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone	16-									│
SC/CL 90 CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND, STA, sand/gravel lense from 21-21.5', loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	-						\mathbb{N}/\mathbb{I}	CLAYEY SAND, STA, odor,		
SC/CL 90 CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/STA, sand/gravel lense from 21-21.5', loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, GW 10 SANDY GRAVEL, STA, white sandstone To/20 Sieve Sand Filter Pack SANDY GRAVEL, STA, white sandstone To/20 Sieve Sand Filter Pack SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	17	2332			SC	70	$\ X\ $			
SC/CL 90 CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/STA, sand/gravel lense from 21-21.5', loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, GW 10 SANDY GRAVEL, STA, white sandstone To/20 Sieve Sand Filter Pack SANDY GRAVEL, STA, white sandstone To/20 Sieve Sand Filter Pack SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	18-									
21—833 SC 60 CLAYEY SAND, STA, sand/gravel lense from 21-21.5'; loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	=							CLAYEY SAND/SANDY CLAY, STA, odor,		
21 833 SC 60 SILTY SAND, STA, sand/gravel lense from 21-21.5', loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	19	702			SC/CL	90				
21 833 SC 60 SILTY SAND, STA, sand/gravel lense from 21-21.5', loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	20-									
SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,								CLAYEY SAND, STA, sand/gravel lense from 21-21.5', loose, damp, grey,		
SM 90 SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	21	833			sc	60				—Bentonite Pellets
SM 90 SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	22									
23 – 398 24 – 24 – 190 26 – 190 26 – 1973 28 – 1973 398 GW 10 SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	-				014					
SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	23	398			SM	90				
SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	24				GW			SANDY GRAVEL, grey sandstone gravel with		2" Sch 40 PVC w/Threaded Joints
26 - 1973 GW 10 SANDY GRAVEL, STA, white sandstone present, GW 10 SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	24							SANDY GRAVEL, STA, white sandstone	-1	
SANDY GRAVEL, STA, white sandstone present, 27	25 –	190		0 0 0	GW	10		present,		
SANDY GRAVEL, STA, white sandstone present, 27	26.			0 0 0						10/20 Signs Sand Filter Back
27 - 1973 GW 10 28 - 2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	20 -			0.00.00						10/20 Sieve Sand Filler Pack
28 = 1684 GW SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	27	1973			GW	10				
1684 GW SANDY GHAVEL, STA, poor recovery, very hard, trace clay, damp,	20			0 6 0 6 0						2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints
	28-	1684			GW			SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp.		
	29 –			0 0 0				,		



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-S

Drilling Method : Hollow-Stem Auger
Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet
Total Depth : 38'
Ground Water : 31'

Start Date : 10/4/2016 Finish Date : 10/4/2016

WELL NO. TK 569-2

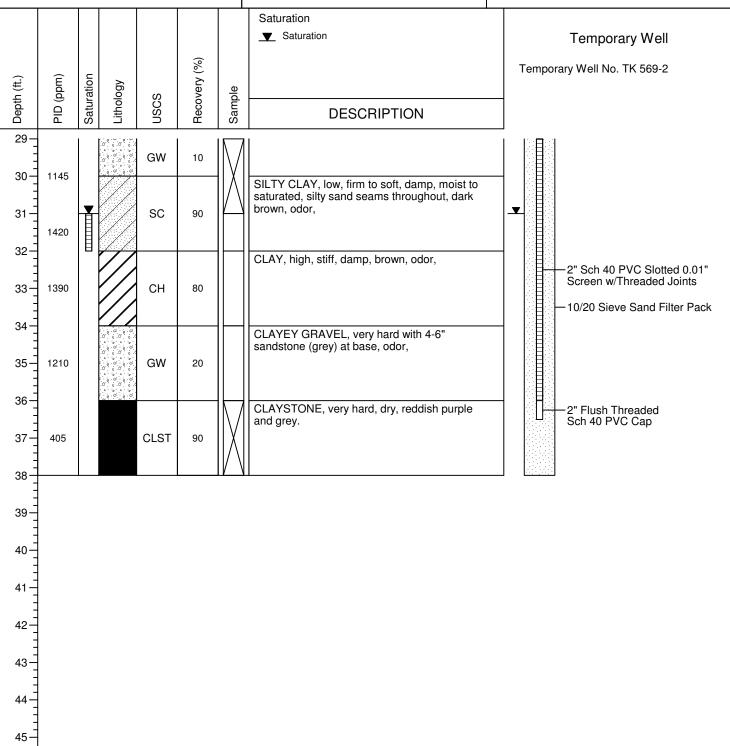
(Sheet 3 of 3)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.403' E : W 108° 25.451'





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME 75

Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter Comments : Hand Augered to 6 Feet

Total Depth : 39'
Ground Water : 26'
Start Date : 9/28/2016
Finish Date : 9/28/2016

WELL NO. TK 569-3

(Sheet 1 of 2)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.390' E : W 108° 25.459'

						Finish Date : 9/28/2016	E : W 108° 25.459'
Depth (ft.)	Saturation	Lithology	SS	Recovery (%)	Sample	Saturation _▼ Saturation _∇ Saturation	Temporary Well Temporary Well No. TK 569-3
Dep PID	Satı	Lith	nscs	Rec	San	DESCRIPTION	
-3 - -2 - -1 -							Top of Casing 2.25' Above Ground Level
0 - 8.9			CL	100		SILTY CLAY, low, firm, damp, brown, no odor,	
3 10.4			CL	100		SILTY CLAY, SIMILAR TO ABOVE (STA),	
5 — 12.4 6 —			CL	100		SILTY CLAY, STA,	
7 - 31.8 8 -			CL	60		SILTY CLAY, STA,	— Open Borehole
9 27.6			CL	50		SILTY CLAY, STA, soft,	2" Sch 40 PVC w/Threaded Joints
10 - 50.9			CL	70		SILTY CLAY, low, firm, damp, brown, odor,	
12 63.9			CL	60		SILTY CLAY, STA, trace very fine grain sand, odor,	
15 303			sc	70		CLAYEY SAND, very fine, compact, damp, brown, odor,	
16 - 377			sc	70		CLAYEY SAND, STA, odor,	—Bentonite Pellets
18 – 250 19 –			SC/CL			CLAYEY SAND/SANDY CLAY, STA, odor,	



Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter Comments : Hand Augered to 6 Feet

 Total Depth
 : 39'

 Ground Water
 : 26'

 Start Date
 : 9/28/2016

 Finish Date
 : 9/28/2016

WELL NO. TK 569-3

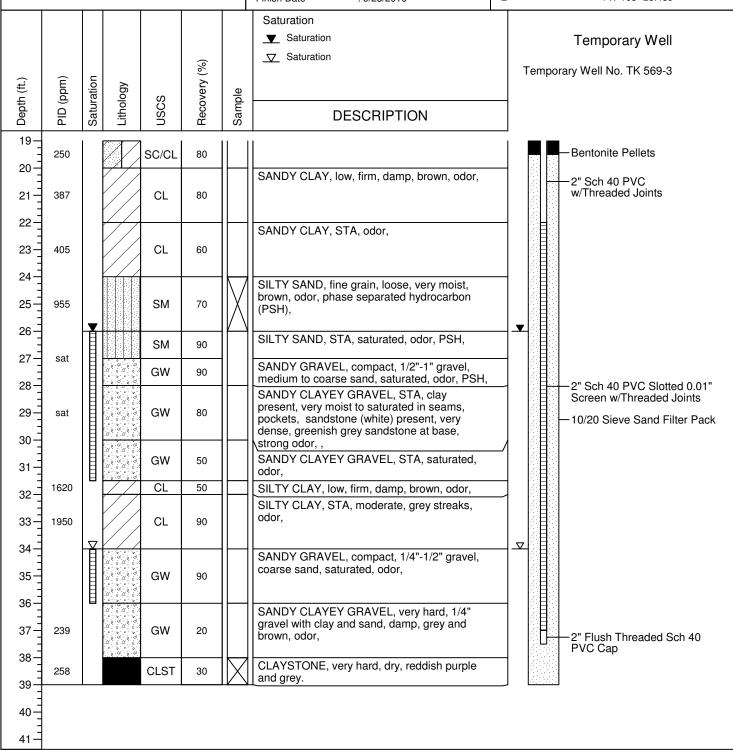
(Sheet 2 of 2)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.390' E : W 108° 25.459'





Geologist : Tracy Payne

: Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75

Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter Comments : Hand Augered to 6 Feet

: 33' BGL

Total Depth Ground Water

Start Date : 9/27/2016 Finish Date : 9/27/2016 WELL NO. TK 570-1

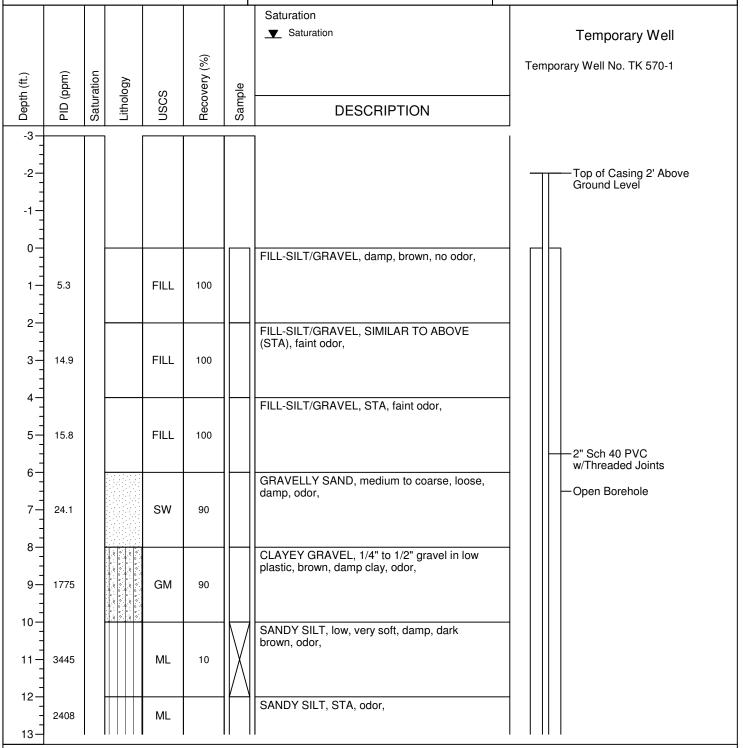
(Sheet 1 of 3)

Elev., TOC (ft.msl) :: Elev., PAD (ft. msl) ::

Elev., GL (ft. msl) : 6958.88

Site Coordinates

N : N 35° 29.377' E : W 108° 25.459'





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75

Drilling Method : Hollow-Stem Auger
Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet Total Depth : 45'

Ground Water : 33' BGL
Start Date : 9/27/2016
Finish Date : 9/27/2016

WELL NO. TK 570-1

(Sheet 2 of 3)

Elev., TOC (ft.msl) :
Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6958.88

Site Coordinates

N : N 35° 29.377' E : W 108° 25.459'

							Finish Date : 9/27/2016		. W 106° 25.459
							Saturation		
							<u>▼</u> Saturation		Temporary Well
	=	ے			(%)				Temporary Well No. TK 570-1
Depth (ft.)	PID (ppm)	Saturation	Lithology	တ္သ	Recovery (%)	Sample			
Deb	PID	Satu	Lithc	nscs	Rec	San	DESCRIPTION		
13-							1		1111
14-	2408			ML	10				
'							SANDY CLAY, low, firm to soft, damp, sandy at base, brown, odor,		
15	2350			CL	90				
10									
16-							SILTY CLAY, low, firm, damp, ocassional sandy clay lenses, brown, odor,		
17-	1139			CL	90				
									Open Borehole
18-							SILTY CLAY, STA, odor,		
19-	1250			CL	90				
20-	1460			CL	90		SILTY CLAY, STA, odor,		2" Sch 40 PVC
21 –	1400			<u> </u>	50	\square	OLAVEY CAND fire and the least design		w/Threaded Joints
				SC	90		CLAYEY SAND, fine, compact to loose, damp, brown, odor,		
22-							CLAYEY SAND, STA, decrease in clay with		
23-	399			SC	90		depth, odor,		
									—Bentonite Pellets
24-							CLAYEY SAND, STA, odor,		Deritorite i citeta
25	695			SC	100				
			///	- •					
26						$\ H \ $	SILTY SAND, very fine, soft/compact, damp,	\dashv	
27-	952			SM	90		brown, odor,		
21 -	332			OIVI	30				-10/20 Sieve Sand Filter Pack
28						$ $ $ $	CLAYEY SAND, very fine, compact, damp,	\dashv	
	1441			SC			brown, odor,		2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints
29 –					•		•		,



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet
Total Depth : 45'
Ground Water : 33' BGL

Start Date : 9/27/2016 Finish Date : 9/27/2016

WELL NO. TK 570-1

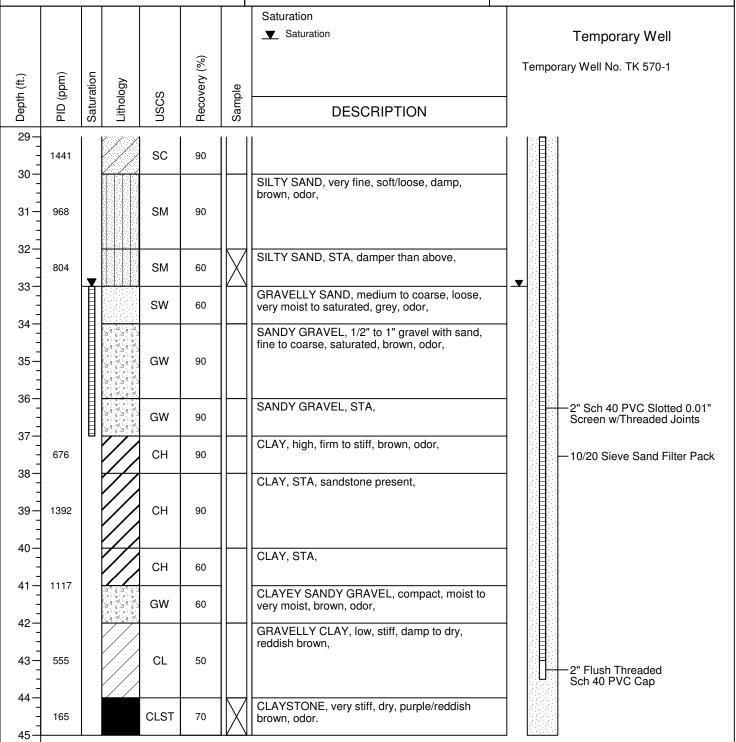
(Sheet 3 of 3)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6958.88

Site Coordinates

N : N 35° 29.377' E : W 108° 25.459'





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc. / Cohagan

Drilling Rig : CME 75

Drilling Method : Hollw Stem Auger 7.5"

Sampling Method : 2' Split Spoon - 2" Diameter

Comments : N 35° 29.493' / W 108° 25.501'

Total Depth : 27'
Ground Water : 18'
Start Date : 09/21/2016
Finish Date : 09/21/2016

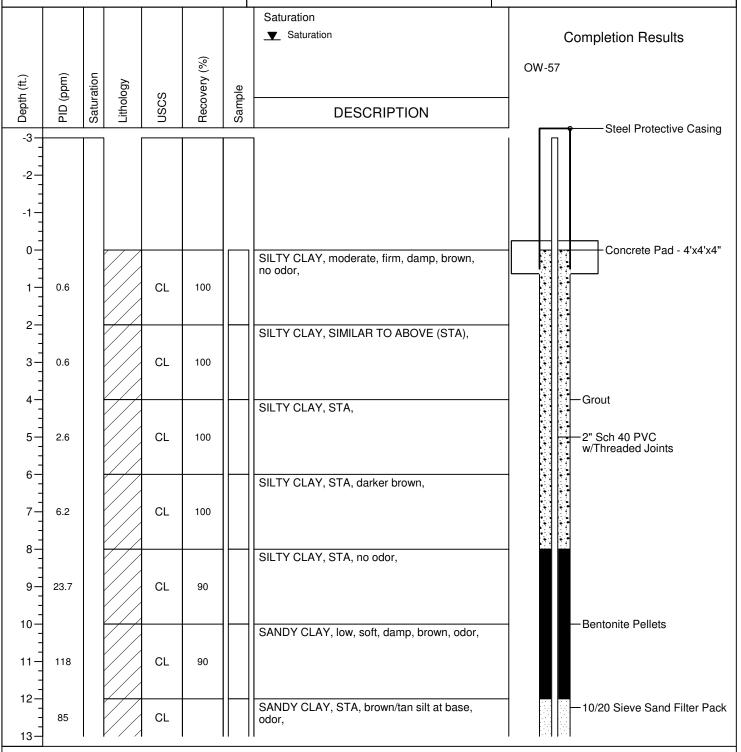
WELL NO. OW-57

(Sheet 1 of 2)

Elev., TOC (ft.msl): 6933.10 Elev., PAD (ft. msl): 6930.64

Elev., GL (ft. msl) : Site Coordinates :

N : N 163475.52 E : E 2546961.79





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc. / Cohagan

Drilling Rig : CME 75

Drilling Method : Hollw Stem Auger 7.5"

Sampling Method : 2' Split Spoon - 2" Diameter

Comments : N 35° 29.493' / W 108° 25.501'

Total Depth : 27'
Ground Water : 18'
Start Date : 09/21/2016
Finish Date : 09/21/2016

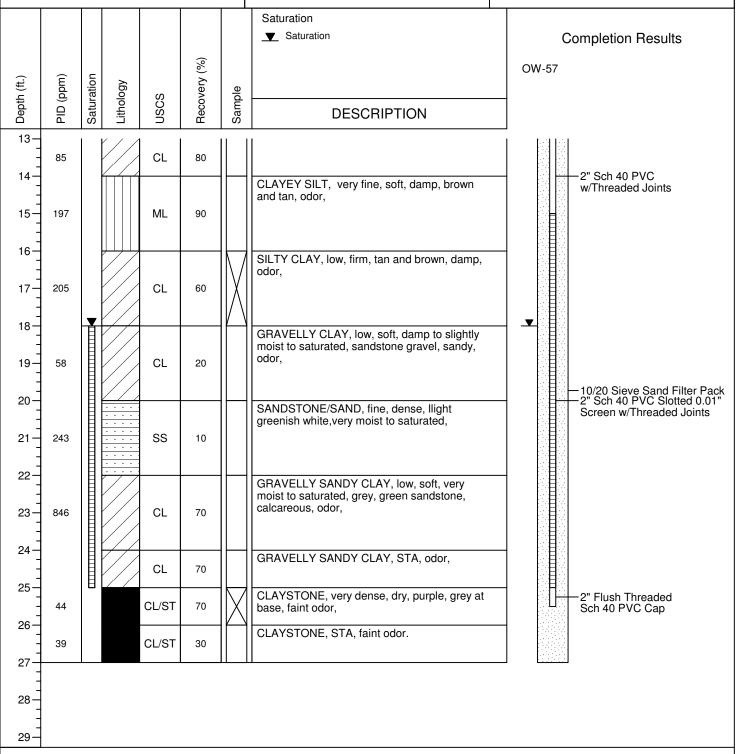
WELL NO. OW-57

(Sheet 2 of 2)

Elev., TOC (ft.msl): 6933.10 Elev., PAD (ft. msl): 6930.64

Elev., GL (ft. msl) : Site Coordinates :

N : N 163475.52 E : E 2546961.79





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc. / Cohagan

Drilling Rig : CME 75

Drilling Method : Hollw Stem Auger 7.5"

Sampling Method : 2' Split Spoon - 2" Diameter

Comments : N 35° 29.500' / W 108° 28.410'

Total Depth : 48.5'
Ground Water : 29'
Start Date : 09/22/2016
Finish Date : 09/22/2016

WELL NO. OW-58

(Sheet 1 of 4)

Elev., TOC (ft.msl): 6934.50 Elev., PAD (ft. msl): 6934.71

Elev., GL (ft. msl) : Site Coordinates :

N : N 1634800.15 E : E 2547414.91

						Finish Date : 09/22/2016	E : E 2547414.91
Depth (ft.)	PID (ppm)	Saturation Lithology	nscs	Recovery (%)	Sample	Saturation Saturation Saturation DESCRIPTION	Completion Results OW-58
-1 —					I	1	
_							Flush Mount
0-			AR	100		ASPHALT/BASE,	Concrete Pad - 4'x4'x4"
-			An	100		SILTY CLAY, moderate, firm to stiff, damp,	
1-	110		CL	100		brown, odor,	
3-	40		CL	100		SILTY CLAY, SIMILAR TO ABOVE (STA),	
5— 	11.2		CL	100		SILTY CLAY, STA, moist, faint odor,	—Grout
6 — - - 7 — - -	2.2		CL	90		SILTY CLAY, low, soft, damp, brown, faint odor,	2" Sch 40 PVC w/Threaded Joints
8 — - 9 — -	5.3		CL	60		SILTY CLAY, STA, no odor,	
10-	37		CL	80		SILTY CLAY, STA, sticky, black discoloration, odor,	
12— - - 13—	42		CL			SILTY CLAY, STA,	

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07-25-2018



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc. / Cohagan

Drilling Rig : CME 75

Drilling Method : Hollw Stem Auger 7.5"

Sampling Method : 2' Split Spoon - 2" Diameter

Comments : N 35° 29.500' / W 108° 28.410'

Total Depth : 48.5'
Ground Water : 29'
Start Date : 09/22/2016
Finish Date : 09/22/2016

WELL NO. OW-58

(Sheet 2 of 4)

Elev., TOC (ft.msl): 6934.50 Elev., PAD (ft. msl): 6934.71

Elev., GL (ft. msl) : Site Coordinates :

N : N 1634800.15 E : E 2547414.91

			Finish Date : 09/22/2016	E : E 2547414.91
Depth (ft.)	Saturation Lithology USCS	Recovery (%)	Saturation Saturation Saturation DESCRIPTION	Completion Results OW-58
13-	CL	70		
14— - - 15— 25	CL	60	SILTY CLAY, low, stiff, damp, brown with black discoloration, faint odor,	
16— - - 17— 226	CL	60	SANDY CLAY, low, stiff, very fine grain sand, damp, brown, odor,	
18 — 240	CL	50	SANDY CLAY, STA, odor,	——————————————————————————————————————
20 200	CL	60	SANDY CLAY, STA, odor,	2" Sch 40 PVC w/Threaded Joints
22 2020	CL	90	SILTY CLAY, low, very stiff, damp, brown, tan silt pockets/seams present, odor,	
24 — - - 25 — 1980	CL	90	SILTY CLAY, low, firm, soft/ crumbly, damp, brown, strong odor, outside of core is oily/phase separated hydrocarbon (PSH),	Proceedings of the control of the co
26 – 973 27 –	CL		SILTY CLAY, STA, firm to stiff, odor, outside of core is oily/PSH,	



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc. / Cohagan

Drilling Rig : CME 75

Drilling Method : Hollw Stem Auger 7.5" Sampling Method: 2' Split Spoon - 2" Diameter Comments : N 35° 29.500' / W 108° 28.410'

Total Depth : 48.5' **Ground Water** : 29' Start Date : 09/22/2016 Einich Data . 00/22/2016

WELL NO. OW-58

(Sheet 3 of 4)

Elev., TOC (ft.msl): 6934.50 Elev., PAD (ft. msl): 6934.71

Elev., GL (ft. msl) : Site Coordinates :

: N 1634800.15 · F 2547414 91

							Finish Date : 09/22/2016	E : E 2547414.91
							Saturation	
							<u>▼</u> Saturation	Completion Results
					(%		<u></u> ✓ Saturation	014.50
t.)	E	ر ا دا	_		ry (9			OW-58
th (f	PID (ppm)	Saturation	goic	SS	Recovery (%)	Jple		
Depth (ft.)	PID	Satu	Lithology	nscs	Rec	Sample	DESCRIPTION	
27 —		l V				l I	1	
-	973		//	CL	90			
28 -								
-				CL	00	IN A	SILTY CLAY, STA, damp to moist, odor,	Grout
		_/		CL	90	$ \setminus $		
29 —	2784					\parallel $\!$ $\!$ $\!$ $\!$	SANDY CLAY/CLAYEY SAND, low, soft,	
-				CL/SC	90	/ \	very moist to saturated, dark brown, odor,	
30 –		$ P \neq $					SANDY SILTY CLAY, low, firm, damp,	
-							saturated sand at base, grey/brown, odor,	
31 —	2350			CL	90			
-								
32 —		1	4					젊 (축
							SILTY SAND, fine, loose, saturated, grey/brown, odor,	—2" Sch 40 PVC
-	4775			SM	90		g.oy/oromi, odor,	w/Threaded Joints
33 —	1775							
-				CL	90		SILTY CLAY, low, soft, damp, greyish brown,	—Bentonite Pellets
34 –			7				odor, SILTY CLAY, STA, damp to very moist, odor,	_ ■
-							SILTY CLAY, STA, damp to very moist, odor,	
35 —	575			CL	90			[X]X
-								
36-			4					
-							SILTY CLAY, low, firm, damp, greyish brown, odor,	
37 <i>-</i>	227			CL	80		,	10/20 Sieve Sand Filter Pack
-					00			
38 -			7				SILTY CLAY, STA, brown, odor,	
-								
39 —	545			CL	50			
-								2" Sch 40 PVC Slotted 0.01"
40 —			4			\parallel	CLAV high firm damp brown adar	Screen w/Threaded Joints
-	531			СН			CLAY, high, firm, damp, brown, odor,	
41 —								

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DiSorbo Consulting, LLC

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



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc. / Cohagan

Drilling Rig : CME 75

Drilling Method : Hollw Stem Auger 7.5"

Sampling Method : 2' Split Spoon - 2" Diameter

Comments : N 35° 29.500' / W 108° 28.410'

Total Depth : 48.5'
Ground Water : 29'
Start Date : 09/22/2016
Finish Date : 09/22/2016

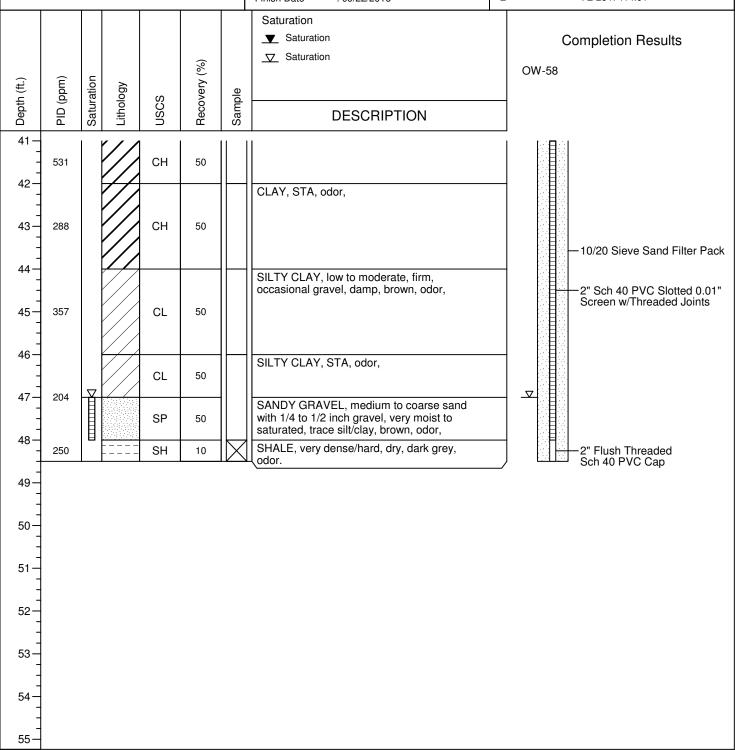
WELL NO. OW-58

(Sheet 4 of 4)

Elev., TOC (ft.msl): 6934.50 Elev., PAD (ft. msl): 6934.71

Elev., GL (ft. msl) : Site Coordinates :

N : N 1634800.15 E : E 2547414.91



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07-25-2018



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-S

Drilling Method : Hollow-Stem Auger Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet Total Depth : 49'

Ground Water : 32' BGL
Start Date : 9/23/2016
Finish Date : 9/23/2016

WELL NO. TK 568-1

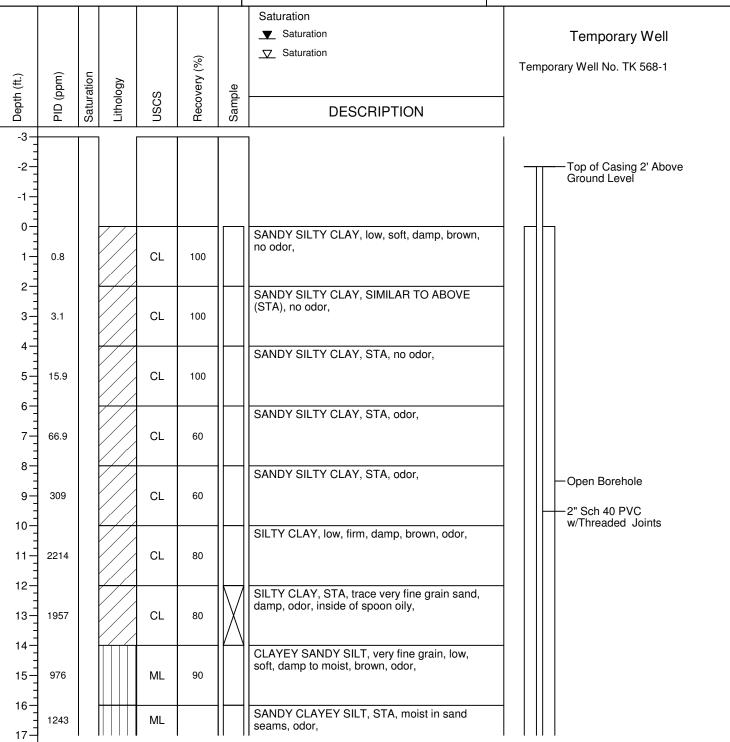
(Sheet 1 of 3)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6950.66

Site Coordinates

N : N 35° 29.412' E : W 108° 25.430





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan Drilling Rig : CME 75

Drilling Method Sampling Method : 2" Split Spoon - 2" Diameter Comments

Total Depth : 49' **Ground Water** Start Date Finish Date

: Hollow-Stem Auger

: Hand Augered to 6 Feet

: 32' BGL : 9/23/2016 : 9/23/2016

WELL NO. TK 568-1

(Sheet 2 of 3)

Elev., TOC (ft.msl) Elev., PAD (ft. msl)

Elev., GL (ft. msl) : 6950.66

Site Coordinates

: N 35° 29.412' Ε : W 108° 25.430

							Finish Date : 9/23/2016	E . W 106* 25.430
					(%)		Saturation ▼ Saturation ✓ Saturation	Temporary Well
(ft.)	(mdc	ation	Явс	(0	Recovery (%)	e		Temporary Well No. TK 568-1
Depth (ft.)	PID (ppm)	Saturation	Lithology	nscs	Recov	Sample	DESCRIPTION	
17-	1243			ML	90			Open Borehole
18						$\ \cdot\ $	SANDY CLAYEY SILT, STA, odor,	
19	1731			ML	90			—Bentonite Pellets
20							SANDY CLAYEY SILT, STA, odor,	
21 -	1780			ML	90			
22							CLAYEY SANDY SILT, very fine grain sand,	2" Sch 40 PVC w/Threaded Joints
23	1125			ML	90		soft, damp to moist, brown, odor,	
24							SILTY SANDY CLAY, low, soft to firm, damp, brown, odor,	
25	1119			CL	90		blown, odol,	
26-							SILTY SANDY CLAY, STA, odor,	
27	965			CL	90			
28-							SILTY SANDY CLAY, STA, odor,	—
29	970			CL	90			2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints
30-							SILTY SANDY CLAY, STA, black discoloration in sand at base, very moist, odor,	Screen w/ Infredued Joints
31 –	1308			CL	90	$\ \wedge \ $	·	
32	1680			SC	90		CLAYEY SAND, fine grain, loose, saturated, black, odor,	
33-	733			CL	90		SILTY CLAY, low, firm, damp, brown, odor,	
34-	1605			CI	90		SILTY SANDY CLAY, low, soft, black discoloration, damp, brown, odor,	
35	1695	∇		CL	90			
36 — 37 —	1282			SM			SILTY SAND, fine, loose, saturated, grey, odor, poor recovery,	
3,								



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan Drilling Rig

: CME 75

: Hollow-Stem Auger

: 2" Split Spoon - 2" Diameter : Hand Augered to 6 Feet

Comments Total Depth : 49' **Ground Water**

Drilling Method

Sampling Method

: 32' BGL Start Date : 9/23/2016 Finish Date : 9/23/2016

WELL NO. TK 568-1

(Sheet 3 of 3)

Elev., TOC (ft.msl) Elev., PAD (ft. msl)

Elev., GL (ft. msl) : 6950.66

Site Coordinates

: N 35° 29.412' Ε : W 108° 25.430

							Finish Date : 9/23/2	2016	E	: W 108° 25.430
							Saturation			
							▼ Saturation			Temporary Well
		_			(%)		∇ Saturation		Temp	orary Well No. TK 568-1
h (ft.)	mdd	atior	logy	S	very) Se				
Depth (ft.)	PID (ppm)	Saturation	Lithology	nscs	Recovery (%)	Sample	DESCRI	PTION		
37						 			— - 1 - 15:F1:	2" Sch 40 PVC Slotted 0.01"
38	1282			SM	10					Screen w/Threaded Joints
]							SANDY CLAY, low, firm, obrown, odor, sheen on cor	amp to moist, e.		2" Flush Threaded Sch 40 PVC Cap
39	1078			CL	80		, ,	-,		
40-			///				SANDY CLAY, STA, damp	o odor		
41 –	383			CL	20		57.115 F 02711, 0171, damp	, odor,		
]	000			OL.	==					
42-							SANDY CLAY, STA, white	clay at base, odor,		10/20 Sieve Sand Filter Pack
43	476			CL	20					
44										
l ∃				01			CLAY, low, dense/crumbly brown/grey, no odor,	, dry, dark reddish		
45-	144			CL	50					
46							CLAY, STA,			
47	80			CL	20					
48										
40]	41			SH	20		SANDY SHALE, very dens odor.	se, dry, grey, no		
49						IV V			<u> </u>	<u>⊴</u>
50										
51										
]										
52-										
53										
54										
-										
55										
56										
57										



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75

Drilling Method : Hollow-Stem Auger Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet

Total Depth : 37'
Ground Water : 30'

Start Date : 9/27/2016 Finish Date : 9/27/2016

WELL NO. TK 568-2

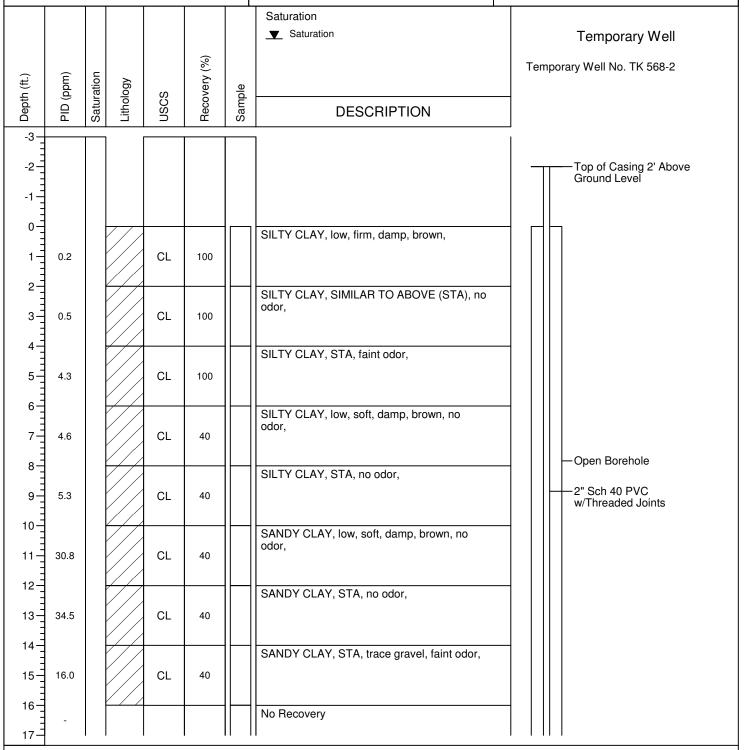
(Sheet 1 of 2)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6950.66

Site Coordinates

N : N 35° 29.396' E : W 108° 25.435'





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter
Comments : Hand Augered to 6 Feet

Total Depth : 37'
Ground Water : 30'
Start Date : 9/27/2016
Finish Date : 9/27/2016

WELL NO. TK 568-2

(Sheet 2 of 2)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6950.66

Site Coordinates

N : N 35° 29.396' E : W 108° 25.435'

							Finish Date : 9/27/2016	E : W 108° 25.435'
							Saturation	
							_▼ Saturation	Temporary Well
	<u> </u>	ے			(%)			Temporary Well No. TK 568-2
Depth (ft.)	PID (ppm)	Saturation	Lithology	δ	Recovery (%)	ble		
Depi	PID	Satu	Litho	nscs	Весс	Sample	DESCRIPTION	
17-					 		1	
18-	-		, , ,		-	Ш	CANDY OLAY OTA frietados	Open Borehole
19 - 3	36.5		///	CL	40		SANDY CLAY, STA, faint odor,	
3	30.3			OL	40			
20							SANDY CLAY, STA, trace gravel, faint odor,	
21 = 2	29.6			CL	40			
22-							CLAYEY SAND, fine grain, loose, trace	—Bentonite Pellets
23	82			SC	60	$ \bigvee $	gravel, damp, brown, odor,	—2" Sch 40 PVC
3	-	}				$\ /\ $		w/Threaded Joints
24							No Recovery - white sandstone lodged in shoe	
25 -	-				-		31106	
26 -						\vdash	No Recovery - very dense hard sandstone in	
27 – 27 –	_				-		shoe	
28						$ \nabla$	CLAYEY SAND, very fine to fine, compact, moist to saturated at 30', brown, odor,	
29 - 2	2803			SC	90	$\ X\ $		
30-		▼				H	CLAYEY SAND, STA, white sandstone	■ ■ 10/20 Sieve Sand Filter Pack
31 –	-			SC	90		lenses present, trace gravel, odor,	2" Sch 40 PVC Slotted 0.01"
32								Screen w/Threaded Joints
=							GRAVELLY SAND, fine to medium, compact, gravel 1/4 to 1/2", saturated, brown, odor,	
33-	-			SP	90		sheen on sampler,	
34 =				0.5	00	$\ - \ $	SANDY GRAVEL, well rounded, loose,	
35 -	-			GP	90		saturated, odor,	
36	53			CLST	90		CLAYSTONE, very hard/dense, dry, dark reddish brown,	
=	21			CLST	50		CLAYSTONE, STA, shaley at base.	2" Flush Threaded Sch 40 PVC Cap
37						IV V	l	



1010 Travis Street

713-955-1230

Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan Drilling Rig : CME 75

: Hollow-Stem Auger Drilling Method

Sampling Method : 2" Split Spoon - 2" Diameter Comments : Hand Augered to 6 Feet

Total Depth : 42' **Ground Water** : 24-26' Start Date : 10/4/2016 Finish Date : 10/4/2016

WELL NO. TK 569-1

(Sheet 1 of 3)

512-693-4190

Elev., TOC (ft.msl) Elev., PAD (ft. msl)

Elev., GL (ft. msl) : 6952.00

Site Coordinates

: N 35° 29.403' Ε : W 108° 25.469'

Depth (ft.)	PID (ppm)	Saturation	nscs	Recovery (%)	Sample	Saturation Saturation Saturation DESCRIPTION	Ten	Temporary Well
-3 -2 -1								Top of Casing 2.5' Above Ground Level
0	7.3		CL	100		SILTY CLAY, low, firm, damp, brown, no odor,		
3-	6.6		CL	100		SILTY CLAY, SIMILAR TO ABOVE (STA),		
5 6	4.1		CL	100		SILTY CLAY, STA, SILTY CLAY, STA,		2" Sch 40 PVC
7- - 8-	0.5		CL	90		SILTY CLAY, STA,		w/Threaded Joints —Open Borehole
9 - 10 - 1	0.5		CL	90		SILTY CLAY, STA,		
11-	2.3		CL	80		SILTY CLAY, STA, trace very fine grain sand,		
13	4.2 13.6		CL	70		SANDY CLAY, low, firm to soft, very fine grain sand throughout, damp, brown,		



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter
Comments : Hand Augered to 6 Feet

Total Depth : 42'
Ground Water : 24-26'
Start Date : 10/4/2016
Finish Date : 10/4/2016

WELL NO. TK 569-1

(Sheet 2 of 3)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.403' E : W 108° 25.469'

							Finish Date : 10/4/2016	E : W 108° 25.469'
							Saturation	
							<u>▼</u> Saturation	Temporary Well
					<u>@</u>		<u></u> Saturation	Tarana arawa Mali Nia Tik 500 d
ft.)	Ê	on	>		Recovery (%)			Temporary Well No. TK 569-1
Depth (ft.)	dd)	Saturation	bolc	၂ တ္က	ove	l de		_
Dep	PID (ppm)	Satı	Lithology	nscs	Rec	Sample	DESCRIPTION	
15-				1 I		 	1	
,]	13.6			CL	70			Open Borehole
16-			///			H	SANDY CLAY, STA, odor,	
=	00.0				00		, , , , , , , , , , , , , , , , , , , ,	
17-	32.6			CL	60			
18						Щ		—Bentonite Pellets
			///			IN /I	SANDY CLAY, STA, odor,	
19	152		///	CL	70	X		—2" Sch 40 PVC
=			///			II/ \I		w/Threaded Joints
20							CLAYEY SILTY SAND, fine to medium grain,	
21	41.6			SC/SM	90		compact, becomes more silty with depth, gravel at base, damp, odor,	
	11.0			OO/OW	00		graver at succe, samp, succe,	
22						$H \rightarrow$	CLAYEY SILTY SAND, STA, medium to	
=							coarse sand, occasional gravel, damp,	
23	92.2			SC/SM	90			
24								
247						IN A	CLAYEY SILTY SAND, very fine grain, compact, moist to saturated in silty sand	
25	2158			SC/SM	90	$ \vee $	seams, brown, odor,	
=						/\		
26		ᄖ				H	SANDY CLAY, STA with greater clay content,	10/20 Sieve Sand Filter Pack
	4447		///		00		brown trace gravel at base, moist to	
27 - -	1147		///	CL	20		saturated in silty sand seams,	
28			<u>, , , , , , , , , , , , , , , , , , , </u>			Щ		2" Sch 40 PVC Slotted 0.01"
							GRAVELLY SILTY SAND, medium to coarse grain, compact, damp to moist in seams-not	Screen w/Threaded Joints
29	1060			SM	50		saturated throughtout core, brown, odor,	
							sandstone gravel present,	
30		悄				IH	CLAYEY SANDY GRAVEL, 1/8" to 1/2" gravel	
31 –	1353	圃		GW	60		with medium to coarse grain sand, compact to loose, saturated, brown, odor,	
317	1000	$ \mathbb{I} $.0 . 6 . 6 . 6			$\ \ \ $		
32				CL	60	Щ	SILTY CLAY, low, firm, damp, brown, odor,	
	1622		///	CL			SILTY CLAY, STA, odor,	
33				1			1	



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75

Drilling Method : Hollow-Stem Auger Sampling Method : 2" Split Spoon - 2" D

Sampling Method : 2" Split Spoon - 2" Diameter Comments : Hand Augered to 6 Feet

Total Depth : 42'

Ground Water : 24-26'

Start Date : 10/4/2016

WELL NO. TK 569-1

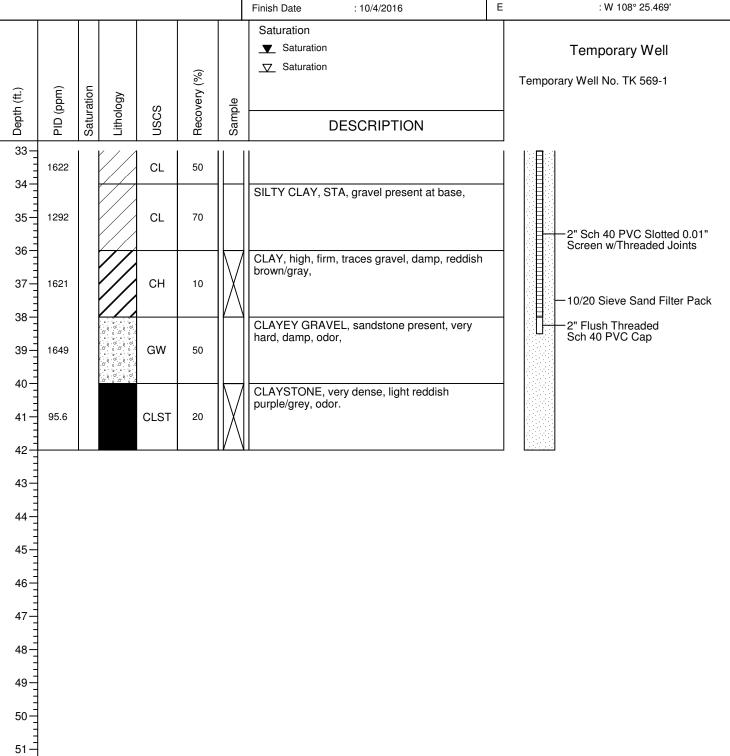
(Sheet 3 of 3)

Elev., TOC (ft.msl)

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.403' E : W 108° 25.469'





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-S

Drilling Method : Hollow-Stem Auger Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet
Total Depth : 38'
Ground Water : 31'

Start Date : 10/4/2016 Finish Date : 10/4/2016

WELL NO. TK 569-2

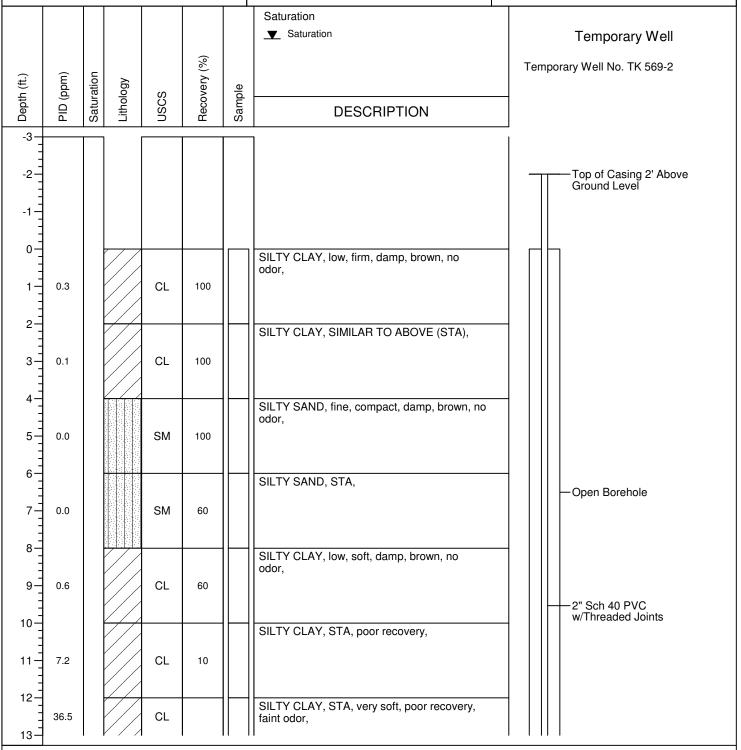
(Sheet 1 of 3)

Elev., TOC (ft.msl) ::
Elev., PAD (ft. msl) ::

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.403' E : W 108° 25.451'





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75

Drilling Method : Hollow-Stem Auger
Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet

Total Depth : 38'
Ground Water : 31'
Start Date : 10/4/2016
Finish Date : 10/4/2016

WELL NO. TK 569-2

(Sheet 2 of 3)

Elev., TOC (ft.msl) :
Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.403' E : W 108° 25.451'

Saturation Temporary Well Temporary Well No. TK 569-2 DESCRIPTION Temporary Well No. TK 569-2 DESCRIPTION Temporary Well No. TK 569-2 DESCRIPTION CLAYEY SAND, very fine grain, compact, damp, brown, odor, SC 70 CLAYEY SAND, STA, odor, CLAYEY SAND, STA, sand/gravel lense from 21-21.5, loose, damp, grey. CLAYEY SAND, STA, sand/gravel lense from 21-21.5, loose, damp, grey. Bentonite Pellets SM 90 GW 10 SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, white sandstone SC 60 SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,								Finish Date : 10/4/2016	E	: W 108° 25.451'
Temporary Well No. Tk 569-2 Temp										
13								_ ▼ Saturation		Temporary Well
13	·	<u></u>	L			(%) k				Temporary Well No. TK 569-2
13	oth (ft	udd)	uratic	ology	SS	over	nple			
14	Dep	PD	Satı	ij)SN	Rec	Sar	DESCRIPTION		
15 899 SC 70 CLAYEY SAND, very fine grain, compact, damp, brown, odor, 17 2332 SC 70 CLAYEY SAND, STA, odor, 18 SC/CL 90 CLAYEY SAND, STA, sand/gravel lense from 21-21.5, loose, damp, grey, 21 833 SC 60 SLTY SAND, STA, sand/gravel lense from 21-21.5, loose, damp, grey, 22 Sch 40 PVC w/Threaded Joints 23 998 SM 90 SANDY GRAVEL, STA, white sandstone present, 24 Sch 40 PVC w/Threaded Joints 26 SANDY GRAVEL, STA, white sandstone present, 27 1973 GW 10 SANDY GRAVEL, STA, white sandstone present, 28 Sch 40 PVC Sicted 0.01" Screen w/Threaded Joints	13-	00.5		Y //		40				
SC 70 CLAYEY SAND, Very line grain, compact, damp, brown, odor, CLAYEY SAND, STA, odor, Open Borehole	14 <i>-</i>	36.5			CL	10				
SC 70 CLAYEY SAND, STA, odor, CLAYEY SAND, STA, odor, CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND, STA, sand/gravel lense from 21-21.5′, loose, damp, grey, SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	-							damp, brown, odor,		
SC 70 CLAYEY SAND, STA, coor, SC/CL 90 CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/STA, sand/gravel lense from 21-21.5'; loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor. SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone	15	899			SC	70				
SC 70 CLAYEY SAND, STA, coor, SC/CL 90 CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/STA, sand/gravel lense from 21-21.5'; loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor. SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone SANDY GRAVEL, STA, white sandstone	16-									│
SC/CL 90 CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND, STA, sand/gravel lense from 21-21.5', loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	-						\mathbb{N}/\mathbb{I}	CLAYEY SAND, STA, odor,		
SC/CL 90 CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/STA, sand/gravel lense from 21-21.5', loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, GW 10 SANDY GRAVEL, STA, white sandstone To/20 Sieve Sand Filter Pack SANDY GRAVEL, STA, white sandstone To/20 Sieve Sand Filter Pack SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	17	2332			SC	70	$\ X\ $			
SC/CL 90 CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/SANDY CLAY, STA, odor, CLAYEY SAND/STA, sand/gravel lense from 21-21.5', loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, GW 10 SANDY GRAVEL, STA, white sandstone To/20 Sieve Sand Filter Pack SANDY GRAVEL, STA, white sandstone To/20 Sieve Sand Filter Pack SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	18-									
21—833 SC 60 CLAYEY SAND, STA, sand/gravel lense from 21-21.5'; loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	=							CLAYEY SAND/SANDY CLAY, STA, odor,		
21 833 SC 60 SILTY SAND, STA, sand/gravel lense from 21-21.5', loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	19	702			SC/CL	90				
21 833 SC 60 SILTY SAND, STA, sand/gravel lense from 21-21.5', loose, damp, grey, SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	20-									
SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,								CLAYEY SAND, STA, sand/gravel lense from 21-21.5', loose, damp, grey,		
SM 90 SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	21	833			sc	60				—Bentonite Pellets
SM 90 SM 90 SILTY SAND, fine grain, loose, damp, brown, odor, SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	22									
23 – 398 24 – 24 – 190 26 – 190 26 – 1973 28 – 1973 398 GW 10 SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	-				014					
SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	23	398			SM	90				
SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	24				GW			SANDY GRAVEL, grey sandstone gravel with		2" Sch 40 PVC w/Threaded Joints
26 - 1973 GW 10 SANDY GRAVEL, STA, white sandstone present, GW 10 SANDY GRAVEL, STA, white sandstone present, SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	24							SANDY GRAVEL, STA, white sandstone	-1	
SANDY GRAVEL, STA, white sandstone present, 27	25 –	190		0 0 0	GW	10		present,		
SANDY GRAVEL, STA, white sandstone present, 27	26.			0 0 0						10/20 Signs Sand Filter Back
27 - 1973 GW 10 28 - 2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	20 -			0.00.00						10/20 Sieve Sand Filler Pack
28 = 1684 GW SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,	27	1973			GW	10				
1684 GW SANDY GHAVEL, STA, poor recovery, very hard, trace clay, damp,	20			0 6 0 6 0						2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints
	28—	1684			GW			SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp.		
	29 –			0 0 0				,		



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-S

Drilling Method : Hollow-Stem Auger
Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet
Total Depth : 38'
Ground Water : 31'

Start Date : 10/4/2016 Finish Date : 10/4/2016

WELL NO. TK 569-2

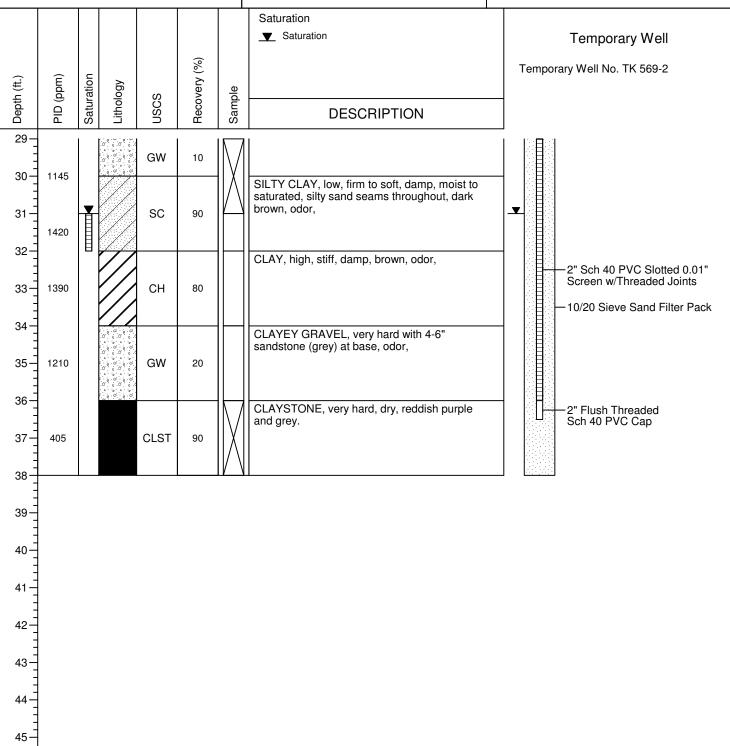
(Sheet 3 of 3)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.403' E : W 108° 25.451'





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME 75

Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter Comments : Hand Augered to 6 Feet

Total Depth : 39'
Ground Water : 26'
Start Date : 9/28/2016
Finish Date : 9/28/2016

WELL NO. TK 569-3

(Sheet 1 of 2)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.390' E : W 108° 25.459'

					Finish Date : 9/28/2016	E : W 108° 25.459'
Depth (ft.)	Saturation Lithology	80	Recovery (%)	Sample	Saturation ▼ Saturation ∇ Saturation	Temporary Well Temporary Well No. TK 569-3
Dep	Satu	nscs	Rec	San	DESCRIPTION	
-3 -2 -1						Top of Casing 2.25' Above Ground Level
0 - 8.9		CL	100		SILTY CLAY, low, firm, damp, brown, no odor,	
3 10.4		CL	100		SILTY CLAY, SIMILAR TO ABOVE (STA),	
5 12.4 6		CL	100		SILTY CLAY, STA,	
7 31.8 8 		CL	60		SILTY CLAY, STA,	— Open Borehole
9 27.6		CL	50		SILTY CLAY, STA, soft,	2" Sch 40 PVC w/Threaded Joints
10 - 50.9		CL	70		SILTY CLAY, low, firm, damp, brown, odor,	
12 - 63.9		CL	60		SILTY CLAY, STA, trace very fine grain sand, odor,	
14 - 303		SC	70		CLAYEY SAND, very fine, compact, damp, brown, odor,	
16 – 377 17 – 377		SC	70		CLAYEY SAND, STA, odor,	—Bentonite Pellets
18 - - 250 19 -		SC/CL			CLAYEY SAND/SANDY CLAY, STA, odor,	



Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter Comments : Hand Augered to 6 Feet

 Total Depth
 : 39'

 Ground Water
 : 26'

 Start Date
 : 9/28/2016

 Finish Date
 : 9/28/2016

WELL NO. TK 569-3

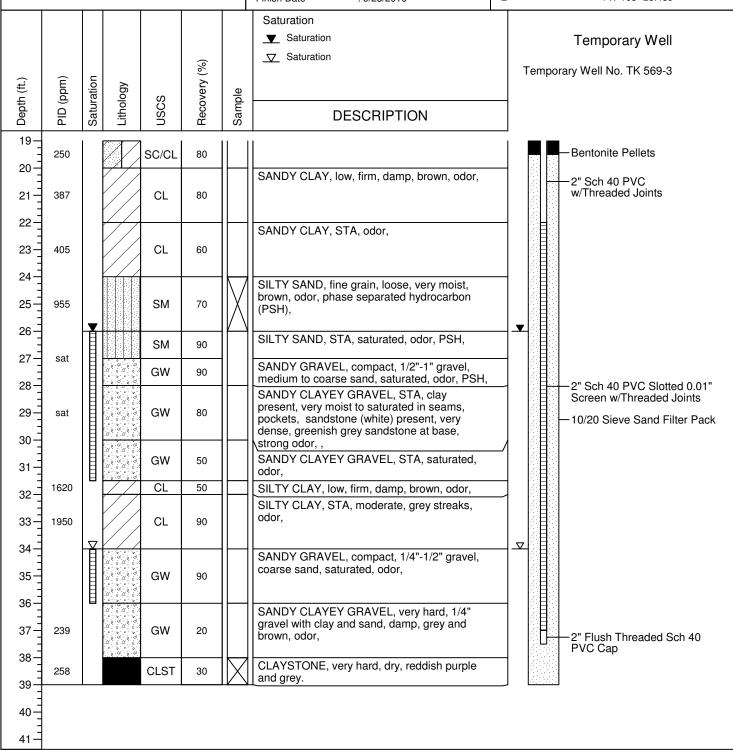
(Sheet 2 of 2)

Elev., TOC (ft.msl) : Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6952.00

Site Coordinates

N : N 35° 29.390' E : W 108° 25.459'





Geologist : Tracy Payne

: Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75

Drilling Method : Hollow-Stem Auger

Sampling Method : 2" Split Spoon - 2" Diameter Comments : Hand Augered to 6 Feet

: 33' BGL

Total Depth Ground Water

Start Date : 9/27/2016 Finish Date : 9/27/2016 WELL NO. TK 570-1

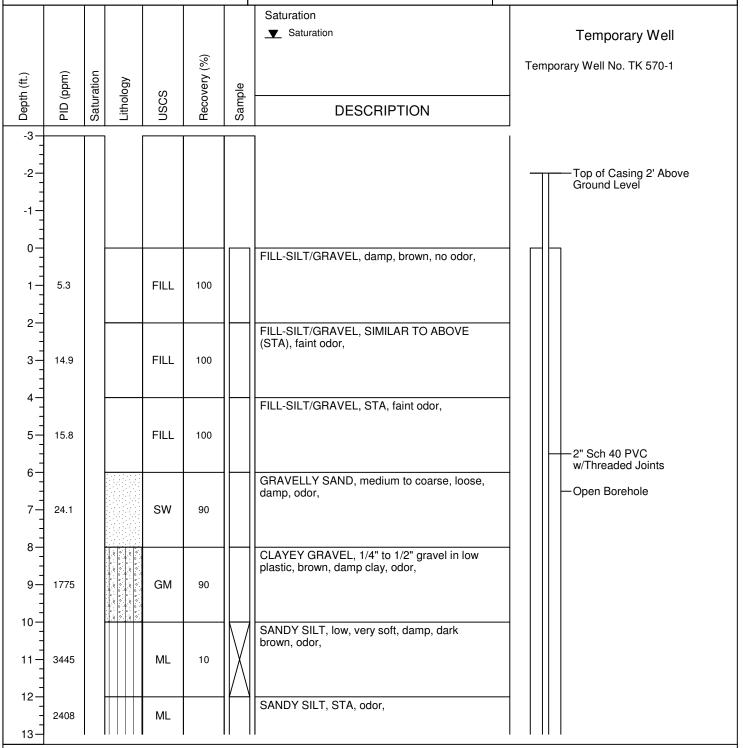
(Sheet 1 of 3)

Elev., TOC (ft.msl) :: Elev., PAD (ft. msl) ::

Elev., GL (ft. msl) : 6958.88

Site Coordinates

N : N 35° 29.377' E : W 108° 25.459'





Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75

Drilling Method : Hollow-Stem Auger
Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet Total Depth : 45'

Ground Water : 33' BGL
Start Date : 9/27/2016
Finish Date : 9/27/2016

WELL NO. TK 570-1

(Sheet 2 of 3)

Elev., TOC (ft.msl) :
Elev., PAD (ft. msl) :

Elev., GL (ft. msl) : 6958.88

Site Coordinates

N : N 35° 29.377' E : W 108° 25.459'

							Finish Date : 9/27/2016		. W 106° 25.459
							Saturation		
							<u>▼</u> Saturation		Temporary Well
	=	ے			(%)				Temporary Well No. TK 570-1
Depth (ft.)	PID (ppm)	Saturation	Lithology	တ္သ	Recovery (%)	Sample			
Dep	PD	Satı	Lith	nscs	Reo	San	DESCRIPTION		
13-							1		1111
14-	2408			ML	10				
'~ -							SANDY CLAY, low, firm to soft, damp, sandy at base, brown, odor,		
15	2350			CL	90				
16-									
-							SILTY CLAY, low, firm, damp, ocassional sandy clay lenses, brown, odor,		
17	1139			CL	90				
18-									Open Borehole
'0 -							SILTY CLAY, STA, odor,		
19	1250			CL	90				
-									
20-	1460			CL	90		SILTY CLAY, STA, odor,		2" Sch 40 PVC
21							CLAYEY SAND, fine, compact to loose, damp,		w/Threaded Joints
-				SC	90		brown, odor,		
22-							CLAYEY SAND, STA, decrease in clay with depth, odor,		
23	399			SC	90		dopan, odon,		
-									—Bentonite Pellets
24-							CLAYEY SAND, STA, odor,		
25 -	695			SC	100				E
26-							SILTY SAND, very fine, soft/compact, damp,		
27	952			SM	90		brown, odor,		
									-10/20 Sieve Sand Filter Pack
28-	1441			SC			CLAYEY SAND, very fine, compact, damp,	\dashv	2" Sch 40 PVC Slotted 0.01"
29-	1441			30			brown, odor,		Screen w/Threaded Joints
ullet									



Geologist : Tracy Payne

Driller : Enviro-Drill, Inc./Cohagan

Drilling Rig : CME 75
Drilling Method : Hollow-S

Drilling Method : Hollow-Stem Auger
Sampling Method : 2" Split Spoon - 2" Diameter

Comments : Hand Augered to 6 Feet Total Depth : 45'

Ground Water : 33' BGL
Start Date : 9/27/2016
Finish Date : 9/27/2016

WELL NO. TK 570-1

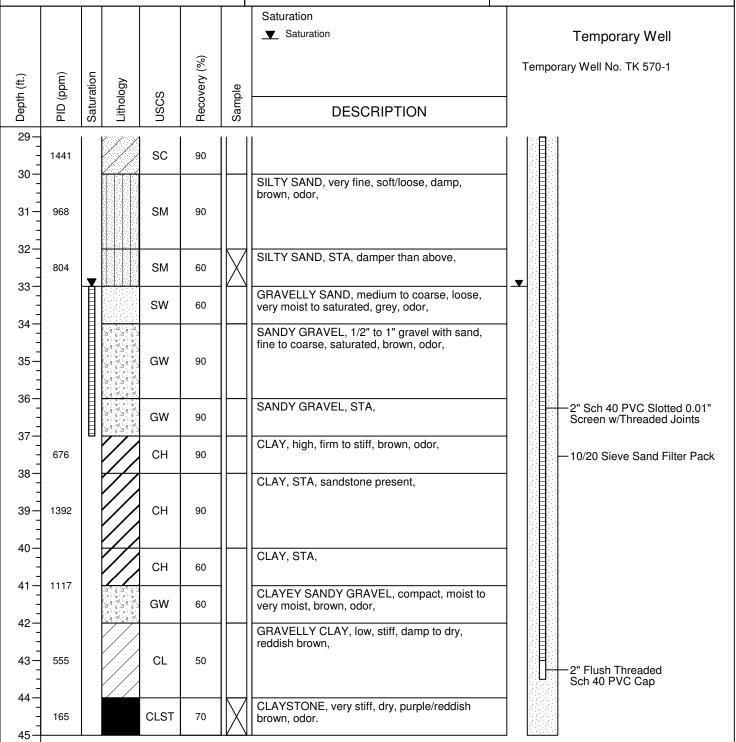
(Sheet 3 of 3)

Elev., TOC (ft.msl) ::
Elev., PAD (ft. msl) ::

Elev., GL (ft. msl) : 6958.88

Site Coordinates

N : N 35° 29.377' E : W 108° 25.459'



Appendix G Permeability and Hydraulic Conductivity Evaluations

APPENDIX C – DISCHARGE PLAN APPLICATION GIANT REFINING COMPANY CINIZA REFINERY

November 21, 1985

APPENDIX C
AQUIFER-TEST DATA AND ANALYSES

TEST PUMPING OF CHINLE SHALE

METHODOLOGY AND DESCRIPTION OF THE TEST

The test consisted of a 5 hour pumping period and a 2 hour recovery period. An air-driven piston pump capable of sustaining pumping rates as low as 10 gallons/hour (0.167 gpm) was used for the test. Water level measurments were taken with an electronic sounder. The well (OW-24) is located approximately 250 feet northwest of the land treatment facility and is completed within the Chinle shale. The lithologic and completion log of the well is attached (Figure F-2).

Pumping began at 1515 hours on February 20, 1985 at a rate of 10 gallons/hour. The produced water was very turbid. Clogging of the pump and pump lines necessitated continuous monitoring and adjustment of the discharge.

After 4 hours of pumping at 10 gallons/hour, the drawdown of the well appeared to stabilize at about 7 feet. The discharge rate was increased to 20 gallons/hour in order to more effectively stress the aquitard. After one hour of additional pumping a total drawdown of 12 feet was observed. However, this higher pumping rate increased the turbidity of the discharge and caused instability of the pumping rate. The lack of control of the discharge rate and the potential of diamage to the pump forced the termination of the test after a total of 5 hours of pumping.

Water level recovery was observed for 100 minutes. At this time the water level had recovered to within 90% of the pre-pumping level.

TABLE F-1
Pump Test Data, OW-24

PUMP TEST ANALYSIS

Field measurements are summarized in Table F-1. Due to the short pumping time and potential well-bore and gravel-pack effects, the final analysis was based on methods developed by Shafer, for low-conductivity materials.

Partial penetration effects were neglected in the analysis because the low pumping rates and the expected anisotropy of the aquitard would prevent significant vertical flow to the well bore. The low pumping rate was also designed to completely drain the gravel pack in the well to insure accurate recovery data.

A copy of Shafer's methodology is attached, and the data for his analysis is given in Table F-2. Figure F-1 is a plot of the recovery data, according to Shafer's methods. This Figure includes calculation of T and K for the Chinle shales.

\$ 18 gal DATA SHEET FOR RECORDING PUMP TEST DATA

Country : McKinley (c: Observation well no. Ow- 24 _ Location Cillize Refinery 2/2/85 Purped well no. OW- 24

			Averse	0		Sten	e =	ſt.	,2=		
	Date	Hour	(min)	(min)	1/1	Depth to water	s (unad- justed)	ment	(#d- justed)	(Ham)	Portarks.
	3-20	1515	U			31-11.5		Feet		10 h	
		1516	i			33 ·	14.5	1.04		,	LA ELE INFILE
		1517	Z			33-1	13,5	1.13			Setting pumps
		1518	3				16.5				
		1519	4				20.75				
		1520	5	100		-	24.0	-			
		1521	6			34-7	26.5	2.22			
		1524	7				17.0				
1 min		1523	8				27,5	2-27			
		1524					25.5	2.37			
-		1525	10			34-5	29.5	2.46			
			13				30.75	-			
		1529						2.79			
- min		1531	-				36.5"				
- mu		1533	18			35.24	38,75	3-23			
~		1535	20			35-4%	41.0	3.42			
	-	1540	25				47.0				
		1545	30			36-3	51.5	4.28			
		1550	35				51.0				
		15.55	40			36-8	56.5	4.71		10gel	Value PHAP
5 mm	-	1600	45				62.75				
	_	1605	20	-		36-142	81.0	5.08			valve
		1610	55	_	-	NA	70.75				
		1615				17-104	70.75 27.75	5.90			Purped 10 gal
10 mi		1625	70			88-1/2	85.09	6.08			

DATA SHEET FOR RECORDING PURP TEST DATA

	County: Location: Cistinga Referency						Observation well no. MW-24 Pumped well no. MW-24					
	Descre	المسيد ال		= 0_ <u>/</u>		4 51.0	·	- 1c. r ² = -				
	Date	Hour	(min)	(r.in)	./ <u>.'</u>	Lo	5 // (unad- justed)	Mjust- ment As	g' (ød- justed)	(57m)	Dectarks	
	z -7v	1635	50	- 		39.3%	justed) 76 88,0	6.33		10		
		1645	9c				91.5	1	 	ļ	Lift pump to 50'	
		1655	100			37-6%	69.0	5.75		}	clear fremp, ready	
		1705	110			38-12	74.0	7.00				
2 hours		1715	120			39-24		7.27			Pamped 20 gal	
		1730	1.35			38-11		6.97				
15 mm		1745	150			31-2/2		7. ح. ح				
		1800	165]	9-03		7.08				
34			180			39-2		7.21			Pumped 30 gal	
		1930	193			37-5		7.46				
		1845	210			39.5		7.46				
		1900	225			39-2		7.21				
44		1915				38-11/3		7.00			Pumped 40 gal	
		1930	<u>a558</u>			39-0		7.04		10		
			257			39-4	·	7.38	ĸ	20	INCREASE PUT PATE TO DO 6PH	
		1934	259"			37-10		7.87		1	PUMP SLIPPED APPRIX 1 FICT - REPLACED TO	
ستسود		1936	26/31			103/2		8.23			APPECK SAME LEVEL	
ð	/	938	263"			10.3%		8.33			PUMPIPL PATE FELL-OFF	
		990	9650			lo-la-		8-17			SLIGHTLY	
	!	945	270			0-9		3.79				
	1/	950	275			1-93		7.83				
4 800	/	955	280			2-0	/	0.04				
7		000	a85'		<u></u>	1-8		9.72				
		1005	en 26			129/		7.75				
	6	010	347			13-4		7. 27			Silf in Hairfd	
م ما م سمون	→ 8	1015 T	315		n Y	13-2% 3-10°		1. 25 .92			Silt in Plurpe And pump value pumped to go !	
5.5 54					Į.	~		•			punito ?	

RECOVERY DATA

Page 1 of 1

DATA SHEET FOR RECORDING PUMP TEST DATA

Observation sell no.

	Campty	·	·	77	·				Cion sell		• .		
	Locati	Location: Cincing Referrag							Purged well no. Man 24				
				٠٠		21·n	r =	st.	,2 <u>-</u>				
્		T]]]	Depth	•	Adjust-		<u> </u>]		
	Date	llour	t (min)	(min)	1/1	to	(unad- justed)	ment As	(#d- justed)	(Car.)],	Bettarks	
	٠ <u>/٨</u> ٠			0		1	f:	12.0	1	209	1 " ; ' ' '		
	/	20 34		2_		42-7-	1	10.63		U			
		20.36		4		41-83/		9.69	2.31			<u>-</u>	
Zmin	, 	3038		6		40 051	 	8.86	3.14				
		2040		8	ļ	40-2		8.21	3.79				
-		20-12		10		39-6	4	7.56	4.44				
		2047		15		36-03		6.11	5.81				
		2052		20		37-1/c		5.17	6.33				
		2057		25		36:4-		4.38	7.62				
		2102		30		35-8/2		3.75	8.25			·	
		2107		<u> </u>		35-25	<u></u>	3.27	8.73			 	
		2112		40		34-97	/	2.86	9.14				
5 min		2/17		45		34.5	·	2.52	9.48				
		2122	•	50		31-34		2.27	9.73				
		3/27		55		34-05		2.07	9.93				
		2132		60		33-104		1.92	10.03				
<i>(</i> 3)		2142		70		3-73		1.66	10.34				
Duin		2152		80		33-534		1.51	10.49		•		
		2207		90		33-4/2		1.42	10.58				
		2212		100		33-34		1.32	10.68				
		2222		110									
		2:32		120									
15		3247		135									
		1302		150									
•		7317		165									

TABLE F-2
DATA FOR SHAFER'S METHOD

					•
Time Since Pumping Started (min)	Drawdown (feet) (s)	Feet of Casing Filled (ft)	Time To Fill (min)	Q (gpm)	S/Q (ft/gpm)
317	12.0	0	0	-	
319	10.63	1.37	2	.45	23.8
321	9.69	.94	2	.31	31.6
323	8.86	.83	2	.27	32.7
325	8.21	.65	2	.21	38.7
327	7.56	.65	2	.21	35.6
332	6.11	1.45	5	.19	32.3
337	5.17	. 94	5	.13	42.1
342	4.38	.79	5	.10	42.5
347	3.75	.63	5	.08	45.6
352	3.27	.48	5	.06	52.2
357	2.86	_41	5	.05	53.4
362	2, 52	.34	5	.04	56.8
367	2,27	.25	5	.03	69.5
372	2.07	_20	5	.026	79.3
377	1.92	.15	5	.019	98.0
387	1.66	.26	10	.017	97.8
·397	1.51	.15	10	.009	154
407	1.42	.15	10	.009	145
417	1.32	.10	10	.006	202

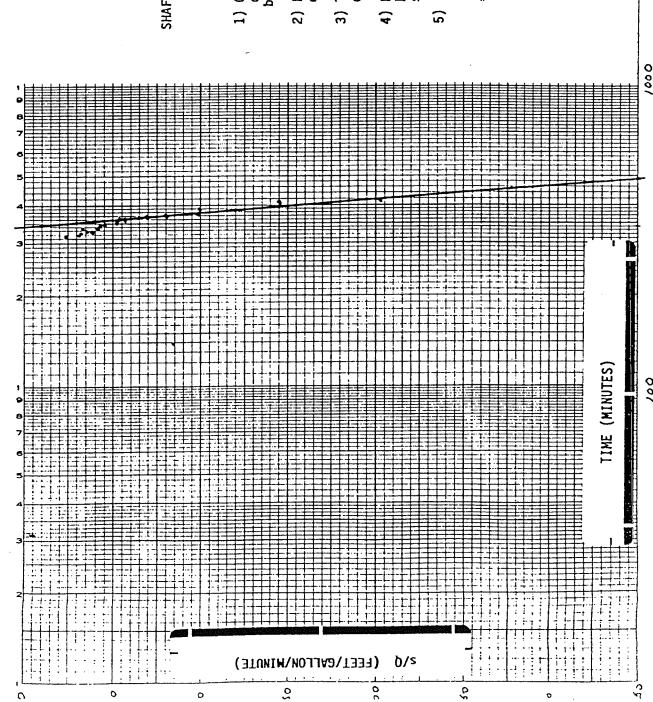


FIGURE F-1 SHAFER PLOT OF DATA FROM OW-24

Calculation of T & K

- Over the total vertical scale of 350 feet/GPM, time varies by 0.1567 log cycles
- 2) For 1 full log cycle, s/Q equals 350/.1567 = 2233
- 3) T = 264/(s/Q) = 264/2233 or T = 0.110 gallons/day/foot
- 4) For a 20 foot screened interval
 K = T/b = 0.0055 gallons/day/
 square foot.
 5) .0055 g/d/ft x 1.55 x 10⁻⁶
 (ft/sec)/(g/d/ft)
- $= 8.3 \times 10^{-9} \text{ ft/sec}$

80. /G OW-24 LABORATORY TEST DATA PENETRATION RATE ATTERSERS LIMITS SURFACE ELEVATION: 6676 FEET STRENCTH TEST DATA ZAMBOTZ TESTS REPORTED TO THE PROPERTY OF THE PROPERTY ROIMAL DR CORFINING PRESSURE (PSF) DAT DERSITT BEFTH IN TELL LIGUID LIMIT [X]
PLASTICITT | PROCE [X] 1176 OF DESCRIPTION 2.4 . TRIASSIC PERIOD CHINEE FORMATION
REDDISH BROWN, YERY FINE SANDY CLAY, SOFT, MICHLY
WEATHERED 2.0 10 2.0 1.6 28 2.0 1.8 2.3 18 SHALE 30 FEET: SHALE, REDOTSH BROWN, SAKOY, SOFT, FRESH 2.3 <u>3.3</u> 49 3.3 4.0 3.7 <u>∓.</u>0 58 3.0 2.3 .. BORING COMPLETED AT 65.0 FEET ON 1/2/81.
4-INCH MYC PIEZONETER INSTALLED WITH PERFORATIONS FROM 41.0 TO 61.0 FEET.
GRAVEL PLACED FROM 28.0 TO 61.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE, CROUND NATER LEYEL MEASURED AT 32.5 FEET BELON GROUND ON 1/5/81. 78 GROUND ON 1/5/81. 11 38 100 118 FIGURE 'F-2 LOG OF WELL ON-24 126 130 140 158

LOG OF BORINGS

-Portfolio #12: Pumping Test Analyses & Devices for Groundwater Monitoring

Pumping Test Analyses for Low Yield Formations

by David C. Shafer

ccasionally it is necessary to . determine aquifer characteristics of very low yielding formations-those with transmissivities less than 500 gallons per day per foot. Though interest in these aquifers is certainly not because of their productive capability, it may be desirable to determine groundwater flow characteristics even in these low yield formations in order to determine such things as regional groundwater flow patterns, effect of dewatering or migration of pollution plumes near point sources of contamination.

Different Approach

Conventional pumping test analysis using the standard time drawdown graph often does not work effectively in low T (transmissivity) formations for two reasons. First, the pumped well's low specific capacity (gallons per minute per foot of drawdown) may cause the pump to break suction during the test and it may be impractical to throttle back the pumping rate sufficiently to prevent this. Second, even if a constant pumping rate can be maintained without breaking suction, most of the data obtained. will probably reflect casing storage effects rather than true aquifer parameters (see "Casing Storage Can Affect Pumping Test Data,"



William F. Achuff Director

Jan-Feb. 1978, Johnson Drillers Journal). Thus a different approach is required.

The best method for analyzing these formations is to pump a substantial portion of the casing empty, then shut the pump off and measure water levels as they recover. In ordinary pumping tests these measurements correspond to the non-pumping portion of the test. However, in the low T formations this "recovery period" is actually the "pumping period!"

After pump shut-off, the casing slowly begins filling with water. This water comes from the aquifer and actually represents the water pumped during this so called "pumping period." The pumping rate is determined by measuring the volume of

Pumping rate = 10 gpm
Pumping period = 15 minutes
Drawdown at pump shut off = 90 ft
Casing — 6" I.D.
Drop pipe — 11/4" I.D.

Time in minutes since pumping started (t)	Drawdown in feet (s)	Number of feet of casing filled	Time in minutes required to fill	Volume filled divided by time required in gallons per minute (Q)	s/Q in feet per gallon per minute
15	90				•
(pump shut off)					
17	85.66	4.34	2	3.04	28.2
20	79.7	5.96	3	2.78	28.6
30	64.2	15.5	10	2.17	29.5
40	51.9	12.3	10	1.72	30.2
60	35.6	13.3	20	1.14	31.1
80	24.6	11.0	20	.77	31.8

Table 1



casing filled in a given length of time.

During the test, careful measurements are made of time since pumpling began (t) along with drawdown (s) at each of these times. Then a calculation is made to determine Q for each time t and finally the ratio s/Q is computed for each measured drawdown value. The ratio is simply the reciprocal of the specific capacity.

A graph is then constructed showing t versus the ratio s/Q plotted as usual on semi-logarithmic graph paper with t on the log scale. A straight line of best fit is drawn through the data points and T is calculated as follows:

$$T = \frac{264}{\triangle(s/Q)}$$

where △(s/Q) is the change in s/Q

over one log cycle of graph paper.

This graph has the unique advantage that it will accurately reflect aquifer transmissivity independent of casing storage effects. In addition it will be sensitive to nearby recharge and/or negative boundaries and will reveal these conditions like any ordinary time drawdown graph.

To see how this technique works it is best to work an example. Table 1 shows data obtained from a 6-inch well pumped at 10 gpm for 15 minutes. Drawdown after 15 minutes of pumping measured 90 feet.

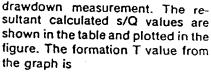
The next data point was recorded two minutes following pump shutoff or 17 minutes since pumping started. At this time the pumping water level was 85.66 feet, indicating that 4.34 feet of casing had filled during the two minute interval.

The annulus between the 6-inch casing and 1½" drop pipe holds 1.4 gallons per foot so that the volume of casing filled is 1.4 times 4.34, or 6.08 gallons in two minutes. Thus,

finally,

which is plotted at a time of 17 minutes on the graph shown here.

This analysis is repeated for each



$$T = \frac{264}{\Delta(s/Q)}$$

= 264/5.3

= 49 gpd/m

Conventional Analysis

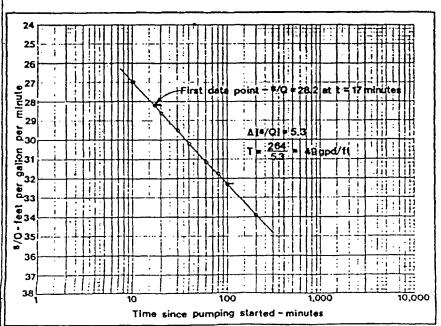
Examination rotation of the Hydraulic characteristics of this well indt included Merel cohows what it a cohwentional time drawdown graph had oeen sused weasing actorage effects would travelasted for approximately twelveshours. This means that data recorded in the first twelve hours of pumping would have been useless and longer pumping than this would have been required to obtain any usable data at all. However, data collected after twelve hours of pumping probably would be more influenced by boundary conditions than by aquifer transmissivity. Thus: min-practice of weether with the weether the weether with the weether the weether weether the weether weether weether the weether weether weether weether weether weether weether weether weether weether weether weether we been impossibilitio idetermine the T value susings conventional fanalysis techniques and essentities in oth of the test. The value of the method described above becomes very clear, it may be the only way to determine T values in certain low yielding aquifers.

In order to maximize the accuracy of this method, it is best to unload (empty) the casing as rapidly as possible. Thus it is actually better to use a high capacity pump than a low capacity pump in analyzing extremely low-yielding wells!

Another good idea is to unload the casing with compressed air since this can typically be done in one minute or less.

Recorded Data Must Be Accurate

An additional important consideration is that all data recorded for this type of analysis must be absolutely accurate. Small errors in the recorded values of time and/or drawdown can result in large errors in the calculated values of s/Q. For best results, drawdown should be recorded to the nearest hundredth of a toot and timed to the nearest second or two.

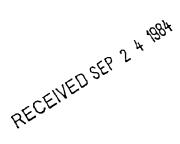


In low transmissivity situations, readings are taken after pump shut-off. In this method, s/Q is the reciprocal of the specific capacity and t is time, measured after shut-off as water begins to enter the casing.

JOHN W. SHOMAKER consulting geologist 3236 candelaria, n.e. albuquerque, new mexico 87107

(505) 884-2897

September 20, 1984



Carl D. Shook, Plant Manager Giant Refining Company, Ciniza Refinery Route 3, Box 7 Gallup, New Mexico 87301

Re: results of permeability tests, July 2 and 3, 1984

Dear Carl:

Copies of the field notes, calculations, and data plots for the two permeability tests are attached. The tests are summarized as follows:

Well OW-4 The well is completed principally in the clay and shale sequence which overlies the uppermost aquifer; a small thickness of sandstone which may be part of the uppermost aquifer was also penetrated. Total depth when drilled was 102.0 ft. Perforations are from 62.0 ft to 102 ft. The well is located near the center of the land-treatment area. A slug test was performed on July 3, 1984, following the method described by S. W. Lohman (1972, Ground-Water Hydraulics, U. S. Geol. Survey Prof. Paper 708, p. 27-29), which indicates the permeability of the section open to the well to be about 4 X 10 cm/sec.

Well MW-l This well is one of the monitoring wells on the boundary of the land-treatment area, and is completed in the uppermost aquifer. It was drilled to 120 ft, and is screened in the interval 87 to 120 ft; the casing is sealed above 89 ft so as to isolate the uppermost aquifer. The slug test performed on July 3, 1984 indicated a permeability of about 1.2 X 10^{-4} cm/sec.

Information as to the construction of the wells is taken from Dames and Moore (March, 1981; Ground water and soils investigation, Ciniza Refinery near Gallup, New Mexico, and November, 1981, Ground-water monitoring plan, Ciniza Refinery near Gallup, New Mexico).

Please let me know if there are questions.

Sincerely,

John W. Shomaker Consulting Geologist

. /man Androva Dalta W Engineering .../one

casing sire: nominal 41/2" TO 4.0 csg. mail. PVC water levels measured from top 1/2 00 PVE casing, 5 side which is 1.7 ± above ground level.

$$00, fi \left(\frac{0.27 \times 1}{0.30} \times 1)^{2} \times 11. \times length, fi = \frac{0.10}{0.04} = \frac{0.006}{0.003} fi$$

$$0.243 = \frac{0.243}{0.27} = \frac{0.26}{0.243} = \frac{0.015}{0.015} = \frac{0.005}{0.015}$$

$$0.18 = \frac{0.006}{0.007} fi$$

$$0.18 = \frac{0.006}{0.007} fi$$

$$0.10 = \frac{0.006}{0.003} fi$$

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$$0.001 = \frac{0.006}{0.005} fi$$

Jum 0.489 = V, ft 3 = 3.66 gol.

 r_c = internal radius of casing above perfs. 0.165 fi r_s : radius of screen or open hale: _____ fi initial water level $\frac{26.15}{4}$ fbelow mp, time 07:51 r_s :

 $H_0 = \frac{V}{\pi R^2} = \frac{0.489}{\pi (0.165)^2} = \frac{5.72}{1} f$

08:20:54	0				top slug: 23.2' M
21:25 !	31 5	20.75	5.40	0.944	
22:28	94	20.76	5.39	0.942	
27:14	140	20.80	5.35	0.935	
33:51	177	2081	5.34	0.934	
24:42	228	20.83	5,32	0.930	
25:42	288	20.87	5.28	0,923	
27:06	372	20.90	5.25	0.918	
28:14	440	20.92	5.23	0,914	
29:43	529	20.95	5.20	0.909	
30:55	601	20.97	5.18	0.906	
32:46	7/2	21.00	5.15	0.900	
35:16	862	21.04	5.11	0.893	
38:38	1064	21.10	5.05	.0.883	
43:30	1356	21.9	4.96	0.867	
46:52	1558	21.21	4.94	0.864	raised slug 0,4ft.
49:26	_1712-	21.25	4.90	0.857	
52:54	1920	21.30	4.85	0.848	

to=08:20:54 H H/Ho remarks l, 50c. kvel -08:54:13-21.34 4.80 0.839 2096 21.35 08:56:50 4.76 09:00:16 2362 21.39 0.832 0:00= 21.45 4.70 :05:00 0,822 2646 09:55 2941 21.50 4.65 0.8.13 17:46 3412 4.55 21.60 0.795 4.44 m-scope trouble 28:25 4051 21.71 0.776 21.89 · 4.26 0.745 46:00 5106 22.05 4,10 10:02:23 0,717 6089 14:00 6786 4.00 0.699 22.15 0.682 stopped test; 10: 24:20 7412 22.25 3.90 Jlug almost uncovered d = 10-1 curve, Tt/2=1 at t= 50,000 sec. late dota matches: 5.4x 10-7 fx T= 1.0 2 = (1.0)(0.165)2 50,000 fi /day = 0.35 gpd/ff K, 0.05 ft /day h 40 ft screen 0.00 1 ft/day x 30.5 cm/ft x 1 = 60 x 140 scr/day 4 x10-7 cm/sec 10-1 = 0.03 : water-table storage 0.080 644 "hole !

09876 48.E-1 OBP PER 0700/ Ð, 5 THE THE SEARCH CARER OF CONTRIBIONS PER INCH 9 8 7 HR. RABILAIB RIBYBBEN I 5 001 2

dole: 7-2-84

casing size: nominal 5/2" 00, ID 5.1" csg. matl. PVC
water levels measured from top PVC casing, sw side
which is 137 ft above ground level, (concrete slab)
volume of slug:

cap OD,
$$f_{1} = \frac{0.37}{0.37} \times \frac{1}{2} \times 17 \times length$$
, $f_{1} = \frac{0.10}{0.05} = \frac{0.011}{0.006} \cdot \frac{1.37}{0.006} = \frac{0.011}{0.006} \cdot \frac{1.37}{0.006} = \frac{0.011}{0.006} \cdot \frac{1.37}{0.006} = \frac{0.011}{0.006} \cdot \frac{1.37}{0.007} = \frac{0.03}{0.007} = \frac{0.001}{0.006} = \frac{0.011}{0.006} \cdot \frac{1.37}{0.007} = \frac{0.03}{0.007} = \frac{0.001}$

Jun 0.474 = V, ft3 = 3.55 gal

re = internal radius of cosing above perfs. 0.711 fi rs : radius of screen or open hole: _____ fi

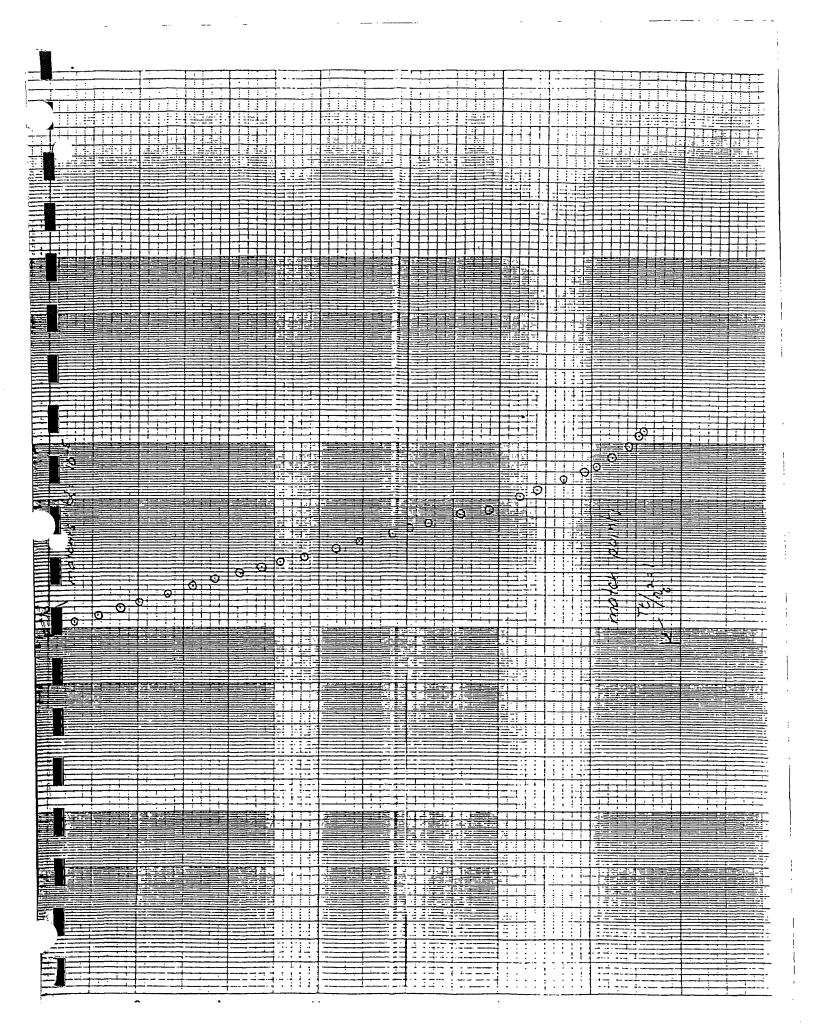
initial water level 5.72 A below MP, time 13:32

$$H_0 = \frac{V}{\pi \chi^2} = \frac{0.474}{\pi (0.211)^2} = \frac{3.389}{\pi (0.211)^2}$$

હ	ζ	/ .			
clock time	t, soc.	water	_ <u>H_</u>	H/Ho	remarks Slug released
13:48:00					Slug released
13:48:20	. 20	2.30 ft	? 3.42	1.009	22
49:00	60	2.36	3.36	0.991	
49:26	86	2.42	3.30	0.974	
49:52	112	2.44	3.28	0.968	
50:32	152	2.50	3,22	0.950	
51:05	185	2.56	3.16	0.932	
51:42	222	2.60	3.12	0.921	
52:19	259	2.65	3.07	0.906	
52:55	295	2.70_	3.02	0.891	
<u> </u>	3.33	2.74	2.98	0.879	
54:26	386	2.80	2.92	0.862	
55;30	450	2.86	2.86	0.844	
57:05	545	2.97	2.75	0.811	
59:12	672	3.10	2.62	0,773	
14:01:05	785	3.20	2.52	0.744	
02:28	868	_ 3,28	2,44	0.720	
<u></u>	952	3.3%	2.36	0.696	
		· .			
	1	ł	1		

clack time	<u>l,50c.</u>	level	<u>. н</u>	H/H0	remarks
14:05:38	1058	3.45	1 227	0 (3=	
		3.54	2.27	0.670	
07:22	1162	3.62	1	0.643	
09:16	12710		2.10	0.620	
11:01	1381	3.69		0.599	
13:17	1517	3.79	1.93	0.569	
15:59	1679	3,89	1.83	0.540	
18:14	1814	3.97	1.75	0.516	
20:40	1960	4,07	1.65	0.487	
23:15	2115	4.15	1.57	0.463	
25:44	2264	4.22	1,50	0.443	
28:45	2445	4.31	1.41	0.416	
33:09	2709	4.43	1.29	0.381	
36:51	2931	4.52	1.20	0,354	
41:56	3236	4.64	1.08	0.319	
16:19	3499	4.71	1,01	0.298	
50:03	3723	4.78	0.94	0.277	
57:39	4179	4.90	0.82.	0.242	
15:05:36	4356	5.01	0.71	0.210	
14.12	5172	5.12	0.60	0.177	
21:12	5592	5.18	0.54	0.159	
33:01	6301	5,28	0.44	0.130	
44:35	6995	5.20	0,36	0.10%	
<u> </u>	7543	5.40	0.32	0.094	
16:08:22	8422	5.46	0.70	0.077	
26:59	9539	<u>5.52</u>	0,20	0.059	
47:10	10,750.	5.5%	0.16	0.047	
17:00:20	11,540	5.58	0.14	0.041	•
····				<u> </u>	
late dota ma	itches:	7 = 10-5 CI	rre, It	/22=1 at	t=830 sec.
	T- 1.0 2	= (1.0)(0.21)	2 <21	× 10-5 12-1	-0.1
	7	830	= 3.30	10 TF /	sec ·
	<u> </u>	920	- 1/19	(2) / - / - / - / - / - / - / - / -	35 apd/f
			= 4.65	It JOAY -	0 2 2 pd / 17
			V. 410	3 676	= 0.35 ft/day
			h 133	3 fillday A screened	- 0.53 / T/ day
			/4, 5	IT SCIECTE	
		0 35 11	30.0	0.0/14	-/.2×/0
		Tr/cu	7 X	10 × 60×	=1.2×10 cm
					7004
,				-	
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5 9 8 7 1-2-6-1 DIETZGEN CORPORATION 70007 £,5æ. 3 NO. 340-LSIO DIETZGEN GRAPH PAPER SEMI-LOGARITHMIC S GYCLES X IO DIVISIONS PER INCH 000/8 6 a I 8 , 6 r:::



APPENDIX C RCRA POST-CLOSURE CARE PERMIT APPLICATION LAND TREATMENT UNIT GIANT REFINING COMPANY CINIZA REFINERY

May 2000

RCRA Part A and Part B

Post-Closure Deimit Application

Land Treatment Unit

May 2000

APPENDIX C

Land Treatment Unit Historical Information and Data

LAND TREATMENT UNIT HISTORICAL INFORMATION AND DATA

1.0 LAND TREATMENT HISTORY

Historical LTU information and data extracted from existing permit applications, operating permits, operating records, and other source documents are provided as Appendix C. The inclusion of this appendix does not imply that historical information and data have been verified.

In August 1980, Ciniza Refinery (Ciniza) notified the U.S. Environmental Protection Agency (EPA) that it was a generator and operator of a hazardous waste management facility. In November 1980, Ciniza submitted a Part A permit application as an "existing facility" (defined at 40 Code of Federal Regulations §260.10). This granted Ciniza interim status for their Land Treatment Unit (LTU) operations. In response to notice from the Regional Administrator, Ciniza submitted a Part B permit application in December 1983. Based on changing guidance, Ciniza submitted a land treatment demonstration plan (LTD) and an application for a two-phase LTD permit in April 1985. On February 9, 1987, Ciniza was issued a Short-term LTD Permit (NMD000333211-1) to conduct a hazardous waste land LTD. The LTD was conducted to identify the land treatment capabilities for refinery waste generated by Ciniza. The LTD defined waste management parameters (e.g., rate-limiting constituent, application-limiting constituent, capacity-limiting constituent, and unit life of the LTU). This was accomplished by identifying the Principal Hazardous Constituents (PHCs) present in refinery waste streams and measuring their degradation, transformation, and immobilization in the treatment zone of the LTU. From the results of the LTD and a modified Part B permit application, Ciniza was issued a Hazardous Waste Facility Permit (NMD 000333211-2) on November 4, 1988. Ciniza has not applied hazardous wastes to the LTU since November 8, 1990.

1.1 Land Treatment Program [20 NMAC 4.1, Subpart IX, §270.20(b)]

Ciniza's Hazardous Waste Facility Permit established operational requirements for the LTU. These requirements inchinclude procedural and engineering controls necessary to ensure that hazardous constituents are fully treated within the LTU without uncontrolled release to the environment.

The LTU consists of a treatment zone of soil extending 5 ft deep from the original soil surface. This depth is shallow enough to ensure that the treatment zone is more than 3 ft above the seasonal high water table. The zone of incorporation (ZOI) within the treatment zone is the volume of soil to which the waste was directly applied.

The ZOI for the Ciniza LTU is the top 12 in. of the treatment zone. The LTU was designed and constructed to prevent both washout of any hazardous waste and to prevent inundation of and discharge from the permitted unit through the use of a continuous dike which surrounds the LTU at an elevation of 3 ft above the natural grade.

The ZOI was tilled during permitted operations to encourage aerobic microbial activity and improve chemical reaction rates. During active treatment soil nutrients were applied, as necessary, to optimize carbon:nitrogen: phosphorous (C:N:P) ratios. Applications of Ciniza wastes to the LTU were limited to ensure that treatment processes were not overwhelmed or poisoned. Performance indicators (e.g., soil moisture, pH, total organic carbon) were monitored in the ZOI to ensure that treatment was proceeding.

1.2 Treatment Zone Description [20 NMAC 4.1, Subpart IX, §270.20(b)(2) and §270.20(b)(5)]

The LTU consists of three 480-by-240-ft sections, each of which contain 2.6 acres (1.0 hectares) of available treatment surface. Each section is delineated by a continuous dike to prevent site runon and runoff. The treatment zone extends 5-ft deep from the top of the soil within the diked section. The top 12 in. of the treatment zone is the ZOI. The ZOI is tilled when active to encourage aerobic degradation of organics and to maintain moisture content of the soil. This leaves 4 ft of the treatment zone undisturbed.

The soil within the treatment zone is silty clay containing closely-spaced root systems in the uppermost 3 to 4 ft. Field infiltration rates (the rate at which water penetrates into the soil surface) averages 1.0 x 10⁻³ cm/sec or 3.6 cm/hr. Soil permeability as determined by laboratory measurements averages 1.9 x 10⁻⁵ cm/sec or 6.8 x 10⁻² cm/hr for three locations at the 6- to 12-in. depth. Field infiltration rate allows prediction of runoff and erosion; permeability (hydraulic conductivity) allows estimation of vertical water movement rates in the soil. The treatment zone soils have a saturated hydraulic conductivity rating of "moderately low" by the U.S. Department of Agriculture Class (Giant Refining Company Part B Permit Application 1984). The low permeability of the treatment zone soil assists in retarding the vertical movement of hazardous constituents through the treatment zone.

The silty clay soil has a high cation exchange capacity (CEC). The CEC is the total amount of exchangeable cations that the soil has to exchange with cations in the soil solution. The exchangeable cations in the LTU are the heavy metals present in the Ciniza wastes. The high CEC results in high sorption of heavy metals in the LTU soils, assuming other factors (such as soil pH) are favorable.

2

RECENT SOIL PERMEABILITY TESTS FIREWATER POND CONSTRUCTION PROJECT

Precision Engineering, Inc. P.O. Box 422 Las Cruces, NM 88004

505-523-7674

People of Fire Wales

Rigid Wall Hydraulic Conductivity Falling Head

ATTN: James Romero
Giant Refining Company
Route 3, Box 7
Gallup, NM 87301

Project: Ciniza Fire Water Lagoon File No.: 05-100
Soil Type: Silty Clay Date: October 13, 2005 Lab No.: 47872
Sampled From: Boring 05-100-1(2.5'-3.0') Performed By: GG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 120.8 pcf Dry Unit Weight: 109.0 pcf

% Moisture: 10.8
% Compaction: n/a
% Compaction Requested: n/a

eroetorikeornation:

Maximum Dry Density: n/a pcf
Optimum Moisture Content: n/a %

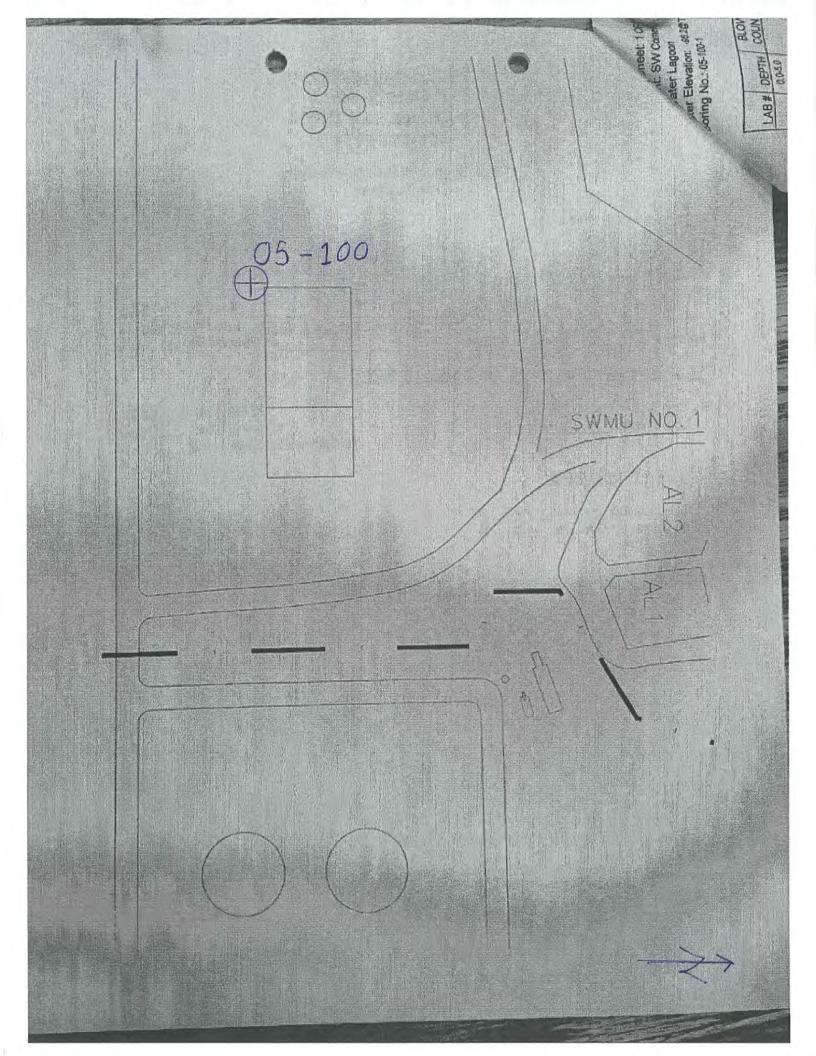
Coefficient of Permeability, k₂₀, 1.1 X 10⁻⁷ cm/sec. ava.

Remarks: Avg of three: 1.1x10", 1.1x10", 1.1x10"

C \text{\text{\text{bill}Permaability.xts}} Report Reviewed By:

Reviewed By:

Section St. Le



Corner of Proposed Lagoon Lagoon 1982 263 TD, 27(0)1 hr

P.O. Box 422 Las Cruces, NM 88004 605-523-7674

File #: 05-100 Site: Glant-Ciniza

Elevation: EXISTING Date: 9/24/2005

Log of Test Borings

LAB # DEPTH 0.0-5.0	BLOW COUNT PLOT SCALE	MATERIAL CHARACTERISTICS IMOISTURE CONDITION COLOR ETC.) %M LL PI CLASS Clay, Very Sirly, Sandy, Very Fine, Dark Red. Wet, Firm.
47872	2.5	[2.5-3.0 hydraulic conductivity sample]
5.0-10.0	<u>5.0</u> 7.6	Same As Above, Wet, Soft
10.0-15.0	10.0	Same As Above
15.0-16.0	15.0	Same As Above Sang, Very Fine, Very Clayey, Very Silty,
17.5-21.5		Weak Water Bearing, Moderately Denise, Dark Red/Brown Clay, Dark Red, Wet, Soft
SIZE & TYPE OF	20.0 BORING: 4 1/4* ID HOLLOW	V STEMMED AUGER LOGGED BY: WHK

C:\bill/Projects\2005\05100cinizafirewt\\Boring 1 xits\Sheet1

Sheet: 2 CF 5
Bore Point: SW Corner of Proposed
Fire Water Lagoon
Water Elevation:
Boring No.: 05-100-1

C UMProjects12005105100cinizafirewiri(Boring 1 xis)Sheet A

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-623-7674

Elevation Existing

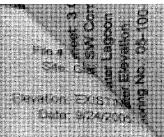
Date: 97247702

Log of Test Borings

LAB# DEPTH GOUN 21.5-22.1 22.1-23.5 23.3-25.1	T PLOT SCALE	MATERIAL CHARACTERISTICS (MOISTURE CONDITION COLOR, ETC.) Clay, Sandy, Dark Brown, Wes, Still Clay, Hard, Red-Brown (Brighter than Above). WesMoist Pertrifled Forest Formation Mudatone/Claystone, Westhered, Some Grey/Green Reduction Spots, Generally Rod/ Brown, Fissile to Crumbly, Damp/Moist Mudatone, As Above, Few Reduction Spots, Damp/Dry	%M LL PI CLASS
30.0-35.0	30.0	Same As Above dry	
35.040.0		Same As Above try	
40.0-45.0 41.5	,	Same As Above, Brighter Red @ 44 5145 0 by Illistone/mudslone, dry, very dense bright ed brown	

Sheet: 2 OF 5
Bore Point: SW Comer of Prepased
Fire Water Lagoon
Water Elevation:
Boring No.: 05-100-1

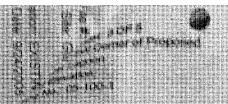
Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674



Log of Test Borings

LAB # DEPTH COUNT 21,5-22-1 22,1-23.5	PLOT SCALE (MOIST	TERIAL CHARACTERISTICS URE, CONDITION, COLOR E dy, Dark Brown, West, Stiff d, Red/Brown (Brighter than Abo	ijes Tawi Lie	PI CLASS
23.5-25.1 25.0-30.0	Mudstone Grey/Gree 25.0 Brown File	Pertrifled Forest Formation ICLAYSTONE, Weathered, Some IN Reduction Spots, Generally R Islanto Coumbly, Damp/Most I As Above, Few Reduction Spo	led.	
30.0-35.0	30.0 Same As	Above dry		
35 0 40 0	35.0			
330400	Same Ag / dry	ADOVE		
40.0-45.0	40.0 Same As A	<u>Nove</u> . Brighter Red @ 44.5-45	(ö;	
41.5 SIZE & TYPE OF BORING: 4		udsfone, dry, very dense bright DAUGER	LOGGED	BY WHK

ChilitProjects/2005/05/100cinizafirevah/Boring 1 xis|Sheet1A



Precision Englowering, in P.O. Box 422
Las Gruces, NM 88004
506-523-7674

File #: 05-100 Stel: Glamt-Ciniza

Ekwation: EXISTING Date: 9/24/2005

Louis Tout Biologia

1.411.0	a)Certa	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE CONOMION, COLOR ETC.)	"W	н ы	CLASS.
	45.0-50.0			45.0	Mudstone/Siltstone, Bright Red/Brown, Dry Very Dense			
	50 0 55 g			sou	Same Av Above			
	55.0-60.0		•	55.0	Same As Above			
	60.0-65.0			10.0	Same As Above			
SIZE C:UINV	& TYPE OF	BORING: 4 05100anizatir	1 1/4" 10-1 #wit\@set	HOLLOW ng 1 siak	STEMMED AUGER	LOX	SEP BY	: WHK

Sheet: 4 OF 5 Bore Point: SW Comer of Pri

dieta Stalater Liagostoff Water Elevation: Boring No.: 05-100-1 Precision Engireering 3 P.G. Bar 422 LNS Cruces, NM 88004 £0\$ 523-78**7**4

og of Test Borings

Canada (Artes de 1 - a .	7.04 W. 1.	
	MATERIAL CHARACTERISTICS	
PECW BLOW	MATERIAL GRANDITION, COLOR ETC.) 94M LL PI	CLASS!
LAR & DEATH COUNT PLOT SCALE		
	Same As Abovit	
10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
	Sandetone, Fine, Red Street, Hard, Fisalin	
7.7.7.7.7.7.7.7.	Grey/Green Orbicular Reduction Spots	
	Grey/Green Octocous / Construction	
	Abundant Dry	
67.4-78.0	process of providing a process of the providing the contract of the contract o	
	Mudatone, Dark Red/Brown, Hard, Dry	
100		
75.0		
	Mudstone, Fissile, Dry, Red/Brown, Some	
78.0-79.1	Grey/Green Reduction Spots	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Sandstone, Fine, Red/Brown, Fissile, Hard	
600	Feldspathic, Bedded 6" to 1.0", White Mottled	
	Upper Sonsela Member	
85.0		4.
	WASTERWISE AUGER LOGGED	D'I WHE
SIZE & TYPE OF BORING: 4 1/4" ID HOLLD	XW STEMMED AUGER LUGGED	

Precisien Engineerin: File # 05-100 , <u>1 1 j. j. j. j. j. j.</u> P.O. Box 422 Sile: Giard Cinica Las Cruces, NM 82004 595-523-7674 Eevallen: EX ST NS Date: 9/24/2005 Log of Test Borings BLOW MATERIAL CHARACTERISTICS COUNT PLOT | SCALE! WM LL PI CLASS (MOISTURE, CONDITION, COLOR, ETC.) Uppet Sonsela Member Continued (dry) 90.0 96.0 Mudstone, Hard, Dry, Green/Grey-White 57.7.952 Sandstone, Fine to Medium, Quartz Grains, 98 2-101 C Water Bearing, Hard, (Sonsela Member, Petrified Forest Formation, Chinle Group) 1000 1016 Borng continuopusly sampled using 5' splitbareled intrusion sampler. Buring closed using 10' of 3/8" TR-30 Pet Plug capped with 50' of 8% bentonite cement slorry 105.0 and backfilled to the ground surface with cultures. SIZE & TYPE OF BORING. 4 1/4" ID HOLLOW STEMMED AUGER Locced by: Whk C:\billProjects\2005\05100cmzafirewtr\[Roring 1 xls\]Sheet1D

Appendix H Analytical Data Reports

Included on CD



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

October 28, 2016

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

FAX

RE: OW-14 SOURCE INV OrderNo.: 1609E26

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 13 sample(s) on 9/23/2016 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman

Laboratory Manager

Andel

4901 Hawkins NE

Albuquerque, NM 87109

Date Reported: 10/28/2016

CLIENT: Western Refining Company

Client Sample ID: OW-57 (16-18')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 2:00:00 PM

 Lab ID:
 1609E26-001
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS	3					Analyst: JME	
Diesel Range Organics (DRO)	ND	1.7	9.4		mg/Kg	1	9/29/2016 4:04:16 AM	27746
Motor Oil Range Organics (MRO)	ND	47	47		mg/Kg	1	9/29/2016 4:04:16 AM	27746
Surr: DNOP	100	0	70-130		%Rec	1	9/29/2016 4:04:16 AM	27746
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0055	0.00056	0.033	J	mg/Kg	1	9/27/2016 11:27:46 AM	27712
EPA METHOD 6010B: SOIL METALS							Analyst: ELS	
Antimony	ND	0.98	2.4		mg/Kg	1	10/1/2016 6:10:07 PM	27710
Arsenic	1.8	0.87	2.4	J	mg/Kg	1	10/1/2016 6:10:07 PM	27710
Barium	180	0.069	0.097	ŭ	mg/Kg	1	10/1/2016 6:10:07 PM	27710
Beryllium	0.52	0.034	0.15		mg/Kg	1	10/1/2016 6:10:07 PM	27710
Cadmium	ND	0.062	0.097		mg/Kg	1	10/1/2016 6:10:07 PM	27710
Chromium	8.8	0.092	0.29		mg/Kg	1	10/1/2016 6:10:07 PM	27710
Cobalt	4.0	0.11	0.29		mg/Kg	1	10/1/2016 6:10:07 PM	27710
Iron	12000	73	240		mg/Kg	100	10/1/2016 2:56:41 PM	27710
Lead	2.8	0.17	0.24		mg/Kg	1	10/1/2016 6:10:07 PM	27710
Manganese	510	1.0	1.9		mg/Kg	20	10/1/2016 6:13:58 PM	27710
Nickel	6.3	0.15	0.49		mg/Kg	1	10/1/2016 6:10:07 PM	27710
Selenium	ND	1.8	2.4		mg/Kg	1	10/1/2016 6:10:07 PM	27710
Silver	ND	0.061	0.24		mg/Kg	1	10/1/2016 6:10:07 PM	27710
Vanadium	17	0.17	2.4		mg/Kg	1	10/1/2016 6:10:07 PM	27710
Zinc	15	0.34	2.4		mg/Kg	1	10/1/2016 6:10:07 PM	27710
EPA METHOD 8270C: SEMIVOLATILES					99		Analyst: DAM	
Acenaphthene	ND	0.086	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Acenaphthylene	ND	0.082	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Aniline	ND	0.002	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Anthracene	ND	0.093	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Azobenzene	ND	0.007	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Benzo(a)pyrene	ND	0.000	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Benzo(b)fluoranthene	ND	0.070	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Benzo(g,h,i)perylene	ND	0.091	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Benzoic acid	ND	0.083	0.50		mg/Kg	1	9/30/2016 12:29:55 PM	
Benzyl alcohol	ND	0.003	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Bis(2-chloroethoxy)methane	ND	0.079	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Bis(2-chloroethyl)ether	ND	0.11	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Bis(2-chloroisopropyl)ether	ND	0.074	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	
Bis(2-ethylhexyl)phthalate	0.13	0.090	0.20	J	mg/Kg	1	9/30/2016 12:29:55 PM	

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 1 of 104

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: OW-57 (16-18')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 2:00:00 PM

 Lab ID:
 1609E26-001
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.096	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Butyl benzyl phthalate	ND	0.089	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Carbazole	ND	0.068	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	9/30/2016 12:29:55 PM	27733
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2-Chloronaphthalene	ND	0.079	0.25		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2-Chlorophenol	ND	0.079	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Chrysene	ND	0.085	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Di-n-butyl phthalate	0.16	0.075	0.40	J	mg/Kg	1	9/30/2016 12:29:55 PM	27733
Di-n-octyl phthalate	ND	0.086	0.40		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
1,2-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
1,3-Dichlorobenzene	ND	0.078	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
1,4-Dichlorobenzene	ND	0.085	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
3,3'-Dichlorobenzidine	ND	0.074	0.25		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Diethyl phthalate	0.14	0.10	0.20	J	mg/Kg	1	9/30/2016 12:29:55 PM	27733
Dimethyl phthalate	ND	0.098	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2,4-Dichlorophenol	ND	0.094	0.40		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	9/30/2016 12:29:55 PM	27733
4,6-Dinitro-2-methylphenol	ND	0.061	0.40		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2,4-Dinitrophenol	ND	0.067	0.50		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2,4-Dinitrotoluene	ND	0.090	0.50		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Fluoranthene	ND	0.058	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Fluorene	ND	0.092	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Isophorone	ND	0.11	0.40		mg/Kg	1	9/30/2016 12:29:55 PM	27733
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2-Methylphenol	ND	0.084	0.40		mg/Kg	1	9/30/2016 12:29:55 PM	27733
3+4-Methylphenol	ND	0.073	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
N-Nitrosodiphenylamine	ND	0.098	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 2 of 104

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: OW-57 (16-18')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 2:00:00 PM

 Lab ID:
 1609E26-001
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	ND	0.096	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
4-Nitroaniline	ND	0.071	0.40		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2-Nitrophenol	ND	0.10	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Phenanthrene	ND	0.068	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Phenol	ND	0.076	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Pyrene	ND	0.076	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Pyridine	ND	0.080	0.40		mg/Kg	1	9/30/2016 12:29:55 PM	27733
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Surr: 2-Fluorophenol	64.1	0	35-97.9		%Rec	1	9/30/2016 12:29:55 PM	27733
Surr: Phenol-d5	67.7	0	37.3-105		%Rec	1	9/30/2016 12:29:55 PM	27733
Surr: 2,4,6-Tribromophenol	75.7	0	35.6-118		%Rec	1	9/30/2016 12:29:55 PM	27733
Surr: Nitrobenzene-d5	59.4		41.2-107		%Rec	1	9/30/2016 12:29:55 PM	27733
Surr: 2-Fluorobiphenyl	61.3		41.9-119		%Rec	1	9/30/2016 12:29:55 PM	27733
Surr: 4-Terphenyl-d14	55.1		15-132		%Rec	1	9/30/2016 12:29:55 PM	27733
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.076	0.013	0.016		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Toluene	ND	0.0019	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Ethylbenzene	ND	0.0026	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Methyl tert-butyl ether (MTBE)	ND	0.010	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,2,4-Trimethylbenzene	ND	0.0024	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,3,5-Trimethylbenzene	ND	0.0023	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,2-Dichloroethane (EDC)	ND	0.0083	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,2-Dibromoethane (EDB)	ND	0.0023	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Naphthalene	ND	0.0050	0.064		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1-Methylnaphthalene	ND	0.0071	0.13		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
2-Methylnaphthalene	ND	0.0068	0.13		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Acetone	ND	0.041	0.48		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Bromobenzene	ND	0.0026	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Bromodichloromethane	ND	0.0019	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Bromoform	ND	0.0039	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Bromomethane	0.016	0.012	0.096	J	mg/Kg	1	9/27/2016 3:01:21 PM	R37518
2-Butanone	ND	0.018	0.32		mg/Kg	1	9/27/2016 3:01:21 PM	R37518

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 3 of 104

Date Reported: 10/28/2016

CLIENT: Western Refining Company

Client Sample ID: OW-57 (16-18')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 2:00:00 PM

 Lab ID:
 1609E26-001
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.011	0.32		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Carbon tetrachloride	ND	0.0021	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Chlorobenzene	ND	0.0026	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Chloroethane	ND	0.0064	0.064		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Chloroform	ND	0.0024	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Chloromethane	ND	0.0028	0.096		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
2-Chlorotoluene	ND	0.0024	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
4-Chlorotoluene	ND	0.0028	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
cis-1,2-DCE	ND	0.0019	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
cis-1,3-Dichloropropene	ND	0.0029	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,2-Dibromo-3-chloropropane	ND	0.0098	0.064		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Dibromochloromethane	ND	0.0029	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Dibromomethane	ND	0.0028	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,2-Dichlorobenzene	ND	0.0028	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,3-Dichlorobenzene	ND	0.0026	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,4-Dichlorobenzene	ND	0.0040	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Dichlorodifluoromethane	ND	0.0099	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,1-Dichloroethane	ND	0.0017	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,1-Dichloroethene	ND	0.010	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,2-Dichloropropane	ND	0.0027	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,3-Dichloropropane	ND	0.0036	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
2,2-Dichloropropane	ND	0.0018	0.064		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,1-Dichloropropene	ND	0.0025	0.064		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Hexachlorobutadiene	ND	0.0039	0.064		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
2-Hexanone	ND	0.017	0.32		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Isopropylbenzene	ND	0.0027	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
4-Isopropyltoluene	ND	0.0029	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
4-Methyl-2-pentanone	ND	0.0093	0.32		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Methylene chloride	ND	0.0092	0.096		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
n-Butylbenzene	ND	0.0028	0.096		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
n-Propylbenzene	ND	0.0025	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
sec-Butylbenzene	ND	0.0044	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Styrene	ND	0.0029	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
tert-Butylbenzene	ND	0.0026	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,1,1,2-Tetrachloroethane	ND	0.0031	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,1,2,2-Tetrachloroethane	ND	0.0052	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Tetrachloroethene (PCE)	ND	0.0027	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
trans-1,2-DCE	ND	0.0089	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
trans-1,3-Dichloropropene	ND	0.0047	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Analytical Report Lab Order 1609E26

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company

Client Sample ID: OW-57 (16-18')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 2:00:00 PM

 Lab ID:
 1609E26-001
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.0048	0.064		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,2,4-Trichlorobenzene	ND	0.0034	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,1,1-Trichloroethane	ND	0.0020	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,1,2-Trichloroethane	ND	0.0038	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Trichloroethene (TCE)	ND	0.0034	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Trichlorofluoromethane	ND	0.0024	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
1,2,3-Trichloropropane	ND	0.0055	0.064		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Vinyl chloride	ND	0.0026	0.032		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Xylenes, Total	ND	0.0061	0.064		mg/Kg	1	9/27/2016 3:01:21 PM	R37518
Surr: Dibromofluoromethane	114		70-130		%Rec	1	9/27/2016 3:01:21 PM	R37518
Surr: 1,2-Dichloroethane-d4	112		70-130		%Rec	1	9/27/2016 3:01:21 PM	R37518
Surr: Toluene-d8	96.1		70-130		%Rec	1	9/27/2016 3:01:21 PM	R37518
Surr: 4-Bromofluorobenzene	89.0		70-130		%Rec	1	9/27/2016 3:01:21 PM	R37518
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF	
Gasoline Range Organics (GRO)	ND	0.48	3.2		mg/Kg	1	9/27/2016 3:01:21 PM	G37518
Surr: BFB	89.0	0	70-130		%Rec	1	9/27/2016 3:01:21 PM	G37518

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

Qualifiers:

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

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: OW-57 (25-27')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 2:15:00 PM

 Lab ID:
 1609E26-002
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Diesel Range Organics (DRO) 5.9 1.8 9.6 J mg/Kg 1 9/29/2016 4:26:04 AM 27746	Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
Motor Oil Range Organics (MRO)	EPA METHOD 8015M/D: DIESEL RAN	GE ORGANIC	S					Analyst: JME	
Motor Oil Range Organics (MRO)	Diesel Range Organics (DRO)	5.9	1.8	9.6	J	mg/Kg	1	9/29/2016 4:26:04 AM	27746
Marcury		ND	48	48			1	9/29/2016 4:26:04 AM	27746
Mercury No.026	Surr: DNOP	99.9	0	70-130			1	9/29/2016 4:26:04 AM	27746
Antimony	EPA METHOD 7471: MERCURY							Analyst: pmf	
Antimony ND 0.99 2.4 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Arsenic 2.8 0.87 2.4 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Barium 1200 1.4 2.0 mg/Kg 20 10/1/2016 6:15:41 PM 27710 Beryllium 0.83 0.034 0.15 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Cadmium ND 0.662 0.998 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Chromium 9.4 0.092 0.29 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Chromium 9.4 0.092 0.29 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Cobalt 3.4 0.11 0.29 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Iron 1500 74 240 mg/Kg 10 10/1/2016 6:15:41 PM 27710 Manganese 1700 1.0 2.0 mg/Kg 10 10/1/2016 6:15:41 PM 27710 Manganese 1700 1.0 2.0 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Nickel 7.9 0.15 0.49 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Selenium ND 1.8 2.4 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Selenium 20 0.061 0.24 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Vanadium 23 0.17 2.4 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Zinc 9.6 0.34 2.4 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Zinc 9.6 0.35:41 PM 27733 Acenaphthylene ND 0.085 0.20 mg/Kg 1 9/30/2016 1:53	Mercury	0.0026	0.00057	0.033	J	mg/Kg	1	9/27/2016 11:29:36 AM	27712
Arsenic 2.8 0.87 2.4 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Barium 1200 1.4 2.0 mg/Kg 20 10/1/2016 6:26:50 PM 27710 Beryllium 0.83 0.034 0.15 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Cadmium ND 0.062 0.098 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Chromium 9.4 0.092 0.29 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Cobalt 3.4 0.11 0.29 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Iron 15000 74 240 mg/Kg 10 10/1/2016 6:15:41 PM 27710 Lead 2.8 0.17 0.24 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Manganese 1700 1.0 2.0 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Nickel 7.9 0.15 0.49 mg/Kg 1 <td>EPA METHOD 6010B: SOIL METALS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Analyst: ELS</td> <td></td>	EPA METHOD 6010B: SOIL METALS							Analyst: ELS	
Arsenic 2.8 0.87 2.4 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Barium 1200 1.4 2.0 mg/Kg 20 10/1/2016 6:26:50 PM 27710 Beryllium 0.83 0.034 0.15 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Cadmium ND 0.062 0.098 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Chromium 9.4 0.092 0.29 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Cobalt 3.4 0.11 0.29 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Iron 15000 74 240 mg/Kg 10 10/1/2016 6:15:41 PM 27710 Lead 2.8 0.17 0.24 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Manganese 1700 1.0 2.0 mg/Kg 1 10/1/2016 6:15:41 PM 27710 Nickel 7.9 0.15 0.49 mg/Kg 1 <td>Antimony</td> <td>ND</td> <td>0.99</td> <td>2.4</td> <td></td> <td>ma/Ka</td> <td>1</td> <td>10/1/2016 6:15:41 PM</td> <td>27710</td>	Antimony	ND	0.99	2.4		ma/Ka	1	10/1/2016 6:15:41 PM	27710
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Acenaphthylene ND 0.080 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Aniline ND 0.093 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Anthracene ND 0.065 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Azobenzene ND 0.12 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benz(a)anthracene ND 0.085 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(a)pyrene ND 0.074 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(b)fluoranthene ND 0.089 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(g,h,i)perylene ND 0.087 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733			0.084	0.20		ma/Ka	1	-	27733
Aniline ND 0.093 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Anthracene ND 0.065 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Azobenzene ND 0.12 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benz(a)anthracene ND 0.085 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(a)pyrene ND 0.074 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(b)fluoranthene ND 0.089 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(g,h,i)perylene ND 0.087 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733	•								
Anthracene ND 0.065 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Azobenzene ND 0.12 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benz(a)anthracene ND 0.085 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(a)pyrene ND 0.074 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(b)fluoranthene ND 0.089 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(g,h,i)perylene ND 0.087 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733	. ,								
Azobenzene ND 0.12 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benz(a)anthracene ND 0.085 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(a)pyrene ND 0.074 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(b)fluoranthene ND 0.089 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(g,h,i)perylene ND 0.087 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733									
Benz(a)anthracene ND 0.085 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(a)pyrene ND 0.074 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(b)fluoranthene ND 0.089 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(g,h,i)perylene ND 0.087 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733									
Benzo(a)pyrene ND 0.074 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(b)fluoranthene ND 0.089 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733 Benzo(g,h,i)perylene ND 0.087 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733									
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Benzo(g,h,i)perylene ND 0.087 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733									
3.3	. ,								
Delizo(k)lidorantifere 14D 0.000 0.20 filig/fig 1 3/30/2010 1.33.23 f W 27733									
Benzoic acid ND 0.081 0.49 mg/Kg 1 9/30/2016 1:53:25 PM 27733									
Benzyl alcohol ND 0.077 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733									
Bis(2-chloroethoxy)methane ND 0.11 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733	•								
Bis(2-chloroethyl)ether ND 0.072 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733									
Bis(2-chloroisopropyl)ether ND 0.088 0.20 mg/Kg 1 9/30/2016 1:53:25 PM 27733	` ,								
Bis(2-ethylhexyl)phthalate 0.11 0.080 0.49 J mg/Kg 1 9/30/2016 1:53:25 PM 27733					1				

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: OW-57 (25-27')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 2:15:00 PM

 Lab ID:
 1609E26-002
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.094	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Butyl benzyl phthalate	ND	0.087	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Carbazole	ND	0.066	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
4-Chloro-3-methylphenol	ND	0.12	0.49		mg/Kg	1	9/30/2016 1:53:25 PM	27733
4-Chloroaniline	ND	0.11	0.49		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2-Chloronaphthalene	ND	0.077	0.25		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2-Chlorophenol	ND	0.077	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Chrysene	ND	0.084	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Di-n-butyl phthalate	0.15	0.073	0.39	J	mg/Kg	1	9/30/2016 1:53:25 PM	27733
Di-n-octyl phthalate	ND	0.084	0.39		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Dibenz(a,h)anthracene	ND	0.079	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Dibenzofuran	ND	0.099	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
1,2-Dichlorobenzene	ND	0.075	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
1,3-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
1,4-Dichlorobenzene	ND	0.083	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
3,3'-Dichlorobenzidine	ND	0.072	0.25		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Diethyl phthalate	0.17	0.10	0.20	J	mg/Kg	1	9/30/2016 1:53:25 PM	27733
Dimethyl phthalate	ND	0.096	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2,4-Dichlorophenol	ND	0.092	0.39		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2,4-Dimethylphenol	ND	0.11	0.29		mg/Kg	1	9/30/2016 1:53:25 PM	27733
4,6-Dinitro-2-methylphenol	ND	0.059	0.39		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2,4-Dinitrophenol	ND	0.065	0.49		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2,4-Dinitrotoluene	ND	0.088	0.49		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2,6-Dinitrotoluene	ND	0.10	0.49		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Fluoranthene	ND	0.057	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Fluorene	ND	0.090	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Hexachlorobenzene	ND	0.077	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Hexachloroethane	ND	0.084	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Indeno(1,2,3-cd)pyrene	ND	0.077	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Isophorone	ND	0.11	0.39		mg/Kg	1	9/30/2016 1:53:25 PM	27733
1-Methylnaphthalene	ND	0.099	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2-Methylphenol	ND	0.082	0.39		mg/Kg	1	9/30/2016 1:53:25 PM	27733
3+4-Methylphenol	ND	0.071	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
N-Nitrosodi-n-propylamine	ND	0.094	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
N-Nitrosodiphenylamine	ND	0.096	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company Client Sample ID: OW-57 (25-27')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 2:15:00 PM

 Lab ID:
 1609E26-002
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	ND	0.094	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
3-Nitroaniline	ND	0.087	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
4-Nitroaniline	ND	0.069	0.39		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Nitrobenzene	ND	0.10	0.39		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2-Nitrophenol	ND	0.097	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
4-Nitrophenol	ND	0.075	0.25		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Pentachlorophenol	ND	0.063	0.39		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Phenanthrene	ND	0.067	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Phenol	ND	0.074	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Pyrene	ND	0.074	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Pyridine	ND	0.078	0.39		mg/Kg	1	9/30/2016 1:53:25 PM	27733
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2,4,5-Trichlorophenol	ND	0.098	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
2,4,6-Trichlorophenol	ND	0.081	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
Surr: 2-Fluorophenol	59.3	0	35-97.9		%Rec	1	9/30/2016 1:53:25 PM	27733
Surr: Phenol-d5	60.2	0	37.3-105		%Rec	1	9/30/2016 1:53:25 PM	27733
Surr: 2,4,6-Tribromophenol	73.4	0	35.6-118		%Rec	1	9/30/2016 1:53:25 PM	27733
Surr: Nitrobenzene-d5	58.5		41.2-107		%Rec	1	9/30/2016 1:53:25 PM	27733
Surr: 2-Fluorobiphenyl	59.8		41.9-119		%Rec	1	9/30/2016 1:53:25 PM	27733
Surr: 4-Terphenyl-d14	52.5		15-132		%Rec	1	9/30/2016 1:53:25 PM	27733
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
Benzene	14.7	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Toluene	ND	0.227	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Ethylbenzene	ND	0.252	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Methyl tert-butyl ether (MTBE)	0.834	0.315	1.87	J	μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,2,4-Trimethylbenzene	ND	0.318	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,3,5-Trimethylbenzene	ND	0.309	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,2-Dichloroethane (EDC)	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,2-Dibromoethane (EDB)	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Naphthalene	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1-Methylnaphthalene	0.281	0.213	3.75	J	μg/Kg	1	10/4/2016 11:17:00 AM	27868
2-Methylnaphthalene	ND	0.493	3.75		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Acetone	19.1	0.555	9.37		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Bromobenzene	ND	0.191	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Bromodichloromethane	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Bromoform	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Bromomethane	ND	0.337	2.81		μg/Kg	1	10/4/2016 11:17:00 AM	27868
2-Butanone	2.29	0.676	9.37	J	μg/Kg	1	10/4/2016 11:17:00 AM	27868

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Lab ID:

Client Sample ID: OW-57 (25-27')

OW-14 SOURCE INV Project: Collection Date: 9/21/2016 2:15:00 PM 1609E26-002 Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
Carbon disulfide	ND	0.693	9.37		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Carbon tetrachloride	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Chlorobenzene	ND	0.215	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Chloroethane	ND	0.346	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Chloroform	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Chloromethane	ND	0.475	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
2-Chlorotoluene	ND	0.319	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
4-Chlorotoluene	ND	0.312	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
cis-1,2-DCE	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
cis-1,3-Dichloropropene	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,2-Dibromo-3-chloropropane	ND	0.200	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Dibromochloromethane	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Dibromomethane	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,2-Dichlorobenzene	ND	0.273	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,3-Dichlorobenzene	ND	0.346	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,4-Dichlorobenzene	ND	0.351	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Dichlorodifluoromethane	ND	1.09	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,1-Dichloroethane	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,1-Dichloroethene	ND	0.307	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,2-Dichloropropane	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	
1,3-Dichloropropane	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
2,2-Dichloropropane	ND	0.237	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,1-Dichloropropene	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Hexachlorobutadiene	ND	0.427	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
2-Hexanone	ND	0.467	9.37		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Isopropylbenzene	ND	0.236	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	
4-Isopropyltoluene	ND	0.352	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
4-Methyl-2-pentanone	ND	3.75	9.37		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Methylene chloride	ND	1.87	2.81		μg/Kg	1	10/4/2016 11:17:00 AM	27868
n-Butylbenzene	ND	0.456	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
n-Propylbenzene	ND	0.336	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
sec-Butylbenzene	ND	0.333	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Styrene	ND	0.240	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
tert-Butylbenzene	ND	0.274	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,1,1,2-Tetrachloroethane	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,1,2,2-Tetrachloroethane	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Tetrachloroethene (PCE)	ND	0.246	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
trans-1,2-DCE	ND	0.189	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
trans-1,3-Dichloropropene	ND	0.227	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	

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

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Analytical Report Lab Order 1609E26

Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: OW-57 (25-27')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 2:15:00 PM

 Lab ID:
 1609E26-002
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
1,2,3-Trichlorobenzene	ND	0.454	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,2,4-Trichlorobenzene	ND	0.568	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,1,1-Trichloroethane	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,1,2-Trichloroethane	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Trichloroethene (TCE)	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Trichlorofluoromethane	ND	0.236	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
1,2,3-Trichloropropane	ND	1.87	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Vinyl chloride	ND	0.493	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Xylenes, Total	ND	0.747	1.87		μg/Kg	1	10/4/2016 11:17:00 AM	27868
Surr: 1,2-Dichloroethane-d4	114	0	70-130		%Rec	1	10/4/2016 11:17:00 AM	27868
Surr: 4-Bromofluorobenzene	101	0	70-130		%Rec	1	10/4/2016 11:17:00 AM	27868
Surr: Dibromofluoromethane	103	0	70-130		%Rec	1	10/4/2016 11:17:00 AM	27868
Surr: Toluene-d8	96.6	0	70-130		%Rec	1	10/4/2016 11:17:00 AM	27868
EPA METHOD 8015D MOD: GASOLINE R	ANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	ND	0.56	3.7		mg/Kg	1	9/27/2016 3:29:56 PM	G37518
Surr: BFB	87.6	0	70-130		%Rec	1	9/27/2016 3:29:56 PM	G37518

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

Qualifiers:

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

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092116

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 3:00:00 PM

 Lab ID:
 1609E26-003
 Matrix: AQUEOUS
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RA	NGE						Analyst: JME	
Diesel Range Organics (DRO)	ND	0.69	1.0		mg/L	1	9/29/2016 2:15:30 AM	27760
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	9/29/2016 2:15:30 AM	27760
Surr: DNOP	119	0	77.1-144		%Rec	1	9/29/2016 2:15:30 AM	27760
EPA METHOD 8015D: GASOLINE RA	ANGE						Analyst: NSB	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	9/29/2016 5:39:55 PM	AG3756
Surr: BFB	87.1	0	66.4-120		%Rec	1	9/29/2016 5:39:55 PM	AG3756
EPA METHOD 300.0: ANIONS							Analyst: LGT	
Fluoride	ND	0.050	0.10		mg/L	1	10/4/2016 1:19:29 PM	R37700
Chloride	0.10	0.051	0.50	J	mg/L	1	10/4/2016 1:19:29 PM	R37700
Sulfate	ND	0.14	0.50		mg/L	1	10/4/2016 1:19:29 PM	R37700
EPA METHOD 200.7: DISSOLVED M	ETALS						Analyst: MED	
Barium	ND	0.0013	0.0020		mg/L	1	10/15/2016 1:46:32 PM	B37965
Beryllium	ND	0.00031	0.0020		mg/L	1	10/15/2016 1:46:32 PM	B37965
Cadmium	ND	0.00075	0.0020		mg/L	1	10/15/2016 1:46:32 PM	B37965
Chromium	ND	0.0018	0.0060		mg/L	1	10/15/2016 1:46:32 PM	B37965
Cobalt	ND	0.00074	0.0060		mg/L	1	10/15/2016 1:46:32 PM	B37965
Iron	ND	0.020	0.020		mg/L	1	10/15/2016 1:46:32 PM	B37965
Manganese	0.00046	0.00032	0.0020	J	mg/L	1	10/15/2016 1:46:32 PM	B37965
Nickel	ND	0.0024	0.010		mg/L	1	10/15/2016 1:46:32 PM	B37965
Silver	ND	0.0028	0.0050		mg/L	1	10/15/2016 1:46:32 PM	B37965
Vanadium	ND	0.0013	0.050		mg/L	1	10/15/2016 1:46:32 PM	B37965
Zinc	ND	0.0028	0.010		mg/L	1	10/15/2016 1:46:32 PM	B37965
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	ND	0.0013	0.0020		mg/L	1	10/17/2016 2:24:35 PM	A37991
Beryllium	ND	0.00036	0.0020		mg/L	1	10/17/2016 2:24:35 PM	A37991
Cadmium	ND	0.0015	0.0020		mg/L	1	10/17/2016 2:24:35 PM	A37991
Chromium	ND	0.0027	0.0060		mg/L	1	10/17/2016 2:24:35 PM	A37991
Cobalt	ND	0.0017	0.0060		mg/L	1	10/17/2016 2:24:35 PM	A37991
Iron	ND	0.020	0.020		mg/L	1	10/17/2016 2:24:35 PM	A37991
Manganese	ND	0.00032	0.0020		mg/L	1	10/17/2016 2:24:35 PM	A37991
Nickel	ND	0.0031	0.010		mg/L	1	10/17/2016 2:24:35 PM	A37991
Silver	ND	0.0028	0.0050		mg/L	1	10/17/2016 2:24:35 PM	A37991
Vanadium	ND	0.0013	0.050		mg/L	1	10/17/2016 2:24:35 PM	A37991
Zinc	ND	0.0027	0.010		mg/L	1	10/17/2016 2:24:35 PM	A37991
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/11/2016 2:29:28 PM	A37903
Arsenic	ND	0.00014	0.0010		mg/L	1	10/10/2016 9:41:13 PM	B37384

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092116

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 3:00:00 PM

 Lab ID:
 1609E26-003
 Matrix: AQUEOUS
 Received Date: 9/23/2016 4:40:00 PM

EPA 200.8: DISSOLVED METALS	Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
Page Page	EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Page	Lead	ND	0.00017	0.00050		mg/L	1	10/11/2016 2:29:28 PM	A37903
Antimony ND 0.00047 0.0010 mg/L 1 10/13/2016 5:54:54 PM 0.37945 Arsenic ND 0.00021 0.0010 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00017 0.00050 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00017 0.0050 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00021 0.0010 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00021 0.0010 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00021 0.0010 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00021 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00021 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00021 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00021 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00021 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00021 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00021 mg/L 1 10/11/2016 8:47:02 PM 0.37903 1.ead ND 0.00021 mg/L 1 10/11/2016 8:49 PM 0.37964 1.ead ND 0.300216 6:59 49 PM 0.37964 1.ead ND 0.300216 6:59 49 PM 0.37964 1.ead ND 0.300216 6:59 49 PM 0.37964 1.ead ND 0.300216 6:59 49 PM 0.37964 1.ead ND 0.300216 6:59 49 PM 0.3002	Selenium	ND	0.00021	0.0010		mg/L	1	10/10/2016 9:41:13 PM	B37384
Arsenic	EPA 200.8: METALS							Analyst: JLF	
Lead ND 0.00017 0.00050 mg/L 1 10/11/2016 8:47:02 PM 0.37903 Selenium ND 0.00021 0.0010 mg/L 1 10/11/2016 8:47:02 PM 0.37903 0.0002 mg/L 1 10/11/2016 8:47:02 PM 0.37903 0.0002 mg/L 1 10/11/2016 8:47:02 PM 0.37903 0.0002 mg/L 1 10/11/2016 8:47:02 PM 0.00053 0.0002 mg/L 1 10/11/2016 8:47:02 PM 0.00053 0.0002 mg/L 1 10/11/2016 8:47:02 PM 0.00053 0.0002 mg/L 1 10/11/2016 8:47:02 PM 0.00053 0.0002 mg/L 1 0.0005016 6:59:49 PM 0.00053 0.0002 mg/L 1 0.0005016 6:59:49 PM 0.0005016 0.00050	Antimony	ND	0.00047	0.0010		mg/L	1	10/13/2016 5:54:54 PM	A37945
Selenium	Arsenic	ND	0.00021	0.0010		mg/L	1	10/11/2016 8:47:02 PM	D37903
Marcury ND 0.000053 0.00020 Mg/L 1 10/5/2016 11:56:02 AM 27892 27894	Lead	ND	0.00017	0.00050		mg/L	1	10/11/2016 8:47:02 PM	D37903
Mercury ND 0.000053 0.00020 mg/L 1 10/5/2016 11:56:02 AM 27892 EPA METHOD 8270C: SEMIVOLATILES Acenaphthene ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Acenaphthylene ND 2.4 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Anlline ND 2.4 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Anlline ND 2.5 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Anthracene ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Azobenzene ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(a)pyrene ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(b, li)perylene ND 2.5 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(b, li)toranthene	Selenium	ND	0.00021	0.0010		mg/L	1	10/11/2016 8:47:02 PM	D37903
Acenaphthene	EPA METHOD 245.1: MERCURY							Analyst: pmf	
Acenaphthene ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Acenaphthylene ND 2.4 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Aniline ND 2.4 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Anilireacne ND 2.5 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Arzobenzene ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(a)pyrene ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(g)fluoranthene ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(g,h.j)perylene ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(g,h.j)perylene ND 3.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(a)(hluoranthene ND 3.0 10	Mercury	ND	0.000053	0.00020		mg/L	1	10/5/2016 11:56:02 AM	27892
Acenaphthylene ND 2.4 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Aniline ND 2.4 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Aniline ND 2.5 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Anthracene ND 2.5 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Azobenzene ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benz(a)anthracene ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(a)pyrene ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(b)fluoranthene ND 2.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(g)h,i)perylene ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(g,h,i)perylene ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(g,h,i)perylene ND 3.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzoic acid 6.2 2.6 20 J µg/L 1 9/30/2016 6:59:49 PM 27764 Benzoic acid 6.2 2.6 20 J µg/L 1 9/30/2016 6:59:49 PM 27764 Benzoic acid 6.2 2.6 20 J µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethoxy)methane ND 2.8 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethoxy)methane ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chlorosthyr)pether ND 1.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chlorosthyr)pether ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chlorosthyr)pether ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chlorosthyr)pether ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chlorosthyr)pether ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chlorosthyr)pether ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 C-Chloro-amethylphenol ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 C-Chloro-amethylphenol ND 2.2 10 µg/L 1 9/30/2016 6:59:49 PM 27764 C-Chloro-amethylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 C-Chloro-amethylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 C-Chloro-amethylphenol ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 C-Chloro-amethylphenol ND 2.8 10 µg/L 1 9/30/2016 6:59:49 PM 27764 C-Chloro-amethylphenol ND 2.8 10 µg/L 1 9/30/2016 6:59:49 PM 27764 C-Chloro-amethylphenol ND	EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Aniline ND 2.4 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Anthracene ND 2.5 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Arthracene ND 2.5 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Azobenzene ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benz(a)nthracene ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(a)pyrene ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(b)fluoranthene ND 2.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(g),hi)perylene ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(g),hi)perylene ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(g),dillouranthene ND 3.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzole acid 6.2 2.6 20 J µg/L 1 9/30/2016 6:59:49 PM 27764 Benzole acid 6.2 2.6 20 J µg/L 1 9/30/2016 6:59:49 PM 27764 Benzole acid 6.2 2.6 20 J µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethoxy)methane ND 3.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethy)lether ND 2.8 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chlorosthy)lether ND 1.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chlorosthy)lether ND 1.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chlorosthy)lether ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chlorosthy)lether ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate 2.7 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate ND 2.5 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.8 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.8 10 µg/L 1 9/30/2016 6:59:49 PM 27764	Acenaphthene	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Anthracene ND 2.5 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Azobenzene ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(a)phyrene ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(c)fluoranthene ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(c)fluoranthene ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(s)fluoranthene ND 3.0 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Benzolacid 6.2 2.6 20 J μg/L 1 9/30/2016 6:59:49 PM 27764 Benzyl alcohol ND 3.0 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethoxy)methane ND 2.8 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethyl)ether ND 1.9	Acenaphthylene	ND	2.4	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Azobenzene ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(a)nthracene ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(a)pyrene ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(b)fluoranthene ND 2.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(b)fluoranthene ND 2.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(g),i,i)perylene ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(k)fluoranthene ND 3.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzoic acid 6.2 2.6 20 Jµg/L 1 9/30/2016 6:59:49 PM 27764 Benzoic acid 6.2 2.6 20 Jµg/L 1 9/30/2016 6:59:49 PM 27764 Benzoic acid ND 3.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethoxy)methane ND 3.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethoxy)methane ND 2.8 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chlorostopropy)ether ND 1.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chlorostopropy)ether ND 1.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-ethylhexyl)phthalate 2.7 2.6 10 Jµg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-ethylhexyl)phthalate ND 2.5 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate ND 2.5 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.4 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.4 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.6 10 µg/L	Aniline	ND	2.4	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Benz(a)anthracene	Anthracene	ND	2.5	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Benzo(a)pyrene ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764	Azobenzene	ND	2.7	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Benzo(b)filuoranthene ND 2.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764	Benz(a)anthracene	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Benzo(g,h,i)perylene ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzo(k)fluoranthene ND 3.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzoic acid 6.2 2.6 20 J µg/L 1 9/30/2016 6:59:49 PM 27764 Benzyl alcohol ND 3.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis (2-chlorobxy)methane ND 2.8 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis (2-chlorosthyl)ether ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis (2-chlorosthyl)ether ND 1.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis (2-chlorosthyl)ether ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis (2-chlorosthyl)ether ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis (2-chlorosthy	Benzo(a)pyrene	ND	2.7	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Benzoic kijfluoranthene ND 3.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Benzoic acid 6.2 2.6 20 J µg/L 1 9/30/2016 6:59:49 PM 27764 Benzyl alcohol ND 3.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethoxy)methane ND 2.8 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethyl)ether ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethyl)ether ND 1.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethyl)phthalate 2.7 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-ethylhexyl)phthalate 2.7 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate ND 2.5 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate ND 2.5 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloroaniline ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloroaniline ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenol ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenol ND 2.2 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Chrysene ND 2.8 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.4 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 27764 Di-n-butyl phthalate ND 27764 Di-n-butyl phthalate ND 27764 Di-n-butyl p	Benzo(b)fluoranthene	ND	2.9	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Benzoic acid 6.2 2.6 20 J µg/L 1 9/30/2016 6:59:49 PM 27764 Benzyl alcohol ND 3.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethoxy)methane ND 2.8 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethyl)ether ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroisopropyl)ether ND 1.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-ethylhexyl)phthalate 2.7 2.6 10 Jg/L 1 9/30/2016 6:59:49 PM 27764 4-Bromophenyl phenyl ether ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate ND 2.5 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloroaphthalen	Benzo(g,h,i)perylene	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Benzyl alcohol ND 3.0 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethoxy)methane ND 2.8 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethyl)ether ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroisopropyl)ether ND 1.9 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-ethylhexyl)phthalate 2.7 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Bromophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate ND 2.5 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chloronaphthalene	Benzo(k)fluoranthene	ND	3.0	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Bis(2-chloroethoxy)methane ND 2.8 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroethyl)ether ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-chloroisopropyl)ether ND 1.9 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Bis(2-ethylhexyl)phthalate 2.7 2.6 10 J µg/L 1 9/30/2016 6:59:49 PM 27764 4-Bromophenyl phenyl ether ND 2.6 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate ND 2.5 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 µg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.7 10 µg/L 1 9/30/2016 6:59:49 PM 27764 2-Chlorophenol </td <td>Benzoic acid</td> <td>6.2</td> <td>2.6</td> <td>20</td> <td>J</td> <td>μg/L</td> <td>1</td> <td>9/30/2016 6:59:49 PM</td> <td>27764</td>	Benzoic acid	6.2	2.6	20	J	μg/L	1	9/30/2016 6:59:49 PM	27764
Bis (2-chloroethyl)ether ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Bis (2-chloroisopropyl)ether ND 1.9 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Bis (2-ethylhexyl)phthalate 2.7 2.6 10 J μg/L 1 9/30/2016 6:59:49 PM 27764 4-Bromophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate ND 2.5 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloroaniline ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chlorophenol ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenyl phenyl ether <td>Benzyl alcohol</td> <td>ND</td> <td>3.0</td> <td>10</td> <td></td> <td>μg/L</td> <td>1</td> <td>9/30/2016 6:59:49 PM</td> <td>27764</td>	Benzyl alcohol	ND	3.0	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Bis (2-chloroisopropyl)ether ND 1.9 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Bis (2-ethylhexyl)phthalate 2.7 2.6 10 J μg/L 1 9/30/2016 6:59:49 PM 27764 4-Bromophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate ND 2.5 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloroaniline ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chlorophenol ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Chrysene ND	Bis(2-chloroethoxy)methane	ND	2.8	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Bis(2-ethylhexyl)phthalate 2.7 2.6 10 J μg/L 1 9/30/2016 6:59:49 PM 27764 4-Bromophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate ND 2.5 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloroaniline ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chlorophenol ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenol ND 2.2 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenol ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Chrysene ND	Bis(2-chloroethyl)ether	ND	2.7	10		μg/L	1	9/30/2016 6:59:49 PM	27764
4-Bromophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Butyl benzyl phthalate ND 2.5 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloroaniline ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chloronaphthalene ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chlorophenol ND 2.2 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Chrysene ND 2.8 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.4 10 μg/L 1 9/30/2016 6:59:49 PM 27764	Bis(2-chloroisopropyl)ether	ND	1.9	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Butyl benzyl phthalate ND 2.5 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Carbazole ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloroaniline ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chloronaphthalene ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chlorophenol ND 2.2 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Chrysene ND 2.8 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.4 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-octyl phthalate ND 2.0 <td>Bis(2-ethylhexyl)phthalate</td> <td>2.7</td> <td>2.6</td> <td>10</td> <td>J</td> <td>μg/L</td> <td>1</td> <td>9/30/2016 6:59:49 PM</td> <td>27764</td>	Bis(2-ethylhexyl)phthalate	2.7	2.6	10	J	μg/L	1	9/30/2016 6:59:49 PM	27764
Carbazole ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloroaniline ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chlorophthalene ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chlorophenol ND 2.2 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Chrysene ND 2.8 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.4 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-octyl phthalate ND 2.0 10 μg/L 1 9/30/2016 6:59:49 PM 27764	4-Bromophenyl phenyl ether	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chloroaniline ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chloronaphthalene ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chlorophenol ND 2.2 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Chrysene ND 2.8 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.4 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-octyl phthalate ND 2.0 10 μg/L 1 9/30/2016 6:59:49 PM 27764	Butyl benzyl phthalate	ND	2.5	10		μg/L	1	9/30/2016 6:59:49 PM	27764
4-Chloroaniline ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chloronaphthalene ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chlorophenol ND 2.2 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Chrysene ND 2.8 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.4 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-octyl phthalate ND 2.0 10 μg/L 1 9/30/2016 6:59:49 PM 27764	Carbazole	ND	2.3	10		μg/L	1	9/30/2016 6:59:49 PM	27764
2-Chloronaphthalene ND 2.3 10 μg/L 1 9/30/2016 6:59:49 PM 27764 2-Chlorophenol ND 2.2 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Chrysene ND 2.8 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.4 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-octyl phthalate ND 2.0 10 μg/L 1 9/30/2016 6:59:49 PM 27764	4-Chloro-3-methylphenol	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
2-Chlorophenol ND 2.2 10 μg/L 1 9/30/2016 6:59:49 PM 27764 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Chrysene ND 2.8 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.4 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-octyl phthalate ND 2.0 10 μg/L 1 9/30/2016 6:59:49 PM 27764	4-Chloroaniline	ND	2.7	10		μg/L	1	9/30/2016 6:59:49 PM	27764
4-Chlorophenyl ether ND 2.6 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Chrysene ND 2.8 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.4 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-octyl phthalate ND 2.0 10 μg/L 1 9/30/2016 6:59:49 PM 27764	2-Chloronaphthalene	ND	2.3	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Chrysene ND 2.8 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-butyl phthalate ND 2.4 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-octyl phthalate ND 2.0 10 μg/L 1 9/30/2016 6:59:49 PM 27764	2-Chlorophenol	ND	2.2	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Di-n-butyl phthalate ND 2.4 10 μg/L 1 9/30/2016 6:59:49 PM 27764 Di-n-octyl phthalate ND 2.0 10 μg/L 1 9/30/2016 6:59:49 PM 27764	4-Chlorophenyl phenyl ether	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Di-n-octyl phthalate ND 2.0 10 µg/L 1 9/30/2016 6:59:49 PM 27764	Chrysene	ND	2.8	10		μg/L	1	9/30/2016 6:59:49 PM	27764
	Di-n-butyl phthalate	ND	2.4	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Dibenz(a,h)anthracene ND 2.7 10 μg/L 1 9/30/2016 6:59:49 PM 27764	Di-n-octyl phthalate	ND	2.0	10		μg/L	1	9/30/2016 6:59:49 PM	27764
	Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	9/30/2016 6:59:49 PM	27764

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092116

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 3:00:00 PM

 Lab ID:
 1609E26-003
 Matrix: AQUEOUS
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Dibenzofuran	ND	2.5	10		μg/L	1	9/30/2016 6:59:49 PM	27764
1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	9/30/2016 6:59:49 PM	27764
1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	9/30/2016 6:59:49 PM	27764
1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	9/30/2016 6:59:49 PM	27764
3,3'-Dichlorobenzidine	ND	2.4	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Diethyl phthalate	ND	2.7	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Dimethyl phthalate	ND	2.4	10		μg/L	1	9/30/2016 6:59:49 PM	27764
2,4-Dichlorophenol	ND	2.3	20		μg/L	1	9/30/2016 6:59:49 PM	27764
2,4-Dimethylphenol	ND	3.0	10		μg/L	1	9/30/2016 6:59:49 PM	27764
4,6-Dinitro-2-methylphenol	ND	1.8	20		μg/L	1	9/30/2016 6:59:49 PM	27764
2,4-Dinitrophenol	ND	2.8	20		μg/L	1	9/30/2016 6:59:49 PM	27764
2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	9/30/2016 6:59:49 PM	27764
2,6-Dinitrotoluene	ND	2.7	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Fluoranthene	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Fluorene	ND	2.7	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Hexachlorobenzene	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Hexachlorobutadiene	ND	2.2	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Hexachlorocyclopentadiene	ND	2.3	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Hexachloroethane	ND	2.4	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Indeno(1,2,3-cd)pyrene	ND	3.0	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Isophorone	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
1-Methylnaphthalene	ND	2.9	10		μg/L	1	9/30/2016 6:59:49 PM	27764
2-Methylnaphthalene	ND	2.9	10		μg/L	1	9/30/2016 6:59:49 PM	27764
2-Methylphenol	ND	2.5	10		μg/L	1	9/30/2016 6:59:49 PM	27764
3+4-Methylphenol	ND	2.3	10		μg/L	1	9/30/2016 6:59:49 PM	27764
N-Nitrosodi-n-propylamine	ND	2.4	10		μg/L	1	9/30/2016 6:59:49 PM	27764
N-Nitrosodimethylamine	ND	2.2	10		μg/L	1	9/30/2016 6:59:49 PM	27764
N-Nitrosodiphenylamine	ND	2.3	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Naphthalene	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
2-Nitroaniline	ND	2.8	10		μg/L	1	9/30/2016 6:59:49 PM	27764
3-Nitroaniline	ND	2.9	10		μg/L	1	9/30/2016 6:59:49 PM	27764
4-Nitroaniline	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Nitrobenzene	ND	2.8	10		μg/L	1	9/30/2016 6:59:49 PM	27764
2-Nitrophenol	ND	2.4	10		μg/L	1	9/30/2016 6:59:49 PM	27764
4-Nitrophenol	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Pentachlorophenol	ND	2.3	20		μg/L	1	9/30/2016 6:59:49 PM	27764
Phenanthrene	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Phenol	ND	2.0	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Pyrene	ND	3.1	10		μg/L	1	9/30/2016 6:59:49 PM	27764

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

Qualifiers: * Val

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

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092116

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 3:00:00 PM

 Lab ID:
 1609E26-003
 Matrix: AQUEOUS
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Pyridine	ND	2.2	10		μg/L	1	9/30/2016 6:59:49 PM	27764
1,2,4-Trichlorobenzene	ND	2.6	10		μg/L	1	9/30/2016 6:59:49 PM	27764
2,4,5-Trichlorophenol	ND	2.2	10		μg/L	1	9/30/2016 6:59:49 PM	27764
2,4,6-Trichlorophenol	ND	2.4	10		μg/L	1	9/30/2016 6:59:49 PM	27764
Surr: 2-Fluorophenol	44.7	0	15-123		%Rec	1	9/30/2016 6:59:49 PM	27764
Surr: Phenol-d5	30.0	0	15-124		%Rec	1	9/30/2016 6:59:49 PM	27764
Surr: 2,4,6-Tribromophenol	65.4	0	18.4-134		%Rec	1	9/30/2016 6:59:49 PM	27764
Surr: Nitrobenzene-d5	58.6	0	28.8-134		%Rec	1	9/30/2016 6:59:49 PM	27764
Surr: 2-Fluorobiphenyl	48.4	0	35.9-125		%Rec	1	9/30/2016 6:59:49 PM	27764
Surr: 4-Terphenyl-d14	51.3	0	15-146		%Rec	1	9/30/2016 6:59:49 PM	27764
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Benzene	ND	0.096	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Toluene	0.12	0.12	1.0	J	μg/L	1	9/27/2016 12:36:00 PM	R37500
Ethylbenzene	ND	0.11	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Methyl tert-butyl ether (MTBE)	ND	0.21	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,2,4-Trimethylbenzene	ND	0.11	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,3,5-Trimethylbenzene	ND	0.12	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,2-Dichloroethane (EDC)	ND	0.12	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,2-Dibromoethane (EDB)	ND	0.11	1.0		μg/L	1	9/27/2016 12:36:00 PM	
Naphthalene	ND	0.093	2.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1-Methylnaphthalene	ND	0.20	4.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
2-Methylnaphthalene	ND	0.16	4.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Acetone	ND	4.9	10		μg/L	1	9/27/2016 12:36:00 PM	R37500
Bromobenzene	ND	0.098	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Bromodichloromethane	ND	0.14	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Bromoform	ND	0.10	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Bromomethane	ND	0.78	3.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
2-Butanone	ND	0.74	10		μg/L	1	9/27/2016 12:36:00 PM	R37500
Carbon disulfide	ND	0.60	10		μg/L	1	9/27/2016 12:36:00 PM	R37500
Carbon Tetrachloride	ND	0.11	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Chlorobenzene	ND	0.11	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Chloroethane	ND	0.19	2.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Chloroform	ND	0.089	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Chloromethane	ND	0.21	3.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
2-Chlorotoluene	ND	0.40	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
4-Chlorotoluene	ND	0.13	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
cis-1,2-DCE	ND	0.12	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
cis-1,3-Dichloropropene	ND	0.11	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,2-Dibromo-3-chloropropane	ND	0.23	2.0		μg/L	1	9/27/2016 12:36:00 PM	R37500

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

Qualifiers:

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

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092116

OW-14 SOURCE INV Project: Collection Date: 9/21/2016 3:00:00 PM 1609E26-003 Lab ID: Matrix: AQUEOUS Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Dibromochloromethane	ND	0.087	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Dibromomethane	ND	0.12	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,2-Dichlorobenzene	ND	0.40	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,3-Dichlorobenzene	ND	0.14	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,4-Dichlorobenzene	ND	0.14	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Dichlorodifluoromethane	ND	0.36	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,1-Dichloroethane	ND	0.11	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,1-Dichloroethene	ND	0.11	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,2-Dichloropropane	ND	0.11	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,3-Dichloropropane	ND	0.16	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
2,2-Dichloropropane	ND	0.17	2.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,1-Dichloropropene	ND	0.13	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Hexachlorobutadiene	ND	0.20	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
2-Hexanone	ND	0.84	10		μg/L	1	9/27/2016 12:36:00 PM	R37500
Isopropylbenzene	ND	0.10	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
4-Isopropyltoluene	ND	0.14	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
4-Methyl-2-pentanone	ND	0.43	10		μg/L	1	9/27/2016 12:36:00 PM	R37500
Methylene Chloride	ND	0.19	3.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
n-Butylbenzene	ND	0.16	3.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
n-Propylbenzene	ND	0.13	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
sec-Butylbenzene	ND	0.12	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Styrene	ND	0.11	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
tert-Butylbenzene	ND	0.12	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,1,1,2-Tetrachloroethane	ND	0.11	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,1,2,2-Tetrachloroethane	ND	0.13	2.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Tetrachloroethene (PCE)	ND	0.15	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
trans-1,2-DCE	ND	0.40	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
trans-1,3-Dichloropropene	ND	0.10	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,2,3-Trichlorobenzene	ND	0.11	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,2,4-Trichlorobenzene	ND	0.13	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,1,1-Trichloroethane	ND	0.091	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,1,2-Trichloroethane	ND	0.13	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Trichloroethene (TCE)	ND	0.18	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Trichlorofluoromethane	ND	0.20	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
1,2,3-Trichloropropane	ND	0.20	2.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Vinyl chloride	ND	0.20	1.0		μg/L	1	9/27/2016 12:36:00 PM	R37500
Xylenes, Total	ND	0.37	1.5		μg/L	1	9/27/2016 12:36:00 PM	R37500
Surr: 1,2-Dichloroethane-d4	82.1	0	70-130		%Rec	1	9/27/2016 12:36:00 PM	R37500
Surr: 4-Bromofluorobenzene	98.4	0	70-130		%Rec	1	9/27/2016 12:36:00 PM	R37500

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

Qualifiers:

Value exceeds Maximum Contaminant Level.

- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Analytical Report Lab Order 1609E26

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092116

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/21/2016 3:00:00 PM

 Lab ID:
 1609E26-003
 Matrix: AQUEOUS
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Surr: Dibromofluoromethane	94.8	0	70-130		%Rec	1	9/27/2016 12:36:00 PM	R37500
Surr: Toluene-d8	99.8	0	70-130		%Rec	1	9/27/2016 12:36:00 PM	R37500

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

Qualifiers:

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

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: OW-58 (10-12)

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 2:40:00 PM

 Lab ID:
 1609E26-004
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANIC	s					Analyst: JME	
Diesel Range Organics (DRO)	ND	1.7	9.3		mg/Kg	1	9/29/2016 4:47:43 AM	27746
Motor Oil Range Organics (MRO)	ND	46	46		mg/Kg	1	9/29/2016 4:47:43 AM	27746
Surr: DNOP	103	0	70-130		%Rec	1	9/29/2016 4:47:43 AM	27746
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0038	0.00055	0.032	J	mg/Kg	1	9/27/2016 11:35:08 AM	27712
EPA METHOD 6010B: SOIL METALS							Analyst: ELS	
Antimony	ND	1.0	2.5		mg/Kg	1	10/1/2016 6:28:35 PM	27710
Arsenic	2.2	0.90	2.5	J	mg/Kg	1	10/1/2016 6:28:35 PM	27710
Barium	320	0.14	0.20		mg/Kg	2	10/1/2016 6:30:24 PM	27710
Beryllium	0.88	0.035	0.15		mg/Kg	1	10/1/2016 6:28:35 PM	27710
Cadmium	ND	0.064	0.10		mg/Kg	1	10/1/2016 6:28:35 PM	27710
Chromium	10	0.096	0.30		mg/Kg	1	10/1/2016 6:28:35 PM	27710
Cobalt	4.1	0.11	0.30		mg/Kg	1	10/1/2016 6:28:35 PM	27710
Iron	15000	76	250		mg/Kg	100	10/1/2016 2:59:45 PM	27710
Lead	2.8	0.18	0.25		mg/Kg	1	10/1/2016 6:28:35 PM	27710
Manganese	270	0.11	0.20		mg/Kg	2	10/1/2016 6:30:24 PM	27710
Nickel	7.6	0.15	0.51		mg/Kg	1	10/1/2016 6:28:35 PM	27710
Selenium	ND	1.8	2.5		mg/Kg	1	10/1/2016 6:28:35 PM	27710
Silver	ND	0.063	0.25		mg/Kg	1	10/1/2016 6:28:35 PM	27710
Vanadium	18	0.18	2.5		mg/Kg	1	10/1/2016 6:28:35 PM	27710
Zinc	13	0.35	2.5		mg/Kg	1	10/1/2016 6:28:35 PM	27710
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Aniline	ND	0.094	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Anthracene	ND	0.066	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Azobenzene	ND	0.12	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Benz(a)anthracene	ND	0.085	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Benzo(k)fluoranthene	ND	0.087	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Benzoic acid	ND	0.082	0.50		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Bis(2-ethylhexyl)phthalate	0.12	0.081	0.50	J	mg/Kg	1	9/30/2016 2:21:13 PM	27733
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Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: OW-58 (10-12)

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 2:40:00 PM

 Lab ID:
 1609E26-004
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Carbazole	ND	0.067	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	9/30/2016 2:21:13 PM	27733
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Chrysene	ND	0.085	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Di-n-butyl phthalate	0.14	0.074	0.40	J	mg/Kg	1	9/30/2016 2:21:13 PM	27733
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Diethyl phthalate	0.12	0.10	0.20	J	mg/Kg	1	9/30/2016 2:21:13 PM	27733
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	9/30/2016 2:21:13 PM	27733
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Fluoranthene	ND	0.057	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Fluorene	ND	0.091	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Indeno(1,2,3-cd)pyrene	ND	0.077	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Isophorone	ND	0.11	0.40		mg/Kg	1	9/30/2016 2:21:13 PM	27733
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	9/30/2016 2:21:13 PM	27733
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
N-Nitrosodi-n-propylamine	ND	0.095	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: OW-58 (10-12)

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 2:40:00 PM

 Lab ID:
 1609E26-004
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	ND	0.095	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
3-Nitroaniline	ND	0.087	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2-Nitrophenol	ND	0.098	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Phenanthrene	ND	0.067	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Phenol	ND	0.075	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Pyrene	ND	0.075	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Pyridine	ND	0.079	0.40		mg/Kg	1	9/30/2016 2:21:13 PM	27733
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2,4,5-Trichlorophenol	ND	0.099	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
2,4,6-Trichlorophenol	ND	0.082	0.20		mg/Kg	1	9/30/2016 2:21:13 PM	27733
Surr: 2-Fluorophenol	58.2	0	35-97.9		%Rec	1	9/30/2016 2:21:13 PM	27733
Surr: Phenol-d5	62.5	0	37.3-105		%Rec	1	9/30/2016 2:21:13 PM	27733
Surr: 2,4,6-Tribromophenol	65.1	0	35.6-118		%Rec	1	9/30/2016 2:21:13 PM	27733
Surr: Nitrobenzene-d5	48.6		41.2-107		%Rec	1	9/30/2016 2:21:13 PM	27733
Surr: 2-Fluorobiphenyl	56.5		41.9-119		%Rec	1	9/30/2016 2:21:13 PM	27733
Surr: 4-Terphenyl-d14	47.7		15-132		%Rec	1	9/30/2016 2:21:13 PM	27733
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.068	0.010	0.013		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Toluene	ND	0.0015	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Ethylbenzene	ND	0.0021	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Methyl tert-butyl ether (MTBE)	ND	0.0080	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,2,4-Trimethylbenzene	ND	0.0019	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,3,5-Trimethylbenzene	ND	0.0019	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,2-Dichloroethane (EDC)	ND	0.0067	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,2-Dibromoethane (EDB)	ND	0.0018	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Naphthalene	ND	0.0040	0.051		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1-Methylnaphthalene	ND	0.0057	0.10		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
2-Methylnaphthalene	ND	0.0055	0.10		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Acetone	0.65	0.033	0.38		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Bromobenzene	ND	0.0021	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Bromodichloromethane	ND	0.0015	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Bromoform	ND	0.0031	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Bromomethane	ND	0.0094	0.077		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
2-Butanone	0.055	0.015	0.26	J	mg/Kg	1	9/27/2016 8:15:53 PM	R37518

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: OW-58 (10-12)

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 2:40:00 PM

 Lab ID:
 1609E26-004
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.0084	0.26		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Carbon tetrachloride	ND	0.0017	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Chlorobenzene	ND	0.0021	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Chloroethane	ND	0.0051	0.051		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Chloroform	ND	0.0019	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Chloromethane	0.0085	0.0023	0.077	J	mg/Kg	1	9/27/2016 8:15:53 PM	R37518
2-Chlorotoluene	ND	0.0019	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
4-Chlorotoluene	ND	0.0023	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
cis-1,2-DCE	ND	0.0015	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
cis-1,3-Dichloropropene	ND	0.0024	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,2-Dibromo-3-chloropropane	ND	0.0078	0.051		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Dibromochloromethane	ND	0.0023	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Dibromomethane	ND	0.0022	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,2-Dichlorobenzene	ND	0.0022	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,3-Dichlorobenzene	ND	0.0021	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,4-Dichlorobenzene	ND	0.0032	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Dichlorodifluoromethane	ND	0.0079	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,1-Dichloroethane	ND	0.0014	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,1-Dichloroethene	ND	0.0084	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,2-Dichloropropane	ND	0.0021	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,3-Dichloropropane	ND	0.0029	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
2,2-Dichloropropane	ND	0.0015	0.051		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,1-Dichloropropene	ND	0.0020	0.051		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Hexachlorobutadiene	ND	0.0031	0.051		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
2-Hexanone	ND	0.014	0.26		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Isopropylbenzene	ND	0.0022	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
4-Isopropyltoluene	ND	0.0023	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
4-Methyl-2-pentanone	ND	0.0074	0.26		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Methylene chloride	0.010	0.0074	0.077	J	mg/Kg	1	9/27/2016 8:15:53 PM	R37518
n-Butylbenzene	ND	0.0023	0.077		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
n-Propylbenzene	ND	0.0020	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
sec-Butylbenzene	ND	0.0035	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Styrene	ND	0.0023	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
tert-Butylbenzene	ND	0.0021	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,1,1,2-Tetrachloroethane	ND	0.0024	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,1,2,2-Tetrachloroethane	ND	0.0041	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Tetrachloroethene (PCE)	ND	0.0021	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
trans-1,2-DCE	ND	0.0071	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
trans-1,3-Dichloropropene	ND	0.0037	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518

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

Qualifiers:

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

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Analytical Report Lab Order 1609E26

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: OW-58 (10-12)

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 2:40:00 PM

 Lab ID:
 1609E26-004
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.0038	0.051		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,2,4-Trichlorobenzene	ND	0.0027	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,1,1-Trichloroethane	ND	0.0016	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,1,2-Trichloroethane	ND	0.0030	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Trichloroethene (TCE)	ND	0.0027	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Trichlorofluoromethane	ND	0.0019	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
1,2,3-Trichloropropane	ND	0.0044	0.051		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Vinyl chloride	ND	0.0021	0.026		mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Xylenes, Total	0.0063	0.0048	0.051	J	mg/Kg	1	9/27/2016 8:15:53 PM	R37518
Surr: Dibromofluoromethane	107		70-130		%Rec	1	9/27/2016 8:15:53 PM	R37518
Surr: 1,2-Dichloroethane-d4	103		70-130		%Rec	1	9/27/2016 8:15:53 PM	R37518
Surr: Toluene-d8	97.7		70-130		%Rec	1	9/27/2016 8:15:53 PM	R37518
Surr: 4-Bromofluorobenzene	85.2		70-130		%Rec	1	9/27/2016 8:15:53 PM	R37518
EPA METHOD 8015D MOD: GASOLINE	E RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	3.2	0.38	2.6		mg/Kg	1	9/27/2016 8:15:53 PM	G37518
Surr: BFB	86.9	0	70-130		%Rec	1	9/27/2016 8:15:53 PM	G37518

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

Qualifiers:

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

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: OW-58 (22-24')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 3:00:00 PM

 Lab ID:
 1609E26-005
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS	S					Analyst: JME	
Diesel Range Organics (DRO)	22	1.8	9.6		mg/Kg	1	9/29/2016 5:09:22 AM	27746
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	9/29/2016 5:09:22 AM	27746
Surr: DNOP	103	0	70-130		%Rec	1	9/29/2016 5:09:22 AM	27746
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0056	0.00057	0.033	J	mg/Kg	1	9/27/2016 11:36:52 AM	27712
EPA METHOD 6010B: SOIL METALS							Analyst: ELS	
Antimony	ND	0.98	2.4		mg/Kg	1	10/1/2016 6:33:54 PM	27710
Arsenic	2.0	0.86	2.4	J	mg/Kg	1	10/1/2016 6:33:54 PM	27710
Barium	160	0.069	0.097		mg/Kg	1	10/1/2016 6:33:54 PM	27710
Beryllium	1.1	0.034	0.15		mg/Kg	1	10/1/2016 6:33:54 PM	27710
Cadmium	ND	0.062	0.097		mg/Kg	1	10/1/2016 6:33:54 PM	27710
Chromium	13	0.092	0.29		mg/Kg	1	10/1/2016 6:33:54 PM	27710
Cobalt	4.7	0.11	0.29		mg/Kg	1	10/1/2016 6:33:54 PM	27710
Iron	18000	73	240		mg/Kg	100	10/1/2016 3:01:19 PM	27710
Lead	2.6	0.17	0.24		mg/Kg	1	10/1/2016 6:33:54 PM	27710
Manganese	280	0.10	0.19		mg/Kg	2	10/1/2016 6:35:38 PM	27710
Nickel	9.2	0.15	0.49		mg/Kg	1	10/1/2016 6:33:54 PM	27710
Selenium	ND	1.8	2.4		mg/Kg	1	10/1/2016 6:33:54 PM	27710
Silver	ND	0.061	0.24		mg/Kg	1	10/1/2016 6:33:54 PM	27710
Vanadium	19	0.17	2.4		mg/Kg	1	10/1/2016 6:33:54 PM	27710
Zinc	16	0.34	2.4		mg/Kg	1	10/1/2016 6:33:54 PM	27710
EPA METHOD 8270C: SEMIVOLATILES		0.01	2		g/. tg	•	Analyst: DAM	2.7.10
	ND	0.005	0.20		m a /1/ a	1	-	27722
Acenaphthene		0.085	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Anthropom	ND	0.094	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Anthracene	ND	0.066	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Azobenzene	ND	0.12	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Benzoic acid	ND	0.083	0.50		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Bis(2-ethylhexyl)phthalate	0.12	0.081	0.50	J	mg/Kg	1	9/30/2016 2:48:55 PM	27733

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: OW-58 (22-24')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 3:00:00 PM

 Lab ID:
 1609E26-005
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Carbazole	ND	0.067	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	9/30/2016 2:48:55 PM	27733
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	9/30/2016 2:48:55 PM	27733
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	9/30/2016 2:48:55 PM	27733
2-Chlorophenol	ND	0.079	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Chrysene	ND	0.085	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Di-n-butyl phthalate	0.15	0.075	0.40	J	mg/Kg	1	9/30/2016 2:48:55 PM	27733
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Diethyl phthalate	0.14	0.10	0.20	J	mg/Kg	1	9/30/2016 2:48:55 PM	27733
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	9/30/2016 2:48:55 PM	27733
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	9/30/2016 2:48:55 PM	27733
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	9/30/2016 2:48:55 PM	27733
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	9/30/2016 2:48:55 PM	27733
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	9/30/2016 2:48:55 PM	27733
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Fluoranthene	ND	0.057	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Fluorene	ND	0.091	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Isophorone	ND	0.11	0.40		mg/Kg	1	9/30/2016 2:48:55 PM	27733
1-Methylnaphthalene	0.12	0.10	0.20	J	mg/Kg	1	9/30/2016 2:48:55 PM	27733
2-Methylnaphthalene	0.22	0.12	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	9/30/2016 2:48:55 PM	27733
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733

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

Qualifiers:

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

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Date Reported: 10/28/2016

CLIENT: Western Refining Company **Client Sample ID:** OW-58 (22-24')

OW-14 SOURCE INV Project: Collection Date: 9/22/2016 3:00:00 PM 1609E26-005 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	0.11	0.096	0.20	J	mg/Kg	1	9/30/2016 2:48:55 PM	27733
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	9/30/2016 2:48:55 PM	27733
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Phenanthrene	ND	0.068	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Phenol	ND	0.075	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Pyrene	ND	0.075	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Pyridine	ND	0.079	0.40		mg/Kg	1	9/30/2016 2:48:55 PM	27733
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	9/30/2016 2:48:55 PM	27733
Surr: 2-Fluorophenol	56.1	0	35-97.9		%Rec	1	9/30/2016 2:48:55 PM	27733
Surr: Phenol-d5	63.7	0	37.3-105		%Rec	1	9/30/2016 2:48:55 PM	27733
Surr: 2,4,6-Tribromophenol	62.2	0	35.6-118		%Rec	1	9/30/2016 2:48:55 PM	27733
Surr: Nitrobenzene-d5	55.6		41.2-107		%Rec	1	9/30/2016 2:48:55 PM	27733
Surr: 2-Fluorobiphenyl	53.6		41.9-119		%Rec	1	9/30/2016 2:48:55 PM	27733
Surr: 4-Terphenyl-d14	49.8		15-132		%Rec	1	9/30/2016 2:48:55 PM	27733
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	7.3	0.28	0.35		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Toluene	45	0.041	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Ethylbenzene	9.3	0.057	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Methyl tert-butyl ether (MTBE)	ND	0.22	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,2,4-Trimethylbenzene	23	0.051	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,3,5-Trimethylbenzene	7.7	0.050	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,2-Dichloroethane (EDC)	ND	0.18	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,2-Dibromoethane (EDB)	ND	0.049	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Naphthalene	3.0	0.11	1.4		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1-Methylnaphthalene	2.8	0.15	2.8		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
2-Methylnaphthalene	4.9	0.15	2.8		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Acetone	ND	0.90	10		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Bromobenzene	ND	0.056	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Bromodichloromethane	ND	0.040	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Bromoform	ND	0.084	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Bromomethane	ND	0.25	2.1		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
2-Butanone	ND	0.40	6.9		mg/Kg	20	9/27/2016 4:27:18 PM	R37518

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

Qualifiers:

Value exceeds Maximum Contaminant Level.

- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: OW-58 (22-24')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 3:00:00 PM

 Lab ID:
 1609E26-005
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.23	6.9		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Carbon tetrachloride	ND	0.045	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Chlorobenzene	ND	0.056	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Chloroethane	ND	0.14	1.4		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Chloroform	ND	0.052	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Chloromethane	ND	0.062	2.1		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
2-Chlorotoluene	ND	0.051	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
4-Chlorotoluene	ND	0.061	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
cis-1,2-DCE	ND	0.040	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
cis-1,3-Dichloropropene	ND	0.064	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,2-Dibromo-3-chloropropane	ND	0.21	1.4		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Dibromochloromethane	ND	0.063	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Dibromomethane	ND	0.060	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,2-Dichlorobenzene	ND	0.060	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,3-Dichlorobenzene	ND	0.057	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,4-Dichlorobenzene	ND	0.086	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Dichlorodifluoromethane	ND	0.21	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,1-Dichloroethane	ND	0.037	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,1-Dichloroethene	ND	0.23	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,2-Dichloropropane	ND	0.058	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,3-Dichloropropane	ND	0.079	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
2,2-Dichloropropane	ND	0.040	1.4		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,1-Dichloropropene	ND	0.055	1.4		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Hexachlorobutadiene	ND	0.085	1.4		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
2-Hexanone	ND	0.38	6.9		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Isopropylbenzene	0.57	0.059	0.69	J	mg/Kg	20	9/27/2016 4:27:18 PM	R37518
4-Isopropyltoluene	0.24	0.062	0.69	J	mg/Kg	20	9/27/2016 4:27:18 PM	R37518
4-Methyl-2-pentanone	ND	0.20	6.9		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Methylene chloride	ND	0.20	2.1		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
n-Butylbenzene	1.4	0.061	2.1	J	mg/Kg	20	9/27/2016 4:27:18 PM	R37518
n-Propylbenzene	3.4	0.053	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
sec-Butylbenzene	0.43	0.096	0.69	J	mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Styrene	ND	0.062	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
tert-Butylbenzene	ND	0.057	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,1,1,2-Tetrachloroethane	ND	0.066	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,1,2,2-Tetrachloroethane	ND	0.11	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Tetrachloroethene (PCE)	ND	0.057	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
trans-1,2-DCE	ND	0.19	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
trans-1,3-Dichloropropene	ND	0.10	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518

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

Qualifiers:

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

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Analytical Report Lab Order 1609E26

Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

1609E26-005

Project:

Lab ID:

OW-14 SOURCE INV

Client Sample ID: OW-58 (22-24')

Collection Date: 9/22/2016 3:00:00 PM

Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.10	1.4		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,2,4-Trichlorobenzene	ND	0.074	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,1,1-Trichloroethane	ND	0.042	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,1,2-Trichloroethane	ND	0.082	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Trichloroethene (TCE)	ND	0.074	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Trichlorofluoromethane	ND	0.052	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
1,2,3-Trichloropropane	ND	0.12	1.4		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Vinyl chloride	ND	0.057	0.69		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Xylenes, Total	55	0.13	1.4		mg/Kg	20	9/27/2016 4:27:18 PM	R37518
Surr: Dibromofluoromethane	84.8		70-130		%Rec	20	9/27/2016 4:27:18 PM	R37518
Surr: 1,2-Dichloroethane-d4	86.4		70-130		%Rec	20	9/27/2016 4:27:18 PM	R37518
Surr: Toluene-d8	96.2		70-130		%Rec	20	9/27/2016 4:27:18 PM	R37518
Surr: 4-Bromofluorobenzene	101		70-130		%Rec	20	9/27/2016 4:27:18 PM	R37518
EPA METHOD 8015D MOD: GASOLINI	E RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	1500	10	69		mg/Kg	20	9/27/2016 4:27:18 PM	G37518
Surr: BFB	103	0	70-130		%Rec	20	9/27/2016 4:27:18 PM	G37518

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

Qualifiers:

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

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: OW-58 (28-29')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 3:20:00 PM

 Lab ID:
 1609E26-006
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Diese Range Organics (DRC) 320 1.8 9.8 mg/Kg 1 9/29/2016 5:30:53 AM 27746 Motor Oil Range Organics (DRC) ND 49 49 mg/Kg 1 9/29/2016 5:30:53 AM 27746 Motor Oil Range Organics (MRC) ND 49 49 mg/Kg 1 9/29/2016 5:30:53 AM 27746 Motor Oil Range Organics (MRC) ND 49 49 mg/Kg 1 9/29/2016 5:30:53 AM 27746 Motor Oil Range Organics (MRC) ND 49 49 mg/Kg 1 9/29/2016 5:30:53 AM 27746 Motor Oil Range Organics (MRC) ND 0.0047 0.00056 0.033 J mg/Kg 1 9/29/2016 5:30:53 AM 27742 Motor Oil Range Organics (MRC) ND 0.0047 0.00056 0.033 J mg/Kg 1 9/29/2016 5:30:53 AM 27742 Motor Oil Range Organics (MRC) ND 0.0047 0.00056 0.033 J mg/Kg 1 10/1/2016 6:39:03 PM 27710 Marsanic 2.7 0.88 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Marsanic 2.7 0.88 2.5 mg/Kg 2 10/1/2016 6:39:03 PM 27710 Marsanic 2.7 0.00056 0.034 0.15 mg/Kg 2 10/1/2016 6:39:03 PM 27710 Marsanic 2.7 0.00056 0.0009 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Marsanic 2.7 0.00056 0.0009 mg/Kg 1 10/1/2016 6:39:03 PM 27710 0.00056 0.00056 0.0009 mg/Kg 1 10/1/2016 6:39:03 PM 27710 0.00056 0.0	Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
Moto Oil Range Organics (MRO) ND 49 49 70 70-130 8/Rec 1 9/29/2016 5.30/53 AM 27746 27746 27733 27746 27733 2773	EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS	3					Analyst: JME	
Surr: DNOP 105	Diesel Range Organics (DRO)	320	1.8	9.8		mg/Kg	1	9/29/2016 5:30:53 AM	27746
Mercury 0.0047 0.0056 0.033 J mg/kg 1 9/27/2016 11:38:36 AM 27712 EPA METHOD 6010B: SOIL METALS	Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	9/29/2016 5:30:53 AM	27746
Mercury No.0047 No.0056 No.033 J mg/Kg 1 9/27/2016 11:38:36 AM 27712		105	0	70-130			1	9/29/2016 5:30:53 AM	27746
Analyst: ELS	EPA METHOD 7471: MERCURY							Analyst: pmf	
Antimony ND 0.99 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Arsenic 2.7 0.88 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Beryllium 360 0.14 0.20 mg/Kg 2 10/1/2016 6:39:03 PM 27710 Beryllium 0.66 0.034 0.15 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Cadmium ND 0.663 0.099 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Chromium 9.4 0.093 0.30 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Chromium 9.4 0.011 0.30 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Cobalt 4.4 0.11 0.30 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Iron 14000 74 250 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Iron 14000 74 250 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Lead 3.8 0.17 0.25 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Nickel 7.1 0.15 0.49 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Nickel 7.1 0.15 0.49 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Selenum ND 1.8 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Selenum ND 0.062 0.25 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Vanadium 21 0.17 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.085 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Aniline ND 0.081 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Aniline ND 0.086 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Aniline ND 0.086 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benz(a)pyrene ND 0.088 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benz(a)pyrene ND 0.088 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benz(b)fluoranthene ND 0.088 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benz(c)pyrene ND 0.088 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benz(c)c)pyrene ND 0.088 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benz(c)c)pyrene ND 0.088 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benz(c)c)pyrene ND 0.075 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benz(c)chloroethy)plether ND 0.089 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Bis(2-chloroethoy)plether	Mercury	0.0047	0.00056	0.033	J	mg/Kg	1	9/27/2016 11:38:36 AM	27712
Arsenic 2.7	EPA METHOD 6010B: SOIL METALS							Analyst: ELS	
Arsenic 2.7	Antimony	ND	0.99	2.5		ma/Ka	1	10/1/2016 6:39:03 PM	27710
Barium 360 0.14 0.20 mg/Kg 2 10/1/2016 6:40:53 PM 27710 Beryllium 0.66 0.034 0.15 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Cadmium ND 0.063 0.099 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Chromium 9.4 0.093 0.30 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Cobalt 4.4 0.11 0.30 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Iron 14000 74 250 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Lead 3.8 0.17 0.25 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Manganese 180 0.053 0.099 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Silver ND 0.18 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Silver ND 0.062 0.25 mg/Kg 1 <td>•</td> <td>2.7</td> <td></td> <td>2.5</td> <td></td> <td></td> <td></td> <td></td> <td>27710</td>	•	2.7		2.5					27710
Beryllium									
Cadmium ND 0.063 0.099 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Chromium 9.4 0.093 0.30 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Cobalt 4.4 0.11 0.30 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Iron 14000 74 250 mg/Kg 10 10/1/2016 6:39:03 PM 27710 Lead 3.8 0.17 0.25 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Manganese 180 0.053 0.099 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Nickel 7.1 0.15 0.49 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Selenium ND 1.8 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Silver ND 0.062 0.25 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Vanadium 21 0.17 2.5 mg/Kg 1	Beryllium	0.66							
Chromium 9.4 0.093 0.30 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Cobalt 4.4 0.11 0.30 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Iron 14000 74 250 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Lead 3.8 0.17 0.25 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Manganese 180 0.053 0.099 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Nikel 7.1 0.15 0.49 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Selenium ND 1.8 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Silver ND 0.062 0.25 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zandium 21 0.17 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zandium 21 0.17 2.5 mg/Kg 1	•								
Cobalt 4.4 0.11 0.30 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Iron 14000 74 250 mg/Kg 100 10/1/2016 6:39:03 PM 27710 Lead 3.8 0.17 0.25 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Manganese 180 0.053 0.099 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Nickel 7.1 0.15 0.49 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Selenium ND 1.8 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Silver ND 0.062 0.25 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Vanadium 21 0.17 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 EPA METHOD 8270C: SEMIVOLATILES 25 mg/Kg 1 10/1/2016 6:39:0									
Iron									
Lead 3.8 0.17 0.25 mg/kg 1 10/1/2016 6:39:03 PM 27710 Manganese 180 0.053 0.099 mg/kg 1 10/1/2016 6:39:03 PM 27710 Nickel 7.1 0.15 0.49 mg/kg 1 10/1/2016 6:39:03 PM 27710 Selenium ND 1.8 2.5 mg/kg 1 10/1/2016 6:39:03 PM 27710 Silver ND 0.062 2.5 mg/kg 1 10/1/2016 6:39:03 PM 27710 Vanadium 21 0.17 2.5 mg/kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.30 mg/kg 1 9/30/2016 3:16:41 PM	Iron	14000	74						27710
Manganese 180 0.053 0.099 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Nickel 7.1 0.15 0.49 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Selenium ND 1.8 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Silver ND 0.062 0.25 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Vanadium 21 0.17 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 EPA METHOD 8270C: SEMIVOLATILES Third 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 EPA METHOD 8270C: SEMIVOLATILES Third 2.0 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Acenaphthene ND 0.085 0.20 mg/Kg 1<	Lead	3.8	0.17	0.25			1	10/1/2016 6:39:03 PM	27710
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Selenium ND 1.8 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Silver ND 0.062 0.25 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Vanadium 21 0.17 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 EPA METHOD 8270C: SEMIVOLATILES Acenaphthene ND 0.085 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Acenaphthylene ND 0.081 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Aniline ND 0.094 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Anthracene ND 0.066 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Azobenzene ND 0.086 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benzo(a)pyrene	<u> </u>	7.1	0.15	0.49			1	10/1/2016 6:39:03 PM	27710
Silver ND 0.062 0.25 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Vanadium 21 0.17 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 Zinc 19 0.34 2.5 mg/Kg 1 10/1/2016 6:39:03 PM 27710 EPA METHOD 8270C: SEMIVOLATILES *** Acenaphthene ND 0.085 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Acenaphthene ND 0.081 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Acenaphthylene ND 0.094 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Aniline ND 0.066 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Anthracene ND 0.066 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benz(a)anthracene ND 0.086 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benzo(a)pyren	Selenium								
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Zinc 19 0.34 2.5 mg/kg 1 10/1/2016 6:39:03 PM 27710 EPA METHOD 8270C: SEMIVOLATILES Family SEMIVOLATILES Acenaphthylene ND 0.085 0.20 mg/kg 1 9/30/2016 3:16:41 PM 27733 Aniline ND 0.094 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Anthracene ND 0.066 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Azobenzene ND 0.12 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benz(a)anthracene ND 0.086 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benzo(a)pyrene ND 0.075 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Benzo(b)fluoranthene ND 0.090 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733									
Analyst: DAM Acenaphthene									
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Bis(2-chloroethyl)ether ND 0.073 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733 Bis(2-chloroisopropyl)ether ND 0.089 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733	•								
Bis(2-chloroisopropyl)ether ND 0.089 0.20 mg/Kg 1 9/30/2016 3:16:41 PM 27733									
	` ,								
DISTZ-CHIVINGAVIDINIAIAGE 0.14 0.001 0.30 J HIU/NU I 3/30/7010.3 ID 41 PM 777.33	Bis(2-ethylhexyl)phthalate	0.14	0.081	0.50	J	mg/Kg	1	9/30/2016 3:16:41 PM	27733

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: OW-58 (28-29')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 3:20:00 PM

 Lab ID:
 1609E26-006
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Carbazole	ND	0.067	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	9/30/2016 3:16:41 PM	27733
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2-Chlorophenol	ND	0.079	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Chrysene	ND	0.085	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Di-n-butyl phthalate	0.25	0.074	0.40	J	mg/Kg	1	9/30/2016 3:16:41 PM	27733
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Diethyl phthalate	0.21	0.10	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2,4-Dimethylphenol	0.19	0.11	0.30	J	mg/Kg	1	9/30/2016 3:16:41 PM	27733
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Fluoranthene	ND	0.057	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Fluorene	0.12	0.091	0.20	J	mg/Kg	1	9/30/2016 3:16:41 PM	27733
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Isophorone	ND	0.11	0.40		mg/Kg	1	9/30/2016 3:16:41 PM	27733
1-Methylnaphthalene	1.2	0.10	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2-Methylnaphthalene	2.1	0.12	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2-Methylphenol	0.26	0.083	0.40	J	mg/Kg	1	9/30/2016 3:16:41 PM	27733
3+4-Methylphenol	0.26	0.072	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: OW-58 (28-29')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 3:20:00 PM

 Lab ID:
 1609E26-006
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	1.3	0.096	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Phenanthrene	0.27	0.068	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Phenol	0.31	0.075	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Pyrene	ND	0.075	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Pyridine	ND	0.079	0.40		mg/Kg	1	9/30/2016 3:16:41 PM	27733
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Surr: 2-Fluorophenol	38.4	0	35-97.9		%Rec	1	9/30/2016 3:16:41 PM	27733
Surr: Phenol-d5	59.8	0	37.3-105		%Rec	1	9/30/2016 3:16:41 PM	27733
Surr: 2,4,6-Tribromophenol	68.1	0	35.6-118		%Rec	1	9/30/2016 3:16:41 PM	27733
Surr: Nitrobenzene-d5	52.8		41.2-107		%Rec	1	9/30/2016 3:16:41 PM	27733
Surr: 2-Fluorobiphenyl	63.7		41.9-119		%Rec	1	9/30/2016 3:16:41 PM	27733
Surr: 4-Terphenyl-d14	59.5		15-132		%Rec	1	9/30/2016 3:16:41 PM	27733
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	16	0.21	0.27		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Toluene	77	0.16	2.7		mg/Kg	100	9/28/2016 12:17:34 PM	S37546
Ethylbenzene	15	0.044	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Methyl tert-butyl ether (MTBE)	0.39	0.17	0.53	J	mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,2,4-Trimethylbenzene	30	0.039	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,3,5-Trimethylbenzene	9.9	0.039	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,2-Dichloroethane (EDC)	ND	0.14	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,2-Dibromoethane (EDB)	ND	0.038	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Naphthalene	3.6	0.083	1.1		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1-Methylnaphthalene	1.6	0.12	2.1	J	mg/Kg	20	9/27/2016 4:56:01 PM	R37518
2-Methylnaphthalene	3.2	0.11	2.1		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Acetone	ND	0.69	8.0		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Bromobenzene	ND	0.043	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Bromodichloromethane	ND	0.031	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Bromoform	ND	0.065	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Bromomethane	ND	0.20	1.6		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
2-Butanone	ND	0.30	5.3		mg/Kg	20	9/27/2016 4:56:01 PM	R37518

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: OW-58 (28-29')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 3:20:00 PM

 Lab ID:
 1609E26-006
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.18	5.3		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Carbon tetrachloride	ND	0.035	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Chlorobenzene	ND	0.043	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Chloroethane	ND	0.11	1.1		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Chloroform	ND	0.040	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Chloromethane	ND	0.047	1.6		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
2-Chlorotoluene	ND	0.039	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
4-Chlorotoluene	ND	0.047	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
cis-1,2-DCE	ND	0.031	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
cis-1,3-Dichloropropene	ND	0.049	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,2-Dibromo-3-chloropropane	ND	0.16	1.1		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Dibromochloromethane	ND	0.048	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Dibromomethane	ND	0.046	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,2-Dichlorobenzene	ND	0.046	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,3-Dichlorobenzene	ND	0.044	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,4-Dichlorobenzene	ND	0.066	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Dichlorodifluoromethane	ND	0.16	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,1-Dichloroethane	ND	0.029	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,1-Dichloroethene	ND	0.17	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,2-Dichloropropane	ND	0.045	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,3-Dichloropropane	ND	0.060	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
2,2-Dichloropropane	ND	0.030	1.1		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,1-Dichloropropene	ND	0.042	1.1		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Hexachlorobutadiene	ND	0.065	1.1		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
2-Hexanone	ND	0.29	5.3		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Isopropylbenzene	0.82	0.046	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
4-Isopropyltoluene	0.27	0.048	0.53	J	mg/Kg	20	9/27/2016 4:56:01 PM	R37518
4-Methyl-2-pentanone	ND	0.16	5.3		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Methylene chloride	ND	0.15	1.6		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
n-Butylbenzene	1.3	0.047	1.6	J	mg/Kg	20	9/27/2016 4:56:01 PM	R37518
n-Propylbenzene	4.7	0.041	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
sec-Butylbenzene	0.48	0.074	0.53	J	mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Styrene	ND	0.048	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
tert-Butylbenzene	ND	0.044	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,1,1,2-Tetrachloroethane	ND	0.051	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,1,2,2-Tetrachloroethane	ND	0.086	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Tetrachloroethene (PCE)	ND	0.044	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
trans-1,2-DCE	ND	0.15	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
trans-1,3-Dichloropropene	ND	0.078	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518

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

Qualifiers:

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

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Analytical Report Lab Order 1609E26

Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: OW-58 (28-29')

Collection Date: 9/22/2016 3:20:00 PM

OW-14 SOURCE INV Project: 1609E26-006 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.080	1.1		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,2,4-Trichlorobenzene	ND	0.057	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,1,1-Trichloroethane	ND	0.032	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,1,2-Trichloroethane	ND	0.063	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Trichloroethene (TCE)	ND	0.057	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Trichlorofluoromethane	ND	0.040	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
1,2,3-Trichloropropane	ND	0.092	1.1		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Vinyl chloride	ND	0.044	0.53		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Xylenes, Total	92	0.10	1.1		mg/Kg	20	9/27/2016 4:56:01 PM	R37518
Surr: Dibromofluoromethane	81.8		70-130		%Rec	20	9/27/2016 4:56:01 PM	R37518
Surr: 1,2-Dichloroethane-d4	86.1		70-130		%Rec	20	9/27/2016 4:56:01 PM	R37518
Surr: Toluene-d8	95.1		70-130		%Rec	20	9/27/2016 4:56:01 PM	R37518
Surr: 4-Bromofluorobenzene	98.1		70-130		%Rec	20	9/27/2016 4:56:01 PM	R37518
EPA METHOD 8015D MOD: GASOLINE	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	1700	8.0	53		mg/Kg	20	9/27/2016 4:56:01 PM	G37518
Surr: BFB	97.5	0	70-130		%Rec	20	9/27/2016 4:56:01 PM	G37518

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

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company Client Sample ID: OW-58 (48-48.5')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 3:35:00 PM

 Lab ID:
 1609E26-007
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS	S					Analyst: JME	
Diesel Range Organics (DRO)	33	1.7	9.3		mg/Kg	1	9/29/2016 5:52:33 AM	27746
Motor Oil Range Organics (MRO)	ND	47	47		mg/Kg	1	9/29/2016 5:52:33 AM	27746
Surr: DNOP	103	0	70-130		%Rec	1	9/29/2016 5:52:33 AM	27746
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0014	0.00057	0.033	J	mg/Kg	1	9/27/2016 11:40:20 AM	27712
EPA METHOD 6010B: SOIL METALS							Analyst: ELS	
Antimony	ND	1.0	2.5		mg/Kg	1	10/1/2016 6:51:49 PM	27710
Arsenic	1.8	0.89	2.5	J	mg/Kg	1	10/1/2016 6:51:49 PM	27710
Barium	45	0.071	0.10		mg/Kg	1	10/1/2016 6:51:49 PM	27710
Beryllium	0.58	0.035	0.15		mg/Kg	1	10/1/2016 6:51:49 PM	27710
Cadmium	ND	0.063	0.10		mg/Kg	1	10/1/2016 6:51:49 PM	27710
Chromium	7.3	0.094	0.30		mg/Kg	1	10/1/2016 6:51:49 PM	27710
Cobalt	3.7	0.11	0.30		mg/Kg	1	10/1/2016 6:51:49 PM	27710
Iron	11000	75	250		mg/Kg	100	10/1/2016 3:04:24 PM	27710
Lead	1.5	0.17	0.25		mg/Kg	1	10/1/2016 6:51:49 PM	27710
Manganese	97	0.053	0.10		mg/Kg	1	10/1/2016 6:51:49 PM	27710
Nickel	6.1	0.15	0.50		mg/Kg	1	10/1/2016 6:51:49 PM	27710
Selenium	ND	1.8	2.5		mg/Kg	1	10/1/2016 6:51:49 PM	27710
Silver	ND	0.063	0.25		mg/Kg	1	10/1/2016 6:51:49 PM	27710
Vanadium	14	0.18	2.5		mg/Kg	1	10/1/2016 6:51:49 PM	27710
Zinc	17	0.35	2.5		mg/Kg	1	10/1/2016 6:51:49 PM	27710
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.086	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Acenaphthylene	ND	0.082	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Aniline	ND	0.095	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Anthracene	ND	0.067	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Azobenzene	ND	0.12	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Benz(a)anthracene	ND	0.087	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Benzo(a)pyrene	ND	0.076	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Benzo(b)fluoranthene	ND	0.091	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Benzo(g,h,i)perylene	ND	0.089	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Benzo(k)fluoranthene	ND	0.089	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Benzoic acid	ND	0.083	0.50		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Benzyl alcohol	ND	0.079	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Bis(2-chloroethyl)ether	ND	0.074	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Bis(2-chloroisopropyl)ether	ND	0.090	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Bis(2-ethylhexyl)phthalate	0.12	0.082	0.50	J	mg/Kg	1	9/30/2016 3:44:33 PM	27733

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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CLIENT: Western Refining Company

Date Reported: 10/28/2016

Client Sample ID: OW-58 (48-48.5')

Collection Date: 9/22/2016 3:35:00 PM

OW-14 SOURCE INV Project: 1609E26-007 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.096	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Butyl benzyl phthalate	ND	0.089	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Carbazole	ND	0.068	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	9/30/2016 3:44:33 PM	27733
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2-Chloronaphthalene	ND	0.079	0.25		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2-Chlorophenol	ND	0.079	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Chrysene	ND	0.086	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Di-n-butyl phthalate	0.15	0.075	0.40	J	mg/Kg	1	9/30/2016 3:44:33 PM	27733
Di-n-octyl phthalate	ND	0.086	0.40		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
1,2-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
1,3-Dichlorobenzene	ND	0.078	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
1,4-Dichlorobenzene	ND	0.085	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
3,3'-Dichlorobenzidine	ND	0.074	0.25		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Diethyl phthalate	0.16	0.10	0.20	J	mg/Kg	1	9/30/2016 3:44:33 PM	27733
Dimethyl phthalate	ND	0.098	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2,4-Dichlorophenol	ND	0.094	0.40		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	9/30/2016 3:44:33 PM	27733
4,6-Dinitro-2-methylphenol	ND	0.061	0.40		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2,4-Dinitrophenol	ND	0.067	0.50		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2,4-Dinitrotoluene	ND	0.090	0.50		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Fluoranthene	ND	0.058	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Fluorene	ND	0.092	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Indeno(1,2,3-cd)pyrene	ND	0.079	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Isophorone	ND	0.11	0.40		mg/Kg	1	9/30/2016 3:44:33 PM	27733
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2-Methylphenol	ND	0.084	0.40		mg/Kg	1	9/30/2016 3:44:33 PM	27733
3+4-Methylphenol	ND	0.073	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
N-Nitrosodi-n-propylamine	ND	0.097	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
N-Nitrosodiphenylamine	ND	0.098	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733

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

Qualifiers: Value exceeds Maximum Contaminant Level.

- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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CLIENT: Western Refining Company

Date Reported: 10/28/2016

Client Sample ID: OW-58 (48-48.5')

Collection Date: 9/22/2016 3:35:00 PM

OW-14 SOURCE INV Project: 1609E26-007 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES	3						Analyst: DAM	
Naphthalene	ND	0.097	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
3-Nitroaniline	ND	0.089	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
4-Nitroaniline	ND	0.071	0.40		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2-Nitrophenol	ND	0.10	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
4-Nitrophenol	ND	0.077	0.25		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Pentachlorophenol	ND	0.065	0.40		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Phenanthrene	ND	0.068	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Phenol	ND	0.076	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Pyrene	ND	0.076	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Pyridine	ND	0.080	0.40		mg/Kg	1	9/30/2016 3:44:33 PM	27733
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	9/30/2016 3:44:33 PM	27733
Surr: 2-Fluorophenol	69.9	0	35-97.9		%Rec	1	9/30/2016 3:44:33 PM	27733
Surr: Phenol-d5	73.8	0	37.3-105		%Rec	1	9/30/2016 3:44:33 PM	27733
Surr: 2,4,6-Tribromophenol	76.2	0	35.6-118		%Rec	1	9/30/2016 3:44:33 PM	27733
Surr: Nitrobenzene-d5	66.7		41.2-107		%Rec	1	9/30/2016 3:44:33 PM	27733
Surr: 2-Fluorobiphenyl	63.3		41.9-119		%Rec	1	9/30/2016 3:44:33 PM	27733
Surr: 4-Terphenyl-d14	70.5		15-132		%Rec	1	9/30/2016 3:44:33 PM	27733
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.077	0.063	0.079	J	mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Toluene	1.1	0.0094	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Ethylbenzene	0.51	0.013	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Methyl tert-butyl ether (MTBE)	ND	0.050	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,2,4-Trimethylbenzene	1.4	0.012	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,3,5-Trimethylbenzene	0.50	0.011	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,2-Dichloroethane (EDC)	ND	0.041	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,2-Dibromoethane (EDB)	ND	0.011	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Naphthalene	0.085	0.025	0.32	J	mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1-Methylnaphthalene	0.083	0.035	0.63	J	mg/Kg	5	9/27/2016 5:24:42 PM	R37518
2-Methylnaphthalene	0.14	0.034	0.63	J	mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Acetone	ND	0.20	2.4		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Bromobenzene	ND	0.013	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Bromodichloromethane	ND	0.0092	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Bromoform	ND	0.019	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Bromomethane	ND	0.058	0.47		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
2-Butanone	ND	0.090	1.6		mg/Kg	5	9/27/2016 5:24:42 PM	R37518

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

Qualifiers: Value exceeds Maximum Contaminant Level.

- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Client Sample ID: OW-58 (48-48.5')

CLIENT: Western Refining Company **OW-14 SOURCE INV Project:** Collection Date: 9/22/2016 3:35:00 PM 1609E26-007 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.052	1.6		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Carbon tetrachloride	ND	0.010	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Chlorobenzene	ND	0.013	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Chloroethane	ND	0.032	0.32		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Chloroform	ND	0.012	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Chloromethane	ND	0.014	0.47		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
2-Chlorotoluene	ND	0.012	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
4-Chlorotoluene	ND	0.014	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
cis-1,2-DCE	ND	0.0092	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
cis-1,3-Dichloropropene	ND	0.015	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,2-Dibromo-3-chloropropane	ND	0.048	0.32		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Dibromochloromethane	ND	0.014	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Dibromomethane	ND	0.014	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,2-Dichlorobenzene	ND	0.014	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,3-Dichlorobenzene	ND	0.013	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,4-Dichlorobenzene	ND	0.020	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Dichlorodifluoromethane	ND	0.049	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,1-Dichloroethane	ND	0.0086	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,1-Dichloroethene	ND	0.052	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,2-Dichloropropane	ND	0.013	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,3-Dichloropropane	ND	0.018	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
2,2-Dichloropropane	ND	0.0091	0.32		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,1-Dichloropropene	ND	0.013	0.32		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Hexachlorobutadiene	ND	0.019	0.32		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
2-Hexanone	ND	0.086	1.6		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Isopropylbenzene	0.090	0.014	0.16	J	mg/Kg	5	9/27/2016 5:24:42 PM	R37518
4-Isopropyltoluene	0.048	0.014	0.16	J	mg/Kg	5	9/27/2016 5:24:42 PM	R37518
4-Methyl-2-pentanone	ND	0.046	1.6		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Methylene chloride	ND	0.046	0.47		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
n-Butylbenzene	0.11	0.014	0.47	J	mg/Kg	5	9/27/2016 5:24:42 PM	R37518
n-Propylbenzene	0.28	0.012	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
sec-Butylbenzene	0.091	0.022	0.16	J	mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Styrene	ND	0.014	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
tert-Butylbenzene	ND	0.013	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,1,1,2-Tetrachloroethane	ND	0.015	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,1,2,2-Tetrachloroethane	ND	0.026	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Tetrachloroethene (PCE)	ND	0.013	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
trans-1,2-DCE	ND	0.044	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
trans-1,3-Dichloropropene	ND	0.023	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518

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

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Analytical Report Lab Order 1609E26

Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: OW-58 (48-48.5')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 3:35:00 PM

 Lab ID:
 1609E26-007
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.024	0.32		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,2,4-Trichlorobenzene	ND	0.017	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,1,1-Trichloroethane	ND	0.0097	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,1,2-Trichloroethane	ND	0.019	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Trichloroethene (TCE)	ND	0.017	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Trichlorofluoromethane	ND	0.012	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
1,2,3-Trichloropropane	ND	0.027	0.32		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Vinyl chloride	ND	0.013	0.16		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Xylenes, Total	3.1	0.030	0.32		mg/Kg	5	9/27/2016 5:24:42 PM	R37518
Surr: Dibromofluoromethane	95.1		70-130		%Rec	5	9/27/2016 5:24:42 PM	R37518
Surr: 1,2-Dichloroethane-d4	98.3		70-130		%Rec	5	9/27/2016 5:24:42 PM	R37518
Surr: Toluene-d8	95.4		70-130		%Rec	5	9/27/2016 5:24:42 PM	R37518
Surr: 4-Bromofluorobenzene	95.7		70-130		%Rec	5	9/27/2016 5:24:42 PM	R37518
EPA METHOD 8015D MOD: GASOLINE	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	130	2.4	16		mg/Kg	5	9/27/2016 5:24:42 PM	G37518
Surr: BFB	96.1	0	70-130		%Rec	5	9/27/2016 5:24:42 PM	G37518

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

1609E26-008

Project:

Lab ID:

OW-14 SOURCE INV

Client Sample ID: TK-568-1 (12-14')

Collection Date: 9/23/2016 12:30:00 PM

Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANG	E ORGANIC	S					Analyst: JME	
Diesel Range Organics (DRO)	300	18	97		mg/Kg	10	9/29/2016 6:14:03 AM	27746
Motor Oil Range Organics (MRO)	ND	490	490		mg/Kg	10	9/29/2016 6:14:03 AM	27746
Surr: DNOP	0	0	70-130	S	%Rec	10	9/29/2016 6:14:03 AM	27746
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0045	0.00055	0.032	J	mg/Kg	1	9/27/2016 11:42:07 AM	27712
EPA METHOD 6010B: SOIL METALS							Analyst: ELS	
Antimony	ND	0.99	2.5		mg/Kg	1	10/1/2016 6:57:19 PM	27710
Arsenic	1.8	0.88	2.5	J	mg/Kg	1	10/1/2016 6:57:19 PM	27710
Barium	130	0.070	0.099		mg/Kg	1	10/1/2016 6:57:19 PM	27710
Beryllium	0.82	0.034	0.15		mg/Kg	1	10/1/2016 6:57:19 PM	27710
Cadmium	ND	0.063	0.099		mg/Kg	1	10/1/2016 6:57:19 PM	27710
Chromium	8.9	0.093	0.30		mg/Kg	1	10/1/2016 6:57:19 PM	27710
Cobalt	3.6	0.11	0.30		mg/Kg	1	10/1/2016 6:57:19 PM	27710
Iron	14000	74	250		mg/Kg	100	10/1/2016 3:11:41 PM	27710
Lead	7.2	0.17	0.25		mg/Kg	1	10/1/2016 6:57:19 PM	27710
Manganese	220	0.053	0.099		mg/Kg	1	10/1/2016 6:57:19 PM	27710
Nickel	7.1	0.15	0.49		mg/Kg	1	10/1/2016 6:57:19 PM	27710
Selenium	ND	1.8	2.5		mg/Kg	1	10/1/2016 6:57:19 PM	27710
Silver	ND	0.062	0.25		mg/Kg	1	10/1/2016 6:57:19 PM	27710
Vanadium	14	0.17	2.5		mg/Kg	1	10/1/2016 6:57:19 PM	27710
Zinc	13	0.34	2.5		mg/Kg	1	10/1/2016 6:57:19 PM	27710
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.84	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Acenaphthylene	ND	0.80	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Aniline	ND	0.92	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Anthracene	ND	0.65	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Azobenzene	ND	1.2	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Benz(a)anthracene	ND	0.84	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Benzo(a)pyrene	ND	0.74	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Benzo(b)fluoranthene	ND	0.88	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Benzo(g,h,i)perylene	ND	0.86	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Benzo(k)fluoranthene	ND	0.86	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Benzoic acid	2.1	0.81	4.9	JD	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Benzyl alcohol	ND	0.76	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Bis(2-chloroethoxy)methane	ND	1.1	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Bis(2-chloroethyl)ether	ND	0.72	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Bis(2-chloroisopropyl)ether	ND	0.87	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Bis(2-ethylhexyl)phthalate	ND	0.80	4.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: TK-568-1 (12-14')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/23/2016 12:30:00 PM

 Lab ID:
 1609E26-008
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.93	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Butyl benzyl phthalate	ND	0.87	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Carbazole	ND	0.66	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
4-Chloro-3-methylphenol	ND	1.2	4.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
4-Chloroaniline	ND	1.1	4.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2-Chloronaphthalene	ND	0.77	2.4	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2-Chlorophenol	ND	0.77	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
4-Chlorophenyl phenyl ether	ND	1.1	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Chrysene	ND	0.83	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Di-n-butyl phthalate	ND	0.73	3.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Di-n-octyl phthalate	ND	0.83	3.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Dibenz(a,h)anthracene	ND	0.79	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Dibenzofuran	ND	0.98	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
1,2-Dichlorobenzene	ND	0.75	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
1,3-Dichlorobenzene	ND	0.76	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
1,4-Dichlorobenzene	ND	0.83	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
3,3'-Dichlorobenzidine	ND	0.72	2.4	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Diethyl phthalate	ND	0.99	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Dimethyl phthalate	ND	0.96	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2,4-Dichlorophenol	ND	0.91	3.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2,4-Dimethylphenol	ND	1.1	2.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
4,6-Dinitro-2-methylphenol	ND	0.59	3.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2,4-Dinitrophenol	ND	0.65	4.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2,4-Dinitrotoluene	ND	0.87	4.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2,6-Dinitrotoluene	ND	1.0	4.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Fluoranthene	ND	0.56	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Fluorene	ND	0.89	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Hexachlorobenzene	ND	0.77	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Hexachlorobutadiene	ND	1.1	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Hexachlorocyclopentadiene	ND	1.1	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Hexachloroethane	ND	0.84	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Indeno(1,2,3-cd)pyrene	ND	0.76	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Isophorone	ND	1.1	3.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
1-Methylnaphthalene	1.5	0.98	2.0	JD	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2-Methylnaphthalene	3.3	1.2	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2-Methylphenol	ND	0.82	3.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
3+4-Methylphenol	ND	0.71	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
N-Nitrosodi-n-propylamine	ND	0.94	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
N-Nitrosodiphenylamine	ND	0.95	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: TK-568-1 (12-14')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/23/2016 12:30:00 PM

 Lab ID:
 1609E26-008
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	4.2	0.94	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2-Nitroaniline	ND	1.1	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
3-Nitroaniline	ND	0.86	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
4-Nitroaniline	ND	0.69	3.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Nitrobenzene	ND	1.0	3.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2-Nitrophenol	ND	0.97	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
4-Nitrophenol	ND	0.74	2.4	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Pentachlorophenol	ND	0.63	3.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Phenanthrene	ND	0.66	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Phenol	ND	0.74	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Pyrene	ND	0.74	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Pyridine	ND	0.77	3.9	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
1,2,4-Trichlorobenzene	ND	1.1	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2,4,5-Trichlorophenol	ND	0.98	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
2,4,6-Trichlorophenol	ND	0.81	2.0	D	mg/Kg	10	9/30/2016 4:12:22 PM	27733
Surr: 2-Fluorophenol	0	0	35-97.9	SD	%Rec	10	9/30/2016 4:12:22 PM	27733
Surr: Phenol-d5	0	0	37.3-105	SD	%Rec	10	9/30/2016 4:12:22 PM	27733
Surr: 2,4,6-Tribromophenol	0	0	35.6-118	SD	%Rec	10	9/30/2016 4:12:22 PM	27733
Surr: Nitrobenzene-d5	0		41.2-107	SD	%Rec	10	9/30/2016 4:12:22 PM	27733
Surr: 2-Fluorobiphenyl	0		41.9-119	SD	%Rec	10	9/30/2016 4:12:22 PM	27733
Surr: 4-Terphenyl-d14	0		15-132	SD	%Rec	10	9/30/2016 4:12:22 PM	27733
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	3.8	0.50	0.63		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Toluene	76	0.074	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Ethylbenzene	19	0.10	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Methyl tert-butyl ether (MTBE)	ND	0.39	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,2,4-Trimethylbenzene	32	0.092	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,3,5-Trimethylbenzene	11	0.091	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,2-Dichloroethane (EDC)	ND	0.33	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,2-Dibromoethane (EDB)	ND	0.089	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Naphthalene	3.0	0.20	2.5		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1-Methylnaphthalene	0.59	0.28	5.0	J	mg/Kg	50	9/27/2016 5:53:15 PM	R37518
2-Methylnaphthalene	1.6	0.27	5.0	J	mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Acetone	ND	1.6	19		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Bromobenzene	ND	0.10	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Bromodichloromethane	ND	0.073	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Bromoform	ND	0.15	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Bromomethane	ND	0.46	3.8		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
2-Butanone	ND	0.72	13		mg/Kg	50	9/27/2016 5:53:15 PM	R37518

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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CLIENT: Western Refining Company

Date Reported: 10/28/2016

Client Sample ID: TK-568-1 (12-14')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/23/2016 12:30:00 PM

 Lab ID:
 1609E26-008
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.41	13		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Carbon tetrachloride	ND	0.082	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Chlorobenzene	ND	0.10	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Chloroethane	ND	0.25	2.5		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Chloroform	ND	0.095	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Chloromethane	ND	0.11	3.8		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
2-Chlorotoluene	ND	0.092	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
4-Chlorotoluene	ND	0.11	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
cis-1,2-DCE	ND	0.073	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
cis-1,3-Dichloropropene	ND	0.12	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,2-Dibromo-3-chloropropane	ND	0.38	2.5		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Dibromochloromethane	ND	0.11	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Dibromomethane	ND	0.11	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,2-Dichlorobenzene	ND	0.11	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,3-Dichlorobenzene	ND	0.10	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,4-Dichlorobenzene	ND	0.16	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Dichlorodifluoromethane	ND	0.39	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,1-Dichloroethane	ND	0.068	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,1-Dichloroethene	ND	0.41	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,2-Dichloropropane	ND	0.11	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,3-Dichloropropane	ND	0.14	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
2,2-Dichloropropane	ND	0.072	2.5		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,1-Dichloropropene	ND	0.099	2.5		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Hexachlorobutadiene	ND	0.15	2.5		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
2-Hexanone	ND	0.68	13		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Isopropylbenzene	0.94	0.11	1.3	J	mg/Kg	50	9/27/2016 5:53:15 PM	R37518
4-Isopropyltoluene	ND	0.11	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
4-Methyl-2-pentanone	ND	0.37	13		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Methylene chloride	ND	0.36	3.8		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
n-Butylbenzene	1.3	0.11	3.8	J	mg/Kg	50	9/27/2016 5:53:15 PM	R37518
n-Propylbenzene	5.2	0.097	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
sec-Butylbenzene	0.49	0.17	1.3	J	mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Styrene	ND	0.11	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
tert-Butylbenzene	ND	0.10	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,1,1,2-Tetrachloroethane	ND	0.12	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,1,2,2-Tetrachloroethane	ND	0.20	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Tetrachloroethene (PCE)	ND	0.10	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
trans-1,2-DCE	ND	0.35	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
trans-1,3-Dichloropropene	ND	0.18	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical Report Lab Order 1609E26

Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

Matrix: SOIL

CLIENT: Western Refining Company

1609E26-008

Project:

Lab ID:

OW-14 SOURCE INV

Client Sample ID: TK-568-1 (12-14')

Collection Date: 9/23/2016 12:30:00 PM Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.19	2.5		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,2,4-Trichlorobenzene	ND	0.13	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,1,1-Trichloroethane	ND	0.076	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,1,2-Trichloroethane	ND	0.15	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Trichloroethene (TCE)	ND	0.13	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Trichlorofluoromethane	ND	0.094	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
1,2,3-Trichloropropane	ND	0.22	2.5		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Vinyl chloride	ND	0.10	1.3		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Xylenes, Total	120	0.24	2.5		mg/Kg	50	9/27/2016 5:53:15 PM	R37518
Surr: Dibromofluoromethane	85.9		70-130		%Rec	50	9/27/2016 5:53:15 PM	R37518
Surr: 1,2-Dichloroethane-d4	87.8		70-130		%Rec	50	9/27/2016 5:53:15 PM	R37518
Surr: Toluene-d8	97.6		70-130		%Rec	50	9/27/2016 5:53:15 PM	R37518
Surr: 4-Bromofluorobenzene	98.2		70-130		%Rec	50	9/27/2016 5:53:15 PM	R37518
EPA METHOD 8015D MOD: GASOLINE	E RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	2700	19	130		mg/Kg	50	9/27/2016 5:53:15 PM	G37518
Surr: BFB	99.1	0	70-130		%Rec	50	9/27/2016 5:53:15 PM	G37518

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

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Date Reported: 10/28/2016

CLIENT: Western Refining Company **Client Sample ID:** TK-568-1 (30-32')

OW-14 SOURCE INV Project: Collection Date: 9/23/2016 1:35:00 PM 1609E26-009 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANIC	S					Analyst: TOM	
Diesel Range Organics (DRO)	11	1.8	9.5		mg/Kg	1	9/29/2016 2:58:55 PM	27772
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	9/29/2016 2:58:55 PM	27772
Surr: DNOP	107	0	70-130		%Rec	1	9/29/2016 2:58:55 PM	27772
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0028	0.00056	0.032	J	mg/Kg	1	9/27/2016 11:44:01 AM	27712
EPA METHOD 6010B: SOIL METALS							Analyst: ELS	
Antimony	ND	0.98	2.4		mg/Kg	1	10/1/2016 7:02:35 PM	27710
Arsenic	1.6	0.87	2.4	J	mg/Kg	1	10/1/2016 7:02:35 PM	27710
Barium	180	0.069	0.097		mg/Kg	1	10/1/2016 7:02:35 PM	27710
Beryllium	0.74	0.034	0.15		mg/Kg	1	10/1/2016 7:02:35 PM	27710
Cadmium	ND	0.062	0.097		mg/Kg	1	10/1/2016 7:02:35 PM	27710
Chromium	7.6	0.092	0.29		mg/Kg	1	10/1/2016 7:02:35 PM	27710
Cobalt	3.3	0.11	0.29		mg/Kg	1	10/1/2016 7:02:35 PM	27710
Iron	12000	74	240		mg/Kg	100	10/1/2016 3:13:13 PM	27710
Lead	3.9	0.17	0.24		mg/Kg	1	10/1/2016 7:02:35 PM	27710
Manganese	290	0.10	0.19		mg/Kg	2	10/1/2016 7:04:27 PM	27710
Nickel	5.9	0.15	0.49		mg/Kg	1	10/1/2016 7:02:35 PM	27710
Selenium	ND	1.8	2.4		mg/Kg	1	10/1/2016 7:02:35 PM	27710
Silver	ND	0.061	0.24		mg/Kg	1	10/1/2016 7:02:35 PM	27710
Vanadium	14	0.17	2.4		mg/Kg	1	10/1/2016 7:02:35 PM	27710
Zinc	11	0.34	2.4		mg/Kg	1	10/1/2016 7:02:35 PM	27710
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Aniline	ND	0.094	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Anthracene	ND	0.066	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Azobenzene	ND	0.12	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Benzoic acid	ND	0.083	0.50		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Bis(2-ethylhexyl)phthalate	0.12	0.081	0.50	J	mg/Kg	1	9/30/2016 4:40:23 PM	27733
, , , , , ,				-	3. 3			

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

Qualifiers: Value exceeds Maximum Contaminant Level.

> D Sample Diluted Due to Matrix

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

Ε Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

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RLReporting Detection Limit

Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Client Sample ID: TK-568-1 (30-32')

CLIENT: Western Refining Company **OW-14 SOURCE INV Project: Collection Date:** 9/23/2016 1:35:00 PM 1609E26-009 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Carbazole	ND	0.067	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	9/30/2016 4:40:23 PM	27733
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Chrysene	ND	0.085	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Di-n-butyl phthalate	0.15	0.074	0.40	J	mg/Kg	1	9/30/2016 4:40:23 PM	27733
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Diethyl phthalate	0.16	0.10	0.20	J	mg/Kg	1	9/30/2016 4:40:23 PM	27733
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	9/30/2016 4:40:23 PM	27733
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Fluoranthene	ND	0.057	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Fluorene	ND	0.091	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Isophorone	ND	0.11	0.40		mg/Kg	1	9/30/2016 4:40:23 PM	27733
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	9/30/2016 4:40:23 PM	27733
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733

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

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Client Sample ID: TK-568-1 (30-32')

CLIENT: Western Refining Company **OW-14 SOURCE INV Project: Collection Date:** 9/23/2016 1:35:00 PM 1609E26-009 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	ND	0.096	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Phenanthrene	ND	0.068	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Phenol	ND	0.075	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Pyrene	ND	0.075	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Pyridine	ND	0.079	0.40		mg/Kg	1	9/30/2016 4:40:23 PM	27733
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	9/30/2016 4:40:23 PM	27733
Surr: 2-Fluorophenol	64.5	0	35-97.9		%Rec	1	9/30/2016 4:40:23 PM	27733
Surr: Phenol-d5	68.0	0	37.3-105		%Rec	1	9/30/2016 4:40:23 PM	27733
Surr: 2,4,6-Tribromophenol	76.9	0	35.6-118		%Rec	1	9/30/2016 4:40:23 PM	27733
Surr: Nitrobenzene-d5	60.4		41.2-107		%Rec	1	9/30/2016 4:40:23 PM	27733
Surr: 2-Fluorobiphenyl	63.0		41.9-119		%Rec	1	9/30/2016 4:40:23 PM	27733
Surr: 4-Terphenyl-d14	63.6		15-132		%Rec	1	9/30/2016 4:40:23 PM	27733
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.26	0.12	0.15		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Toluene	0.40	0.018	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Ethylbenzene	1.5	0.025	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Methyl tert-butyl ether (MTBE)	1.0	0.095	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,2,4-Trimethylbenzene	5.5	0.022	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,3,5-Trimethylbenzene	1.9	0.022	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,2-Dichloroethane (EDC)	ND	0.078	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,2-Dibromoethane (EDB)	ND	0.021	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Naphthalene	0.61	0.047	0.60		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1-Methylnaphthalene	0.23	0.067	1.2	J	mg/Kg	10	9/27/2016 6:21:51 PM	R37518
2-Methylnaphthalene	0.55	0.064	1.2	J	mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Acetone	ND	0.39	4.5		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Bromobenzene	ND	0.024	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Bromodichloromethane	ND	0.018	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Bromoform	ND	0.037	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Bromomethane	ND	0.11	0.90		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
2-Butanone	ND	0.17	3.0		mg/Kg	10	9/27/2016 6:21:51 PM	R37518

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

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK-568-1 (30-32')

Collection Date: 9/23/2016 1:35:00 PM

OW-14 SOURCE INV Project: 1609E26-009 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.099	3.0		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Carbon tetrachloride	ND	0.020	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Chlorobenzene	ND	0.024	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Chloroethane	ND	0.060	0.60		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Chloroform	ND	0.023	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Chloromethane	ND	0.027	0.90		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
2-Chlorotoluene	ND	0.022	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
4-Chlorotoluene	ND	0.027	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
cis-1,2-DCE	ND	0.017	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
cis-1,3-Dichloropropene	ND	0.028	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,2-Dibromo-3-chloropropane	ND	0.092	0.60		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Dibromochloromethane	ND	0.027	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Dibromomethane	ND	0.026	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,2-Dichlorobenzene	ND	0.026	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,3-Dichlorobenzene	ND	0.025	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,4-Dichlorobenzene	ND	0.037	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Dichlorodifluoromethane	ND	0.093	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,1-Dichloroethane	ND	0.016	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,1-Dichloroethene	ND	0.099	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,2-Dichloropropane	ND	0.025	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,3-Dichloropropane	ND	0.034	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
2,2-Dichloropropane	ND	0.017	0.60		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,1-Dichloropropene	ND	0.024	0.60		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Hexachlorobutadiene	ND	0.037	0.60		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
2-Hexanone	ND	0.16	3.0		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Isopropylbenzene	0.11	0.026	0.30	J	mg/Kg	10	9/27/2016 6:21:51 PM	R37518
4-Isopropyltoluene	ND	0.027	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
4-Methyl-2-pentanone	ND	0.088	3.0		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Methylene chloride	ND	0.087	0.90		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
n-Butylbenzene	0.37	0.027	0.90	J	mg/Kg	10	9/27/2016 6:21:51 PM	R37518
n-Propylbenzene	0.83	0.023	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
sec-Butylbenzene	0.11	0.042	0.30	J	mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Styrene	ND	0.027	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
tert-Butylbenzene	ND	0.025	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,1,1,2-Tetrachloroethane	ND	0.029	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,1,2,2-Tetrachloroethane	ND	0.049	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Tetrachloroethene (PCE)	ND	0.025	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
trans-1,2-DCE	ND	0.084	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
trans-1,3-Dichloropropene	ND	0.044	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518

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

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Analytical Report Lab Order 1609E26

Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK-568-1 (30-32')

Collection Date: 9/23/2016 1:35:00 PM

OW-14 SOURCE INV Project: 1609E26-009 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.045	0.60		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,2,4-Trichlorobenzene	ND	0.032	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,1,1-Trichloroethane	ND	0.018	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,1,2-Trichloroethane	ND	0.035	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Trichloroethene (TCE)	ND	0.032	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Trichlorofluoromethane	ND	0.022	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
1,2,3-Trichloropropane	ND	0.052	0.60		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Vinyl chloride	ND	0.025	0.30		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Xylenes, Total	9.1	0.057	0.60		mg/Kg	10	9/27/2016 6:21:51 PM	R37518
Surr: Dibromofluoromethane	89.8		70-130		%Rec	10	9/27/2016 6:21:51 PM	R37518
Surr: 1,2-Dichloroethane-d4	89.8		70-130		%Rec	10	9/27/2016 6:21:51 PM	R37518
Surr: Toluene-d8	96.4		70-130		%Rec	10	9/27/2016 6:21:51 PM	R37518
Surr: 4-Bromofluorobenzene	98.5		70-130		%Rec	10	9/27/2016 6:21:51 PM	R37518
EPA METHOD 8015D MOD: GASOLINE	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	330	4.5	30		mg/Kg	10	9/27/2016 6:21:51 PM	G37518
Surr: BFB	96.3	0	70-130		%Rec	10	9/27/2016 6:21:51 PM	G37518

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

Qualifiers:

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- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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CLIENT: Western Refining Company

Date Reported: 10/28/2016

Client Sample ID: TK-568-1 (48-49')

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/23/2016 2:00:00 PM

 Lab ID:
 1609E26-010
 Matrix: SOIL
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS	S					Analyst: TOM	
Diesel Range Organics (DRO)	8.4	1.8	9.9	J	mg/Kg	1	9/29/2016 4:08:16 PM	27772
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	9/29/2016 4:08:16 PM	27772
Surr: DNOP	106	0	70-130		%Rec	1	9/29/2016 4:08:16 PM	27772
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.00089	0.00055	0.032	J	mg/Kg	1	9/27/2016 11:45:50 AM	27712
EPA METHOD 6010B: SOIL METALS							Analyst: ELS	
Antimony	ND	1.0	2.5		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Arsenic	2.7	0.88	2.5		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Barium	35	0.071	0.10		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Beryllium	0.74	0.034	0.15		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Cadmium	ND	0.063	0.10		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Chromium	8.3	0.094	0.30		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Cobalt	5.7	0.11	0.30		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Iron	9300	75	250		mg/Kg	100	10/1/2016 3:14:47 PM	27710
Lead	0.54	0.17	0.25		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Manganese	120	0.053	0.10		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Nickel	8.6	0.15	0.50		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Selenium	ND	1.8	2.5		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Silver	ND	0.062	0.25		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Vanadium	26	0.18	2.5		mg/Kg	1	10/1/2016 7:07:57 PM	27710
Zinc	27	0.35	2.5		mg/Kg	1	10/1/2016 7:07:57 PM	27710
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.086	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Aniline	ND	0.095	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Anthracene	ND	0.066	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Azobenzene	ND	0.12	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Benzo(a)pyrene	ND	0.076	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Benzoic acid	ND	0.083	0.50		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Bis(2-chloroethyl)ether	ND	0.074	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Bis(2-ethylhexyl)phthalate	0.14	0.082	0.50	J	mg/Kg	1	9/30/2016 5:08:19 PM	27733

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 10/28/2016

CLIENT: Western Refining Company **Client Sample ID:** TK-568-1 (48-49')

OW-14 SOURCE INV Project: Collection Date: 9/23/2016 2:00:00 PM 1609E26-010 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.096	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Butyl benzyl phthalate	ND	0.089	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Carbazole	ND	0.068	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	9/30/2016 5:08:19 PM	27733
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2-Chloronaphthalene	ND	0.079	0.25		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2-Chlorophenol	ND	0.079	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Chrysene	ND	0.085	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Di-n-butyl phthalate	0.20	0.075	0.40	J	mg/Kg	1	9/30/2016 5:08:19 PM	27733
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
1,2-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
1,4-Dichlorobenzene	ND	0.085	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
3,3´-Dichlorobenzidine	ND	0.074	0.25		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Diethyl phthalate	0.16	0.10	0.20	J	mg/Kg	1	9/30/2016 5:08:19 PM	27733
Dimethyl phthalate	ND	0.098	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	9/30/2016 5:08:19 PM	27733
4,6-Dinitro-2-methylphenol	ND	0.061	0.40		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Fluoranthene	ND	0.058	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Fluorene	ND	0.092	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Isophorone	ND	0.11	0.40		mg/Kg	1	9/30/2016 5:08:19 PM	27733
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2-Methylphenol	ND	0.084	0.40		mg/Kg	1	9/30/2016 5:08:19 PM	27733
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
N-Nitrosodiphenylamine	ND	0.098	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733

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

Qualifiers: Value exceeds Maximum Contaminant Level.

> D Sample Diluted Due to Matrix

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

Ε Value above quantitation range

J Analyte detected below quantitation limits

Sample pH Not In Range

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P

RLReporting Detection Limit

Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Project:

OW-14 SOURCE INV

Client Sample ID: TK-568-1 (48-49')

Collection Date: 9/23/2016 2:00:00 PM

Lab ID: 1609E26-010 **Matrix:** SOIL **Received Date:** 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	ND	0.096	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
4-Nitroaniline	ND	0.071	0.40		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Phenanthrene	ND	0.068	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Phenol	ND	0.075	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Pyrene	ND	0.076	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Pyridine	ND	0.079	0.40		mg/Kg	1	9/30/2016 5:08:19 PM	27733
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	9/30/2016 5:08:19 PM	27733
Surr: 2-Fluorophenol	60.1	0	35-97.9		%Rec	1	9/30/2016 5:08:19 PM	27733
Surr: Phenol-d5	64.3	0	37.3-105		%Rec	1	9/30/2016 5:08:19 PM	27733
Surr: 2,4,6-Tribromophenol	67.9	0	35.6-118		%Rec	1	9/30/2016 5:08:19 PM	27733
Surr: Nitrobenzene-d5	55.2		41.2-107		%Rec	1	9/30/2016 5:08:19 PM	27733
Surr: 2-Fluorobiphenyl	59.3		41.9-119		%Rec	1	9/30/2016 5:08:19 PM	27733
Surr: 4-Terphenyl-d14	55.7		15-132		%Rec	1	9/30/2016 5:08:19 PM	27733
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.041	0.012	0.016		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Toluene	ND	0.0018	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Ethylbenzene	ND	0.0026	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Methyl tert-butyl ether (MTBE)	0.014	0.0098	0.031	J	mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,2,4-Trimethylbenzene	0.011	0.0023	0.031	J	mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,3,5-Trimethylbenzene	0.0025	0.0023	0.031	J	mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,2-Dichloroethane (EDC)	ND	0.0081	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,2-Dibromoethane (EDB)	ND	0.0022	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Naphthalene	ND	0.0049	0.062		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1-Methylnaphthalene	ND	0.0069	0.12		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
2-Methylnaphthalene	ND	0.0067	0.12		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Acetone	ND	0.040	0.47		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Bromobenzene	ND	0.0025	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Bromodichloromethane	ND	0.0018	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Bromoform	ND	0.0038	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Bromomethane	0.012	0.012	0.094	J	mg/Kg	1	9/27/2016 6:50:22 PM	R37518
2-Butanone	ND	0.018	0.31		mg/Kg	1	9/27/2016 6:50:22 PM	R37518

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

Collection Date: 9/23/2016 2:00:00 PM

CLIENT: Western Refining Company **Client Sample ID:** TK-568-1 (48-49') **OW-14 SOURCE INV Project:** 1609E26-010 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.010	0.31		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Carbon tetrachloride	ND	0.0021	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Chlorobenzene	ND	0.0025	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Chloroethane	ND	0.0062	0.062		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Chloroform	ND	0.0024	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Chloromethane	ND	0.0028	0.094		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
2-Chlorotoluene	ND	0.0023	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
4-Chlorotoluene	ND	0.0028	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
cis-1,2-DCE	ND	0.0018	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
cis-1,3-Dichloropropene	ND	0.0029	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,2-Dibromo-3-chloropropane	ND	0.0096	0.062		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Dibromochloromethane	ND	0.0028	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Dibromomethane	ND	0.0027	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,2-Dichlorobenzene	ND	0.0027	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,3-Dichlorobenzene	ND	0.0026	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,4-Dichlorobenzene	ND	0.0039	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Dichlorodifluoromethane	ND	0.0097	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,1-Dichloroethane	ND	0.0017	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,1-Dichloroethene	ND	0.010	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,2-Dichloropropane	ND	0.0026	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,3-Dichloropropane	ND	0.0035	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
2,2-Dichloropropane	ND	0.0018	0.062		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,1-Dichloropropene	ND	0.0025	0.062		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Hexachlorobutadiene	ND	0.0038	0.062		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
2-Hexanone	ND	0.017	0.31		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Isopropylbenzene	ND	0.0027	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
4-Isopropyltoluene	ND	0.0028	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
4-Methyl-2-pentanone	ND	0.0091	0.31		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Methylene chloride	ND	0.0090	0.094		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
n-Butylbenzene	ND	0.0028	0.094		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
n-Propylbenzene	ND	0.0024	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
sec-Butylbenzene	ND	0.0043	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Styrene	ND	0.0028	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
tert-Butylbenzene	ND	0.0026	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,1,1,2-Tetrachloroethane	ND	0.0030	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,1,2,2-Tetrachloroethane	ND	0.0051	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Tetrachloroethene (PCE)	ND	0.0026	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
trans-1,2-DCE	ND	0.0087	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
trans-1,3-Dichloropropene	ND	0.0046	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518

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

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK-568-1 (48-49')

OW-14 SOURCE INV Project: Collection Date: 9/23/2016 2:00:00 PM 1609E26-010 Lab ID: Matrix: SOIL Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.0047	0.062		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,2,4-Trichlorobenzene	ND	0.0033	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,1,1-Trichloroethane	ND	0.0019	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,1,2-Trichloroethane	ND	0.0037	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Trichloroethene (TCE)	ND	0.0033	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Trichlorofluoromethane	ND	0.0023	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
1,2,3-Trichloropropane	ND	0.0054	0.062		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Vinyl chloride	ND	0.0026	0.031		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Xylenes, Total	ND	0.0059	0.062		mg/Kg	1	9/27/2016 6:50:22 PM	R37518
Surr: Dibromofluoromethane	108		70-130		%Rec	1	9/27/2016 6:50:22 PM	R37518
Surr: 1,2-Dichloroethane-d4	103		70-130		%Rec	1	9/27/2016 6:50:22 PM	R37518
Surr: Toluene-d8	96.5		70-130		%Rec	1	9/27/2016 6:50:22 PM	R37518
Surr: 4-Bromofluorobenzene	90.7		70-130		%Rec	1	9/27/2016 6:50:22 PM	R37518
EPA METHOD 8015D MOD: GASOLINE	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	1.3	0.47	3.1	J	mg/Kg	1	9/27/2016 6:50:22 PM	G37518
Surr: BFB	92.4	0	70-130		%Rec	1	9/27/2016 6:50:22 PM	G37518

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

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining CompanyClient Sample ID: DUP01Project: OW-14 SOURCE INVCollection Date: 9/23/2016

Lab ID: 1609E26-011 **Matrix:** SOIL **Received Date:** 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS	3					Analyst: TOM	
Diesel Range Organics (DRO)	430	1.8	9.6		mg/Kg	1	9/29/2016 4:31:18 PM	27772
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	9/29/2016 4:31:18 PM	27772
Surr: DNOP	110	0	70-130		%Rec	1	9/29/2016 4:31:18 PM	27772
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0045	0.00055	0.032	J	mg/Kg	1	9/27/2016 11:47:36 AM	27712
EPA METHOD 6010B: SOIL METALS							Analyst: ELS	
Antimony	ND	1.0	2.5		mg/Kg	1	10/1/2016 7:22:09 PM	27710
Arsenic	1.6	0.89	2.5	J	mg/Kg	1	10/1/2016 7:22:09 PM	27710
Barium	210	0.071	0.10		mg/Kg	1	10/1/2016 7:22:09 PM	27710
Beryllium	0.62	0.035	0.15		mg/Kg	1	10/1/2016 7:22:09 PM	27710
Cadmium	ND	0.063	0.10		mg/Kg	1	10/1/2016 7:22:09 PM	27710
Chromium	6.4	0.095	0.30		mg/Kg	1	10/1/2016 7:22:09 PM	27710
Cobalt	3.0	0.11	0.30		mg/Kg	1	10/1/2016 7:22:09 PM	27710
Iron	10000	76	250		mg/Kg	100	10/1/2016 3:16:20 PM	27710
Lead	6.0	0.17	0.25		mg/Kg	1	10/1/2016 7:22:09 PM	27710
Manganese	300	0.11	0.20		mg/Kg	2	10/1/2016 7:23:57 PM	27710
Nickel	5.2	0.15	0.50		mg/Kg	1	10/1/2016 7:22:09 PM	27710
Selenium	ND	1.8	2.5		mg/Kg	1	10/1/2016 7:22:09 PM	27710
Silver	ND	0.063	0.25		mg/Kg	1	10/1/2016 7:22:09 PM	27710
Vanadium	12	0.18	2.5		mg/Kg	1	10/1/2016 7:22:09 PM	27710
Zinc	9.4	0.35	2.5		mg/Kg	1	10/1/2016 7:22:09 PM	27710
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Aniline	ND	0.001	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Anthracene	ND	0.066	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Azobenzene	ND	0.000	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Benz(a)anthracene	ND	0.085	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Benzo(a)pyrene	ND	0.005	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Benzo(b)fluoranthene	ND	0.073	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Benzo(g,h,i)perylene	ND	0.090	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Benzo(k)fluoranthene	ND	0.087	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Benzoic acid	ND	0.087	0.50		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Benzyl alcohol	ND	0.002	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Bis(2-chloroethoxy)methane	ND	0.076	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Bis(2-chloroethyl)ether	ND ND	0.11	0.20			1	9/30/2016 5:36:06 PM	27733 27733
` ' '	ND ND	0.073	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Bis(2-chloroisopropyl)ether		0.089		1	mg/Kg	1		
Bis(2-ethylhexyl)phthalate	0.15	0.081	0.50	J	mg/Kg	1	9/30/2016 5:36:06 PM	27733

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: DUP01

Project: OW-14 SOURCE INV

Collection Date: 9/23/2016

Lab ID: 1609E26-011 **Matrix:** SOIL **Received Date:** 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Carbazole	ND	0.067	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	9/30/2016 5:36:06 PM	27733
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	9/30/2016 5:36:06 PM	27733
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	9/30/2016 5:36:06 PM	27733
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Chrysene	ND	0.084	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Di-n-butyl phthalate	0.17	0.074	0.40	J	mg/Kg	1	9/30/2016 5:36:06 PM	27733
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Diethyl phthalate	0.17	0.10	0.20	J	mg/Kg	1	9/30/2016 5:36:06 PM	27733
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	9/30/2016 5:36:06 PM	27733
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	9/30/2016 5:36:06 PM	27733
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	9/30/2016 5:36:06 PM	27733
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	9/30/2016 5:36:06 PM	27733
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	9/30/2016 5:36:06 PM	27733
2,6-Dinitrotoluene	ND	0.10	0.50		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Fluoranthene	ND	0.057	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Fluorene	ND	0.091	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Indeno(1,2,3-cd)pyrene	ND	0.077	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Isophorone	ND	0.11	0.40		mg/Kg	1	9/30/2016 5:36:06 PM	27733
1-Methylnaphthalene	1.6	0.10	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
2-Methylnaphthalene	3.7	0.12	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	9/30/2016 5:36:06 PM	27733
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
N-Nitrosodi-n-propylamine	ND	0.095	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Project:

OW-14 SOURCE INV

Client Sample ID: DUP01

Collection Date: 9/23/2016

Lab ID: 1609E26-011 **Matrix:** SOIL **Received Date:** 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	4.2	0.19	0.40		mg/Kg	2	10/3/2016 1:02:41 PM	27733
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
3-Nitroaniline	ND	0.087	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	9/30/2016 5:36:06 PM	27733
2-Nitrophenol	ND	0.098	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Phenanthrene	ND	0.067	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Phenol	ND	0.075	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Pyrene	ND	0.075	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Pyridine	ND	0.079	0.40		mg/Kg	1	9/30/2016 5:36:06 PM	27733
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
2,4,5-Trichlorophenol	ND	0.099	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
2,4,6-Trichlorophenol	ND	0.082	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Surr: 2-Fluorophenol	25.9	0	35-97.9	S	%Rec	1	9/30/2016 5:36:06 PM	27733
Surr: Phenol-d5	11.7	0	37.3-105	S	%Rec	1	9/30/2016 5:36:06 PM	27733
Surr: 2,4,6-Tribromophenol	86.3	0	35.6-118		%Rec	1	9/30/2016 5:36:06 PM	27733
Surr: Nitrobenzene-d5	39.7		41.2-107	S	%Rec	1	9/30/2016 5:36:06 PM	27733
Surr: 2-Fluorobiphenyl	78.5		41.9-119		%Rec	1	9/30/2016 5:36:06 PM	27733
Surr: 4-Terphenyl-d14	68.9		15-132		%Rec	1	9/30/2016 5:36:06 PM	27733
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.39	0.10	0.13		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Toluene	0.46	0.016	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	
Ethylbenzene	1.5	0.021	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	
Methyl tert-butyl ether (MTBE)	1.1	0.082	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	
1,2,4-Trimethylbenzene	5.3	0.019	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	
1,3,5-Trimethylbenzene	1.8	0.019	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	
1,2-Dichloroethane (EDC)	ND	0.068	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	
1,2-Dibromoethane (EDB)	ND	0.019	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Naphthalene	0.58	0.041	0.52		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1-Methylnaphthalene	0.19	0.058	1.0	J	mg/Kg	10	9/28/2016 12:46:21 PM	S37546
2-Methylnaphthalene	0.47	0.056	1.0	J	mg/Kg	10	9/28/2016 12:46:21 PM	
Acetone	ND	0.34	3.9		mg/Kg	10	9/28/2016 12:46:21 PM	
Bromobenzene	ND	0.021	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Bromodichloromethane	ND	0.015	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	
Bromoform	ND	0.032	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Bromomethane	ND	0.097	0.79		mg/Kg	10	9/28/2016 12:46:21 PM	
2-Butanone	ND	0.15	2.6		mg/Kg	10	9/28/2016 12:46:21 PM	

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: DUP01

Project: OW-14 SOURCE INV **Collection Date:** 9/23/2016

Lab ID: 1609E26-011 **Matrix:** SOIL **Received Date:** 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.087	2.6		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Carbon tetrachloride	ND	0.017	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Chlorobenzene	ND	0.021	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Chloroethane	ND	0.052	0.52		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Chloroform	ND	0.020	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Chloromethane	ND	0.023	0.79		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
2-Chlorotoluene	ND	0.019	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
4-Chlorotoluene	ND	0.023	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
cis-1,2-DCE	ND	0.015	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
cis-1,3-Dichloropropene	ND	0.024	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,2-Dibromo-3-chloropropane	ND	0.080	0.52		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Dibromochloromethane	ND	0.024	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Dibromomethane	ND	0.023	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,2-Dichlorobenzene	ND	0.023	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,3-Dichlorobenzene	ND	0.021	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,4-Dichlorobenzene	ND	0.032	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Dichlorodifluoromethane	ND	0.081	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,1-Dichloroethane	ND	0.014	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,1-Dichloroethene	ND	0.086	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,2-Dichloropropane	ND	0.022	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,3-Dichloropropane	ND	0.030	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
2,2-Dichloropropane	ND	0.015	0.52		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,1-Dichloropropene	ND	0.021	0.52		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Hexachlorobutadiene	ND	0.032	0.52		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
2-Hexanone	ND	0.14	2.6		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Isopropylbenzene	0.11	0.023	0.26	J	mg/Kg	10	9/28/2016 12:46:21 PM	S37546
4-Isopropyltoluene	ND	0.024	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
4-Methyl-2-pentanone	ND	0.076	2.6		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Methylene chloride	ND	0.076	0.79		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
n-Butylbenzene	0.34	0.023	0.79	J	mg/Kg	10	9/28/2016 12:46:21 PM	S37546
n-Propylbenzene	0.81	0.020	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
sec-Butylbenzene	0.11	0.036	0.26	J	mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Styrene	ND	0.023	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
tert-Butylbenzene	ND	0.022	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,1,1,2-Tetrachloroethane	ND	0.025	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,1,2,2-Tetrachloroethane	ND	0.042	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Tetrachloroethene (PCE)	ND	0.022	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
trans-1,2-DCE	ND	0.073	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
trans-1,3-Dichloropropene	ND	0.038	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

e detected below quantitation limits Page 55 of 104

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Project:

OW-14 SOURCE INV

Client Sample ID: DUP01

Collection Date: 9/23/2016

Lab ID: 1609E26-011 **Matrix:** SOIL **Received Date:** 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.039	0.52		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,2,4-Trichlorobenzene	ND	0.028	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,1,1-Trichloroethane	ND	0.016	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,1,2-Trichloroethane	ND	0.031	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Trichloroethene (TCE)	ND	0.028	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Trichlorofluoromethane	ND	0.020	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,2,3-Trichloropropane	ND	0.045	0.52		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Vinyl chloride	ND	0.021	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Xylenes, Total	9.2	0.050	0.52		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Surr: Dibromofluoromethane	89.5		70-130		%Rec	10	9/28/2016 12:46:21 PM	S37546
Surr: 1,2-Dichloroethane-d4	93.2		70-130		%Rec	10	9/28/2016 12:46:21 PM	S37546
Surr: Toluene-d8	98.0		70-130		%Rec	10	9/28/2016 12:46:21 PM	S37546
Surr: 4-Bromofluorobenzene	96.3		70-130		%Rec	10	9/28/2016 12:46:21 PM	S37546
EPA METHOD 8015D MOD: GASOLINE	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	340	3.9	26		mg/Kg	10	9/28/2016 12:46:21 PM	G37546
Surr: BFB	98.6	0	70-130		%Rec	10	9/28/2016 12:46:21 PM	G37546

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092216

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 4:45:00 PM

 Lab ID:
 1609E26-012
 Matrix: AQUEOUS
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RA	NGE						Analyst: JME	
Diesel Range Organics (DRO)	ND	0.69	1.0		mg/L	1	9/29/2016 2:37:13 AM	27760
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	9/29/2016 2:37:13 AM	27760
Surr: DNOP	122	0	77.1-144		%Rec	1	9/29/2016 2:37:13 AM	27760
EPA METHOD 8015D: GASOLINE R	ANGE						Analyst: NSB	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	9/29/2016 6:04:06 PM	AG3756
Surr: BFB	84.7	0	66.4-120		%Rec	1	9/29/2016 6:04:06 PM	AG3756
EPA METHOD 300.0: ANIONS							Analyst: LGT	
Fluoride	ND	0.050	0.10		mg/L	1	10/4/2016 1:44:19 PM	R37700
Chloride	0.091	0.051	0.50	J	mg/L	1	10/4/2016 1:44:19 PM	R37700
Sulfate	ND	0.14	0.50		mg/L	1	10/4/2016 1:44:19 PM	R37700
EPA METHOD 200.7: DISSOLVED N	IETALS						Analyst: MED	
Barium	ND	0.0013	0.0020		mg/L	1	10/15/2016 1:50:09 PM	B37965
Beryllium	ND	0.00031	0.0020		mg/L	1	10/15/2016 1:50:09 PM	B37965
Cadmium	ND	0.00075	0.0020		mg/L	1	10/15/2016 1:50:09 PM	B37965
Chromium	ND	0.0018	0.0060		mg/L	1	10/15/2016 1:50:09 PM	B37965
Cobalt	ND	0.00074	0.0060		mg/L	1	10/15/2016 1:50:09 PM	B37965
Iron	ND	0.020	0.020		mg/L	1	10/15/2016 1:50:09 PM	B37965
Manganese	0.00061	0.00032	0.0020	J	mg/L	1	10/15/2016 1:50:09 PM	B37965
Nickel	ND	0.0024	0.010		mg/L	1	10/15/2016 1:50:09 PM	B37965
Silver	ND	0.0028	0.0050		mg/L	1	10/15/2016 1:50:09 PM	B37965
Vanadium	ND	0.0013	0.050		mg/L	1	10/15/2016 1:50:09 PM	B37965
Zinc	ND	0.0028	0.010		mg/L	1	10/15/2016 1:50:09 PM	B37965
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	ND	0.0013	0.0020		mg/L	1	10/17/2016 2:26:27 PM	A37991
Beryllium	ND	0.00036	0.0020		mg/L	1	10/17/2016 2:26:27 PM	A37991
Cadmium	ND	0.0015	0.0020		mg/L	1	10/17/2016 2:26:27 PM	A37991
Chromium	ND	0.0027	0.0060		mg/L	1	10/17/2016 2:26:27 PM	A37991
Cobalt	ND	0.0017	0.0060		mg/L	1	10/17/2016 2:26:27 PM	A37991
Iron	ND	0.020	0.020		mg/L	1	10/17/2016 2:26:27 PM	A37991
Manganese	ND	0.00032	0.0020		mg/L	1	10/17/2016 2:26:27 PM	
Nickel	ND	0.0031	0.010		mg/L	1	10/17/2016 2:26:27 PM	
Silver	ND	0.0028	0.0050		mg/L	1	10/17/2016 2:26:27 PM	
Vanadium	ND	0.0013	0.050		mg/L	1	10/17/2016 2:26:27 PM	
Zinc	ND	0.0027	0.010		mg/L	1	10/17/2016 2:26:27 PM	A37991
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/11/2016 2:34:36 PM	A37903
Arsenic	ND	0.00014	0.0010		mg/L	1	10/10/2016 9:46:22 PM	B37384

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092216

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 4:45:00 PM

 Lab ID:
 1609E26-012
 Matrix: AQUEOUS
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Lead	ND	0.00017	0.00050		mg/L	1	10/11/2016 2:34:36 PM	A37903
Selenium	ND	0.00021	0.0010		mg/L	1	10/10/2016 9:46:22 PM	
EPA 200.8: METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/13/2016 6:10:20 PM	A37945
Arsenic	ND	0.00021	0.0010		mg/L	1	10/13/2016 6:10:20 PM	
Lead	ND	0.00017	0.00050		mg/L	1	10/13/2016 6:10:20 PM	A37945
Selenium	ND	0.00021	0.0010		mg/L	1	10/13/2016 6:10:20 PM	A37945
EPA METHOD 245.1: MERCURY							Analyst: pmf	
Mercury	ND	0.000053	0.00020		mg/L	1	10/5/2016 12:05:41 PM	27892
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Acenaphthylene	ND	2.4	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Aniline	ND	2.4	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Anthracene	ND	2.5	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Azobenzene	ND	2.7	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Benz(a)anthracene	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Benzo(a)pyrene	ND	2.7	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Benzo(b)fluoranthene	ND	2.9	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Benzo(g,h,i)perylene	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Benzo(k)fluoranthene	ND	3.0	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Benzoic acid	5.0	2.6	20	J	μg/L	1	9/30/2016 8:23:31 PM	27764
Benzyl alcohol	ND	3.0	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Bis(2-chloroethoxy)methane	ND	2.8	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Bis(2-chloroethyl)ether	ND	2.7	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Bis(2-chloroisopropyl)ether	ND	1.9	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Bis(2-ethylhexyl)phthalate	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
4-Bromophenyl phenyl ether	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Butyl benzyl phthalate	ND	2.5	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Carbazole	ND	2.3	10		μg/L	1	9/30/2016 8:23:31 PM	27764
4-Chloro-3-methylphenol	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
4-Chloroaniline	ND	2.7	10		μg/L	1	9/30/2016 8:23:31 PM	27764
2-Chloronaphthalene	ND	2.3	10		μg/L	1	9/30/2016 8:23:31 PM	27764
2-Chlorophenol	ND	2.2	10		μg/L	1	9/30/2016 8:23:31 PM	27764
4-Chlorophenyl phenyl ether	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Chrysene	ND	2.8	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Di-n-butyl phthalate	ND	2.4	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Di-n-octyl phthalate	ND	2.0	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	9/30/2016 8:23:31 PM	27764

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

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E Value above quantitation range

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P Sample pH Not In Range

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W Sample container temperature is out of limit as specified

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Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: EB092216

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 4:45:00 PM

 Lab ID:
 1609E26-012
 Matrix: AQUEOUS
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Dibenzofuran	ND	2.5	10		μg/L	1	9/30/2016 8:23:31 PM	27764
1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	9/30/2016 8:23:31 PM	27764
1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	9/30/2016 8:23:31 PM	27764
1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	9/30/2016 8:23:31 PM	27764
3,3'-Dichlorobenzidine	ND	2.4	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Diethyl phthalate	ND	2.7	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Dimethyl phthalate	ND	2.4	10		μg/L	1	9/30/2016 8:23:31 PM	27764
2,4-Dichlorophenol	ND	2.3	20		μg/L	1	9/30/2016 8:23:31 PM	27764
2,4-Dimethylphenol	ND	3.0	10		μg/L	1	9/30/2016 8:23:31 PM	27764
4,6-Dinitro-2-methylphenol	ND	1.8	20		μg/L	1	9/30/2016 8:23:31 PM	27764
2,4-Dinitrophenol	ND	2.8	20		μg/L	1	9/30/2016 8:23:31 PM	27764
2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	9/30/2016 8:23:31 PM	27764
2,6-Dinitrotoluene	ND	2.7	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Fluoranthene	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Fluorene	ND	2.7	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Hexachlorobenzene	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Hexachlorobutadiene	ND	2.2	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Hexachlorocyclopentadiene	ND	2.3	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Hexachloroethane	ND	2.4	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Indeno(1,2,3-cd)pyrene	ND	3.0	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Isophorone	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
1-Methylnaphthalene	ND	2.9	10		μg/L	1	9/30/2016 8:23:31 PM	27764
2-Methylnaphthalene	ND	2.9	10		μg/L	1	9/30/2016 8:23:31 PM	27764
2-Methylphenol	ND	2.5	10		μg/L	1	9/30/2016 8:23:31 PM	27764
3+4-Methylphenol	ND	2.3	10		μg/L	1	9/30/2016 8:23:31 PM	27764
N-Nitrosodi-n-propylamine	ND	2.4	10		μg/L	1	9/30/2016 8:23:31 PM	27764
N-Nitrosodimethylamine	ND	2.2	10		μg/L	1	9/30/2016 8:23:31 PM	27764
N-Nitrosodiphenylamine	ND	2.3	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Naphthalene	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
2-Nitroaniline	ND	2.8	10		μg/L	1	9/30/2016 8:23:31 PM	27764
3-Nitroaniline	ND	2.9	10		μg/L	1	9/30/2016 8:23:31 PM	27764
4-Nitroaniline	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Nitrobenzene	ND	2.8	10		μg/L	1	9/30/2016 8:23:31 PM	27764
2-Nitrophenol	ND	2.4	10		μg/L	1	9/30/2016 8:23:31 PM	27764
4-Nitrophenol	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Pentachlorophenol	ND	2.3	20		μg/L	1	9/30/2016 8:23:31 PM	27764
Phenanthrene	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Phenol	ND	2.0	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Pyrene	ND	3.1	10		μg/L	1	9/30/2016 8:23:31 PM	27764

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092216

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 4:45:00 PM

 Lab ID:
 1609E26-012
 Matrix: AQUEOUS
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Pyridine	ND	2.2	10		μg/L	1	9/30/2016 8:23:31 PM	27764
1,2,4-Trichlorobenzene	ND	2.6	10		μg/L	1	9/30/2016 8:23:31 PM	27764
2,4,5-Trichlorophenol	ND	2.2	10		μg/L	1	9/30/2016 8:23:31 PM	27764
2,4,6-Trichlorophenol	ND	2.4	10		μg/L	1	9/30/2016 8:23:31 PM	27764
Surr: 2-Fluorophenol	45.6	0	15-123		%Rec	1	9/30/2016 8:23:31 PM	27764
Surr: Phenol-d5	31.2	0	15-124		%Rec	1	9/30/2016 8:23:31 PM	27764
Surr: 2,4,6-Tribromophenol	66.5	0	18.4-134		%Rec	1	9/30/2016 8:23:31 PM	27764
Surr: Nitrobenzene-d5	59.1	0	28.8-134		%Rec	1	9/30/2016 8:23:31 PM	27764
Surr: 2-Fluorobiphenyl	46.6	0	35.9-125		%Rec	1	9/30/2016 8:23:31 PM	27764
Surr: 4-Terphenyl-d14	49.5	0	15-146		%Rec	1	9/30/2016 8:23:31 PM	27764
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Benzene	0.19	0.096	1.0	J	μg/L	1	9/27/2016 1:00:00 PM	R37500
Toluene	0.39	0.12	1.0	J	μg/L	1	9/27/2016 1:00:00 PM	R37500
Ethylbenzene	ND	0.11	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Methyl tert-butyl ether (MTBE)	ND	0.21	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,2,4-Trimethylbenzene	ND	0.11	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,3,5-Trimethylbenzene	ND	0.12	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,2-Dichloroethane (EDC)	ND	0.12	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,2-Dibromoethane (EDB)	ND	0.11	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Naphthalene	ND	0.093	2.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1-Methylnaphthalene	ND	0.20	4.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
2-Methylnaphthalene	ND	0.16	4.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Acetone	6.6	4.9	10	J	μg/L	1	9/27/2016 1:00:00 PM	R37500
Bromobenzene	ND	0.098	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Bromodichloromethane	ND	0.14	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Bromoform	ND	0.10	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Bromomethane	ND	0.78	3.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
2-Butanone	ND	0.74	10		μg/L	1	9/27/2016 1:00:00 PM	R37500
Carbon disulfide	ND	0.60	10		μg/L	1	9/27/2016 1:00:00 PM	R37500
Carbon Tetrachloride	ND	0.11	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Chlorobenzene	ND	0.11	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Chloroethane	ND	0.19	2.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Chloroform	ND	0.089	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Chloromethane	ND	0.21	3.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
2-Chlorotoluene	ND	0.40	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
4-Chlorotoluene	ND	0.13	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
cis-1,2-DCE	ND	0.12	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
cis-1,3-Dichloropropene	ND	0.11	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,2-Dibromo-3-chloropropane	ND	0.23	2.0		μg/L	1	9/27/2016 1:00:00 PM	R37500

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092216

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 4:45:00 PM

 Lab ID:
 1609E26-012
 Matrix: AQUEOUS
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Dibromochloromethane	ND	0.087	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Dibromomethane	ND	0.12	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,2-Dichlorobenzene	ND	0.40	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,3-Dichlorobenzene	ND	0.14	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,4-Dichlorobenzene	ND	0.14	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Dichlorodifluoromethane	ND	0.36	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,1-Dichloroethane	ND	0.11	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,1-Dichloroethene	ND	0.11	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,2-Dichloropropane	ND	0.11	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,3-Dichloropropane	ND	0.16	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
2,2-Dichloropropane	ND	0.17	2.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,1-Dichloropropene	ND	0.13	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Hexachlorobutadiene	ND	0.20	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
2-Hexanone	ND	0.84	10		μg/L	1	9/27/2016 1:00:00 PM	R37500
Isopropylbenzene	ND	0.10	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
4-Isopropyltoluene	ND	0.14	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
4-Methyl-2-pentanone	ND	0.43	10		μg/L	1	9/27/2016 1:00:00 PM	R37500
Methylene Chloride	ND	0.19	3.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
n-Butylbenzene	ND	0.16	3.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
n-Propylbenzene	ND	0.13	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
sec-Butylbenzene	ND	0.12	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Styrene	ND	0.11	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
tert-Butylbenzene	ND	0.12	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,1,1,2-Tetrachloroethane	ND	0.11	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,1,2,2-Tetrachloroethane	ND	0.13	2.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Tetrachloroethene (PCE)	ND	0.15	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
trans-1,2-DCE	ND	0.40	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
trans-1,3-Dichloropropene	ND	0.10	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,2,3-Trichlorobenzene	ND	0.11	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,2,4-Trichlorobenzene	ND	0.13	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,1,1-Trichloroethane	ND	0.091	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,1,2-Trichloroethane	ND	0.13	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Trichloroethene (TCE)	ND	0.18	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Trichlorofluoromethane	ND	0.20	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
1,2,3-Trichloropropane	ND	0.20	2.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Vinyl chloride	ND	0.20	1.0		μg/L	1	9/27/2016 1:00:00 PM	R37500
Xylenes, Total	ND	0.37	1.5		μg/L	1	9/27/2016 1:00:00 PM	R37500
Surr: 1,2-Dichloroethane-d4	83.0	0	70-130		%Rec	1	9/27/2016 1:00:00 PM	R37500
Surr: 4-Bromofluorobenzene	98.4	0	70-130		%Rec	1	9/27/2016 1:00:00 PM	R37500

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

Qualifiers: * Value exce

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

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092216

 Project:
 OW-14 SOURCE INV
 Collection Date: 9/22/2016 4:45:00 PM

 Lab ID:
 1609E26-012
 Matrix: AQUEOUS
 Received Date: 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Surr: Dibromofluoromethane	93.9	0	70-130		%Rec	1	9/27/2016 1:00:00 PM	R37500
Surr: Toluene-d8	99.1	0	70-130		%Rec	1	9/27/2016 1:00:00 PM	R37500

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: Methanol Blank

Project: OW-14 SOURCE INV Collection Date:

Lab ID: 1609E26-013 **Matrix:** MEOH (SOIL) **Received Date:** 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	ND	0.020	0.025		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Toluene	ND	0.0030	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Ethylbenzene	ND	0.0041	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Methyl tert-butyl ether (MTBE)	ND	0.016	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,2,4-Trimethylbenzene	ND	0.0037	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,3,5-Trimethylbenzene	ND	0.0036	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,2-Dichloroethane (EDC)	ND	0.013	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,2-Dibromoethane (EDB)	ND	0.0036	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Naphthalene	ND	0.0078	0.10		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
2-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Acetone	ND	0.065	0.75		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Bromobenzene	ND	0.0040	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Bromodichloromethane	ND	0.0029	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Bromoform	ND	0.0061	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Bromomethane	ND	0.018	0.15		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
2-Butanone	ND	0.029	0.50		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Carbon disulfide	ND	0.017	0.50		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Carbon tetrachloride	ND	0.0033	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Chlorobenzene	ND	0.0041	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Chloroethane	ND	0.010	0.10		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Chloroform	ND	0.0038	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Chloromethane	ND	0.0044	0.15		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
2-Chlorotoluene	ND	0.0037	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
4-Chlorotoluene	ND	0.0044	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
cis-1,2-DCE	ND	0.0029	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
cis-1,3-Dichloropropene	ND	0.0046	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,2-Dibromo-3-chloropropane	ND	0.015	0.10		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Dibromochloromethane	ND	0.0045	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Dibromomethane	ND	0.0043	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,2-Dichlorobenzene	ND	0.0044	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,3-Dichlorobenzene	ND	0.0041	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,4-Dichlorobenzene	ND	0.0062	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Dichlorodifluoromethane	ND	0.015	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,1-Dichloroethane	ND	0.0027	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,1-Dichloroethene	ND	0.016	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,2-Dichloropropane	ND	0.0042	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,3-Dichloropropane	ND	0.0057	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
2,2-Dichloropropane	ND	0.0029	0.10		mg/Kg	1	9/27/2016 7:47:24 PM	R37518

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: Methanol Blank

Project: OW-14 SOURCE INV Collection Date:

Lab ID: 1609E26-013 **Matrix:** MEOH (SOIL) **Received Date:** 9/23/2016 4:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,1-Dichloropropene	ND	0.0040	0.10		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Hexachlorobutadiene	ND	0.0061	0.10		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
2-Hexanone	ND	0.027	0.50		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Isopropylbenzene	ND	0.0043	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
4-Isopropyltoluene	ND	0.0045	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
4-Methyl-2-pentanone	ND	0.015	0.50		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Methylene chloride	ND	0.014	0.15		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
n-Butylbenzene	ND	0.0044	0.15		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
n-Propylbenzene	ND	0.0038	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
sec-Butylbenzene	ND	0.0069	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Styrene	ND	0.0045	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
tert-Butylbenzene	ND	0.0041	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,1,1,2-Tetrachloroethane	ND	0.0048	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,1,2,2-Tetrachloroethane	ND	0.0081	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Tetrachloroethene (PCE)	ND	0.0041	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
trans-1,2-DCE	ND	0.014	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
trans-1,3-Dichloropropene	ND	0.0073	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,2,3-Trichlorobenzene	ND	0.0075	0.10		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,2,4-Trichlorobenzene	ND	0.0053	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,1,1-Trichloroethane	ND	0.0031	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,1,2-Trichloroethane	ND	0.0059	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Trichloroethene (TCE)	ND	0.0054	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Trichlorofluoromethane	ND	0.0037	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
1,2,3-Trichloropropane	ND	0.0086	0.10		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Vinyl chloride	ND	0.0041	0.050		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Xylenes, Total	ND	0.0095	0.10		mg/Kg	1	9/27/2016 7:47:24 PM	R37518
Surr: Dibromofluoromethane	112		70-130		%Rec	1	9/27/2016 7:47:24 PM	R37518
Surr: 1,2-Dichloroethane-d4	109		70-130		%Rec	1	9/27/2016 7:47:24 PM	R37518
Surr: Toluene-d8	97.6		70-130		%Rec	1	9/27/2016 7:47:24 PM	R37518
Surr: 4-Bromofluorobenzene	87.7		70-130		%Rec	1	9/27/2016 7:47:24 PM	R37518
EPA METHOD 8015D MOD: GASOLINE	E RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	ND	0.75	5.0		mg/Kg	1	9/27/2016 7:47:24 PM	G37518
Surr: BFB	89.4	0	70-130		%Rec	1	9/27/2016 7:47:24 PM	G37518

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

Qualifiers: *

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

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1609E26-001C OW-57 (16-18') Collected date/time: 09/21/16 14:00

SAMPLE RESULTS - 01

ONE LAB. NATIONWIDE.

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
Cyanide	ND		0.250	1	10/04/2016 15:36	WG913180





















1609E26-002C OW-57 (25-27') Collected date/time: 09/21/16 14:15

SAMPLE RESULTS - 02

ONE LAB, NATIONWIDE.

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Cyanide	ND		0.250	1	10/04/2016 15:39	WG913180	



















1609E26-003G EB092116 Collected date/time: 09/21/16 15:00

SAMPLE RESULTS - 03

ONE LAB. NATIONWIDE,

Wet Chemistry by Method 4500CN E-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/l		mg/l		date / time		
Cyanide	ND		0.00500	1	10/06/2016 20:53	WG914871	



















1609E26-004C OW-58 (10-12) Collected date/time: 09/22/16 14:40

SAMPLE RESULTS - 04

ONE LAB, NATIONWIDE.

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
Cyanide	ND		0.250	1	10/04/2016 16:07	<u>WG913180</u>



















1609E26-005C OW-58 (22-24') Collected date/time: 09/22/16 15:00

SAMPLE RESULTS - 05

ONE LAB. NATIONWIDE.

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	,
Cyanide	ND		0.250	1	10/04/2016 15:42	<u>W</u> G913180



















1609E26-006C OW-58 (28-29') Collected date/time: 09/22/16 15:20

SAMPLE RESULTS - 06

ONE LAB. NATIONWIDE.

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Cyanide	ND		0.250	1	10/04/2016 15:43	<u>WG913180</u>	





















1609E26-007C OW-58 (48-48.5') Collected date/time: 09/22/16 15:35

SAMPLE RESULTS - 07

ONE LAB. NATIONWIDE.

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	_
Cyanide	ND		0.250	1	10/04/2016 15:44	WG913180



















1609E26-008C TK-568-1 (12-14') Collected date/time: 09/22/16 12:30

SAMPLE RESULTS - 08

ONE LAB. NATIONWIDE,

	Result	<u>Qualifier</u>	RDL	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
Cyanide	ND		0.250	1	10/04/2016 15:45	WG913180



















1609E26-009C TK568-1 (30-32') Collected date/time: 09/22/16 13:35

SAMPLE RESULTS - 09

ONE LAB. NATIONWIDE.

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
Cyanide	ND		0.250	1	10/04/2016 15:46	WG913180



















1609E26-010C TK568-1 (48-49') Collected date/time: 09/22/16 14:00

SAMPLE RESULTS - 10

ONE LAB, NATIONWIDE.

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
Cyanide	ND		0.250	1	10/04/2016 15:47	<u>WG913180</u>



















1609E26-011C DUP01 Collected date/time: 09/22/16 00:00

SAMPLE RESULTS - 11

ONE LAB. NATIONWIDE.

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
Cyanide	ND		0.250	1	10/04/2016 15:48	WG913180





















1609E26-012G EB092216 Collected date/time: 09/22/16 16:45

SAMPLE RESULTS - 12

ONE LAB. NATIONWIDE.

Wet Chemistry by Method 4500CN E-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Cyanide	ND		0.00500	1	10/06/2016 20:54	WG914871



















QUALITY CONTROL SUMMARY 1862217-03-12

ONE LAB, NATIONWIDE.

Method Blank (MB)

(MB) R3168792-1 10/06/16 20:40	16/16 20:40				
	MB Result	MB Qualifier MB MDL	MB MDL	MB RDL	
Analyte	∥g/l		l/gm	пgл	
Cyanide	·		0.00180	0.00180 0.00500	:

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L862594-02 Original Sample (OS) • Duplicate (DUP)

(OS) L862594-02 10/06/16 20:56 • (DOP) R3168/92-4 10/06/16 20:57 Original Result DUP Result Dilution DUP RPD Analyte mg/l mg/l 8	K3168/924 DUP Result mg/l	Dilution	20:56 • (DUP) R3168/92-4 10/06/16 20:57 Original Result DUP Result Dilution DUP RPD DUP Quing/l mg/l	DUP Qualifier DUP	DUP Qualifier DUP RPD Limits	
2	S	-	0000		20	

L863487-02 Original Sample (OS) • Duplicate (DUP)

	DUP Qualifier DUP RPD Limits	ઝ િ	20
4	Difution DUP RPD	96	0.000
3/06/16 21:1	Difution		-
3168792-7 10			S
3/16 21:11 • (DUP) R3	Original Result DUP Result	l/6m	9
(OS) L863487-02 10/06/16 21:11 • (DUP) R3168792-7 10/06/16 21:14		Analyte	Cyanide

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

	RPD Limits	96	20
	LCSD Qualifier RPD	88	0000
	LCS Qualifier		
	Rec. Limits	8 €	85.0-115
	LCSD Rec.	% % /5m //5m	98.0
7	LCS Rec.	96	98.0
10/00/10 20:4	Spike Amount LCS Result LCSD Result LCS Rec.	l/6m	0.0982
J) KSID8/82-0	LCS Result	mg/J	0.0978
(LCS) K3168/32-2 (V/06/16 20:41 • (LCSD) K3168/32-3 (V/06/16 20:4	Spike Amount	l/gm	0.100
(LCS) K3168/92-2		Analyte	Cyanide

L862596-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

	RPD Limits	96	20
	MSD Qualifier RPD	96	7.00
	MS Qualifier		
	Dilution Rec. Limits	₅ 6	75.0-125
	Dilution		 -
3 21:06	MSD Rec.	98	94.0
32-6 10/06/16	MS Rec.	%	87.0
· (MSD) R3168792-6 10/06/16 21:06	MSD Result MS Rec.	ж //вш	0.187
7/06/16 21:05	: MS Result	l/gm	0.174
3168792-5 10	Spike Amount Original Result MS Result	mg∕l	9
(OS) L862596-02 10/06/16 21:04 · (MS) R3168792-5 10/06/16 21:05 ·	Spike Amount	l/gm	0.200
(OS) L862596-02 1t		Analyte	Cyanide

Method Blank (MB)

QUALITY CONTROL SUMMARY

1862217-01,02,04,05,06,07,08,09,10,11

ONE LAB. NATIONWIDE.

L862217-01 Original Sample (OS) • Duplicate (DUP)

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L862583-04 Original Sample (OS) • Duplicate (DUP)

(OS) L862583-04 10/04/16 15:56 • (DUP) R3168076-7 10/04/16 15:57	Original Result DUP Result Dilution DUP RPD DUP RPD Limits	mg/kg mg/kg %	ND ND 1 0,000 20
(OS) L862583-04 10/04		Analyte	Cyanide

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

	RPD Limits	96	20
	LCSD Qualifier RPD	%	00.6
	LCS Qualifier		
	Rec. Limits	×	50.0-150
	LCSD Rec.	3 %	
01		ઋ	
२३१६८०७६-३ १०/०४/१६ १५:३2	LCS Result LCSD Result LCS Rec.	ng/kg mg/kg %	57.5
J) R3168076-3	: LCS Result	mg/kg	
1/04/16 15:31 • (LCSI	Spike Amount	тg/kg	48.4
(LCS) R3168076-2 10/04/16 15:31 • (LCSD) F		Analyte	Cyanide

L862217-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

)/OL LI-/LZZ98T (SO)	US) L86221/-11 10/04/16 15:48 • (MS) K31680/6-5 10/04/16 15:49 • (MS)	70/0L <-9/089L	4/16 15:49 • (MSD) K31680/6	U) K31680/6-6 10/04/16 15:50	550						
	Spike Amount	Spike Amount Original Result MS Result	MS Result	MSD Result MS Rec.	MS Rec.	MSD Rec.	Dilution	Dilution Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	96		96			9-6	3 6
Cyanide		ND 3.23		3.10 97.0 93.0	97.0	93.0		1 75.0-125			4.00	20

GLOSSARY OF TERMS



Abbreviations and Definitions

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

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

















Hall Environmental Analysis Laboratory, Inc.

ND

0.010

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID MB-A SampType: MBLK TestCode: EPA Method 200.7: Metals PBW Client ID: Batch ID: A37991 RunNo: 37991 Prep Date: Analysis Date: 10/17/2016 SeqNo: 1183971 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Barium ND 0.0020 ND 0.0020 Beryllium 0.0020 Cadmium ND Chromium ND 0.0060 Cobalt ND 0.0060 ND 0.020 Iron Manganese ND 0.0020 Nickel ND 0.010 Silver ND 0.0050 Vanadium ND 0.050

Sample ID LCS-A	Samp	Type: LC	s	Tes	tCode: El	PA Method	200.7: Metals	;		
Client ID: LCSW	Bato	h ID: A3	7991	F	RunNo: 3	7991				
Prep Date:	Analysis I	Date: 1 (0/17/2016	S	SeqNo: 1	183972	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.46	0.0020	0.5000	0	92.5	85	115			
Beryllium	0.49	0.0020	0.5000	0	98.1	85	115			
Cadmium	0.47	0.0020	0.5000	0	94.1	85	115			
Chromium	0.47	0.0060	0.5000	0	93.3	85	115			
Cobalt	0.44	0.0060	0.5000	0	87.9	85	115			
Iron	0.46	0.020	0.5000	0	92.6	85	115			
Manganese	0.45	0.0020	0.5000	0	90.5	85	115			
Nickel	0.45	0.010	0.5000	0	89.4	85	115			
Silver	0.097	0.0050	0.1000	0	97.1	85	115			
Vanadium	0.50	0.050	0.5000	0	99.7	85	115			
Zinc	0.46	0.010	0.5000	0	92.5	85	115			

Sample ID LLLCS-A	SampT	ype: LC	SLL	Tes	tCode: El	PA Method	200.7: Metals			
Client ID: BatchQC	Batch	ID: A3	7991	F	RunNo: 3	7991				
Prep Date:	Analysis D	ate: 10	/17/2016	S	SeqNo: 1	183973	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0022	0.0020	0.002000	0	110	50	150			_
Beryllium	0.0019	0.0020	0.002000	0	97.0	50	150			J
Cadmium	0.0020	0.0020	0.002000	0	100	50	150			
Chromium	0.0056	0.0060	0.006000	0	93.7	50	150			J
Cobalt	0.0062	0.0060	0.006000	0	103	50	150			
Iron	0.022	0.020	0.02000	0	110	50	150			

Qualifiers:

Zinc

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID LLLCS-A	Samp	Type: LC	SLL	Tes	tCode: El	PA Method	200.7: Metals	;		
Client ID: BatchQC	Bato	h ID: A3	7991	F	RunNo: 3	7991				
Prep Date:	Analysis	Date: 10)/17/2016	S	SeqNo: 1	183973	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.0019	0.0020	0.002000	0	96.5	50	150			J
Nickel	0.0049	0.010	0.005000	0	97.2	50	150			J
Silver	0.0049	0.0050	0.005000	0	97.2	50	150			J
Vanadium	0.0098	0.050	0.01000	0	97.5	50	150			J
Zinc	0.0049	0.010	0.005000	0	98.6	50	150			J

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID LLLCS-B	Samp	Type: LC	SLL	Tes	tCode: El	PA Method	200.7: Disso	lved Meta	ls	
Client ID: BatchQC	Bato	h ID: B3	7965	F	RunNo: 3	7965				
Prep Date:	Analysis I	Date: 10	/15/2016	S	SeqNo: 1	183095	Units: mg/L	i		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0019	0.0020	0.002000	0	94.0	50	150			J
Beryllium	0.0015	0.0020	0.002000	0	76.5	50	150			J
Cadmium	0.0017	0.0020	0.002000	0	83.5	50	150			J
Chromium	0.0056	0.0060	0.006000	0	93.8	50	150			J
Cobalt	0.0054	0.0060	0.006000	0	90.7	50	150			J
Iron	0.018	0.020	0.02000	0	87.8	50	150			J
Manganese	0.0019	0.0020	0.002000	0	97.0	50	150			J
Nickel	0.0055	0.010	0.005000	0	109	50	150			J
Silver	0.0046	0.0050	0.005000	0	91.2	50	150			J
Vanadium	0.0072	0.050	0.01000	0	72.3	50	150			J
Zinc	0.0051	0.010	0.005000	0	102	50	150			J

Sample ID LCS-B	Samp	Type: LC	S	Tes	tCode: El	PA Method	200.7: Dissol	ved Meta	ls	
Client ID: LCSW	Bato	ch ID: B3	7965	F	RunNo: 3	7965				
Prep Date:	Analysis	Date: 1 ()/15/2016	8	SeqNo: 1	183096	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.46	0.0020	0.5000	0	93.0	85	115			
Beryllium	0.49	0.0020	0.5000	0	97.8	85	115			
Cadmium	0.47	0.0020	0.5000	0	93.6	85	115			
Chromium	0.47	0.0060	0.5000	0	93.3	85	115			
Cobalt	0.44	0.0060	0.5000	0	88.5	85	115			
Iron	0.47	0.020	0.5000	0	94.4	85	115			
Manganese	0.46	0.0020	0.5000	0	91.2	85	115			
Nickel	0.44	0.010	0.5000	0	87.9	85	115			
Silver	0.096	0.0050	0.1000	0	95.7	85	115			
Vanadium	0.50	0.050	0.5000	0	99.4	85	115			
Zinc	0.45	0.010	0.5000	0	90.3	85	115			

Sample ID MB-B	Samp	Type: ME	BLK	Tes	tCode: E	PA Method	200.7: Dissol	ved Metal	s	
Client ID: PBW	Bato	h ID: B3	7965	F	RunNo: 3	7965				
Prep Date:	Analysis l	Date: 10)/15/2016	5	SeqNo: 1	183105	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Iron	ND	0.020								

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID MB-B SampType: MBLK TestCode: EPA Method 200.7: Dissolved Metals

Client ID: PBW Batch ID: B37965 RunNo: 37965

Prep Date: Analysis Date: 10/15/2016 SeqNo: 1183105 Units: mg/L

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 0.00058 0.0020 Manganese Nickel ND 0.010 ND 0.0050 Silver Vanadium ND 0.050 Zinc ND 0.010

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

0.023

0.0010

0.02500

WO#: **1609E26**

28-Oct-16

Client:	Western Refining Company
Project:	OW-14 SOURCE INV

Troject.	0 11 15	OUNCL	11 ()								
Sample ID	1609E26-003EMS	DL Samp	Туре: МЅ	DLL	Tes	tCode: El	PA 200.8: N	letals			
Client ID:	EB092116	Bat	ch ID: D3	7903	F	RunNo: 3	7903				
Prep Date:		Analysis	Date: 10	/11/2016	9	SeqNo: 1	180790	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic		0.022	0.0010	0.02500	0	88.2	70	130	0.937	20	
Lead		0.011	0.00050	0.01250	0	90.1	70	130	0.745	20	
Selenium		0.022	0.0010	0.02500	0	89.8	70	130	0.990	20	
Sample ID	1609E26-003EMS	L L Samp	туре: м	BLL	Tes	tCode: El	PA 200.8: N	letals			
Client ID:	EB092116	Bat	ch ID: D3	7903	F	RunNo: 3	7903				
Prep Date:		Analysis	Date: 10	/11/2016	5	SeqNo: 1	180791	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic		0.022	0.0010	0.02500	0	89.0	70	130			
Lead		0.011	0.00050	0.01250	0	90.7	70	130			

Sample ID LCS	SampType: L (s	Tes	tCode: El	PA 200.8: N	letals			
Client ID: LCSW	Batch ID: D3	37903	F	tunNo: 3	7903				
Prep Date:	Analysis Date: 1	0/11/2016	S	eqNo: 1	180829	Units: mg/L			
Analyte	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.023 0.0010	0.02500	0	92.5	85	115			
Lead	0.011 0.00050	0.01250	0	91.0	85	115			
Selenium	0.023 0.0010	0.02500	0	92.2	85	115			

0

90.6

70

130

Sample ID LLLCS	SampType: L	CSLL	Tes	tCode: El	PA 200.8: N	letals			
Client ID: BatchQC	Batch ID: D	37903	F	RunNo: 3	7903				
Prep Date:	Analysis Date: 1	0/11/2016	8	SeqNo: 1	180832	Units: mg/L			
		001/							
Analyte	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Analyte Arsenic	0.00094 0.0010		SPK Ref Val	%REC 93.9	LowLimit 50	HighLimit 150	%RPD	RPDLimit	Qual J
		0.001000	SPK Ref Val 0 0			<u> </u>	%RPD	RPDLimit	Qual J J

	Sample ID MB	1 71			Tes	tCode: E						
	Client ID: PBW				F	RunNo: 3	37903					
Prep Date:		Analysis Date: 10/11/2016			SeqNo: 1180833			Units: mg/L				
	Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
	Arsenic	ND	0.0010									

Arsenic ND 0.0010

Lead ND 0.00050

Selenium ND 0.0010

Qualifiers:

Selenium

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

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Client:

Hall Environmental Analysis Laboratory, Inc.

Western Refining Company

WO#: **1609E26**

28-Oct-16

Project:	OW-14 S	OURCE	INV	,									
Sample ID	D 1609E26-003EMSDL SampType: MSDLL				TestCode: EPA 200.8: Metals								
Client ID:	EB092116	Bat	ch ID: A3	7945	F	RunNo: 3	7945						
Prep Date:		Analysis	Date: 10	0/13/2016	S	SeqNo: 1	182530	Units: mg/L					
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Antimony		0.024	0.0010	0.02500	0	97.1	70	130	2.60	20			
Sample ID	D 1609E26-003EMSLL SampType: MSLL				Tes	tCode: El							
Client ID:	EB092116	Batch ID: A37945			F	RunNo: 3							
Prep Date:		Analysis Date: 10/13/2016			S	SeqNo: 1	182531	Units: mg/L					
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Antimony		0.025	0.0010	0.02500	0	99.6	70	130					
Sample ID	1609E26-012EMSI	L Samp	Туре: М	SLL	Tes	tCode: El	PA 200.8: N	letals					
Client ID:				F									
Prep Date:				S	SeqNo: 1	182533	Units: mg/L						
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Antimony		0.024	0.0010	0.02500	0	96.0	70	130					
Arsenic		0.024	0.0010	0.02500	0	95.2	70	130					
Lead		0.012	0.00050	0.01250	0	95.3	70	130					
Selenium		0.024	0.0010	0.02500	0	94.1	70	130					
Sample ID	LCS	SampType: LCS			Tes								
Client ID:	LCSW	Batch ID: A37945 Analysis Date: 10/13/2016			RunNo: 37945								
Prep Date:					SeqNo: 1182561			Units: mg/L					
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Antimony		0.024	0.0010	0.02500	0	96.9	85	115					
Arsenic		0.024	0.0010	0.02500	0	94.8	85	115					
Lead		0.012	0.00050	0.01250	0	99.0	85	115					
Loud													

Qualifiers:

Sample ID LLLCS

Prep Date:

Analyte

Antimony

Selenium

Arsenic

Lead

Client ID: BatchQC

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded

SampType: LCSLL

Batch ID: A37945

Analysis Date: 10/13/2016

PQL

0.0010

0.0010

0.00056 0.00050 0.0005000

0.0010

SPK value SPK Ref Val

0

0

0

0

0.001000

0.001000

0.001000

Result

0.0010

0.0010

0.0010

- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank

TestCode: EPA 200.8: Metals

LowLimit

50

50

50

50

Units: mg/L

HighLimit

150

150

150

150

%RPD

RPDLimit

Qual

RunNo: 37945

%REC

100

103

112

102

SeqNo: 1182563

- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID MB SampType: MBLK TestCode: EPA 200.8: Metals

Client ID: PBW Batch ID: A37945 RunNo: 37945

Prep Date: Analysis Date: 10/13/2016 SeqNo: 1182564 Units: mg/L

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

 Antimony
 ND
 0.0010

 Arsenic
 ND
 0.0010

 Lead
 ND
 0.00050

 Selenium
 ND
 0.0010

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Client:

Hall Environmental Analysis Laboratory, Inc.

Western Refining Company

WO#: **1609E26**

28-Oct-16

Project:	(OW-14 SOURCE	INV								
Sample ID	LCS	Samp	Type: LC	s	Tes	tCode: El	PA 200.8: I	Dissolved Me	tals		
Client ID:	LCSW	Bato	h ID: B3	7384	F	RunNo: 3	7834				
Prep Date:		Analysis I	Date: 10	0/10/2016	8	SeqNo: 1	178573	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic		0.024	0.0010	0.02500	0	96.7	85	115			
Selenium		0.024	0.0010	0.02500	0	94.5	85	115			
Sample ID	LLLCS	Samp	Type: LC	SLL	Tes	tCode: El	PA 200.8: I	Dissolved Me	tals		
Client ID:	BatchQC	Bato	h ID: B3	7384	F	RunNo: 3	7834				
Prep Date:		Analysis I	Date: 10	0/10/2016	S	SeqNo: 1	178574	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic		0.0010	0.0010	0.001000	0	102	50	150			
Selenium		0.00095	0.0010	0.001000	0	95.0	50	150			J
Sample ID	MB	Samp	Type: ME	BLK	Tes	tCode: El	PA 200.8: I	Dissolved Me	tals		
Client ID:	PBW	Bato	h ID: B3	7384	F	RunNo: 3	7834				
Prep Date:		Analysis I	Date: 10	0/10/2016	S	SeqNo: 1	178575	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic		ND	0.0010								
Selenium		ND ND	0.0010								
	LCS	ND		:s	Tes	tCode: E l	PA 200.8: I	Dissolved Me	tals		
Selenium		ND Samp	0.0010			tCode: El		Dissolved Me	tals		
Selenium Sample ID	LCSW	ND Samp	0.0010 Type: LC ch ID: A3	7903	F		7903	Dissolved Me Units: mg/L			
Selenium Sample ID Client ID:	LCSW	ND Samp Bato	0.0010 Type: LC ch ID: A3	7903 0/11/2016	F	RunNo: 3	7903			RPDLimit	Qual
Sample ID Client ID: Prep Date: Analyte Antimony	LCSW	Samp Bato Analysis I Result 0.023	0.0010 Type: LC ch ID: A3 Date: 10 PQL 0.0010	7903 0/11/2016 SPK value 0.02500	SPK Ref Val	RunNo: 3 SeqNo: 1 %REC 90.7	7903 180780 LowLimit 85	Units: mg/L HighLimit		RPDLimit	Qual
Sample ID Client ID: Prep Date: Analyte	LCSW	Samp Bato Analysis I Result 0.023	0.0010 Type: LC th ID: A3 Date: 10	7903 0/11/2016 SPK value	F S SPK Ref Val	RunNo: 3 SeqNo: 1 %REC	7903 180780 LowLimit	Units: mg/L HighLimit		RPDLimit	Qual
Sample ID Client ID: Prep Date: Analyte Antimony	LCSW	Sampi Bato Analysis I Result 0.023 0.012	0.0010 Type: LC ch ID: A3 Date: 10 PQL 0.0010	7903 0/11/2016 SPK value 0.02500 0.01250	SPK Ref Val 0 0	RunNo: 3 SeqNo: 1 **REC 90.7 93.4	7903 180780 LowLimit 85 85	Units: mg/L HighLimit	%RPD	RPDLimit	Qual
Sample ID Client ID: Prep Date: Analyte Antimony Lead	LLLCS	Samp Bato Analysis I Result 0.023 0.012	0.0010 Type: LC th ID: A3 Date: 10 PQL 0.0010 0.00050	7903 0/11/2016 SPK value 0.02500 0.01250	SPK Ref Val 0 0	RunNo: 3 SeqNo: 1 **REC 90.7 93.4	7903 180780 LowLimit 85 85	Units: mg/L HighLimit 115 115	%RPD	RPDLimit	Qual
Sample ID Client ID: Prep Date: Analyte Antimony Lead Sample ID	LLLCS BatchQC	Samp Bato Analysis I Result 0.023 0.012	0.0010 Type: LC ch ID: A3 Date: 10 PQL 0.0010 0.00050 Type: LC ch ID: A3	7903 0/11/2016 SPK value 0.02500 0.01250 SSLL 7903	SPK Ref Val 0 0	RunNo: 3 SeqNo: 1 **REC 90.7 93.4 tCode: E I	7903 180780 LowLimit 85 85 PA 200.8: I	Units: mg/L HighLimit 115 115	%RPD	RPDLimit	Qual
Sample ID Client ID: Prep Date: Analyte Antimony Lead Sample ID Client ID:	LLLCS BatchQC	Samp Bato Analysis I Result 0.023 0.012 Samp Bato Analysis I	0.0010 Type: LC ch ID: A3 Date: 10 PQL 0.0010 0.00050 Type: LC ch ID: A3 Date: 10 PQL	7903 0/11/2016 SPK value 0.02500 0.01250 SSLL 7903 0/11/2016	SPK Ref Val 0 0	RunNo: 3 SeqNo: 1 %REC 90.7 93.4 tCode: El RunNo: 3 SeqNo: 1 %REC	7903 180780 LowLimit 85 85 PA 200.8: I	Units: mg/L HighLimit 115 115	%RPD	RPDLimit RPDLimit	Qual
Selenium Sample ID Client ID: Prep Date: Analyte Antimony Lead Sample ID Client ID: Prep Date: Analyte Antimony	LLLCS BatchQC	Samp Bato Analysis I Result 0.023 0.012 Samp Bato Analysis I Result 0.00076	0.0010 Type: LC ch ID: A3 Date: 10 PQL 0.0010 0.00050 Type: LC ch ID: A3 Date: 10 PQL 0.0010	7903 0/11/2016 SPK value 0.02500 0.01250 SSLL 7903 0/11/2016 SPK value 0.001000	SPK Ref Val 0 0 Tes F SPK Ref Val 0	RunNo: 3 SeqNo: 1 %REC 90.7 93.4 tCode: El RunNo: 3 SeqNo: 1 %REC 75.9	7903 180780 LowLimit 85 85 PA 200.8: I 7903 180783 LowLimit 50	Units: mg/L HighLimit 115 115 Dissolved Me Units: mg/L HighLimit 150	%RPD		Qual J
Selenium Sample ID Client ID: Prep Date: Analyte Antimony Lead Sample ID Client ID: Prep Date: Analyte	LLLCS BatchQC	Samp Bato Analysis I Result 0.023 0.012 Samp Bato Analysis I	0.0010 Type: LC ch ID: A3 Date: 10 PQL 0.0010 0.00050 Type: LC ch ID: A3 Date: 10 PQL 0.0010	7903 0/11/2016 SPK value 0.02500 0.01250 SSLL 7903 0/11/2016 SPK value 0.001000	SPK Ref Val 0 0 Tes F SPK Ref Val	RunNo: 3 SeqNo: 1 %REC 90.7 93.4 tCode: El RunNo: 3 SeqNo: 1 %REC	7903 180780 LowLimit 85 85 PA 200.8: I 7903 180783 LowLimit	Units: mg/L HighLimit 115 115 Dissolved Me Units: mg/L HighLimit	%RPD		Qual
Selenium Sample ID Client ID: Prep Date: Analyte Antimony Lead Sample ID Client ID: Prep Date: Analyte Antimony	LLLCS BatchQC	Samp Bato Analysis I Result 0.023 0.012 Samp Bato Analysis I Result 0.00076 0.00049	0.0010 Type: LC ch ID: A3 Date: 10 PQL 0.0010 0.00050 Type: LC ch ID: A3 Date: 10 PQL 0.0010	7903 0/11/2016 SPK value 0.02500 0.01250 SSLL 7903 0/11/2016 SPK value 0.001000 0.0005000	SPK Ref Val 0 0 Tes F S SPK Ref Val 0 0	RunNo: 3 SeqNo: 1 %REC 90.7 93.4 tCode: El RunNo: 3 SeqNo: 1 %REC 75.9 97.6	7903 180780 LowLimit 85 85 PA 200.8: I 7903 180783 LowLimit 50 50	Units: mg/L HighLimit 115 115 Dissolved Me Units: mg/L HighLimit 150	%RPD tals %RPD		Qual J
Selenium Sample ID Client ID: Prep Date: Analyte Antimony Lead Sample ID Client ID: Prep Date: Analyte Antimony Lead	LLLCS BatchQC	Samp Bato Analysis I Result 0.023 0.012 Samp Bato Analysis I Result 0.00076 0.00049	0.0010 Type: LC th ID: A3 Date: 10 PQL 0.0010 0.00050 Type: LC th ID: A3 Date: 10 PQL 0.0010 0.00050	7903 D/11/2016 SPK value 0.02500 0.01250 SSLL 7903 D/11/2016 SPK value 0.001000 0.0005000	SPK Ref Val 0 0 Tes SPK Ref Val 0 0	RunNo: 3 SeqNo: 1 %REC 90.7 93.4 tCode: El RunNo: 3 SeqNo: 1 %REC 75.9 97.6	7903 180780 LowLimit 85 85 PA 200.8: I 7903 180783 LowLimit 50 50 PA 200.8: I	Units: mg/L HighLimit 115 115 Dissolved Me Units: mg/L HighLimit 150 150	%RPD tals %RPD		Qual J
Selenium Sample ID Client ID: Prep Date: Analyte Antimony Lead Sample ID Client ID: Prep Date: Analyte Antimony Lead Sample ID Sample ID Client ID:	LLLCS BatchQC	Samp Bato Analysis I Result 0.023 0.012 Samp Bato Analysis I Result 0.00076 0.00049	0.0010 Type: LC ch ID: A3 Date: 10 PQL 0.0010 0.00050 Type: LC ch ID: A3 Date: 10 PQL 0.0010 0.00050 Type: ME ch ID: A3	7903 0/11/2016 SPK value 0.02500 0.01250 SSLL 7903 0/11/2016 SPK value 0.001000 0.0005000 BLK 7903	SPK Ref Val O O Tes SPK Ref Val O O Tes SPK Ref Val O O Tes	RunNo: 3 SeqNo: 1 %REC 90.7 93.4 tCode: El %REC 75.9 97.6	7903 180780 LowLimit 85 85 PA 200.8: I 7903 LowLimit 50 50 PA 200.8: I 7903	Units: mg/L HighLimit 115 115 Dissolved Me Units: mg/L HighLimit 150 150	%RPD tals %RPD		Qual J

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
 - v quantitation limits Page 72 of 104
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID MB SampType: MBLK TestCode: EPA 200.8: Dissolved Metals

Client ID: PBW Batch ID: A37903 RunNo: 37903

Prep Date: Analysis Date: 10/11/2016 SeqNo: 1180786 Units: mg/L

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

Antimony ND 0.0010 Lead ND 0.00050

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

P Sample pH Not In Range RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1609E26

28-Oct-16

Client: Western Refining Company **Project: OW-14 SOURCE INV**

Sample ID MB-27892 SampType: MBLK TestCode: EPA Method 245.1: Mercury

Client ID: **PBW** Batch ID: 27892 RunNo: 37703

Prep Date: 10/5/2016 Analysis Date: 10/5/2016 SeqNo: 1174319 Units: mg/L

Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

ND 0.00020 Mercury

Sample ID LCS-27892 SampType: LCS TestCode: EPA Method 245.1: Mercury

Client ID: LCSW Batch ID: 27892 RunNo: 37703

Prep Date: 10/5/2016 Analysis Date: 10/5/2016 SeqNo: 1174320 Units: mg/L

SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Analyte Result PQL Qual

Mercury 0.0052 0.00020 0.005000 0 104 120

Qualifiers:

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

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P Sample pH Not In Range

RL Reporting Detection Limit

Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

ND

0.50

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID MB SampType: MBLK TestCode: EPA Method 300.0: Anions Client ID: **PBW** Batch ID: **R37700** RunNo: 37700 Analysis Date: 10/4/2016 Prep Date: SeqNo: 1174191 Units: mg/L Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Fluoride ND 0.10 Chloride ND 0.50

Sample ID LCS SampType: LCS TestCode: EPA Method 300.0: Anions LCSW Batch ID: R37700 Client ID: RunNo: 37700 Prep Date: Analysis Date: 10/4/2016 SeqNo: 1174192 Units: mg/L Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 0.51 0.10 0 102 90 110 Fluoride 0.5000 Chloride 4.9 0.50 5.000 0 97.0 90 110 0 9.8 0.50 10.00 97.7 90 110 Sulfate

Qualifiers:

Sulfate

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

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Client:

Hall Environmental Analysis Laboratory, Inc.

Western Refining Company

WO#: 1609E26

28-Oct-16

Project:	OW-14 S	OURCE IN	1V								
Sample ID	MB-27746	SampTy	/pe: ME	BLK	Tes	tCode: E l	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	PBS	Batch	ID: 27	746	F	RunNo: 3	7493				
Prep Date:	9/27/2016	Analysis Da	ate: 9/	28/2016	5	SeqNo: 1	166916	Units: mg/h	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
•	Organics (DRO)	5.8	10								J
-	e Organics (MRO)	ND	50								
Surr: DNOP		9.7		10.00		96.8	70	130			
Sample ID	LCS-27746	SampTy	/pe: LC	s	Tes	tCode: E	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	LCSS	Batch	ID: 27	746	F	RunNo: 3	7493				
Prep Date:	9/27/2016	Analysis Da	ate: 9/	28/2016	5	SeqNo: 1	166919	Units: mg/h	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range (Organics (DRO)	54	10	50.00	0	108	62.6	124			
Surr: DNOP		4.8		5.000		96.9	70	130			
Sample ID	1609E26-009AMS	SampTy	/pe: M \$	3	Tes	tCode: E	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	TK-568-1 (30-32')	Batch	ID: 27	772	F	RunNo: 3	7555				
Prep Date:	9/28/2016	Analysis Da	ate: 9/	29/2016	8	SeqNo: 1	169380	Units: mg/h	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range (Organics (DRO)	61	9.3	46.25	10.96	108	33.9	141			
Surr: DNOP		4.6		4.625		100	70	130			
Sample ID	1609E26-009AMS	D SampTy	/pe: M \$	SD	Tes	tCode: E	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	TK-568-1 (30-32')	Batch	ID: 27	772	F	RunNo: 3	7555				
Prep Date:	9/28/2016	Analysis Da	ate: 9 /	29/2016	5	SeqNo: 1	169381	Units: mg/h	K g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range (Organics (DRO)	83	9.7	48.73	10.96	148	33.9	141	31.1	20	RS
Surr: DNOP		5.1		4.873		104	70	130	0	0	
Sample ID	LCS-27772	SampTy	/pe: LC	s	Tes	tCode: E l	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	LCSS	Batch	ID: 27	772	F	RunNo: 3	7555				
Prep Date:	9/28/2016	Analysis Da	ate: 9/	29/2016	S	SeqNo: 1	169384	Units: mg/k	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range (Organics (DRO)	52	10	50.00	0	104	62.6	124			

Qualifiers:

Surr: DNOP

Value exceeds Maximum Contaminant Level.

Sample Diluted Due to Matrix D

Η Holding times for preparation or analysis exceeded

4.9

5.000

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits R

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

70

130

Е Value above quantitation range

97.5

J

Analyte detected below quantitation limits

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P Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: 1609E26

28-Oct-16

Client: Western Refining Company **Project: OW-14 SOURCE INV**

Sample ID MB-27772 SampType: MBLK TestCode: EPA Method 8015M/D: Diesel Range Organics PBS Client ID: Batch ID: 27772 RunNo: 37555 SeqNo: 1169386 Prep Date: 9/28/2016 Analysis Date: 9/29/2016 Units: mg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Diesel Range Organics (DRO) 5.8 10

Motor Oil Range Organics (MRO) ND 50

Surr: DNOP 12 10.00 118 70 130

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1609E26

28-Oct-16

Client: Western Refining Company **Project: OW-14 SOURCE INV**

Sample ID MB-27760 SampType: MBLK TestCode: EPA Method 8015M/D: Diesel Range Client ID: **PBW** Batch ID: 27760 RunNo: 37493 Analysis Date: 9/28/2016 Prep Date: 9/28/2016 SeqNo: 1167285 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 1.000 105 77.1 1.1 144

Sample ID LCS-27760 SampType: LCS TestCode: EPA Method 8015M/D: Diesel Range Client ID: LCSW RunNo: 37493 Batch ID: 27760 Analysis Date: 9/28/2016 Prep Date: 9/28/2016 SeqNo: 1167407 Units: mg/L Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Diesel Range Organics (DRO) 1.0 0 63.2 5.7 5.000 113 155 Surr: DNOP 0.52 0.5000 103 77.1 144

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID RB SampType: MBLK TestCode: EPA Method 8015D: Gasoline Range

Client ID: PBW Batch ID: AG37567 RunNo: 37567

Prep Date: Analysis Date: 9/29/2016 SeqNo: 1169373 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 87.9 66.4 120

Sample ID 2.5UG GRO LCS SampType: LCS TestCode: EPA Method 8015D: Gasoline Range

Client ID: LCSW Batch ID: AG37567 RunNo: 37567

Prep Date: Analysis Date: 9/29/2016 SeqNo: 1169374 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
 98.8
 80
 120

 Surr: BFB
 20
 20.00
 97.6
 66.4
 120

Sample ID 1609E26-003BMS SampType: MS TestCode: EPA Method 8015D: Gasoline Range

Client ID: EB092116 Batch ID: AG37567 RunNo: 37567

Prep Date: Analysis Date: 9/29/2016 SeqNo: 1169376 Units: mg/L

SPK value SPK Ref Val %RPD **RPDLimit** Analyte Result **PQL** %REC LowLimit HighLimit Qual 0.38 0.050 0.5000 75.6 70 130

 Gasoline Range Organics (GRO)
 0.38
 0.050
 0.5000
 0
 75.6
 70
 130

 Surr: BFB
 18
 20.00
 92.0
 66.4
 120

Sample ID 1609E26-003BMSD SampType: MSD TestCode: EPA Method 8015D: Gasoline Range

Client ID: **EB092116** Batch ID: **AG37567** RunNo: **37567**

Prep Date: Analysis Date: 9/29/2016 SeqNo: 1169377 Units: mg/L

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Gasoline Range Organics (GRO) 0.47 0.050 0.5000 93.1 70 130 20.7 20 R Surr: BFB 20 20.00 98.5 66.4 120 0 0

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

Page 79 of 104

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: 1609E26

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID rb SampType: MBLK TestCode: EPA Method 8260B: Volatiles Client ID: **PBS** Batch ID: R37518 RunNo: 37518 Prep Date: Analysis Date: 9/27/2016 SeqNo: 1166864 Units: mg/Kg Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Benzene ND 0.025 0.050 Toluene ND ND 0.050 Ethylbenzene Methyl tert-butyl ether (MTBE) ND 0.050 1,2,4-Trimethylbenzene ND 0.050 1,3,5-Trimethylbenzene ND 0.050 1,2-Dichloroethane (EDC) ND 0.050 1,2-Dibromoethane (EDB) ND 0.050 Naphthalene ND 0.10 ND 0.20 1-Methylnaphthalene 2-Methylnaphthalene ND 0.20 ND 0.75 Acetone ND 0.050 Bromobenzene Bromodichloromethane ND 0.050 ND 0.050 Bromoform Bromomethane ND 0.15 2-Butanone ND 0.50 Carbon disulfide ND 0.50 Carbon tetrachloride ND 0.050 Chlorobenzene ND 0.050 Chloroethane ND 0.10 Chloroform ND 0.050 Chloromethane ND 0.15 2-Chlorotoluene ND 0.050 4-Chlorotoluene ND 0.050 cis-1,2-DCE ND 0.050 cis-1,3-Dichloropropene ND 0.050 1,2-Dibromo-3-chloropropane ND 0.10 Dibromochloromethane ND 0.050 ND 0.050 Dibromomethane ND 0.050 1.2-Dichlorobenzene ND 0.050 1,3-Dichlorobenzene 1.4-Dichlorobenzene ND 0.050 Dichlorodifluoromethane ND 0.050 1,1-Dichloroethane ND 0.050 1,1-Dichloroethene ND 0.050 ND 0.050 1,2-Dichloropropane 1,3-Dichloropropane ND 0.050

Qualifiers:

2,2-Dichloropropane

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded

ND

0.10

- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID rb	SampT	ype: ME	BLK	Test	tCode: El	PA Method	8260B: Volat	iles		
Client ID: PBS	Batch	n ID: R3	7518	R	unNo: 3	7518				
Prep Date:	Analysis D	ate: 9 /	27/2016	S	eqNo: 1	166864	Units: mg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.56		0.5000		113	70	130			
Surr: 1,2-Dichloroethane-d4	0.55		0.5000		109	70	130			
Surr: Toluene-d8	0.48		0.5000		95.0	70	130			
Surr: 4-Bromofluorobenzene	0.45		0.5000		89.0	70	130			
Sample ID 100ng Ics	SampT	ype: LC	S	Test	tCode: EI	PA Method	8260B: Volat	iles		
Client ID: LCSS		n ID: R3			tunNo: 3			-		
Prep Date:	Analysis D	ate: 9 /	27/2016	S	eqNo: 1	166865	Units: mg/K	.g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

Chlorobenzene

Benzene Toluene

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded

1.2

1.0

1.0

0.025

0.050

0.050

1.000

1.000

1.000

- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank

70

70

70

130

130

130

E Value above quantitation range

118

102

103

- J Analyte detected below quantitation limits
- P Sample pH Not In Range

0

0

0

- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1609E26

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID 100ng lcs SampType: LCS TestCode: EPA Method 8260B: Volatiles Client ID: LCSS Batch ID: R37518 RunNo: 37518 SeqNo: 1166865 Prep Date: Analysis Date: 9/27/2016 Units: mg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 1,1-Dichloroethene 1.2 0.050 1.000 0 119 70 130 Trichloroethene (TCE) 0.050 0 70 1.1 1.000 113 130 0.5000 109 70 Surr: Dibromofluoromethane 0.54 130 Surr: 1,2-Dichloroethane-d4 0.56 0.5000 111 70 130 Surr: Toluene-d8 0.49 0.5000 98.3 70 130 Surr: 4-Bromofluorobenzene 0.47 0.5000 93.1 70 130

Sample ID 1609e26-002ams	Samp1	уре: МS	3	TestCode: EPA Method 8260B: Volatiles						
Client ID: OW-57 (25-27')	Batcl	h ID: R3	7518	F	RunNo: 3	7518				
Prep Date:	Analysis D	Date: 9/	27/2016	S	SeqNo: 1	166959	Units: mg/h	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.89	0.019	0.7440	0	120	49.2	155			
Toluene	0.76	0.037	0.7440	0	102	52	154			
Chlorobenzene	0.75	0.037	0.7440	0	101	53.2	150			
1,1-Dichloroethene	0.91	0.037	0.7440	0	123	34.2	163			
Trichloroethene (TCE)	0.84	0.037	0.7440	0	113	48.2	151			
Surr: Dibromofluoromethane	0.43		0.3720		114	70	130			
Surr: 1,2-Dichloroethane-d4	0.40		0.3720		109	70	130			
Surr: Toluene-d8	0.36		0.3720		95.4	70	130			
Surr: 4-Bromofluorobenzene	0.35		0.3720		93.9	70	130			

Sample ID 1609e26-002amsd	I SampT	ype: MS	SD	TestCode: EPA Method 8260B: Volatiles						
Client ID: OW-57 (25-27')	Batch	1D: R3	7518	F	RunNo: 3	7518				
Prep Date:	Analysis D	ate: 9/	27/2016	8	SeqNo: 1	166960	Units: mg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.83	0.019	0.7440	0	111	49.2	155	7.67	20	
Toluene	0.76	0.037	0.7440	0	102	52	154	0.207	20	
Chlorobenzene	0.74	0.037	0.7440	0	99.7	53.2	150	1.31	20	
1,1-Dichloroethene	0.85	0.037	0.7440	0	114	34.2	163	7.29	20	
Trichloroethene (TCE)	0.76	0.037	0.7440	0	102	48.2	151	10.0	20	
Surr: Dibromofluoromethane	0.40		0.3720		109	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	0.39		0.3720		106	70	130	0	0	
Surr: Toluene-d8	0.36		0.3720		96.6	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.33		0.3720		89.5	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1609E26

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID rb SampType: MBLK TestCode: EPA Method 8260B: Volatiles Client ID: **PBS** Batch ID: **S37546** RunNo: 37546 Prep Date: Analysis Date: 9/28/2016 SeqNo: 1168081 Units: mg/Kg Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Benzene ND 0.025 0.050 Toluene ND ND 0.050 Ethylbenzene Methyl tert-butyl ether (MTBE) ND 0.050 1,2,4-Trimethylbenzene ND 0.050 1,3,5-Trimethylbenzene ND 0.050 1,2-Dichloroethane (EDC) ND 0.050 1,2-Dibromoethane (EDB) ND 0.050 Naphthalene ND 0.10 ND 0.20 1-Methylnaphthalene 2-Methylnaphthalene ND 0.20 0.074 0.75 J Acetone ND 0.050 Bromobenzene Bromodichloromethane ND 0.050 ND 0.050 Bromoform Bromomethane ND 0.15 2-Butanone ND 0.50 Carbon disulfide ND 0.50 Carbon tetrachloride ND 0.050 Chlorobenzene ND 0.050 Chloroethane ND 0.10 Chloroform ND 0.050 Chloromethane ND 0.15 2-Chlorotoluene ND 0.050 4-Chlorotoluene ND 0.050 cis-1,2-DCE ND 0.050 cis-1,3-Dichloropropene ND 0.050 1,2-Dibromo-3-chloropropane ND 0.10 Dibromochloromethane ND 0.050 ND 0.050 Dibromomethane ND 0.050 1.2-Dichlorobenzene ND 0.050 1,3-Dichlorobenzene 1.4-Dichlorobenzene ND 0.050 Dichlorodifluoromethane ND 0.050 1,1-Dichloroethane ND 0.050 1,1-Dichloroethene ND 0.050 ND 0.050 1,2-Dichloropropane 1,3-Dichloropropane ND 0.050 2,2-Dichloropropane ND 0.10

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1609E26

28-Oct-16

Client: Western Refining Company **Project: OW-14 SOURCE INV**

Sample ID rb	SampT	Гуре: МЕ	======= 3LK	Tesf	tCode: E l	PA Method	8260B: Volat	iles		
Client ID: PBS	Batch	h ID: S3	7546	R	RunNo: 3	7546				
Prep Date:	Analysis D)ate: 9 /	28/2016	S	SeqNo: 1	168081	Units: mg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.59		0.5000		118	70	130			
Surr: 1,2-Dichloroethane-d4	0.60		0.5000		119	70	130			
Surr: Toluene-d8	0.48		0.5000		96.1	70	130			
Surr: 4-Bromofluorobenzene	0.44		0.5000		88.4	70	130			
Sample ID 100ng Ics	SampT	Гуре: LC	 s	Tesf	tCode: El	PA Method	8260B: Volat	iles		
Client ID: LCSS	Batch	h ID: S3	7546	R	RunNo: 3	7546				

Qualifiers:

Prep Date:

Chlorobenzene

Analyte

Benzene Toluene

Value exceeds Maximum Contaminant Level.

Sample Diluted Due to Matrix D

Η Holding times for preparation or analysis exceeded

Analysis Date: 9/28/2016

PQL

0.025

0.050

0.050

SPK value SPK Ref Val

1.000

1.000

1.000

Result

1.1

1.0

0.98

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits R

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

LowLimit

70

70

70

E Value above quantitation range

J Analyte detected below quantitation limits

SeqNo: 1168082

%REC

108

101

98.0

0

0

0

Units: mg/Kg

130

130

130

HighLimit

P

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RPDLimit

Qual

%RPD

Sample pH Not In Range

Reporting Detection Limit RL

Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID 100ng Ics Client ID: LCSS	•	ype: LC		TestCode: EPA Method 8260B: Volatiles RunNo: 37546						
Prep Date:	Analysis D	ate: 9 /	28/2016	S	168082	Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	1.1	0.050	1.000	0	107	70	130			
Trichloroethene (TCE)	1.0	0.050	1.000	0	101	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		105	70	130			
Surr: 1,2-Dichloroethane-d4	0.54		0.5000		108	70	130			
Surr: Toluene-d8	0.49		0.5000		99.0	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		94.2	70	130			

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID MB-27789	SampType: MBLK TestCode: Method 8260B/5035LOW: VOLATILES									
Client ID: PBS	Batch I	ID: 27 7	789	R	unNo: 3	7599				
Prep Date: 9/29/2016	Analysis Dat	te: 9/ 3	30/2016	S	eqNo: 1	170203	Units: %Red	;		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.67		10.00		96.7	70	130			
Surr: 4-Bromofluorobenzene	9.83		10.00		98.3	70	130			
Surr: Dibromofluoromethane	9.47		10.00		94.7	70	130			
Surr: Toluene-d8	9.82		10.00		98.2	70	130			
Sample ID I CC 27790	CompTu			Toot	Cada: M	athad 0000	B/5035LOW:	VOLATILI	FC	
Sample ID LCS-27789	SampTyp	pe: LC	3	rest	Code. IVI	etnoa ozou	D/SUSSLUVV:	VULATILI	E3	
Client ID: LCSS	Batch I	•			unNo: 3		D/SUSSLOW:	VOLATILI	E 3	
	. ,.	ID: 27 7	789	R		7599	Units: %Red		=5	
Client ID: LCSS	Batch I Analysis Dat	ID: 27 7	789 30/2016	R	unNo: 3	7599			RPDLimit	Qual
Client ID: LCSS Prep Date: 9/29/2016	Batch I Analysis Dat	ID: 27 7 te: 9 /3	789 30/2016	R S	unNo: 3	7599 170204	Units: %Red	:		Qual
Client ID: LCSS Prep Date: 9/29/2016 Analyte	Batch I Analysis Dat Result	ID: 27 7 te: 9 /3	789 30/2016 SPK value	R S	unNo: 3 eqNo: 1 %REC	7599 170204 LowLimit	Units: %Red HighLimit	:		Qual
Client ID: LCSS Prep Date: 9/29/2016 Analyte Surr: 1,2-Dichloroethane-d4	Batch I Analysis Dat Result 10.2	ID: 27 7 te: 9 /3	789 30/2016 SPK value 10.00	R S	unNo: 3 eqNo: 1 %REC 102	7599 170204 LowLimit 70	Units: %Rec HighLimit	:		Qual
Client ID: LCSS Prep Date: 9/29/2016 Analyte Surr: 1,2-Dichloroethane-d4 Surr: 4-Bromofluorobenzene	Batch I Analysis Dat Result 10.2 10.1	ID: 27 7 te: 9 /3	789 30/2016 SPK value 10.00 10.00	R S	unNo: 3 eqNo: 1 %REC 102 101	7599 170204 LowLimit 70 70	Units: %Red HighLimit 130 130	:		Qual

Sample 10 LCSD-27789	Sampiy	/pe. LC	יפט	resicode. Method 8260B/5035LOW: VOLATILES						
Client ID: LCSS02	Batch	ID: 27	789	R	RunNo: 3	7599				
Prep Date: 9/29/2016	Analysis Da	ate: 9/	30/2016	S	SeqNo: 1	170205	Units: %Red			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.91		10.00		99.1	70	130	0	0	
Surr: 4-Bromofluorobenzene	10.1		10.00		101	70	130	0	0	
Surr: Dibromofluoromethane	9.84		10.00		98.4	70	130	0	0	
Surr: Toluene-d8	9.80		10.00		98.0	70	130	0	0	

Sample ID MB-27868	SampType: MBLK Batch ID: 27868			Tes	tCode: M	ethod 8260	B/5035LOW:	VOLATILI	ES	
Client ID: PBS	Batch	ID: 27	868	F	RunNo: 3	7658				
Prep Date: 10/4/2016	Analysis D	ate: 10	0/4/2016	8	SeqNo: 1	172683	Units: μg/Κο	9		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	2.00								
Toluene	ND	2.00								
Ethylbenzene	ND	2.00								
Methyl tert-butyl ether (MTBE)	ND	2.00								
1,2,4-Trimethylbenzene	ND	2.00								
1,3,5-Trimethylbenzene	ND	2.00								
1,2-Dichloroethane (EDC)	ND	2.00								
1,2-Dibromoethane (EDB)	ND	2.00								
Naphthalene	ND	2.00								
1-Methylnaphthalene	0.380	4.00								J

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1

1609E26 28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID MB-27868 SampType: MBLK TestCode: Method 8260B/5035LOW: VOLATILES

Sample ID WB-27868	Sampı	ype: wi	DLN	res	icode: IVI	etiiod 8260	B/5035LOW:	VOLATILI	Eð	
Client ID: PBS	Batch	n ID: 27	868	F	RunNo: 3	7658				
Prep Date: 10/4/2016	Analysis D)ate: 10	0/4/2016	8	SeqNo: 1	172683	Units: µg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylnaphthalene	ND	4.00								
Acetone	0.690	10.0								J
Bromobenzene	ND	2.00								
Bromodichloromethane	ND	2.00								
Bromoform	ND	2.00								
Bromomethane	ND	3.00								
2-Butanone	ND	10.0								
Carbon disulfide	ND	10.0								
Carbon tetrachloride	ND	2.00								
Chlorobenzene	ND	2.00								
Chloroethane	ND	2.00								
Chloroform	ND	2.00								
Chloromethane	ND	2.00								
2-Chlorotoluene	ND	2.00								
4-Chlorotoluene	ND	2.00								
cis-1,2-DCE	ND	2.00								
cis-1,3-Dichloropropene	ND	2.00								
1,2-Dibromo-3-chloropropane	ND	2.00								
Dibromochloromethane	ND	2.00								
Dibromomethane	ND	2.00								
1,2-Dichlorobenzene	ND	2.00								
1,3-Dichlorobenzene	ND	2.00								
1,4-Dichlorobenzene	ND	2.00								
Dichlorodifluoromethane	ND	2.00								
1,1-Dichloroethane	ND	2.00								
1,1-Dichloroethene	ND	2.00								
1,2-Dichloropropane	ND	2.00								
1,3-Dichloropropane	ND	2.00								
2,2-Dichloropropane	ND	2.00								
1,1-Dichloropropene	ND	2.00								
Hexachlorobutadiene	ND	2.00								
2-Hexanone	ND	10.0								
Isopropylbenzene	ND	2.00								
4-Isopropyltoluene	ND	2.00								
4-Methyl-2-pentanone	ND	10.0								
Methylene chloride	ND	3.00								
n-Butylbenzene	ND	2.00								
n-Propylbenzene	ND	2.00								
sec-Butylbenzene	ND	2.00								
300 Datymonizono	ND	00								

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID MB-27868 SampType: MBLK TestCode: Method 8260B/5035LOW: VOLATILES Client ID: **PBS** Batch ID: 27868 RunNo: 37658 Analysis Date: 10/4/2016 Prep Date: 10/4/2016 SeqNo: 1172683 Units: µg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual ND 2.00 Styrene ND tert-Butylbenzene 2.00 ND 1,1,1,2-Tetrachloroethane 2.00 1,1,2,2-Tetrachloroethane ND 2.00 Tetrachloroethene (PCE) ND 2.00 trans-1,2-DCE ND 2.00 trans-1,3-Dichloropropene ND 2.00 ND 2.00 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene ND 2.00 1,1,1-Trichloroethane ND 2.00 1,1,2-Trichloroethane ND 2.00 ND 2.00 Trichloroethene (TCE) Trichlorofluoromethane ND 2.00 1,2,3-Trichloropropane ND 2.00 Vinyl chloride ND 2.00 Xylenes, Total ND 2.00 Surr: 1,2-Dichloroethane-d4 9.93 10.00 99.3 70 130 Surr: 4-Bromofluorobenzene 10.0 10.00 100 70 130 Surr: Dibromofluoromethane 9.88 10.00 98.8 70 130 Surr: Toluene-d8 10.0 10.00 100 70 130

Sample ID LCS-27868	SampT	ype: LC	S	Tes	tCode: M	ethod 8260	B/5035LOW:	VOLATILI	ES	
Client ID: LCSS	Batch	n ID: 27	868	F	RunNo: 3	7658				
Prep Date: 10/4/2016	Analysis D	ate: 10	0/4/2016	8	SeqNo: 1	172684	Units: µg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	9.14	2.00	10.00	0	91.4	70	130			
Toluene	9.27	2.00	10.00	0	92.7	70	130			
Chlorobenzene	9.42	2.00	10.00	0	94.2	70	130			
1,1-Dichloroethene	9.19	2.00	10.00	0	91.9	68	129			
Trichloroethene (TCE)	9.01	2.00	10.00	0	90.1	70	130			
Surr: 1,2-Dichloroethane-d4	10.1		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	10.2		10.00		102	70	130			
Surr: Dibromofluoromethane	9.89		10.00		98.9	70	130			
Surr: Toluene-d8	9.88		10.00		98.8	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

Denouting Detection Limit

Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID LCSD-27868	SampT	ype: LC	SD	Tes	TestCode: Method 8260B/5035LOW: VOLATILES						
Client ID: LCSS02	Batch	n ID: 27 8	868	F	RunNo: 3	7658					
Prep Date: 10/4/2016	Analysis D	Analysis Date: 10/4/2016			SeqNo: 1	172759	Units: µg/K	g			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Benzene	9.35	2.00	10.00	0	93.5	70	130	2.27	20		
Toluene	9.49	2.00	10.00	0	94.9	70	130	2.35	20		
Chlorobenzene	9.63	2.00	10.00	0	96.3	70	130	2.20	20		
1,1-Dichloroethene	9.37	2.00	10.00	0	93.7	68	129	1.94	20		
Trichloroethene (TCE)	9.16	2.00	10.00	0	91.6	70	130	1.65	20		
Surr: 1,2-Dichloroethane-d4	10.1		10.00		101	70	130	0	0		
Surr: 4-Bromofluorobenzene	10.1		10.00		101	70	130	0	0		
Surr: Dibromofluoromethane	9.93		10.00		99.3	70	130	0	0		
Surr: Toluene-d8	9.97		10.00		99.7	70	130	0	0		

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

SampType: MBLK

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID 100NG LCS	SampT	ype: LC	S	Tes	tCode: El	PA Method	8260B: VOL	ATILES		
Client ID: LCSW	Batch	1D: R3	7500	F	RunNo: 3	7500				
Prep Date:	Analysis D	ate: 9/	27/2016	S	SeqNo: 1	166023	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	104	70	130			
Toluene	21	1.0	20.00	0	103	70	130			
Chlorobenzene	21	1.0	20.00	0	103	70	130			
1,1-Dichloroethene	21	1.0	20.00	0	103	70	130			
Trichloroethene (TCE)	20	1.0	20.00	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	9.1		10.00		91.4	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		97.7	70	130			
Surr: Dibromofluoromethane	9.8		10.00		98.4	70	130			
Surr: Toluene-d8	9.8		10.00		97.8	70	130			

TestCode: EPA Method 8260B: VOLATILES

Client ID: PBW	Batch	n ID: R3	37500	F	RunNo: 3	7500				
Prep Date:	Analysis D	ate: 9 /	27/2016	S	SeqNo: 1	166024	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.12	1.0								J
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	0.14	2.0								J
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

Sample ID rb

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1609E26

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID rb SampType: MBLK TestCode: EPA Method 8260B: VOLATILES RunNo: 37500 Client ID: **PBW** Batch ID: R37500 Prep Date: Analysis Date: 9/27/2016 SeqNo: 1166024 Units: µg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 4-Chlorotoluene ND 1.0 ND cis-1,2-DCE 1.0 ND cis-1,3-Dichloropropene 1.0 1,2-Dibromo-3-chloropropane ND 2.0 Dibromochloromethane ND 1.0 Dibromomethane ND 1.0 1,2-Dichlorobenzene ND 1.0 ND 1.0 1,3-Dichlorobenzene 1,4-Dichlorobenzene ND 1.0 ND Dichlorodifluoromethane 1.0 1,1-Dichloroethane ND 1.0 ND 1.0 1,1-Dichloroethene ND 1.0 1,2-Dichloropropane 1,3-Dichloropropane ND 1.0 ND 2.0 2,2-Dichloropropane 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 10 J 1.9 Methylene Chloride ND 3.0 n-Butylbenzene ND 3.0 n-Propylbenzene ND 1.0 sec-Butylbenzene ND 1.0 ND 1.0 Styrene 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 ND trans-1,2-DCE 1.0 ND 1.0 trans-1,3-Dichloropropene 1,2,3-Trichlorobenzene ND 1.0 1,2,4-Trichlorobenzene 0.20 1.0 J 1,1,1-Trichloroethane ND 1.0 1,1,2-Trichloroethane ND 1.0 ND 1.0 Trichloroethene (TCE) Trichlorofluoromethane ND 1.0 1,2,3-Trichloropropane ND 2.0

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1609E26

28-Oct-16

Client: Western Refining Company **Project: OW-14 SOURCE INV**

Sample ID rb SampType: MBLK TestCode: EPA Method 8260B: VOLATILES RunNo: 37500 Client ID: **PBW** Batch ID: **R37500** Prep Date: Analysis Date: 9/27/2016 SeqNo: 1166024 Units: µg/L Analyte SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Vinyl chloride ND 1.0 ND Xylenes, Total 1.5 97.3 70 Surr: 1,2-Dichloroethane-d4 9.7 10.00 130 Surr: 4-Bromofluorobenzene 11 10.00 107 70 130 Surr: Dibromofluoromethane 10 10.00 101 70 130 Surr: Toluene-d8 10 10.00 100 70 130

Sample ID 1609e26-003ams SampType: MS TestCode: EPA Method 8260B: VOLATILES Client ID: EB092116 Batch ID: R37500 RunNo: 37500 Prep Date: Analysis Date: 9/27/2016 SeqNo: 1166511 Units: µg/L %REC Result **PQL** SPK value SPK Ref Val HighLimit %RPD **RPDLimit** Analyte LowLimit Qual Benzene 21 1.0 20.00 103 70 130 21 1.0 20.00 0.1220 103 70 130 Toluene 20 20.00 102 70 Chlorobenzene 1.0 0 130 21 106 70 1,1-Dichloroethene 1.0 20.00 0 130 Trichloroethene (TCE) 20 1.0 20.00 0 100 70 130 Surr: 1,2-Dichloroethane-d4 8.8 10.00 88.5 70 130 Surr: 4-Bromofluorobenzene 99.4 70 9.9 10.00 130 Surr: Dibromofluoromethane 9.8 10.00 97.6 70 130 98.1 Surr: Toluene-d8 9.8 10.00 70 130

Sample ID 1609e26-003amsc	I SampT	ype: MS	SD	Tes	tCode: E l	PA Method	8260B: VOL	ATILES		
Client ID: EB092116	Batch	n ID: R3	7500	F	RunNo: 3	7500				
Prep Date:	Analysis D	ate: 9 /	27/2016	S	SeqNo: 1	166512	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	99.2	70	130	3.85	20	
Toluene	20	1.0	20.00	0.1220	101	70	130	2.06	20	
Chlorobenzene	20	1.0	20.00	0	101	70	130	1.48	20	
1,1-Dichloroethene	20	1.0	20.00	0	100	70	130	5.49	20	
Trichloroethene (TCE)	19	1.0	20.00	0	96.0	70	130	4.17	20	
Surr: 1,2-Dichloroethane-d4	8.5		10.00		85.2	70	130	0	0	
Surr: 4-Bromofluorobenzene	9.9		10.00		99.1	70	130	0	0	
Surr: Dibromofluoromethane	9.3		10.00		92.8	70	130	0	0	
Surr: Toluene-d8	9.8		10.00		98.3	70	130	0	0	

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- P
 - Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID mb-27733 SampType: MBLK TestCode: EPA Method 8270C: Semivolatiles **PBS** Client ID: Batch ID: 27733 RunNo: 37618 Prep Date: 9/27/2016 Analysis Date: 9/30/2016 SeqNo: 1170903 Units: mg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Acenaphthene ND 0.20 Acenaphthylene ND 0.20 ND 0.20 Aniline Anthracene ND 0.20 Azobenzene ND 0.20 Benz(a)anthracene ND 0.20 Benzo(a)pyrene ND 0.20 Benzo(b)fluoranthene ND 0.20 Benzo(q,h,i)perylene ND 0.20 ND 0.20 Benzo(k)fluoranthene Benzoic acid ND 0.50 ND 0.20 Benzyl alcohol Bis(2-chloroethoxy)methane ND 0.20 Bis(2-chloroethyl)ether ND 0.20 Bis(2-chloroisopropyl)ether ND 0.20 Bis(2-ethylhexyl)phthalate 0.14 0.50 J 4-Bromophenyl phenyl ether ND 0.20 Butyl benzyl phthalate ND 0.20 Carbazole ND 0.20 4-Chloro-3-methylphenol ND 0.50 4-Chloroaniline ND 0.50 2-Chloronaphthalene ND 0.25 ND 2-Chlorophenol 0.20 4-Chlorophenyl phenyl ether ND 0.20 Chrysene ND 0.20 0.10 0.40 Di-n-butyl phthalate J Di-n-octyl phthalate ND 0.40 Dibenz(a,h)anthracene ND 0.20 Dibenzofuran ND 0.20 ND 0.20 1,2-Dichlorobenzene ND 0.20 1.3-Dichlorobenzene 1,4-Dichlorobenzene ND 0.20 3.3´-Dichlorobenzidine ND 0.25 Diethyl phthalate 0.14 0.20 J Dimethyl phthalate ND 0.20 2,4-Dichlorophenol ND 0.40 2,4-Dimethylphenol ND 0.30 4,6-Dinitro-2-methylphenol ND 0.40 2,4-Dinitrophenol ND 0.50

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID mb-27733 SampType: MBLK TestCode: EPA Method 8270C: Semivolatiles Client ID: **PBS** Batch ID: 27733 RunNo: 37618 Prep Date: 9/27/2016 Analysis Date: 9/30/2016 SeqNo: 1170903 Units: mg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 2,4-Dinitrotoluene ND 0.50 2,6-Dinitrotoluene ND 0.50 ND 0.20 Fluoranthene Fluorene ND 0.20 Hexachlorobenzene ND 0.20 Hexachlorobutadiene ND 0.20 Hexachlorocyclopentadiene ND 0.20 ND 0.20 Hexachloroethane Indeno(1,2,3-cd)pyrene ND 0.20 0.40 Isophorone ND 1-Methylnaphthalene ND 0.20 2-Methylnaphthalene ND 0.20 2-Methylphenol ND 0.40 3+4-Methylphenol ND 0.20 N-Nitrosodi-n-propylamine ND 0.20 N-Nitrosodiphenylamine ND 0.20 Naphthalene ND 0.20 2-Nitroaniline ND 0.20 3-Nitroaniline ND 0.20 4-Nitroaniline ND 0.40 Nitrobenzene ND 0.40 2-Nitrophenol ND 0.20 4-Nitrophenol 0.25 ND Pentachlorophenol ND 0.40 Phenanthrene ND 0.20 Phenol ND 0.20 Pyrene ND 0.20 Pyridine ND 0.40 1,2,4-Trichlorobenzene ND 0.20 0.20 2,4,5-Trichlorophenol ND 2,4,6-Trichlorophenol ND 0.20 78.4 97.9 Surr: 2-Fluorophenol 2.6 3.330 35 Surr: Phenol-d5 2.9 3.330 87.1 37.3 105 Surr: 2,4,6-Tribromophenol 3.1 3.330 92.0 35.6 118 Surr: Nitrobenzene-d5 1.3 1.670 78.3 41.2 107 Surr: 2-Fluorobiphenyl 1.3 1.670 80.5 41.9 119 1.670 Surr: 4-Terphenyl-d14 72.8 15 132 1.2

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
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- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
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- P Sample pH Not In Range
- RL Reporting Detection Limit
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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID Ics-27733	SampT	ype: LC	s	Tes	tCode: El	PA Method	8270C: Sem	ivolatiles		
Client ID: LCSS	Batch	n ID: 27	733	F	RunNo: 3	7618				
Prep Date: 9/27/2016	Analysis D	ate: 9 /	30/2016	S	SeqNo: 1	170904	Units: mg/k	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.3	0.20	1.670	0	75.3	45.8	99.8			
4-Chloro-3-methylphenol	2.3	0.50	3.330	0	69.8	51.5	103			
2-Chlorophenol	2.2	0.20	3.330	0	66.8	46.5	105			
1,4-Dichlorobenzene	1.1	0.20	1.670	0	63.4	45.5	103			
2,4-Dinitrotoluene	1.2	0.50	1.670	0	72.8	36	87.2			
N-Nitrosodi-n-propylamine	1.2	0.20	1.670	0	70.1	47.3	104			
4-Nitrophenol	2.6	0.25	3.330	0	77.1	47.3	95.3			
Pentachlorophenol	2.2	0.40	3.330	0	65.1	38.7	89.3			
Phenol	2.3	0.20	3.330	0	69.7	47.8	106			
Pyrene	1.3	0.20	1.670	0	77.5	33.4	105			
1,2,4-Trichlorobenzene	1.2	0.20	1.670	0	72.1	50.4	115			
Surr: 2-Fluorophenol	2.1		3.330		64.0	35	97.9			
Surr: Phenol-d5	2.4		3.330		70.6	37.3	105			
Surr: 2,4,6-Tribromophenol	2.6		3.330		77.5	35.6	118			
Surr: Nitrobenzene-d5	1.1		1.670		63.1	41.2	107			
Surr: 2-Fluorobiphenyl	1.2		1.670		70.1	41.9	119			
Surr: 4-Terphenyl-d14	1.1		1.670		66.0	15	132			

Sample ID 1609e26-001ams	SampT	ype: MS	3	Tes	tCode: E	PA Method	8270C: Sem	ivolatiles		
Client ID: OW-57 (16-18')	Batch	n ID: 27	733	F	RunNo: 3	7618				
Prep Date: 9/27/2016	Analysis D	ate: 9 /	30/2016	8	SeqNo: 1	170906	Units: mg/h	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.3	0.20	1.662	0	78.1	39.3	86.4			
4-Chloro-3-methylphenol	2.7	0.50	3.315	0	81.3	37.5	96.4			
2-Chlorophenol	2.7	0.20	3.315	0	81.0	37.4	90.6			
1,4-Dichlorobenzene	1.2	0.20	1.662	0	70.0	31.7	85			
2,4-Dinitrotoluene	1.2	0.50	1.662	0	71.6	26.4	86			
N-Nitrosodi-n-propylamine	1.4	0.20	1.662	0	84.5	43.5	83			S
4-Nitrophenol	2.6	0.25	3.315	0	79.0	32.7	98			
Pentachlorophenol	2.4	0.40	3.315	0	71.8	26.6	87.4			
Phenol	2.6	0.20	3.315	0	79.6	40.5	85.3			
Pyrene	1.3	0.20	1.662	0	79.9	23.2	93.9			
1,2,4-Trichlorobenzene	1.3	0.20	1.662	0	80.2	38.7	99			
Surr: 2-Fluorophenol	2.4		3.315		71.9	35	97.9			
Surr: Phenol-d5	2.7		3.315		82.9	37.3	105			
Surr: 2,4,6-Tribromophenol	2.5		3.315		76.5	35.6	118			
Surr: Nitrobenzene-d5	1.2		1.662		73.5	41.2	107			
Surr: 2-Fluorobiphenyl	1.1		1.662		67.8	41.9	119			

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID 1609e26-001ams SampType: MS TestCode: EPA Method 8270C: Semivolatiles

Client ID: OW-57 (16-18') Batch ID: 27733 RunNo: 37618

Prep Date: 9/27/2016 Analysis Date: 9/30/2016 SeqNo: 1170906 Units: mg/Kg

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

Surr: 4-Terphenyl-d14 0.95 1.662 56.9 15 132

Sample ID 1609e26-001amso	J SampT	уре: МS	SD	Tes	tCode: El	PA Method	8270C: Semi	volatiles		
Client ID: OW-57 (16-18')	Batch	n ID: 27	733	F	RunNo: 3	7618				
Prep Date: 9/27/2016	Analysis D	ate: 9 /	30/2016	S	SeqNo: 1	170907	Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.1	0.20	1.667	0	68.2	39.3	86.4	13.2	30.2	
4-Chloro-3-methylphenol	2.3	0.50	3.323	0	68.0	37.5	96.4	17.6	37.2	
2-Chlorophenol	2.2	0.20	3.323	0	67.4	37.4	90.6	17.9	48	
1,4-Dichlorobenzene	0.95	0.20	1.667	0	56.7	31.7	85	20.7	40.6	
2,4-Dinitrotoluene	1.1	0.50	1.667	0	64.9	26.4	86	9.53	47.7	
N-Nitrosodi-n-propylamine	1.1	0.20	1.667	0	67.5	43.5	83	22.1	52.5	
4-Nitrophenol	2.3	0.25	3.323	0	69.6	32.7	98	12.3	36.6	
Pentachlorophenol	2.1	0.40	3.323	0	63.5	26.6	87.4	12.1	65.5	
Phenol	2.3	0.20	3.323	0	67.8	40.5	85.3	15.8	44	
Pyrene	1.2	0.20	1.667	0	70.8	23.2	93.9	11.8	42.1	
1,2,4-Trichlorobenzene	1.1	0.20	1.667	0	67.2	38.7	99	17.3	31.5	
Surr: 2-Fluorophenol	2.1		3.323		61.9	35	97.9	0	0	
Surr: Phenol-d5	2.2		3.323		65.2	37.3	105	0	0	
Surr: 2,4,6-Tribromophenol	2.3		3.323		70.4	35.6	118	0	0	
Surr: Nitrobenzene-d5	0.97		1.667		58.5	41.2	107	0	0	
Surr: 2-Fluorobiphenyl	1.0		1.667		62.8	41.9	119	0	0	
Surr: 4-Terphenyl-d14	0.87		1.667		52.3	15	132	0	0	

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID mb-27764 SampType: MBLK TestCode: EPA Method 8270C: Semivolatiles RunNo: 37618 Client ID: **PBW** Batch ID: 27764 Prep Date: 9/28/2016 Analysis Date: 9/30/2016 SeqNo: 1170918 Units: µg/L Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Acenaphthene ND 10 ND 10 Acenaphthylene ND 10 Aniline Anthracene ND 10 Azobenzene ND 10 Benz(a)anthracene ND 10 Benzo(a)pyrene ND 10 ND Benzo(b)fluoranthene 10 Benzo(q,h,i)perylene ND 10 ND 10 Benzo(k)fluoranthene Benzoic acid 4.7 20 J ND 10 Benzyl alcohol 10 Bis(2-chloroethoxy)methane ND 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 ND 10 Di-n-butyl phthalate Di-n-octyl phthalate ND 10 Dibenz(a,h)anthracene ND 10 Dibenzofuran ND 10 ND 10 1,2-Dichlorobenzene ND 10 1.3-Dichlorobenzene 1,4-Dichlorobenzene ND 10 3.3´-Dichlorobenzidine ND 10 Diethyl phthalate ND 10 Dimethyl phthalate ND 10 20 2,4-Dichlorophenol ND 2,4-Dimethylphenol ND 10 4,6-Dinitro-2-methylphenol ND 20 2,4-Dinitrophenol 7.5 20 J

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID mb-27764 SampType: MBLK TestCode: EPA Method 8270C: Semivolatiles Client ID: **PBW** Batch ID: 27764 RunNo: 37618 Prep Date: 9/28/2016 Analysis Date: 9/30/2016 SeqNo: 1170918 Units: µg/L Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 2,4-Dinitrotoluene ND 10 ND 10 2,6-Dinitrotoluene ND 10 Fluoranthene Fluorene ND 10 Hexachlorobenzene ND 10 Hexachlorobutadiene ND 10 Hexachlorocyclopentadiene ND 10 ND 10 Hexachloroethane Indeno(1,2,3-cd)pyrene ND 10 ND 10 Isophorone 1-Methylnaphthalene ND 10 2-Methylnaphthalene ND 10 10 2-Methylphenol ND 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 ND 10 2-Nitrophenol 4-Nitrophenol ND 10 20 Pentachlorophenol ND Phenanthrene ND 10 Phenol ND 10 ND 10 Pyrene Pyridine ND 10 ND 10 1,2,4-Trichlorobenzene 2,4,5-Trichlorophenol ND 10 10 2,4,6-Trichlorophenol ND Surr: 2-Fluorophenol 120 200.0 60.2 15 123 Surr: Phenol-d5 100 200.0 51.9 4.13 124 Surr: 2,4,6-Tribromophenol 130 200.0 64.9 18.4 134 Surr: Nitrobenzene-d5 58 100.0 57.6 28.8 134 Surr: 2-Fluorobiphenyl 54 100.0 54.2 35.9 125 Surr: 4-Terphenyl-d14 50 100.0 49.5 15 146

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID Ics-27764	SampT	ype: LC	s	Tes	tCode: El	PA Method	8270C: Semi	volatiles		
Client ID: LCSW	Batch	n ID: 27	764	F	RunNo: 3	7618				
Prep Date: 9/28/2016	Analysis D	ate: 9 /	30/2016	S	SeqNo: 1	170921	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	67	10	100.0	0	66.9	35	113			
4-Chloro-3-methylphenol	160	10	200.0	0	81.0	40.7	114			
2-Chlorophenol	130	10	200.0	0	64.8	37.6	113			
1,4-Dichlorobenzene	52	10	100.0	0	51.8	37.7	106			
2,4-Dinitrotoluene	66	10	100.0	0	66.3	37	91			
N-Nitrosodi-n-propylamine	74	10	100.0	0	73.8	45.4	105			
4-Nitrophenol	120	10	200.0	0	59.1	33.4	104			
Pentachlorophenol	120	20	200.0	0	61.0	29.5	94.9			
Phenol	110	10	200.0	0	56.0	30.6	119			
Pyrene	68	10	100.0	0	68.3	26.2	120			
1,2,4-Trichlorobenzene	62	10	100.0	0	61.5	39.9	125			
Surr: 2-Fluorophenol	100		200.0		51.0	15	123			
Surr: Phenol-d5	95		200.0		47.4	4.13	124			
Surr: 2,4,6-Tribromophenol	130		200.0		63.7	18.4	134			
Surr: Nitrobenzene-d5	57		100.0		57.4	28.8	134			
Surr: 2-Fluorobiphenyl	52		100.0		52.2	35.9	125			
Surr: 4-Terphenyl-d14	47		100.0		46.9	15	146			

Sample ID 1609e26-003hms	SampT	ype: MS	3	Tes	tCode: El	PA Method	8270C: Semi	volatiles		
Client ID: EB092116	Batch	n ID: 27	764	F	RunNo: 3	7618				
Prep Date: 9/28/2016	Analysis D	ate: 9/	30/2016	S	SeqNo: 1	170928	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	64	10	100.0	0	63.7	27.6	123			
4-Chloro-3-methylphenol	130	10	200.0	0	66.3	29.3	126			
2-Chlorophenol	130	10	200.0	0	65.7	15	133			
1,4-Dichlorobenzene	45	10	100.0	0	45.1	17.6	127			
2,4-Dinitrotoluene	58	10	100.0	0	58.3	38.9	98.5			
N-Nitrosodi-n-propylamine	79	10	100.0	0	79.5	25.9	131			
4-Nitrophenol	67	10	200.0	0	33.6	15	102			
Pentachlorophenol	120	20	200.0	0	58.4	15	120			
Phenol	72	10	200.0	0	36.0	15	100			
Pyrene	64	10	100.0	0	63.9	22.8	126			
1,2,4-Trichlorobenzene	52	10	100.0	0	51.5	15	143			
Surr: 2-Fluorophenol	94		200.0		46.9	15	123			
Surr: Phenol-d5	71		200.0		35.4	4.13	124			
Surr: 2,4,6-Tribromophenol	140		200.0		69.6	18.4	134			
Surr: Nitrobenzene-d5	61		100.0		61.2	28.8	134			
Surr: 2-Fluorobiphenyl	56		100.0		56.3	35.9	125			

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1609E26

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID 1609e26-003hms SampType: MS TestCode: EPA Method 8270C: Semivolatiles

Client ID: **EB092116** Batch ID: **27764** RunNo: **37618**

Prep Date: 9/28/2016 Analysis Date: 9/30/2016 SeqNo: 1170928 Units: μg/L

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

Surr: 4-Terphenyl-d14 51 100.0 50.8 15 146

Sample ID 1609e26-003hmsc	I SampT	уре: МS	SD	Tes	tCode: El										
Client ID: EB092116	Batch	ID: 27	764	F	unNo: 3	7618									
Prep Date: 9/28/2016	Analysis D	ate: 9/	30/2016	S	SeqNo: 1	170929	Units: µg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual					
Acenaphthene	41	10	100.0	0	41.3	27.6	123	42.7	31.3	R					
4-Chloro-3-methylphenol	97	10	200.0	0	48.4	29.3	126	31.2	29	R					
2-Chlorophenol	86	10	200.0	0	42.8	15	133	42.2	28.4	R					
1,4-Dichlorobenzene	30	10	100.0	0	30.0	17.6	127	40.3	28.2	R					
2,4-Dinitrotoluene	41	10	100.0	0	40.6	38.9	98.5	35.7	22.9	R					
N-Nitrosodi-n-propylamine	51	10	100.0	0	50.5	25.9	131	44.5	28.8	R					
4-Nitrophenol	48	10	200.0	0	24.0	15	102	33.4	41.5						
Pentachlorophenol	79	20	200.0	0	39.6	15	120	38.4	45.1						
Phenol	48	10	200.0	0	24.1	15	100	39.7	33.9	R					
Pyrene	46	10	100.0	0	46.3	22.8	126	31.9	33.6						
1,2,4-Trichlorobenzene	34	10	100.0	0	33.9	15	143	41.1	28.2	R					
Surr: 2-Fluorophenol	65		200.0		32.3	15	123	0	0						
Surr: Phenol-d5	47		200.0		23.4	4.13	124	0	0						
Surr: 2,4,6-Tribromophenol	98		200.0		49.0	18.4	134	0	0						
Surr: Nitrobenzene-d5	43		100.0		43.3	28.8	134	0	0						
Surr: 2-Fluorobiphenyl	36		100.0		36.4	35.9	125	0	0						
Surr: 4-Terphenyl-d14	38		100.0		38.3	15	146	0	0						

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID MB-27712 SampType: MBLK TestCode: EPA Method 7471: Mercury

Client ID: PBS Batch ID: 27712 RunNo: 37501

Prep Date: 9/26/2016 Analysis Date: 9/27/2016 SeqNo: 1166058 Units: mg/Kg

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

Mercury ND 0.033

Sample ID LCS-27712 SampType: LCS TestCode: EPA Method 7471: Mercury

Client ID: LCSS Batch ID: 27712 RunNo: 37501

Prep Date: 9/26/2016 Analysis Date: 9/27/2016 SeqNo: 1166059 Units: mg/Kg

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

Mercury 0.18 0.033 0.1667 0 106 80 120

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

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P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: 1609E26

28-Oct-16

Client: Western Refining Company
Project: OW-14 SOURCE INV

Sample ID MB-27710 SampType: MBLK TestCode: EPA Method 6010B: Soil Metals Client ID: **PBS** Batch ID: 27710 RunNo: 37616 Units: mg/Kg Prep Date: 9/26/2016 Analysis Date: 10/1/2016 SeqNo: 1170694 Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual ND Antimony 2.5 ND Arsenic 2.5 ND Barium 0.10 Beryllium ND 0.15 Cadmium ND 0.10 Chromium ND 0.30 Cobalt ND 0.30 ND 2.5 Iron Lead ND 0.25 ND 0.10 Manganese Nickel ND 0.50 ND 2.5 Selenium ND 0.25 Silver Vanadium ND 2.5 Zinc 0.37 2.5

Sample ID LCS-27710	SampT	ype: LC	s	Tes	tCode: El	PA Method	6010B: Soil	Metals		
Client ID: LCSS	Batch	1D: 27	710	F	RunNo: 3	7616				
Prep Date: 9/26/2016	Analysis D	ate: 10	0/1/2016	S	SeqNo: 1	170695	Units: mg/k	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	21	2.5	25.00	0	84.4	80	120			
Arsenic	22	2.5	25.00	0	86.5	80	120			
Barium	22	0.10	25.00	0	86.8	80	120			
Beryllium	22	0.15	25.00	0	90.0	80	120			
Cadmium	22	0.10	25.00	0	87.7	80	120			
Chromium	22	0.30	25.00	0	86.3	80	120			
Cobalt	21	0.30	25.00	0	84.2	80	120			
Iron	22	2.5	25.00	0	89.0	80	120			
Lead	21	0.25	25.00	0	83.7	80	120			
Manganese	22	0.10	25.00	0	86.6	80	120			
Nickel	21	0.50	25.00	0	84.7	80	120			
Selenium	21	2.5	25.00	0	83.4	80	120			
Silver	4.5	0.25	5.000	0	90.9	80	120			
Vanadium	23	2.5	25.00	0	91.3	80	120			
Zinc	21	2.5	25.00	0	83.9	80	120			

Qualifiers:

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

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Client:

Hall Environmental Analysis Laboratory, Inc.

Western Refining Company

WO#: 1609E26

28-Oct-16

Project:	OW-14 S	OURCE IN	IV								
Sample ID	rb	SampTy	pe: ME	BLK	Tes	tCode: El	PA Method	8015D Mod:	Gasoline	Range	
Client ID:	PBS	Batch	ID: G3	7518	F	RunNo: 3	7518				
Prep Date:		Analysis Da	ite: 9/	27/2016	S	SeqNo: 1	166974	Units: mg/h	K g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
	e Organics (GRO)	ND	5.0					400			
Surr: BFB		440		500.0		87.5	70	130			
Sample ID	2.5ug gro lcs	SampTy	pe: LC	S	Tes	tCode: El	PA Method	8015D Mod:	Gasoline	Range	
Client ID:	LCSS	Batch	ID: G3	7518	F	RunNo: 3	7518				
Prep Date:		Analysis Da	ite: 9/	27/2016	S	SeqNo: 1	166975	Units: mg/h	K g		
Analyte		Result	PQL		SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
=	e Organics (GRO)	25 450	5.0	25.00	0	98.2	62.9	123			
Surr: BFB		450		500.0		89.5	70	130			
Sample ID	1609e26-001ams	SampTy	pe: MS	5	Tes	tCode: El	PA Method	8015D Mod:	Gasoline	Range	
Client ID:	OW-57 (16-18')	Batch	ID: G3	7518	F	RunNo: 3	7518				
Prep Date:		Analysis Da	ite: 9/	27/2016	S	SeqNo: 1	166977	Units: mg/h	K g		
Analyte		Result	PQL		SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
=	e Organics (GRO)	16	3.2	15.98	0	99.6	52.3 70	132 130			
Surr: BFB		300		319.7		93.5	70	130			
Sample ID	rb	SampTy	pe: ME	BLK	Tes	tCode: El	PA Method	8015D Mod:	Gasoline	Range	
Client ID:	PBS	Batch	ID: G3	7546	F	RunNo: 3	7546				
Prep Date:		Analysis Da	ite: 9/	28/2016	S	SeqNo: 1	168043	Units: mg/k	K g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang Surr: BFB	e Organics (GRO)	ND 440	5.0	500.0		87.2	70	130			
Juli. DFD		440		500.0		07.2	70	130			
Sample ID	2.5ug gro lcs	SampTy	pe: LC	S	Tes	tCode: El	PA Method	8015D Mod:	Gasoline	Range	
Client ID:	LCSS	Batch	ID: G3	7546	F	RunNo: 3	7546				
Prep Date:		Analysis Da	ite: 9/	28/2016	S	SeqNo: 1	168044	Units: mg/k	K g		
Analyte		Result	PQL		SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang Surr: BFB	e Organics (GRO)	25 470	5.0	25.00 500.0	0	98.5 93.7	62.9 70	123 130			
Sull. DFD		470		500.0		93.1	70	130			
Sample ID	1609e26-001amsd							8015D Mod:	Gasoline	Range	
Client ID:	OW-57 (16-18')		ID: G3			RunNo: 3					
Prep Date:		Analysis Da	ite: 9/	28/2016	S	SeqNo: 1	168046	Units: mg/h	K g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- Sample Diluted Due to Matrix D
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
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- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: 1609E26

28-Oct-16

Client: Western Refining Company **Project: OW-14 SOURCE INV**

Sample ID 1609e26-001amsd SampType: MSD TestCode: EPA Method 8015D Mod: Gasoline Range

Client ID: OW-57 (16-18') Batch ID: G37518 RunNo: 37546

Prep Date:	Analysis D	ate: 9 /	28/2016	S	eqNo: 1	168046	Units: mg/K	(g			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Organics (GRO)	16	3.2	15.98	0	101	52.3	132	1.12	20		
Surr: BFB	290		319.7		91.8	70	130	0	0		

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- Sample Diluted Due to Matrix D
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits R
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits

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- P Sample pH Not In Range
- Reporting Detection Limit RL
- Sample container temperature is out of limit as specified



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: 1609E26 RcptNo: 1 Received by/date: 0917.3/16 anne Stran Logged By: Anne Thorne 9/23/2016 4:40:00 PM anne Am Completed By: Anne Thorne 9/26/2016 09/26/16 Reviewed By: 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? No 🗌 NA 🗌 Yes 🗸 5. Were all samples received at a temperature of >0° C to 6.0°C Yes 🗸 No 🗌 NA 🗌 Sample(s) in proper container(s)? No 🗆 7. Sufficient sample volume for indicated test(s)? Yes 🗸 No 8. Are samples (except VOA and ONG) properly preserved? No 9. Was preservative added to bottles? Yes 🗌 No 🗸 NA 🗌 10. VOA vials have zero headspace? Yes 🗸 No No VOA Vials 11. Were any sample containers received broken? Yes 🗆 No 🔽 # of preserved bottles checked 12. Does paperwork match bottle labels? for pH: Yes 🗹 No 🗌 (Note discrepancies on chain of custody) 12 unless noted) 13. Are matrices correctly identified on Chain of Custody? Yes 🗹 No 🗌 14. Is it clear what analyses were requested? No 🗌 Yes 🗹 15. Were all holding times able to be met? Yes 🗹 No 🗌 Checked by: (If no, notify customer for authorization.) 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 1.0 Good

INTROUMENTAL ENVIRONMENTAL	Rush ANALYSIS LABORATORY	www.hallenvironmental.com	Source TNV. 4901 Hawkins NE - Albuquerque, NM 87109	Tel. 505-345-3975	Sm.	(O) (A)	8,8 ''20 ')	O \ (80)	MB's 200 S (1) (1) (1) (2) (2) (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	1 + TT + TT + TT + TT + TT + TT + TT +	(G) (G) (G) (G) (G) (G) (G) (G) (G) (G)	HEALTNO. BTEX + MT BTEX + MT BTEX + MT TPH 8015B TPH 8015B TPH 8015B TPH 8015B TPH 8015B TPH 8015B TPH 8015B TPH 8015B TPH 8015B TPH 8015B TPH 8015B TPH 8015B TPH 8015B TPH 8015B	% ////	MEOH VOOL V		V/V / / / Z02 /	MEOH 702 /	308				Date Time Remarks:	Date Time	1
Chain-of-Custody Record turn-Around line	Client: WESTERN REFINITING SW. INC. X Standard		99 GIANT CROSSING RD	Project #:	CALLE NET 07.301	Phone #: 505-72-0217	l a	Charles Anderd		□ Other	K EDD (Type) FXCEL	Matrix Sample Request ID	9/21/6 1400 301 ON-57 (16-18') IARS-3		Z-8-18/V	1415 OW-57 (25-27') JARS-3		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				Date: Time: Relinquished by: Received by	Fime:	

WESTERN REFINING SOUTHWEST, INC. GALLUP REFINERY

OW-14 SOURCE INVESTIGATION - SEPTEMBER 2016

METALS AND CYANIDE ANALYSES FOR SOIL SAMPLES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

FNVTRONMFNTAL	ANALYSIS LABORATORY	u	87109	107		(COM	nos	SIC		ZĀ]	10 10	S270 (Semi METALS GEU CH LYANID				<u> </u>		>	>	>			-	
VIROR	SLAB	www.hallenvironmental.com	Albuquerque, NM 87109	505-345-4107	_	_				3 / 9	ides (/	081 Pestio	>										- - -	
	ILYSI	hallenviro	ι		Analysi	(*0					slals	188) s'HA9 M 8 AADA D,A) snoinA										<u> </u>		
H	ANA	www.	4901 Hawkins NE	Tel. 505-345-3975					(1	.81 .40	≯ թն	TPH (Metho												
			4901 F	Tel. 5((ɣlr	io si	3Đ)	Hd.	<u>l</u> +	BE	TM + X3T8 TM + X3T8 82108 H9T	₩		>								Remarks:	
			N<						PAYNE			HEALNO.		293	-763	203	-203	2003	502	5003			Date Time R	12
ime:	□ Rush		Source			Jer:		RIEGE	<u>۔</u> پ	Xes	erature: $/\!\!\!/\!\!\!/$	Preservative Type	HCL	NEAT	NEAT	HNOZ	HNOz	H2 504	NEAT	NAOH				
Turn-Around Time:	Standard	Project Name:	11-WO	Project #:		Project Manager:		Eo RI	Sampler:		Sample Temperature:	<u> </u>	40 ML VOA-6	ALITER AMBER-2	_				SOOML PLASTIC-1				Received by:	Received by
Chain-of-Custody Record	Client: WESTERN REFINING SWINC		Mailing Address: 92 Grant CROSSING RD	_	C	COM		Level 4 (Full Validation)			The state of the s	Sample Request ID	EB 092116							->				
-of-Cu	N RE	REFINERY	92 Gz	GALL	505-	D. RI			•	□ Other	EXCE	Matrix	WATER							->			Relinquished by:	Relinquished by.
Chain	STER	GALLUP	g Address) #: 	or Fax#:	QA/QC Package:	☐ Standard	Accreditation	:LAP	🗡 ЕDD (Туре)	Time	6 1500							_>			Pate: Time: P	Time:
	Client	⊕	Mailin		Phone #:	email	QA/Q(□ St	Accre		X EC	Date	9/2/6							->			Parte:	Date:

VINCE-2 COT V Date: Time: Relinquished by: Date Time Received by: Date Time Laber: Time: Relinquished by: Received by: Date Time Call: Image: Call: Call: Call: Call: Image: Call: Call: Call: Call: Image: Call: Call: Call: Call: Image: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call: Call:
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Air Bubbles (Y or N)

WESTERN REFINING SOUTHWEST, INC. GALLUP REFINERY

OW-14 SOURCE INVESTIGATION - SEPTEMBER 2016

METALS AND CYANIDE ANALYSES FOR GROUNDWATER SAMPLES AND WATER QA/QC SAMPLES

TOTAL METALS ANALYSIS AND DISSOLVED METALS ANALYSIS

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

GENERAL CHEMISTRY PARAMETERS FOR GROUNDWATER SAMPLES AND WATER QA/QC SAMPLES

Analyte	Analytical Method
Chloride	EPA method 300.0
Fluoride	EPA method 300.0
Sulfate	EPA method 300.0

LAIL ENVIDONMENTAL		www.hallenvironmental.com	: NE - Albuquerque, NM 87109		Analysis	_	S CB,e O ⁴ '8C	3 4 1	072 ON, 0808 (04)	or 8 11s 10s 10s 10s 10s 10s 10s 10s 10s 10s	EDB (Methoc PAH's (8310 RCRA 8 Meta Anions (F,Cl, 8081 Pesticic 8260B (VOA) 8270 (Semi-V MCTALS &	>	<u> </u>	>	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	<u> </u>	7	>	>	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\ <u>\</u>					other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.
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Chain-of-Custody Record	IING SN, INC		Mailing Address'q 2 GIANT CROSSING RD	GALLUP NM 87301	66-772-0217	ED. RIEGE @ WNR. COM		▼ Level 4 (Full Validation)	S.		Sample Request ID	TK 568-1 (12-14")		->	TK568-1 (30-32')		→	TK5ce-1 (48-49')			TOADA			1			i necessary, samples subconfracted to Hall Environmental may be subconfracted to
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Chain-of-Custody Record	Client WESTERN REFINING SW. INC.	GALUP REFINERY	Mailing Address: 92 Grant Crossing	GALLUP NM	505-722-0217	ED. RIEGE @ WNR. COM Project N					EXCE に	Matrix	WATER							->				Refinquished by		Kelipquished by
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Hall Environmental Analysis Laboratory 4901 Hawkins NE Albuquerque, NM 87109 TEL: 505-345-3975 FAX: 505-345-4107 Website: www.hallenvironmental.com

October 28, 2016

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

FAX

RE: OW-14 Source Inv OrderNo.: 1609G57

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 2 sample(s) on 9/29/2016 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman

Laboratory Manager

Andel

4901 Hawkins NE

Albuquerque, NM 87109

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092716

 Project:
 OW-14 Source Inv
 Collection Date: 9/27/2016 5:40:00 PM

 Lab ID:
 1609G57-001
 Matrix: AQUEOUS
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANG	GE						Analyst: TOM	
Diesel Range Organics (DRO)	ND	0.69	1.0		mg/L	1	9/30/2016 6:34:19 PM	27808
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	9/30/2016 6:34:19 PM	27808
Surr: DNOP	116	0	77.1-144		%Rec	1	9/30/2016 6:34:19 PM	27808
EPA METHOD 8015D: GASOLINE RAN	IGE						Analyst: NSB	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	9/30/2016 12:29:50 AM	AG3756
Surr: BFB	88.2	0	66.4-120		%Rec	1	9/30/2016 12:29:50 AM	AG3756
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Fluoride	ND	0.050	0.10		mg/L	1	9/29/2016 5:22:33 PM	R37589
Chloride	0.19	0.051	0.50	J	mg/L	1	9/29/2016 5:22:33 PM	R37589
Sulfate	0.65	0.14	0.50		mg/L	1	9/29/2016 5:22:33 PM	R37589
EPA METHOD 200.7: DISSOLVED MET	ΓALS						Analyst: MED	
Barium	ND	0.0013	0.0020		mg/L	1	10/15/2016 2:01:02 PM	B37965
Beryllium	ND	0.00031	0.0020		mg/L	1	10/15/2016 2:01:02 PM	B37965
Cadmium	ND	0.00075	0.0020		mg/L	1	10/15/2016 2:01:02 PM	B37965
Chromium	ND	0.0018	0.0060		mg/L	1	10/15/2016 2:01:02 PM	B37965
Cobalt	ND	0.00074	0.0060		mg/L	1	10/15/2016 2:01:02 PM	B37965
Iron	ND	0.020	0.020		mg/L	1	10/15/2016 2:01:02 PM	B37965
Manganese	ND	0.00032	0.0020		mg/L	1	10/15/2016 2:01:02 PM	B37965
Nickel	ND	0.0024	0.010		mg/L	1	10/15/2016 2:01:02 PM	B37965
Silver	ND	0.0028	0.0050		mg/L	1	10/15/2016 2:01:02 PM	B37965
Vanadium	ND	0.0013	0.050		mg/L	1	10/15/2016 2:01:02 PM	B37965
Zinc	ND	0.0028	0.010		mg/L	1	10/15/2016 2:01:02 PM	B37965
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	ND	0.0013	0.0020		mg/L	1	10/17/2016 2:28:17 PM	A37991
Beryllium	ND	0.00036	0.0020		mg/L	1	10/17/2016 2:28:17 PM	A37991
Cadmium	ND	0.0015	0.0020		mg/L	1	10/17/2016 2:28:17 PM	A37991
Chromium	ND	0.0027	0.0060		mg/L	1	10/17/2016 2:28:17 PM	A37991
Cobalt	ND	0.0017	0.0060		mg/L	1	10/17/2016 2:28:17 PM	A37991
Iron	ND	0.020	0.020		mg/L	1	10/17/2016 2:28:17 PM	A37991
Manganese	ND	0.00032	0.0020		mg/L	1	10/17/2016 2:28:17 PM	A37991
Nickel	ND	0.0031	0.010		mg/L	1	10/17/2016 2:28:17 PM	A37991
Silver	ND	0.0028	0.0050		mg/L	1	10/17/2016 2:28:17 PM	A37991
Vanadium	ND	0.0013	0.050		mg/L	1	10/17/2016 2:28:17 PM	A37991
Zinc	ND	0.0027	0.010		mg/L	1	10/17/2016 2:28:17 PM	A37991
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/13/2016 8:55:01 PM	B37945
Arsenic	ND	0.00014	0.0010		mg/L	1	10/11/2016 6:38:20 PM	C37903

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 1 of 29

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092716

 Project:
 OW-14 Source Inv
 Collection Date: 9/27/2016 5:40:00 PM

 Lab ID:
 1609G57-001
 Matrix: AQUEOUS
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Lead	ND	0.00017	0.00050		mg/L	1	10/11/2016 6:38:20 PM	C37903
Selenium	ND	0.00021	0.0010		mg/L	1	10/11/2016 6:38:20 PM	C37903
EPA 200.8: METALS					-		Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/13/2016 6:36:05 PM	A37945
Arsenic	ND	0.00021	0.0010		mg/L	1	10/13/2016 6:36:05 PM	A37945
Lead	ND	0.00017	0.00050		mg/L	1	10/13/2016 6:36:05 PM	A37945
Selenium	ND	0.00021	0.0010		mg/L	1	10/13/2016 6:36:05 PM	A37945
EPA METHOD 245.1: MERCURY					Ü		Analyst: pmf	
Mercury	0.000057	0.000053	0.00020	J	mg/L	1	10/5/2016 7:47:36 AM	27871
EPA METHOD 8270C: SEMIVOLATILE					Ü		Analyst: DAM	
Acenaphthene	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Acenaphthylene	ND	2.4	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Aniline	ND	2.4	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Anthracene	ND	2.5	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Azobenzene	ND	2.7	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Benz(a)anthracene	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Benzo(a)pyrene	ND	2.7	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Benzo(b)fluoranthene	ND	2.9	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Benzo(g,h,i)perylene	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Benzo(k)fluoranthene	ND	3.0	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Benzoic acid	11	2.6	20	J	μg/L	1	10/11/2016 1:12:14 PM	27882
Benzyl alcohol	ND	3.0	10	-	μg/L	1	10/11/2016 1:12:14 PM	27882
Bis(2-chloroethoxy)methane	ND	2.8	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Bis(2-chloroethyl)ether	ND	2.7	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Bis(2-chloroisopropyl)ether	ND	1.9	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Bis(2-ethylhexyl)phthalate	2.7	2.6	10	J	μg/L	1	10/11/2016 1:12:14 PM	27882
4-Bromophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Butyl benzyl phthalate	ND	2.5	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Carbazole	ND	2.3	10		μg/L	1	10/11/2016 1:12:14 PM	27882
4-Chloro-3-methylphenol	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
4-Chloroaniline	ND	2.7	10		μg/L	1	10/11/2016 1:12:14 PM	27882
2-Chloronaphthalene	ND	2.3	10		μg/L	1	10/11/2016 1:12:14 PM	27882
2-Chlorophenol	ND	2.2	10		μg/L	1	10/11/2016 1:12:14 PM	27882
4-Chlorophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Chrysene	ND	2.8	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Di-n-butyl phthalate	ND	2.4	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Di-n-octyl phthalate	ND	2.0	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	10/11/2016 1:12:14 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 2 of 29

Analytical Report Lab Order 1609G57

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092716

 Project:
 OW-14 Source Inv
 Collection Date: 9/27/2016 5:40:00 PM

 Lab ID:
 1609G57-001
 Matrix: AQUEOUS
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Dibenzofuran	ND	2.5	10		μg/L	1	10/11/2016 1:12:14 PM	27882
1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 1:12:14 PM	27882
1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 1:12:14 PM	27882
1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	10/11/2016 1:12:14 PM	27882
3,3'-Dichlorobenzidine	ND	2.4	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Diethyl phthalate	ND	2.7	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Dimethyl phthalate	ND	2.4	10		μg/L	1	10/11/2016 1:12:14 PM	27882
2,4-Dichlorophenol	ND	2.3	20		μg/L	1	10/11/2016 1:12:14 PM	27882
2,4-Dimethylphenol	ND	3.0	10		μg/L	1	10/11/2016 1:12:14 PM	27882
4,6-Dinitro-2-methylphenol	ND	1.8	20		μg/L	1	10/11/2016 1:12:14 PM	27882
2,4-Dinitrophenol	ND	2.8	20		μg/L	1	10/11/2016 1:12:14 PM	27882
2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	10/11/2016 1:12:14 PM	27882
2,6-Dinitrotoluene	ND	2.7	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Fluoranthene	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Fluorene	ND	2.7	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Hexachlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Hexachlorobutadiene	ND	2.2	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Hexachlorocyclopentadiene	ND	2.3	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Hexachloroethane	ND	2.4	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Indeno(1,2,3-cd)pyrene	ND	3.0	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Isophorone	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
1-Methylnaphthalene	ND	2.9	10		μg/L	1	10/11/2016 1:12:14 PM	27882
2-Methylnaphthalene	ND	2.9	10		μg/L	1	10/11/2016 1:12:14 PM	27882
2-Methylphenol	ND	2.5	10		μg/L	1	10/11/2016 1:12:14 PM	27882
3+4-Methylphenol	ND	2.3	10		μg/L	1	10/11/2016 1:12:14 PM	27882
N-Nitrosodi-n-propylamine	ND	2.4	10		μg/L	1	10/11/2016 1:12:14 PM	27882
N-Nitrosodimethylamine	ND	2.2	10		μg/L	1	10/11/2016 1:12:14 PM	27882
N-Nitrosodiphenylamine	ND	2.3	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Naphthalene	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
2-Nitroaniline	ND	2.8	10		μg/L	1	10/11/2016 1:12:14 PM	27882
3-Nitroaniline	ND	2.9	10		μg/L	1	10/11/2016 1:12:14 PM	27882
4-Nitroaniline	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Nitrobenzene	ND	2.8	10		μg/L	1	10/11/2016 1:12:14 PM	27882
2-Nitrophenol	ND	2.4	10		μg/L	1	10/11/2016 1:12:14 PM	27882
4-Nitrophenol	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Pentachlorophenol	ND	2.3	20		μg/L	1	10/11/2016 1:12:14 PM	27882
Phenanthrene	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Phenol	ND	2.0	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Pyrene	ND	3.1	10		μg/L	1	10/11/2016 1:12:14 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092716

 Project:
 OW-14 Source Inv
 Collection Date: 9/27/2016 5:40:00 PM

 Lab ID:
 1609G57-001
 Matrix: AQUEOUS
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Pyridine	ND	2.2	10		μg/L	1	10/11/2016 1:12:14 PM	27882
1,2,4-Trichlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 1:12:14 PM	27882
2,4,5-Trichlorophenol	ND	2.2	10		μg/L	1	10/11/2016 1:12:14 PM	27882
2,4,6-Trichlorophenol	ND	2.4	10		μg/L	1	10/11/2016 1:12:14 PM	27882
Surr: 2-Fluorophenol	44.3	0	15-123		%Rec	1	10/11/2016 1:12:14 PM	27882
Surr: Phenol-d5	31.8	0	15-124		%Rec	1	10/11/2016 1:12:14 PM	27882
Surr: 2,4,6-Tribromophenol	74.5	0	18.4-134		%Rec	1	10/11/2016 1:12:14 PM	27882
Surr: Nitrobenzene-d5	60.6	0	28.8-134		%Rec	1	10/11/2016 1:12:14 PM	27882
Surr: 2-Fluorobiphenyl	56.9	0	35.9-125		%Rec	1	10/11/2016 1:12:14 PM	27882
Surr: 4-Terphenyl-d14	76.1	0	15-146		%Rec	1	10/11/2016 1:12:14 PM	27882
EPA METHOD 8260B: VOLATILES							Analyst: AG	
Benzene	ND	0.096	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Toluene	ND	0.12	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Ethylbenzene	ND	0.11	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Methyl tert-butyl ether (MTBE)	ND	0.21	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,2,4-Trimethylbenzene	ND	0.11	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,3,5-Trimethylbenzene	ND	0.12	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,2-Dichloroethane (EDC)	ND	0.12	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,2-Dibromoethane (EDB)	ND	0.11	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Naphthalene	ND	0.093	2.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1-Methylnaphthalene	ND	0.20	4.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
2-Methylnaphthalene	ND	0.16	4.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Acetone	ND	4.9	10		μg/L	1	9/29/2016 2:53:18 PM	R37576
Bromobenzene	ND	0.098	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Bromodichloromethane	ND	0.14	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Bromoform	ND	0.10	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Bromomethane	ND	0.78	3.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
2-Butanone	ND	0.74	10		μg/L	1	9/29/2016 2:53:18 PM	R37576
Carbon disulfide	ND	0.60	10		μg/L	1	9/29/2016 2:53:18 PM	R37576
Carbon Tetrachloride	ND	0.11	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Chlorobenzene	ND	0.11	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Chloroethane	ND	0.19	2.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Chloroform	ND	0.089	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Chloromethane	ND	0.21	3.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
2-Chlorotoluene	ND	0.40	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
4-Chlorotoluene	ND	0.13	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
cis-1,2-DCE	ND	0.12	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
cis-1,3-Dichloropropene	ND	0.11	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,2-Dibromo-3-chloropropane	ND	0.23	2.0		μg/L	1	9/29/2016 2:53:18 PM	R37576

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092716

 Project:
 OW-14 Source Inv
 Collection Date: 9/27/2016 5:40:00 PM

 Lab ID:
 1609G57-001
 Matrix: AQUEOUS
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: AG	
Dibromochloromethane	ND	0.087	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Dibromomethane	ND	0.12	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,2-Dichlorobenzene	ND	0.40	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,3-Dichlorobenzene	ND	0.14	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,4-Dichlorobenzene	ND	0.14	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Dichlorodifluoromethane	ND	0.36	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,1-Dichloroethane	ND	0.11	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,1-Dichloroethene	ND	0.11	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,2-Dichloropropane	ND	0.11	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,3-Dichloropropane	ND	0.16	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
2,2-Dichloropropane	ND	0.17	2.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,1-Dichloropropene	ND	0.13	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Hexachlorobutadiene	ND	0.20	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
2-Hexanone	ND	0.84	10		μg/L	1	9/29/2016 2:53:18 PM	R37576
Isopropylbenzene	ND	0.10	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
4-Isopropyltoluene	ND	0.14	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
4-Methyl-2-pentanone	ND	0.43	10		μg/L	1	9/29/2016 2:53:18 PM	R37576
Methylene Chloride	ND	0.19	3.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
n-Butylbenzene	ND	0.16	3.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
n-Propylbenzene	ND	0.13	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
sec-Butylbenzene	ND	0.12	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Styrene	ND	0.11	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
tert-Butylbenzene	ND	0.12	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,1,1,2-Tetrachloroethane	ND	0.11	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,1,2,2-Tetrachloroethane	ND	0.13	2.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Tetrachloroethene (PCE)	ND	0.15	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
trans-1,2-DCE	ND	0.40	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
trans-1,3-Dichloropropene	ND	0.10	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,2,3-Trichlorobenzene	ND	0.11	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,2,4-Trichlorobenzene	ND	0.13	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,1,1-Trichloroethane	ND	0.091	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,1,2-Trichloroethane	ND	0.13	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Trichloroethene (TCE)	ND	0.18	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Trichlorofluoromethane	ND	0.20	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
1,2,3-Trichloropropane	ND	0.20	2.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Vinyl chloride	ND	0.20	1.0		μg/L	1	9/29/2016 2:53:18 PM	R37576
Xylenes, Total	ND	0.37	1.5		μg/L	1	9/29/2016 2:53:18 PM	R37576
Surr: 1,2-Dichloroethane-d4	115	0	70-130		%Rec	1	9/29/2016 2:53:18 PM	R37576
Surr: 4-Bromofluorobenzene	99.2	0	70-130		%Rec	1	9/29/2016 2:53:18 PM	R37576

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical Report

Lab Order **1609G57**

Date Reported: 10/28/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: EB092716

 Project:
 OW-14 Source Inv
 Collection Date: 9/27/2016 5:40:00 PM

 Lab ID:
 1609G57-001
 Matrix: AQUEOUS
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: AG	
Surr: Dibromofluoromethane	124	0	70-130		%Rec	1	9/29/2016 2:53:18 PM	R37576
Surr: Toluene-d8	86.0	0	70-130		%Rec	1	9/29/2016 2:53:18 PM	R37576

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

Qualifiers: Value exceeds Maximum Contaminant Level. В Analyte detected in the associated Method Blank D Sample Diluted Due to Matrix Ε Value above quantitation range Η Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits Page 6 of 29 ND Not Detected at the Reporting Limit P Sample pH Not In Range RPD outside accepted recovery limits RLReporting Detection Limit % Recovery outside of range due to dilution or matrix Sample container temperature is out of limit as specified

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092816

Project: OW-14 Source Inv Collection Date: 9/28/2016 2:40:00 PM 1609G57-002 Lab ID: Matrix: AQUEOUS Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RAI	NGE						Analyst: TOM	
Diesel Range Organics (DRO)	ND	0.69	1.0		mg/L	1	9/30/2016 6:55:49 PM	27808
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	9/30/2016 6:55:49 PM	27808
Surr: DNOP	122	0	77.1-144		%Rec	1	9/30/2016 6:55:49 PM	27808
EPA METHOD 8015D: GASOLINE RA	NGE						Analyst: NSB	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	9/30/2016 12:53:51 AM	AG3756
Surr: BFB	86.4	0	66.4-120		%Rec	1	9/30/2016 12:53:51 AM	AG3756
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Fluoride	ND	0.050	0.10		mg/L	1	9/29/2016 5:47:22 PM	R37589
Chloride	0.11	0.051	0.50	J	mg/L	1	9/29/2016 5:47:22 PM	R37589
Sulfate	ND	0.14	0.50		mg/L	1	9/29/2016 5:47:22 PM	R37589
EPA METHOD 200.7: DISSOLVED ME	ETALS						Analyst: MED	
Barium	ND	0.0013	0.0020		mg/L	1	10/15/2016 2:16:36 PM	B37965
Beryllium	ND	0.00031	0.0020		mg/L	1	10/15/2016 2:16:36 PM	B37965
Cadmium	ND	0.00075	0.0020		mg/L	1	10/15/2016 2:16:36 PM	
Chromium	ND	0.0018	0.0060		mg/L	1	10/15/2016 2:16:36 PM	B37965
Cobalt	ND	0.00074	0.0060		mg/L	1	10/15/2016 2:16:36 PM	B37965
Iron	ND	0.020	0.020		mg/L	1	10/15/2016 2:16:36 PM	B37965
Manganese	0.00089	0.00032	0.0020	J	mg/L	1	10/15/2016 2:16:36 PM	B37965
Nickel	ND	0.0024	0.010		mg/L	1	10/15/2016 2:16:36 PM	B37965
Silver	ND	0.0028	0.0050		mg/L	1	10/15/2016 2:16:36 PM	B37965
Vanadium	ND	0.0013	0.050		mg/L	1	10/15/2016 2:16:36 PM	B37965
Zinc	ND	0.0028	0.010		mg/L	1	10/15/2016 2:16:36 PM	B37965
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	ND	0.0013	0.0020		mg/L	1	10/17/2016 2:30:07 PM	A37991
Beryllium	ND	0.00036	0.0020		mg/L	1	10/17/2016 2:30:07 PM	A37991
Cadmium	ND	0.0015	0.0020		mg/L	1	10/17/2016 2:30:07 PM	A37991
Chromium	ND	0.0027	0.0060		mg/L	1	10/17/2016 2:30:07 PM	A37991
Cobalt	ND	0.0017	0.0060		mg/L	1	10/17/2016 2:30:07 PM	A37991
Iron	ND	0.020	0.020		mg/L	1	10/17/2016 2:30:07 PM	A37991
Manganese	ND	0.00032	0.0020		mg/L	1	10/17/2016 2:30:07 PM	A37991
Nickel	ND	0.0031	0.010		mg/L	1	10/17/2016 2:30:07 PM	A37991
Silver	ND	0.0028	0.0050		mg/L	1	10/17/2016 2:30:07 PM	
Vanadium	ND	0.0013	0.050		mg/L	1	10/17/2016 2:30:07 PM	A37991
Zinc	ND	0.0027	0.010		mg/L	1	10/17/2016 2:30:07 PM	A37991
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/13/2016 9:00:10 PM	B37945
Arsenic	ND	0.00014	0.0010		mg/L	1	10/11/2016 7:04:05 PM	C37903

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

Qualifiers: Value exceeds Maximum Contaminant Level.

> D Sample Diluted Due to Matrix

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

Ε Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

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Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092816

 Project:
 OW-14 Source Inv
 Collection Date: 9/28/2016 2:40:00 PM

 Lab ID:
 1609G57-002
 Matrix: AQUEOUS
 Received Date: 9/29/2016 8:50:00 AM

Lead ND 0.00017 0.00050 mg/L 1 10/11/2016 7:04:05 PM C37903 Selenium ND 0.00021 0.0010 mg/L 1 10/11/2016 7:04:05 PM C37903	Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
Selenium	EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Analyst: JJF	Lead	ND	0.00017	0.00050		mg/L	1	10/11/2016 7:04:05 PM	C37903
Antimony ND 0.00047 0.0010 mg/L 1 10/13/2016 6.41:14 PM A37945	Selenium	ND	0.00021	0.0010		mg/L	1	10/11/2016 7:04:05 PM	C37903
Arsenic	EPA 200.8: METALS							Analyst: JLF	
Arsenic	Antimony	ND	0.00047	0.0010		mg/L	1	10/13/2016 6:41:14 PM	A37945
Lead	Arsenic	ND	0.00021	0.0010		_	1	10/13/2016 6:41:14 PM	A37945
Mercury 0.000055 0.000053 0.00020 J mg/L 1 10/5/2016 7:49:37 AM 27871	Lead	ND	0.00017	0.00050		_	1	10/13/2016 6:41:14 PM	A37945
Mercury 0.000055 0.000053 0.00020 J mg/L 1 10/5/2016 7:49:37 AM 27871	Selenium	ND	0.00021	0.0010		mg/L	1	10/13/2016 6:41:14 PM	A37945
Acenaphthene ND 2.6 10	EPA METHOD 245.1: MERCURY							Analyst: pmf	
Acenaphthene ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Acenaphthylene ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Aniline ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Anthracene ND 2.5 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Azobenzene ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(a)anthracene ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(a)pyrene ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(b)fluoranthene ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(a cid 11 2.6 20 J μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(b)fluoranthene ND 3.0 10	Mercury	0.000055	0.000053	0.00020	J	mg/L	1	• •	27871
Acenaphthylene	EPA METHOD 8270C: SEMIVOLATIL	ES						Analyst: DAM	
Aniline ND 2.4 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Anthracene ND 2.5 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Azobenzene ND 2.7 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benz(a)anthracene ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benz(a)pyrene ND 2.7 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(a)pyrene ND 2.7 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(b)fluoranthene ND 2.9 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(g),hi)perylene ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(g),hi)perylene ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(g),hi)perylene ND 3.0 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(g),hi)perylene ND 3.0 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(b)fluoranthene ND 3.0 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(b acid 11 2.6 20 J µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(b acid ND 3.0 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.8 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethyy)ether ND 2.7 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethyy)ether ND 1.9 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethy)pether ND 2.7 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethy)pether ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethyp)phenyl ether ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Bromophenyl phenyl ether ND 2.5 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Bromophenyl phenyl ether ND 2.5 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Bromophenyl phenyl ether ND 2.3 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Bromophenyl phenyl ether ND 2.3 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Bromophenyl phenyl ether ND 2.3 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-amethylphenol ND 2.3 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-amethylphenol ND 2.3 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-amethylphenol ND 2.3 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-amethylphenol ND 2.3 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-amethylphenol ND 2.2 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-amethylphenol ND 2.3 10 µg/L 1 10/11/2016 1:40:20 PM	Acenaphthene	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Anilline ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Anthracene ND 2.5 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Azobenzene ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benz(a)anthracene ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(b)fluoranthene ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(g), h)perylene ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(g), fluoranthene ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzolc acid 11 2.6 20 J μg/L 1 10/11/2016 1:40:20 PM 27882 Benzyl alcohol ND 3.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethxy))etther ND <t< td=""><td>Acenaphthylene</td><td>ND</td><td>2.4</td><td>10</td><td></td><td>μg/L</td><td>1</td><td>10/11/2016 1:40:20 PM</td><td>27882</td></t<>	Acenaphthylene	ND	2.4	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Anthracene ND 2.5 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Azobenzene ND 2.7 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benz(a)anthracene ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(a)pyrene ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(b)fluoranthene ND 2.7 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(g),h.j)perylene ND 2.9 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(g,h.j)perylene ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(k)fluoranthene ND 3.0 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(k)fluoranthene ND 3.0 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzoic acid 11 2.6 20 J µg/L 1 10/11/2016 1:40:20 PM 27882 Benzoic acid 11 2.6 20 J µg/L 1 10/11/2016 1:40:20 PM 27882 Benzyl alcohol ND 3.0 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chlorosthy)methane ND 2.8 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chlorostopropyl)ether ND 2.7 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chlorostopropyl)ether ND 1.9 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chlorostopropyl)ether ND 1.9 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-ethylhexyl)phthalate 2.8 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-ethylhexyl)phthalate 2.8 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.5 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.5 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.3 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-3-methylphenol ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-3-methylphenol ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-a-methylphenol ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-a-methylphenol ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-a-methylphenol ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-a-methylphenol ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-a-methylphenol ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-a-methylphenol ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-a-methylphenol ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 A-Chloro-a-methylphenol ND 2.6 10 µg/L 1		ND	2.4	10			1	10/11/2016 1:40:20 PM	27882
Azobenzene ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benz(a)anthracene ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(a)pyrene ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(b)fluoranthene ND 2.9 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(k)fluoranthene ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzoic acid 11 2.6 20 J μg/L 1 10/11/2016 1:40:20 PM 27882 Benzyl alcohol ND 3.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethyl)ether ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethyl)ether <	Anthracene	ND	2.5	10			1	10/11/2016 1:40:20 PM	27882
Benzo(a)pyrene ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(b)fluoranthene ND 2.9 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(g,h,i)perylene ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(k)fluoranthene ND 3.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzoic acid 11 2.6 20 J μg/L 1 10/11/2016 1:40:20 PM 27882 Benzyl alcohol ND 3.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chlorosporpyl)ether ND 1.9 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-ethylhexyl)phthalate	Azobenzene	ND	2.7	10			1	10/11/2016 1:40:20 PM	27882
Benzo(b)fluoranthene ND 2.9 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(g,h,i)perylene ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(k)fluoranthene ND 3.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzolc acid 11 2.6 20 J μg/L 1 10/11/2016 1:40:20 PM 27882 Benzyl alcohol ND 3.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)me	Benz(a)anthracene	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Benzo(g,h,i)perylene ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzo(k)fluoranthene ND 3.0 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Benzoic acid 11 2.6 20 J µg/L 1 10/11/2016 1:40:20 PM 27882 Benzyl alcohol ND 3.0 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethyl)methane ND 2.8 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethyl)ether ND 2.7 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroisopropyl)ether ND 1.9 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chlorosphyl)ether ND 1.9 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chlorosphyl)ether ND 2.8 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882	Benzo(a)pyrene	ND	2.7	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Benzo(k)fluoranthene ND 3.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Benzoic acid 11 2.6 20 J μg/L 1 10/11/2016 1:40:20 PM 27882 Benzyl alcohol ND 3.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)pether ND 2.8 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroephenyl phenyl ether ND 2.5 10 μg/L 1 10/11/2016 1:40:20 PM 27882 <td>Benzo(b)fluoranthene</td> <td>ND</td> <td>2.9</td> <td>10</td> <td></td> <td>μg/L</td> <td>1</td> <td>10/11/2016 1:40:20 PM</td> <td>27882</td>	Benzo(b)fluoranthene	ND	2.9	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Benzoic acid 11 2.6 20 J µg/L 1 10/11/2016 1:40:20 PM 27882 Benzyl alcohol ND 3.0 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.8 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethyl)ether ND 2.7 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroisopropyl)ether ND 1.9 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-ethylhexyl)phthalate 2.8 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 4-Bromophenyl phenyl ether ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.5 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Carbazole ND 2.3 10 µg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloro-	Benzo(g,h,i)perylene	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Benzyl alcohol ND 3.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethoxy)methane ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethyl)ether ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroisopropyl)ether ND 1.9 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-ethylhexyl)phthalate 2.8 2.6 10 J μg/L 1 10/11/2016 1:40:20 PM 27882 4-Bromophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.5 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Carbazole ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloroaniline	Benzo(k)fluoranthene	ND	3.0	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Bis(2-chloroethoxy)methane ND 2.8 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroethyl)ether ND 2.7 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroisopropyl)ether ND 1.9 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-ethylhexyl)phthalate 2.8 2.6 10 J µg/L 1 10/11/2016 1:40:20 PM 27882 4-Bromophenyl phenyl ether ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.5 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.5 10 µg/L 1 10/11/2016 1:40:20 PM 27882 Carbazole ND 2.3 10 µg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloro-3-methylphenol ND 2.6 10 µg/L 1 10/11/2016 1:40:20 PM 27882 2-Chlor	Benzoic acid	11	2.6	20	J	μg/L	1	10/11/2016 1:40:20 PM	27882
Bis(2-chloroethyl)ether ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-chloroisopropyl)ether ND 1.9 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-ethylhexyl)phthalate 2.8 2.6 10 J μg/L 1 10/11/2016 1:40:20 PM 27882 4-Bromophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.5 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.5 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Carbazole ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloroaniline ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chlorophenol <td>Benzyl alcohol</td> <td>ND</td> <td>3.0</td> <td>10</td> <td></td> <td>μg/L</td> <td>1</td> <td>10/11/2016 1:40:20 PM</td> <td>27882</td>	Benzyl alcohol	ND	3.0	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Bis(2-chloroisopropyl)ether ND 1.9 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Bis(2-ethylhexyl)phthalate 2.8 2.6 10 J μg/L 1 10/11/2016 1:40:20 PM 27882 4-Bromophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.5 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.5 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Carbazole ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chlorophthalene ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 <td< td=""><td>Bis(2-chloroethoxy)methane</td><td>ND</td><td>2.8</td><td>10</td><td></td><td>μg/L</td><td>1</td><td>10/11/2016 1:40:20 PM</td><td>27882</td></td<>	Bis(2-chloroethoxy)methane	ND	2.8	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Bis(2-ethylhexyl)phthalate 2.8 2.6 10 J μg/L 1 10/11/2016 1:40:20 PM 27882 4-Bromophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.5 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Carbazole ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloroaniline ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chlorophenol ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Chrysene ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882	Bis(2-chloroethyl)ether	ND	2.7	10		μg/L	1	10/11/2016 1:40:20 PM	27882
4-Bromophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Butyl benzyl phthalate ND 2.5 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Carbazole ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloroaniline ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chloronaphthalene ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chlorophenol ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chlorophenyl phenyl ether ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882	Bis(2-chloroisopropyl)ether	ND	1.9	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Butyl benzyl phthalate ND 2.5 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Carbazole ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloroaniline ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chloroaphthalene ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Chrysene ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-octyl phthalate ND <th< td=""><td>Bis(2-ethylhexyl)phthalate</td><td>2.8</td><td>2.6</td><td>10</td><td>J</td><td>μg/L</td><td>1</td><td>10/11/2016 1:40:20 PM</td><td>27882</td></th<>	Bis(2-ethylhexyl)phthalate	2.8	2.6	10	J	μg/L	1	10/11/2016 1:40:20 PM	27882
Carbazole ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloroaniline ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chloronaphthalene ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Chrysene ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882	4-Bromophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chloroaniline ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chloronaphthalene ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Chrysene ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882	Butyl benzyl phthalate	ND	2.5	10		μg/L	1	10/11/2016 1:40:20 PM	27882
4-Chloroaniline ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chloronaphthalene ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Chrysene ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882	Carbazole	ND	2.3	10		μg/L	1	10/11/2016 1:40:20 PM	27882
2-Chloronaphthalene ND 2.3 10 μg/L 1 10/11/2016 1:40:20 PM 27882 2-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Chrysene ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882	4-Chloro-3-methylphenol	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
2-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 1:40:20 PM 27882 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Chrysene ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882	4-Chloroaniline	ND	2.7	10		μg/L	1	10/11/2016 1:40:20 PM	27882
4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Chrysene ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882	2-Chloronaphthalene	ND	2.3	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Chrysene ND 2.8 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882	2-Chlorophenol	ND	2.2	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 1:40:20 PM 27882 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882	4-Chlorophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 1:40:20 PM 27882	Chrysene	ND	2.8	10		μg/L	1	10/11/2016 1:40:20 PM	27882
, ,	Di-n-butyl phthalate	ND	2.4	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Dibenz(a,h)anthracene ND 2.7 10 μg/L 1 10/11/2016 1:40:20 PM 27882	Di-n-octyl phthalate	ND	2.0	10		μg/L	1	10/11/2016 1:40:20 PM	27882
	Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	10/11/2016 1:40:20 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 8 of 29

Analytical Report Lab Order 1609G57

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092816

 Project:
 OW-14 Source Inv
 Collection Date: 9/28/2016 2:40:00 PM

 Lab ID:
 1609G57-002
 Matrix: AQUEOUS
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Dibenzofuran	ND	2.5	10		μg/L	1	10/11/2016 1:40:20 PM	27882
1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 1:40:20 PM	27882
1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 1:40:20 PM	27882
1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	10/11/2016 1:40:20 PM	27882
3,3'-Dichlorobenzidine	ND	2.4	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Diethyl phthalate	ND	2.7	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Dimethyl phthalate	ND	2.4	10		μg/L	1	10/11/2016 1:40:20 PM	27882
2,4-Dichlorophenol	ND	2.3	20		μg/L	1	10/11/2016 1:40:20 PM	27882
2,4-Dimethylphenol	ND	3.0	10		μg/L	1	10/11/2016 1:40:20 PM	27882
4,6-Dinitro-2-methylphenol	ND	1.8	20		μg/L	1	10/11/2016 1:40:20 PM	27882
2,4-Dinitrophenol	ND	2.8	20		μg/L	1	10/11/2016 1:40:20 PM	27882
2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	10/11/2016 1:40:20 PM	27882
2,6-Dinitrotoluene	ND	2.7	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Fluoranthene	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Fluorene	ND	2.7	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Hexachlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Hexachlorobutadiene	ND	2.2	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Hexachlorocyclopentadiene	ND	2.3	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Hexachloroethane	ND	2.4	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Indeno(1,2,3-cd)pyrene	ND	3.0	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Isophorone	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
1-Methylnaphthalene	ND	2.9	10		μg/L	1	10/11/2016 1:40:20 PM	27882
2-Methylnaphthalene	ND	2.9	10		μg/L	1	10/11/2016 1:40:20 PM	27882
2-Methylphenol	ND	2.5	10		μg/L	1	10/11/2016 1:40:20 PM	27882
3+4-Methylphenol	ND	2.3	10		μg/L	1	10/11/2016 1:40:20 PM	27882
N-Nitrosodi-n-propylamine	ND	2.4	10		μg/L	1	10/11/2016 1:40:20 PM	27882
N-Nitrosodimethylamine	ND	2.2	10		μg/L	1	10/11/2016 1:40:20 PM	27882
N-Nitrosodiphenylamine	ND	2.3	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Naphthalene	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
2-Nitroaniline	ND	2.8	10		μg/L	1	10/11/2016 1:40:20 PM	27882
3-Nitroaniline	ND	2.9	10		μg/L	1	10/11/2016 1:40:20 PM	27882
4-Nitroaniline	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Nitrobenzene	ND	2.8	10		μg/L	1	10/11/2016 1:40:20 PM	27882
2-Nitrophenol	ND	2.4	10		μg/L	1	10/11/2016 1:40:20 PM	27882
4-Nitrophenol	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Pentachlorophenol	ND	2.3	20		μg/L	1	10/11/2016 1:40:20 PM	27882
Phenanthrene	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Phenol	ND	2.0	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Pyrene	ND	3.1	10		μg/L	1	10/11/2016 1:40:20 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 9 of 29

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092816

 Project:
 OW-14 Source Inv
 Collection Date: 9/28/2016 2:40:00 PM

 Lab ID:
 1609G57-002
 Matrix: AQUEOUS
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Pyridine	ND	2.2	10		μg/L	1	10/11/2016 1:40:20 PM	27882
1,2,4-Trichlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 1:40:20 PM	27882
2,4,5-Trichlorophenol	ND	2.2	10		μg/L	1	10/11/2016 1:40:20 PM	27882
2,4,6-Trichlorophenol	ND	2.4	10		μg/L	1	10/11/2016 1:40:20 PM	27882
Surr: 2-Fluorophenol	51.8	0	15-123		%Rec	1	10/11/2016 1:40:20 PM	27882
Surr: Phenol-d5	39.9	0	15-124		%Rec	1	10/11/2016 1:40:20 PM	27882
Surr: 2,4,6-Tribromophenol	93.6	0	18.4-134		%Rec	1	10/11/2016 1:40:20 PM	27882
Surr: Nitrobenzene-d5	77.5	0	28.8-134		%Rec	1	10/11/2016 1:40:20 PM	27882
Surr: 2-Fluorobiphenyl	70.5	0	35.9-125		%Rec	1	10/11/2016 1:40:20 PM	27882
Surr: 4-Terphenyl-d14	94.2	0	15-146		%Rec	1	10/11/2016 1:40:20 PM	27882
EPA METHOD 8260B: VOLATILES							Analyst: AG	
Benzene	ND	0.096	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Toluene	ND	0.12	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Ethylbenzene	ND	0.11	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Methyl tert-butyl ether (MTBE)	ND	0.21	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,2,4-Trimethylbenzene	ND	0.11	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,3,5-Trimethylbenzene	ND	0.12	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,2-Dichloroethane (EDC)	ND	0.12	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,2-Dibromoethane (EDB)	ND	0.11	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Naphthalene	ND	0.093	2.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1-Methylnaphthalene	ND	0.20	4.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
2-Methylnaphthalene	ND	0.16	4.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Acetone	ND	4.9	10		μg/L	1	9/29/2016 3:22:14 PM	R37576
Bromobenzene	ND	0.098	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Bromodichloromethane	ND	0.14	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Bromoform	ND	0.10	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Bromomethane	ND	0.78	3.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
2-Butanone	ND	0.74	10		μg/L	1	9/29/2016 3:22:14 PM	R37576
Carbon disulfide	ND	0.60	10		μg/L	1	9/29/2016 3:22:14 PM	R37576
Carbon Tetrachloride	ND	0.11	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Chlorobenzene	ND	0.11	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Chloroethane	ND	0.19	2.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Chloroform	ND	0.089	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Chloromethane	ND	0.21	3.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
2-Chlorotoluene	ND	0.40	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
4-Chlorotoluene	ND	0.13	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
cis-1,2-DCE	ND	0.12	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
cis-1,3-Dichloropropene	ND	0.11	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,2-Dibromo-3-chloropropane	ND	0.23	2.0		μg/L	1	9/29/2016 3:22:14 PM	R37576

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

Qualifiers:

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

Page 10 of 29

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092816

 Project:
 OW-14 Source Inv
 Collection Date: 9/28/2016 2:40:00 PM

 Lab ID:
 1609G57-002
 Matrix: AQUEOUS
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: AG	
Dibromochloromethane	ND	0.087	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Dibromomethane	ND	0.12	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,2-Dichlorobenzene	ND	0.40	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,3-Dichlorobenzene	ND	0.14	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,4-Dichlorobenzene	ND	0.14	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Dichlorodifluoromethane	ND	0.36	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,1-Dichloroethane	ND	0.11	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,1-Dichloroethene	ND	0.11	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,2-Dichloropropane	ND	0.11	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,3-Dichloropropane	ND	0.16	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
2,2-Dichloropropane	ND	0.17	2.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,1-Dichloropropene	ND	0.13	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Hexachlorobutadiene	ND	0.20	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
2-Hexanone	ND	0.84	10		μg/L	1	9/29/2016 3:22:14 PM	R37576
Isopropylbenzene	ND	0.10	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
4-Isopropyltoluene	ND	0.14	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
4-Methyl-2-pentanone	ND	0.43	10		μg/L	1	9/29/2016 3:22:14 PM	R37576
Methylene Chloride	ND	0.19	3.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
n-Butylbenzene	ND	0.16	3.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
n-Propylbenzene	ND	0.13	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
sec-Butylbenzene	ND	0.12	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Styrene	ND	0.11	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
tert-Butylbenzene	ND	0.12	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,1,1,2-Tetrachloroethane	ND	0.11	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,1,2,2-Tetrachloroethane	ND	0.13	2.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Tetrachloroethene (PCE)	ND	0.15	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
trans-1,2-DCE	ND	0.40	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
trans-1,3-Dichloropropene	ND	0.10	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,2,3-Trichlorobenzene	ND	0.11	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,2,4-Trichlorobenzene	ND	0.13	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,1,1-Trichloroethane	ND	0.091	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,1,2-Trichloroethane	ND	0.13	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Trichloroethene (TCE)	ND	0.18	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Trichlorofluoromethane	ND	0.20	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
1,2,3-Trichloropropane	ND	0.20	2.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Vinyl chloride	ND	0.20	1.0		μg/L	1	9/29/2016 3:22:14 PM	R37576
Xylenes, Total	ND	0.37	1.5		μg/L	1	9/29/2016 3:22:14 PM	R37576
Surr: 1,2-Dichloroethane-d4	116	0	70-130		%Rec	1	9/29/2016 3:22:14 PM	R37576
Surr: 4-Bromofluorobenzene	95.8	0	70-130		%Rec	1	9/29/2016 3:22:14 PM	R37576

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 11 of 29

Analytical Report

Lab Order **1609G57**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2016

CLIENT: Western Refining Company Client Sample ID: EB092816

 Project:
 OW-14 Source Inv
 Collection Date: 9/28/2016 2:40:00 PM

 Lab ID:
 1609G57-002
 Matrix: AQUEOUS
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: AG	
Surr: Dibromofluoromethane	127	0	70-130		%Rec	1	9/29/2016 3:22:14 PM	R37576
Surr: Toluene-d8	87.8	0	70-130		%Rec	1	9/29/2016 3:22:14 PM	R37576

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

Qualifiers:

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

Page 12 of 29

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Address:

4901 HAWKINS NE SUITE D

ALBUQUERQUE, NM 87109

Attn:

ANDY FREEMAN

Batch #:

160930046

Project Name:

1609G57

Analytical Results Report

Sample Number

160930046-001

Sampling Date

9/27/2016

Date/Time Received 9/30/2016 11:50 AM

Client Sample ID Matrix

1609G57-001G / EB092716

Sampling Time 5:40 PM

Comments

Water

.....

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	10/3/2016	MER	EPA 335.4	

Sample Number

160930046-002

Sampling Date
Sampling Time

9/28/2016 2:40 PM Date/Time Received 9/30/2016 11:50 AM

Client Sample ID Matrix 1609G57-002G / EB092816 Water

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	10/3/2016	MER	EPA 335.4	

Authorized Signature

Todd Taruscio, Lab Manager

MCL

EPA's Maximum Contaminant Level

ND

Not Detected

PQL

Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated. Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C586; MT:Cert0095; FL(NELAP): E871099

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Batch #:

160930046

Address:

4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109

Project Name:

1609G57

Attn:

ANDY FREEMAN

Analytical Results Report Quality Control Data

Lab Control Sample	,									<u>- </u>
Parameter Cyanide	LCS Resu 0.522	It Units mg/L		-				Prep Date 10/3/2016		Analysis Date 10/3/2016
Matrix Spike	<u></u>									
Sample Number Parameter 160927038-004 Cyanide		Sample Result ND	MS Result 0.500	Units mg/L		MS Spike 0.5	%Rec 100.0	AR %Rec 90-110	Prep Date 10/3/2016	-
Matrix Spike Duplicate										
Parameter Cyanide	MSD Result 0.487	Units mg/L	MSD Spike 0.5	%Re 97.4		% RPD 2.6	AR %RPI 0-20		p Date 3/2016	Analysis Date 10/3/2016
Method Blank		•••								
Parameter Cyanide			sult D	Unit mg/	-		PQL 0.01		ep Date /3/2016	Analysis Date 10/3/2016

AR Acceptable Range ND Not Detected

PQL Practical Quantitation Limit RPD Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID MB-A	Samp	Туре: МЕ	BLK	TestCode: EPA Method 200.7: Metals						
Client ID: PBW	Bato	h ID: A3	7991	F	RunNo: 3	7991				
Prep Date:	Analysis [Date: 10)/17/2016	5	SeqNo: 1	183971	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Iron	ND	0.020								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								
Sample ID LCS-A	Samp	Type: LC	S	Tes	tCode: El	PA Method	200.7: Metals		<u>-</u>	

		. , ,	•								
Client ID: LCSW	Bato	ch ID: A3	7991	F	RunNo: 3	7991					
Prep Date:	Analysis	Date: 1 0)/17/2016	S	SeqNo: 1	183972	Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Barium	0.46	0.0020	0.5000	0	92.5	85	115				
Beryllium	0.49	0.0020	0.5000	0	98.1	85	115				
Cadmium	0.47	0.0020	0.5000	0	94.1	85	115				
Chromium	0.47	0.0060	0.5000	0	93.3	85	115				
Cobalt	0.44	0.0060	0.5000	0	87.9	85	115				
Iron	0.46	0.020	0.5000	0	92.6	85	115				
Manganese	0.45	0.0020	0.5000	0	90.5	85	115				
Nickel	0.45	0.010	0.5000	0	89.4	85	115				
Silver	0.097	0.0050	0.1000	0	97.1	85	115				
Vanadium	0.50	0.050	0.5000	0	99.7	85	115				
Zinc	0.46	0.010	0.5000	0	92.5	85	115				

Sample ID LLLCS-A	SampT	ype: LC	SLL	Test	tCode: El	PA Method	200.7: Metals			
Client ID: BatchQC	Batch	n ID: A3	7991	R	RunNo: 3	7991				
Prep Date:	Analysis D	ate: 10	/17/2016	S	SeqNo: 1	183973	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0022	0.0020	0.002000	0	110	50	150			
Beryllium	0.0019	0.0020	0.002000	0	97.0	50	150			J
Cadmium	0.0020	0.0020	0.002000	0	100	50	150			
Chromium	0.0056	0.0060	0.006000	0	93.7	50	150			J
Cobalt	0.0062	0.0060	0.006000	0	103	50	150			
Iron	0.022	0.020	0.02000	0	110	50	150			

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID LLLCS-A	Samp	Type: LC	SLL	Tes	tCode: El	PA Method	200.7: Metals			
Client ID: BatchQC	Bato	h ID: A3	7991	F	RunNo: 3	7991				
Prep Date:	Analysis	Date: 10)/17/2016	8	SeqNo: 1	183973	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.0019	0.0020	0.002000	0	96.5	50	150			J
Nickel	0.0049	0.010	0.005000	0	97.2	50	150			J
Silver	0.0049	0.0050	0.005000	0	97.2	50	150			J
Vanadium	0.0098	0.050	0.01000	0	97.5	50	150			J
Zinc	0.0049	0.010	0.005000	0	98.6	50	150			J

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID LLLCS-B	Samp	Type: LC	SLL	Test	tCode: El	PA Method	200.7: Dissol	ved Meta	ls	
Client ID: BatchQC	Bato	h ID: B3	7965	R	RunNo: 3	7965				
Prep Date:	Analysis	Date: 10)/15/2016	S	SeqNo: 1	183095	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0019	0.0020	0.002000	0	94.0	50	150			J
Beryllium	0.0015	0.0020	0.002000	0	76.5	50	150			J
Cadmium	0.0017	0.0020	0.002000	0	83.5	50	150			J
Chromium	0.0056	0.0060	0.006000	0	93.8	50	150			J
Cobalt	0.0054	0.0060	0.006000	0	90.7	50	150			J
Iron	0.018	0.020	0.02000	0	87.8	50	150			J
Manganese	0.0019	0.0020	0.002000	0	97.0	50	150			J
Nickel	0.0055	0.010	0.005000	0	109	50	150			J
Silver	0.0046	0.0050	0.005000	0	91.2	50	150			J
Vanadium	0.0072	0.050	0.01000	0	72.3	50	150			J
Zinc	0.0051	0.010	0.005000	0	102	50	150			J

Sample ID LCS-B	Samp ⁻	Type: LC	S	Tes	tCode: El	PA Method	200.7: Dissol	ved Metal	s	
Client ID: LCSW	Batc	h ID: B3	7965	F	RunNo: 3	7965				
Prep Date:	Analysis [Date: 10)/15/2016	S	SeqNo: 1	183096	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.46	0.0020	0.5000	0	93.0	85	115			
Beryllium	0.49	0.0020	0.5000	0	97.8	85	115			
Cadmium	0.47	0.0020	0.5000	0	93.6	85	115			
Chromium	0.47	0.0060	0.5000	0	93.3	85	115			
Cobalt	0.44	0.0060	0.5000	0	88.5	85	115			
Iron	0.47	0.020	0.5000	0	94.4	85	115			
Manganese	0.46	0.0020	0.5000	0	91.2	85	115			
Nickel	0.44	0.010	0.5000	0	87.9	85	115			
Silver	0.096	0.0050	0.1000	0	95.7	85	115			
Vanadium	0.50	0.050	0.5000	0	99.4	85	115			
Zinc	0.45	0.010	0.5000	0	90.3	85	115			

Sample ID MB-B	SampType: MBLK	TestCode: EPA Method	d 200.7: Dissolved Metals
Client ID: PBW	Batch ID: B37965	RunNo: 37965	
Prep Date:	Analysis Date: 10/15/20	16 SeqNo: 1183105	Units: mg/L
Analyte	Result PQL SPK v	alue SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit Qual
Barium	ND 0.0020		
Beryllium	ND 0.0020		
Cadmium	ND 0.0020		
Chromium	ND 0.0060		
Cobalt	ND 0.0060		

Qualifiers:

Iron

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded

0.020

ND

- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

ND

WO#: 1609G57

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Zinc

Sample ID MB-B SampType: MBLK TestCode: EPA Method 200.7: Dissolved Metals

PBW Client ID: Batch ID: **B37965** RunNo: 37965

0.010

Prep Date: Analysis Date: 10/15/2016 SeqNo: 1183105 Units: mg/L

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 0.00058 0.0020 Manganese Nickel ND 0.010 ND 0.0050 Silver Vanadium ND 0.050

Qualifiers:

Value exceeds Maximum Contaminant Level.

Sample Diluted Due to Matrix D

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits R

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

Reporting Detection Limit RL

Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

0.0010

0.0010

0.0010

0.0010

0.00056 0.00050 0.0005000

0.001000

0.001000

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID LCS	SampType: LCS	TestCode: EPA 200.8: N	Metals	
Client ID: LCSW	Batch ID: A37945	RunNo: 37945		
Prep Date:	Analysis Date: 10/13/2016	SeqNo: 1182561	Units: mg/L	
Analyte	Result PQL SPK value	e SPK Ref Val %REC LowLimit	HighLimit %RPD	RPDLimit Qual
Antimony	0.024 0.0010 0.0250	0 96.9 85	115	
Arsenic	0.024 0.0010 0.0250	0 94.8 85	115	
Lead	0.012 0.00050 0.01250	0 99.0 85	115	
Selenium	0.024 0.0010 0.0250	0 95.9 85	115	
Sample ID LLLCS	SampType: LCSLL	TestCode: EPA 200.8: N	Metals	
Client ID: BatchQC	Batch ID: A37945	RunNo: 37945		
Prep Date:	Analysis Date: 10/13/2016	SeqNo: 1182563	Units: mg/L	
Analyte	Result PQL SPK value	e SPK Ref Val %REC LowLimit	HighLimit %RPD	RPDLimit Qual
Antimony	0.0010 0.0010 0.00100	0 100 50	150	

Sample ID MB	SampType: MBLK	TestCode: EPA 200.8: Metals	
Client ID: PBW	Batch ID: A37945	RunNo: 37945	
Prep Date:	Analysis Date: 10/13/2016	SeqNo: 1182564 Units: mg/L	
Analyte	Result POI SPK value SE	PK Ref Val %REC Lowl imit Highl imit %RPD RE	PDI imit Oual

0

0

103

112

102

50

50

50

150

150

150

Antimony	ND	0.0010
Arsenic	ND	0.0010
Lead	ND	0.00050
Selenium	ND	0.0010

Qualifiers:

Arsenic Lead

Selenium

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

D C 1 HN I D

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P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: 1609G57

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID 1	609G57-001EM	SDL Samp	Type: MS	SD.	Tes	tCode: El	PA 200.8: I	Dissolved Me	tals		
Client ID: E	B092716	Bat	ch ID: C3	7903	F	tunNo: 3	7903				
Prep Date:		Analysis	Date: 10	/11/2016	S	eqNo: 1	180767	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic		0.022	0.0010	0.02500	0	89.5	70	130	0.0923	20	
Lead		0.011	0.00050	0.01250	0	91.2	70	130	0.101	20	
Selenium		0.022	0.0010	0.02500	0	89.5	70	130	1.92	20	

Sample ID 1609G57-001EM	SLL Samp	Type: MS	3	Tes	tCode: El	PA 200.8:	Dissolved Met	als		
Client ID: EB092716	Bate	ch ID: C3	7903	F	RunNo: 3	7903				
Prep Date:	Analysis	Date: 10)/11/2016	S	SeqNo: 1	180768	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.022	0.0010	0.02500	0	89.4	70	130			
Lead	0.011	0.00050	0.01250	0	91.1	70	130			
Selenium	0.022	0.0010	0.02500	0	87.8	70	130			

Sample ID LCS	SampType: LC	S	Test	tCode: El	PA 200.8: [Dissolved Me	tals		
Client ID: LCSW	Batch ID: C3	7903	R	RunNo: 3	7903				
Prep Date:	Analysis Date: 10	/11/2016	S	SeqNo: 1	180781	Units: mg/L			
Analyte	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.022 0.0010	0.02500	0	89.4	85	115			
Lead	0.012 0.00050	0.01250	0	92.6	85	115			
Selenium	0.024 0.0010	0.02500	0	94.5	85	115			

Sample ID LLLCS	SampType: L	CSLL	Tes	tCode: El	PA 200.8: I	Dissolved Me	tals		
Client ID: BatchQC	Batch ID: C	37903	F	RunNo: 3	7903				
Prep Date:	Analysis Date: '	0/11/2016	S	SeqNo: 1	180785	Units: mg/L			
Analyte	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Analyte Arsenic	Result PQL 0.00098 0.0010		SPK Ref Val	%REC 98.2	LowLimit 50	HighLimit 150	%RPD	RPDLimit	Qual J
		0.001000	SPK Ref Val 0 0			<u> </u>	%RPD	RPDLimit	Qual J J

Sample ID MB	MB SampType: MBLK				TestCode: EPA 200.8: Dissolved Metals						
Client ID: PBW Batch ID: C37903				R	RunNo: :	37903					
Prep Date: Analysis Date: 10/11/2			/11/2016	S	SeqNo: '	1180788	Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	ND	0.0010									

ND 0.00050 Lead Selenium 0.0010

Qualifiers:

Value exceeds Maximum Contaminant Level.

Sample Diluted Due to Matrix D

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits R

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

P Reporting Detection Limit

Sample pH Not In Range

RL

Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID LCS SampType: LCS TestCode: EPA 200.8: Dissolved Metals

Client ID: LCSW Batch ID: B37945 RunNo: 37945

Prep Date: Analysis Date: 10/13/2016 SeqNo: 1182520 Units: mg/L

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

Antimony 0.024 0.0010 0.02500 0 94.2 85 115

Sample ID LLLCS SampType: LCSLL TestCode: EPA 200.8: Dissolved Metals

Client ID: BatchQC Batch ID: B37945 RunNo: 37945

Prep Date: Analysis Date: 10/13/2016 SeqNo: 1182521 Units: mg/L

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

Antimony 0.0010 0.0010 0.001000 0 104 50 150

Sample ID MB SampType: MBLK TestCode: EPA 200.8: Dissolved Metals

Client ID: PBW Batch ID: B37945 RunNo: 37945

Prep Date: Analysis Date: 10/13/2016 SeqNo: 1182522 Units: mg/L

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

Antimony ND 0.0010

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID MB-27871 SampType: MBLK TestCode: EPA Method 245.1: Mercury

Client ID: PBW Batch ID: 27871 RunNo: 37680

Prep Date: 10/4/2016 Analysis Date: 10/5/2016 SeqNo: 1173463 Units: mg/L

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

Mercury 0.000059 0.00020 J

Sample ID LCS-27871 SampType: LCS TestCode: EPA Method 245.1: Mercury

Client ID: LCSW Batch ID: 27871 RunNo: 37680

Prep Date: 10/4/2016 Analysis Date: 10/5/2016 SeqNo: 1173464 Units: mg/L

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

Mercury 0.0050 0.00020 0.005000 0 100 80 120

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

s Page 20 of 29

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Analyte detected in the associated Method Blank

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Hall Environmental Analysis Laboratory, Inc.

ND

0.50

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sulfate

Sample ID MB SampType: mblk TestCode: EPA Method 300.0: Anions Client ID: **PBW** Batch ID: R37589 RunNo: 37589 Analysis Date: 9/29/2016 Prep Date: SeqNo: 1169949 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Fluoride ND 0.10 Chloride 0.082 0.50 J

Sample ID LCSb TestCode: EPA Method 300.0: Anions SampType: Ics Client ID: LCSW Batch ID: R37589 RunNo: 37589 Prep Date: Analysis Date: 9/29/2016 SeqNo: 1169952 Units: mg/L Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 0.48 0.10 0 95.3 90 110 Fluoride 0.5000 Chloride 4.6 0.50 5.000 0 91.4 90 110 0 9.3 0.50 10.00 93.2 90 110 Sulfate

Qualifiers:

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

7 maryte detected in the associated Method Blank

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1609G57

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID LCS-27808 SampType: LCS TestCode: EPA Method 8015M/D: Diesel Range Client ID: LCSW Batch ID: 27808 RunNo: 37585 Analysis Date: 9/30/2016 Prep Date: 9/30/2016 SeqNo: 1170879 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Diesel Range Organics (DRO) 5.5 1.0 5.000 0 109 63.2 155 Surr: DNOP 0.50 0.5000 101 77.1 144

TestCode: EPA Method 8015M/D: Diesel Range Sample ID MB-27808 SampType: MBLK Client ID: PBW Batch ID: 27808 RunNo: 37585 Prep Date: 9/30/2016 Analysis Date: 9/30/2016 SeqNo: 1170882 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 1.3 1.000 132 77.1 144

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID RB SampType: MBLK TestCode: EPA Method 8015D: Gasoline Range

Client ID: PBW Batch ID: AG37567 RunNo: 37567

Prep Date: Analysis Date: 9/29/2016 SeqNo: 1169373 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 87.9 66.4 120

Sample ID 2.5UG GRO LCS SampType: LCS TestCode: EPA Method 8015D: Gasoline Range

Client ID: LCSW Batch ID: AG37567 RunNo: 37567

Prep Date: Analysis Date: 9/29/2016 SeqNo: 1169374 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
 98.8
 80
 120

 Surr: BFB
 20
 20.00
 97.6
 66.4
 120

Qualifiers:

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

in the associated Method Blank

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Hall Environmental Analysis Laboratory, Inc.

SampType: MBLK

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID rb2

Sample ID 100ng Ics	SampType: LCS Batch ID: R37576			Tes						
Client ID: LCSW				F	RunNo: 3					
Prep Date:	Analysis Date: 9/29/2016		SeqNo: 1169404			Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	111	70	130			
Toluene	17	1.0	20.00	0	84.8	70	130			
Chlorobenzene	16	1.0	20.00	0	81.0	70	130			
1,1-Dichloroethene	21	1.0	20.00	0	106	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	92.6	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		109	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.6	70	130			
Surr: Dibromofluoromethane	11		10.00		115	70	130			
Surr: Toluene-d8	8.8		10.00		88.3	70	130			

TestCode: EPA Method 8260B: VOLATILES

Client ID: PBW	Batch	ID: R3	37576	F	RunNo: 3	7576				
Prep Date:	Analysis D	ate: 9/	/29/2016	S	SeqNo: 1	169410	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Client ID: PBW	Batc	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES						
	Date	Batch ID: R37576			RunNo: 37576						
Prep Date:	Analysis [Date: 9/	29/2016	5	SeqNo: 1169410 Units: μg						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
4-Chlorotoluene	ND	1.0									
cis-1,2-DCE	ND	1.0									
cis-1,3-Dichloropropene	ND	1.0									
1,2-Dibromo-3-chloropropane		2.0									
Dibromochloromethane	ND	1.0									
Dibromomethane	ND	1.0									
1,2-Dichlorobenzene	ND	1.0									
1,3-Dichlorobenzene	ND	1.0									
1,4-Dichlorobenzene	ND	1.0									
Dichlorodifluoromethane	ND	1.0									
1,1-Dichloroethane	ND	1.0									
1,1-Dichloroethene	ND	1.0									
1,2-Dichloropropane	ND	1.0									
1,3-Dichloropropane	ND	1.0									
2,2-Dichloropropane	ND	2.0									
1,1-Dichloropropene	ND	1.0									
Hexachlorobutadiene	ND	1.0									
2-Hexanone	ND	10									
Isopropylbenzene	ND	1.0									
4-Isopropyltoluene	ND	1.0									
4-Methyl-2-pentanone	ND	10									
Methylene Chloride	0.85	3.0								J	
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									
1,2,0 memoropropane	110	2.0									

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID rb2 SampType: MBLK TestCode: EPA Method 8260B: VOLATILES Client ID: **PBW** Batch ID: R37576 RunNo: 37576 Prep Date: Analysis Date: 9/29/2016 SeqNo: 1169410 Units: µg/L Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Vinyl chloride ND 1.0 Xylenes, Total ND 1.5 115 70 Surr: 1,2-Dichloroethane-d4 12 10.00 130 Surr: 4-Bromofluorobenzene 10 10.00 99.8 70 130 Surr: Dibromofluoromethane 12 10.00 125 70 130 Surr: Toluene-d8 8.6 10.00 85.8 70 130

Sample ID 1609g57-001ams SampType: MS TestCode: EPA Method 8260B: VOLATILES Client ID: EB092716 Batch ID: R37576 RunNo: 37576 Prep Date: Analysis Date: 9/29/2016 SeqNo: 1169419 Units: µg/L %REC Result **PQL** SPK value SPK Ref Val HighLimit %RPD **RPDLimit** Analyte LowLimit Qual Benzene 21 1.0 20.00 106 70 130 16 20.00 0 79.1 70 130 Toluene 1.0 20.00 0 74.6 70 Chlorobenzene 15 1.0 130 97.1 19 0 70 1,1-Dichloroethene 1.0 20.00 130 Trichloroethene (TCE) 17 1.0 20.00 0 86.1 70 130 Surr: 1,2-Dichloroethane-d4 11 10.00 110 70 130 93.8 70 Surr: 4-Bromofluorobenzene 9.4 10.00 130 Surr: Dibromofluoromethane 11 10.00 114 70 130 Surr: Toluene-d8 8.9 10.00 88.7 70 130

Sample ID 1609g57-001amsd SampType: MSD				Tes	tCode: El	PA Method	8260B: VOL	ATILES		
Client ID: EB092716	Batch ID: R37576			F	RunNo: 37576					
Prep Date:	Analysis D	ate: 9 /	29/2016	S	SeqNo: 1	169420	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	98.3	70	130	7.13	20	
Toluene	15	1.0	20.00	0	75.9	70	130	4.10	20	
Chlorobenzene	14	1.0	20.00	0	71.0	70	130	4.98	20	
1,1-Dichloroethene	18	1.0	20.00	0	92.1	70	130	5.25	20	
Trichloroethene (TCE)	16	1.0	20.00	0	82.0	70	130	4.80	20	
Surr: 1,2-Dichloroethane-d4	11		10.00		109	70	130	0	0	
Surr: 4-Bromofluorobenzene	10		10.00		99.6	70	130	0	0	
Surr: Dibromofluoromethane	11		10.00		111	70	130	0	0	
Surr: Toluene-d8	8.6		10.00		86.4	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID mb-27882	SampType: MBLK			TestCode: EPA Method 8270C: Semivolatiles							
Client ID: PBW	Batch ID: 27882			F	RunNo: 37716						
Prep Date: 10/4/2016	Analysis D			SeqNo: 1174799		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	11	20								J	
Benzyl alcohol	ND	10									
Bis(2-chloroethoxy)methane	ND	10									
Bis(2-chloroethyl)ether	ND	10									
Bis(2-chloroisopropyl)ether	ND	10									
Bis(2-ethylhexyl)phthalate	3.2	10								J	
4-Bromophenyl phenyl ether	ND	10									
Butyl benzyl phthalate	ND	10									
Carbazole	ND	10									
4-Chloro-3-methylphenol	ND	10									
4-Chloroaniline	ND	10									
2-Chloronaphthalene	ND	10									
2-Chlorophenol	ND	10									
4-Chlorophenyl phenyl ether	ND	10									
Chrysene	ND	10									
Di-n-butyl phthalate	ND	10									
Di-n-octyl phthalate	ND	10									
Dibenz(a,h)anthracene	ND	10									
Dibenzofuran	ND	10									
1,2-Dichlorobenzene	ND	10									
1,3-Dichlorobenzene	ND	10									
1,4-Dichlorobenzene	ND	10									
3,3´-Dichlorobenzidine	ND	10									
Diethyl phthalate	ND	10									
Dimethyl phthalate	ND	10									
2,4-Dichlorophenol	ND	20									
2,4-Dimethylphenol	ND	10									
4,6-Dinitro-2-methylphenol	ND	20									
2,4-Dinitrophenol	7.5	20								J	
2, . 5 0 0 10 10 10 1		_0								ū	

Qualifiers:

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

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID mb-27882	SampTyp	e: MBLK	TestCode: I	PA Method	8270C: Semi	volatiles		
Client ID: PBW	Batch II	D: 27882	RunNo:	37716				
Prep Date: 10/4/2016	Analysis Date	e: 10/5/2016	SeqNo:	1174799	Units: µg/L			
Analyte	Result	PQL SPK value	SPK Ref Val %REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	10						
2,6-Dinitrotoluene	ND	10						
Fluoranthene	ND	10						
Fluorene	ND	10						
Hexachlorobenzene	ND	10						
Hexachlorobutadiene	ND	10						
Hexachlorocyclopentadiene	ND	10						
Hexachloroethane	ND	10						
Indeno(1,2,3-cd)pyrene	ND	10						
Isophorone	ND	10						
1-Methylnaphthalene	ND	10						
2-Methylnaphthalene	ND	10						
2-Methylphenol	ND	10						
3+4-Methylphenol	ND	10						
N-Nitrosodi-n-propylamine	ND	10						
N-Nitrosodimethylamine	ND	10						
N-Nitrosodiphenylamine	ND	10						
Naphthalene	ND	10						
2-Nitroaniline	ND	10						
3-Nitroaniline	ND	10						
4-Nitroaniline	ND	10						
Nitrobenzene	ND	10						
2-Nitrophenol	ND	10						
4-Nitrophenol	ND	10						
Pentachlorophenol	ND	20						
Phenanthrene	ND	10						
Phenol	ND	10						
Pyrene	ND	10						
Pyridine	ND	10						
1,2,4-Trichlorobenzene	ND	10						
2,4,5-Trichlorophenol	ND	10						
2,4,6-Trichlorophenol	ND	10						
Surr: 2-Fluorophenol	120	200.0	60.4	15	123			
Surr: Phenol-d5	88	200.0	44.0	4.13	124			
Surr: 2,4,6-Tribromophenol	170	200.0	84.8		134			
Surr: Nitrobenzene-d5	71	100.0	71.0	28.8	134			
Surr: 2-Fluorobiphenyl	58	100.0	57.8		125			
Surr: 4-Terphenyl-d14	80	100.0	80.1	15	146			

Qualifiers:

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- D Sample Diluted Due to Matrix
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- B Analyte detected in the associated Method Blank
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- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID Ics-27882	SampT	ype: LC	s	Tes	tCode: El	PA Method	8270C: Semi	volatiles		
Client ID: LCSW	Batch	n ID: 27	882	F	RunNo: 3	7716				
Prep Date: 10/4/2016	Analysis D	Date: 10	0/5/2016	S	SeqNo: 1	174800	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	35	113			
4-Chloro-3-methylphenol	170	10	200.0	0	84.0	40.7	114			
2-Chlorophenol	160	10	200.0	0	79.3	37.6	113			
1,4-Dichlorobenzene	62	10	100.0	0	61.6	37.7	106			
2,4-Dinitrotoluene	77	10	100.0	0	76.8	37	91			
N-Nitrosodi-n-propylamine	86	10	100.0	0	86.3	45.4	105			
4-Nitrophenol	120	10	200.0	0	59.1	33.4	104			
Pentachlorophenol	120	20	200.0	0	60.8	29.5	94.9			
Phenol	130	10	200.0	0	63.0	30.6	119			
Pyrene	83	10	100.0	0	83.5	26.2	120			
1,2,4-Trichlorobenzene	66	10	100.0	0	66.0	39.9	125			
Surr: 2-Fluorophenol	140		200.0		70.0	15	123			
Surr: Phenol-d5	110		200.0		57.4	4.13	124			
Surr: 2,4,6-Tribromophenol	140		200.0		69.3	18.4	134			
Surr: Nitrobenzene-d5	74		100.0		74.0	28.8	134			
Surr: 2-Fluorobiphenyl	66		100.0		66.4	35.9	125			
Surr: 4-Terphenyl-d14	74		100.0		73.7	15	146			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
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- P Sample pH Not In Range
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- W Sample container temperature is out of limit as specified

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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 Numbe	r: 1609G57		RcptNo:	1
Received by/date:	09/29	10			
Logged By: Lindsay Mangin	9/29/2016 8:50:00 AM	Л	Jimby Hlengo		
Completed By: Ashley Gallegos	9/29/2016 10:21:54 A	M	A		ļ
Reviewed By: A C	09/29/10	>	V		
Chain of Custody	· · · · · · · · · · · · · · · · · · ·	7 ·····			
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			
<u>Log In</u>					
4. Was an attempt made to cool the sample	oles?	Yes 🖈	No 🗆	na 🗆	
5. Were all samples received at a temper	ature 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) p	roperly preserved?	Yes 🕏	No 🗌		
9. Was preservative added to bottles?		Yes 🗌	No 🗹	NA 🗆	
10.VOA vials have zero headspace?		Yes 🗹	No 🗆	No VOA Vials	
11. Were any sample containers received	broken?	Yes □	No 🗹	# of preserved	
12. Does paperwork match bottle labels?		Yes 🖈	No □	bottles checked for pH:	2
(Note discrepancies on chain of custod	у)			@	r 12 unless noted)
13. Are matrices correctly identified on Cha	in of Custody?	Yes 🗹	No 🗆	Adjusted?	29
14. Is it clear what analyses were requeste	d?	Yes 🖈	No 📙	Checked by:	a <<
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 🗹	1
Person Notified:	Date	A THE RESIDENCE AND A STREET OF STREET AND A STREET AND A STREET AND A STREET AND A STREET AND A STREET AND A			
By Whom:	Via:	eMail	Phone 🗌 Fax	In Person	
Regarding: Client Instructions:			ko korto ten en este establista en en en en en entre de la constanta de la constanta de la constanta de la cons		
17. Additional remarks:					
18. Cooler Information Cooler No Temp °C Condition	Seal Intact Seal No	Seal Date	Signed By		
1 1.2 Good	Yes Yes	Jour Date	Ungricularly		
To a commence of the commence	ner er energie traduction terrette tradition de la constant de la constant de la constant de la constant de la				

HALL ENVIDONMENTA!	ANALYSIS LABORATORY	www.hallenvironmental.com	- Albuquerque, NM 87109	Fax 505-345-4107	Analysis Request		s,80)d 7	808	(A() - \(\frac{1}{2} \) - \(\frac{1}{2} \)	Poinons (F.O.) anoinnes of the Soor (Seminos) occidentes of the Soor of the So		<u> </u>		<u> </u>			>					e clearly notated on the analytical report.
	ANALY	www.hallen	4901 Hawkins NE - All	Tel. 505-345-3975	Anal	(ʎju	IW /	(Gs	H97 IO \ i (1.	CSS -	3 or (G)	3TEX + MT 3TEX + MT 1PH (Metho 1PH's (831) 2CRA 8 Me			7							Remarks:		ssibility. Any sub-contracted data will be
Turn-Around time:	Standard Rush	Project Name:	OW-14 SOURCE INV.	Project #:		Project Manager:		ED RIEGE	TRACY PAWE	On Ice: 🗡 Yes 🗆 🗆 No	Sample Temperature I/\mathcal{I}	Preservative Type IIACLE			l			RASTIC-I NEAT -(D)	PLASTIC-1 NAOH - (D)			by: Date Time	Received by Time Oate Time	tracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.
Chain-of-Custody Record	Client: WESTERN REFINING SWINC.		Mailing Addressig Colon Consting RD		Phone #: 505-722-0217	R. COM	QA/QC Package:	☐ Standard X Level 4 (Full Validation)	uo	☐ Other	X EDD (Type) EXCEC	Date Time Matrix Sample Request ID	947/16 1740 WATER ETS 092716						→ →		S =	Time: Relinquished by:	Date: Time: Relinquished by: If I So Mill Hay	If necessary, samples supmitted to bat Environmental may be subcontracted to

HALL ENVIDONMENTAL	ANALYSIS LABORATORY	www.hallenvironmental.com	4901 Hawkins NE - Albuquerque, NM 87109	Tel. 505-345-3975 Fax 505-345-4107	Analysis Request		s'8C	O4, D4 <u>9</u>	3085 3085 3085 3085 3085 3085 3085 3085	28 28 1, _e C	5 bot 5 bot	letho 8310 3 Met (F,Cl (YOA) iemi-	EDB (M ED	N N N N N N N N N N	>		>		<u> </u>								ntracted data will be clearly notated on the analytical report.
			4901 Ha	Tel. 50		(ʎJu	10 SE	3Đ)	Hd	<u>L</u> +	38	HTM -	+ X3T8 08 H9	3		>								Kemarks:			bility. Any sub
Turn-Around Time:	X Standard	Project Name:	OW-14 SOURCE INV.	Project #:		Project Manager:	208	ED RIEGE	TRACY PAYNE	/ Yes	Sample Temperature: 7		Type and # Type HEAL No. X X X X X X X X X X X X X X X X X X X	101 - UZ	1 LITER NEAT - MY		_				}		Deto Timo	THE WAY I FOOT	Received by: Date Time	July 9/4/6 08TO	ocontracted to other acceptance aboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.
Chain-of-Custody Record	Client: WESTERN REFINING SW, INC.	GALLIP REFINERY	Mailing Addresoz GIANT CROSSING RD	GALLUP, NM 87301	Phone #: 505-722-0217	email or Fax#: FD. RIEGE @ NNR.COM	QA/QC Package:	☐ Standard	uo	□ NELAP □ Other	X EDD (Type) EXCEL	` —	Date Time Matrix Sample Request ID	9/28/16/1440 WINTER EESM7816			100			^ ^ ^ ^			Defect Times. Define an independ has	ē	ime: Refind	My 850 Hill Hill	f necessary, samples

WESTERN REFINING SOUTHWEST, INC. GALLUP REFINERY

OW-14 SOURCE INVESTIGATION - SEPTEMBER 2016

METALS AND CYANIDE ANALYSES FOR GROUNDWATER SAMPLES AND WATER QA/QC SAMPLES

TOTAL METALS ANALYSIS AND DISSOLVED METALS ANALYSIS

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

GENERAL CHEMISTRY PARAMETERS FOR GROUNDWATER SAMPLES AND WATER QA/QC SAMPLES

Analyte	Analytical Method
Chloride	EPA method 300.0
Fluoride	EPA method 300.0
Sulfate	EPA method 300.0



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

November 01, 2016

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

FAX

RE: OW-14 Source Inv. OrderNo.: 1609G64

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 10 sample(s) on 9/29/2016 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman

Laboratory Manager

andel

4901 Hawkins NE

Albuquerque, NM 87109

Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 568-2 (22-24')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 11:15:00 AM

 Lab ID:
 1609G64-001
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANIC	S					Analyst: TOM	
Diesel Range Organics (DRO)	ND	1.8	9.8		mg/Kg	1	10/3/2016 2:16:15 PM	27809
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	10/3/2016 2:16:15 PM	27809
Surr: DNOP	89.7	0	70-130		%Rec	1	10/3/2016 2:16:15 PM	27809
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0028	0.00056	0.033	J	mg/Kg	1	10/4/2016 8:47:44 AM	27844
EPA METHOD 6010B: SOIL METALS							Analyst: MED	
Antimony	ND	10	25		mg/Kg	10	10/5/2016 8:36:40 AM	27843
Arsenic	ND	8.9	25		mg/Kg	10	10/5/2016 8:36:40 AM	27843
Barium	590	0.71	1.0		mg/Kg	10	10/5/2016 8:36:40 AM	27843
Beryllium	ND	0.35	1.5		mg/Kg	10	10/5/2016 8:36:40 AM	27843
Cadmium	ND	0.63	1.0		mg/Kg	10	10/5/2016 8:36:40 AM	27843
Chromium	2.5	0.94	3.0	J	mg/Kg	10	10/5/2016 8:36:40 AM	27843
Cobalt	2.6	1.1	3.0	J	mg/Kg	10	10/5/2016 8:36:40 AM	27843
Iron	4900	75	250		mg/Kg	100	10/5/2016 9:33:13 AM	27843
Lead	5.9	1.7	2.5		mg/Kg	10	10/5/2016 8:36:40 AM	27843
Manganese	2300	0.53	1.0		mg/Kg	10	10/5/2016 8:36:40 AM	27843
Nickel	3.1	1.5	5.0	J	mg/Kg	10	10/5/2016 8:36:40 AM	27843
Selenium	ND	18	25		mg/Kg	10	10/5/2016 8:36:40 AM	27843
Silver	ND	0.62	2.5		mg/Kg	10	10/5/2016 8:36:40 AM	27843
Vanadium	58	1.8	25		mg/Kg	10	10/5/2016 8:36:40 AM	27843
Zinc	6.3	3.5	25	J	mg/Kg	10	10/5/2016 8:36:40 AM	27843
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	
Aniline	ND	0.094	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Anthracene	ND	0.066	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	
Benz(a)anthracene	ND	0.085	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Benzo(k)fluoranthene	ND	0.087	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	
Benzoic acid	ND	0.082	0.50		mg/Kg	1	10/5/2016 10:47:03 AM	
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	
Bis(2-ethylhexyl)phthalate	ND	0.081	0.50		mg/Kg	1	10/5/2016 10:47:03 AM	

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 1 of 67

Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (22-24')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 11:15:00 AM

 Lab ID:
 1609G64-001
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Carbazole	ND	0.067	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/5/2016 10:47:03 AM	27836
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Chrysene	ND	0.085	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Di-n-butyl phthalate	0.094	0.074	0.40	J	mg/Kg	1	10/5/2016 10:47:03 AM	27836
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Diethyl phthalate	ND	0.10	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/5/2016 10:47:03 AM	27836
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Fluoranthene	ND	0.057	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Fluorene	ND	0.091	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Indeno(1,2,3-cd)pyrene	ND	0.077	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Isophorone	ND	0.11	0.40		mg/Kg	1	10/5/2016 10:47:03 AM	27836
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	10/5/2016 10:47:03 AM	27836
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
N-Nitrosodi-n-propylamine	ND	0.095	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 2 of 67

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (22-24')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 11:15:00 AM

 Lab ID:
 1609G64-001
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	ND	0.095	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
3-Nitroaniline	ND	0.087	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2-Nitrophenol	ND	0.098	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Phenanthrene	ND	0.067	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Phenol	ND	0.075	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Pyrene	ND	0.075	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Pyridine	ND	0.079	0.40		mg/Kg	1	10/5/2016 10:47:03 AM	27836
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2,4,5-Trichlorophenol	ND	0.099	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
2,4,6-Trichlorophenol	ND	0.082	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Surr: 2-Fluorophenol	61.7	0	35-97.9		%Rec	1	10/5/2016 10:47:03 AM	27836
Surr: Phenol-d5	66.7	0	37.3-105		%Rec	1	10/5/2016 10:47:03 AM	27836
Surr: 2,4,6-Tribromophenol	64.1	0	35.6-118		%Rec	1	10/5/2016 10:47:03 AM	27836
Surr: Nitrobenzene-d5	56.5		41.2-107		%Rec	1	10/5/2016 10:47:03 AM	27836
Surr: 2-Fluorobiphenyl	57.1		41.9-119		%Rec	1	10/5/2016 10:47:03 AM	27836
Surr: 4-Terphenyl-d14	63.0		15-132		%Rec	1	10/5/2016 10:47:03 AM	27836
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
Benzene	5.37	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Toluene	0.897	0.201	1.66	J	μg/Kg	1	10/4/2016 11:43:00 AM	27868
Ethylbenzene	ND	0.223	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Methyl tert-butyl ether (MTBE)	0.573	0.279	1.66	J	μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,2,4-Trimethylbenzene	0.307	0.282	1.66	J	μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,3,5-Trimethylbenzene	ND	0.274	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,2-Dichloroethane (EDC)	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	
1,2-Dibromoethane (EDB)	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Naphthalene	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1-Methylnaphthalene	0.249	0.189	3.32	J	μg/Kg	1	10/4/2016 11:43:00 AM	27868
2-Methylnaphthalene	ND	0.437	3.32		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Acetone	8.53	0.492	8.31		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Bromobenzene	ND	0.169	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Bromodichloromethane	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Bromoform	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Bromomethane	ND	0.299	2.49		μg/Kg	1	10/4/2016 11:43:00 AM	27868
2-Butanone	ND	0.599	8.31		μg/Kg	1	10/4/2016 11:43:00 AM	27868

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 3 of 67

Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (22-24')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 11:15:00 AM

 Lab ID:
 1609G64-001
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
Carbon disulfide	ND	0.614	8.31		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Carbon tetrachloride	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Chlorobenzene	ND	0.191	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Chloroethane	ND	0.307	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Chloroform	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Chloromethane	ND	0.421	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
2-Chlorotoluene	ND	0.283	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
4-Chlorotoluene	ND	0.276	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
cis-1,2-DCE	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
cis-1,3-Dichloropropene	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,2-Dibromo-3-chloropropane	ND	0.177	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Dibromochloromethane	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Dibromomethane	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,2-Dichlorobenzene	ND	0.242	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,3-Dichlorobenzene	ND	0.307	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,4-Dichlorobenzene	ND	0.311	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Dichlorodifluoromethane	ND	0.970	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,1-Dichloroethane	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,1-Dichloroethene	ND	0.272	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,2-Dichloropropane	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,3-Dichloropropane	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
2,2-Dichloropropane	ND	0.210	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,1-Dichloropropene	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Hexachlorobutadiene	ND	0.379	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
2-Hexanone	ND	0.414	8.31		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Isopropylbenzene	ND	0.209	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
4-Isopropyltoluene	ND	0.312	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
4-Methyl-2-pentanone	ND	3.32	8.31		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Methylene chloride	ND	1.66	2.49		μg/Kg	1	10/4/2016 11:43:00 AM	27868
n-Butylbenzene	ND	0.405	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
n-Propylbenzene	ND	0.297	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
sec-Butylbenzene	ND	0.295	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Styrene	ND	0.212	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
tert-Butylbenzene	ND	0.243	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,1,1,2-Tetrachloroethane	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,1,2,2-Tetrachloroethane	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Tetrachloroethene (PCE)	ND	0.218	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
trans-1,2-DCE	ND	0.168	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
trans-1,3-Dichloropropene	ND	0.201	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 4 of 67

Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (22-24')

Project: OW-14 Source Inv.
 Collection Date: 9/27/2016 11:15:00 AM

 Lab ID: 1609G64-001
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
1,2,3-Trichlorobenzene	ND	0.402	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,2,4-Trichlorobenzene	ND	0.504	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,1,1-Trichloroethane	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,1,2-Trichloroethane	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Trichloroethene (TCE)	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Trichlorofluoromethane	ND	0.209	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
1,2,3-Trichloropropane	ND	1.66	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Vinyl chloride	ND	0.437	1.66		μg/Kg	1	10/4/2016 11:43:00 AM	27868
Xylenes, Total	1.02	0.662	1.66	J	μg/Kg	1	10/4/2016 11:43:00 AM	27868
Surr: 1,2-Dichloroethane-d4	116	0	70-130		%Rec	1	10/4/2016 11:43:00 AM	27868
Surr: 4-Bromofluorobenzene	103	0	70-130		%Rec	1	10/4/2016 11:43:00 AM	27868
Surr: Dibromofluoromethane	104	0	70-130		%Rec	1	10/4/2016 11:43:00 AM	27868
Surr: Toluene-d8	96.5	0	70-130		%Rec	1	10/4/2016 11:43:00 AM	27868
EPA METHOD 8015D MOD: GASOLINE R	ANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	ND	0.48	3.2		mg/Kg	1	9/29/2016 7:43:46 PM	G37582
Surr: BFB	90.6	0	70-130		%Rec	1	9/29/2016 7:43:46 PM	G37582

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (28-30')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 11:25:00 AM

 Lab ID:
 1609G64-002
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANIC	S					Analyst: TOM	
Diesel Range Organics (DRO)	300	1.7	9.2		mg/Kg	1	10/3/2016 3:21:07 PM	27809
Motor Oil Range Organics (MRO)	ND	46	46		mg/Kg	1	10/3/2016 3:21:07 PM	27809
Surr: DNOP	98.3	0	70-130		%Rec	1	10/3/2016 3:21:07 PM	27809
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0021	0.00056	0.033	J	mg/Kg	1	10/4/2016 8:53:01 AM	27844
EPA METHOD 6010B: SOIL METALS							Analyst: MED	
Antimony	ND	0.99	2.5		mg/Kg	1	10/5/2016 8:39:33 AM	27843
Arsenic	1.6	0.88	2.5	J	mg/Kg	1	10/5/2016 8:39:33 AM	27843
Barium	230	0.070	0.099		mg/Kg	1	10/5/2016 8:39:33 AM	27843
Beryllium	0.58	0.034	0.15		mg/Kg	1	10/5/2016 8:39:33 AM	27843
Cadmium	ND	0.063	0.099		mg/Kg	1	10/5/2016 8:39:33 AM	27843
Chromium	5.6	0.093	0.30		mg/Kg	1	10/5/2016 8:39:33 AM	27843
Cobalt	2.7	0.11	0.30		mg/Kg	1	10/5/2016 8:39:33 AM	27843
Iron	9100	74	250		mg/Kg	100	10/5/2016 8:38:05 AM	27843
Lead	1.8	0.17	0.25		mg/Kg	1	10/5/2016 8:39:33 AM	27843
Manganese	200	0.053	0.099		mg/Kg	1	10/5/2016 8:39:33 AM	27843
Nickel	4.7	0.15	0.49		mg/Kg	1	10/5/2016 8:39:33 AM	27843
Selenium	ND	1.8	2.5		mg/Kg	1	10/5/2016 8:39:33 AM	27843
Silver	ND	0.062	0.25		mg/Kg	1	10/5/2016 8:39:33 AM	27843
Vanadium	10	0.17	2.5		mg/Kg	1	10/5/2016 8:39:33 AM	27843
Zinc	9.3	0.34	2.5		mg/Kg	1	10/5/2016 8:39:33 AM	27843
EPA METHOD 8270C: SEMIVOLATILES					0 0		Analyst: DAM	
Acenaphthene	ND	0.086	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	
Aniline	ND	0.001	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	
Anthracene	ND	0.066	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	
Benzo(a)pyrene	ND	0.076	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	
Benzoic acid	ND	0.083	0.50		mg/Kg	1	10/5/2016 12:10:48 PM	
Benzyl alcohol	ND	0.003	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Bis(2-chloroethoxy)methane	ND	0.078	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	
Bis(2-chloroethyl)ether	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Bis(2-chloroisopropyl)ether	ND	0.073	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	
Bis(2-ethylhexyl)phthalate	0.10	0.089	0.20	J	mg/Kg	1	10/5/2016 12:10:48 PM	
Dio(2 outyliloxyl)pritialate	0.10	0.001	0.50	J	ilig/itg	'	10,0,2010 12.10.401 10	21000

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (28-30')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 11:25:00 AM

 Lab ID:
 1609G64-002
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Carbazole	ND	0.067	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/5/2016 12:10:48 PM	27836
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2-Chloronaphthalene	ND	0.079	0.25		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2-Chlorophenol	ND	0.079	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Chrysene	ND	0.085	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Di-n-butyl phthalate	0.12	0.075	0.40	J	mg/Kg	1	10/5/2016 12:10:48 PM	27836
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Diethyl phthalate	0.12	0.10	0.20	J	mg/Kg	1	10/5/2016 12:10:48 PM	27836
Dimethyl phthalate	ND	0.098	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/5/2016 12:10:48 PM	27836
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Fluoranthene	ND	0.057	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Fluorene	ND	0.091	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Isophorone	ND	0.11	0.40		mg/Kg	1	10/5/2016 12:10:48 PM	27836
1-Methylnaphthalene	0.66	0.10	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2-Methylnaphthalene	1.3	0.12	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2-Methylphenol	0.14	0.083	0.40	J	mg/Kg	1	10/5/2016 12:10:48 PM	27836
3+4-Methylphenol	0.15	0.072	0.20	J	mg/Kg	1	10/5/2016 12:10:48 PM	
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (28-30')

Project: OW-14 Source Inv.

Collection Date: 9/27/2016 11:25:00 AM

Lab ID: 1609G64-002 **Matrix:** MEOH (SOIL) **Received Date:** 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	1.4	0.096	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Phenanthrene	0.070	0.068	0.20	J	mg/Kg	1	10/5/2016 12:10:48 PM	27836
Phenol	0.14	0.075	0.20	J	mg/Kg	1	10/5/2016 12:10:48 PM	27836
Pyrene	ND	0.075	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Pyridine	ND	0.079	0.40		mg/Kg	1	10/5/2016 12:10:48 PM	27836
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Surr: 2-Fluorophenol	41.4	0	35-97.9		%Rec	1	10/5/2016 12:10:48 PM	27836
Surr: Phenol-d5	72.1	0	37.3-105		%Rec	1	10/5/2016 12:10:48 PM	27836
Surr: 2,4,6-Tribromophenol	75.3	0	35.6-118		%Rec	1	10/5/2016 12:10:48 PM	27836
Surr: Nitrobenzene-d5	65.2		41.2-107		%Rec	1	10/5/2016 12:10:48 PM	27836
Surr: 2-Fluorobiphenyl	64.9		41.9-119		%Rec	1	10/5/2016 12:10:48 PM	27836
Surr: 4-Terphenyl-d14	65.1		15-132		%Rec	1	10/5/2016 12:10:48 PM	27836
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	5.2	0.26	0.33		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Toluene	28	0.038	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Ethylbenzene	7.0	0.053	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Methyl tert-butyl ether (MTBE)	ND	0.20	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,2,4-Trimethylbenzene	18	0.048	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,3,5-Trimethylbenzene	5.6	0.047	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,2-Dichloroethane (EDC)	ND	0.17	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,2-Dibromoethane (EDB)	ND	0.046	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Naphthalene	2.6	0.10	1.3		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1-Methylnaphthalene	0.86	0.14	2.6	J	mg/Kg	10	9/29/2016 9:09:13 PM	S37582
2-Methylnaphthalene	1.9	0.14	2.6	J	mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Acetone	ND	0.84	9.8		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Bromobenzene	ND	0.052	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Bromodichloromethane	ND	0.038	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Bromoform	ND	0.079	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Bromomethane	ND	0.24	2.0		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
2-Butanone	ND	0.37	6.5		mg/Kg	10	9/29/2016 9:09:13 PM	S37582

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (28-30')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 11:25:00 AM

 Lab ID:
 1609G64-002
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.21	6.5		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Carbon tetrachloride	ND	0.043	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Chlorobenzene	ND	0.053	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Chloroethane	ND	0.13	1.3		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Chloroform	ND	0.049	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Chloromethane	ND	0.058	2.0		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
2-Chlorotoluene	ND	0.048	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
4-Chlorotoluene	ND	0.057	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
cis-1,2-DCE	ND	0.038	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
cis-1,3-Dichloropropene	ND	0.060	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,2-Dibromo-3-chloropropane	ND	0.20	1.3		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Dibromochloromethane	ND	0.059	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Dibromomethane	ND	0.056	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,2-Dichlorobenzene	ND	0.057	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,3-Dichlorobenzene	ND	0.053	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,4-Dichlorobenzene	ND	0.081	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Dichlorodifluoromethane	ND	0.20	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,1-Dichloroethane	ND	0.035	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,1-Dichloroethene	ND	0.21	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,2-Dichloropropane	ND	0.055	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,3-Dichloropropane	ND	0.074	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
2,2-Dichloropropane	ND	0.037	1.3		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,1-Dichloropropene	ND	0.052	1.3		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Hexachlorobutadiene	ND	0.079	1.3		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
2-Hexanone	ND	0.35	6.5		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Isopropylbenzene	0.34	0.056	0.65	J	mg/Kg	10	9/29/2016 9:09:13 PM	S37582
4-Isopropyltoluene	0.13	0.058	0.65	J	mg/Kg	10	9/29/2016 9:09:13 PM	S37582
4-Methyl-2-pentanone	ND	0.19	6.5		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Methylene chloride	ND	0.19	2.0		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
n-Butylbenzene	0.87	0.058	2.0	J	mg/Kg	10	9/29/2016 9:09:13 PM	S37582
n-Propylbenzene	2.4	0.050	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
sec-Butylbenzene	0.31	0.090	0.65	J	mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Styrene	ND	0.058	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
tert-Butylbenzene	ND	0.054	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,1,1,2-Tetrachloroethane	ND	0.062	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,1,2,2-Tetrachloroethane	ND	0.11	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Tetrachloroethene (PCE)	ND	0.054	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
trans-1,2-DCE	ND	0.18	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
trans-1,3-Dichloropropene	ND	0.095	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (28-30')

Project: OW-14 Source Inv.

Collection Date: 9/27/2016 11:25:00 AM

Lab ID: 1609G64-002 **Matrix:** MEOH (SOIL) **Received Date:** 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.097	1.3		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,2,4-Trichlorobenzene	ND	0.070	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,1,1-Trichloroethane	ND	0.040	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,1,2-Trichloroethane	ND	0.077	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Trichloroethene (TCE)	ND	0.070	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Trichlorofluoromethane	ND	0.049	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
1,2,3-Trichloropropane	ND	0.11	1.3		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Vinyl chloride	ND	0.053	0.65		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Xylenes, Total	46	0.12	1.3		mg/Kg	10	9/29/2016 9:09:13 PM	S37582
Surr: Dibromofluoromethane	91.2		70-130		%Rec	10	9/29/2016 9:09:13 PM	S37582
Surr: 1,2-Dichloroethane-d4	93.8		70-130		%Rec	10	9/29/2016 9:09:13 PM	S37582
Surr: Toluene-d8	94.6		70-130		%Rec	10	9/29/2016 9:09:13 PM	S37582
Surr: 4-Bromofluorobenzene	96.0		70-130		%Rec	10	9/29/2016 9:09:13 PM	S37582
EPA METHOD 8015D MOD: GASOLINE	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	740	9.8	65		mg/Kg	10	9/29/2016 9:09:13 PM	G37582
Surr: BFB	99.8	0	70-130		%Rec	10	9/29/2016 9:09:13 PM	G37582

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (36-37')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 11:35:00 AM

 Lab ID:
 1609G64-003
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

EPA METHOD 6010B: SOIL METALS Antimony 1.4 Arsenic 2.1 Barium 130 Beryllium 0.74 Cadmium ND	1DL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
Motor Oil Range Organics (MRO) ND Surr: DNOP 96.0 EPA METHOD 7471: MERCURY Mercury ND 0.0 EPA METHOD 6010B: SOIL METALS Antimony 1.4 4 Arsenic 2.1 8 Barium 130 0 Beryllium 0.74 0 Cadmium ND 0 Chromium 8.3 0						Analyst: TOM	
Surr: DNOP 96.0 EPA METHOD 7471: MERCURY Mercury ND 0.0 EPA METHOD 6010B: SOIL METALS Antimony 1.4 Arsenic 2.1 Barium 130 0 Beryllium 0.74 0 Cadmium ND 0 Chromium 8.3 0	1.8	9.8	J	mg/Kg	1	10/3/2016 3:42:59 PM	27809
EPA METHOD 7471: MERCURY Mercury ND 0.0 EPA METHOD 6010B: SOIL METALS Antimony 1.4 4 Arsenic 2.1 8 Barium 130 6 Beryllium 0.74 6 Cadmium ND 6 Chromium 8.3 6	49	49		mg/Kg	1	10/3/2016 3:42:59 PM	27809
Mercury ND 0.0 EPA METHOD 6010B: SOIL METALS Antimony 1.4 Arsenic 2.1 Barium 130 Beryllium 0.74 Cadmium ND Chromium 8.3	0	70-130		%Rec	1	10/3/2016 3:42:59 PM	27809
EPA METHOD 6010B: SOIL METALS Antimony 1.4 Arsenic 2.1 Barium 130 Beryllium 0.74 Cadmium ND Chromium 8.3						Analyst: pmf	
Antimony 1.4 Arsenic 2.1 Barium 130 Beryllium 0.74 Cadmium ND Chromium 8.3	00056	0.033		mg/Kg	1	10/4/2016 8:54:48 AM	27844
Arsenic 2.1 Barium 130 Beryllium 0.74 Cadmium ND Chromium 8.3						Analyst: MED	
Arsenic 2.1 Barium 130 Beryllium 0.74 Cadmium ND Chromium 8.3	1.0	2.5	J	mg/Kg	1	10/5/2016 8:49:01 AM	27843
Barium 130 Beryllium 0.74 Cadmium ND Chromium 8.3	0.89	2.5	J	mg/Kg	1	10/5/2016 8:49:01 AM	27843
Beryllium 0.74 0 Cadmium ND 0 Chromium 8.3 0	0.071	0.10		mg/Kg	1	10/5/2016 8:49:01 AM	27843
Cadmium ND Chromium 8.3	0.035	0.15		mg/Kg	1	10/5/2016 8:49:01 AM	27843
Chromium 8.3	0.063	0.10		mg/Kg	1	10/5/2016 8:49:01 AM	27843
	0.094	0.30		mg/Kg	1	10/5/2016 8:49:01 AM	27843
	0.11	0.30		mg/Kg	1	10/5/2016 8:49:01 AM	27843
Iron 14000	75	250		mg/Kg	100	10/5/2016 8:40:58 AM	27843
Lead 1.6	0.17	0.25		mg/Kg	1	10/5/2016 8:49:01 AM	27843
Manganese 330	0.11	0.20		mg/Kg	2	10/5/2016 8:42:22 AM	27843
Nickel 5.7	0.15	0.50		mg/Kg	1	10/5/2016 8:49:01 AM	27843
Selenium ND	1.8	2.5		mg/Kg	1	10/5/2016 8:49:01 AM	27843
	0.062	0.25		mg/Kg	1	10/5/2016 8:49:01 AM	27843
Vanadium 6.4	0.18	2.5		mg/Kg	1	10/5/2016 8:49:01 AM	27843
Zinc 9.0	0.35	2.5		mg/Kg	1	10/5/2016 8:49:01 AM	27843
EPA METHOD 8270C: SEMIVOLATILES				99		Analyst: DAM	
	0.084	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
•	0.080	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
. ,	0.000	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
	0.065	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Azobenzene ND	0.12	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
	0.12	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
` '	0.074	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
	0.089	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
()	0.087	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
(3, 7,11)	0.087	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
	0.081	0.49		mg/Kg	1	10/5/2016 12:38:53 PM	27836
	0.077	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Bis(2-chloroethoxy)methane ND	0.077	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
***	0.11	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
	0.072	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
	0.080	0.20	J	mg/Kg	1	10/5/2016 12:38:53 PM	27836

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (36-37')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 11:35:00 AM

 Lab ID:
 1609G64-003
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.094	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Butyl benzyl phthalate	ND	0.087	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Carbazole	ND	0.066	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
4-Chloro-3-methylphenol	ND	0.12	0.49		mg/Kg	1	10/5/2016 12:38:53 PM	27836
4-Chloroaniline	ND	0.11	0.49		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2-Chloronaphthalene	ND	0.077	0.25		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2-Chlorophenol	ND	0.077	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Chrysene	ND	0.084	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Di-n-butyl phthalate	0.14	0.073	0.39	J	mg/Kg	1	10/5/2016 12:38:53 PM	27836
Di-n-octyl phthalate	ND	0.084	0.39		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Dibenz(a,h)anthracene	ND	0.079	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Dibenzofuran	ND	0.099	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
1,2-Dichlorobenzene	ND	0.075	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
1,3-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
1,4-Dichlorobenzene	ND	0.083	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
3,3'-Dichlorobenzidine	ND	0.072	0.25		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Diethyl phthalate	0.14	0.10	0.20	J	mg/Kg	1	10/5/2016 12:38:53 PM	27836
Dimethyl phthalate	ND	0.096	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2,4-Dichlorophenol	ND	0.092	0.39		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2,4-Dimethylphenol	ND	0.11	0.29		mg/Kg	1	10/5/2016 12:38:53 PM	27836
4,6-Dinitro-2-methylphenol	ND	0.059	0.39		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2,4-Dinitrophenol	ND	0.065	0.49		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2,4-Dinitrotoluene	ND	0.088	0.49		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2,6-Dinitrotoluene	ND	0.10	0.49		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Fluoranthene	ND	0.057	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Fluorene	ND	0.090	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Hexachlorobenzene	ND	0.077	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Hexachloroethane	ND	0.084	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Indeno(1,2,3-cd)pyrene	ND	0.077	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Isophorone	ND	0.11	0.39		mg/Kg	1	10/5/2016 12:38:53 PM	27836
1-Methylnaphthalene	ND	0.099	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2-Methylphenol	ND	0.082	0.39		mg/Kg	1	10/5/2016 12:38:53 PM	27836
3+4-Methylphenol	ND	0.071	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
N-Nitrosodi-n-propylamine	ND	0.094	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
N-Nitrosodiphenylamine	ND	0.096	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (36-37')

Project: OW-14 Source Inv.

Collection Date: 9/27/2016 11:35:00 AM

Lab ID: 1609G64-003 **Matrix:** MEOH (SOIL) **Received Date:** 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	ND	0.094	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
3-Nitroaniline	ND	0.087	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
4-Nitroaniline	ND	0.069	0.39		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Nitrobenzene	ND	0.10	0.39		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2-Nitrophenol	ND	0.097	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
4-Nitrophenol	ND	0.075	0.25		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Pentachlorophenol	ND	0.063	0.39		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Phenanthrene	ND	0.067	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Phenol	ND	0.074	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Pyrene	ND	0.074	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Pyridine	ND	0.078	0.39		mg/Kg	1	10/5/2016 12:38:53 PM	27836
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2,4,5-Trichlorophenol	ND	0.098	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
2,4,6-Trichlorophenol	ND	0.082	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Surr: 2-Fluorophenol	80.7	0	35-97.9		%Rec	1	10/5/2016 12:38:53 PM	27836
Surr: Phenol-d5	84.5	0	37.3-105		%Rec	1	10/5/2016 12:38:53 PM	27836
Surr: 2,4,6-Tribromophenol	88.1	0	35.6-118		%Rec	1	10/5/2016 12:38:53 PM	27836
Surr: Nitrobenzene-d5	73.9		41.2-107		%Rec	1	10/5/2016 12:38:53 PM	27836
Surr: 2-Fluorobiphenyl	75.0		41.9-119		%Rec	1	10/5/2016 12:38:53 PM	27836
Surr: 4-Terphenyl-d14	86.8		15-132		%Rec	1	10/5/2016 12:38:53 PM	27836
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
Benzene	7.74	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Toluene	1.31	0.206	1.71	J	μg/Kg	1	10/4/2016 12:08:00 PM	27868
Ethylbenzene	0.717	0.230	1.71	J	μg/Kg	1	10/4/2016 12:08:00 PM	27868
Methyl tert-butyl ether (MTBE)	12.4	0.287	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,2,4-Trimethylbenzene	0.632	0.290	1.71	J	μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,3,5-Trimethylbenzene	ND	0.282	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,2-Dichloroethane (EDC)	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,2-Dibromoethane (EDB)	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Naphthalene	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1-Methylnaphthalene	0.282	0.194	3.42	J	μg/Kg	1	10/4/2016 12:08:00 PM	27868
2-Methylnaphthalene	ND	0.450	3.42		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Acetone	5.29	0.505	8.54	J	μg/Kg	1	10/4/2016 12:08:00 PM	27868
Bromobenzene	ND	0.174	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Bromodichloromethane	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Bromoform	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Bromomethane	ND	0.307	2.56		μg/Kg	1	10/4/2016 12:08:00 PM	27868
2-Butanone	ND	0.616	8.54		μg/Kg	1	10/4/2016 12:08:00 PM	27868

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-2 (36-37')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 11:35:00 AM

 Lab ID:
 1609G64-003
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
Carbon disulfide	ND	0.632	8.54		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Carbon tetrachloride	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Chlorobenzene	ND	0.196	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Chloroethane	ND	0.315	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Chloroform	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Chloromethane	ND	0.433	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
2-Chlorotoluene	ND	0.291	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
4-Chlorotoluene	ND	0.284	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
cis-1,2-DCE	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
cis-1,3-Dichloropropene	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,2-Dibromo-3-chloropropane	ND	0.182	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Dibromochloromethane	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Dibromomethane	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,2-Dichlorobenzene	ND	0.249	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,3-Dichlorobenzene	ND	0.315	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	
1,4-Dichlorobenzene	ND	0.320	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Dichlorodifluoromethane	ND	0.997	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,1-Dichloroethane	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,1-Dichloroethene	ND	0.280	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	
1,2-Dichloropropane	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,3-Dichloropropane	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
2,2-Dichloropropane	ND	0.216	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	
1,1-Dichloropropene	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	
Hexachlorobutadiene	ND	0.389	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
2-Hexanone	ND	0.425	8.54		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Isopropylbenzene	ND	0.215	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	
4-Isopropyltoluene	ND	0.320	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	
4-Methyl-2-pentanone	ND	3.42	8.54		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Methylene chloride	ND	1.71	2.56		μg/Kg	1	10/4/2016 12:08:00 PM	27868
n-Butylbenzene	ND	0.416	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	
n-Propylbenzene	ND	0.306	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	
sec-Butylbenzene	ND	0.303	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Styrene	ND	0.218	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
tert-Butylbenzene	ND	0.250	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,1,1,2-Tetrachloroethane	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	
1,1,2,2-Tetrachloroethane	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Tetrachloroethene (PCE)	ND	0.224	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
trans-1,2-DCE	ND	0.173	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
trans-1,3-Dichloropropene	ND	0.207	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 568-2 (36-37')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 11:35:00 AM

 Lab ID:
 1609G64-003
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
1,2,3-Trichlorobenzene	ND	0.413	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,2,4-Trichlorobenzene	ND	0.518	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,1,1-Trichloroethane	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,1,2-Trichloroethane	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Trichloroethene (TCE)	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Trichlorofluoromethane	ND	0.215	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
1,2,3-Trichloropropane	ND	1.71	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Vinyl chloride	ND	0.449	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Xylenes, Total	1.97	0.681	1.71		μg/Kg	1	10/4/2016 12:08:00 PM	27868
Surr: 1,2-Dichloroethane-d4	119	0	70-130		%Rec	1	10/4/2016 12:08:00 PM	27868
Surr: 4-Bromofluorobenzene	103	0	70-130		%Rec	1	10/4/2016 12:08:00 PM	27868
Surr: Dibromofluoromethane	106	0	70-130		%Rec	1	10/4/2016 12:08:00 PM	27868
Surr: Toluene-d8	97.0	0	70-130		%Rec	1	10/4/2016 12:08:00 PM	27868
EPA METHOD 8015D MOD: GASOLINE F	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	ND	0.48	3.2		mg/Kg	1	9/29/2016 9:37:40 PM	G37582
Surr: BFB	94.3	0	70-130		%Rec	1	9/29/2016 9:37:40 PM	G37582

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

Qualifiers:

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

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Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company Client Sample ID: MEOH BLANK

Project: OW-14 Source Inv. Collection Date:

Lab ID: 1609G64-004 **Matrix:** MEOH BLAN **Received Date:** 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	ND	0.020	0.025		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Toluene	ND	0.0030	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Ethylbenzene	ND	0.0041	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Methyl tert-butyl ether (MTBE)	ND	0.016	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,2,4-Trimethylbenzene	ND	0.0037	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,3,5-Trimethylbenzene	ND	0.0036	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,2-Dichloroethane (EDC)	ND	0.013	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,2-Dibromoethane (EDB)	ND	0.0036	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Naphthalene	ND	0.0078	0.10		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	9/30/2016 2:55:24 PM	27796
2-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Acetone	ND	0.065	0.75		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Bromobenzene	ND	0.0040	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Bromodichloromethane	ND	0.0029	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Bromoform	ND	0.0061	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Bromomethane	ND	0.018	0.15		mg/Kg	1	9/30/2016 2:55:24 PM	27796
2-Butanone	0.053	0.029	0.50	J	mg/Kg	1	9/30/2016 2:55:24 PM	27796
Carbon disulfide	ND	0.017	0.50		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Carbon tetrachloride	ND	0.0033	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Chlorobenzene	ND	0.0041	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Chloroethane	ND	0.010	0.10		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Chloroform	ND	0.0038	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Chloromethane	ND	0.0044	0.15		mg/Kg	1	9/30/2016 2:55:24 PM	27796
2-Chlorotoluene	ND	0.0037	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
4-Chlorotoluene	ND	0.0044	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
cis-1,2-DCE	ND	0.0029	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
cis-1,3-Dichloropropene	ND	0.0046	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,2-Dibromo-3-chloropropane	ND	0.015	0.10		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Dibromochloromethane	ND	0.0045	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Dibromomethane	ND	0.0043	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,2-Dichlorobenzene	ND	0.0044	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,3-Dichlorobenzene	ND	0.0041	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,4-Dichlorobenzene	ND	0.0062	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Dichlorodifluoromethane	ND	0.015	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,1-Dichloroethane	ND	0.0027	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,1-Dichloroethene	ND	0.016	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,2-Dichloropropane	ND	0.0042	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,3-Dichloropropane	ND	0.0057	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
2,2-Dichloropropane	ND	0.0029	0.10		mg/Kg	1	9/30/2016 2:55:24 PM	27796

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: MEOH BLANK

Project: OW-14 Source Inv. Collection Date:

Lab ID: 1609G64-004 **Matrix:** MEOH BLAN **Received Date:** 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,1-Dichloropropene	ND	0.0040	0.10		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Hexachlorobutadiene	ND	0.0061	0.10		mg/Kg	1	9/30/2016 2:55:24 PM	27796
2-Hexanone	ND	0.027	0.50		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Isopropylbenzene	ND	0.0043	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
4-Isopropyltoluene	ND	0.0045	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
4-Methyl-2-pentanone	ND	0.015	0.50		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Methylene chloride	ND	0.014	0.15		mg/Kg	1	9/30/2016 2:55:24 PM	27796
n-Butylbenzene	ND	0.0044	0.15		mg/Kg	1	9/30/2016 2:55:24 PM	27796
n-Propylbenzene	ND	0.0038	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
sec-Butylbenzene	ND	0.0069	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Styrene	ND	0.0045	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
tert-Butylbenzene	ND	0.0041	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,1,1,2-Tetrachloroethane	ND	0.0048	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,1,2,2-Tetrachloroethane	ND	0.0081	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Tetrachloroethene (PCE)	ND	0.0041	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
trans-1,2-DCE	ND	0.014	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
trans-1,3-Dichloropropene	ND	0.0073	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,2,3-Trichlorobenzene	ND	0.0075	0.10		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,2,4-Trichlorobenzene	ND	0.0053	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,1,1-Trichloroethane	ND	0.0031	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,1,2-Trichloroethane	ND	0.0059	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Trichloroethene (TCE)	ND	0.0054	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Trichlorofluoromethane	ND	0.0037	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
1,2,3-Trichloropropane	ND	0.0086	0.10		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Vinyl chloride	ND	0.0041	0.050		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Xylenes, Total	ND	0.0095	0.10		mg/Kg	1	9/30/2016 2:55:24 PM	27796
Surr: Dibromofluoromethane	95.7		70-130		%Rec	1	9/30/2016 2:55:24 PM	27796
Surr: 1,2-Dichloroethane-d4	99.1		70-130		%Rec	1	9/30/2016 2:55:24 PM	27796
Surr: Toluene-d8	96.7		70-130		%Rec	1	9/30/2016 2:55:24 PM	27796
Surr: 4-Bromofluorobenzene	93.8		70-130		%Rec	1	9/30/2016 2:55:24 PM	27796
EPA METHOD 8015D MOD: GASOLINE	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	ND	0.75	5.0		mg/Kg	1	9/30/2016 1:26:07 AM	G37582
Surr: BFB	94.4	0	70-130		%Rec	1	9/30/2016 1:26:07 AM	G37582

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

Qualifiers:

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

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Date Reported: 11/1/2016

CLIENT: Western Refining Company **Client Sample ID:** TK 570-1 (10-12') **Project:** OW-14 Source Inv. **Collection Date:** 9/27/2016 4:15:00 PM 1609G64-005 Matrix: SOIL Lab ID: Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS	}					Analyst: TOM	
Diesel Range Organics (DRO)	52	1.8	9.7		mg/Kg	1	10/3/2016 4:04:38 PM	27809
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	10/3/2016 4:04:38 PM	27809
Surr: DNOP	91.7	0	70-130		%Rec	1	10/3/2016 4:04:38 PM	27809
EPA METHOD 8015D: GASOLINE RANG	E						Analyst: NSB	
Gasoline Range Organics (GRO)	540	9.6	46		mg/Kg	10	9/30/2016 10:02:32 AM	27796
Surr: BFB	116	0	68.3-144		%Rec	10	9/30/2016 10:02:32 AM	27796
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0033	0.00056	0.032	J	mg/Kg	1	10/4/2016 8:56:35 AM	27844
EPA METHOD 6010B: SOIL METALS					0 0		Analyst: MED	
Antimony	ND	1.0	2.5		mg/Kg	1	10/5/2016 8:53:28 AM	27843
Arsenic	1.7	0.88	2.5	J	mg/Kg	1	10/5/2016 8:53:28 AM	27843
Barium	440	0.14	0.20	ŭ	mg/Kg	2	10/5/2016 8:52:00 AM	27843
Beryllium	0.57	0.034	0.15		mg/Kg	1	10/5/2016 8:53:28 AM	27843
Cadmium	ND	0.063	0.099		mg/Kg	1	10/5/2016 8:53:28 AM	27843
Chromium	6.4	0.093	0.30		mg/Kg	1	10/5/2016 8:53:28 AM	27843
Cobalt	2.9	0.11	0.30		mg/Kg	1	10/5/2016 8:53:28 AM	27843
Iron	10000	75	250		mg/Kg	100	10/5/2016 8:50:33 AM	27843
Lead	3.4	0.17	0.25		mg/Kg	1	10/5/2016 8:53:28 AM	27843
Manganese	390	0.11	0.20		mg/Kg	2	10/5/2016 8:52:00 AM	27843
Nickel	4.6	0.15	0.49		mg/Kg	1	10/5/2016 8:53:28 AM	27843
Selenium	ND	1.8	2.5		mg/Kg	1	10/5/2016 8:53:28 AM	27843
Silver	ND	0.062	0.25		mg/Kg	1	10/5/2016 8:53:28 AM	27843
Vanadium	14	0.17	2.5		mg/Kg	1	10/5/2016 8:53:28 AM	27843
Zinc	11	0.34	2.5		mg/Kg	1	10/5/2016 8:53:28 AM	27843
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.086	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Acenaphthylene	ND	0.082	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Aniline	ND	0.095	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Anthracene	ND	0.067	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Benzo(a)pyrene	ND	0.076	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Benzo(b)fluoranthene	ND	0.091	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Benzo(g,h,i)perylene	ND	0.089	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Benzoic acid	0.17	0.083	0.50	J	mg/Kg	1	10/5/2016 1:07:06 PM	27836
Benzyl alcohol	ND	0.079	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836

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

Qualifiers: Value exceeds Maximum Contaminant Level.

> D Sample Diluted Due to Matrix

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

Ε Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

CLIENT: Western Refining Company

Client Sample ID: TK 570-1 (10-12')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:15:00 PM

 Lab ID:
 1609G64-005
 Matrix: SOIL
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Bis(2-chloroethyl)ether	ND	0.074	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Bis(2-chloroisopropyl)ether	ND	0.090	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Bis(2-ethylhexyl)phthalate	0.11	0.082	0.50	J	mg/Kg	1	10/5/2016 1:07:06 PM	27836
4-Bromophenyl phenyl ether	ND	0.096	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Butyl benzyl phthalate	ND	0.089	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Carbazole	ND	0.068	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/5/2016 1:07:06 PM	27836
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/5/2016 1:07:06 PM	27836
2-Chloronaphthalene	ND	0.079	0.25		mg/Kg	1	10/5/2016 1:07:06 PM	27836
2-Chlorophenol	ND	0.079	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Chrysene	ND	0.086	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Di-n-butyl phthalate	0.13	0.075	0.40	J	mg/Kg	1	10/5/2016 1:07:06 PM	27836
Di-n-octyl phthalate	ND	0.086	0.40		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
1,2-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
1,3-Dichlorobenzene	ND	0.078	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
1,4-Dichlorobenzene	ND	0.085	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
3,3'-Dichlorobenzidine	ND	0.074	0.25		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Diethyl phthalate	0.11	0.10	0.20	J	mg/Kg	1	10/5/2016 1:07:06 PM	27836
Dimethyl phthalate	ND	0.098	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
2,4-Dichlorophenol	ND	0.094	0.40		mg/Kg	1	10/5/2016 1:07:06 PM	27836
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/5/2016 1:07:06 PM	27836
4,6-Dinitro-2-methylphenol	ND	0.061	0.40		mg/Kg	1	10/5/2016 1:07:06 PM	27836
2,4-Dinitrophenol	ND	0.067	0.50		mg/Kg	1	10/5/2016 1:07:06 PM	27836
2,4-Dinitrotoluene	ND	0.090	0.50		mg/Kg	1	10/5/2016 1:07:06 PM	27836
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Fluoranthene	ND	0.058	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Fluorene	ND	0.092	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Isophorone	ND	0.11	0.40		mg/Kg	1	10/5/2016 1:07:06 PM	27836
1-Methylnaphthalene	0.15	0.10	0.20	J	mg/Kg	1	10/5/2016 1:07:06 PM	27836
2-Methylnaphthalene	0.31	0.12	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 570-1 (10-12')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:15:00 PM

 Lab ID:
 1609G64-005
 Matrix: SOIL
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
2-Methylphenol	0.13	0.084	0.40	J	mg/Kg	1	10/5/2016 1:07:06 PM	27836
3+4-Methylphenol	0.11	0.073	0.20	J	mg/Kg	1	10/5/2016 1:07:06 PM	27836
N-Nitrosodi-n-propylamine	ND	0.097	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
N-Nitrosodiphenylamine	ND	0.098	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Naphthalene	0.52	0.096	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
3-Nitroaniline	ND	0.089	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
4-Nitroaniline	ND	0.071	0.40		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/5/2016 1:07:06 PM	27836
2-Nitrophenol	ND	0.10	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
4-Nitrophenol	ND	0.077	0.25		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Pentachlorophenol	ND	0.065	0.40		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Phenanthrene	ND	0.068	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Phenol	ND	0.076	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Pyrene	ND	0.076	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Pyridine	ND	0.080	0.40		mg/Kg	1	10/5/2016 1:07:06 PM	27836
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	10/5/2016 1:07:06 PM	27836
Surr: 2-Fluorophenol	70.8	0	35-97.9		%Rec	1	10/5/2016 1:07:06 PM	27836
Surr: Phenol-d5	80.4	0	37.3-105		%Rec	1	10/5/2016 1:07:06 PM	27836
Surr: 2,4,6-Tribromophenol	79.7	0	35.6-118		%Rec	1	10/5/2016 1:07:06 PM	27836
Surr: Nitrobenzene-d5	72.0		41.2-107		%Rec	1	10/5/2016 1:07:06 PM	27836
Surr: 2-Fluorobiphenyl	62.8		41.9-119		%Rec	1	10/5/2016 1:07:06 PM	27836
Surr: 4-Terphenyl-d14	81.7		15-132		%Rec	1	10/5/2016 1:07:06 PM	27836
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	ND	0.19	0.23		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Toluene	16	0.028	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Ethylbenzene	6.6	0.038	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Methyl tert-butyl ether (MTBE)	ND	0.15	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,2,4-Trimethylbenzene	19	0.034	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,3,5-Trimethylbenzene	5.8	0.034	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,2-Dichloroethane (EDC)	ND	0.12	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,2-Dibromoethane (EDB)	ND	0.033	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Naphthalene	2.8	0.073	0.93		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1-Methylnaphthalene	0.73	0.10	1.9	J	mg/Kg	10	9/30/2016 1:00:36 PM	27796
2-Methylnaphthalene	1.6	0.10	1.9	J	mg/Kg	10	9/30/2016 1:00:36 PM	27796
Acetone	ND	0.60	7.0		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Bromobenzene	ND	0.037	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 570-1 (10-12')

Collection Date: 9/27/2016 4:15:00 PM

Project: OW-14 Source Inv. 1609G64-005 Lab ID: Matrix: SOIL Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Bromodichloromethane	ND	0.027	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Bromoform	ND	0.057	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Bromomethane	ND	0.17	1.4		mg/Kg	10	9/30/2016 1:00:36 PM	27796
2-Butanone	ND	0.27	4.6		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Carbon disulfide	ND	0.15	4.6		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Carbon tetrachloride	ND	0.031	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Chlorobenzene	ND	0.038	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Chloroethane	ND	0.093	0.93		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Chloroform	ND	0.035	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Chloromethane	ND	0.041	1.4		mg/Kg	10	9/30/2016 1:00:36 PM	27796
2-Chlorotoluene	ND	0.034	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
4-Chlorotoluene	ND	0.041	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
cis-1,2-DCE	ND	0.027	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
cis-1,3-Dichloropropene	ND	0.043	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,2-Dibromo-3-chloropropane	ND	0.14	0.93		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Dibromochloromethane	ND	0.042	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Dibromomethane	ND	0.040	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,2-Dichlorobenzene	ND	0.041	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,3-Dichlorobenzene	ND	0.038	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,4-Dichlorobenzene	ND	0.058	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Dichlorodifluoromethane	ND	0.14	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,1-Dichloroethane	ND	0.025	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,1-Dichloroethene	ND	0.15	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,2-Dichloropropane	ND	0.039	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,3-Dichloropropane	ND	0.053	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
2,2-Dichloropropane	ND	0.027	0.93		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,1-Dichloropropene	ND	0.037	0.93		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Hexachlorobutadiene	ND	0.057	0.93		mg/Kg	10	9/30/2016 1:00:36 PM	27796
2-Hexanone	ND	0.25	4.6		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Isopropylbenzene	0.64	0.040	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
4-Isopropyltoluene	0.22	0.042	0.46	J	mg/Kg	10	9/30/2016 1:00:36 PM	27796
4-Methyl-2-pentanone	ND	0.14	4.6		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Methylene chloride	ND	0.13	1.4		mg/Kg	10	9/30/2016 1:00:36 PM	27796
n-Butylbenzene	1.4	0.041	1.4		mg/Kg	10	9/30/2016 1:00:36 PM	27796
n-Propylbenzene	2.9	0.036	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
sec-Butylbenzene	0.42	0.064	0.46	J	mg/Kg	10	9/30/2016 1:00:36 PM	27796
Styrene	ND	0.041	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
tert-Butylbenzene	ND	0.039	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,1,1,2-Tetrachloroethane	ND	0.044	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796

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

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 570-1 (10-12')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:15:00 PM

 Lab ID:
 1609G64-005
 Matrix: SOIL
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,1,2,2-Tetrachloroethane	ND	0.075	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Tetrachloroethene (PCE)	ND	0.039	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
trans-1,2-DCE	ND	0.13	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
trans-1,3-Dichloropropene	ND	0.068	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,2,3-Trichlorobenzene	ND	0.070	0.93		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,2,4-Trichlorobenzene	ND	0.050	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,1,1-Trichloroethane	ND	0.028	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,1,2-Trichloroethane	ND	0.055	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Trichloroethene (TCE)	ND	0.050	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Trichlorofluoromethane	ND	0.035	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
1,2,3-Trichloropropane	ND	0.080	0.93		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Vinyl chloride	ND	0.038	0.46		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Xylenes, Total	42	0.088	0.93		mg/Kg	10	9/30/2016 1:00:36 PM	27796
Surr: Dibromofluoromethane	83.1		70-130		%Rec	10	9/30/2016 1:00:36 PM	27796
Surr: 1,2-Dichloroethane-d4	90.5		70-130		%Rec	10	9/30/2016 1:00:36 PM	27796
Surr: Toluene-d8	98.6		70-130		%Rec	10	9/30/2016 1:00:36 PM	27796
Surr: 4-Bromofluorobenzene	99.3		70-130		%Rec	10	9/30/2016 1:00:36 PM	27796

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 570-1 (32-34')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:20:00 PM

 Lab ID:
 1609G64-006
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS	3					Analyst: TOM	
Diesel Range Organics (DRO)	350	17	93		mg/Kg	10	10/4/2016 11:31:20 AM	27809
Motor Oil Range Organics (MRO)	ND	470	470		mg/Kg	10	10/4/2016 11:31:20 AM	27809
Surr: DNOP	0	0	70-130	S	%Rec	10	10/4/2016 11:31:20 AM	27809
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0021	0.00057	0.033	J	mg/Kg	1	10/4/2016 8:58:23 AM	27844
EPA METHOD 6010B: SOIL METALS							Analyst: MED	
Antimony	ND	1.0	2.5		mg/Kg	1	10/5/2016 8:56:27 AM	27843
Arsenic	1.6	0.88	2.5	J	mg/Kg	1	10/5/2016 8:56:27 AM	27843
Barium	180	0.071	0.10	·	mg/Kg	1	10/5/2016 8:56:27 AM	27843
Beryllium	0.64	0.034	0.15		mg/Kg	1	10/5/2016 8:56:27 AM	27843
Cadmium	ND	0.063	0.10		mg/Kg	1	10/5/2016 8:56:27 AM	27843
Chromium	6.8	0.094	0.30		mg/Kg	1	10/5/2016 8:56:27 AM	27843
Cobalt	3.4	0.11	0.30		mg/Kg	1	10/5/2016 8:56:27 AM	27843
Iron	10000	75	250		mg/Kg	100	10/5/2016 8:55:03 AM	27843
Lead	2.7	0.17	0.25		mg/Kg	1	10/5/2016 8:56:27 AM	27843
Manganese	200	0.053	0.10		mg/Kg	1	10/5/2016 8:56:27 AM	27843
Nickel	5.5	0.15	0.50		mg/Kg	1	10/5/2016 8:56:27 AM	27843
Selenium	ND	1.8	2.5		mg/Kg	1	10/5/2016 8:56:27 AM	27843
Silver	ND	0.062	0.25		mg/Kg	1	10/5/2016 8:56:27 AM	27843
Vanadium	13	0.18	2.5		mg/Kg	1	10/5/2016 8:56:27 AM	27843
Zinc	10	0.35	2.5		mg/Kg	1	10/5/2016 8:56:27 AM	27843
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Aniline	ND	0.001	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Anthracene	ND	0.066	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Azobenzene	ND	0.000	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Benz(a)anthracene	ND	0.085	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Benzo(a)pyrene	ND	0.005	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Benzo(b)fluoranthene	ND	0.073	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Benzo(g,h,i)perylene	ND	0.003	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Benzo(k)fluoranthene	ND	0.087	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Benzoic acid	ND	0.087	0.50		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Benzyl alcohol	ND	0.002	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Bis(2-chloroethoxy)methane	ND	0.076	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Bis(2-chloroethyl)ether	ND ND	0.11	0.20			1	10/5/2016 1:35:18 PM	27836
` ,	ND ND	0.073	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Bis(2-chloroisopropyl)ether				1	mg/Kg			
Bis(2-ethylhexyl)phthalate	0.14	0.081	0.50	J	mg/Kg	1	10/5/2016 1:35:18 PM	27836

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 570-1 (32-34')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:20:00 PM

 Lab ID:
 1609G64-006
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Carbazole	ND	0.067	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/5/2016 1:35:18 PM	27836
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Chrysene	ND	0.084	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Di-n-butyl phthalate	0.24	0.074	0.40	J	mg/Kg	1	10/5/2016 1:35:18 PM	27836
Di-n-octyl phthalate	ND	0.084	0.40		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Diethyl phthalate	0.15	0.10	0.20	J	mg/Kg	1	10/5/2016 1:35:18 PM	27836
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2,4-Dichlorophenol	ND	0.092	0.40		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2,4-Dimethylphenol	0.27	0.11	0.30	J	mg/Kg	1	10/5/2016 1:35:18 PM	27836
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2,4-Dinitrotoluene	ND	0.088	0.50		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2,6-Dinitrotoluene	ND	0.10	0.50		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Fluoranthene	ND	0.057	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Fluorene	ND	0.091	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Indeno(1,2,3-cd)pyrene	ND	0.077	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Isophorone	ND	0.11	0.40		mg/Kg	1	10/5/2016 1:35:18 PM	27836
1-Methylnaphthalene	1.3	0.10	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2-Methylnaphthalene	2.9	0.12	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	10/5/2016 1:35:18 PM	27836
3+4-Methylphenol	0.44	0.072	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
N-Nitrosodi-n-propylamine	ND	0.095	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 570-1 (32-34')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:20:00 PM

 Lab ID:
 1609G64-006
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	3.6	0.095	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
3-Nitroaniline	ND	0.087	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2-Nitrophenol	ND	0.098	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
4-Nitrophenol	ND	0.075	0.25		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Phenanthrene	ND	0.067	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Phenol	0.44	0.075	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Pyrene	ND	0.075	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Pyridine	ND	0.079	0.40		mg/Kg	1	10/5/2016 1:35:18 PM	27836
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2,4,5-Trichlorophenol	ND	0.099	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
2,4,6-Trichlorophenol	ND	0.082	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Surr: 2-Fluorophenol	21.1	0	35-97.9	S	%Rec	1	10/5/2016 1:35:18 PM	27836
Surr: Phenol-d5	28.9	0	37.3-105	S	%Rec	1	10/5/2016 1:35:18 PM	27836
Surr: 2,4,6-Tribromophenol	89.9	0	35.6-118		%Rec	1	10/5/2016 1:35:18 PM	27836
Surr: Nitrobenzene-d5	94.9		41.2-107		%Rec	1	10/5/2016 1:35:18 PM	27836
Surr: 2-Fluorobiphenyl	86.3		41.9-119		%Rec	1	10/5/2016 1:35:18 PM	27836
Surr: 4-Terphenyl-d14	94.8		15-132		%Rec	1	10/5/2016 1:35:18 PM	27836
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	11	0.50	0.62		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Toluene	73	0.074	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Ethylbenzene	19	0.10	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Methyl tert-butyl ether (MTBE)	ND	0.39	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,2,4-Trimethylbenzene	35	0.092	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,3,5-Trimethylbenzene	13	0.091	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,2-Dichloroethane (EDC)	ND	0.33	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,2-Dibromoethane (EDB)	ND	0.089	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Naphthalene	2.1	0.20	2.5	J	mg/Kg	50	9/30/2016 1:29:18 PM	27796
1-Methylnaphthalene	0.49	0.28	5.0	J	mg/Kg	50	9/30/2016 1:29:18 PM	27796
2-Methylnaphthalene	1.1	0.27	5.0	J	mg/Kg	50	9/30/2016 1:29:18 PM	27796
Acetone	ND	1.6	19		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Bromobenzene	ND	0.10	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Bromodichloromethane	ND	0.073	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Bromoform	ND	0.15	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Bromomethane	ND	0.46	3.7		mg/Kg	50	9/30/2016 1:29:18 PM	27796
2-Butanone	ND	0.71	12		mg/Kg	50	9/30/2016 1:29:18 PM	27796

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 570-1 (32-34')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:20:00 PM

 Lab ID:
 1609G64-006
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.41	12		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Carbon tetrachloride	ND	0.082	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Chlorobenzene	ND	0.10	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Chloroethane	ND	0.25	2.5		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Chloroform	ND	0.094	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Chloromethane	ND	0.11	3.7		mg/Kg	50	9/30/2016 1:29:18 PM	27796
2-Chlorotoluene	ND	0.092	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
4-Chlorotoluene	ND	0.11	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
cis-1,2-DCE	ND	0.073	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
cis-1,3-Dichloropropene	ND	0.12	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,2-Dibromo-3-chloropropane	ND	0.38	2.5		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Dibromochloromethane	ND	0.11	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Dibromomethane	ND	0.11	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,2-Dichlorobenzene	ND	0.11	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,3-Dichlorobenzene	ND	0.10	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,4-Dichlorobenzene	ND	0.15	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Dichlorodifluoromethane	ND	0.39	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,1-Dichloroethane	ND	0.067	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,1-Dichloroethene	ND	0.41	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,2-Dichloropropane	ND	0.10	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,3-Dichloropropane	ND	0.14	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
2,2-Dichloropropane	ND	0.071	2.5		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,1-Dichloropropene	ND	0.099	2.5		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Hexachlorobutadiene	ND	0.15	2.5		mg/Kg	50	9/30/2016 1:29:18 PM	27796
2-Hexanone	ND	0.68	12		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Isopropylbenzene	3.8	0.11	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
4-Isopropyltoluene	1.5	0.11	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
4-Methyl-2-pentanone	ND	0.36	12		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Methylene chloride	ND	0.36	3.7		mg/Kg	50	9/30/2016 1:29:18 PM	27796
n-Butylbenzene	2.6	0.11	3.7	J	mg/Kg	50	9/30/2016 1:29:18 PM	27796
n-Propylbenzene	7.4	0.096	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
sec-Butylbenzene	1.8	0.17	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Styrene	ND	0.11	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
tert-Butylbenzene	ND	0.10	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,1,1,2-Tetrachloroethane	ND	0.12	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,1,2,2-Tetrachloroethane	ND	0.20	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Tetrachloroethene (PCE)	ND	0.10	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
trans-1,2-DCE	ND	0.35	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
trans-1,3-Dichloropropene	ND	0.18	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 570-1 (32-34')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:20:00 PM

 Lab ID:
 1609G64-006
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.19	2.5		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,2,4-Trichlorobenzene	ND	0.13	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,1,1-Trichloroethane	ND	0.076	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,1,2-Trichloroethane	ND	0.15	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Trichloroethene (TCE)	ND	0.13	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Trichlorofluoromethane	ND	0.093	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
1,2,3-Trichloropropane	ND	0.22	2.5		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Vinyl chloride	ND	0.10	1.2		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Xylenes, Total	110	0.24	2.5		mg/Kg	50	9/30/2016 1:29:18 PM	27796
Surr: Dibromofluoromethane	83.2		70-130		%Rec	50	9/30/2016 1:29:18 PM	27796
Surr: 1,2-Dichloroethane-d4	90.3		70-130		%Rec	50	9/30/2016 1:29:18 PM	27796
Surr: Toluene-d8	98.3		70-130		%Rec	50	9/30/2016 1:29:18 PM	27796
Surr: 4-Bromofluorobenzene	103		70-130		%Rec	50	9/30/2016 1:29:18 PM	27796
EPA METHOD 8015D MOD: GASOLINE	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	2500	19	120		mg/Kg	50	9/30/2016 1:54:43 AM	G37582
Surr: BFB	103	0	70-130		%Rec	50	9/30/2016 1:54:43 AM	G37582

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

Qualifiers:

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

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Date Reported: 11/1/2016

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 570-1 (44-45')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:30:00 PM

 Lab ID:
 1609G64-007
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANIC	s					Analyst: TOM	
Diesel Range Organics (DRO)	23	1.8	10		mg/Kg	1	10/3/2016 4:47:57 PM	27809
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	10/3/2016 4:47:57 PM	27809
Surr: DNOP	105	0	70-130		%Rec	1	10/3/2016 4:47:57 PM	27809
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	ND	0.00057	0.033		mg/Kg	1	10/4/2016 9:00:12 AM	27844
EPA METHOD 6010B: SOIL METALS							Analyst: MED	
Antimony	2.2	0.99	2.5	J	mg/Kg	1	10/5/2016 9:00:44 AM	27843
Arsenic	2.1	0.87	2.5	J	mg/Kg	1	10/5/2016 9:00:44 AM	27843
Barium	300	0.14	0.20		mg/Kg	2	10/5/2016 8:59:19 AM	27843
Beryllium	1.1	0.034	0.15		mg/Kg	1	10/5/2016 9:00:44 AM	27843
Cadmium	ND	0.062	0.098		mg/Kg	1	10/5/2016 9:00:44 AM	27843
Chromium	9.5	0.093	0.29		mg/Kg	1	10/5/2016 9:00:44 AM	27843
Cobalt	4.9	0.11	0.29		mg/Kg	1	10/5/2016 9:00:44 AM	27843
Iron	20000	74	250		mg/Kg	100	10/5/2016 8:57:54 AM	27843
Lead	4.7	0.17	0.25		mg/Kg	1	10/5/2016 9:00:44 AM	27843
Manganese	300	0.11	0.20		mg/Kg	2	10/5/2016 8:59:19 AM	27843
Nickel	9.0	0.15	0.49		mg/Kg	1	10/5/2016 9:00:44 AM	27843
Selenium	ND	1.8	2.5		mg/Kg	1	10/5/2016 9:00:44 AM	27843
Silver	ND	0.062	0.25		mg/Kg	1	10/5/2016 9:00:44 AM	27843
Vanadium	13	0.17	2.5		mg/Kg	1	10/5/2016 9:00:44 AM	27843
Zinc	22	0.34	2.5		mg/Kg	1	10/5/2016 9:00:44 AM	27843
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Aniline	ND	0.094	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Anthracene	ND	0.066	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Benzoic acid	0.13	0.082	0.50	J	mg/Kg	1	10/5/2016 2:03:31 PM	27836
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Bis(2-ethylhexyl)phthalate	0.12	0.081	0.50	J	mg/Kg	1	10/5/2016 2:03:31 PM	27836
. , , , , , , , , , , , , , , , , , , ,					0 0			

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 570-1 (44-45')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:30:00 PM

 Lab ID:
 1609G64-007
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Carbazole	ND	0.067	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/5/2016 2:03:31 PM	27836
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Chrysene	ND	0.085	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Di-n-butyl phthalate	0.24	0.074	0.40	J	mg/Kg	1	10/5/2016 2:03:31 PM	27836
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
3,3´-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Diethyl phthalate	0.17	0.10	0.20	J	mg/Kg	1	10/5/2016 2:03:31 PM	27836
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/5/2016 2:03:31 PM	27836
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Fluoranthene	ND	0.057	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Fluorene	ND	0.091	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Isophorone	ND	0.11	0.40		mg/Kg	1	10/5/2016 2:03:31 PM	27836
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	10/5/2016 2:03:31 PM	27836
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 570-1 (44-45')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:30:00 PM

 Lab ID:
 1609G64-007
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	ND	0.095	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Phenanthrene	ND	0.068	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Phenol	ND	0.075	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Pyrene	ND	0.075	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Pyridine	ND	0.079	0.40		mg/Kg	1	10/5/2016 2:03:31 PM	27836
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2,4,5-Trichlorophenol	ND	0.099	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
2,4,6-Trichlorophenol	ND	0.082	0.20		mg/Kg	1	10/5/2016 2:03:31 PM	27836
Surr: 2-Fluorophenol	75.3	0	35-97.9		%Rec	1	10/5/2016 2:03:31 PM	27836
Surr: Phenol-d5	81.5	0	37.3-105		%Rec	1	10/5/2016 2:03:31 PM	27836
Surr: 2,4,6-Tribromophenol	88.9	0	35.6-118		%Rec	1	10/5/2016 2:03:31 PM	27836
Surr: Nitrobenzene-d5	76.1		41.2-107		%Rec	1	10/5/2016 2:03:31 PM	27836
Surr: 2-Fluorobiphenyl	84.4		41.9-119		%Rec	1	10/5/2016 2:03:31 PM	27836
Surr: 4-Terphenyl-d14	94.2		15-132		%Rec	1	10/5/2016 2:03:31 PM	27836
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.25	0.027	0.033		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Toluene	2.3	0.0039	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Ethylbenzene	1.0	0.0055	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Methyl tert-butyl ether (MTBE)	ND	0.021	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,2,4-Trimethylbenzene	2.4	0.0049	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,3,5-Trimethylbenzene	0.87	0.0048	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,2-Dichloroethane (EDC)	ND	0.017	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,2-Dibromoethane (EDB)	ND	0.0047	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Naphthalene	0.079	0.010	0.13	J	mg/Kg	2	9/30/2016 1:58:05 PM	27796
1-Methylnaphthalene	0.023	0.015	0.27	J	mg/Kg	2	9/30/2016 1:58:05 PM	27796
2-Methylnaphthalene	0.045	0.014	0.27	J	mg/Kg	2	9/30/2016 1:58:05 PM	27796
Acetone	ND	0.086	1.0		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Bromobenzene	ND	0.0054	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Bromodichloromethane	ND	0.0039	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Bromoform	ND	0.0081	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Bromomethane	ND	0.025	0.20		mg/Kg	2	9/30/2016 1:58:05 PM	27796
2-Butanone	ND	0.038	0.67		mg/Kg	2	9/30/2016 1:58:05 PM	27796

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 570-1 (44-45')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:30:00 PM

 Lab ID:
 1609G64-007
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.022	0.67		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Carbon tetrachloride	ND	0.0044	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Chlorobenzene	ND	0.0054	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Chloroethane	ND	0.013	0.13		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Chloroform	ND	0.0050	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Chloromethane	ND	0.0059	0.20		mg/Kg	2	9/30/2016 1:58:05 PM	27796
2-Chlorotoluene	ND	0.0049	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
4-Chlorotoluene	ND	0.0059	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
cis-1,2-DCE	ND	0.0039	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
cis-1,3-Dichloropropene	ND	0.0061	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,2-Dibromo-3-chloropropane	ND	0.020	0.13		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Dibromochloromethane	ND	0.0060	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Dibromomethane	ND	0.0058	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,2-Dichlorobenzene	ND	0.0058	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,3-Dichlorobenzene	ND	0.0055	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,4-Dichlorobenzene	ND	0.0082	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Dichlorodifluoromethane	ND	0.021	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,1-Dichloroethane	ND	0.0036	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,1-Dichloroethene	ND	0.022	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,2-Dichloropropane	ND	0.0056	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,3-Dichloropropane	ND	0.0076	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
2,2-Dichloropropane	ND	0.0038	0.13		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,1-Dichloropropene	ND	0.0053	0.13		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Hexachlorobutadiene	ND	0.0081	0.13		mg/Kg	2	9/30/2016 1:58:05 PM	27796
2-Hexanone	ND	0.036	0.67		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Isopropylbenzene	0.32	0.0057	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
4-Isopropyltoluene	0.17	0.0060	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
4-Methyl-2-pentanone	ND	0.019	0.67		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Methylene chloride	ND	0.019	0.20		mg/Kg	2	9/30/2016 1:58:05 PM	27796
n-Butylbenzene	0.24	0.0059	0.20		mg/Kg	2	9/30/2016 1:58:05 PM	27796
n-Propylbenzene	0.53	0.0051	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
sec-Butylbenzene	0.19	0.0092	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Styrene	ND	0.0059	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
tert-Butylbenzene	ND	0.0055	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,1,1,2-Tetrachloroethane	ND	0.0064	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,1,2,2-Tetrachloroethane	ND	0.011	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Tetrachloroethene (PCE)	ND	0.0055	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
trans-1,2-DCE	ND	0.019	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
trans-1,3-Dichloropropene	ND	0.0097	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical Report Lab Order 1609G64

Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 570-1 (44-45')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/27/2016 4:30:00 PM

 Lab ID:
 1609G64-007
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.010	0.13		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,2,4-Trichlorobenzene	ND	0.0071	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,1,1-Trichloroethane	ND	0.0041	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,1,2-Trichloroethane	ND	0.0078	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Trichloroethene (TCE)	ND	0.0071	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Trichlorofluoromethane	ND	0.0050	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
1,2,3-Trichloropropane	ND	0.012	0.13		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Vinyl chloride	ND	0.0054	0.067		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Xylenes, Total	6.0	0.013	0.13		mg/Kg	2	9/30/2016 1:58:05 PM	27796
Surr: Dibromofluoromethane	89.5		70-130		%Rec	2	9/30/2016 1:58:05 PM	27796
Surr: 1,2-Dichloroethane-d4	91.9		70-130		%Rec	2	9/30/2016 1:58:05 PM	27796
Surr: Toluene-d8	96.4		70-130		%Rec	2	9/30/2016 1:58:05 PM	27796
Surr: 4-Bromofluorobenzene	95.3		70-130		%Rec	2	9/30/2016 1:58:05 PM	27796
EPA METHOD 8015D MOD: GASOLINE	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	170	2.5	17		mg/Kg	5	9/30/2016 2:23:16 AM	G37582
Surr: BFB	99.5	0	70-130		%Rec	5	9/30/2016 2:23:16 AM	G37582

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 569-3 (16-18')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 1:35:00 PM

 Lab ID:
 1609G64-008
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANIC	s					Analyst: TOM	
Diesel Range Organics (DRO)	1.7	1.7	9.4	J	mg/Kg	1	10/3/2016 5:09:44 PM	27809
Motor Oil Range Organics (MRO)	ND	47	47		mg/Kg	1	10/3/2016 5:09:44 PM	27809
Surr: DNOP	112	0	70-130		%Rec	1	10/3/2016 5:09:44 PM	27809
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0019	0.00056	0.032	J	mg/Kg	1	10/4/2016 9:05:48 AM	27844
EPA METHOD 6010B: SOIL METALS							Analyst: MED	
Antimony	1.0	1.0	2.5	J	mg/Kg	1	10/5/2016 9:10:17 AM	27843
Arsenic	1.3	0.88	2.5	J	mg/Kg	1	10/5/2016 9:10:17 AM	27843
Barium	320	0.14	0.20		mg/Kg	2	10/5/2016 9:08:52 AM	27843
Beryllium	0.58	0.034	0.15		mg/Kg	1	10/5/2016 9:10:17 AM	27843
Cadmium	ND	0.063	0.099		mg/Kg	1	10/5/2016 9:10:17 AM	27843
Chromium	6.6	0.094	0.30		mg/Kg	1	10/5/2016 9:10:17 AM	27843
Cobalt	3.2	0.11	0.30		mg/Kg	1	10/5/2016 9:10:17 AM	27843
Iron	11000	75	250		mg/Kg	100	10/5/2016 9:02:18 AM	27843
Lead	2.8	0.17	0.25		mg/Kg	1	10/5/2016 9:10:17 AM	27843
Manganese	230	0.053	0.099		mg/Kg	1	10/5/2016 9:10:17 AM	27843
Nickel	5.7	0.15	0.50		mg/Kg	1	10/6/2016 8:37:06 AM	27843
Selenium	ND	1.8	2.5		mg/Kg	1	10/5/2016 9:10:17 AM	27843
Silver	ND	0.062	0.25		mg/Kg	1	10/5/2016 9:10:17 AM	27843
Vanadium	13	0.17	2.5		mg/Kg	1	10/5/2016 9:10:17 AM	27843
Zinc	9.3	0.35	2.5		mg/Kg	1	10/5/2016 9:10:17 AM	27843
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Aniline	ND	0.094	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Anthracene	ND	0.066	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Benz(a)anthracene	ND	0.085	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Benzo(k)fluoranthene	ND	0.087	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Benzoic acid	ND	0.082	0.50		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Bis(2-ethylhexyl)phthalate	0.11	0.081	0.50	J	mg/Kg	1	10/5/2016 2:31:46 PM	27836
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Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 569-3 (16-18')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 1:35:00 PM

 Lab ID:
 1609G64-008
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Carbazole	ND	0.067	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/5/2016 2:31:46 PM	27836
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Chrysene	ND	0.085	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Di-n-butyl phthalate	0.22	0.074	0.40	J	mg/Kg	1	10/5/2016 2:31:46 PM	27836
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Diethyl phthalate	0.12	0.10	0.20	J	mg/Kg	1	10/5/2016 2:31:46 PM	27836
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/5/2016 2:31:46 PM	27836
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Fluoranthene	ND	0.057	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Fluorene	ND	0.091	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Isophorone	ND	0.11	0.40		mg/Kg	1	10/5/2016 2:31:46 PM	27836
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	10/5/2016 2:31:46 PM	27836
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
N-Nitrosodi-n-propylamine	ND	0.095	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 569-3 (16-18')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 1:35:00 PM

 Lab ID:
 1609G64-008
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	ND	0.095	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2-Nitrophenol	ND	0.098	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Phenanthrene	ND	0.067	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Phenol	ND	0.075	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Pyrene	ND	0.075	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Pyridine	ND	0.079	0.40		mg/Kg	1	10/5/2016 2:31:46 PM	27836
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2,4,5-Trichlorophenol	ND	0.099	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
2,4,6-Trichlorophenol	ND	0.082	0.20		mg/Kg	1	10/5/2016 2:31:46 PM	27836
Surr: 2-Fluorophenol	65.9	0	35-97.9		%Rec	1	10/5/2016 2:31:46 PM	27836
Surr: Phenol-d5	66.9	0	37.3-105		%Rec	1	10/5/2016 2:31:46 PM	27836
Surr: 2,4,6-Tribromophenol	71.8	0	35.6-118		%Rec	1	10/5/2016 2:31:46 PM	27836
Surr: Nitrobenzene-d5	61.3		41.2-107		%Rec	1	10/5/2016 2:31:46 PM	27836
Surr: 2-Fluorobiphenyl	67.2		41.9-119		%Rec	1	10/5/2016 2:31:46 PM	27836
Surr: 4-Terphenyl-d14	75.8		15-132		%Rec	1	10/5/2016 2:31:46 PM	27836
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.014	0.013	0.016	J	mg/Kg	1	9/30/2016 2:26:47 PM	27796
Toluene	0.011	0.0019	0.033	J	mg/Kg	1	9/30/2016 2:26:47 PM	27796
Ethylbenzene	ND	0.0027	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Methyl tert-butyl ether (MTBE)	ND	0.010	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,2,4-Trimethylbenzene	0.012	0.0024	0.033	J	mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,3,5-Trimethylbenzene	0.0026	0.0024	0.033	J	mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,2-Dichloroethane (EDC)	ND	0.0085	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,2-Dibromoethane (EDB)	ND	0.0023	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Naphthalene	ND	0.0051	0.065		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1-Methylnaphthalene	ND	0.0073	0.13		mg/Kg	1	9/30/2016 2:26:47 PM	27796
2-Methylnaphthalene	0.0075	0.0070	0.13	J	mg/Kg	1	9/30/2016 2:26:47 PM	27796
Acetone	ND	0.042	0.49		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Bromobenzene	ND	0.0026	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Bromodichloromethane	ND	0.0019	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Bromoform	ND	0.0040	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Bromomethane	ND	0.012	0.098		mg/Kg	1	9/30/2016 2:26:47 PM	27796
2-Butanone	ND	0.019	0.33		mg/Kg	1	9/30/2016 2:26:47 PM	27796

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 569-3 (16-18')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 1:35:00 PM

 Lab ID:
 1609G64-008
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.011	0.33		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Carbon tetrachloride	ND	0.0021	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Chlorobenzene	ND	0.0027	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Chloroethane	ND	0.0065	0.065		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Chloroform	ND	0.0025	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Chloromethane	ND	0.0029	0.098		mg/Kg	1	9/30/2016 2:26:47 PM	27796
2-Chlorotoluene	ND	0.0024	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
4-Chlorotoluene	ND	0.0029	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
cis-1,2-DCE	ND	0.0019	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
cis-1,3-Dichloropropene	ND	0.0030	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,2-Dibromo-3-chloropropane	ND	0.010	0.065		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Dibromochloromethane	ND	0.0030	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Dibromomethane	ND	0.0028	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,2-Dichlorobenzene	ND	0.0029	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,3-Dichlorobenzene	ND	0.0027	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,4-Dichlorobenzene	ND	0.0040	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Dichlorodifluoromethane	ND	0.010	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,1-Dichloroethane	ND	0.0018	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,1-Dichloroethene	ND	0.011	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,2-Dichloropropane	ND	0.0027	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,3-Dichloropropane	ND	0.0037	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
2,2-Dichloropropane	ND	0.0019	0.065		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,1-Dichloropropene	ND	0.0026	0.065		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Hexachlorobutadiene	ND	0.0040	0.065		mg/Kg	1	9/30/2016 2:26:47 PM	27796
2-Hexanone	ND	0.018	0.33		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Isopropylbenzene	ND	0.0028	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
4-Isopropyltoluene	ND	0.0029	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
4-Methyl-2-pentanone	ND	0.0095	0.33		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Methylene chloride	ND	0.0094	0.098		mg/Kg	1	9/30/2016 2:26:47 PM	27796
n-Butylbenzene	ND	0.0029	0.098		mg/Kg	1	9/30/2016 2:26:47 PM	27796
n-Propylbenzene	ND	0.0025	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
sec-Butylbenzene	ND	0.0045	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Styrene	ND	0.0029	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
tert-Butylbenzene	ND	0.0027	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,1,1,2-Tetrachloroethane	ND	0.0031	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,1,2,2-Tetrachloroethane	ND	0.0053	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Tetrachloroethene (PCE)	ND	0.0027	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
trans-1,2-DCE	ND	0.0091	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
trans-1,3-Dichloropropene	ND	0.0048	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Analytical Report Lab Order 1609G64

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 569-3 (16-18')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 1:35:00 PM

 Lab ID:
 1609G64-008
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.0049	0.065		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,2,4-Trichlorobenzene	ND	0.0035	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,1,1-Trichloroethane	ND	0.0020	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,1,2-Trichloroethane	ND	0.0039	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Trichloroethene (TCE)	ND	0.0035	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Trichlorofluoromethane	ND	0.0024	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
1,2,3-Trichloropropane	ND	0.0057	0.065		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Vinyl chloride	ND	0.0027	0.033		mg/Kg	1	9/30/2016 2:26:47 PM	27796
Xylenes, Total	0.015	0.0062	0.065	J	mg/Kg	1	9/30/2016 2:26:47 PM	27796
Surr: Dibromofluoromethane	90.7		70-130		%Rec	1	9/30/2016 2:26:47 PM	27796
Surr: 1,2-Dichloroethane-d4	91.9		70-130		%Rec	1	9/30/2016 2:26:47 PM	27796
Surr: Toluene-d8	96.3		70-130		%Rec	1	9/30/2016 2:26:47 PM	27796
Surr: 4-Bromofluorobenzene	93.6		70-130		%Rec	1	9/30/2016 2:26:47 PM	27796
EPA METHOD 8015D MOD: GASOLINE	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	2.7	0.49	3.3	J	mg/Kg	1	9/30/2016 2:51:45 AM	G37582
Surr: BFB	94.8	0	70-130		%Rec	1	9/30/2016 2:51:45 AM	G37582

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 569-3 (24-26')

Project: OW-14 Source Inv. Collection Date: 9/28/2016 1:45:00 PM 1609G64-009 Lab ID: Matrix: MEOH (SOIL) Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS	3					Analyst: TOM	
Diesel Range Organics (DRO)	1500	19	100		mg/Kg	10	10/4/2016 11:53:03 AM	27809
Motor Oil Range Organics (MRO)	ND	500	500		mg/Kg	10	10/4/2016 11:53:03 AM	27809
Surr: DNOP	0	0	70-130	S	%Rec	10	10/4/2016 11:53:03 AM	27809
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0020	0.00056	0.032	J	mg/Kg	1	10/4/2016 9:07:37 AM	27844
EPA METHOD 6010B: SOIL METALS							Analyst: MED	
Antimony	ND	1.0	2.5		mg/Kg	1	10/5/2016 9:14:34 AM	27843
Arsenic	1.8	0.89	2.5	J	mg/Kg	1	10/5/2016 9:14:34 AM	27843
Barium	300	0.14	0.20		mg/Kg	2	10/5/2016 9:13:09 AM	27843
Beryllium	0.52	0.035	0.15		mg/Kg	1	10/5/2016 9:14:34 AM	27843
Cadmium	ND	0.063	0.10		mg/Kg	1	10/5/2016 9:14:34 AM	27843
Chromium	4.7	0.094	0.30		mg/Kg	1	10/5/2016 9:14:34 AM	27843
Cobalt	3.2	0.11	0.30		mg/Kg	1	10/5/2016 9:14:34 AM	27843
Iron	10000	75	250		mg/Kg	100	10/5/2016 9:11:44 AM	27843
Lead	2.3	0.17	0.25		mg/Kg	1	10/5/2016 9:14:34 AM	27843
Manganese	300	0.11	0.20		mg/Kg	2	10/5/2016 9:13:09 AM	27843
Nickel	4.7	0.15	0.50		mg/Kg	1	10/6/2016 8:38:21 AM	27843
Selenium	ND	1.8	2.5		mg/Kg	1	10/5/2016 9:14:34 AM	27843
Silver	ND	0.063	0.25		mg/Kg	1	10/5/2016 9:14:34 AM	27843
Vanadium	13	0.18	2.5		mg/Kg	1	10/5/2016 9:14:34 AM	27843
Zinc	9.9	0.35	2.5		mg/Kg	1	10/5/2016 9:14:34 AM	27843
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.86	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	1 27836
Acenaphthylene	ND	0.81	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	
Aniline	ND	0.94	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	
Anthracene	ND	0.66	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	
Azobenzene	ND	1.2	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	
Benz(a)anthracene	ND	0.86	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	
Benzo(a)pyrene	ND	0.76	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	1 27836
Benzo(b)fluoranthene	ND	0.90	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	1 27836
Benzo(g,h,i)perylene	ND	0.88	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	1 27836
Benzo(k)fluoranthene	ND	0.88	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	1 27836
Benzoic acid	2.0	0.83	5.0	J	mg/Kg	10	10/11/2016 11:47:57 AM	1 27836
Benzyl alcohol	ND	0.78	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	1 27836
Bis(2-chloroethoxy)methane	ND	1.1	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	1 27836
Bis(2-chloroethyl)ether	ND	0.73	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	
Bis(2-chloroisopropyl)ether	ND	0.89	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	1 27836
Bis(2-ethylhexyl)phthalate	ND	0.81	5.0		mg/Kg	10	10/11/2016 11:47:57 AM	1 27836

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

Qualifiers: Value exceeds Maximum Contaminant Level.

> D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

Ε Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

Page 38 of 67

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 569-3 (24-26')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 1:45:00 PM

 Lab ID:
 1609G64-009
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.96	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Butyl benzyl phthalate	ND	0.89	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Carbazole	ND	0.68	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
4-Chloro-3-methylphenol	ND	1.2	5.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
4-Chloroaniline	ND	1.1	5.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
2-Chloronaphthalene	ND	0.79	2.5		mg/Kg	10	10/11/2016 11:47:57	AM 27836
2-Chlorophenol	ND	0.79	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
4-Chlorophenyl phenyl ether	ND	1.1	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Chrysene	ND	0.85	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Di-n-butyl phthalate	ND	0.75	4.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Di-n-octyl phthalate	ND	0.85	4.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Dibenz(a,h)anthracene	ND	0.81	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Dibenzofuran	ND	1.0	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
1,2-Dichlorobenzene	ND	0.77	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
1,3-Dichlorobenzene	ND	0.77	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
1,4-Dichlorobenzene	ND	0.85	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
3,3'-Dichlorobenzidine	ND	0.74	2.5		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Diethyl phthalate	ND	1.0	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Dimethyl phthalate	ND	0.98	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
2,4-Dichlorophenol	ND	0.93	4.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
2,4-Dimethylphenol	ND	1.1	3.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
4,6-Dinitro-2-methylphenol	ND	0.60	4.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
2,4-Dinitrophenol	ND	0.66	5.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
2,4-Dinitrotoluene	ND	0.89	5.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
2,6-Dinitrotoluene	ND	1.1	5.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Fluoranthene	ND	0.58	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Fluorene	ND	0.92	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Hexachlorobenzene	ND	0.79	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Hexachlorobutadiene	ND	1.1	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Hexachlorocyclopentadiene	ND	1.1	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Hexachloroethane	ND	0.86	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Indeno(1,2,3-cd)pyrene	ND	0.78	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
Isophorone	ND	1.1	4.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
1-Methylnaphthalene	ND	1.0	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
2-Methylnaphthalene	ND	1.2	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
2-Methylphenol	ND	0.84	4.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
3+4-Methylphenol	ND	0.72	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
N-Nitrosodi-n-propylamine	ND	0.96	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836
N-Nitrosodiphenylamine	ND	0.98	2.0		mg/Kg	10	10/11/2016 11:47:57	AM 27836

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 39 of 67

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 569-3 (24-26')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 1:45:00 PM

 Lab ID:
 1609G64-009
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	1.2	0.96	2.0	J	mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
2-Nitroaniline	ND	1.1	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
3-Nitroaniline	ND	0.88	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
4-Nitroaniline	ND	0.71	4.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
Nitrobenzene	ND	1.0	4.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
2-Nitrophenol	ND	0.99	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
4-Nitrophenol	ND	0.76	2.5		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
Pentachlorophenol	ND	0.64	4.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
Phenanthrene	ND	0.68	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
Phenol	ND	0.75	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
Pyrene	ND	0.76	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
Pyridine	ND	0.79	4.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
1,2,4-Trichlorobenzene	ND	1.1	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
2,4,5-Trichlorophenol	ND	1.0	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
2,4,6-Trichlorophenol	ND	0.83	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	Л 27836
Surr: 2-Fluorophenol	25.3	0	35-97.9	S	%Rec	10	10/11/2016 11:47:57 AM	Л 27836
Surr: Phenol-d5	29.9	0	37.3-105	S	%Rec	10	10/11/2016 11:47:57 AM	Л 27836
Surr: 2,4,6-Tribromophenol	55.3	0	35.6-118		%Rec	10	10/11/2016 11:47:57 AM	Л 27836
Surr: Nitrobenzene-d5	88.4		41.2-107		%Rec	10	10/11/2016 11:47:57 AM	Л 27836
Surr: 2-Fluorobiphenyl	62.9		41.9-119		%Rec	10	10/11/2016 11:47:57 AM	Л 27836
Surr: 4-Terphenyl-d14	48.1		15-132		%Rec	10	10/11/2016 11:47:57 AM	Л 27836
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	44	2.4	3.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Toluene	310	0.36	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Ethylbenzene	88	0.50	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Methyl tert-butyl ether (MTBE)	ND	1.9	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,2,4-Trimethylbenzene	140	0.45	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,3,5-Trimethylbenzene	51	0.44	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,2-Dichloroethane (EDC)	ND	1.6	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,2-Dibromoethane (EDB)	ND	0.43	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Naphthalene	1.2	0.95	12	J	mg/Kg	200	9/30/2016 12:31:49 PM	27796
1-Methylnaphthalene	ND	1.4	24		mg/Kg	200	9/30/2016 12:31:49 PM	27796
2-Methylnaphthalene	ND	1.3	24		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Acetone	ND	7.9	92		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Bromobenzene	ND	0.49	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Bromodichloromethane	ND	0.36	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Bromoform	ND	0.74	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Bromomethane	ND	2.2	18		mg/Kg	200	9/30/2016 12:31:49 PM	27796
2-Butanone	ND	3.5	61		mg/Kg	200	9/30/2016 12:31:49 PM	27796

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 40 of 67

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 569-3 (24-26')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 1:45:00 PM

 Lab ID:
 1609G64-009
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Result **PQL** Qual Units DF **Date Analyzed Batch ID Analyses MDL EPA METHOD 8260B: VOLATILES** Analyst: DJF 200 Carbon disulfide ND 2.0 61 mg/Kg 9/30/2016 12:31:49 PM 27796 Carbon tetrachloride ND 0.40 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 Chlorobenzene ND 0.50 6.1 200 mg/Kg 9/30/2016 12:31:49 PM 27796 ND 12 Chloroethane 1.2 mg/Kg 200 9/30/2016 12:31:49 PM 27796 ND 0.46 6.1 Chloroform 200 9/30/2016 12:31:49 PM 27796 mg/Kg Chloromethane ND 0.54 18 mg/Kg 200 9/30/2016 12:31:49 PM 27796 2-Chlorotoluene ND 0.45 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 4-Chlorotoluene ND 0.54 6.1 200 9/30/2016 12:31:49 PM 27796 mg/Kg cis-1,2-DCE ND 0.35 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 ND 0.56 6.1 200 9/30/2016 12:31:49 PM 27796 cis-1,3-Dichloropropene mg/Kg 1,2-Dibromo-3-chloropropane ND 1.9 12 mg/Kg 200 9/30/2016 12:31:49 PM 27796 Dibromochloromethane ND 0.55 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 Dibromomethane ND 0.53 6.1 200 9/30/2016 12:31:49 PM 27796 mg/Kg ND 0.53 6.1 200 1,2-Dichlorobenzene mg/Kg 9/30/2016 12:31:49 PM 27796 ND 0.50 6.1 200 1,3-Dichlorobenzene mg/Kg 9/30/2016 12:31:49 PM 27796 ND 1,4-Dichlorobenzene 0.76 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 Dichlorodifluoromethane ND 1.9 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 ND 0.33 6.1 200 9/30/2016 12:31:49 PM 1,1-Dichloroethane mg/Kg 27796 1,1-Dichloroethene ND 2.0 6.1 200 9/30/2016 12:31:49 PM 27796 mg/Kg 1,2-Dichloropropane ND 0.51 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 ND 0.69 200 9/30/2016 12:31:49 PM 1,3-Dichloropropane 6 1 mg/Kg 27796 2,2-Dichloropropane ND 0.35 12 mg/Kg 200 9/30/2016 12:31:49 PM 27796 ND 0.48 12 200 9/30/2016 12:31:49 PM 27796 1,1-Dichloropropene mg/Kg Hexachlorobutadiene ND 0.75 12 200 9/30/2016 12:31:49 PM 27796 mg/Kg ND 3.3 61 200 9/30/2016 12:31:49 PM 27796 2-Hexanone mg/Kg 0.52 Isopropylbenzene 23 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 4-Isopropyltoluene 8.5 0.55 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 4-Methyl-2-pentanone ND 1.8 61 mg/Kg 200 9/30/2016 12:31:49 PM 27796 ND Methylene chloride 1.8 18 mg/Kg 200 9/30/2016 12:31:49 PM 27796 n-Butylbenzene 9.9 0.54 18 J 200 9/30/2016 12:31:49 PM 27796 mg/Kg n-Propylbenzene 33 0.47 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 sec-Butylbenzene 11 0.84 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 Styrene ND 0.54 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 tert-Butylbenzene ND 0.51 6.1 200 9/30/2016 12:31:49 PM 27796 mg/Kg 1,1,1,2-Tetrachloroethane ND 0.58 6.1 200 9/30/2016 12:31:49 PM mg/Kg ND 0.99 6.1 200 1,1,2,2-Tetrachloroethane mg/Kg 9/30/2016 12:31:49 PM 27796 Tetrachloroethene (PCE) ND 0.51 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796 trans-1,2-DCE ND 6.1 200 9/30/2016 12:31:49 PM 27796 17 mg/Kg trans-1,3-Dichloropropene ND 0.89 6.1 mg/Kg 200 9/30/2016 12:31:49 PM 27796

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical Report Lab Order 1609G64

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 569-3 (24-26')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 1:45:00 PM

 Lab ID:
 1609G64-009
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.91	12		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,2,4-Trichlorobenzene	ND	0.65	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,1,1-Trichloroethane	ND	0.37	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,1,2-Trichloroethane	ND	0.72	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Trichloroethene (TCE)	ND	0.65	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Trichlorofluoromethane	ND	0.46	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,2,3-Trichloropropane	ND	1.1	12		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Vinyl chloride	ND	0.50	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Xylenes, Total	500	1.2	12		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Surr: Dibromofluoromethane	85.8		70-130		%Rec	200	9/30/2016 12:31:49 PM	27796
Surr: 1,2-Dichloroethane-d4	90.8		70-130		%Rec	200	9/30/2016 12:31:49 PM	27796
Surr: Toluene-d8	97.0		70-130		%Rec	200	9/30/2016 12:31:49 PM	27796
Surr: 4-Bromofluorobenzene	101		70-130		%Rec	200	9/30/2016 12:31:49 PM	27796
EPA METHOD 8015D MOD: GASOLINE	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	13000	92	610		mg/Kg	200	9/30/2016 12:31:49 PM	G37617
Surr: BFB	105	0	70-130		%Rec	200	9/30/2016 12:31:49 PM	G37617

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 569-3 (38-39')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 2:00:00 PM

 Lab ID:
 1609G64-010
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANIC	S					Analyst: TOM	
Diesel Range Organics (DRO)	5.3	1.7	9.5	J	mg/Kg	1	10/3/2016 5:52:58 PM	27809
Motor Oil Range Organics (MRO)	ND	47	47		mg/Kg	1	10/3/2016 5:52:58 PM	27809
Surr: DNOP	84.4	0	70-130		%Rec	1	10/3/2016 5:52:58 PM	27809
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	ND	0.00056	0.032		mg/Kg	1	10/4/2016 9:09:26 AM	27844
EPA METHOD 6010B: SOIL METALS							Analyst: MED	
Antimony	ND	1.0	2.5		mg/Kg	1	10/5/2016 9:18:49 AM	27843
Arsenic	2.2	0.89	2.5	J	mg/Kg	1	10/5/2016 9:18:49 AM	27843
Barium	340	0.14	0.20		mg/Kg	2	10/5/2016 9:17:24 AM	27843
Beryllium	0.90	0.035	0.15		mg/Kg	1	10/5/2016 9:18:49 AM	27843
Cadmium	ND	0.064	0.10		mg/Kg	1	10/5/2016 9:18:49 AM	27843
Chromium	9.0	0.095	0.30		mg/Kg	1	10/5/2016 9:18:49 AM	27843
Cobalt	4.5	0.11	0.30		mg/Kg	1	10/5/2016 9:18:49 AM	27843
Iron	7500	76	250		mg/Kg	100	10/5/2016 9:16:00 AM	27843
Lead	ND	0.17	0.25		mg/Kg	1	10/5/2016 9:18:49 AM	27843
Manganese	130	0.054	0.10		mg/Kg	1	10/5/2016 9:18:49 AM	27843
Nickel	11	0.15	0.50		mg/Kg	1	10/6/2016 8:39:35 AM	27843
Selenium	ND	1.8	2.5		mg/Kg	1	10/5/2016 9:18:49 AM	27843
Silver	ND	0.063	0.25		mg/Kg	1	10/5/2016 9:18:49 AM	27843
Vanadium	25	0.18	2.5		mg/Kg	1	10/5/2016 9:18:49 AM	27843
Zinc	20	0.35	2.5		mg/Kg	1	10/5/2016 9:18:49 AM	27843
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.086	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Aniline	ND	0.094	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Anthracene	ND	0.066	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Benzo(a)pyrene	ND	0.076	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Benzoic acid	ND	0.083	0.50		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Bis(2-ethylhexyl)phthalate	0.12	0.081	0.50	J	mg/Kg	1	10/5/2016 3:28:23 PM	27836

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 569-3 (38-39')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 2:00:00 PM

 Lab ID:
 1609G64-010
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
4-Bromophenyl phenyl ether	ND	0.096	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Carbazole	ND	0.067	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/5/2016 3:28:23 PM	27836
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2-Chloronaphthalene	ND	0.079	0.25		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2-Chlorophenol	ND	0.079	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Chrysene	ND	0.085	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Di-n-butyl phthalate	0.23	0.075	0.40	J	mg/Kg	1	10/5/2016 3:28:23 PM	27836
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
1,2-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
3,3'-Dichlorobenzidine	ND	0.074	0.25		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Diethyl phthalate	0.17	0.10	0.20	J	mg/Kg	1	10/5/2016 3:28:23 PM	27836
Dimethyl phthalate	ND	0.098	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/5/2016 3:28:23 PM	27836
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Fluoranthene	ND	0.058	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Fluorene	ND	0.091	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Isophorone	ND	0.11	0.40		mg/Kg	1	10/5/2016 3:28:23 PM	27836
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2-Methylphenol	ND	0.084	0.40		mg/Kg	1	10/5/2016 3:28:23 PM	27836
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
N-Nitrosodiphenylamine	ND	0.098	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 569-3 (38-39')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 2:00:00 PM

 Lab ID:
 1609G64-010
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Naphthalene	ND	0.096	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Phenanthrene	ND	0.068	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Phenol	ND	0.075	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Pyrene	ND	0.075	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Pyridine	ND	0.079	0.40		mg/Kg	1	10/5/2016 3:28:23 PM	27836
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	10/5/2016 3:28:23 PM	27836
Surr: 2-Fluorophenol	83.1	0	35-97.9		%Rec	1	10/5/2016 3:28:23 PM	27836
Surr: Phenol-d5	89.3	0	37.3-105		%Rec	1	10/5/2016 3:28:23 PM	27836
Surr: 2,4,6-Tribromophenol	79.6	0	35.6-118		%Rec	1	10/5/2016 3:28:23 PM	27836
Surr: Nitrobenzene-d5	80.4		41.2-107		%Rec	1	10/5/2016 3:28:23 PM	27836
Surr: 2-Fluorobiphenyl	82.5		41.9-119		%Rec	1	10/5/2016 3:28:23 PM	27836
Surr: 4-Terphenyl-d14	93.4		15-132		%Rec	1	10/5/2016 3:28:23 PM	27836
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.060	0.013	0.016		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Toluene	0.21	0.0019	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Ethylbenzene	0.086	0.0026	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Methyl tert-butyl ether (MTBE)	ND	0.010	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,2,4-Trimethylbenzene	0.23	0.0023	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,3,5-Trimethylbenzene	0.083	0.0023	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,2-Dichloroethane (EDC)	ND	0.0083	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,2-Dibromoethane (EDB)	ND	0.0023	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Naphthalene	ND	0.0050	0.063		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1-Methylnaphthalene	ND	0.0071	0.13		mg/Kg	1	9/30/2016 12:03:11 PM	27796
2-Methylnaphthalene	ND	0.0068	0.13		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Acetone	ND	0.041	0.48		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Bromobenzene	ND	0.0026	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Bromodichloromethane	ND	0.0018	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Bromoform	ND	0.0039	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Bromomethane	ND	0.012	0.095		mg/Kg	1	9/30/2016 12:03:11 PM	27796
2-Butanone	ND	0.018	0.32		mg/Kg	1	9/30/2016 12:03:11 PM	27796

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Analytical Report Lab Order 1609G64

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 569-3 (38-39')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 2:00:00 PM

 Lab ID:
 1609G64-010
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Carbon disulfide	ND	0.010	0.32		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Carbon tetrachloride	ND	0.0021	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Chlorobenzene	ND	0.0026	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Chloroethane	ND	0.0063	0.063		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Chloroform	ND	0.0024	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Chloromethane	ND	0.0028	0.095		mg/Kg	1	9/30/2016 12:03:11 PM	27796
2-Chlorotoluene	ND	0.0023	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
4-Chlorotoluene	ND	0.0028	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
cis-1,2-DCE	ND	0.0018	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
cis-1,3-Dichloropropene	ND	0.0029	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,2-Dibromo-3-chloropropane	ND	0.0097	0.063		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Dibromochloromethane	ND	0.0029	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Dibromomethane	ND	0.0027	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,2-Dichlorobenzene	ND	0.0028	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,3-Dichlorobenzene	ND	0.0026	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,4-Dichlorobenzene	ND	0.0039	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Dichlorodifluoromethane	ND	0.0098	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,1-Dichloroethane	ND	0.0017	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,1-Dichloroethene	ND	0.010	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,2-Dichloropropane	ND	0.0027	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,3-Dichloropropane	ND	0.0036	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
2,2-Dichloropropane	ND	0.0018	0.063		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,1-Dichloropropene	ND	0.0025	0.063		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Hexachlorobutadiene	ND	0.0039	0.063		mg/Kg	1	9/30/2016 12:03:11 PM	27796
2-Hexanone	ND	0.017	0.32		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Isopropylbenzene	0.020	0.0027	0.032	J	mg/Kg	1	9/30/2016 12:03:11 PM	27796
4-Isopropyltoluene	0.010	0.0028	0.032	J	mg/Kg	1	9/30/2016 12:03:11 PM	27796
4-Methyl-2-pentanone	ND	0.0092	0.32		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Methylene chloride	ND	0.0091	0.095		mg/Kg	1	9/30/2016 12:03:11 PM	27796
n-Butylbenzene	0.019	0.0028	0.095	J	mg/Kg	1	9/30/2016 12:03:11 PM	27796
n-Propylbenzene	0.048	0.0024	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
sec-Butylbenzene	0.017	0.0044	0.032	J	mg/Kg	1	9/30/2016 12:03:11 PM	27796
Styrene	ND	0.0028	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
tert-Butylbenzene	ND	0.0026	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,1,1,2-Tetrachloroethane	ND	0.0030	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,1,2,2-Tetrachloroethane	ND	0.0051	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Tetrachloroethene (PCE)	ND	0.0026	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
trans-1,2-DCE	ND	0.0089	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
trans-1,3-Dichloropropene	ND	0.0046	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical Report Lab Order 1609G64

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

 CLIENT:
 Western Refining Company
 Client Sample ID: TK 569-3 (38-39')

 Project:
 OW-14 Source Inv.
 Collection Date: 9/28/2016 2:00:00 PM

 Lab ID:
 1609G64-010
 Matrix: MEOH (SOIL)
 Received Date: 9/29/2016 8:50:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,2,3-Trichlorobenzene	ND	0.0047	0.063		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,2,4-Trichlorobenzene	ND	0.0034	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,1,1-Trichloroethane	ND	0.0019	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,1,2-Trichloroethane	ND	0.0037	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Trichloroethene (TCE)	ND	0.0034	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Trichlorofluoromethane	ND	0.0024	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
1,2,3-Trichloropropane	ND	0.0055	0.063		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Vinyl chloride	ND	0.0026	0.032		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Xylenes, Total	0.50	0.0060	0.063		mg/Kg	1	9/30/2016 12:03:11 PM	27796
Surr: Dibromofluoromethane	84.6		70-130		%Rec	1	9/30/2016 12:03:11 PM	27796
Surr: 1,2-Dichloroethane-d4	89.0		70-130		%Rec	1	9/30/2016 12:03:11 PM	27796
Surr: Toluene-d8	96.8		70-130		%Rec	1	9/30/2016 12:03:11 PM	27796
Surr: 4-Bromofluorobenzene	100		70-130		%Rec	1	9/30/2016 12:03:11 PM	27796
EPA METHOD 8015D MOD: GASOLINE	RANGE						Analyst: DJF	
Gasoline Range Organics (GRO)	27	0.48	3.2		mg/Kg	1	9/30/2016 12:03:11 PM	G37617
Surr: BFB	99.7	0	70-130		%Rec	1	9/30/2016 12:03:11 PM	G37617

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

Qualifiers:

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

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1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Batch #:

160930051

Address:

4901 HAWKINS NE SUITE D

Project Name:

1609G64

ALBUQUERQUE, NM 87109

Attn:

ANDY FREEMAN

Analytical Results Report

Sample Number

160930051-001

9/27/2016 **Sampling Date**

Date/Time Received 9/30/2016

11:50 AM

Client Sample ID

1609G64-001C / TK 568-2 (22-24)

1609G64-002C / TK 568-2 (28-30)

Sampling Time 11:15 AM

Matrix

Comments

Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide		ND	mg/Kg	0.254	10/11/2016	MER	EPA 335.4	
%moisture	~	8.4	Percent		10/10/2016	MER	%moisture	

Sample Number

160930051-002

Sampling Date 9/27/2016 Date/Time Received 9/30/2016

Sampling Time 11:25 AM

11:50 AM

Client Sample ID

Soil

Matrix Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.208	10/11/2016	MER	EPA 335.4	
%moisture	17.8	Percent		10/10/2016	MER	%moisture	

Sample Number

160930051-003

9/27/2016 Sampling Date

Date/Time Received 9/30/2016 11:50 AM

Sampling Time 11:35 AM

Client Sample ID Matrix

1609G64-003C / TK 568-2 (36-37) Soil

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide %moisture	ND	mg/Kg	0.225	10/11/2016	MER	EPA 335.4	-
/ontoisture	13.7	Percent		10/10/2016	MER	. %moisture	

Sample Number

160930051-004

Soil

Sampling Date 9/27/2016 Date/Time Received 9/30/2016 11:50 AM

Client Sample ID Matrix

1609G64-005C / TK 570-1 (10-12)

Sampling Time 4:15 PM

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	0.586	mg/Kg	0.288	10/11/2016	MER	EPA 335.4	
%moisture	20.1	Percent		10/10/2016	MER	%moisture	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Monday, October 17, 2016

Page 1 of 3

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Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Address:

4901 HAWKINS NE SUITE D

ALBUQUERQUE, NM 87109

Attn:

ANDY FREEMAN

Batch #:

160930051

Project Name:

1609G64

Analytical Results Report

Sample Number

160930051-005

Sampling Date 9/27/2016 Date/Time Received 9/30/2016

11:50 AM

Client Sample ID

1609G64-006C / TK 570-1 (32-34)

Sampling Time 4:20 PM

MER

Sampling Time 4:30 PM

Matrix

Comments

Soil

Parameter Result Units **PQL Analysis Date** Analyst Method Qualifier Cyanide ND mg/Kg 0.23 10/11/2016 MER EPA 335.4 %moisture 20.2 Percent 10/10/2016

Sample Number

160930051-006

Sampling Date 9/27/2016 Date/Time Received 9/30/2016

%moisture

1609G64-007C / TK 570-1 (44-45)

Client Sample ID **Matrix** Comments

Soil

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	0.367	mg/Kg	0.259	10/11/2016	MER	EPA 335.4	
%moisture	17.4	Percent		10/10/2016	MER	%moisture	

Sample Number

160930051-007 1609G64-008C / TK 569-3 (16-18)

Sampling Date 9/28/2016 Date/Time Received 9/30/2016

Sampling Time 1:35 PM

Client Sample ID Matrix

Soil

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.283	10/11/2016	MER	EPA 335.4	
%moisture	16.6	Percent		10/10/2016	MER	%moisture	

Sample Number

160930051-008

Sampling Date 9/28/2016 Date/Time Received 9/30/2016

Sampling Time 1:45 PM

Client Sample ID 1609G64-009C / TK 569-3 (24-26)

Matrix Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.269	10/11/2016	MER	EPA 335.4	
%moisture	16.3	Percent		10/10/2016	MER	%moisture	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT'0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

11:50 AM

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Client:

Address:

HALL ENVIRONMENTAL ANALYSIS LAB

4901 HAWKINS NE SUITE D

ALBUQUERQUE, NM 87109

Attn:

ANDY FREEMAN

Batch #:

160930051

Project Name:

1609G64

Analytical Results Report

Sample Number

160930051-009

Sampling Date 9/28/2016

Date/Time Received 9/30/2016

)/30/2016 11:50 AM

Client Sample ID

1609G64-010C / TK 569-3 (38-39)

Sampling Time 2:00 PM

Matrix

Soil

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.284	10/11/2016	MER	EPA 335.4	
%moisture	17.3	Percent		10/10/2016	MER	%moisture	

Authorized Signature

Todd Taruscio, Lab Manager

MCL

EPA's Maximum Contaminant Level

ND

Not Detected

PQL

Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated.

Soil/solid results are reported on a dry-weight basis unless otherwise noted.

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Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Address:

4901 HAWKINS NE SUITE D

ALBUQUERQUE, NM 87109

Attn:

ANDY FREEMAN

Batch #:

160930051

Project Name:

1609G64

Analytical Results Report
Quality Control Data

Lab Control Sample	······································								_	
Parameter Cyanide	LCS Resul 0.504	t Units mg/kg		•	%Rec 100.8		%Rec -110	-	Date /2016	Analysis Date 10/11/2016
Matrix Spike						<u> </u>				
Sample Number Parameter 160930051-001 Cyanide		Sample Result ND	MS Result 12.4	Units mg/kg		MS Spike 12.7	%Rec 97.6	AR %Rec 70-130	Prep Date 10/11/2016	•
Matrix Spike Duplicate										
Parameter	MSD Result	Units	MSD Spike	%R	ac .	%RPD	AR %RPE) Dra	p Date	Analysis Date
Cyanide	12.7	mg/kg	12.7	100		2.4	0-25		11/2016	10/11/2016
Method Blank		<u>.</u>								
Parameter Cyanide			suit D	Un mg,			PQL 5		ep Date 11/2016	Analysis Date 10/11/2016

AR

Acceptable Range

ND PQL Not Detected

RPD

Practical Quantitation Limit Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID LCS-27809	SampT	ype: LC	S	TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: LCSS	Batch	ID: 27 8	309	F	RunNo: 3	7625				
Prep Date: 9/30/2016	Analysis D	ate: 10	/3/2016	S	SeqNo: 1	171361	Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	52	10	50.00	0	104	62.6	124			
Surr: DNOP	5.1		5.000		101	70	130			
Sample ID MB-27809	SampT	ype: ME	BLK	Tes	tCode: EI	PA Method	8015M/D: Die	esel Rang	e Organics	

Client ID: PBS	Batch	ID: 27 8	809	F	RunNo: 3	7625				
Prep Date: 9/30/2016	Analysis D	ate: 10	0/3/2016	S	SeqNo: 1	171362	Units: mg/K	.g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10		•			_			
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		106	70	130			

Sample ID	1609G64-001AMS	SampT	ype: MS	3	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	TK 568-2 (22-24')	Batch	ID: 27	809	F	RunNo: 3	7625				
Prep Date:	9/30/2016	Analysis D	ate: 10	0/3/2016	S	SeqNo: 1	171397	Units: mg/k	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range C	Organics (DRO)	50	9.5	47.53	0	105	33.9	141			
Surr: DNOP		4.0		4.753		84.4	70	130			

Sample ID	1609G64-001AMSI) SampTy	ре: М\$	SD	Tes	tCode: El	PA Method	8015M/D: Die	esel Rang	e Organics	
Client ID:	TK 568-2 (22-24')	Batch	ID: 27	809	F	RunNo: 3	7625				
Prep Date:	9/30/2016	Analysis Da	ite: 10	0/3/2016	S	SeqNo: 1	172011	Units: mg/K	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range O	rganics (DRO)	50	10	50.40	0	99.7	33.9	141	0.761	20	
Surr: DNOP		3.9		5.040		78.0	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

Reporting Detection Limit

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1609G64

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-27796 SampType: MBLK TestCode: EPA Method 8015D: Gasoline Range

Client ID: **PBS** Batch ID: 27796 RunNo: 37594

Analysis Date: 9/30/2016 Prep Date: 9/29/2016 SeqNo: 1170668 Units: mg/Kg

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

Gasoline Range Organics (GRO) ND 5.0

Surr: BFB 830 1000 82.9 68.3 144

Sample ID LCS-27796 SampType: LCS TestCode: EPA Method 8015D: Gasoline Range

Client ID: LCSS RunNo: 37594 Batch ID: 27796

Prep Date: 9/29/2016 Analysis Date: 9/30/2016 SeqNo: 1170673 Units: mg/Kg

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

Gasoline Range Organics (GRO) 29 5.0 25.00 0 115 74.6 123 900 1000 89.9 68.3 Surr: BFB 144

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- В
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Analyte detected in the associated Method Blank

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Hall Environmental Analysis Laboratory, Inc.

SampType: MBLK

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID rb

Client ID: PBS	Batch	n ID: S3	7582	F	RunNo: 3'	7582				
Prep Date:	Analysis D	Date: 9 /	29/2016	S	SeqNo: 1	169683	Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Methyl tert-butyl ether (MTBE)	ND	0.050								
1,2,4-Trimethylbenzene	ND	0.050								
1,3,5-Trimethylbenzene	ND	0.050								
1,2-Dichloroethane (EDC)	ND	0.050								
1,2-Dibromoethane (EDB)	ND	0.050								
Naphthalene	ND	0.10								
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
Acetone	ND	0.75								
Bromobenzene	ND	0.050								
Bromodichloromethane	ND	0.050								
Bromoform	ND	0.050								
Bromomethane	ND	0.15								
2-Butanone	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.050								
Chlorobenzene	ND	0.050								
Chloroethane	ND	0.10								
Chloroform	ND	0.050								
Chloromethane	ND	0.15								
2-Chlorotoluene	ND	0.050								
4-Chlorotoluene	ND	0.050								
cis-1,2-DCE	ND	0.050								
cis-1,3-Dichloropropene	ND	0.050								
1,2-Dibromo-3-chloropropane	ND	0.10								
Dibromochloromethane	ND	0.050								
Dibromomethane	ND	0.050								
1,2-Dichlorobenzene	ND	0.050								
1,3-Dichlorobenzene	ND	0.050								
1,4-Dichlorobenzene	ND	0.050								
Dichlorodifluoromethane	ND	0.050								
1,1-Dichloroethane	ND	0.050								
1,1-Dichloroethene	ND	0.050								
1,2-Dichloropropane	ND	0.050								
1,3-Dichloropropane	ND	0.050								
2,2-Dichloropropane	ND	0.10								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank

TestCode: EPA Method 8260B: Volatiles

- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID rb	SampT	ype: ME	BLK	Test	tCode: El	PA Method	8260B: Volat	iles		
Client ID: PBS	Batch	n ID: S3	7582	R	RunNo: 3	7582				
Prep Date:	Analysis D	ate: 9 /	29/2016	S	eqNo: 1	169683	Units: mg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.53		0.5000		106	70	130			
Surr: 1,2-Dichloroethane-d4	0.54		0.5000		107	70	130			
Surr: Toluene-d8	0.49		0.5000		97.0	70	130			
Surr: 4-Bromofluorobenzene	0.45		0.5000		90.6	70	130			
Sample ID 100ng lcsb	SampT	ype: LC	s	Test	tCode: El	PA Method	8260B: Volat	iles		
Client ID: LCSS		n ID: S3			lunNo: 3					
Prep Date:	Analysis D	ate: 9 /	29/2016	S	eqNo: 1	169684	Units: mg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

Chlorobenzene

Benzene Toluene

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded

1.1

1.0

0.97

0.025

0.050

0.050

1.000

1.000

1.000

- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank

70

70

70

130

130

130

E Value above quantitation range

106

101

97.3

- J Analyte detected below quantitation limits
- P Sample pH Not In Range

0

0

0

- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID 100ng lcsb SampType: LCS TestCode: EPA Method 8260B: Volatiles LCSS Client ID: Batch ID: \$37582 RunNo: 37582 SeqNo: 1169684 Prep Date: Analysis Date: 9/29/2016 Units: mg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 1,1-Dichloroethene 0.050 1.000 0 106 70 1.1 130 Trichloroethene (TCE) 0.050 1.000 0 101 70 1.0 130 0.5000 103 70 Surr: Dibromofluoromethane 0.51 130 Surr: 1,2-Dichloroethane-d4 0.52 0.5000 104 70 130 Surr: Toluene-d8 0.48 0.5000 96.0 70 130 Surr: 4-Bromofluorobenzene 0.46 0.5000 92.1 70 130

Sample ID 1609g64-002ams	SampT	ype: MS	3	Tes	tCode: El	PA Method	8260B: Vola	tiles		
Client ID: TK 568-2 (28-30')	Batch	n ID: S3	7582	F	RunNo: 3	7582				
Prep Date:	Analysis D	ate: 9/	29/2016	S	SeqNo: 1	169687	Units: mg/k	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	0.33	13.00	5.184	99.2	49.2	155			
Toluene	41	0.65	13.00	27.91	103	52	154			
Chlorobenzene	14	0.65	13.00	0	106	53.2	150			
1,1-Dichloroethene	13	0.65	13.00	0	99.1	34.2	163			
Trichloroethene (TCE)	13	0.65	13.00	0	101	48.2	151			
Surr: Dibromofluoromethane	6.1		6.502		93.4	70	130			
Surr: 1,2-Dichloroethane-d4	6.3		6.502		97.5	70	130			
Surr: Toluene-d8	6.2		6.502		95.6	70	130			
Surr: 4-Bromofluorobenzene	6.3		6.502		96.2	70	130			

Sample ID 1609g64-002amsd	I SampT	SampType: MSD TestCode: EPA Method 8260B: Volatiles								
Client ID: TK 568-2 (28-30')	Batch	n ID: S3	7582	F	RunNo: 3	7582				
Prep Date:	Analysis D	ate: 9 /	29/2016	S	SeqNo: 1	169688	Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	0.33	13.00	5.184	95.5	49.2	155	2.67	20	
Toluene	40	0.65	13.00	27.91	89.1	52	154	4.62	20	
Chlorobenzene	13	0.65	13.00	0	102	53.2	150	3.47	20	
1,1-Dichloroethene	12	0.65	13.00	0	95.2	34.2	163	4.07	20	
Trichloroethene (TCE)	13	0.65	13.00	0	96.5	48.2	151	4.20	20	
Surr: Dibromofluoromethane	6.2		6.502		94.6	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	6.2		6.502		95.3	70	130	0	0	
Surr: Toluene-d8	6.2		6.502		95.0	70	130	0	0	
Surr: 4-Bromofluorobenzene	6.3		6.502		97.6	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID mb-27796	SampT	ype: MBLK	TestCode: E	PA Method	8260B: Volat	iles		
Client ID: PBS	Batch	n ID: 27796	RunNo: 3	7617				
Prep Date: 9/29/2016	Analysis D	oate: 9/30/2016	SeqNo: 1	170900	Units: mg/K	g		
Analyte	Result		SPK Ref Val %REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025						
Toluene	ND	0.050						
Ethylbenzene	ND	0.050						
Methyl tert-butyl ether (MTBE)	ND	0.050						
1,2,4-Trimethylbenzene	ND	0.050						
1,3,5-Trimethylbenzene	ND	0.050						
1,2-Dichloroethane (EDC)	ND	0.050						
1,2-Dibromoethane (EDB)	ND	0.050						
Naphthalene	ND	0.10						
1-Methylnaphthalene	ND	0.20						
2-Methylnaphthalene	ND	0.20						
Acetone	ND	0.75						
Bromobenzene	ND	0.050						
Bromodichloromethane	ND	0.050						
Bromoform	ND	0.050						
Bromomethane	ND	0.15						
2-Butanone	0.050	0.50						J
Carbon disulfide	ND	0.50						
Carbon tetrachloride	ND	0.050						
Chlorobenzene	ND	0.050						
Chloroethane	ND	0.10						
Chloroform	ND	0.050						
Chloromethane	ND	0.15						
2-Chlorotoluene	ND	0.050						
4-Chlorotoluene	ND	0.050						
cis-1,2-DCE	ND	0.050						
cis-1,3-Dichloropropene	ND	0.050						
1,2-Dibromo-3-chloropropane	ND	0.10						
Dibromochloromethane	ND	0.050						
Dibromomethane	ND	0.050						
1,2-Dichlorobenzene	ND	0.050						
1,3-Dichlorobenzene	ND	0.050						
1,4-Dichlorobenzene	ND	0.050						
Dichlorodifluoromethane	ND	0.050						
1,1-Dichloroethane	ND	0.050						
1,1-Dichloroethene	ND	0.050						
1,2-Dichloropropane	ND	0.050						
1,3-Dichloropropane	ND	0.050						
2,2-Dichloropropane	ND	0.10						

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID mb-27796	SampT	уре: МЕ	MBLK TestCode: EPA Method 8260B: Volatiles							
Client ID: PBS	Batch	n ID: 27	796	F	RunNo: 3	7617				
Prep Date: 9/29/2016	Analysis D)ate: 9/	30/2016	S	SeqNo: 1	170900	Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.47		0.5000		93.2	70	130			
Surr: 1,2-Dichloroethane-d4	0.47		0.5000		93.2	70	130			
Surr: Toluene-d8	0.50		0.5000		99.3	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		95.3	70	130			
Sample ID Ics-27796	SampT	ype: LC	s	Tes	tCode: El	PA Method	8260B: Volat	iles		
Client ID: LCSS	Batch	n ID: 27	796	F	RunNo: 3	7617				
Prep Date: 9/29/2016	Analysis D)ate: 9 /	30/2016	S	SeqNo: 1	170901	Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

Chlorobenzene

Benzene Toluene

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

0.94

1.0

1.0

0.025

0.050

0.050

1.000

1.000

1.000

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

70

70

70

130

130

130

E Value above quantitation range

93.9

102

101

J Analyte detected below quantitation limits

P Sample pH Not In Range

0

0

0

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

0.48

0.49

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Surr: Toluene-d8

Surr: 4-Bromofluorobenzene

Sample ID Ics-27796 SampType: LCS TestCode: EPA Method 8260B: Volatiles Client ID: LCSS Batch ID: 27796 RunNo: 37617 Prep Date: 9/29/2016 Analysis Date: 9/30/2016 SeqNo: 1170901 Units: mg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 1,1-Dichloroethene 0.050 1.000 70 1.0 0 103 130 0.96 95.9 Trichloroethene (TCE) 0.050 1.000 0 70 130 92.3 70 Surr: Dibromofluoromethane 0.46 0.5000 130 Surr: 1,2-Dichloroethane-d4 0.48 0.5000 96.2 70 130

96.5

97.2

70

70

130

130

0.5000

0.5000

SampType: MS Sample ID 1609g64-010ams TestCode: EPA Method 8260B: Volatiles Client ID: TK 569-3 (38-39') Batch ID: 27796 RunNo: 37617 Prep Date: Analysis Date: 9/30/2016 SeqNo: 1170939 Units: mg/Kg **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Analyte Result Qual Benzene 0.63 0.016 0.6345 0.05975 89.2 49.2 155 0.87 0.032 0.6345 0.2082 104 52 154 Toluene 0.032 107 53.2 Chlorobenzene 0.68 0.6345 0 150 0 99.5 34.2 1,1-Dichloroethene 0.63 0.032 0.6345 163 Trichloroethene (TCE) 0.60 0.032 0.6345 0 94.6 48.2 151 Surr: Dibromofluoromethane 0.28 0.3173 88.5 70 130 Surr: 1,2-Dichloroethane-d4 91.6 70 0.29 0.3173 130 Surr: Toluene-d8 0.31 0.3173 98.1 70 130 99.3 Surr: 4-Bromofluorobenzene 0.32 0.3173 70 130

Sample ID 1609g64-010amsc	d SampTyp	SampType: MSD TestCode: EPA Method 8260B: Volatiles								
Client ID: TK 569-3 (38-39')	Batch I	D: 27	796	F	RunNo: 37617					
Prep Date:	Analysis Date: 9/30/2016			S	SeqNo: 1170940 Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.61	0.016	0.6345	0.05975	86.2	49.2	155	3.02	20	
Toluene	0.86	0.032	0.6345	0.2082	103	52	154	1.31	20	
Chlorobenzene	0.66	0.032	0.6345	0	105	53.2	150	1.85	20	
1,1-Dichloroethene	0.57	0.032	0.6345	0	90.1	34.2	163	9.89	20	
Trichloroethene (TCE)	0.56	0.032	0.6345	0	88.5	48.2	151	6.67	20	
Surr: Dibromofluoromethane	0.27		0.3173		84.3	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	0.28		0.3173		89.8	70	130	0	0	
Surr: Toluene-d8	0.31		0.3173		97.4	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.31		0.3173		98.2	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1609G64

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-27789	SampTy	SampType: MBLK TestCode: Method 8260B/5035LOW: VOLATILES							ES	
Client ID: PBS	Batch	ID: 27	789	F	RunNo: 3	7599				
Prep Date: 9/29/2016	Analysis Da	ate: 9 /	/30/2016	8	SeqNo: 1	170203	Units: %Re	С		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.67		10.00		96.7	70	130			
Surr: 4-Bromofluorobenzene	9.83		10.00		98.3	70	130			
Surr: Dibromofluoromethane	9.47		10.00		94.7	70	130			
Surr: Toluene-d8	9.82		10.00		98.2	70	130			
Sample ID LCS-27789	SampTy	ype: LC	s	TestCode: Method 8260B/5035LOW: VOLATILES						
Client ID: LCSS	Batch	ID: 27	789	F	RunNo: 3	7599				
D D / 2/22/22/2	A			_						

Client ID: LCSS	Batch ID: 27/89 Runno: 3/599					7599				
Prep Date: 9/29/2016	Analysis Date: 9/30/2016			S	SeqNo: 1	170204	Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10.2		10.00		102	70	130			
Surr: 4-Bromofluorobenzene	10.1		10.00		101	70	130			
Surr: Dibromofluoromethane	10.1		10.00		101	70	130			
Surr: Toluene-d8	9.94		10.00		99.4	70	130			

Sample ID LCSD-27789	SampT	SampType: LCSD TestCode: Method 8260B					B/5035LOW:	VOLATILI	ES	
Client ID: LCSS02	Batch	Batch ID: 27789 RunNo: 37599								
Prep Date: 9/29/2016	Analysis D	ate: 9 /	tte: 9/30/2016 SeqNo: 1170205 U					;		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.91		10.00		99.1	70	130	0	0	
Surr: 4-Bromofluorobenzene	10.1		10.00		101	70	130	0	0	
Surr: Dibromofluoromethane	9.84		10.00		98.4	70	130	0	0	
Surr: Toluene-d8	9.80		10.00		98.0	70	130	0	0	

Sample ID MB-27868	SampType: MBLK TestCode: Meth			ethod 8260	60B/5035LOW: VOLATILES						
Client ID: PBS	Batch	Batch ID: 27868			RunNo: 3	7658					
Prep Date: 10/4/2016	Analysis D	ate: 10	0/4/2016	1/2016 SeqNo: 1172683			Units: µg/K	Jnits: μg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Benzene	ND	2.00									
Toluene	ND	2.00									
Ethylbenzene	ND	2.00									
Methyl tert-butyl ether (MTBE)	ND	2.00									
1,2,4-Trimethylbenzene	ND	2.00									
1,3,5-Trimethylbenzene	ND	2.00									
1,2-Dichloroethane (EDC)	ND	2.00									
1,2-Dibromoethane (EDB)	ND	2.00									
Naphthalene	ND	2.00									
1-Methylnaphthalene	0.380	4.00								J	

Qualifiers:

Value exceeds Maximum Contaminant Level.

Sample Diluted Due to Matrix D

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits R

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

P

Sample pH Not In Range

Reporting Detection Limit RLSample container temperature is out of limit as specified Page 56 of 67

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-27868 SampType: MBLK TestCode: Method 8260B/5035LOW: VOLATILES Client ID: **PBS** Batch ID: 27868 RunNo: 37658 Prep Date: 10/4/2016 Analysis Date: 10/4/2016 SeqNo: 1172683 Units: µg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 2-Methylnaphthalene ND 4.00 0.690 J Acetone 10.0 ND Bromobenzene 2.00 Bromodichloromethane ND 2.00 Bromoform ND 2.00 Bromomethane ND 3.00 ND 10.0 2-Butanone ND 10.0 Carbon disulfide Carbon tetrachloride ND 2.00 Chlorobenzene ND 2.00 Chloroethane ND 2.00 ND 2.00 Chloroform Chloromethane ND 2.00 2-Chlorotoluene ND 2.00 4-Chlorotoluene ND 2.00 cis-1,2-DCE ND 2.00 ND 2.00 cis-1,3-Dichloropropene 1,2-Dibromo-3-chloropropane ND 2.00 Dibromochloromethane ND 2.00 Dibromomethane ND 2.00 1,2-Dichlorobenzene ND 2.00 1,3-Dichlorobenzene ND 2.00 1,4-Dichlorobenzene ND 2.00 Dichlorodifluoromethane ND 2.00 1,1-Dichloroethane ND 2.00 ND 2.00 1.1-Dichloroethene 1,2-Dichloropropane ND 2.00 1,3-Dichloropropane ND 2.00 2,2-Dichloropropane ND 2.00 2.00 1,1-Dichloropropene ND Hexachlorobutadiene ND 2.00 2-Hexanone ND 10.0 Isopropylbenzene ND 2.00 4-Isopropyltoluene ND 2.00 4-Methyl-2-pentanone ND 10.0 Methylene chloride ND 3.00 n-Butylbenzene ND 2.00 n-Propylbenzene ND 2.00 sec-Butylbenzene ND 2.00

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-27868	SampT	mpType: MBLK TestCode: Method 8260B/5035LOW: VOLATILES						ES			
Client ID: PBS	Batch	ID: 27 8	368	F	RunNo: 3	7658					
Prep Date: 10/4/2016	Analysis D	ate: 10	/4/2016	\$	SeqNo: 1	172683	Units: µg/K	µg/Кg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Styrene	ND	2.00									
tert-Butylbenzene	ND	2.00									
1,1,1,2-Tetrachloroethane	ND	2.00									
1,1,2,2-Tetrachloroethane	ND	2.00									
Tetrachloroethene (PCE)	ND	2.00									
trans-1,2-DCE	ND	2.00									
trans-1,3-Dichloropropene	ND	2.00									
1,2,3-Trichlorobenzene	ND	2.00									
1,2,4-Trichlorobenzene	ND	2.00									
1,1,1-Trichloroethane	ND	2.00									
1,1,2-Trichloroethane	ND	2.00									
Trichloroethene (TCE)	ND	2.00									
Trichlorofluoromethane	ND	2.00									
1,2,3-Trichloropropane	ND	2.00									
Vinyl chloride	ND	2.00									
Xylenes, Total	ND	2.00									
Surr: 1,2-Dichloroethane-d4	9.93		10.00		99.3	70	130				
Surr: 4-Bromofluorobenzene	10.0		10.00		100	70	130				
Surr: Dibromofluoromethane	9.88		10.00		98.8	70	130				
Surr: Toluene-d8	10.0		10.00		100	70	130				

Sample ID LCS-27868	SampT	SampType: LCS TestCode: Method 8260B/5035LOV						VOLATILI	ES	
Client ID: LCSS	Batcl	Batch ID: 27868 RunNo: 37658								
Prep Date: 10/4/2016	Analysis D	Date: 10	0/4/2016	S	SeqNo: 1172684 Units: μg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	9.14	2.00	10.00	0	91.4	70	130			
Toluene	9.27	2.00	10.00	0	92.7	70	130			
Chlorobenzene	9.42	2.00	10.00	0	94.2	70	130			
1,1-Dichloroethene	9.19	2.00	10.00	0	91.9	68	129			
Trichloroethene (TCE)	9.01	2.00	10.00	0	90.1	70	130			
Surr: 1,2-Dichloroethane-d4	10.1		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	10.2		10.00		102	70	130			
Surr: Dibromofluoromethane	9.89		10.00		98.9	70	130			
Surr: Toluene-d8	9.88		10.00		98.8	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

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P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID LCSD-27868	SampT	ype: LC	SD	Tes	tCode: M	ethod 8260	B/5035LOW:	VOLATILI	ES		
Client ID: LCSS02	Batch	n ID: 27 8	868	F	RunNo: 37658						
Prep Date: 10/4/2016	Analysis Date: 10/4/2016			S	SeqNo: 1	172759	Units: µg/K	g			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Benzene	9.35	2.00	10.00	0	93.5	70	130	2.27	20		
Toluene	9.49	2.00	10.00	0	94.9	70	130	2.35	20		
Chlorobenzene	9.63	2.00	10.00	0	96.3	70	130	2.20	20		
1,1-Dichloroethene	9.37	2.00	10.00	0	93.7	68	129	1.94	20		
Trichloroethene (TCE)	9.16	2.00	10.00	0	91.6	70	130	1.65	20		
Surr: 1,2-Dichloroethane-d4	10.1		10.00		101	70	130	0	0		
Surr: 4-Bromofluorobenzene	10.1		10.00		101	70	130	0	0		
Surr: Dibromofluoromethane	9.93		10.00		99.3	70	130	0	0		
Surr: Toluene-d8	9.97		10.00		99.7	70	130	0	0		

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: 10

1609G64 *01-Nov-16*

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID 1609G64-001AMS SampType: MS TestCode: EPA Method 8270C: Semivolatiles Client ID: TK 568-2 (22-24') Batch ID: 27836 RunNo: 37716 Prep Date: 10/3/2016 Analysis Date: 10/5/2016 SeqNo: 1174803 Units: mg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Acenaphthene 0.20 1.673 80.7 24.7 1.4 0 111 77.3 4-Chloro-3-methylphenol 2.6 0.50 3.337 0 21.7 108 0.20 85.0 21.9 2-Chlorophenol 2.8 3.337 0 103 1,4-Dichlorobenzene 1.3 0.20 1.673 0 76.4 15.8 93.9 2,4-Dinitrotoluene 1.2 0.50 1.673 0 71.0 19.9 101 N-Nitrosodi-n-propylamine 1.4 0.20 1.673 0 85.1 17.7 100 4-Nitrophenol 2.2 0.25 3.337 0 66.4 19.3 112 Pentachlorophenol 0.40 3.337 0 72.1 20.5 105 2.4 Phenol 2.9 0.20 3.337 0 86.4 23.1 101 0.20 0 84.3 Pyrene 1.4 1.673 18.3 113 1,2,4-Trichlorobenzene 1.4 0.20 1.673 82.5 21.8 108 81.1 97.9 Surr: 2-Fluorophenol 2.7 3.337 35 Surr: Phenol-d5 3.0 3.337 88.5 37.3 105 Surr: 2,4,6-Tribromophenol 2.8 3.337 82.5 35.6 118 Surr: Nitrobenzene-d5 75.9 41.2 107 1.3 1.673 Surr: 2-Fluorobiphenyl 1.3 1.673 79.7 41.9 119 Surr: 4-Terphenyl-d14 1.3 1.673 77.1 15 132

Sample ID 1609G64-001AMSD SampType: MSD TestCode: EPA Method 8270C: Semivolatiles

Client ID: **TK 568-2 (22-24')** Batch ID: **27836** RunNo: **37716**

Prep Date: 10/3/2016	Analysis D	ate: 10	0/5/2016	S	SeqNo: 1	174804	Units: mg/k	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.5	0.20	1.681	0	88.3	24.7	111	9.43	30.2	
4-Chloro-3-methylphenol	3.3	0.50	3.351	0	97.6	21.7	108	23.7	37.2	
2-Chlorophenol	3.0	0.20	3.351	0	88.3	21.9	103	4.29	48	
1,4-Dichlorobenzene	1.3	0.20	1.681	0	76.1	15.8	93.9	0.147	40.6	
2,4-Dinitrotoluene	1.3	0.50	1.681	0	78.9	19.9	101	10.9	47.7	
N-Nitrosodi-n-propylamine	1.5	0.20	1.681	0	90.8	17.7	100	6.86	52.5	
4-Nitrophenol	2.7	0.25	3.351	0	81.8	19.3	112	21.2	36.6	
Pentachlorophenol	2.7	0.40	3.351	0	81.3	20.5	105	12.5	65.5	
Phenol	3.1	0.20	3.351	0	91.4	23.1	101	6.04	44	
Pyrene	1.6	0.20	1.681	0	95.7	18.3	113	13.1	42.1	
1,2,4-Trichlorobenzene	1.6	0.20	1.681	0	92.6	21.8	108	11.9	31.5	
Surr: 2-Fluorophenol	2.7		3.351		81.2	35	97.9	0	0	
Surr: Phenol-d5	3.2		3.351		96.2	37.3	105	0	0	
Surr: 2,4,6-Tribromophenol	3.4		3.351		101	35.6	118	0	0	
Surr: Nitrobenzene-d5	1.5		1.681		87.7	41.2	107	0	0	
Surr: 2-Fluorobiphenyl	1.4		1.681		82.2	41.9	119	0	0	

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID 1609G64-001AMSD SampType: MSD TestCode: EPA Method 8270C: Semivolatiles

Client ID: TK 568-2 (22-24') Batch ID: 27836 RunNo: 37716

Prep Date: 10/3/2016 Analysis Date: 10/5/2016 SeqNo: 1174804 Units: mg/Kg

Analyte Result SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Surr: 4-Terphenyl-d14 1.681 86.8 1.5 15 132 0 0

Client ID: PBS	D - 4 - 1-						8270C: Semi	· o · a c · · · o o		
D D. t	Batch	ID: 278	336	F	RunNo: 3	7716				
Prep Date: 10/3/2016	Analysis D	ate: 10	/5/2016	8	SeqNo: 1	174815	Units: mg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	0.20								
Acenaphthylene	ND	0.20								
Aniline	ND	0.20								
Anthracene	ND	0.20								
Azobenzene	ND	0.20								
Benz(a)anthracene	ND	0.20								
Benzo(a)pyrene	ND	0.20								
Benzo(b)fluoranthene	ND	0.20								
Benzo(g,h,i)perylene	ND	0.20								
Benzo(k)fluoranthene	ND	0.20								
Benzoic acid	ND	0.50								
Benzyl alcohol	ND	0.20								
Bis(2-chloroethoxy)methane	ND	0.20								
Bis(2-chloroethyl)ether	ND	0.20								
Bis(2-chloroisopropyl)ether	ND	0.20								
Bis(2-ethylhexyl)phthalate	0.12	0.50								J
4-Bromophenyl phenyl ether	ND	0.20								
Butyl benzyl phthalate	ND	0.20								
Carbazole	ND	0.20								
4-Chloro-3-methylphenol	ND	0.50								
4-Chloroaniline	ND	0.50								
2-Chloronaphthalene	ND	0.25								
2-Chlorophenol	ND	0.20								
4-Chlorophenyl phenyl ether	ND	0.20								
Chrysene	ND	0.20								
Di-n-butyl phthalate	0.17	0.40								J
Di-n-octyl phthalate	ND	0.40								
Dibenz(a,h)anthracene	ND	0.20								
Dibenzofuran	ND	0.20								
1,2-Dichlorobenzene	ND	0.20								
1,3-Dichlorobenzene	ND	0.20								
1,4-Dichlorobenzene	ND	0.20								

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1609G64

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID mb-27836 SampType: MBLK TestCode: EPA Method 8270C: Semivolatiles Client ID: **PBS** Batch ID: 27836 RunNo: 37716 Prep Date: 10/3/2016 Analysis Date: 10/5/2016 SeqNo: 1174815 Units: mg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 3,3 - Dichlorobenzidine ND 0.25 0.21 Diethyl phthalate 0.20 ND 0.20 Dimethyl phthalate 2,4-Dichlorophenol ND 0.40 2,4-Dimethylphenol ND 0.30 4,6-Dinitro-2-methylphenol ND 0.40 2,4-Dinitrophenol 0.12 0.50 J 2,4-Dinitrotoluene ND 0.50 2,6-Dinitrotoluene ND 0.50 Fluoranthene ND 0.20 Fluorene ND 0.20 ND 0.20 Hexachlorobenzene Hexachlorobutadiene ND 0.20 Hexachlorocyclopentadiene ND 0.20 ND 0.20 Hexachloroethane Indeno(1,2,3-cd)pyrene ND 0.20 Isophorone ND 0.40 1-Methylnaphthalene ND 0.20 2-Methylnaphthalene ND 0.20 2-Methylphenol ND 0.40 0.20 3+4-Methylphenol ND N-Nitrosodi-n-propylamine ND 0.20 N-Nitrosodiphenylamine ND 0.20 Naphthalene ND 0.20 2-Nitroaniline ND 0.20 3-Nitroaniline ND 0.20 4-Nitroaniline ND 0.40 Nitrobenzene ND 0.40 2-Nitrophenol ND 0.20 4-Nitrophenol ND 0.25 Pentachlorophenol ND 0.40 Phenanthrene ND 0.20 Phenol ND 0.20 Pyrene ND 0.20 Pyridine ND 0.40 0.20 1,2,4-Trichlorobenzene ND 2,4,5-Trichlorophenol ND 0.20 2,4,6-Trichlorophenol ND 0.20 Surr: 2-Fluorophenol 2.5 3.330 74.4 35 97.9

Qualifiers:

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RLReporting Detection Limit W Sample container temperature is out of limit as specified Page 62 of 67

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID mb-27836	SampT	уре: МІ	BLK	Tes	tCode: El	PA Method	8270C: Semi	ivolatiles		
Client ID: PBS	Batch	1D: 27	836	F	RunNo: 3	7716				
Prep Date: 10/3/2016	Analysis D	ate: 1	0/5/2016	S	SeqNo: 1	174815	Units: mg/K	(g		
Analyte	Result	Result PQL SPK value			%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Phenol-d5	2.7		3.330		82.1	37.3	105			
Surr: 2,4,6-Tribromophenol	2.6		3.330		78.9	35.6	118			
Surr: Nitrobenzene-d5	1.2		1.670		72.9	41.2	107			
Surr: 2-Fluorobiphenyl	1.2	1.2 1.670			73.3	41.9	119			
Surr: 4-Terphenyl-d14	1.3				79.2	15	132			

Sample ID Ics-27836	SampT	SampType: LCS TestCode: EPA Method 8270C: Semivolatiles											
Client ID: LCSS	Batch	n ID: 27	836	F	RunNo: 3	7716							
Prep Date: 10/3/2016	Analysis D	ate: 10	0/5/2016	8	SeqNo: 1	174816	Units: mg/h	(g					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual			
Acenaphthene	1.4	0.20	1.670	0	85.0	45.8	99.8						
4-Chloro-3-methylphenol	2.7	0.50	3.330	0	81.5	51.5	103						
2-Chlorophenol	2.6	0.20	3.330	0	79.1	46.5	105						
1,4-Dichlorobenzene	1.2	0.20	1.670	0	73.6	45.5	103						
2,4-Dinitrotoluene	1.3	0.50	1.670	0	79.9	36	87.2						
N-Nitrosodi-n-propylamine	1.3	0.20	1.670	0	76.6	47.3	104						
4-Nitrophenol	2.2	0.25	3.330	0	66.8	47.3	95.3						
Pentachlorophenol	2.1	0.40	3.330	0	63.6	38.7	89.3						
Phenol	2.7	0.20	3.330	0	80.3	47.8	106						
Pyrene	1.3	0.20	1.670	0	79.3	33.4	105						
1,2,4-Trichlorobenzene	1.3	0.20	1.670	0	75.6	50.4	115						
Surr: 2-Fluorophenol	2.5		3.330		73.8	35	97.9						
Surr: Phenol-d5	2.6		3.330		77.7	37.3	105						
Surr: 2,4,6-Tribromophenol	2.7		3.330		80.1	35.6	118						
Surr: Nitrobenzene-d5	1.2		1.670		73.0 41.2 107								
Surr: 2-Fluorobiphenyl	1.2		1.670	72.9 41.9 119									
Surr: 4-Terphenyl-d14	1.2		1.670		74.2	15	132						

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-27844 SampType: MBLK TestCode: EPA Method 7471: Mercury

Client ID: PBS Batch ID: 27844 RunNo: 37670

Prep Date: 10/3/2016 Analysis Date: 10/4/2016 SeqNo: 1173007 Units: mg/Kg

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

Mercury ND 0.033

Sample ID LCS-27844 SampType: LCS TestCode: EPA Method 7471: Mercury

Client ID: LCSS Batch ID: 27844 RunNo: 37670

Prep Date: 10/3/2016 Analysis Date: 10/4/2016 SeqNo: 1173008 Units: mg/Kg

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

Mercury 0.17 0.033 0.1667 0 101 80 120

Sample ID 1609G64-001BMS SampType: MS TestCode: EPA Method 7471: Mercury

Client ID: TK 568-2 (22-24') Batch ID: 27844 RunNo: 37670

Prep Date: 10/3/2016 Analysis Date: 10/4/2016 SeqNo: 1173010 Units: mg/Kg

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

Mercury 0.17 0.032 0.1632 0.002795 102 75 125

Sample ID 1609G64-001BMSD SampType: MSD TestCode: EPA Method 7471: Mercury

Client ID: TK 568-2 (22-24') Batch ID: 27844 RunNo: 37670

Prep Date: 10/3/2016 Analysis Date: 10/4/2016 SeqNo: 1173011 Units: mg/Kg

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

Mercury 0.17 0.033 0.1664 0.002795 102 75 125 2.10 20

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

SampType: LCS

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-27843	SampT	ype: ME	BLK	Tes	tCode: El	PA Method	6010B: Soil I	Metals		
Client ID: PBS	Batch	ID: 27	843	F	RunNo: 3	7679				
Prep Date: 10/3/2016	Analysis D	ate: 10)/5/2016	S	SeqNo: 1	173421	Units: mg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	2.5								
Arsenic	ND	2.5								
Barium	ND	0.10								
Beryllium	ND	0.15								
Cadmium	ND	0.10								
Chromium	ND	0.30								
Cobalt	ND	0.30								
Iron	1.1	2.5								J
Lead	ND	0.25								
Manganese	0.091	0.10								J
Nickel	ND	0.50								
Selenium	ND	2.5								
Silver	ND	0.25								
Vanadium	ND	2.5								
Zinc	ND	2.5								

Client ID: LCSS	Batch	n ID: 27	843	F	RunNo: 3	7679				
Prep Date: 10/3/2016	Analysis D)ate: 10	0/5/2016	8	SeqNo: 1	173422	Units: mg/k	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	23	2.5	25.00	0	92.8	80	120			
Arsenic	23	2.5	25.00	0	93.3	80	120			
Barium	24	0.10	25.00	0	96.3	80	120			
Beryllium	25	0.15	25.00	0	99.2	80	120			
Cadmium	24	0.10	25.00	0	95.8	80	120			
Chromium	24	0.30	25.00	0	95.0	80	120			
Cobalt	23	0.30	25.00	0	92.3	80	120			
Iron	25	2.5	25.00	0	99.8	80	120			
Lead	23	0.25	25.00	0	90.1	80	120			
Manganese	24	0.10	25.00	0	96.3	80	120			
Nickel	23	0.50	25.00	0	92.8	80	120			
Selenium	22	2.5	25.00	0	88.1	80	120			
Silver	4.8	0.25	5.000	0	96.6	80	120			
Vanadium	26	2.5	25.00	0	102	80	120			
Zinc	24	2.5	25.00	0	94.1	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Sample ID LCS-27843

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

TestCode: EPA Method 6010B: Soil Metals

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Project:	OW-14 S	ource Inv.									
Sample ID	rb1	SampTy	pe: ME	BLK	Tes	tCode: El	PA Method	8015D Mod:	Gasoline	Range	
Client ID:	PBS	Batch I	D: G3	7582	F	RunNo: 3	7582				
Prep Date:		Analysis Da	te: 9 /	30/2016	S	SeqNo: 1	169692	Units: mg/h	K g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
_	ge Organics (GRO)	ND	5.0	500.0		00.4	70	400			
Surr: BFB		450		500.0		90.1	70	130			
Sample ID	2.5ug gro lcs	SampTy	pe: LC	S				8015D Mod:	Gasoline	Range	
Client ID:	LCSS	Batch I	D: G3	7582	F	RunNo: 3	7582				
Prep Date:		Analysis Da	te: 9/	29/2016	S	SeqNo: 1	169693	Units: mg/h	K g		
Analyte		Result	PQL		SPK Ref Val		LowLimit	HighLimit	%RPD	RPDLimit	Qual
_	ge Organics (GRO)	26	5.0	25.00	0	102	62.9	123			
Surr: BFB		460		500.0		92.9	70	130			
Sample ID	1609g64-001ams	SampTy	pe: MS	3	Tes	tCode: EI	PA Method	8015D Mod:	Gasoline	Range	
Client ID:	TK 568-2 (22-24')	Batch I	D: G3	7582	F	RunNo: 3	7582				
Prep Date:		Analysis Da	te: 9/	29/2016	S	SeqNo: 1	169695	Units: mg/h	K g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
_	ge Organics (GRO)	16	3.2	15.94	0	103	52.3	132			
Surr: BFB		300		318.9		93.5	70	130			
Sample ID	1609g64-001amsc	d SampTy	pe: MS	SD	Tes	tCode: El	PA Method	8015D Mod:	Gasoline	Range	
Client ID:	TK 568-2 (22-24')	Batch I	D: G3	7582	F	RunNo: 3	7582				
Prep Date:		Analysis Da	te: 9/	29/2016	S	SeqNo: 1	169696	Units: mg/k	K g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
_	ge Organics (GRO)	16	3.2	15.94	0	101	52.3	132	2.39	20	
Surr: BFB		300		318.9		95.2	70	130	0	0	
Sample ID	rb	SampTy	pe: ME	BLK	Tes	tCode: El	PA Method	8015D Mod:	Gasoline	Range	
Client ID:	PBS	Batch I	D: G3	7617	F	RunNo: 3	7617				
Prep Date:		Analysis Da	te: 9 /	30/2016	S	SeqNo: 1	170946	Units: mg/h	K g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang Surr: BFB	ge Organics (GRO)	ND 490	5.0	500.0		97.2	70	130			
Sample ID	2.5ug gro lcs	SampTy	pe: LC	:S	Tes	tCode: EI	PA Method	8015D Mod:	Gasoline	Range	
Client ID:		Batch I	D: G3	7617	F	RunNo: 3	7617				
Prep Date:		Analysis Da	te: 9 /	30/2016				Units: mg/l	K g		
Analyte		Result	PQL	SPK value	•			HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- D. Camala all Nat la Danas
- Page 66 of 67

- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

500

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Surr: BFB

Sample ID 2.5ug gro Ics SampType: LCS TestCode: EPA Method 8015D Mod: Gasoline Range

Client ID: LCSS Batch ID: G37617 RunNo: 37617

Prep Date: Analysis Date: 9/30/2016 SeqNo: 1170947 Units: mg/Kg

500.0

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	5.0	25.00	0	111	62.9	123			•

99.8

70

130

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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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

RcptNo: 1 Work Order Number: ≥1609G64 Western Refining Gallup Client Name: Received by/date: Logged By: **Ashley Gallegos** 9/29/2016 10:26:20 AM **Ashley Gallegos** Completed By: 09/29/16 Reviewed By: Chain of Custody No 🗌 Not Present Yes 🗌 1. Custody seals intact on sample bottles? No 🔲 Not Present Yes 🖈 2. Is Chain of Custody complete? <u>Courier</u> 3 How was the sample delivered? Log <u>In</u> No 🗌 NA 🖂 4. Was an attempt made to cool the samples? NA 🗌 No 🔲 Were all samples received at a temperature of >0° C to 6.0°C No \square 6. Sample(s) in proper container(s)? No \square Yes 7. Sufficient sample volume for indicated test(s)? No 🗌 8. Are samples (except VOA and ONG) properly preserved? Yes No 🗷 NA 🗆 Yes 🗌 9. Was preservative added to bottles? No VOA Vials No 📙 Yes 10. VOA vials have zero headspace? No 🗷 Yes 11. Were any sample containers received broken? # of preserved bottles checked for pH: Yes 🗷 No 12. Does paperwork match bottle labels? (<2 or >12 unless noted) (Note discrepancies on chain of custody) Adjusted? No ∐ 13. Are matrices correctly identified on Chain of Custody? No 🗌 14. Is it clear what analyses were requested? Checked by: No 🗌 Yes 🛃 15. Were all holding times able to be met? (If no, notify customer for authorization.) Special Handling (if applicable) NA 🐼 No 🔲 Yes 🗌 16. Was client notified of all discrepancies with this order? Person Notified: Date Phone Fax In Person By Whom: Via: ☐ eMail Regarding: Client Instructions: 17. Additional remarks: 18. Cooler Information Seal Intact | Seal No Seal Date Signed By Cooler No | Temp ºC | Condition Good Yes 1.2

	ANALYSIS LABORATORY		www.nallenvironmental.com	4901 Hawkins NE - Albuquerque, NM 87109	Tel 505-345-3075	Lax	Analysis Request	(0)	*;8(s) (s)	Oq,	() () () () () () () () ()	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	4 4 (GR	thoo thoo 310 310 510 ticio ticio ticio	901(9801(900)) (MetM) (Selson	ВТЕХ НОТ НОТ РОБР ВОВЛ ВОВЛ ВОВЛ ВОВЛ ВОВЛ ВОВЛ ВОВЛ ВОВ	\ \ \ \	<u> </u>	>	> >	>	>				>	ırks:		
Turn-Around Time:	Standard 🗆 Rush	roject Name:		OW-14 SOURCE INV.	Project #:			Project Manager:	120	FD RIEGE	DAYNE	Nes No	emberature 1.7.		Preservative HEAL No.	Type and # Type Type Type Type and # Type BTE T	3 NEAT	7						١ .	VIALS-2 5081	VIALS-2 MEOH	Received by: Date Time Remarks:	List 14 1886 1700	Received by: C Date Time
Chain-of-Custody Record			NERY	ailing Address 22 GIANT CROSSING RD	0720	50%	hone #: 505-722 -0217	WR. COM	A/QC Package:	Standard Kevel 4 (Full Validation)	1	□ Other	(EDD (Type) EXCEL		Sample Beginest ID		27/6 1115 SOIL TK 568-2 (22-24) TARS-	<i>/</i>		1125 SOIL TK 568-2 (28-30')		> ->	1135 SOIL TK 568-2(36-37')			Eylo - NEOH MEOH BLANK V	Time: Relinquished by:	16 6:45 Sty	ite: Time: Kelinquished by: Re

Chain	-of-CL		Turn-Around Time:	ime:				I	A	Ш	\geq	RO	Ž	HALL ENVIRONMENTAL	Q E	پ	
lient: Wester	N RE	WESTERN REFINING SWINC.	Standard	□ Rush				<	ANALYSIS	 	IS	5	BO	LABORATORY	0	X	
JALLUP REFINERY	REFI		Project Name:					5	www.hallenvironmental.com	illenvi	ronm	ental.c	E O				
ailing Address	22 6	ailing Address 2 GIANT CROSSING RD	OM-14	Source	INV.	7	901 F	4901 Hawkins NE	s NE	- Alb	ndner	Albuquerque, NM 87109	W 8	7109			
	GALL	GALLUP NM 87301	Project #:			,	Tel. 5(Tel. 505-345-3975	-3975		Fax 5(505-345-4107	5-410	7			
hone #:	505-7	505-722-0217								Analy	sis R	Analysis Request	st				
nail or Fax#:	ED. R	ED, RIEGE@ WNR. COM	Project Manager:	er:													
A/QC Package:									(SI			s.go		30			
Standard		Level 4 (Full Validation)	ED	ED RIEGE					MIS			nd 7.		IIN			
ccreditation NELAP	□ Other		Sampler: TR	TRACK PA	PAYNE			(1.81				2027:	(A	AYD			(NJ
(EDD (Type)	EXCE		ļΨ	erature: / ; ·				.tp						タ) Y)
Date Time	Matrix	Sample Request ID	Container I	Preservative Type	HEAL NO.	BTEX + MTI	TPH 8015B	odjeM) H9T	EDB (Metho	RCRA 8 Me	O,7) snoinA	8081 Pestici 8081 (VO	-imə2) 0728	METALS			Air Bubbles
7/10 1615	301L	TK510-1(10-12')	IARS-2	NEAT	500-		>					>	>	>			
	4		X	4694								1	V	1			
	143	\$		30B1 -								1	\				
0291 41/12	7105	TK570-1(32-34')	JARS-3	NEAT	<u> 100€</u>							7	7	7			
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27/16 1 630	105	TK570-1 (44-4 3) JARS-2	_	NEAT	-007		>	$\frac{1}{2}$	+		\dashv	<u> </u>	>,	7			
	_		VIAS-2	MEOH				\exists	+			<u> </u>	$ \bot $				
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	Relinquished by	ed by:	Received by											•			
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Air Bubbles (Y or N) **ANALYSIS LABORATORY** HALL ENVIRONMENTAL If necessary, samples softwitted 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 4901 Hawkins NE - Albuquerque, NM 87109 Fax 505-345-4107 (AOV-imə2) 0728 www.hallenvironmental.com **Analysis Request** (AOV) 809S8 8081 Pesticides / 8082 PCB's Anions (F,CI,NO3,NO2,PO4,SO4) RCRA 8 Metals Tel. 505-345-3975 (2MIS 0728 10 0188) s'HA9 EDB (Method 504.1) Remarks: BTEX + MTBE + TPH (Gas only) (1208) s'BMT BLEX + WIBE + 100001 g 00% 0580 000 Time HEAL No. SOURCE INV TAKEN FI ED RIESE Preservative ☐ Rush NEAT MEOH Type MEOH NEAT **3081** HOH HOH RACY Sample Temberature: NEAT 908 **308**1 Turn-Around Time: 子声らこの **が//R, LOM**|Project Manager: DN-14 Project Name: X Standard JARS-3 V (ALS -2 VIALS-2 Type and # VIALS-2 VIALS-2 IARS-3 Container VIALS-2 VIA15-2 JARS -2 Received by: Project #: Seceived by Sampler: POSTNERD TK 569-3(16-18') Level 4 (Full Validation) Sample Request ID TK569-3(24-26) TK569-3(38-39'. ient: Iestern Refining 9m, Inc. Chain-of-Custody Record GALLUP, NMB. ailing Address: 92 GzANT BALLUP REFINERY Relinquished by: 田XC匠 □ Other Matrix S 4/QC Package: Time [335 ロイカ 1600 EDD (Type) 8 nail or Fax#: screditation ille: Standard NELAP none #: 9/8 Date

GALLUP REFINERY МЕЗТЕВИ ВЕГІИІИВ **SOUTHWEST**, **INC.**

OM-14 SOURCE INVESTIGATION - SEPTEMBER 2016

METALS AND CYANIDE ANALYSES FOR SOIL SAMPLES

Analytical Method	etylenA
SW-846 method 6010/6020	YnomitnA
0209/0109 bodiem 948-WS	Arsenic
0209/0109 bontem 848-W2	muins8
0209/0109 bodiem 948-WS	Beryllium
SW-846 method 6010/6020	muimbeO
0209/0109 bodtəm 948-WS	muimordƏ
0209/0109 bodtəm 948-WS	Cobalt
5W-846 method 335.4/335.2 mod	Syanide
0209/0109 bodtəm 948-WS	реэд
1747/0747 bodfəm 848-WS	Mercury
0209/0109 bodtəm 948-WS	Nickel
0209/0109 bodjam 948-WS	muinələ2
0209/0109 bodiam 948-WS	Silver
0209/0109 bodtəm 948-WS	muibeneV
0209/0109 bodtəm 948-WS	əniZ
0209/0109 bodiem 948-WS	lkon
0209\0109 bodfam 948-W2	Manganese



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

December 01, 2016

Ed Riege Western Refining Company Rt. 3 Box 7

Gallup, NM 87301 TEL: (505) 722-0231

FAX

RE: OW-14 Source Inv. OrderNo.: 1610091

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 7 sample(s) on 10/3/2016 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued November 03, 2016.

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

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

Sincerely,<<>>>

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 568-1-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 9:15:00 AM

 Lab ID:
 1610091-001
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RAN	GE						Analyst: TOM	
Diesel Range Organics (DRO)	10	0.69	1.0		mg/L	1	10/4/2016 8:11:42 PM	27867
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	10/4/2016 8:11:42 PM	27867
Surr: DNOP	123	0	77.1-144		%Rec	1	10/4/2016 8:11:42 PM	27867
EPA METHOD 8015D: GASOLINE RA	NGE						Analyst: NSB	
Gasoline Range Organics (GRO)	140	5.1	10		mg/L	200	10/5/2016 1:13:10 PM	G37702
Surr: BFB	82.3	0	66.4-120		%Rec	200	10/5/2016 1:13:10 PM	G37702
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Fluoride	0.24	0.050	0.10		mg/L	1	10/6/2016 5:37:14 PM	R37783
Chloride	130	1.0	10		mg/L	20	10/6/2016 5:49:39 PM	R37783
Sulfate	35	0.14	0.50		mg/L	1	10/6/2016 5:37:14 PM	R37783
EPA METHOD 200.7: DISSOLVED ME	TALS						Analyst: MED	
Barium	1.8	0.013	0.020		mg/L	10	10/18/2016 4:46:27 PM	E38016
Beryllium	ND	0.00031	0.0020		mg/L	1	10/18/2016 12:10:37 PN	
Cadmium	ND	0.00075	0.0020		mg/L	1	10/18/2016 12:10:37 PN	1 C38016
Chromium	ND	0.0018	0.0060		mg/L	1	10/18/2016 12:10:37 PM	1 C38016
Cobalt	0.0022	0.00074	0.0060	J	mg/L	1	10/18/2016 12:10:37 PM	1 C38016
Iron	4.7	0.20	0.20	*	mg/L	10	10/18/2016 4:46:27 PM	E38016
Manganese	1.6	0.0032	0.020	*	mg/L	10	10/18/2016 4:46:27 PM	E38016
Nickel	0.031	0.0024	0.010		mg/L	1	10/18/2016 12:10:37 PM	1 C38016
Silver	ND	0.0028	0.0050		mg/L	1	10/18/2016 12:10:37 PM	1 C38016
Vanadium	0.0017	0.0013	0.050	J	mg/L	1	10/18/2016 12:10:37 PM	1 C38016
Zinc	0.0049	0.0028	0.010	J	mg/L	1	10/18/2016 12:10:37 PN	1 C38016
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	2.0	0.0066	0.010	*	mg/L	5	10/18/2016 5:25:59 PM	28061
Beryllium	0.00071	0.00036	0.0020	J	mg/L	1	10/17/2016 6:06:57 PM	28061
Cadmium	ND	0.0015	0.0020		mg/L	1	10/17/2016 6:06:57 PM	28061
Chromium	0.011	0.0027	0.0060		mg/L	1	10/17/2016 6:06:57 PM	28061
Cobalt	0.0046	0.0017	0.0060	J	mg/L	1	10/17/2016 6:06:57 PM	28061
Iron	10	1.0	1.0	*	mg/L	50	10/18/2016 5:27:52 PM	28061
Manganese	1.8	0.0016	0.010	*	mg/L	5	10/18/2016 5:25:59 PM	28061
Nickel	0.034	0.0031	0.010		mg/L	1	10/17/2016 6:06:57 PM	28061
Silver	ND	0.0028	0.0050		mg/L	1	10/17/2016 6:06:57 PM	28061
Vanadium	0.016	0.0013	0.050	J	mg/L	1	10/17/2016 6:06:57 PM	28061
Zinc	0.030	0.0027	0.010		mg/L	1	10/17/2016 6:06:57 PM	28061
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/19/2016 8:01:00 PM	A38075
Arsenic	0.0078	0.0028	0.020	J	mg/L	20	10/21/2016 9:10:44 PM	C38136

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Page 1 of 56

Date Reported: 12/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-1-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 9:15:00 AM

 Lab ID:
 1610091-001
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Lead	0.00041	0.00017	0.00050	J	mg/L	1	10/20/2016 7:42:19 PM	A38120
Selenium	0.0074	0.0042	0.020	J	mg/L	20	10/21/2016 9:10:44 PM	
EPA 200.8: METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/14/2016 1:41:59 PM	28061
Arsenic	0.0077	0.0011	0.0050		mg/L	5	10/14/2016 6:08:43 PM	28061
Lead	0.012	0.00017	0.00050		mg/L	1	10/14/2016 1:41:59 PM	28061
Selenium	0.013	0.0011	0.0050		mg/L	5	10/14/2016 6:08:43 PM	28061
EPA METHOD 245.1: MERCURY							Analyst: pmf	
Mercury	0.00016	0.000053	0.00020	J	mg/L	1	10/7/2016 12:18:08 PM	27928
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Acenaphthylene	ND	2.4	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Aniline	ND	2.4	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Anthracene	ND	2.5	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Azobenzene	ND	2.7	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Benz(a)anthracene	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Benzo(a)pyrene	ND	2.7	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Benzo(b)fluoranthene	ND	2.9	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Benzo(g,h,i)perylene	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Benzo(k)fluoranthene	ND	3.0	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Benzoic acid	41	2.6	20		μg/L	1	10/11/2016 2:36:30 PM	27882
Benzyl alcohol	ND	3.0	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Bis(2-chloroethoxy)methane	ND	2.8	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Bis(2-chloroethyl)ether	ND	2.7	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Bis(2-chloroisopropyl)ether	ND	1.9	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Bis(2-ethylhexyl)phthalate	6.0	2.6	10	J	μg/L	1	10/11/2016 2:36:30 PM	27882
4-Bromophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Butyl benzyl phthalate	ND	2.5	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Carbazole	2.6	2.3	10	J	μg/L	1	10/11/2016 2:36:30 PM	27882
4-Chloro-3-methylphenol	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882
4-Chloroaniline	ND	2.7	10		μg/L	1	10/11/2016 2:36:30 PM	27882
2-Chloronaphthalene	ND	2.3	10		μg/L	1	10/11/2016 2:36:30 PM	27882
2-Chlorophenol	ND	2.2	10		μg/L	1	10/11/2016 2:36:30 PM	27882
4-Chlorophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Chrysene	ND	2.8	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Di-n-butyl phthalate	ND	2.4	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Di-n-octyl phthalate	2.0	2.0	10	J	μg/L	1	10/11/2016 2:36:30 PM	27882
Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	10/11/2016 2:36:30 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 2 of 56

Date Reported: 12/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-1-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 9:15:00 AM

 Lab ID:
 1610091-001
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID			
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM 1 10/11/2016 2:36:30 PM 27882				
Dibenzofuran	ND	2.5	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
3,3'-Dichlorobenzidine	ND	2.4	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Diethyl phthalate	ND	2.7	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Dimethyl phthalate	3.1	2.4	10	J	μg/L	1	10/11/2016 2:36:30 PM	27882			
2,4-Dichlorophenol	ND	2.3	20		μg/L	1	10/11/2016 2:36:30 PM	27882			
2,4-Dimethylphenol	71	3.0	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
4,6-Dinitro-2-methylphenol	ND	1.8	20		μg/L	1	10/11/2016 2:36:30 PM	27882			
2,4-Dinitrophenol	ND	2.8	20		μg/L	1	10/11/2016 2:36:30 PM	27882			
2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
2,6-Dinitrotoluene	ND	2.7	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Fluoranthene	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Fluorene	ND	2.7	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Hexachlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Hexachlorobutadiene	ND	2.2	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Hexachlorocyclopentadiene	ND	2.3	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Hexachloroethane	ND	2.4	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Indeno(1,2,3-cd)pyrene	ND	3.0	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Isophorone	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
1-Methylnaphthalene	66	2.9	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
2-Methylnaphthalene	57	2.9	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
2-Methylphenol	65	2.5	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
3+4-Methylphenol	87	2.3	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
N-Nitrosodi-n-propylamine	ND	2.4	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
N-Nitrosodimethylamine	ND	2.2	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
N-Nitrosodiphenylamine	ND	2.3	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Naphthalene	210	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
2-Nitroaniline	ND	2.8	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
3-Nitroaniline	ND	2.9	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
4-Nitroaniline	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Nitrobenzene	ND	2.8	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
2-Nitrophenol	ND	2.4	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
4-Nitrophenol	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Pentachlorophenol	ND	2.3	20		μg/L	1	10/11/2016 2:36:30 PM	27882			
Phenanthrene	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Phenol	160	2.0	10		μg/L	1	10/11/2016 2:36:30 PM	27882			
Pyrene	ND	3.1	10		μg/L	1	10/11/2016 2:36:30 PM	27882			

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

Qualifiers:

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

Page 3 of 56

Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 568-1-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 9:15:00 AM

 Lab ID:
 1610091-001
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Pyridine	ND	2.2	10		μg/L	1	10/11/2016 2:36:30 PM	27882
1,2,4-Trichlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 2:36:30 PM	27882
2,4,5-Trichlorophenol	ND	2.2	10		μg/L	1	10/11/2016 2:36:30 PM	27882
2,4,6-Trichlorophenol	ND	2.4	10		μg/L	1	10/11/2016 2:36:30 PM	27882
Surr: 2-Fluorophenol	6.85	0	15-123	S	%Rec	1	10/11/2016 2:36:30 PM	27882
Surr: Phenol-d5	47.1	0	15-124		%Rec	1	10/11/2016 2:36:30 PM	27882
Surr: 2,4,6-Tribromophenol	70.5	0	18.4-134		%Rec	1	10/11/2016 2:36:30 PM	27882
Surr: Nitrobenzene-d5	56.8	0	28.8-134		%Rec	1	10/11/2016 2:36:30 PM	27882
Surr: 2-Fluorobiphenyl	57.3	0	35.9-125		%Rec	1	10/11/2016 2:36:30 PM	27882
Surr: 4-Terphenyl-d14	73.1	0	15-146		%Rec	1	10/11/2016 2:36:30 PM	27882
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Benzene	16000	19	200		μg/L	200	10/6/2016 1:53:00 PM	R37724
Toluene	10000	24	200		μg/L	200	10/6/2016 1:53:00 PM	R37724
Ethylbenzene	1800	2.2	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Methyl tert-butyl ether (MTBE)	10000	42	200		μg/L	200	10/6/2016 1:53:00 PM	R37724
1,2,4-Trimethylbenzene	1300	2.2	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,3,5-Trimethylbenzene	350	2.3	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,2-Dichloroethane (EDC)	ND	2.3	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,2-Dibromoethane (EDB)	57	2.2	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Naphthalene	280	1.9	40		μg/L	20	10/6/2016 2:16:00 PM	R37724
1-Methylnaphthalene	40	4.1	80	J	μg/L	20	10/6/2016 2:16:00 PM	R37724
2-Methylnaphthalene	59	3.2	80	J	μg/L	20	10/6/2016 2:16:00 PM	R37724
Acetone	140	98	200	J	μg/L	20	10/6/2016 2:16:00 PM	R37724
Bromobenzene	ND	2.0	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Bromodichloromethane	ND	2.8	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Bromoform	ND	2.0	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Bromomethane	ND	16	60		μg/L	20	10/6/2016 2:16:00 PM	R37724
2-Butanone	77	15	200	J	μg/L	20	10/6/2016 2:16:00 PM	R37724
Carbon disulfide	ND	12	200		μg/L	20	10/6/2016 2:16:00 PM	R37724
Carbon Tetrachloride	ND	2.2	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Chlorobenzene	ND	2.3	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Chloroethane	ND	3.8	40		μg/L	20	10/6/2016 2:16:00 PM	R37724
Chloroform	ND	1.8	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Chloromethane	ND	4.3	60		μg/L	20	10/6/2016 2:16:00 PM	R37724
2-Chlorotoluene	ND	8.0	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
4-Chlorotoluene	ND	2.6	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
cis-1,2-DCE	ND	2.5	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
cis-1,3-Dichloropropene	ND	2.1	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,2-Dibromo-3-chloropropane	ND	4.7	40		μg/L	20	10/6/2016 2:16:00 PM	R37724

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 568-1-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 9:15:00 AM

 Lab ID:
 1610091-001
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Dibromochloromethane	ND	1.7	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Dibromomethane	ND	2.4	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,2-Dichlorobenzene	ND	8.0	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,3-Dichlorobenzene	ND	2.9	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,4-Dichlorobenzene	ND	2.9	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Dichlorodifluoromethane	ND	7.1	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,1-Dichloroethane	ND	2.2	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,1-Dichloroethene	ND	2.1	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,2-Dichloropropane	32	2.2	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,3-Dichloropropane	ND	3.1	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
2,2-Dichloropropane	ND	3.3	40		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,1-Dichloropropene	ND	2.7	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Hexachlorobutadiene	ND	4.0	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
2-Hexanone	ND	17	200		μg/L	20	10/6/2016 2:16:00 PM	R37724
Isopropylbenzene	43	2.1	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
4-Isopropyltoluene	6.4	2.8	20	J	μg/L	20	10/6/2016 2:16:00 PM	R37724
4-Methyl-2-pentanone	ND	8.6	200		μg/L	20	10/6/2016 2:16:00 PM	R37724
Methylene Chloride	ND	3.7	60		μg/L	20	10/6/2016 2:16:00 PM	R37724
n-Butylbenzene	14	3.2	60	J	μg/L	20	10/6/2016 2:16:00 PM	R37724
n-Propylbenzene	160	2.6	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
sec-Butylbenzene	7.8	2.5	20	J	μg/L	20	10/6/2016 2:16:00 PM	R37724
Styrene	ND	2.2	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
tert-Butylbenzene	ND	2.3	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,1,1,2-Tetrachloroethane	ND	2.2	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,1,2,2-Tetrachloroethane	ND	2.6	40		μg/L	20	10/6/2016 2:16:00 PM	R37724
Tetrachloroethene (PCE)	ND	3.0	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
trans-1,2-DCE	ND	8.0	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
trans-1,3-Dichloropropene	ND	2.1	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,2,3-Trichlorobenzene	ND	2.3	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,2,4-Trichlorobenzene	ND	2.7	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,1,1-Trichloroethane	ND	1.8	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,1,2-Trichloroethane	ND	2.5	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Trichloroethene (TCE)	ND	3.5	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Trichlorofluoromethane	ND	4.1	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
1,2,3-Trichloropropane	ND	4.0	40		μg/L	20	10/6/2016 2:16:00 PM	R37724
Vinyl chloride	ND	3.9	20		μg/L	20	10/6/2016 2:16:00 PM	R37724
Xylenes, Total	10000	73	300		μg/L	200	10/6/2016 1:53:00 PM	R37724
Surr: 1,2-Dichloroethane-d4	96.5	0	70-130		%Rec	20	10/6/2016 2:16:00 PM	R37724
Surr: 4-Bromofluorobenzene	101	0	70-130		%Rec	20	10/6/2016 2:16:00 PM	R37724

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical ReportLab Order **1610091**

Date Reported: 12/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company Client Sample ID: TK 568-1-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 9:15:00 AM

 Lab ID:
 1610091-001
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Surr: Dibromofluoromethane	94.8	0	70-130		%Rec	20	10/6/2016 2:16:00 PM	R37724
Surr: Toluene-d8	101	0	70-130		%Rec	20	10/6/2016 2:16:00 PM	R37724
EPA 335.4: TOTAL CYANIDE SUBBED							Analyst: SUB	
Cyanide	ND	0.0100	0.0100		mg/L	1	10/11/2016	R38822

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

Qualifiers: Value exceeds Maximum Contaminant Level. В Analyte detected in the associated Method Blank D Sample Diluted Due to Matrix Ε Value above quantitation range Η Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits Page 6 of 56 ND Not Detected at the Reporting Limit P Sample pH Not In Range RPD outside accepted recovery limits RLReporting Detection Limit % Recovery outside of range due to dilution or matrix Sample container temperature is out of limit as specified

Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 568-2-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 8:30:00 AM

 Lab ID:
 1610091-002
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANG	GE .						Analyst: TOM	
Diesel Range Organics (DRO)	12	0.69	1.0		mg/L	1	10/4/2016 8:33:17 PM	27867
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	10/4/2016 8:33:17 PM	27867
Surr: DNOP	135	0	77.1-144		%Rec	1	10/4/2016 8:33:17 PM	27867
EPA METHOD 8015D: GASOLINE RAN	GE						Analyst: NSB	
Gasoline Range Organics (GRO)	140	5.1	10		mg/L	200	10/5/2016 1:37:26 PM	G37702
Surr: BFB	87.2	0	66.4-120		%Rec	200	10/5/2016 1:37:26 PM	G37702
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Fluoride	0.37	0.050	0.10		mg/L	1	10/6/2016 6:02:03 PM	R37783
Chloride	150	1.0	10		mg/L	20	10/6/2016 6:14:27 PM	R37783
Sulfate	5.8	0.14	0.50		mg/L	1	10/6/2016 6:02:03 PM	R37783
EPA METHOD 200.7: DISSOLVED MET	ALS						Analyst: MED	
Barium	3.6	0.0066	0.010	*	mg/L	5	10/18/2016 4:48:28 PM	E38016
Beryllium	ND	0.00031	0.0020		mg/L	1	10/18/2016 12:17:57 PM	
Cadmium	ND	0.00075	0.0020		mg/L	1	10/18/2016 12:17:57 PM	
Chromium	ND	0.0018	0.0060		mg/L	1	10/18/2016 12:17:57 PM	1 C38016
Cobalt	0.0016	0.00074	0.0060	J	mg/L	1	10/18/2016 12:17:57 PM	1 C38016
Iron	0.92	0.020	0.020	*	mg/L	1	10/18/2016 12:17:57 PM	1 C38016
Manganese	1.7	0.0016	0.010	*	mg/L	5	10/18/2016 4:48:28 PM	E38016
Nickel	0.069	0.0024	0.010		mg/L	1	10/18/2016 12:17:57 PM	1 C38016
Silver	ND	0.0028	0.0050		mg/L	1	10/18/2016 12:17:57 PM	1 C38016
Vanadium	0.0047	0.0013	0.050	J	mg/L	1	10/18/2016 12:17:57 PM	1 C38016
Zinc	0.0093	0.0028	0.010	J	mg/L	1	10/18/2016 12:17:57 PM	1 C38016
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	3.8	0.0066	0.010	*	mg/L	5	10/18/2016 5:29:50 PM	28061
Beryllium	ND	0.00036	0.0020		mg/L	1	10/17/2016 6:08:47 PM	28061
Cadmium	ND	0.0015	0.0020		mg/L	1	10/17/2016 6:08:47 PM	28061
Chromium	ND	0.0027	0.0060		mg/L	1	10/17/2016 6:08:47 PM	28061
Cobalt	ND	0.0017	0.0060		mg/L	1	10/17/2016 6:08:47 PM	28061
Iron	3.5	0.10	0.10	*	mg/L	5	10/18/2016 5:29:50 PM	28061
Manganese	1.8	0.0016	0.010	*	mg/L	5	10/18/2016 5:29:50 PM	28061
Nickel	0.070	0.0031	0.010		mg/L	1	10/17/2016 6:08:47 PM	28061
Silver	ND	0.0028	0.0050		mg/L	1	10/17/2016 6:08:47 PM	28061
Vanadium	0.0038	0.0013	0.050	J	mg/L	1	10/17/2016 6:08:47 PM	28061
Zinc	0.0082	0.0027	0.010	J	mg/L	1	10/17/2016 6:08:47 PM	28061
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/19/2016 8:06:09 PM	A38075
Arsenic	0.0029	0.00069	0.0050	J	mg/L	5	10/20/2016 7:51:28 PM	A38120

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 568-2-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 8:30:00 AM

 Lab ID:
 1610091-002
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Lead	ND	0.00017	0.00050		mg/L	1	10/20/2016 7:48:25 PM	A38120
Selenium	0.0056	0.0021	0.010	J	mg/L	10	10/21/2016 9:26:13 PM	C38136
EPA 200.8: METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/14/2016 1:47:07 PM	28061
Arsenic	0.0049	0.0011	0.0050	J	mg/L	5	10/14/2016 6:14:44 PM	
Lead	0.00031	0.00017	0.00050	J	mg/L	1	10/14/2016 1:47:07 PM	28061
Selenium	0.011	0.0011	0.0050		mg/L	5	10/14/2016 6:14:44 PM	28061
EPA METHOD 245.1: MERCURY							Analyst: pmf	
Mercury	0.00015	0.000053	0.00020	J	mg/L	1	10/7/2016 12:25:12 PM	27928
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Acenaphthylene	ND	2.4	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Aniline	ND	2.4	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Anthracene	ND	2.5	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Azobenzene	ND	2.7	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Benz(a)anthracene	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Benzo(a)pyrene	ND	2.7	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Benzo(b)fluoranthene	ND	2.9	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Benzo(g,h,i)perylene	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Benzo(k)fluoranthene	ND	3.0	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Benzoic acid	45	2.6	20		μg/L	1	10/11/2016 3:04:41 PM	27882
Benzyl alcohol	ND	3.0	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Bis(2-chloroethoxy)methane	ND	2.8	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Bis(2-chloroethyl)ether	ND	2.7	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Bis(2-chloroisopropyl)ether	ND	1.9	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Bis(2-ethylhexyl)phthalate	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
4-Bromophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Butyl benzyl phthalate	ND	2.5	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Carbazole	5.0	2.3	10	J	μg/L	1	10/11/2016 3:04:41 PM	27882
4-Chloro-3-methylphenol	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
4-Chloroaniline	ND	2.7	10		μg/L	1	10/11/2016 3:04:41 PM	27882
2-Chloronaphthalene	ND	2.3	10		μg/L	1	10/11/2016 3:04:41 PM	27882
2-Chlorophenol	ND	2.2	10		μg/L	1	10/11/2016 3:04:41 PM	27882
4-Chlorophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Chrysene	ND	2.8	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Di-n-butyl phthalate	ND	2.4	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Di-n-octyl phthalate	ND	2.0	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	10/11/2016 3:04:41 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 8 of 56

Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 568-2-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 8:30:00 AM

 Lab ID:
 1610091-002
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Dibenzofuran	ND	2.5	10		μg/L	1	10/11/2016 3:04:41 PM	27882
1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 3:04:41 PM	27882
1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 3:04:41 PM	27882
1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	10/11/2016 3:04:41 PM	27882
3,3'-Dichlorobenzidine	ND	2.4	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Diethyl phthalate	ND	2.7	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Dimethyl phthalate	3.0	2.4	10	J	μg/L	1	10/11/2016 3:04:41 PM	27882
2,4-Dichlorophenol	ND	2.3	20		μg/L	1	10/11/2016 3:04:41 PM	27882
2,4-Dimethylphenol	34	3.0	10		μg/L	1	10/11/2016 3:04:41 PM	27882
4,6-Dinitro-2-methylphenol	ND	1.8	20		μg/L	1	10/11/2016 3:04:41 PM	27882
2,4-Dinitrophenol	ND	2.8	20		μg/L	1	10/11/2016 3:04:41 PM	27882
2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	10/11/2016 3:04:41 PM	27882
2,6-Dinitrotoluene	ND	2.7	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Fluoranthene	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Fluorene	3.1	2.7	10	J	μg/L	1	10/11/2016 3:04:41 PM	27882
Hexachlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Hexachlorobutadiene	ND	2.2	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Hexachlorocyclopentadiene	ND	2.3	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Hexachloroethane	ND	2.4	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Indeno(1,2,3-cd)pyrene	ND	3.0	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Isophorone	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
1-Methylnaphthalene	80	2.9	10		μg/L	1	10/11/2016 3:04:41 PM	27882
2-Methylnaphthalene	49	2.9	10		μg/L	1	10/11/2016 3:04:41 PM	27882
2-Methylphenol	23	2.5	10		μg/L	1	10/11/2016 3:04:41 PM	27882
3+4-Methylphenol	26	2.3	10		μg/L	1	10/11/2016 3:04:41 PM	27882
N-Nitrosodi-n-propylamine	ND	2.4	10		μg/L	1	10/11/2016 3:04:41 PM	27882
N-Nitrosodimethylamine	ND	2.2	10		μg/L	1	10/11/2016 3:04:41 PM	27882
N-Nitrosodiphenylamine	ND	2.3	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Naphthalene	130	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
2-Nitroaniline	ND	2.8	10		μg/L	1	10/11/2016 3:04:41 PM	27882
3-Nitroaniline	ND	2.9	10		μg/L	1	10/11/2016 3:04:41 PM	27882
4-Nitroaniline	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Nitrobenzene	ND	2.8	10		μg/L	1	10/11/2016 3:04:41 PM	27882
2-Nitrophenol	ND	2.4	10		μg/L	1	10/11/2016 3:04:41 PM	27882
4-Nitrophenol	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Pentachlorophenol	ND	2.3	20		μg/L	1	10/11/2016 3:04:41 PM	27882
Phenanthrene	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Phenol	69	2.0	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Pyrene	ND	3.1	10		μg/L	1	10/11/2016 3:04:41 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 9 of 56

Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 568-2-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 8:30:00 AM

 Lab ID:
 1610091-002
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Pyridine	ND	2.2	10		μg/L	1	10/11/2016 3:04:41 PM	27882
1,2,4-Trichlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 3:04:41 PM	27882
2,4,5-Trichlorophenol	ND	2.2	10		μg/L	1	10/11/2016 3:04:41 PM	27882
2,4,6-Trichlorophenol	ND	2.4	10		μg/L	1	10/11/2016 3:04:41 PM	27882
Surr: 2-Fluorophenol	10.9	0	15-123	S	%Rec	1	10/11/2016 3:04:41 PM	27882
Surr: Phenol-d5	37.7	0	15-124		%Rec	1	10/11/2016 3:04:41 PM	27882
Surr: 2,4,6-Tribromophenol	59.5	0	18.4-134		%Rec	1	10/11/2016 3:04:41 PM	27882
Surr: Nitrobenzene-d5	51.8	0	28.8-134		%Rec	1	10/11/2016 3:04:41 PM	27882
Surr: 2-Fluorobiphenyl	49.0	0	35.9-125		%Rec	1	10/11/2016 3:04:41 PM	27882
Surr: 4-Terphenyl-d14	60.3	0	15-146		%Rec	1	10/11/2016 3:04:41 PM	27882
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Benzene	28000	48	500		μg/L	500	10/6/2016 3:49:00 PM	R37724
Toluene	9300	59	500		μg/L	500	10/6/2016 3:49:00 PM	R37724
Ethylbenzene	1600	5.6	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Methyl tert-butyl ether (MTBE)	140	11	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,2,4-Trimethylbenzene	850	5.5	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,3,5-Trimethylbenzene	190	5.8	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,2-Dichloroethane (EDC)	ND	5.8	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,2-Dibromoethane (EDB)	ND	5.6	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Naphthalene	220	4.6	100		μg/L	50	10/6/2016 4:12:00 PM	R37724
1-Methylnaphthalene	67	10	200	J	μg/L	50	10/6/2016 4:12:00 PM	R37724
2-Methylnaphthalene	76	7.9	200	J	μg/L	50	10/6/2016 4:12:00 PM	R37724
Acetone	ND	250	500		μg/L	50	10/6/2016 4:12:00 PM	R37724
Bromobenzene	ND	4.9	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Bromodichloromethane	ND	7.0	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Bromoform	ND	5.1	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Bromomethane	ND	39	150		μg/L	50	10/6/2016 4:12:00 PM	R37724
2-Butanone	ND	37	500		μg/L	50	10/6/2016 4:12:00 PM	R37724
Carbon disulfide	ND	30	500		μg/L	50	10/6/2016 4:12:00 PM	R37724
Carbon Tetrachloride	ND	5.4	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Chlorobenzene	ND	5.7	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Chloroethane	ND	9.6	100		μg/L	50	10/6/2016 4:12:00 PM	R37724
Chloroform	ND	4.4	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Chloromethane	ND	11	150		μg/L	50	10/6/2016 4:12:00 PM	R37724
2-Chlorotoluene	ND	20	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
4-Chlorotoluene	ND	6.4	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
cis-1,2-DCE	ND	6.2	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
cis-1,3-Dichloropropene	ND	5.3	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,2-Dibromo-3-chloropropane	ND	12	100		μg/L	50	10/6/2016 4:12:00 PM	R37724

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 12/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 568-2-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 8:30:00 AM

 Lab ID:
 1610091-002
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Dibromochloromethane	ND	4.3	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Dibromomethane	ND	6.0	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,2-Dichlorobenzene	ND	20	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,3-Dichlorobenzene	ND	7.2	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,4-Dichlorobenzene	ND	7.1	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Dichlorodifluoromethane	ND	18	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,1-Dichloroethane	ND	5.4	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,1-Dichloroethene	ND	5.4	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,2-Dichloropropane	ND	5.5	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,3-Dichloropropane	ND	7.8	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
2,2-Dichloropropane	ND	8.3	100		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,1-Dichloropropene	ND	6.7	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Hexachlorobutadiene	ND	9.9	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
2-Hexanone	ND	42	500		μg/L	50	10/6/2016 4:12:00 PM	R37724
Isopropylbenzene	74	5.2	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
4-Isopropyltoluene	16	7.0	50	J	μg/L	50	10/6/2016 4:12:00 PM	R37724
4-Methyl-2-pentanone	ND	21	500		μg/L	50	10/6/2016 4:12:00 PM	R37724
Methylene Chloride	ND	9.4	150		μg/L	50	10/6/2016 4:12:00 PM	R37724
n-Butylbenzene	18	8.0	150	J	μg/L	50	10/6/2016 4:12:00 PM	R37724
n-Propylbenzene	140	6.6	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
sec-Butylbenzene	17	6.2	50	J	μg/L	50	10/6/2016 4:12:00 PM	R37724
Styrene	ND	5.5	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
tert-Butylbenzene	ND	5.8	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,1,1,2-Tetrachloroethane	ND	5.6	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,1,2,2-Tetrachloroethane	ND	6.4	100		μg/L	50	10/6/2016 4:12:00 PM	R37724
Tetrachloroethene (PCE)	ND	7.6	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
trans-1,2-DCE	ND	20	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
trans-1,3-Dichloropropene	ND	5.2	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,2,3-Trichlorobenzene	ND	5.6	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,2,4-Trichlorobenzene	ND	6.6	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,1,1-Trichloroethane	ND	4.6	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,1,2-Trichloroethane	ND	6.4	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Trichloroethene (TCE)	ND	8.8	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Trichlorofluoromethane	ND	10	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
1,2,3-Trichloropropane	ND	10	100		μg/L	50	10/6/2016 4:12:00 PM	R37724
Vinyl chloride	ND	9.8	50		μg/L	50	10/6/2016 4:12:00 PM	R37724
Xylenes, Total	5900	18	75		μg/L	50	10/6/2016 4:12:00 PM	R37724
Surr: 1,2-Dichloroethane-d4	97.3	0	70-130		%Rec	50	10/6/2016 4:12:00 PM	R37724
Surr: 4-Bromofluorobenzene	101	0	70-130		%Rec	50	10/6/2016 4:12:00 PM	R37724

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical ReportLab Order **1610091**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 568-2-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 8:30:00 AM

 Lab ID:
 1610091-002
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Surr: Dibromofluoromethane	96.0	0	70-130		%Rec	50	10/6/2016 4:12:00 PM	R37724
Surr: Toluene-d8	100	0	70-130		%Rec	50	10/6/2016 4:12:00 PM	R37724
EPA 335.4: TOTAL CYANIDE SUBBED							Analyst: SUB	
Cyanide	ND	0.0100	0.0100		mg/L	1	10/11/2016	R38822

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 12 of 56

Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 569-3-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 7:45:00 AM

 Lab ID:
 1610091-003
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANG	E						Analyst: TOM	
Diesel Range Organics (DRO)	21	0.69	1.0		mg/L	1	10/4/2016 8:55:00 PM	27867
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	10/4/2016 8:55:00 PM	27867
Surr: DNOP	126	0	77.1-144		%Rec	1	10/4/2016 8:55:00 PM	27867
EPA METHOD 8015D: GASOLINE RANG	GE						Analyst: NSB	
Gasoline Range Organics (GRO)	170	5.1	10		mg/L	200	10/5/2016 2:01:42 PM	G37702
Surr: BFB	94.7	0	66.4-120		%Rec	200	10/5/2016 2:01:42 PM	G37702
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Fluoride	0.44	0.050	0.10		mg/L	1	10/6/2016 6:26:51 PM	R37783
Chloride	140	1.0	10		mg/L	20	10/6/2016 6:39:17 PM	R37783
Sulfate	3.1	0.14	0.50		mg/L	1	10/6/2016 6:26:51 PM	R37783
EPA METHOD 200.7: DISSOLVED META	ALS						Analyst: MED	
Barium	3.2	0.0066	0.010	*	mg/L	5	10/18/2016 4:57:45 PM	E38016
Beryllium	ND	0.00031	0.0020		mg/L	1	10/18/2016 12:19:38 PN	1 C38016
Cadmium	ND	0.00075	0.0020		mg/L	1	10/18/2016 12:19:38 PN	1 C38016
Chromium	ND	0.0018	0.0060		mg/L	1	10/18/2016 12:19:38 PN	1 C38016
Cobalt	0.0048	0.00074	0.0060	J	mg/L	1	10/18/2016 12:19:38 PM	1 C38016
Iron	3.9	0.10	0.10	*	mg/L	5	10/18/2016 4:57:45 PM	E38016
Manganese	1.6	0.0016	0.010	*	mg/L	5	10/18/2016 4:57:45 PM	E38016
Nickel	0.074	0.0024	0.010		mg/L	1	10/18/2016 12:19:38 PM	1 C38016
Silver	ND	0.0028	0.0050		mg/L	1	10/18/2016 12:19:38 PM	1 C38016
Vanadium	0.0048	0.0013	0.050	J	mg/L	1	10/18/2016 12:19:38 PN	1 C38016
Zinc	0.0095	0.0028	0.010	J	mg/L	1	10/18/2016 12:19:38 PN	1 C38016
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	4.2	0.0066	0.010	*	mg/L	5	10/18/2016 5:31:51 PM	28061
Beryllium	ND	0.00036	0.0020		mg/L	1	10/17/2016 6:10:29 PM	28061
Cadmium	ND	0.0015	0.0020		mg/L	1	10/17/2016 6:10:29 PM	28061
Chromium	ND	0.0027	0.0060		mg/L	1	10/17/2016 6:10:29 PM	28061
Cobalt	0.0044	0.0017	0.0060	J	mg/L	1	10/17/2016 6:10:29 PM	28061
Iron	8.2	0.20	0.20	*	mg/L	10	10/18/2016 5:33:44 PM	28061
Manganese	1.9	0.0016	0.010	*	mg/L	5	10/18/2016 5:31:51 PM	28061
Nickel	0.082	0.0031	0.010		mg/L	1	10/17/2016 6:10:29 PM	28061
Silver	ND	0.0028	0.0050		mg/L	1	10/17/2016 6:10:29 PM	28061
Vanadium	0.0074	0.0013	0.050	J	mg/L	1	10/17/2016 6:10:29 PM	28061
Zinc	0.013	0.0027	0.010		mg/L	1	10/17/2016 6:10:29 PM	28061
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/19/2016 8:11:17 PM	A38075
Arsenic	0.0034	0.00014	0.0010		mg/L	1	10/20/2016 7:54:31 PM	A38120

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 569-3-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 7:45:00 AM

 Lab ID:
 1610091-003
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Lead	ND	0.00017	0.00050		mg/L	1	10/20/2016 7:54:31 PM	A38120
Selenium	0.0052	0.0021	0.010	J	mg/L	10	10/21/2016 9:31:21 PM	C38136
EPA 200.8: METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/14/2016 1:52:16 PM	28061
Arsenic	0.0080	0.0042	0.020	J	mg/L	20	10/14/2016 6:23:45 PM	28061
Lead	0.0019	0.00017	0.00050		mg/L	1	10/14/2016 1:52:16 PM	28061
Selenium	0.010	0.0011	0.0050		mg/L	5	10/14/2016 6:20:45 PM	28061
EPA METHOD 245.1: MERCURY							Analyst: pmf	
Mercury	0.00012	0.000053	0.00020	J	mg/L	1	10/7/2016 12:27:11 PM	27928
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Acenaphthylene	ND	2.4	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Aniline	ND	2.4	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Anthracene	ND	2.5	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Azobenzene	ND	2.7	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Benz(a)anthracene	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Benzo(a)pyrene	ND	2.7	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Benzo(b)fluoranthene	ND	2.9	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Benzo(g,h,i)perylene	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Benzo(k)fluoranthene	ND	3.0	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Benzoic acid	68	2.6	20		μg/L	1	10/11/2016 3:32:45 PM	27882
Benzyl alcohol	ND	3.0	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Bis(2-chloroethoxy)methane	ND	2.8	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Bis(2-chloroethyl)ether	ND	2.7	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Bis(2-chloroisopropyl)ether	ND	1.9	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Bis(2-ethylhexyl)phthalate	7.8	2.6	10	J	μg/L	1	10/11/2016 3:32:45 PM	27882
4-Bromophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Butyl benzyl phthalate	ND	2.5	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Carbazole	ND	2.3	10		μg/L	1	10/11/2016 3:32:45 PM	27882
4-Chloro-3-methylphenol	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
4-Chloroaniline	ND	2.7	10		μg/L	1	10/11/2016 3:32:45 PM	27882
2-Chloronaphthalene	ND	2.3	10		μg/L	1	10/11/2016 3:32:45 PM	27882
2-Chlorophenol	ND	2.2	10		μg/L	1	10/11/2016 3:32:45 PM	27882
4-Chlorophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Chrysene	ND	2.8	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Di-n-butyl phthalate	ND	2.4	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Di-n-octyl phthalate	ND	2.0	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	10/11/2016 3:32:45 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 569-3-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 7:45:00 AM

 Lab ID:
 1610091-003
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Dibenzofuran	ND	2.5	10		μg/L	1	10/11/2016 3:32:45 PM	27882
1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 3:32:45 PM	27882
1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 3:32:45 PM	27882
1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	10/11/2016 3:32:45 PM	27882
3,3'-Dichlorobenzidine	ND	2.4	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Diethyl phthalate	3.4	2.7	10	J	μg/L	1	10/11/2016 3:32:45 PM	27882
Dimethyl phthalate	31	2.4	10		μg/L	1	10/11/2016 3:32:45 PM	27882
2,4-Dichlorophenol	ND	2.3	20		μg/L	1	10/11/2016 3:32:45 PM	27882
2,4-Dimethylphenol	97	3.0	10		μg/L	1	10/11/2016 3:32:45 PM	27882
4,6-Dinitro-2-methylphenol	ND	1.8	20		μg/L	1	10/11/2016 3:32:45 PM	27882
2,4-Dinitrophenol	ND	2.8	20		μg/L	1	10/11/2016 3:32:45 PM	27882
2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	10/11/2016 3:32:45 PM	27882
2,6-Dinitrotoluene	ND	2.7	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Fluoranthene	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Fluorene	ND	2.7	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Hexachlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Hexachlorobutadiene	ND	2.2	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Hexachlorocyclopentadiene	ND	2.3	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Hexachloroethane	ND	2.4	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Indeno(1,2,3-cd)pyrene	ND	3.0	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Isophorone	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
1-Methylnaphthalene	110	2.9	10		μg/L	1	10/11/2016 3:32:45 PM	27882
2-Methylnaphthalene	ND	2.9	10		μg/L	1	10/11/2016 3:32:45 PM	27882
2-Methylphenol	98	2.5	10		μg/L	1	10/11/2016 3:32:45 PM	27882
3+4-Methylphenol	99	2.3	10		μg/L	1	10/11/2016 3:32:45 PM	27882
N-Nitrosodi-n-propylamine	ND	2.4	10		μg/L	1	10/11/2016 3:32:45 PM	27882
N-Nitrosodimethylamine	ND	2.2	10		μg/L	1	10/11/2016 3:32:45 PM	27882
N-Nitrosodiphenylamine	ND	2.3	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Naphthalene	68	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
2-Nitroaniline	ND	2.8	10		μg/L	1	10/11/2016 3:32:45 PM	27882
3-Nitroaniline	ND	2.9	10		μg/L	1	10/11/2016 3:32:45 PM	27882
4-Nitroaniline	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Nitrobenzene	ND	2.8	10		μg/L	1	10/11/2016 3:32:45 PM	27882
2-Nitrophenol	ND	2.4	10		μg/L	1	10/11/2016 3:32:45 PM	27882
4-Nitrophenol	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Pentachlorophenol	ND	2.3	20		μg/L	1	10/11/2016 3:32:45 PM	27882
Phenanthrene	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Phenol	98	2.0	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Pyrene	ND	3.1	10		μg/L	1	10/11/2016 3:32:45 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 569-3-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 7:45:00 AM

 Lab ID:
 1610091-003
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Pyridine	ND	2.2	10		μg/L	1	10/11/2016 3:32:45 PM	27882
1,2,4-Trichlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 3:32:45 PM	27882
2,4,5-Trichlorophenol	ND	2.2	10		μg/L	1	10/11/2016 3:32:45 PM	27882
2,4,6-Trichlorophenol	ND	2.4	10		μg/L	1	10/11/2016 3:32:45 PM	27882
Surr: 2-Fluorophenol	0	0	15-123	S	%Rec	1	10/11/2016 3:32:45 PM	27882
Surr: Phenol-d5	65.8	0	15-124		%Rec	1	10/11/2016 3:32:45 PM	27882
Surr: 2,4,6-Tribromophenol	53.8	0	18.4-134		%Rec	1	10/11/2016 3:32:45 PM	27882
Surr: Nitrobenzene-d5	58.5	0	28.8-134		%Rec	1	10/11/2016 3:32:45 PM	27882
Surr: 2-Fluorobiphenyl	56.5	0	35.9-125		%Rec	1	10/11/2016 3:32:45 PM	27882
Surr: 4-Terphenyl-d14	73.9	0	15-146		%Rec	1	10/11/2016 3:32:45 PM	27882
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Benzene	24000	48	500		μg/L	500	10/6/2016 4:35:00 PM	R37724
Toluene	20000	59	500		μg/L	500	10/6/2016 4:35:00 PM	R37724
Ethylbenzene	1700	5.6	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Methyl tert-butyl ether (MTBE)	700	11	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,2,4-Trimethylbenzene	930	5.5	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,3,5-Trimethylbenzene	270	5.8	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,2-Dichloroethane (EDC)	ND	5.8	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,2-Dibromoethane (EDB)	ND	5.6	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Naphthalene	82	4.6	100	J	μg/L	50	10/6/2016 4:59:00 PM	R37724
1-Methylnaphthalene	24	10	200	J	μg/L	50	10/6/2016 4:59:00 PM	R37724
2-Methylnaphthalene	28	7.9	200	J	μg/L	50	10/6/2016 4:59:00 PM	R37724
Acetone	ND	250	500		μg/L	50	10/6/2016 4:59:00 PM	R37724
Bromobenzene	ND	4.9	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Bromodichloromethane	ND	7.0	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Bromoform	ND	5.1	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Bromomethane	ND	39	150		μg/L	50	10/6/2016 4:59:00 PM	R37724
2-Butanone	ND	37	500		μg/L	50	10/6/2016 4:59:00 PM	R37724
Carbon disulfide	ND	30	500		μg/L	50	10/6/2016 4:59:00 PM	R37724
Carbon Tetrachloride	ND	5.4	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Chlorobenzene	ND	5.7	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Chloroethane	ND	9.6	100		μg/L	50	10/6/2016 4:59:00 PM	R37724
Chloroform	ND	4.4	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Chloromethane	ND	11	150		μg/L	50	10/6/2016 4:59:00 PM	R37724
2-Chlorotoluene	ND	20	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
4-Chlorotoluene	ND	6.4	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
cis-1,2-DCE	ND	6.2	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
cis-1,3-Dichloropropene	ND	5.3	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,2-Dibromo-3-chloropropane	ND	12	100		μg/L	50	10/6/2016 4:59:00 PM	R37724

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 569-3-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 7:45:00 AM

 Lab ID:
 1610091-003
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Dibromochloromethane	ND	4.3	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Dibromomethane	ND	6.0	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,2-Dichlorobenzene	ND	20	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,3-Dichlorobenzene	ND	7.2	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,4-Dichlorobenzene	ND	7.1	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Dichlorodifluoromethane	ND	18	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,1-Dichloroethane	ND	5.4	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,1-Dichloroethene	ND	5.4	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,2-Dichloropropane	ND	5.5	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,3-Dichloropropane	ND	7.8	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
2,2-Dichloropropane	ND	8.3	100		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,1-Dichloropropene	ND	6.7	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Hexachlorobutadiene	ND	9.9	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
2-Hexanone	ND	42	500		μg/L	50	10/6/2016 4:59:00 PM	R37724
Isopropylbenzene	140	5.2	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
4-Isopropyltoluene	21	7.0	50	J	μg/L	50	10/6/2016 4:59:00 PM	R37724
4-Methyl-2-pentanone	ND	21	500		μg/L	50	10/6/2016 4:59:00 PM	R37724
Methylene Chloride	ND	9.4	150		μg/L	50	10/6/2016 4:59:00 PM	R37724
n-Butylbenzene	17	8.0	150	J	μg/L	50	10/6/2016 4:59:00 PM	R37724
n-Propylbenzene	160	6.6	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
sec-Butylbenzene	21	6.2	50	J	μg/L	50	10/6/2016 4:59:00 PM	R37724
Styrene	ND	5.5	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
tert-Butylbenzene	ND	5.8	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,1,1,2-Tetrachloroethane	ND	5.6	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,1,2,2-Tetrachloroethane	ND	6.4	100		μg/L	50	10/6/2016 4:59:00 PM	R37724
Tetrachloroethene (PCE)	ND	7.6	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
trans-1,2-DCE	ND	20	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
trans-1,3-Dichloropropene	ND	5.2	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,2,3-Trichlorobenzene	ND	5.6	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,2,4-Trichlorobenzene	ND	6.6	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,1,1-Trichloroethane	ND	4.6	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,1,2-Trichloroethane	ND	6.4	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Trichloroethene (TCE)	ND	8.8	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Trichlorofluoromethane	ND	10	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
1,2,3-Trichloropropane	ND	10	100		μg/L	50	10/6/2016 4:59:00 PM	R37724
Vinyl chloride	ND	9.8	50		μg/L	50	10/6/2016 4:59:00 PM	R37724
Xylenes, Total	9200	18	75		μg/L	50	10/6/2016 4:59:00 PM	R37724
Surr: 1,2-Dichloroethane-d4	97.6	0	70-130		%Rec	50	10/6/2016 4:59:00 PM	R37724
Surr: 4-Bromofluorobenzene	102	0	70-130		%Rec	50	10/6/2016 4:59:00 PM	R37724

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical ReportLab Order **1610091**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 569-3-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 10/2/2016 7:45:00 AM

 Lab ID:
 1610091-003
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Surr: Dibromofluoromethane	97.8	0	70-130		%Rec	50	10/6/2016 4:59:00 PM	R37724
Surr: Toluene-d8	100	0	70-130		%Rec	50	10/6/2016 4:59:00 PM	R37724
EPA 335.4: TOTAL CYANIDE SUBBED							Analyst: SUB	
Cyanide	ND	0.0100	0.0100		mg/L	1	10/11/2016	R38822

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

Qualifiers: Value exceeds Maximum Contaminant Level. В Analyte detected in the associated Method Blank D Sample Diluted Due to Matrix Ε Value above quantitation range Η Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits Page 18 of 56 ND Not Detected at the Reporting Limit P Sample pH Not In Range RPD outside accepted recovery limits RLReporting Detection Limit % Recovery outside of range due to dilution or matrix Sample container temperature is out of limit as specified

Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 570-1-GW

Project: OW-14 Source Inv. **Collection Date:** 9/30/2016 2:30:00 PM 1610091-004 Lab ID: Matrix: AQUEOUS Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANG	GE						Analyst: TOM	
Diesel Range Organics (DRO)	170	6.9	10		mg/L	10	10/5/2016 12:31:53 PM	27867
Motor Oil Range Organics (MRO)	ND	50	50		mg/L	10	10/5/2016 12:31:53 PM	27867
Surr: DNOP	0	0	77.1-144	S	%Rec	10	10/5/2016 12:31:53 PM	27867
EPA METHOD 8015D: GASOLINE RAN	IGE						Analyst: NSB	
Gasoline Range Organics (GRO)	240	25	50		mg/L	1000	10/5/2016 2:25:58 PM	G37702
Surr: BFB	88.3	0	66.4-120		%Rec	1000	10/5/2016 2:25:58 PM	G37702
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Fluoride	ND	0.25	0.50		mg/L	5	10/6/2016 6:51:41 PM	R37783
Chloride	94	1.0	10		mg/L	20	10/6/2016 7:04:06 PM	R37783
Sulfate	4.1	0.71	2.5		mg/L	5	10/6/2016 6:51:41 PM	R37783
EPA METHOD 200.7: DISSOLVED MET	ΓALS						Analyst: MED	
Barium	3.1	0.013	0.020	*	mg/L	10	10/18/2016 4:59:51 PM	E38016
Beryllium	ND	0.00031	0.0020		mg/L	1	10/18/2016 12:21:19 PM	1 C38016
Cadmium	ND	0.00075	0.0020		mg/L	1	10/18/2016 12:21:19 PM	1 C38016
Chromium	ND	0.0018	0.0060		mg/L	1	10/18/2016 12:21:19 PM	1 C38016
Cobalt	0.0051	0.00074	0.0060	J	mg/L	1	10/18/2016 12:21:19 PM	1 C38016
Iron	7.6	0.20	0.20	*	mg/L	10	10/18/2016 4:59:51 PM	E38016
Manganese	3.1	0.0032	0.020	*	mg/L	10	10/18/2016 4:59:51 PM	E38016
Nickel	0.088	0.0024	0.010		mg/L	1	10/18/2016 12:21:19 PM	1 C38016
Silver	ND	0.0028	0.0050		mg/L	1	10/18/2016 12:21:19 PM	1 C38016
Vanadium	0.0078	0.0013	0.050	J	mg/L	1	10/18/2016 12:21:19 PM	1 C38016
Zinc	0.010	0.0028	0.010		mg/L	1	10/18/2016 12:21:19 PM	1 C38016
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	8.5	0.013	0.020	*	mg/L	10	10/18/2016 5:35:44 PM	28061
Beryllium	0.0064	0.00036	0.0020	*	mg/L	1	10/17/2016 6:12:13 PM	28061
Cadmium	ND	0.0015	0.0020		mg/L	1	10/17/2016 6:12:13 PM	28061
Chromium	0.031	0.0027	0.0060		mg/L	1	10/17/2016 6:12:13 PM	28061
Cobalt	0.020	0.0017	0.0060		mg/L	1	10/17/2016 6:12:13 PM	28061
Iron	36	1.0	1.0	*	mg/L	50	10/18/2016 5:37:34 PM	28061
Manganese	7.2	0.0032	0.020	*	mg/L	10	10/18/2016 5:35:44 PM	28061
Nickel	0.10	0.0031	0.010	*	mg/L	1	10/17/2016 6:12:13 PM	28061
Silver	ND	0.0028	0.0050		mg/L	1	10/17/2016 6:12:13 PM	28061
Vanadium	0.065	0.0013	0.050		mg/L	1	10/17/2016 6:12:13 PM	28061
Zinc	0.064	0.0027	0.010		mg/L	1	10/17/2016 6:12:13 PM	28061
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/19/2016 8:16:26 PM	A38075
Arsenic	0.0093	0.00014	0.0010		mg/L	1	10/20/2016 8:00:38 PM	A38120

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

Qualifiers: Value exceeds Maximum Contaminant Level.

> D Sample Diluted Due to Matrix

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

Ε Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

Page 19 of 56

Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 570-1-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 9/30/2016 2:30:00 PM

 Lab ID:
 1610091-004
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

EPA 200.8: DISSOLVED METALS Lead Selenium EPA 200.8: METALS	0.0012 0.0042 ND 0.016 0.064	0.00017 0.0021 0.00047 0.0011	0.00050 0.010 0.0010	J	mg/L mg/L	1	Analyst: JLF 10/20/2016 8:00:38 PM	A38120
Selenium	0.0042 ND 0.016	0.0021	0.010	J	_	1	10/20/2016 8·00·38 PM	Δ38120
	ND 0.016	0.00047		J	ma/l		. 5, 25, 25 . 5 6.00.00 1 1	A30120
EPA 200.8: METALS	0.016		0.0010		mg/L	10	10/21/2016 9:36:29 PM	C38136
	0.016		0.0010				Analyst: JLF	
Antimony		0.0011	0.0010		mg/L	1	10/14/2016 1:57:24 PM	28061
Arsenic	0.064	0.0011	0.0050	*	mg/L	5	10/14/2016 6:32:51 PM	28061
Lead		0.00084	0.0025	*	mg/L	5	10/14/2016 6:32:51 PM	28061
Selenium	0.0092	0.0011	0.0050		mg/L	5	10/14/2016 6:32:51 PM	28061
EPA METHOD 245.1: MERCURY							Analyst: pmf	
Mercury	0.00018	0.000053	0.00020	J	mg/L	1	10/7/2016 12:29:13 PM	27928
EPA METHOD 8270C: SEMIVOLATILE	S						Analyst: DAM	
Acenaphthene	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Acenaphthylene	ND	24	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Aniline	ND	24	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Anthracene	ND	25	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Azobenzene	ND	27	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Benz(a)anthracene	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Benzo(a)pyrene	ND	27	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Benzo(b)fluoranthene	ND	29	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Benzo(g,h,i)perylene	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Benzo(k)fluoranthene	ND	30	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Benzoic acid	450	26	200		μg/L	1	10/11/2016 4:00:19 PM	27882
Benzyl alcohol	ND	30	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Bis(2-chloroethoxy)methane	ND	28	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Bis(2-chloroethyl)ether	ND	27	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Bis(2-chloroisopropyl)ether	ND	19	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Bis(2-ethylhexyl)phthalate	66	26	100	J	μg/L	1	10/11/2016 4:00:19 PM	27882
4-Bromophenyl phenyl ether	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Butyl benzyl phthalate	ND	25	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Carbazole	ND	23	100		μg/L	1	10/11/2016 4:00:19 PM	27882
4-Chloro-3-methylphenol	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
4-Chloroaniline	ND	27	100		μg/L	1	10/11/2016 4:00:19 PM	27882
2-Chloronaphthalene	ND	23	100		μg/L	1	10/11/2016 4:00:19 PM	27882
2-Chlorophenol	ND	22	100		μg/L	1	10/11/2016 4:00:19 PM	27882
4-Chlorophenyl phenyl ether	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Chrysene	ND	28	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Di-n-butyl phthalate	ND	24	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Di-n-octyl phthalate	ND	20	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Dibenz(a,h)anthracene	ND	27	100		μg/L	1	10/11/2016 4:00:19 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 20 of 56

Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: TK 570-1-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 9/30/2016 2:30:00 PM

 Lab ID:
 1610091-004
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Dibenzofuran	ND	25	100		μg/L	1	10/11/2016 4:00:19 PM	27882
1,2-Dichlorobenzene	ND	23	100		μg/L	1	10/11/2016 4:00:19 PM	27882
1,3-Dichlorobenzene	ND	23	100		μg/L	1	10/11/2016 4:00:19 PM	27882
1,4-Dichlorobenzene	ND	24	100		μg/L	1	10/11/2016 4:00:19 PM	27882
3,3´-Dichlorobenzidine	ND	24	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Diethyl phthalate	ND	27	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Dimethyl phthalate	ND	24	100		μg/L	1	10/11/2016 4:00:19 PM	27882
2,4-Dichlorophenol	ND	23	200		μg/L	1	10/11/2016 4:00:19 PM	27882
2,4-Dimethylphenol	52	30	100	J	μg/L	1	10/11/2016 4:00:19 PM	27882
4,6-Dinitro-2-methylphenol	ND	18	200		μg/L	1	10/11/2016 4:00:19 PM	27882
2,4-Dinitrophenol	ND	28	200		μg/L	1	10/11/2016 4:00:19 PM	27882
2,4-Dinitrotoluene	ND	31	100		μg/L	1	10/11/2016 4:00:19 PM	27882
2,6-Dinitrotoluene	ND	27	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Fluoranthene	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Fluorene	ND	27	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Hexachlorobenzene	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Hexachlorobutadiene	ND	22	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Hexachlorocyclopentadiene	ND	23	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Hexachloroethane	ND	24	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Indeno(1,2,3-cd)pyrene	ND	30	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Isophorone	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
1-Methylnaphthalene	120	29	100		μg/L	1	10/11/2016 4:00:19 PM	27882
2-Methylnaphthalene	110	29	100		μg/L	1	10/11/2016 4:00:19 PM	27882
2-Methylphenol	210	25	100		μg/L	1	10/11/2016 4:00:19 PM	27882
3+4-Methylphenol	200	23	100		μg/L	1	10/11/2016 4:00:19 PM	27882
N-Nitrosodi-n-propylamine	ND	24	100		μg/L	1	10/11/2016 4:00:19 PM	27882
N-Nitrosodimethylamine	ND	22	100		μg/L	1	10/11/2016 4:00:19 PM	27882
N-Nitrosodiphenylamine	ND	23	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Naphthalene	220	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
2-Nitroaniline	ND	28	100		μg/L	1	10/11/2016 4:00:19 PM	27882
3-Nitroaniline	ND	29	100		μg/L	1	10/11/2016 4:00:19 PM	27882
4-Nitroaniline	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Nitrobenzene	ND	28	100		μg/L	1	10/11/2016 4:00:19 PM	27882
2-Nitrophenol	ND	24	100		μg/L	1	10/11/2016 4:00:19 PM	27882
4-Nitrophenol	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Pentachlorophenol	ND	23	200		μg/L	1	10/11/2016 4:00:19 PM	27882
Phenanthrene	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Phenol	120	20	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Pyrene	ND	31	100		μg/L	1	10/11/2016 4:00:19 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 12/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 570-1-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 9/30/2016 2:30:00 PM

 Lab ID:
 1610091-004
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Pyridine	ND	22	100		μg/L	1	10/11/2016 4:00:19 PM	27882
1,2,4-Trichlorobenzene	ND	26	100		μg/L	1	10/11/2016 4:00:19 PM	27882
2,4,5-Trichlorophenol	ND	22	100		μg/L	1	10/11/2016 4:00:19 PM	27882
2,4,6-Trichlorophenol	ND	24	100		μg/L	1	10/11/2016 4:00:19 PM	27882
Surr: 2-Fluorophenol	30.7	0	15-123		%Rec	1	10/11/2016 4:00:19 PM	27882
Surr: Phenol-d5	36.5	0	15-124		%Rec	1	10/11/2016 4:00:19 PM	27882
Surr: 2,4,6-Tribromophenol	88.9	0	18.4-134		%Rec	1	10/11/2016 4:00:19 PM	27882
Surr: Nitrobenzene-d5	71.1	0	28.8-134		%Rec	1	10/11/2016 4:00:19 PM	27882
Surr: 2-Fluorobiphenyl	73.3	0	35.9-125		%Rec	1	10/11/2016 4:00:19 PM	27882
Surr: 4-Terphenyl-d14	90.3	0	15-146		%Rec	1	10/11/2016 4:00:19 PM	27882
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Benzene	23000	48	500		μg/L	500	10/6/2016 5:23:00 PM	R37724
Toluene	25000	59	500		μg/L	500	10/6/2016 5:23:00 PM	R37724
Ethylbenzene	2100	5.6	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Methyl tert-butyl ether (MTBE)	74	11	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,2,4-Trimethylbenzene	1400	5.5	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,3,5-Trimethylbenzene	430	5.8	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,2-Dichloroethane (EDC)	ND	5.8	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,2-Dibromoethane (EDB)	ND	5.6	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Naphthalene	92	4.6	100	J	μg/L	50	10/6/2016 5:46:00 PM	R37724
1-Methylnaphthalene	24	10	200	J	μg/L	50	10/6/2016 5:46:00 PM	R37724
2-Methylnaphthalene	33	7.9	200	J	μg/L	50	10/6/2016 5:46:00 PM	R37724
Acetone	ND	250	500		μg/L	50	10/6/2016 5:46:00 PM	R37724
Bromobenzene	ND	4.9	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Bromodichloromethane	ND	7.0	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Bromoform	ND	5.1	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Bromomethane	ND	39	150		μg/L	50	10/6/2016 5:46:00 PM	R37724
2-Butanone	110	37	500	J	μg/L	50	10/6/2016 5:46:00 PM	R37724
Carbon disulfide	ND	30	500		μg/L	50	10/6/2016 5:46:00 PM	R37724
Carbon Tetrachloride	ND	5.4	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Chlorobenzene	ND	5.7	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Chloroethane	ND	9.6	100		μg/L	50	10/6/2016 5:46:00 PM	R37724
Chloroform	ND	4.4	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Chloromethane	ND	11	150		μg/L	50	10/6/2016 5:46:00 PM	R37724
2-Chlorotoluene	ND	20	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
4-Chlorotoluene	ND	6.4	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
cis-1,2-DCE	ND	6.2	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
cis-1,3-Dichloropropene	ND	5.3	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,2-Dibromo-3-chloropropane	ND	12	100		μg/L	50	10/6/2016 5:46:00 PM	R37724

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 12/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 570-1-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 9/30/2016 2:30:00 PM

 Lab ID:
 1610091-004
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Dibromochloromethane	ND	4.3	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Dibromomethane	ND	6.0	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,2-Dichlorobenzene	ND	20	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,3-Dichlorobenzene	ND	7.2	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,4-Dichlorobenzene	ND	7.1	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Dichlorodifluoromethane	ND	18	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,1-Dichloroethane	ND	5.4	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,1-Dichloroethene	ND	5.4	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,2-Dichloropropane	ND	5.5	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,3-Dichloropropane	ND	7.8	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
2,2-Dichloropropane	ND	8.3	100		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,1-Dichloropropene	ND	6.7	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Hexachlorobutadiene	ND	9.9	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
2-Hexanone	ND	42	500		μg/L	50	10/6/2016 5:46:00 PM	R37724
Isopropylbenzene	220	5.2	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
4-Isopropyltoluene	47	7.0	50	J	μg/L	50	10/6/2016 5:46:00 PM	R37724
4-Methyl-2-pentanone	240	21	500	J	μg/L	50	10/6/2016 5:46:00 PM	R37724
Methylene Chloride	ND	9.4	150		μg/L	50	10/6/2016 5:46:00 PM	R37724
n-Butylbenzene	47	8.0	150	J	μg/L	50	10/6/2016 5:46:00 PM	R37724
n-Propylbenzene	270	6.6	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
sec-Butylbenzene	51	6.2	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Styrene	ND	5.5	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
tert-Butylbenzene	ND	5.8	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,1,1,2-Tetrachloroethane	ND	5.6	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,1,2,2-Tetrachloroethane	ND	6.4	100		μg/L	50	10/6/2016 5:46:00 PM	R37724
Tetrachloroethene (PCE)	ND	7.6	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
trans-1,2-DCE	ND	20	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
trans-1,3-Dichloropropene	ND	5.2	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,2,3-Trichlorobenzene	ND	5.6	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,2,4-Trichlorobenzene	ND	6.6	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,1,1-Trichloroethane	ND	4.6	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,1,2-Trichloroethane	ND	6.4	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Trichloroethene (TCE)	ND	8.8	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Trichlorofluoromethane	ND	10	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
1,2,3-Trichloropropane	ND	10	100		μg/L	50	10/6/2016 5:46:00 PM	R37724
Vinyl chloride	ND	9.8	50		μg/L	50	10/6/2016 5:46:00 PM	R37724
Xylenes, Total	11000	18	75		μg/L	50	10/6/2016 5:46:00 PM	R37724
Surr: 1,2-Dichloroethane-d4	99.5	0	70-130		%Rec	50	10/6/2016 5:46:00 PM	R37724
Surr: 4-Bromofluorobenzene	102	0	70-130		%Rec	50	10/6/2016 5:46:00 PM	R37724

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical ReportLab Order **1610091**

Date Reported: 12/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK 570-1-GW

 Project:
 OW-14 Source Inv.
 Collection Date: 9/30/2016 2:30:00 PM

 Lab ID:
 1610091-004
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Result **PQL Analyses MDL** Qual Units DF **Date Analyzed Batch ID EPA METHOD 8260B: VOLATILES** Analyst: BCN 70-130 Surr: Dibromofluoromethane 98.7 0 %Rec 50 10/6/2016 5:46:00 PM R37724 10/6/2016 5:46:00 PM Surr: Toluene-d8 100 0 70-130 %Rec 50 R37724 **EPA 335.4: TOTAL CYANIDE SUBBED** Analyst: SUB ND 0.0100 10/11/2016 Cyanide 0.0100 mg/L 1 R38822

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

Qualifiers: Value exceeds Maximum Contaminant Level. В Analyte detected in the associated Method Blank D Sample Diluted Due to Matrix Е Value above quantitation range Η Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits Page 24 of 56 Not Detected at the Reporting Limit P Sample pH Not In Range R RPD outside accepted recovery limits RLReporting Detection Limit % Recovery outside of range due to dilution or matrix Sample container temperature is out of limit as specified

Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: OW-57

Project: OW-14 Source Inv. **Collection Date:** 10/1/2016 10:40:00 AM 1610091-005 Lab ID: Matrix: AQUEOUS **Received Date:** 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANG	iΕ						Analyst: TOM	
Diesel Range Organics (DRO)	9.3	0.69	1.0		mg/L	1	10/4/2016 9:38:19 PM	27867
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	10/4/2016 9:38:19 PM	27867
Surr: DNOP	123	0	77.1-144		%Rec	1	10/4/2016 9:38:19 PM	27867
EPA METHOD 8015D: GASOLINE RANG	GE						Analyst: NSB	
Gasoline Range Organics (GRO)	46	5.1	10		mg/L	200	10/5/2016 2:50:14 PM	G37702
Surr: BFB	83.9	0	66.4-120		%Rec	200	10/5/2016 2:50:14 PM	G37702
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Fluoride	0.22	0.050	0.10		mg/L	1	10/6/2016 7:16:31 PM	R37783
Chloride	180	1.0	10		mg/L	20	10/6/2016 7:28:56 PM	R37783
Sulfate	6.2	0.14	0.50		mg/L	1	10/6/2016 7:16:31 PM	R37783
EPA METHOD 200.7: DISSOLVED MET	ALS				Ü		Analyst: MED	
Barium	2.1	0.0066	0.010	*	mg/L	5	10/18/2016 5:01:53 PM	E38016
Beryllium	ND	0.00031	0.0020		mg/L	1	10/18/2016 12:23:04 PM	
Cadmium	ND	0.00075	0.0020		mg/L	1	10/18/2016 12:23:04 PM	
Chromium	ND	0.0018	0.0060		mg/L	1	10/18/2016 12:23:04 PM	
Cobalt	0.0083	0.00074	0.0060		mg/L	1	10/18/2016 12:23:04 PM	
Iron	0.74	0.020	0.020	*	mg/L	1	10/18/2016 12:23:04 PM	
Manganese	2.1	0.0016	0.010	*	mg/L	5	10/18/2016 5:01:53 PM	E38016
Nickel	0.080	0.0024	0.010		mg/L	1	10/18/2016 12:23:04 PM	1 C38016
Silver	ND	0.0028	0.0050		mg/L	1	10/18/2016 12:23:04 PM	1 C38016
Vanadium	0.0049	0.0013	0.050	J	mg/L	1	10/18/2016 12:23:04 PM	1 C38016
Zinc	0.0053	0.0028	0.010	J	mg/L	1	10/18/2016 12:23:04 PM	1 C38016
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	3.0	0.0066	0.010	*	mg/L	5	10/18/2016 5:39:34 PM	28061
Beryllium	0.00051	0.00036	0.0020	J	mg/L	1	10/17/2016 6:14:05 PM	28061
Cadmium	ND	0.0015	0.0020		mg/L	1	10/17/2016 6:14:05 PM	28061
Chromium	0.0045	0.0027	0.0060	J	mg/L	1	10/17/2016 6:14:05 PM	28061
Cobalt	0.012	0.0017	0.0060		mg/L	1	10/17/2016 6:14:05 PM	28061
Iron	9.1	0.20	0.20	*	mg/L	10	10/18/2016 5:41:24 PM	28061
Manganese	3.5	0.0016	0.010	*	mg/L	5	10/18/2016 5:39:34 PM	28061
Nickel	0.084	0.0031	0.010		mg/L	1	10/17/2016 6:14:05 PM	28061
Silver	ND	0.0028	0.0050		mg/L	1	10/17/2016 6:14:05 PM	28061
Vanadium	0.017	0.0013	0.050	J	mg/L	1	10/17/2016 6:14:05 PM	28061
Zinc	0.017	0.0027	0.010		mg/L	1	10/17/2016 6:14:05 PM	28061
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/21/2016 9:41:38 PM	C38136
Arsenic	0.0041	0.00069	0.0050	J	mg/L	5	10/20/2016 8:15:56 PM	A38120

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

Qualifiers: Value exceeds Maximum Contaminant Level.

> D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

Ε Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: OW-57

 Project:
 OW-14 Source Inv.
 Collection Date: 10/1/2016 10:40:00 AM

 Lab ID:
 1610091-005
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Lead	ND	0.00017	0.00050		mg/L	1	10/20/2016 8:06:44 PM	A38120
Selenium	0.0082	0.0042	0.020	J	mg/L	20	10/21/2016 9:46:46 PM	C38136
EPA 200.8: METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/14/2016 2:02:32 PM	28061
Arsenic	0.0087	0.0042	0.020	J	mg/L	20	10/14/2016 6:41:52 PM	28061
Lead	0.0093	0.00017	0.00050		mg/L	1	10/14/2016 2:02:32 PM	28061
Selenium	0.013	0.0011	0.0050		mg/L	5	10/14/2016 6:38:51 PM	28061
EPA METHOD 245.1: MERCURY							Analyst: pmf	
Mercury	0.00014	0.000053	0.00020	J	mg/L	1	10/7/2016 12:31:15 PM	27928
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Acenaphthylene	ND	2.4	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Aniline	ND	2.4	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Anthracene	ND	2.5	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Azobenzene	ND	2.7	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Benz(a)anthracene	ND	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Benzo(a)pyrene	ND	2.7	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Benzo(b)fluoranthene	ND	2.9	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Benzo(g,h,i)perylene	ND	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Benzo(k)fluoranthene	ND	3.0	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Benzoic acid	32	2.6	20		μg/L	1	10/11/2016 4:28:23 PM	27882
Benzyl alcohol	ND	3.0	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Bis(2-chloroethoxy)methane	ND	2.8	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Bis(2-chloroethyl)ether	ND	2.7	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Bis(2-chloroisopropyl)ether	ND	1.9	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Bis(2-ethylhexyl)phthalate	4.2	2.6	10	J	μg/L	1	10/11/2016 4:28:23 PM	27882
4-Bromophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Butyl benzyl phthalate	ND	2.5	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Carbazole	4.2	2.3	10	J	μg/L	1	10/11/2016 4:28:23 PM	27882
4-Chloro-3-methylphenol	ND	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
4-Chloroaniline	ND	2.7	10		μg/L	1	10/11/2016 4:28:23 PM	27882
2-Chloronaphthalene	ND	2.3	10		μg/L	1	10/11/2016 4:28:23 PM	27882
2-Chlorophenol	ND	2.2	10		μg/L	1	10/11/2016 4:28:23 PM	27882
4-Chlorophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Chrysene	ND	2.8	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Di-n-butyl phthalate	ND	2.4	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Di-n-octyl phthalate	ND	2.0	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	10/11/2016 4:28:23 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: OW-57

 Project:
 OW-14 Source Inv.
 Collection Date: 10/1/2016 10:40:00 AM

 Lab ID:
 1610091-005
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Dibenzofuran	ND	2.5	10		μg/L	1	10/11/2016 4:28:23 PM	27882
1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 4:28:23 PM	27882
1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 4:28:23 PM	27882
1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	10/11/2016 4:28:23 PM	27882
3,3'-Dichlorobenzidine	ND	2.4	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Diethyl phthalate	ND	2.7	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Dimethyl phthalate	ND	2.4	10		μg/L	1	10/11/2016 4:28:23 PM	27882
2,4-Dichlorophenol	ND	2.3	20		μg/L	1	10/11/2016 4:28:23 PM	27882
2,4-Dimethylphenol	8.4	3.0	10	J	μg/L	1	10/11/2016 4:28:23 PM	27882
4,6-Dinitro-2-methylphenol	ND	1.8	20		μg/L	1	10/11/2016 4:28:23 PM	27882
2,4-Dinitrophenol	ND	2.8	20		μg/L	1	10/11/2016 4:28:23 PM	27882
2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	10/11/2016 4:28:23 PM	27882
2,6-Dinitrotoluene	ND	2.7	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Fluoranthene	ND	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Fluorene	7.2	2.7	10	J	μg/L	1	10/11/2016 4:28:23 PM	27882
Hexachlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Hexachlorobutadiene	ND	2.2	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Hexachlorocyclopentadiene	ND	2.3	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Hexachloroethane	ND	2.4	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Indeno(1,2,3-cd)pyrene	ND	3.0	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Isophorone	ND	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
1-Methylnaphthalene	110	2.9	10		μg/L	1	10/11/2016 4:28:23 PM	27882
2-Methylnaphthalene	98	2.9	10		μg/L	1	10/11/2016 4:28:23 PM	27882
2-Methylphenol	ND	2.5	10		μg/L	1	10/11/2016 4:28:23 PM	27882
3+4-Methylphenol	ND	2.3	10		μg/L	1	10/11/2016 4:28:23 PM	27882
N-Nitrosodi-n-propylamine	ND	2.4	10		μg/L	1	10/11/2016 4:28:23 PM	27882
N-Nitrosodimethylamine	ND	2.2	10		μg/L	1	10/11/2016 4:28:23 PM	27882
N-Nitrosodiphenylamine	ND	2.3	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Naphthalene	140	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
2-Nitroaniline	ND	2.8	10		μg/L	1	10/11/2016 4:28:23 PM	27882
3-Nitroaniline	ND	2.9	10		μg/L	1	10/11/2016 4:28:23 PM	27882
4-Nitroaniline	ND	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Nitrobenzene	ND	2.8	10		μg/L	1	10/11/2016 4:28:23 PM	27882
2-Nitrophenol	ND	2.4	10		μg/L	1	10/11/2016 4:28:23 PM	27882
4-Nitrophenol	ND	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Pentachlorophenol	ND	2.3	20		μg/L	1	10/11/2016 4:28:23 PM	27882
Phenanthrene	7.6	2.6	10	J	μg/L	1	10/11/2016 4:28:23 PM	27882
Phenol	88	2.0	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Pyrene	ND	3.1	10		μg/L	1	10/11/2016 4:28:23 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: OW-57

 Project:
 OW-14 Source Inv.
 Collection Date: 10/1/2016 10:40:00 AM

 Lab ID:
 1610091-005
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Pyridine	ND	2.2	10		μg/L	1	10/11/2016 4:28:23 PM	27882
1,2,4-Trichlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 4:28:23 PM	27882
2,4,5-Trichlorophenol	ND	2.2	10		μg/L	1	10/11/2016 4:28:23 PM	27882
2,4,6-Trichlorophenol	ND	2.4	10		μg/L	1	10/11/2016 4:28:23 PM	27882
Surr: 2-Fluorophenol	44.6	0	15-123		%Rec	1	10/11/2016 4:28:23 PM	27882
Surr: Phenol-d5	31.8	0	15-124		%Rec	1	10/11/2016 4:28:23 PM	27882
Surr: 2,4,6-Tribromophenol	63.6	0	18.4-134		%Rec	1	10/11/2016 4:28:23 PM	27882
Surr: Nitrobenzene-d5	63.3	0	28.8-134		%Rec	1	10/11/2016 4:28:23 PM	27882
Surr: 2-Fluorobiphenyl	51.3	0	35.9-125		%Rec	1	10/11/2016 4:28:23 PM	27882
Surr: 4-Terphenyl-d14	68.7	0	15-146		%Rec	1	10/11/2016 4:28:23 PM	27882
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Benzene	11000	48	500		μg/L	500	10/6/2016 6:10:00 PM	R37724
Toluene	54	5.9	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Ethylbenzene	570	5.6	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Methyl tert-butyl ether (MTBE)	180	11	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,2,4-Trimethylbenzene	7.3	5.5	50	J	μg/L	50	10/6/2016 6:33:00 PM	R37724
1,3,5-Trimethylbenzene	ND	5.8	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,2-Dichloroethane (EDC)	ND	5.8	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,2-Dibromoethane (EDB)	ND	5.6	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Naphthalene	220	4.6	100		μg/L	50	10/6/2016 6:33:00 PM	R37724
1-Methylnaphthalene	150	10	200	J	μg/L	50	10/6/2016 6:33:00 PM	R37724
2-Methylnaphthalene	140	7.9	200	J	μg/L	50	10/6/2016 6:33:00 PM	R37724
Acetone	ND	250	500		μg/L	50	10/6/2016 6:33:00 PM	R37724
Bromobenzene	ND	4.9	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Bromodichloromethane	ND	7.0	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Bromoform	ND	5.1	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Bromomethane	ND	39	150		μg/L	50	10/6/2016 6:33:00 PM	R37724
2-Butanone	ND	37	500		μg/L	50	10/6/2016 6:33:00 PM	R37724
Carbon disulfide	ND	30	500		μg/L	50	10/6/2016 6:33:00 PM	R37724
Carbon Tetrachloride	ND	5.4	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Chlorobenzene	ND	5.7	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Chloroethane	ND	9.6	100		μg/L	50	10/6/2016 6:33:00 PM	R37724
Chloroform	ND	4.4	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Chloromethane	ND	11	150		μg/L	50	10/6/2016 6:33:00 PM	R37724
2-Chlorotoluene	ND	20	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
4-Chlorotoluene	ND	6.4	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
cis-1,2-DCE	ND	6.2	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
cis-1,3-Dichloropropene	ND	5.3	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,2-Dibromo-3-chloropropane	ND	12	100		μg/L	50	10/6/2016 6:33:00 PM	R37724

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

Qualifiers:

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

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: OW-57

 Project:
 OW-14 Source Inv.
 Collection Date: 10/1/2016 10:40:00 AM

 Lab ID:
 1610091-005
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Dibromochloromethane	ND	4.3	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Dibromomethane	ND	6.0	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,2-Dichlorobenzene	ND	20	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,3-Dichlorobenzene	ND	7.2	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,4-Dichlorobenzene	ND	7.1	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Dichlorodifluoromethane	ND	18	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,1-Dichloroethane	ND	5.4	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,1-Dichloroethene	ND	5.4	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,2-Dichloropropane	ND	5.5	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,3-Dichloropropane	ND	7.8	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
2,2-Dichloropropane	ND	8.3	100		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,1-Dichloropropene	ND	6.7	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Hexachlorobutadiene	ND	9.9	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
2-Hexanone	ND	42	500		μg/L	50	10/6/2016 6:33:00 PM	R37724
Isopropylbenzene	22	5.2	50	J	μg/L	50	10/6/2016 6:33:00 PM	R37724
4-Isopropyltoluene	ND	7.0	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
4-Methyl-2-pentanone	ND	21	500		μg/L	50	10/6/2016 6:33:00 PM	R37724
Methylene Chloride	ND	9.4	150		μg/L	50	10/6/2016 6:33:00 PM	R37724
n-Butylbenzene	9.1	8.0	150	J	μg/L	50	10/6/2016 6:33:00 PM	R37724
n-Propylbenzene	48	6.6	50	J	μg/L	50	10/6/2016 6:33:00 PM	R37724
sec-Butylbenzene	ND	6.2	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Styrene	ND	5.5	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
tert-Butylbenzene	ND	5.8	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,1,1,2-Tetrachloroethane	ND	5.6	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,1,2,2-Tetrachloroethane	ND	6.4	100		μg/L	50	10/6/2016 6:33:00 PM	R37724
Tetrachloroethene (PCE)	ND	7.6	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
trans-1,2-DCE	ND	20	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
trans-1,3-Dichloropropene	ND	5.2	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,2,3-Trichlorobenzene	ND	5.6	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,2,4-Trichlorobenzene	ND	6.6	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,1,1-Trichloroethane	ND	4.6	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,1,2-Trichloroethane	ND	6.4	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Trichloroethene (TCE)	ND	8.8	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Trichlorofluoromethane	ND	10	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
1,2,3-Trichloropropane	ND	10	100		μg/L	50	10/6/2016 6:33:00 PM	R37724
Vinyl chloride	ND	9.8	50		μg/L	50	10/6/2016 6:33:00 PM	R37724
Xylenes, Total	140	18	75		μg/L	50	10/6/2016 6:33:00 PM	R37724
Surr: 1,2-Dichloroethane-d4	99.1	0	70-130		%Rec	50	10/6/2016 6:33:00 PM	R37724
Surr: 4-Bromofluorobenzene	101	0	70-130		%Rec	50	10/6/2016 6:33:00 PM	R37724

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical ReportLab Order **1610091**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 12/1/2016

CLIENT: Western Refining Company

Client Sample ID: OW-57

 Project:
 OW-14 Source Inv.
 Collection Date: 10/1/2016 10:40:00 AM

 Lab ID:
 1610091-005
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Surr: Dibromofluoromethane	98.1	0	70-130		%Rec	50	10/6/2016 6:33:00 PM	R37724
Surr: Toluene-d8	98.0	0	70-130		%Rec	50	10/6/2016 6:33:00 PM	R37724
EPA 335.4: TOTAL CYANIDE SUBBED							Analyst: SUB	
Cyanide	ND	0.0100	0.0100		mg/L	1	10/14/2016	R38822

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

Qualifiers: Value exceeds Maximum Contaminant Level. В Analyte detected in the associated Method Blank D Sample Diluted Due to Matrix Ε Value above quantitation range Н Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits Page 30 of 56 ND Not Detected at the Reporting Limit P Sample pH Not In Range RPD outside accepted recovery limits RLReporting Detection Limit % Recovery outside of range due to dilution or matrix Sample container temperature is out of limit as specified

Date Reported: 12/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company Client Sample ID: OW-58

Project: OW-14 Source Inv. Collection Date: 9/30/2016 10:45:00 AM Lab ID: 1610091-006 Matrix: AQUEOUS **Received Date:** 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANG	E						Analyst: TOM	
Diesel Range Organics (DRO)	5.6	0.69	1.0		mg/L	1	10/4/2016 9:59:52 PM	27867
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	10/4/2016 9:59:52 PM	27867
Surr: DNOP	134	0	77.1-144		%Rec	1	10/4/2016 9:59:52 PM	27867
EPA METHOD 8015D: GASOLINE RANG	GE						Analyst: NSB	
Gasoline Range Organics (GRO)	150	5.1	10		mg/L	200	10/5/2016 3:14:30 PM	G37702
Surr: BFB	82.7	0	66.4-120		%Rec	200	10/5/2016 3:14:30 PM	G37702
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Fluoride	0.25	0.050	0.10		mg/L	1	10/6/2016 8:06:09 PM	R37783
Chloride	160	1.0	10		mg/L	20	10/6/2016 8:18:34 PM	R37783
Sulfate	1.2	0.14	0.50		mg/L	1	10/6/2016 8:06:09 PM	R37783
EPA METHOD 200.7: DISSOLVED META	ALS						Analyst: MED	
Barium	3.0	0.0066	0.010	*	mg/L	5	10/18/2016 5:05:39 PM	E38016
Beryllium	ND	0.00031	0.0020		mg/L	1	10/18/2016 5:04:00 PM	E38016
Cadmium	ND	0.00075	0.0020		mg/L	1	10/18/2016 5:04:00 PM	E38016
Chromium	ND	0.0018	0.0060		mg/L	1	10/18/2016 5:04:00 PM	E38016
Cobalt	0.0022	0.00074	0.0060	J	mg/L	1	10/18/2016 5:04:00 PM	E38016
Iron	6.6	0.20	0.20	*	mg/L	10	10/18/2016 5:07:22 PM	E38016
Manganese	2.1	0.0016	0.010	*	mg/L	5	10/18/2016 5:05:39 PM	E38016
Nickel	0.015	0.0024	0.010		mg/L	1	10/18/2016 5:04:00 PM	E38016
Silver	ND	0.0028	0.0050		mg/L	1	10/18/2016 5:04:00 PM	E38016
Vanadium	0.0046	0.0013	0.050	J	mg/L	1	10/18/2016 5:04:00 PM	E38016
Zinc	0.0030	0.0028	0.010	J	mg/L	1	10/18/2016 5:04:00 PM	E38016
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	5.2	0.013	0.020	*	mg/L	10	10/18/2016 5:50:35 PM	28061
Beryllium	0.0037	0.00036	0.0020		mg/L	1	10/17/2016 6:15:47 PM	28061
Cadmium	ND	0.0015	0.0020		mg/L	1	10/17/2016 6:15:47 PM	28061
Chromium	0.017	0.0027	0.0060		mg/L	1	10/17/2016 6:15:47 PM	28061
Cobalt	0.013	0.0017	0.0060		mg/L	1	10/17/2016 6:15:47 PM	28061
Iron	27	1.0	1.0	*	mg/L	50	10/18/2016 5:52:27 PM	28061
Manganese	4.1	0.0032	0.020	*	mg/L	10	10/18/2016 5:50:35 PM	28061
Nickel	0.035	0.0031	0.010		mg/L	1	10/17/2016 6:15:47 PM	28061
Silver	ND	0.0028	0.0050		mg/L	1	10/17/2016 6:15:47 PM	28061
Vanadium	0.043	0.0013	0.050	J	mg/L	1	10/17/2016 6:15:47 PM	28061
Zinc	0.048	0.0027	0.010		mg/L	1	10/17/2016 6:15:47 PM	28061
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/21/2016 9:51:54 PM	C38136
Arsenic	0.0041	0.00069	0.0050	J	mg/L	5	10/20/2016 8:22:02 PM	A38120

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

Qualifiers: Value exceeds Maximum Contaminant Level.

> D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

Ε Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: OW-58

 Project:
 OW-14 Source Inv.
 Collection Date: 9/30/2016 10:45:00 AM

 Lab ID:
 1610091-006
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Lead	0.0011	0.00017	0.00050		mg/L	1	10/20/2016 8:18:59 PM	A38120
Selenium	0.0064	0.0042	0.020	J	mg/L	20	10/21/2016 9:57:03 PM	C38136
EPA 200.8: METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/14/2016 2:07:40 PM	28061
Arsenic	0.0094	0.0011	0.0050		mg/L	5	10/14/2016 6:44:52 PM	28061
Lead	0.036	0.00084	0.0025	*	mg/L	5	10/14/2016 6:44:52 PM	28061
Selenium	0.012	0.0011	0.0050		mg/L	5	10/14/2016 6:44:52 PM	28061
EPA METHOD 245.1: MERCURY							Analyst: pmf	
Mercury	0.00013	0.000053	0.00020	J	mg/L	1	10/7/2016 12:33:16 PM	27928
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Acenaphthylene	ND	2.4	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Aniline	ND	2.4	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Anthracene	ND	2.5	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Azobenzene	ND	2.7	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Benz(a)anthracene	ND	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Benzo(a)pyrene	ND	2.7	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Benzo(b)fluoranthene	ND	2.9	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Benzo(g,h,i)perylene	ND	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Benzo(k)fluoranthene	ND	3.0	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Benzoic acid	16	2.6	20	J	μg/L	1	10/11/2016 4:56:32 PM	27882
Benzyl alcohol	ND	3.0	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Bis(2-chloroethoxy)methane	ND	2.8	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Bis(2-chloroethyl)ether	ND	2.7	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Bis(2-chloroisopropyl)ether	ND	1.9	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Bis(2-ethylhexyl)phthalate	2.8	2.6	10	J	μg/L	1	10/11/2016 4:56:32 PM	27882
4-Bromophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Butyl benzyl phthalate	ND	2.5	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Carbazole	2.8	2.3	10	J	μg/L	1	10/11/2016 4:56:32 PM	27882
4-Chloro-3-methylphenol	ND	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
4-Chloroaniline	ND	2.7	10		μg/L	1	10/11/2016 4:56:32 PM	27882
2-Chloronaphthalene	ND	2.3	10		μg/L	1	10/11/2016 4:56:32 PM	27882
2-Chlorophenol	ND	2.2	10		μg/L	1	10/11/2016 4:56:32 PM	27882
4-Chlorophenyl phenyl ether	ND	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Chrysene	ND	2.8	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Di-n-butyl phthalate	ND	2.4	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Di-n-octyl phthalate	ND	2.0	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	10/11/2016 4:56:32 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: OW-58

 Project:
 OW-14 Source Inv.
 Collection Date: 9/30/2016 10:45:00 AM

 Lab ID:
 1610091-006
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Dibenzofuran	ND	2.5	10		μg/L	1	10/11/2016 4:56:32 PM	27882
1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 4:56:32 PM	27882
1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 4:56:32 PM	27882
1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	10/11/2016 4:56:32 PM	27882
3,3´-Dichlorobenzidine	ND	2.4	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Diethyl phthalate	ND	2.7	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Dimethyl phthalate	ND	2.4	10		μg/L	1	10/11/2016 4:56:32 PM	27882
2,4-Dichlorophenol	ND	2.3	20		μg/L	1	10/11/2016 4:56:32 PM	27882
2,4-Dimethylphenol	3.9	3.0	10	J	μg/L	1	10/11/2016 4:56:32 PM	27882
4,6-Dinitro-2-methylphenol	ND	1.8	20		μg/L	1	10/11/2016 4:56:32 PM	27882
2,4-Dinitrophenol	ND	2.8	20		μg/L	1	10/11/2016 4:56:32 PM	27882
2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	10/11/2016 4:56:32 PM	27882
2,6-Dinitrotoluene	ND	2.7	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Fluoranthene	ND	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Fluorene	3.8	2.7	10	J	μg/L	1	10/11/2016 4:56:32 PM	27882
Hexachlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Hexachlorobutadiene	ND	2.2	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Hexachlorocyclopentadiene	ND	2.3	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Hexachloroethane	ND	2.4	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Indeno(1,2,3-cd)pyrene	ND	3.0	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Isophorone	ND	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
1-Methylnaphthalene	65	2.9	10		μg/L	1	10/11/2016 4:56:32 PM	27882
2-Methylnaphthalene	71	2.9	10		μg/L	1	10/11/2016 4:56:32 PM	27882
2-Methylphenol	5.2	2.5	10	J	μg/L	1	10/11/2016 4:56:32 PM	27882
3+4-Methylphenol	7.9	2.3	10	J	μg/L	1	10/11/2016 4:56:32 PM	27882
N-Nitrosodi-n-propylamine	ND	2.4	10		μg/L	1	10/11/2016 4:56:32 PM	27882
N-Nitrosodimethylamine	ND	2.2	10		μg/L	1	10/11/2016 4:56:32 PM	27882
N-Nitrosodiphenylamine	ND	2.3	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Naphthalene	160	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
2-Nitroaniline	ND	2.8	10		μg/L	1	10/11/2016 4:56:32 PM	27882
3-Nitroaniline	ND	2.9	10		μg/L	1	10/11/2016 4:56:32 PM	27882
4-Nitroaniline	ND	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Nitrobenzene	ND	2.8	10		μg/L	1	10/11/2016 4:56:32 PM	27882
2-Nitrophenol	ND	2.4	10		μg/L	1	10/11/2016 4:56:32 PM	27882
4-Nitrophenol	ND	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Pentachlorophenol	ND	2.3	20		μg/L	1	10/11/2016 4:56:32 PM	27882
Phenanthrene	2.9	2.6	10	J	μg/L	1	10/11/2016 4:56:32 PM	27882
Phenol	51	2.0	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Pyrene	ND	3.1	10		μg/L	1	10/11/2016 4:56:32 PM	27882

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: OW-58

 Project:
 OW-14 Source Inv.
 Collection Date: 9/30/2016 10:45:00 AM

 Lab ID:
 1610091-006
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Pyridine	ND	2.2	10		μg/L	1	10/11/2016 4:56:32 PM	27882
1,2,4-Trichlorobenzene	ND	2.6	10		μg/L	1	10/11/2016 4:56:32 PM	27882
2,4,5-Trichlorophenol	ND	2.2	10		μg/L	1	10/11/2016 4:56:32 PM	27882
2,4,6-Trichlorophenol	ND	2.4	10		μg/L	1	10/11/2016 4:56:32 PM	27882
Surr: 2-Fluorophenol	22.8	0	15-123		%Rec	1	10/11/2016 4:56:32 PM	27882
Surr: Phenol-d5	41.5	0	15-124		%Rec	1	10/11/2016 4:56:32 PM	27882
Surr: 2,4,6-Tribromophenol	71.0	0	18.4-134		%Rec	1	10/11/2016 4:56:32 PM	27882
Surr: Nitrobenzene-d5	65.2	0	28.8-134		%Rec	1	10/11/2016 4:56:32 PM	27882
Surr: 2-Fluorobiphenyl	58.1	0	35.9-125		%Rec	1	10/11/2016 4:56:32 PM	27882
Surr: 4-Terphenyl-d14	71.3	0	15-146		%Rec	1	10/11/2016 4:56:32 PM	27882
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Benzene	32000	48	500		μg/L	500	10/6/2016 6:57:00 PM	R37724
Toluene	6600	59	500		μg/L	500	10/6/2016 6:57:00 PM	R37724
Ethylbenzene	1500	5.6	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Methyl tert-butyl ether (MTBE)	3300	11	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,2,4-Trimethylbenzene	690	5.5	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,3,5-Trimethylbenzene	210	5.8	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,2-Dichloroethane (EDC)	ND	5.8	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,2-Dibromoethane (EDB)	ND	5.6	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Naphthalene	240	4.6	100		μg/L	50	10/6/2016 7:20:00 PM	R37724
1-Methylnaphthalene	89	10	200	J	μg/L	50	10/6/2016 7:20:00 PM	R37724
2-Methylnaphthalene	97	7.9	200	J	μg/L	50	10/6/2016 7:20:00 PM	R37724
Acetone	ND	250	500		μg/L	50	10/6/2016 7:20:00 PM	R37724
Bromobenzene	ND	4.9	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Bromodichloromethane	ND	7.0	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Bromoform	ND	5.1	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Bromomethane	ND	39	150		μg/L	50	10/6/2016 7:20:00 PM	R37724
2-Butanone	ND	37	500		μg/L	50	10/6/2016 7:20:00 PM	R37724
Carbon disulfide	ND	30	500		μg/L	50	10/6/2016 7:20:00 PM	R37724
Carbon Tetrachloride	ND	5.4	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Chlorobenzene	ND	5.7	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Chloroethane	ND	9.6	100		μg/L	50	10/6/2016 7:20:00 PM	R37724
Chloroform	ND	4.4	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Chloromethane	ND	11	150		μg/L	50	10/6/2016 7:20:00 PM	R37724
2-Chlorotoluene	ND	20	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
4-Chlorotoluene	ND	6.4	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
cis-1,2-DCE	ND	6.2	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
cis-1,3-Dichloropropene	ND	5.3	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,2-Dibromo-3-chloropropane	ND	12	100		μg/L	50	10/6/2016 7:20:00 PM	R37724

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

Qualifiers:

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

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Date Reported: 12/1/2016

CLIENT: Western Refining Company Client Sample ID: OW-58

 Project:
 OW-14 Source Inv.
 Collection Date: 9/30/2016 10:45:00 AM

 Lab ID:
 1610091-006
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Dibromochloromethane	ND	4.3	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Dibromomethane	ND	6.0	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,2-Dichlorobenzene	ND	20	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,3-Dichlorobenzene	ND	7.2	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,4-Dichlorobenzene	ND	7.1	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Dichlorodifluoromethane	ND	18	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,1-Dichloroethane	ND	5.4	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,1-Dichloroethene	ND	5.4	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,2-Dichloropropane	ND	5.5	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,3-Dichloropropane	ND	7.8	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
2,2-Dichloropropane	ND	8.3	100		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,1-Dichloropropene	ND	6.7	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Hexachlorobutadiene	ND	9.9	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
2-Hexanone	ND	42	500		μg/L	50	10/6/2016 7:20:00 PM	R37724
Isopropylbenzene	72	5.2	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
4-Isopropyltoluene	15	7.0	50	J	μg/L	50	10/6/2016 7:20:00 PM	R37724
4-Methyl-2-pentanone	ND	21	500		μg/L	50	10/6/2016 7:20:00 PM	R37724
Methylene Chloride	ND	9.4	150		μg/L	50	10/6/2016 7:20:00 PM	R37724
n-Butylbenzene	21	8.0	150	J	μg/L	50	10/6/2016 7:20:00 PM	R37724
n-Propylbenzene	150	6.6	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
sec-Butylbenzene	18	6.2	50	J	μg/L	50	10/6/2016 7:20:00 PM	R37724
Styrene	ND	5.5	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
tert-Butylbenzene	ND	5.8	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,1,1,2-Tetrachloroethane	ND	5.6	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,1,2,2-Tetrachloroethane	ND	6.4	100		μg/L	50	10/6/2016 7:20:00 PM	R37724
Tetrachloroethene (PCE)	ND	7.6	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
trans-1,2-DCE	ND	20	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
trans-1,3-Dichloropropene	ND	5.2	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,2,3-Trichlorobenzene	ND	5.6	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,2,4-Trichlorobenzene	ND	6.6	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,1,1-Trichloroethane	ND	4.6	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,1,2-Trichloroethane	ND	6.4	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Trichloroethene (TCE)	ND	8.8	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Trichlorofluoromethane	ND	10	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
1,2,3-Trichloropropane	ND	10	100		μg/L	50	10/6/2016 7:20:00 PM	R37724
Vinyl chloride	ND	9.8	50		μg/L	50	10/6/2016 7:20:00 PM	R37724
Xylenes, Total	4400	18	75		μg/L	50	10/6/2016 7:20:00 PM	R37724
Surr: 1,2-Dichloroethane-d4	97.9	0	70-130		%Rec	50	10/6/2016 7:20:00 PM	R37724
Surr: 4-Bromofluorobenzene	104	0	70-130		%Rec	50	10/6/2016 7:20:00 PM	R37724

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

Qualifiers: * Value excee

* Value exceeds Maximum Contaminant Level.

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

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Analytical ReportLab Order **1610091**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 12/1/2016

CLIENT: Western Refining Company

Client Sample ID: OW-58

 Project:
 OW-14 Source Inv.
 Collection Date: 9/30/2016 10:45:00 AM

 Lab ID:
 1610091-006
 Matrix: AQUEOUS
 Received Date: 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Surr: Dibromofluoromethane	95.5	0	70-130		%Rec	50	10/6/2016 7:20:00 PM	R37724
Surr: Toluene-d8	101	0	70-130		%Rec	50	10/6/2016 7:20:00 PM	R37724
EPA 335.4: TOTAL CYANIDE SUBBED							Analyst: SUB	
Cyanide	0.0273	0.0100	0.0100		mg/L	1	10/14/2016	R38822

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

Qualifiers: Value exceeds Maximum Contaminant Level. В Analyte detected in the associated Method Blank D Sample Diluted Due to Matrix Ε Value above quantitation range Н Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits Page 36 of 56 ND Not Detected at the Reporting Limit P Sample pH Not In Range RPD outside accepted recovery limits RLReporting Detection Limit % Recovery outside of range due to dilution or matrix Sample container temperature is out of limit as specified

Date Reported: 12/1/2016

CLIENT: Western Refining Company

Client Sample ID: TRIP BLANK

Project: OW-14 Source Inv. Collection Date:

Lab ID: 1610091-007 **Matrix:** TRIP BLANK **Received Date:** 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANGE	.						Analyst: NSB	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	10/5/2016 3:38:46 PM	G37702
Surr: BFB	92.2	0	66.4-120		%Rec	1	10/5/2016 3:38:46 PM	G37702
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Benzene	0.15	0.096	1.0	J	μg/L	1	10/6/2016 8:07:00 PM	R37724
Toluene	0.20	0.12	1.0	J	μg/L	1	10/6/2016 8:07:00 PM	R37724
Ethylbenzene	ND	0.11	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Methyl tert-butyl ether (MTBE)	ND	0.21	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,2,4-Trimethylbenzene	0.11	0.11	1.0	J	μg/L	1	10/6/2016 8:07:00 PM	R37724
1,3,5-Trimethylbenzene	ND	0.12	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,2-Dichloroethane (EDC)	ND	0.12	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,2-Dibromoethane (EDB)	ND	0.11	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Naphthalene	0.28	0.093	2.0	J	μg/L	1	10/6/2016 8:07:00 PM	R37724
1-Methylnaphthalene	ND	0.20	4.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
2-Methylnaphthalene	0.40	0.16	4.0	J	μg/L	1	10/6/2016 8:07:00 PM	R37724
Acetone	ND	4.9	10		μg/L	1	10/6/2016 8:07:00 PM	R37724
Bromobenzene	ND	0.098	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Bromodichloromethane	ND	0.14	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Bromoform	ND	0.10	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Bromomethane	ND	0.78	3.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
2-Butanone	ND	0.74	10		μg/L	1	10/6/2016 8:07:00 PM	R37724
Carbon disulfide	ND	0.60	10		μg/L	1	10/6/2016 8:07:00 PM	R37724
Carbon Tetrachloride	ND	0.11	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Chlorobenzene	ND	0.11	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Chloroethane	ND	0.19	2.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Chloroform	ND	0.089	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Chloromethane	ND	0.21	3.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
2-Chlorotoluene	ND	0.40	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
4-Chlorotoluene	ND	0.13	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
cis-1,2-DCE	ND	0.12	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
cis-1,3-Dichloropropene	ND	0.11	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,2-Dibromo-3-chloropropane	ND	0.23	2.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Dibromochloromethane	ND	0.087	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Dibromomethane	ND	0.12	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,2-Dichlorobenzene	ND	0.40	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,3-Dichlorobenzene	ND	0.14	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,4-Dichlorobenzene	ND	0.14	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Dichlorodifluoromethane	ND	0.36	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,1-Dichloroethane	ND	0.11	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,1-Dichloroethene	ND	0.11	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 12/1/2016

CLIENT: Western Refining Company

Client Sample ID: TRIP BLANK

Project: OW-14 Source Inv. Collection Date:

Lab ID: 1610091-007 **Matrix:** TRIP BLANK **Received Date:** 10/3/2016 4:55:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
1,2-Dichloropropane	ND	0.11	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,3-Dichloropropane	ND	0.16	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
2,2-Dichloropropane	ND	0.17	2.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,1-Dichloropropene	ND	0.13	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Hexachlorobutadiene	ND	0.20	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
2-Hexanone	ND	0.84	10		μg/L	1	10/6/2016 8:07:00 PM	R37724
Isopropylbenzene	ND	0.10	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
4-Isopropyltoluene	ND	0.14	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
4-Methyl-2-pentanone	ND	0.43	10		μg/L	1	10/6/2016 8:07:00 PM	R37724
Methylene Chloride	ND	0.19	3.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
n-Butylbenzene	ND	0.16	3.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
n-Propylbenzene	ND	0.13	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
sec-Butylbenzene	ND	0.12	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Styrene	ND	0.11	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
tert-Butylbenzene	ND	0.12	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,1,1,2-Tetrachloroethane	ND	0.11	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,1,2,2-Tetrachloroethane	ND	0.13	2.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Tetrachloroethene (PCE)	ND	0.15	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
trans-1,2-DCE	ND	0.40	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
trans-1,3-Dichloropropene	ND	0.10	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,2,3-Trichlorobenzene	ND	0.11	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,2,4-Trichlorobenzene	ND	0.13	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,1,1-Trichloroethane	ND	0.091	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,1,2-Trichloroethane	ND	0.13	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Trichloroethene (TCE)	ND	0.18	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Trichlorofluoromethane	ND	0.20	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
1,2,3-Trichloropropane	ND	0.20	2.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Vinyl chloride	ND	0.20	1.0		μg/L	1	10/6/2016 8:07:00 PM	R37724
Xylenes, Total	ND	0.37	1.5		μg/L	1	10/6/2016 8:07:00 PM	R37724
Surr: 1,2-Dichloroethane-d4	98.3	0	70-130		%Rec	1	10/6/2016 8:07:00 PM	R37724
Surr: 4-Bromofluorobenzene	102	0	70-130		%Rec	1	10/6/2016 8:07:00 PM	R37724
Surr: Dibromofluoromethane	97.5	0	70-130		%Rec	1	10/6/2016 8:07:00 PM	R37724
Surr: Toluene-d8	98.3	0	70-130		%Rec	1	10/6/2016 8:07:00 PM	R37724

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

Qualifiers:

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

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Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Address:

4901 HAWKINS NE SUITE D

ALBUQUERQUE, NM 87109

Attn:

ANDY FREEMAN

Batch #:

161006024

Project Name:

1610091

Analytical Results Report

Sample Number

161006024-001

Sampling Date

10/2/2016 9:15 AM

Date/Time Received 10/5/2016 12:00 PM

Client Sample ID Matrix

1610091-001G / TK 568-1-GW Sampling Time

Water

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	10/11/2016	MER	EPA 335.4	

Sample Number

161006024-002

Sampling Date 10/2/2016

Client Sample ID

1610091-002G / TK 568-2-GW Sampling Time

8:30 AM

Date/Time Received 10/5/2016 12:00 PM

Matrix

Water

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	10/11/2016	MER	EPA 335.4	

Sample Number

161006024-003

Sampling Date

10/2/2016

Date/Time Received 10/5/2016 12:00 PM

Client Sample ID

1610091-003G / TK 569-3-GW

Sampling Time

7:45 AM

Comments

Water

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	10/11/2016	MER	EPA 335.4	

Sample Number Client Sample ID 161006024-004

Sampling Date 1610091-004G / TK 570-1-GW Sampling Time

9/30/2016

Date/Time Received 10/5/2016 12:00 PM

Matrix

Water

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	10/11/2016	MER	EPA 335.4	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Anatek Labs, Inc.

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Client:

HALL ENVIRONMENTAL ANALYSIS LAB

161006024

Address:

4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109

Project Name:

Batch #:

1610091

Attn:

ANDY FREEMAN

Analytical Results Report

Sample Number Client Sample ID

161006024-005 1610091-005G / OW-57

10/1/2016 Sampling Date

Sampling Time

Date/Time Received 10/5/2016 12:00 PM

Matrix

Water

Comments

Parameter	Result	Units	PQL.	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	10/14/2016	MER	EPA 335.4	

9/30/2016

10:40 AM

Sample Number

161006024-006

Sampling Date

Date/Time Received 10/5/2016 12:00 PM

Client Sample ID

1610091-006G / OW-58

Sampling Time

10:45 AM

Matrix

Water

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	0.0273	mg/L	0.01	10/14/2016	MER	EPA 335.4	

Authorized Signature

MCL

EPA's Maximum Contaminant Level

ND

Not Detected

PQL

Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.

The results reported relate only to the samples indicated.

Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Batch #:

161006024

Address:

4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109

Project Name:

1610091

Attn:

ANDY FREEMAN

Analytical Results Report Quality Control Data

Lab Control Sa	mple										
Parameter		LCS Result	Units	LCS:	Spike	%Rec	AR	%Rec	Prep	Date	Analysis Date
Cyanide		0.516	mg/L	. 0.	.5	103.2	90	-110	10/14	/2016	10/14/2016
Cyanide ——		0.504	mg/L	. 0.	.5	100.8	90	-110	10/11	/2016	10/11/2016
Matrix Spike		·									
Sample Number	Parameter		Sample	MS	11!	4-	MS	0/ 53	AR	Davis Data	Amelia Data
-	Cvanide		Result	Result 0.504	Uni		Spike	%Rec 95.3	%Rec 90-110	Prep Date 10/14/2016	•
	Cyanide		0.0273 ND	0.504	mg, mg,		0.5 0.5	95.3 104.8		10/14/2016	
						·					-
Matrix Spike Du	ıplicate	MSD		мор				45			
Parameter		พอบ Result	Units	MSD Spike	%E	Rec	%RPD	AR %RPD	Pre	p Date	Analysis Date
Cyanide		0.498	mg/L	0.5		4.1	1.2	0-20		14/2016	10/14/2016
Cyanide		0.518	mg/L	0.5	10	3.6	1.2	0-20	10/	11/2016	10/11/2016
Method Blank											
Parameter			Re	suit	U	nits		PQL	Pı	rep Date	Analysis Date
Cyanide			N	ID	m	ng/L		0.01	10/	14/2016	10/14/2016
Cyanide			N	ID	m	ng/L		0.01	10/	11/2016	10/11/2016

AR

Acceptable Range

ND PQL Not Detected

RPD

Practical Quantitation Limit Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Hall Environmental Analysis Laboratory, Inc.

ND

ND

0.050

0.010

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-28061 SampType: MBLK TestCode: EPA Method 200.7: Metals Client ID: **PBW** Batch ID: 28061 RunNo: 37991 Prep Date: 10/13/2016 Analysis Date: 10/17/2016 SeqNo: 1184300 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Barium ND 0.0020 ND 0.0020 Beryllium 0.0020 Cadmium ND Chromium ND 0.0060 Cobalt ND 0.0060 ND 0.020 Iron Manganese ND 0.0020 Nickel ND 0.010 Silver ND 0.0050

Sample ID LCS-28061	Samp	Type: LC	S	Tes	tCode: El	PA Method	200.7: Metals	;		
Client ID: LCSW	Bato	h ID: 28	061	F	RunNo: 3	7991				
Prep Date: 10/13/2016	Analysis	Date: 1 0	0/17/2016	S	SeqNo: 1	184301	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.46	0.0020	0.5000	0	91.1	85	115			
Beryllium	0.49	0.0020	0.5000	0	97.5	85	115			
Cadmium	0.47	0.0020	0.5000	0	93.9	85	115			
Chromium	0.46	0.0060	0.5000	0	91.2	85	115			
Cobalt	0.44	0.0060	0.5000	0	87.4	85	115			
Iron	0.47	0.020	0.5000	0	94.1	85	115			
Manganese	0.45	0.0020	0.5000	0	89.6	85	115			
Nickel	0.45	0.010	0.5000	0	89.1	85	115			
Silver	0.097	0.0050	0.1000	0	97.0	85	115			
Vanadium	0.49	0.050	0.5000	0	98.7	85	115			
Zinc	0.45	0.010	0.5000	0	90.0	85	115			

Sample ID LLLCS-28061	SampTy	pe: LC	SLL	Tes	tCode: El	PA Method	200.7: Metals			
Client ID: BatchQC	Batch I	D: 28 0	061	F	RunNo: 3	7991				
Prep Date: 10/13/2016	Analysis Da	te: 10	/17/2016	S	SeqNo: 1	184302	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0020 0	.0020	0.002000	0	102	50	150			
Beryllium	0.0017 0	.0020	0.002000	0	83.5	50	150			J
Cadmium	0.0020 0	.0020	0.002000	0	102	50	150			
Chromium	0.0051 0	.0060	0.006000	0	84.8	50	150			J
Cobalt	0.0051 0	.0060	0.006000	0	85.5	50	150			J
Iron	0.020	0.020	0.02000	0	99.7	50	150			J

Qualifiers:

Vanadium

Zinc

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- Page 39 of 56

- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: 1610091

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID LLLCS-28061	Samp	Type: LC	SLL	Tes	tCode: E	PA Method	200.7: Metals	3		
Client ID: BatchQC	Bato	ch ID: 28	061	F	RunNo: 3	7991				
Prep Date: 10/13/2016	Analysis	Date: 10	0/17/2016	8	SeqNo: 1	184302	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.0021	0.0020	0.002000	0	103	50	150			
Nickel	0.0050	0.010	0.005000	0	99.8	50	150			J
Silver	0.0048	0.0050	0.005000	0	95.0	50	150			J
Vanadium	0.0080	0.050	0.01000	0	79.8	50	150			J
Zinc	0.0058	0.010	0.005000	0	117	50	150			J

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- Sample Diluted Due to Matrix D
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-C SampType: MBLK TestCode: EPA Method 200.7: Dissolved Metals PBW Client ID: Batch ID: C38016 RunNo: 38016 SeqNo: 1185332 Prep Date: Analysis Date: 10/18/2016 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Beryllium ND 0.0020 Cadmium ND 0.0020 0.0060 Chromium ND Cobalt ND 0.0060 Iron ND 0.020 Nickel ND 0.010 Silver ND 0.0050 Vanadium ND 0.050 Zinc ND 0.010

Sample ID LCS-C	Samp	Type: LC	S	TestCode: EPA Method 200.7: Dissolved Metals							
Client ID: LCSW	Bato	ch ID: C3	8016	F	RunNo: 3						
Prep Date:	Analysis	Date: 1 0	0/18/2016	8	SeqNo: 1	185333	Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Beryllium	0.50	0.0020	0.5000	0	101	85	115				
Cadmium	0.49	0.0020	0.5000	0	98.5	85	115				
Chromium	0.48	0.0060	0.5000	0	95.9	85	115				
Cobalt	0.46	0.0060	0.5000	0	92.8	85	115				
Iron	0.50	0.020	0.5000	0	99.1	85	115				
Nickel	0.46	0.010	0.5000	0	92.4	85	115				
Silver	0.10	0.0050	0.1000	0	99.6	85	115				
Vanadium	0.51	0.050	0.5000	0	102	85	115				
7inc	0 47	0.010	0.5000	0	94 1	85	115				

Sample ID LLLCS-C	Samp	Type: LC	SLL	Tes	TestCode: EPA Method 200.7: Dissolved Metals						
Client ID: BatchQC	Bato	ch ID: C3	8016	F	RunNo: 38016						
Prep Date:	Analysis	Date: 10)/18/2016	S	SeqNo: 1	185334	Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Beryllium	0.0018	0.0020	0.002000	0	89.0	50	150			J	
Cadmium	0.0020	0.0020	0.002000	0	99.0	50	150			J	
Chromium	0.0055	0.0060	0.006000	0	91.5	50	150			J	
Cobalt	0.0055	0.0060	0.006000	0	92.2	50	150			J	
Iron	0.021	0.020	0.02000	0	105	50	150				
Nickel	0.0046	0.010	0.005000	0	92.4	50	150			J	
Silver	0.0046	0.0050	0.005000	0	91.4	50	150			J	
Vanadium	0.0087	0.050	0.01000	0	87.3	50	150			J	
Zinc	0.0048	0.010	0.005000	0	95.6	50	150			J	

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-E SampType: MBLK TestCode: EPA Method 200.7: Dissolved Metals PBW Client ID: Batch ID: E38016 RunNo: 38016 SeqNo: 1186382 Prep Date: Analysis Date: 10/18/2016 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Barium ND 0.0020 ND 0.0020 Beryllium 0.0020 Cadmium ND Chromium ND 0.0060 Cobalt ND 0.0060 ND 0.020 Iron Manganese ND 0.0020 Nickel ND 0.010 Silver ND 0.0050 0.050 Vanadium ND Zinc ND 0.010

Sample ID LCS-E	SampType: LCS TestCode: EPA Method 200.7: Dissolved Metals							ls		
Client ID: LCSW	Bato	h ID: E3	8016	F	RunNo: 3	8016				
Prep Date:	Analysis	Date: 1 ()/18/2016	S	SeqNo: 1	186383	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	98.6	85	115			
Beryllium	0.52	0.0020	0.5000	0	104	85	115			
Cadmium	0.50	0.0020	0.5000	0	100	85	115			
Chromium	0.48	0.0060	0.5000	0	96.1	85	115			
Cobalt	0.47	0.0060	0.5000	0	94.6	85	115			
Iron	0.51	0.020	0.5000	0	102	85	115			
Manganese	0.48	0.0020	0.5000	0	96.5	85	115			
Nickel	0.49	0.010	0.5000	0	98.9	85	115			
Silver	0.10	0.0050	0.1000	0	101	85	115			
Vanadium	0.53	0.050	0.5000	0	106	85	115			
Zinc	0.50	0.010	0.5000	0	99.6	85	115			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- Page 42 of 56

- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

ND

0.024

0.0010

0.0010

0.02500

WO#: 1610091

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Selenium

Selenium

Sample ID MB-28061 SampType: MBLK TestCode: EPA 200.8: Metals Client ID: **PBW** Batch ID: 28061 RunNo: 37962 Prep Date: 10/13/2016 Analysis Date: 10/14/2016 SeqNo: 1182962 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 0.0010 Antimony ND J Arsenic 0.00042 0.0010 Lead ND 0.00050

Sample ID MSLCS-28061 SampType: LCS TestCode: EPA 200.8: Metals Client ID: **LCSW** Batch ID: 28061 RunNo: 37962 Prep Date: 10/13/2016 Analysis Date: 10/14/2016 SeqNo: 1182964 Units: mg/L SPK Ref Val %REC HighLimit %RPD **RPDLimit** Result **PQL** SPK value LowLimit Qual Analyte Antimony 0.026 0.0010 0.02500 0 104 85 115 0.02500 0 0.0010 100 85 Arsenic 0.025 115 Lead 0.012 0.00050 0.01250 0 100 85 115

0

95.1

85

115

Sample ID MSLLLCS-28061 SampType: LCSLL TestCode: EPA 200.8: Metals Client ID: **BatchQC** Batch ID: 28061 RunNo: 37962 Units: mg/L Prep Date: 10/13/2016 Analysis Date: 10/14/2016 SeqNo: 1182966 %RPD Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit **RPDLimit** Qual 0.00097 0.0010 0.001000 0 96.7 50 150 Antimony Arsenic 0.0014 0.0010 0.001000 0 142 50 150 0.00052 0.00050 0.0005000 0 104 50 150 Lead Selenium 0.00095 0.0010 0.001000 94.6 50 150 J

Qualifiers:

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

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P Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: 1610091

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID LCS SampType: LCS TestCode: EPA 200.8: Dissolved Metals LCSW Client ID: Batch ID: A38075 RunNo: 38075

Units: mg/L Prep Date: Analysis Date: 10/19/2016 SeqNo: 1187756

Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

0.024 0.0010 0.02500 96.0 85 Antimony n 115

Sample ID LLLCS SampType: LCSLL TestCode: EPA 200.8: Dissolved Metals Client ID: BatchQC Batch ID: A38075 RunNo: 38075 Prep Date: Analysis Date: 10/19/2016 SeqNo: 1187758 Units: mg/L SPK value SPK Ref Val %RPD **RPDLimit** Analyte Result **PQL** %REC LowLimit HighLimit Qual Antimony 0.00088 0.0010 0.001000 87.9 150 J

Sample ID MB SampType: MBLK TestCode: EPA 200.8: Dissolved Metals Client ID: **PBW** Batch ID: A38075 RunNo: 38075

Prep Date: Units: mg/L Analysis Date: 10/19/2016 SeqNo: 1187760

SPK value SPK Ref Val %REC LowLimit Result **PQL** %RPD **RPDLimit** Analyte HighLimit Qual

ND 0.0010 Antimony

Sample ID LCS SampType: LCS TestCode: EPA 200.8: Dissolved Metals Client ID: Batch ID: A38120 RunNo: 38120 LCSW Prep Date: Analysis Date: 10/20/2016 SeqNo: 1189487 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 0.0010 93.6 85 Arsenic 0.023 0.02500 0 115

0.012 0.00050 0.01250 0 94.1 85 Lead 115

Sample ID LLLCS SampType: LCSLL TestCode: EPA 200.8: Dissolved Metals Client ID: BatchQC Batch ID: A38120 RunNo: 38120 Prep Date: Analysis Date: 10/20/2016 SeqNo: 1189488 Units: mg/L Analyte SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Result POI Qual Arsenic 0.00099 0.0010 0.001000 99.1 50 150 J 0.00050 0.00050 0.0005000 99.8 50 Lead 150 J

Sample ID MB SampType: MBLK TestCode: EPA 200.8: Dissolved Metals Client ID: PBW Batch ID: A38120 RunNo: 38120 Prep Date: Analysis Date: 10/20/2016 SeqNo: 1189489 Units: mg/L SPK value SPK Ref Val %REC LowLimit %RPD **RPDLimit** Analyte Result **PQL** HighLimit Qual

0.0010 Arsenic ND Lead ND 0.00050

Qualifiers:

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

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P Sample pH Not In Range

RL Reporting Detection Limit

Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID LCS	Samp	Tes	TestCode: EPA 200.8: Dissolved Metals							
Client ID: LCSW	Bato	F	RunNo: 3	8136						
Prep Date:	Analysis [Date: 10)/21/2016	S	SeqNo: 1	190552	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.023	0.0010	0.02500	0	93.9	85	115			
Arsenic	0.024	0.0010	0.02500	0	94.6	85	115			
Selenium	0.024	0.0010	0.02500	0	97.7	85	115			

Sample ID LLLCS	Samp	Type: LC	SLL	Tes	tCode: El	PA 200.8: I	Dissolved Me	tals		
Client ID: BatchQC	Bato	ch ID: C3	8136	F	RunNo: 3	8136				
Prep Date:	Analysis	Date: 1 (0/21/2016	S	eqNo: 1	190553	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00089	0.0010	0.001000	0	89.4	50	150			J
Arsenic	0.00097	0.0010	0.001000	0	96.7	50	150			J
	0.00031	0.0010	0.001000	U	00.1	00				•

Sample ID MB	SampType: MBLK	TestCode: EPA 200.8: Dissolved Metals	
Client ID: PBW	Batch ID: C38136	RunNo: 38136	
Prep Date:	Analysis Date: 10/21/2016	SeqNo: 1190554 Units: mg/L	
Analyte	Result PQL SPK value SF	K Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual	

 Antimony
 ND
 0.0010

 Arsenic
 ND
 0.0010

 Selenium
 ND
 0.0010

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1610091

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-27928 SampType: MBLK TestCode: EPA Method 245.1: Mercury

Client ID: **PBW** Batch ID: 27928 RunNo: 37782

Prep Date: 10/6/2016 Analysis Date: 10/7/2016 SeqNo: 1176949 Units: mg/L

Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

0.00015 0.00020 Mercury J

Sample ID LCS-27928 SampType: LCS TestCode: EPA Method 245.1: Mercury

Client ID: LCSW Batch ID: 27928 RunNo: 37782

Prep Date: 10/6/2016 Analysis Date: 10/7/2016 SeqNo: 1176952 Units: mg/L

SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Analyte Result PQL Qual

Mercury 0.0050 0.00020 0.005000 0 101 120

Qualifiers:

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

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P Sample pH Not In Range

RL Reporting Detection Limit

Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: 1610091

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB SampType: mblk TestCode: EPA Method 300.0: Anions Client ID: **PBW** Batch ID: R37783 RunNo: 37783 Analysis Date: 10/6/2016 Prep Date: SeqNo: 1176976 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Fluoride ND 0.10 ND 0.50

Chloride Sulfate ND 0.50

Sample ID LCS TestCode: EPA Method 300.0: Anions SampType: Ics LCSW Batch ID: R37783 Client ID: RunNo: 37783 Prep Date: Analysis Date: 10/6/2016 SeqNo: 1176977 Units: mg/L

Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 0.54 0.10 0 90 110 Fluoride 0.5000 107 Chloride 5.0 0.50 5.000 0 100 90 110 0 10 0.50 10.00 104 90 110 Sulfate

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

0.56

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-27867 SampType: MBLK TestCode: EPA Method 8015M/D: Diesel Range Client ID: **PBW** Batch ID: 27867 RunNo: 37649 Analysis Date: 10/4/2016 Prep Date: 10/4/2016 SeqNo: 1173041 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Diesel Range Organics (DRO) ND 1.0 Motor Oil Range Organics (MRO) ND 5.0 Surr: DNOP 1.2 1.000 121 77.1 144

Sample ID LCS-27867 SampType: LCS TestCode: EPA Method 8015M/D: Diesel Range Client ID: LCSW RunNo: 37649 Batch ID: 27867 Analysis Date: 10/4/2016 Prep Date: 10/4/2016 SeqNo: 1173047 Units: mg/L Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Diesel Range Organics (DRO) 6.0 1.0 0 120 63.2 5.000 155

112

77.1

144

0.5000

Qualifiers:

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

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Qualifici 5.

Surr: DNOP

Hall Environmental Analysis Laboratory, Inc.

WO#: 1610091

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID RB SampType: MBLK TestCode: EPA Method 8015D: Gasoline Range

Client ID: **PBW** Batch ID: G37702 RunNo: 37702

Prep Date: Analysis Date: 10/5/2016 SeqNo: 1174850 Units: mg/L

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

Gasoline Range Organics (GRO) ND 0.050

20.00 Surr: BFB 17 85.5 66.4 120

Sample ID 2.5UG GRO LCS SampType: LCS TestCode: EPA Method 8015D: Gasoline Range

Client ID: LCSW Batch ID: G37702 RunNo: 37702

Prep Date: Analysis Date: 10/5/2016 SeqNo: 1174851 Units: mg/L

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

Gasoline Range Organics (GRO) 0.53 0.050 0.5000 0 107 80 120 Surr: BFB 66.4 18 20.00 88.9 120

Sample ID 1610091-001AMS SampType: MS TestCode: EPA Method 8015D: Gasoline Range

Client ID: TK 568-1-GW Batch ID: G37702 RunNo: 37702

Prep Date: Analysis Date: 10/5/2016 SeqNo: 1174860 Units: mg/L

%REC SPK value SPK Ref Val %RPD **RPDLimit** Analyte Result PQL LowLimit HighLimit Qual 250 10 100.0 138.8 107 70 130

Gasoline Range Organics (GRO) Surr: BFB 3800 4000 95.2 120 66.4

Sample ID 1610091-001AMSD SampType: MSD TestCode: EPA Method 8015D: Gasoline Range

Client ID: TK 568-1-GW Batch ID: G37702 RunNo: 37702

Analysis Date: 10/5/2016 Prep Date: SeqNo: 1174862 Units: mg/L

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Gasoline Range Organics (GRO) 230 10 100.0 138 8 95.4 70 130 4.75 20 Surr: BFB 3700 4000 91.7 66.4 120 0 0

Qualifiers:

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Holding times for preparation or analysis exceeded Η

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

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P Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

SampType: MBLK

WO#: 1610091

01-Dec-16

Client: Western Refining Company

OW-14 Source Inv. **Project:**

Sample ID 100ng Ics3	Sampl	ype: LC	S	l es	tCode: El					
Client ID: LCSW	Batch	n ID: R3	7724	F	RunNo: 3	7724				
Prep Date:	Analysis D	ate: 10	0/6/2016	S	SeqNo: 1	175699	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	93.0	70	130			
Toluene	19	1.0	20.00	0	96.8	70	130			
Chlorobenzene	19	1.0	20.00	0	96.3	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	96.5	70	130			
Trichloroethene (TCE)	16	1.0	20.00	0	81.7	70	130			
Surr: 1,2-Dichloroethane-d4	9.6		10.00		95.7	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		103	70	130			
Surr: Dibromofluoromethane	9.5		10.00		95.3	70	130			
Surr: Toluene-d8	9.9		10.00		99.3	70	130			

Client ID: PBW	Batch	ı ID: R3	37724	F	RunNo: 3	7724				
Prep Date:	Analysis D	ate: 10	0/6/2016	S	SeqNo: 1	175700	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	0.22	1.0								J
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	0.14	1.0								J
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	0.33	2.0								J
1-Methylnaphthalene	0.43	4.0								J
2-Methylnaphthalene	0.51	4.0								J
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

Sample ID rb

Value exceeds Maximum Contaminant Level.

Sample Diluted Due to Matrix D

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits R

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

TestCode: EPA Method 8260B: VOLATILES

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

Reporting Detection Limit RL

Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID rb	SampT	уре: МВ	LK	TestCode: EPA Method 8260B: VOLATILES								
Client ID: PBW	Batch	1D: R37	7724	F	RunNo: 3	7724						
Prep Date:	Analysis D	ate: 10	/6/2016	S	SeqNo: 1	175700	Units: µg/L	Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
4-Chlorotoluene	ND	1.0										
cis-1,2-DCE	ND	1.0										
cis-1,3-Dichloropropene	ND	1.0										
1,2-Dibromo-3-chloropropane	ND	2.0										
Dibromochloromethane	ND	1.0										
Dibromomethane	ND	1.0										
1,2-Dichlorobenzene	ND	1.0										
1,3-Dichlorobenzene	ND	1.0										
1,4-Dichlorobenzene	ND	1.0										
Dichlorodifluoromethane	ND	1.0										
1,1-Dichloroethane	ND	1.0										
1,1-Dichloroethene	ND	1.0										
1,2-Dichloropropane	ND	1.0										
1,3-Dichloropropane	ND	1.0										
2,2-Dichloropropane	ND	2.0										
1,1-Dichloropropene	ND	1.0										
Hexachlorobutadiene	ND	1.0										
2-Hexanone	ND	10										
Isopropylbenzene	ND	1.0										
4-Isopropyltoluene	ND	1.0										
4-Methyl-2-pentanone	1.4	10								J		
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	0.13	1.0								J		
1,2,4-Trichlorobenzene	0.18	1.0								J		
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										
1,2,0 monioropropano	140	2.0										

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID rb SampType: MBLK TestCode: EPA Method 8260B: VOLATILES PBW Client ID: Batch ID: R37724 RunNo: 37724 Prep Date: Analysis Date: 10/6/2016 SeqNo: 1175700 Units: µg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Vinyl chloride ND 1.0 Xylenes, Total 0.42 J 1.5 99.4 70 9.9 10.00 130 Surr: 1,2-Dichloroethane-d4 70 Surr: 4-Bromofluorobenzene 10 10.00 103 130 Surr: Dibromofluoromethane 9.7 10.00 96.9 70 130 Surr: Toluene-d8 9.9 10.00 99.4 70 130

Sample ID 1610091-001ams	Samp1	ype: MS	3	Tes	tCode: E l	PA Method	8260B: VOL	ATILES		
Client ID: TK 568-1-GW	Batcl	n ID: R3	7724	F	RunNo: 37724					
Prep Date:	Analysis D)ate: 10	0/6/2016	S	SeqNo: 1	176577	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	15000	20	400.0	14040	135	70	130			ES
Toluene	9900	20	400.0	9318	137	70	130			ES
Chlorobenzene	390	20	400.0	0	96.7	70	130			
1,1-Dichloroethene	380	20	400.0	0	95.6	70	130			
Trichloroethene (TCE)	320	20	400.0	0	81.0	70	130			
Surr: 1,2-Dichloroethane-d4	190		200.0		95.3	70	130			
Surr: 4-Bromofluorobenzene	210		200.0		103	70	130			
Surr: Dibromofluoromethane	190		200.0		95.4	70	130			
Surr: Toluene-d8	200		200.0		100	70	130			

Sample ID 1610091-001amsd	I SampT	ype: MS	SD	Tes	tCode: El	PA Method	8260B: VOL	ATILES		
Client ID: TK 568-1-GW	Batch	n ID: R3	7724	F	RunNo: 3	7724				
Prep Date:	Analysis D	ate: 10	0/6/2016	8	SeqNo: 1	176578	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	13000	20	400.0	14040	-358	70	130	14.5	20	ES
Toluene	8500	20	400.0	9318	-213	70	130	15.3	20	ES
Chlorobenzene	570	20	400.0	0	143	70	130	38.9	20	RS
1,1-Dichloroethene	550	20	400.0	0	137	70	130	35.9	20	RS
Trichloroethene (TCE)	480	20	400.0	0	119	70	130	38.1	20	R
Surr: 1,2-Dichloroethane-d4	190		200.0		96.6	70	130	0	0	
Surr: 4-Bromofluorobenzene	200		200.0		102	70	130	0	0	
Surr: Dibromofluoromethane	190		200.0		96.1	70	130	0	0	
Surr: Toluene-d8	200		200.0		99.8	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 52 of 56

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID mb-27882 SampType: MBLK TestCode: EPA Method 8270C: Semivolatiles Client ID: **PBW** Batch ID: 27882 RunNo: 37716 Analysis Date: 10/5/2016 Prep Date: 10/4/2016 SeqNo: 1174799 Units: µg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Acenaphthene ND 10 ND 10 Acenaphthylene ND 10 Aniline Anthracene ND 10 Azobenzene ND 10 Benz(a)anthracene ND 10 Benzo(a)pyrene ND 10 ND Benzo(b)fluoranthene 10 Benzo(q,h,i)perylene ND 10 Benzo(k)fluoranthene ND 10 Benzoic acid 11 20 J ND 10 Benzyl alcohol 10 Bis(2-chloroethoxy)methane ND Bis(2-chloroethyl)ether ND 10 Bis(2-chloroisopropyl)ether ND 10 J Bis(2-ethylhexyl)phthalate 3.2 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 ND 10 Di-n-butyl phthalate Di-n-octyl phthalate ND 10 Dibenz(a,h)anthracene ND 10 Dibenzofuran ND 10 ND 10 1,2-Dichlorobenzene ND 10 1.3-Dichlorobenzene 1,4-Dichlorobenzene ND 10 3.3´-Dichlorobenzidine ND 10 Diethyl phthalate ND 10 Dimethyl phthalate ND 10 20 2,4-Dichlorophenol ND 2,4-Dimethylphenol ND 10 4,6-Dinitro-2-methylphenol ND 20 2,4-Dinitrophenol 7.5 20 J

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID mb-27882	SampT	уре: МЕ	BLK	TestCode: EPA Method 8270C: Semivolatiles								
Client ID: PBW	Batch	ID: 27 8	882	F	RunNo: 3	7716						
Prep Date: 10/4/2016	Analysis D	ate: 10	0/5/2016	S	SeqNo: 1	174799	Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
2,4-Dinitrotoluene	ND	10										
2,6-Dinitrotoluene	ND	10										
Fluoranthene	ND	10										
Fluorene	ND	10										
Hexachlorobenzene	ND	10										
Hexachlorobutadiene	ND	10										
Hexachlorocyclopentadiene	ND	10										
Hexachloroethane	ND	10										
Indeno(1,2,3-cd)pyrene	ND	10										
Isophorone	ND	10										
1-Methylnaphthalene	ND	10										
2-Methylnaphthalene	ND	10										
2-Methylphenol	ND	10										
3+4-Methylphenol	ND	10										
N-Nitrosodi-n-propylamine	ND	10										
N-Nitrosodimethylamine	ND	10										
N-Nitrosodiphenylamine	ND	10										
Naphthalene	ND	10										
2-Nitroaniline	ND	10										
3-Nitroaniline	ND	10										
4-Nitroaniline	ND	10										
Nitrobenzene	ND	10										
2-Nitrophenol	ND	10										
4-Nitrophenol	ND	10										
Pentachlorophenol	ND	20										
Phenanthrene	ND	10										
Phenol	ND	10										
Pyrene	ND	10										
Pyridine	ND	10										
1,2,4-Trichlorobenzene	ND	10										
2,4,5-Trichlorophenol	ND	10										
2,4,6-Trichlorophenol	ND	10										
Surr: 2-Fluorophenol	120		200.0		60.4	15	123					
Surr: Phenol-d5	88		200.0		44.0	4.13	124					
Surr: 2,4,6-Tribromophenol	170		200.0		84.8	18.4	134					
Surr: Nitrobenzene-d5	71		100.0		71.0	28.8	134					
Surr: 2-Fluorobiphenyl	58		100.0		57.8	35.9	125					
Surr: 4-Terphenyl-d14	80		100.0		80.1	15	146					
Sa I Torphonyr a i i			.00.0		· · · · ·	10	0					

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID Ics-27882	SampType: LCS			TestCode: EPA Method 8270C: Semivolatiles						
Client ID: LCSW	Batch ID: 27882			RunNo: 37716						
Prep Date: 10/4/2016	Analysis Date: 10/5/2016		SeqNo: 1174800		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	35	113			
4-Chloro-3-methylphenol	170	10	200.0	0	84.0	40.7	114			
2-Chlorophenol	160	10	200.0	0	79.3	37.6	113			
1,4-Dichlorobenzene	62	10	100.0	0	61.6	37.7	106			
2,4-Dinitrotoluene	77	10	100.0	0	76.8	37	91			
N-Nitrosodi-n-propylamine	86	10	100.0	0	86.3	45.4	105			
4-Nitrophenol	120	10	200.0	0	59.1	33.4	104			
Pentachlorophenol	120	20	200.0	0	60.8	29.5	94.9			
Phenol	130	10	200.0	0	63.0	30.6	119			
Pyrene	83	10	100.0	0	83.5	26.2	120			
1,2,4-Trichlorobenzene	66	10	100.0	0	66.0	39.9	125			
Surr: 2-Fluorophenol	140		200.0		70.0	15	123			
Surr: Phenol-d5	110		200.0		57.4	4.13	124			
Surr: 2,4,6-Tribromophenol	140		200.0		69.3	18.4	134			
Surr: Nitrobenzene-d5	74		100.0		74.0	28.8	134			
Surr: 2-Fluorobiphenyl	66		100.0		66.4	35.9	125			
Surr: 4-Terphenyl-d14	74		100.0		73.7	15	146			

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-R38822 SampType: MBLK TestCode: EPA 335.4: Total Cyanide Subbed

Client ID: PBW Batch ID: R38822 RunNo: 38822

Prep Date: Analysis Date: 10/11/2016 SeqNo: 1213068 Units: mg/L

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

Cyanide ND 0.0100

Sample ID LCS-R38822 SampType: LCS TestCode: EPA 335.4: Total Cyanide Subbed

Client ID: LCSW Batch ID: R38822 RunNo: 38822

Prep Date: Analysis Date: 10/11/2016 SeqNo: 1213069 Units: mg/L

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

Cyanide 0.504 0.5000 0 101 90 110

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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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 N	umber: 1610091		RcptNo: 1
Received by/date: 10/03/1	0		
Logged By: Ashley Gallegos 10/3/2016 4:55:0	00 PM	A	
Completed By: Ashley Gallegos 10/4/2016 9:22:4	17 AM	1	
Reviewed By:	_	2 ,- 0	
Chain of Custody			
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 🔽	Je .
9. Was preservative added to bottles?	Yes 🔽	NO V	W///V 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 🗆	# of preserved bottles checked for pH: 12, 6
(Note discrepancies on chain of custody)	Yes 🗹	No ∐	((<2 or 212 Junless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes 🗹	No 🗆	Adjusted? Ue S
14. Is it clear what analyses were requested?	Yes 🗹	No 🗆	. I
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: Da	ate		
By Whom: Vi	a: 🗌 eMail 🔲 Ph	none Fax	☐ In Person
Regarding:			
Client Instructions:			
17. Additional remarks: For metals analysis: added IML HND3 † 18. Cooler Information Cooler No Temp °C Condition Seal Intact Seal No.		acuptable	pm. 10/4/16 @ 1155
1 4.4 Good Yes			Ju

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Chain-of-Custody Record	Turn-Around Time:	HALL ENVIRONMENTAL
Client: WESTERN REFINING SW. INC.	X Standard	ANALYSIS LABORATORY
GALUP REFINERY	Project Name:	www.hallenvironmental.com
PROSSING RD	OW-14 SOURCE INV.	4901 Hawkins NE - Albuquerque, NM 87109
	Project #:	Tel. 505-345-3975 Fax 505-345-4107
1		Analysis Request
email or Fax#: ED. RIEGE @WNR.COM Project	Project Manager:	(O ⁴)
QA/QC Package:		(SI)
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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.

Chemistre Reconding Swill Container	Chain-of-Custody Record	Turn-Around Time:	INTERNATIONAL TALE
	ERN REFINING SWI INC.		ANALYSIS LABORATORY
Contained Cont	UP REFINERY	Project Name:	www.hallenvironmental.com
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ain-of-Custody Record AN REFINERY GRILLIP NM 67301 505-722-0217 SAM: ED. RTEGE @ WNR. COM kage: d	Turn-Around Time: X Standard Rush Project Name: OW - I 4 SOURCE INV. Project #: Project Manager: ED RIEGE Sampler: TRACY PAYNE	HALL ENVIRONMENTAL ANALYSIS LABORATORY www.hallenvironmental.com 4901 Hawkins NE - Albuquerque, NM 87109 Tel. 505-345-3975 Fax 505-3454107 Analysis Request
Type) EXCE C. Time Matrix Sample Request ID	On Ice Sample Temperature: עישי ב Container Preservative HEAL No. Type and # Type	BTEX + MTBE + - BTEX + MTBE + - TPH 8015B (GRC TPH 8015B (GRC TPH (Method 418 TPH (Method 504 PAH's (8310 or 82 RCRA 8 Metals RCRA 8 Metals Anions (F,CI,NO ₃ , 8081 Pesticides \(\text{ROB} \) Anions (F,CI,NO ₃ , 8260B (VOA) 8260B (VOA) 8270 (Semi-VOA) AETALECTORU CHEM
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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.

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GALLIP, NM 87301	Project #:		_	Tel. 505-345-3975	5-345	3975	Fax		505-345-4107	1107				
Phone #: 505 - 722 - 0217						٧	Analysis Request	s Req	uest					
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If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

WESTERN REFINING SOUTHWEST, INC. GALLUP REFINERY

OW-14 SOURCE INVESTIGATION: SEPTEMBER 2016

METALS AND CYANIDE ANALYSES FOR GROUNDWATER SAMELES AND WATER DA/QC SAMPLES

TOTAL METALS ANALYSIS AND DISSOLVED METALS ANALYSIS

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenio	SW-846 methop 6010/6029
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 7470/7472
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 5010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
a Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

GENERAL CHEMISTRY PARAMETERS FOR GROUNDWATER SAMPLES AND WATER QA/QC SAMPLES

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

November 03, 2016

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

FAX

RE: OW-14 Source Inv. OrderNo.: 1610237

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 1 sample(s) on 10/5/2016 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman

Laboratory Manager

andel

4901 Hawkins NE

Albuquerque, NM 87109

Lab Order: 1610237

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/3/2016

CLIENT: Western Refining Company Client Sample ID: EB100416

Project: OW-14 Source Inv. Collection Date: 10/4/2016 5:30:00 PM

Lab ID: 1610237-001A **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB	_
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	10/6/2016 12:11:18 PM	I G37741
Surr: BFB	88.3	0 6	66.4-120		%Rec	1	10/6/2016 12:11:18 PM	G37741
EPA METHOD 8260B: VOLATILES							Analyst: AG	
Benzene	ND	0.096	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Toluene	ND	0.12	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Ethylbenzene	ND	0.11	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Methyl tert-butyl ether (MTBE)	ND	0.21	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,2,4-Trimethylbenzene	ND	0.11	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,3,5-Trimethylbenzene	ND	0.12	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,2-Dichloroethane (EDC)	ND	0.12	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,2-Dibromoethane (EDB)	ND	0.11	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Naphthalene	ND	0.093	2.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1-Methylnaphthalene	ND	0.20	4.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
2-Methylnaphthalene	ND	0.16	4.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Acetone	ND	4.9	10		μg/L	1	10/6/2016 4:32:46 PM	R37747
Bromobenzene	ND	0.098	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Bromodichloromethane	ND	0.14	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Bromoform	ND	0.10	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Bromomethane	ND	0.78	3.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
2-Butanone	ND	0.74	10		μg/L	1	10/6/2016 4:32:46 PM	R37747
Carbon disulfide	ND	0.60	10		μg/L	1	10/6/2016 4:32:46 PM	R37747
Carbon Tetrachloride	ND	0.11	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Chlorobenzene	ND	0.11	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Chloroethane	ND	0.19	2.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Chloroform	ND	0.089	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Chloromethane	ND	0.21	3.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
2-Chlorotoluene	ND	0.40	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
4-Chlorotoluene	ND	0.13	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
cis-1,2-DCE	ND	0.12	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
cis-1,3-Dichloropropene	ND	0.11	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,2-Dibromo-3-chloropropane	ND	0.23	2.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Dibromochloromethane	ND	0.087	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Dibromomethane	ND	0.12	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,2-Dichlorobenzene	ND	0.40	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,3-Dichlorobenzene	ND	0.14	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,4-Dichlorobenzene	ND	0.14	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Dichlorodifluoromethane	ND	0.36	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,1-Dichloroethane	ND	0.11	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,1-Dichloroethene	ND	0.11	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
 - Page 1 of 26
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: 1610237

Hall Environmental Analysis Laboratory, Inc. Date Reported: 11/3/2016

CLIENT: Western Refining Company Client Sample ID: EB100416

Project: OW-14 Source Inv. Collection Date: 10/4/2016 5:30:00 PM

Lab ID: 1610237-001A **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: AG	
1,2-Dichloropropane	ND	0.11	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,3-Dichloropropane	ND	0.16	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
2,2-Dichloropropane	ND	0.17	2.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,1-Dichloropropene	ND	0.13	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Hexachlorobutadiene	ND	0.20	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
2-Hexanone	ND	0.84	10		μg/L	1	10/6/2016 4:32:46 PM	R37747
Isopropylbenzene	ND	0.10	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
4-Isopropyltoluene	ND	0.14	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
4-Methyl-2-pentanone	ND	0.43	10		μg/L	1	10/6/2016 4:32:46 PM	R37747
Methylene Chloride	ND	0.19	3.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
n-Butylbenzene	ND	0.16	3.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
n-Propylbenzene	ND	0.13	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
sec-Butylbenzene	ND	0.12	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Styrene	ND	0.11	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
tert-Butylbenzene	ND	0.12	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,1,1,2-Tetrachloroethane	ND	0.11	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,1,2,2-Tetrachloroethane	ND	0.13	2.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Tetrachloroethene (PCE)	ND	0.15	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
trans-1,2-DCE	ND	0.40	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
trans-1,3-Dichloropropene	ND	0.10	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,2,3-Trichlorobenzene	ND	0.11	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,2,4-Trichlorobenzene	ND	0.13	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,1,1-Trichloroethane	ND	0.091	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,1,2-Trichloroethane	ND	0.13	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Trichloroethene (TCE)	ND	0.18	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Trichlorofluoromethane	ND	0.20	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
1,2,3-Trichloropropane	ND	0.20	2.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Vinyl chloride	ND	0.20	1.0		μg/L	1	10/6/2016 4:32:46 PM	R37747
Xylenes, Total	ND	0.37	1.5		μg/L	1	10/6/2016 4:32:46 PM	R37747
Surr: 1,2-Dichloroethane-d4	100	0	70-130		%Rec	1	10/6/2016 4:32:46 PM	R37747
Surr: 4-Bromofluorobenzene	98.5	0	70-130		%Rec	1	10/6/2016 4:32:46 PM	R37747
Surr: Dibromofluoromethane	111	0	70-130		%Rec	1	10/6/2016 4:32:46 PM	R37747
Surr: Toluene-d8	88.5	0	70-130		%Rec	1	10/6/2016 4:32:46 PM	R37747

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- Page 2 of 26
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: 1610237

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/3/2016

CLIENT: Western Refining Company Client Sample ID: EB100416

Project: OW-14 Source Inv. **Collection Date:** 10/4/2016 5:30:00 PM

Lab ID: 1610237-001B **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: JME	
Diesel Range Organics (DRO)	ND	0.69	1.0	mg/L	1	10/7/2016 12:29:40 PM	27938
Motor Oil Range Organics (MRO)	ND	5.0	5.0	mg/L	1	10/7/2016 12:29:40 PM	27938
Surr: DNOP	132	0	77.1-144	%Rec	1	10/7/2016 12:29:40 PM	27938

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated Me	thod Blank				
Q	D	Sample Diluted Due to Matrix	E	E Value above quantitation range					
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation li	mits				
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 3 of 26				
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	1 age 3 01 20				
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out o	f limit as specified				

Lab Order: 1610237

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/3/2016

CLIENT: Western Refining Company Client Sample ID: EB100416

Project: OW-14 Source Inv. Collection Date: 10/4/2016 5:30:00 PM

Lab ID: 1610237-001C **Matrix:** Aqueous

Acenaphthylene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 Aniline ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 Anthracene ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 Azobenzene ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 Benzo(a)pyrene ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Benzo(g)fyluoranthene ND 2.9 10 μg/L 1 10/11/2016 5:52:44 PM 27 Benzo(g,h.j)perylene ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Benzo(a)filuoranthene ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Benzo(a)fylioranthene ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Benzo(bylioranthene ND 3.0 10 μg/L	Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
Acenaphthylene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 Aniline ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 Anthracene ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 Azobenzene ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 Benzo(a)pyrene ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Benzo(g)fyluoranthene ND 2.9 10 μg/L 1 10/11/2016 5:52:44 PM 27 Benzo(g,h.j)perylene ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Benzo(a)filuoranthene ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Benzo(a)fylioranthene ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Benzo(bylioranthene ND 3.0 10 μg/L	EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthylene ND 2.4 Aniline ND 2.4 Aniline ND 2.4 Aniline ND 2.4 Aniline ND 2.4 Aniline ND 2.4 Aniline ND 2.5 Display in the companion of the companion o	Acenaphthene	ND	2.6	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
Aniline ND 2.4 Anthracene ND 2.5 10 µg/L 1 10/11/2016 5:52:44 PM 27 Azobenzene ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benz(a)anthracene ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benz(a)pyrene ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzo(a)pyrene ND 2.7 Bonzo(b)fluoranthene ND 2.9 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzo(b)fluoranthene ND 2.9 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzo(k)fluoranthene ND 2.0 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzo(k)fluoranthene ND 3.0 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzo(k)fluoranthene ND 3.0 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzo(k)fluoranthene ND 3.0 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzo(k)fluoranthene ND 3.0 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzok acid 9.5 2.6 20 J µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethoxy)methane ND 2.8 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethoxy)methane ND 2.8 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethoxy)methane ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethyl)ether ND 1.9 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethyl)ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethyl)ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethyl)ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Buyl benzyl phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Buyl benzyl phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Buyl benzyl phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Buyl benzyl phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Buyl benzyl phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Buyl benzyl phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Buyl benzyl phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Buyl benzyl phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Buyl benzyl phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Buyl benzyl	•	ND	2.4	10			1	10/11/2016 5:52:44 P	M 27939
Anthracene ND 2.5 10 µg/L 1 10/11/2016 5:52:44 PM 27 Azobenzene ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benz(a)anthracene ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benz(a)pyrene ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzo(b)fluoranthene ND 2.9 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzo(b)fluoranthene ND 2.9 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzo(k)fluoranthene ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzo(k)fluoranthene ND 3.0 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzo(k)fluoranthene ND 3.0 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzoi acid 9.5 2.6 20 J µg/L 1 10/11/2016 5:52:44 PM 27 Benzoi acid 9.5 2.6 20 J µg/L 1 10/11/2016 5:52:44 PM 27 Benzoi acid 9.5 2.6 20 J µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethoxy)methane ND 2.8 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethyl)ether ND 2.8 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chlorosthyl)ether ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chlorosthyl)ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chlorosthyl)ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chlorosthyl)ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chlorosthyl)ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chlorosthyl)ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chlorosthyl)ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chlorosthyl)ether ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chloro-3-methylphenol ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenol ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenol ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenol ND 2.8 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenol ND 2.8 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenol ND 2.8 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenol ND 2.8 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenol ND 2.8 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenol ND 2.5 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenol ND 2.5 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenol ND 2.5 10 µg/L		ND	2.4	10			1	10/11/2016 5:52:44 P	M 27939
Azobenzene	Anthracene	ND	2.5	10			1	10/11/2016 5:52:44 P	M 27939
Benz(a)anthracene	Azobenzene	ND	2.7	10			1	10/11/2016 5:52:44 P	M 27939
Benzo(a)pyrene ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 27 27 28 27 29 10 µg/L 1 10/11/2016 5:52:44 PM 27 27 28 27 29 10 µg/L 1 10/11/2016 5:52:44 PM 27 27 28 27 29 29 20 µg/L 1 20/11/2016 5:52:44 PM 27 27 28 27 29 29 29 29 20 µg/L 1 20/11/2016 5:52:44 PM 27 27 28 27 29 29 29 29 29 29 29	Benz(a)anthracene	ND	2.6	10			1	10/11/2016 5:52:44 P	M 27939
Benzo(b)fluoranthene ND 2.9 10 µg/L 1 10/11/2016 5:52:44 PM 27 27 27 27 28 27 28 27 27	Benzo(a)pyrene	ND	2.7	10			1	10/11/2016 5:52:44 P	M 27939
Benzo(g,h,i)perylene	Benzo(b)fluoranthene	ND	2.9	10			1	10/11/2016 5:52:44 P	M 27939
Benzoic (k)fluoranthene ND 3.0 10 µg/L 1 10/11/2016 5:52:44 PM 27 Benzoic acid 9.5 2.6 20 J µg/L 1 10/11/2016 5:52:44 PM 27 Benzyl alcohol 3.1 3.0 10 J µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethxy)methane ND 2.8 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethxy)bether ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroisopropyl)ether ND 1.9 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-ethylhexyl)phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Bromophenyl benyl ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Butyl benzyl phthalate ND 2.5 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-C	Benzo(g,h,i)perylene	ND	2.6	10			1	10/11/2016 5:52:44 P	M 27939
Benzoic acid 9.5 2.6 20 J μg/L 1 10/11/2016 5:52:44 PM 27 Benzyl alcohol 3.1 3.0 10 J μg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethoxy)methane ND 2.8 10 μg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethyl)ether ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chlorojsopropyl)ether ND 1.9 10 μg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chlyflexyl)phthalate ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 4-Bromophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Butyl benzyl phthalate ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 Butyl benzyl phthalate ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 Ca	Benzo(k)fluoranthene	ND	3.0	10			1	10/11/2016 5:52:44 P	M 27939
Benzyl alcohol 3.1 3.0 10 J µg/L 1 10/11/2016 5:52:44 PM 27	Benzoic acid	9.5	2.6	20	J		1	10/11/2016 5:52:44 P	M 27939
Bis(2-chloroethoxy)methane ND 2.8 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroethyl)ether ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroisopropyl)ether ND 1.9 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chlylhexyl)phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Bromophenyl phenyl ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Butyl benzyl phthalate ND 2.5 10 µg/L 1 10/11/2016 5:52:44 PM 27 Butyl benzyl phthalate ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 Carbazole ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chloro-3-methylphenol ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chloropanliline ND	Benzyl alcohol	3.1	3.0	10	J		1	10/11/2016 5:52:44 P	M 27939
Bis(2-chloroethyl)ether ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-chloroisopropyl)ether ND 1.9 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-ethylhexyl)phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Bromophenyl phenyl ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Butyl benzyl phthalate ND 2.5 10 µg/L 1 10/11/2016 5:52:44 PM 27 Carbazole ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chloro-3-methylphenol ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chloropathylphenol ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 2-Chloropathylphenol ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 2-Chloropathylphthalene ND </td <td>Bis(2-chloroethoxy)methane</td> <td>ND</td> <td>2.8</td> <td>10</td> <td></td> <td></td> <td>1</td> <td>10/11/2016 5:52:44 P</td> <td>M 27939</td>	Bis(2-chloroethoxy)methane	ND	2.8	10			1	10/11/2016 5:52:44 P	M 27939
Bis(2-chloroisopropyl)ether ND 1.9 10 µg/L 1 10/11/2016 5:52:44 PM 27 Bis(2-ethylhexyl)phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Bromophenyl phenyl ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Butyl benzyl phthalate ND 2.5 10 µg/L 1 10/11/2016 5:52:44 PM 27 Carbazole ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chloro-3-methylphenol ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chloropaniline ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 2-Chloropanbthalene ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 2-Chlorophenol ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenyl phenyl ether ND	Bis(2-chloroethyl)ether	ND	2.7	10			1	10/11/2016 5:52:44 P	M 27939
Bis(2-ethylhexyl)phthalate ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Bromophenyl phenyl ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Butyl benzyl phthalate ND 2.5 10 µg/L 1 10/11/2016 5:52:44 PM 27 Carbazole ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chloro-3-methylphenol ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chloroaniline ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 2-Chloroaphthalene ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 2-Chlorophenol ND 2.2 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenyl phenyl ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Chrysene ND 2.8	Bis(2-chloroisopropyl)ether	ND	1.9	10			1	10/11/2016 5:52:44 P	M 27939
4-Bromophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Butyl benzyl phthalate ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 Carbazole ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 4-Chloro-aniline ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 2-Chloronaphthalene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 2-Chloronaphthalene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 2-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Chrysene ND 2.8 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenz(a,h)anthracene ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenzofuran ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,2-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,3-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,3-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene	Bis(2-ethylhexyl)phthalate	ND	2.6	10			1	10/11/2016 5:52:44 P	M 27939
Carbazole ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chloro-3-methylphenol ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chloroaniline ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 2-Chloronaphthalene ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 2-Chlorophenol ND 2.2 10 µg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenyl phenyl ether ND 2.6 10 µg/L 1 10/11/2016 5:52:44 PM 27 Chrysene ND 2.8 10 µg/L 1 10/11/2016 5:52:44 PM 27 Di-n-butyl phthalate ND 2.4 10 µg/L 1 10/11/2016 5:52:44 PM 27 Di-n-octyl phthalate ND 2.0 10 µg/L 1 10/11/2016 5:52:44 PM 27 Dibenz(a,h)anthracene ND 2.7 10 µg/L 1 10/11/2016 5:52:44 PM 27 Dibenzofuran ND 2.5 10 µg/L 1 10/11/2016 5:52:44 PM 27 1,2-Dichlorobenzene ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 1,3-Dichlorobenzene ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.3 10 µg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 µg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 µg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 µg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 µg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 µg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 µg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 µg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene	4-Bromophenyl phenyl ether	ND	2.6	10			1	10/11/2016 5:52:44 P	M 27939
4-Chloro-3-methylphenol ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 4-Chloroaniline ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 2-Chloroaphthalene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 2-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Chrysene ND 2.8 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenz(a,h)anthracene ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenzofuran ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,2-Dichlorobenz	Butyl benzyl phthalate	ND	2.5	10			1	10/11/2016 5:52:44 P	M 27939
4-Chloro-3-methylphenolND2.610μg/L110/11/2016 5:52:44 PM274-ChloroanilineND2.710μg/L110/11/2016 5:52:44 PM272-ChloronaphthaleneND2.310μg/L110/11/2016 5:52:44 PM272-ChlorophenolND2.210μg/L110/11/2016 5:52:44 PM274-Chlorophenyl phenyl etherND2.610μg/L110/11/2016 5:52:44 PM27ChryseneND2.810μg/L110/11/2016 5:52:44 PM27Di-n-butyl phthalateND2.410μg/L110/11/2016 5:52:44 PM27Di-n-octyl phthalateND2.010μg/L110/11/2016 5:52:44 PM27Dibenz(a,h)anthraceneND2.710μg/L110/11/2016 5:52:44 PM27DibenzofuranND2.510μg/L110/11/2016 5:52:44 PM271,2-DichlorobenzeneND2.310μg/L110/11/2016 5:52:44 PM271,3-DichlorobenzeneND2.310μg/L110/11/2016 5:52:44 PM271,4-DichlorobenzeneND2.410μg/L110/11/2016 5:52:44 PM27	Carbazole	ND	2.3	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
4-Chloroaniline ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 2-Chloronaphthalene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 2-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Chrysene ND 2.8 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenz(a,h)anthracene ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenzofuran ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,2-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene	4-Chloro-3-methylphenol	ND	2.6	10			1	10/11/2016 5:52:44 P	M 27939
2-Chloronaphthalene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 2-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Chrysene ND 2.8 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenz(a,h)anthracene ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenzofuran ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,2-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichloroben	4-Chloroaniline	ND	2.7	10			1	10/11/2016 5:52:44 P	M 27939
2-Chlorophenol ND 2.2 10 μg/L 1 10/11/2016 5:52:44 PM 27 4-Chlorophenyl phenyl ether ND 2.6 10 μg/L 1 10/11/2016 5:52:44 PM 27 Chrysene ND 2.8 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenz(a,h)anthracene ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenzofuran ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,2-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27	2-Chloronaphthalene	ND	2.3	10			1	10/11/2016 5:52:44 P	M 27939
Chrysene ND 2.8 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenz(a,h)anthracene ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenzofuran ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,2-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,3-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27	2-Chlorophenol	ND	2.2	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
Di-n-butyl phthalate ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenz(a,h)anthracene ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenzofuran ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,2-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,3-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27	4-Chlorophenyl phenyl ether	ND	2.6	10			1	10/11/2016 5:52:44 P	M 27939
Di-n-octyl phthalate ND 2.0 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenz(a,h)anthracene ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenzofuran ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,2-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,3-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27	Chrysene	ND	2.8	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
Dibenz(a,h)anthracene ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27 Dibenzofuran ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,2-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,3-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27	Di-n-butyl phthalate	ND	2.4	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
Dibenzofuran ND 2.5 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,2-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,3-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27	Di-n-octyl phthalate	ND	2.0	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
1,2-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,3-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene	Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
1,3-Dichlorobenzene ND 2.3 10 μg/L 1 10/11/2016 5:52:44 PM 27 1,4-Dichlorobenzene ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27	Dibenzofuran	ND	2.5	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
1,4-Dichlorobenzene ND 2.4 10 µg/L 1 10/11/2016 5:52:44 PM 27	1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
,	1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
3,3´-Dichlorobenzidine ND 2.4 10 μg/L 1 10/11/2016 5:52:44 PM 27	1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
	3,3'-Dichlorobenzidine	ND	2.4	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
Diethyl phthalate ND 2.7 10 μg/L 1 10/11/2016 5:52:44 PM 27	Diethyl phthalate	ND	2.7	10		μg/L	1	10/11/2016 5:52:44 P	M 27939
	Dimethyl phthalate	ND	2.4	10			1	10/11/2016 5:52:44 P	M 27939
2,4-Dichlorophenol ND 2.3 20 μg/L 1 10/11/2016 5:52:44 PM 27	2,4-Dichlorophenol	ND	2.3	20		μg/L	1	10/11/2016 5:52:44 P	M 27939
	2,4-Dimethylphenol	ND	3.0	10			1	10/11/2016 5:52:44 P	M 27939
	4,6-Dinitro-2-methylphenol	ND	1.8	20			1	10/11/2016 5:52:44 P	M 27939
	2,4-Dinitrophenol	ND	2.8	20			1	10/11/2016 5:52:44 P	M 27939
2,4-Dinitrotoluene ND 3.1 10 µg/L 1 10/11/2016 5:52:44 PM 27	2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	10/11/2016 5:52:44 P	M 27939

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- Page 4 of 26
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: 1610237

Hall Environmental Analysis Laboratory, Inc. Date Reported: 11/3/2016

CLIENT: Western Refining Company Client Sample ID: EB100416

Project: OW-14 Source Inv. Collection Date: 10/4/2016 5:30:00 PM

Lab ID: 1610237-001C **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES						Analyst: DAM	
2,6-Dinitrotoluene	ND	2.7	10	μg/L	1	10/11/2016 5:52:44 PN	A 27939
Fluoranthene	ND	2.6	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Fluorene	ND	2.7	10	μg/L	1	10/11/2016 5:52:44 PN	A 27939
Hexachlorobenzene	ND	2.6	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Hexachlorobutadiene	ND	2.2	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Hexachlorocyclopentadiene	ND	2.3	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Hexachloroethane	ND	2.4	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Indeno(1,2,3-cd)pyrene	ND	3.0	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Isophorone	ND	2.6	10	μg/L	1	10/11/2016 5:52:44 PN	A 27939
1-Methylnaphthalene	ND	2.9	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
2-Methylnaphthalene	ND	2.9	10	μg/L	1	10/11/2016 5:52:44 PN	A 27939
2-Methylphenol	ND	2.5	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
3+4-Methylphenol	ND	2.3	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
N-Nitrosodi-n-propylamine	ND	2.4	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
N-Nitrosodimethylamine	ND	2.2	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
N-Nitrosodiphenylamine	ND	2.3	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Naphthalene	ND	2.6	10	μg/L	1	10/11/2016 5:52:44 PN	A 27939
2-Nitroaniline	ND	2.8	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
3-Nitroaniline	ND	2.9	10	μg/L	1	10/11/2016 5:52:44 PN	A 27939
4-Nitroaniline	ND	2.6	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Nitrobenzene	ND	2.8	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
2-Nitrophenol	ND	2.4	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
4-Nitrophenol	ND	2.6	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Pentachlorophenol	ND	2.3	20	μg/L	1	10/11/2016 5:52:44 PN	A 27939
Phenanthrene	ND	2.6	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Phenol	ND	2.0	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Pyrene	ND	3.1	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Pyridine	ND	2.2	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
1,2,4-Trichlorobenzene	ND	2.6	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
2,4,5-Trichlorophenol	ND	2.2	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
2,4,6-Trichlorophenol	ND	2.4	10	μg/L	1	10/11/2016 5:52:44 PM	A 27939
Surr: 2-Fluorophenol	21.2	0	15-123	%Rec	1	10/11/2016 5:52:44 PM	A 27939
Surr: Phenol-d5	16.9	0	15-124	%Rec	1	10/11/2016 5:52:44 PM	A 27939
Surr: 2,4,6-Tribromophenol	36.5	0	18.4-134	%Rec	1	10/11/2016 5:52:44 PM	A 27939
Surr: Nitrobenzene-d5	48.6	0	28.8-134	%Rec	1	10/11/2016 5:52:44 PN	A 27939
Surr: 2-Fluorobiphenyl	48.7	0	35.9-125	%Rec	1	10/11/2016 5:52:44 PN	A 27939
Surr: 4-Terphenyl-d14	53.0	0	15-146	%Rec	1	10/11/2016 5:52:44 PM	<i>I</i> 27939

Ω_{110}	1:4:	030	

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- Page 5 of 26
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: 1610237

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/3/2016

CLIENT: Western Refining Company Client Sample ID: EB100416

Project: OW-14 Source Inv. Collection Date: 10/4/2016 5:30:00 PM

Lab ID: 1610237-001D **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: MRA	
Fluoride	ND	0.050	0.10	mg/L	1	10/6/2016 9:20:37 PM	R37783
Chloride	ND	0.051	0.50	mg/L	1	10/6/2016 9:20:37 PM	R37783
Sulfate	ND	0.14	0.50	mg/L	1	10/6/2016 9:20:37 PM	R37783

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated Method	l Blank	
	D	Sample Diluted Due to Matrix	E Value above quantitation range			
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	S	
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 6 of 26	
	R	RPD outside accepted recovery limits	RL Reporting Detection Limit		1 age 0 01 20	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of lin	nit as specified	

Lab Order: 1610237

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/3/2016

CLIENT: Western Refining Company Client Sample ID: EB100416

Project: OW-14 Source Inv. Collection Date: 10/4/2016 5:30:00 PM

Lab ID: 1610237-001E **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed I	Batch ID
EPA METHOD 200.7: DISSOLVED ME	ETALS						Analyst: MED	
Barium	ND	0.0013	0.0020		mg/L	1	10/20/2016 3:00:15 PM	A38098
Beryllium	ND	0.00031	0.0020		mg/L	1	10/20/2016 3:00:15 PM	A38098
Cadmium	ND	0.00075	0.0020		mg/L	1	10/20/2016 3:00:15 PM	A38098
Chromium	ND	0.0018	0.0060		mg/L	1	10/20/2016 3:00:15 PM	A38098
Cobalt	ND	0.00074	0.0060		mg/L	1	10/20/2016 3:00:15 PM	A38098
Iron	0.037	0.020	0.020		mg/L	1	10/20/2016 3:00:15 PM	A38098
Manganese	0.00058	0.00032	0.0020	J	mg/L	1	10/20/2016 3:00:15 PM	A38098
Nickel	ND	0.0024	0.010		mg/L	1	10/20/2016 3:00:15 PM	A38098
Silver	ND	0.0028	0.0050		mg/L	1	10/20/2016 3:00:15 PM	A38098
Vanadium	ND	0.0013	0.050		mg/L	1	10/20/2016 3:00:15 PM	A38098
Zinc	ND	0.0028	0.010		mg/L	1	10/20/2016 3:00:15 PM	A38098
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/21/2016 10:38:12 PM	C38136
Arsenic	ND	0.00014	0.0010		mg/L	1	10/21/2016 10:38:12 PM	C38136
Lead	ND	0.00017	0.00050		mg/L	1	10/21/2016 10:38:12 PM	C38136
Selenium	ND	0.00021	0.0010		mg/L	1	10/21/2016 10:38:12 PM	C38136
EPA METHOD 245.1: MERCURY							Analyst: pmf	
Mercury	0.00012	0.000053	0.00020	J	mg/L	1	10/13/2016 11:54:26 AM	28031

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank				
•	D	Sample Diluted Due to Matrix	e to Matrix E Value above quantitatio				
	Н	Holding times for preparation or analysis exceeded	J	J Analyte detected below quantitation limits			
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 7 of 26		
	R	RPD outside accepted recovery limits	RL Reporting Detection Limit		1 age 7 01 20		
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of li	mit as specified		

Lab Order: 1610237

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/3/2016

CLIENT: Western Refining Company Client Sample ID: EB100416

Project: OW-14 Source Inv. Collection Date: 10/4/2016 5:30:00 PM

Lab ID: 1610237-001F **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed B	atch ID
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	ND	0.0013	0.0020		mg/L	1	10/19/2016 11:29:22 AM	A38043
Beryllium	ND	0.00036	0.0020		mg/L	1	10/19/2016 11:29:22 AM	A38043
Cadmium	ND	0.0015	0.0020		mg/L	1	10/19/2016 11:29:22 AM	A38043
Chromium	ND	0.0027	0.0060		mg/L	1	10/19/2016 11:29:22 AM	A38043
Cobalt	ND	0.0017	0.0060		mg/L	1	10/20/2016 4:48:37 PM	C38098
Iron	ND	0.020	0.020		mg/L	1	10/19/2016 11:29:22 AM	A38043
Manganese	ND	0.00032	0.0020		mg/L	1	10/19/2016 11:29:22 AM	A38043
Nickel	ND	0.0031	0.010		mg/L	1	10/19/2016 11:29:22 AM	A38043
Silver	ND	0.0028	0.0050		mg/L	1	10/19/2016 11:29:22 AM	A38043
Vanadium	ND	0.0013	0.050		mg/L	1	10/19/2016 11:29:22 AM	A38043
Zinc	ND	0.0027	0.010		mg/L	1	10/19/2016 11:29:22 AM	A38043
EPA 200.8: METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/24/2016 6:45:01 PM	A38180
Arsenic	ND	0.00021	0.0010		mg/L	1	10/21/2016 7:33:03 PM	B38136
Lead	ND	0.00017	0.00050		mg/L	1	10/24/2016 6:45:01 PM	A38180
Selenium	ND	0.00021	0.0010		mg/L	1	10/21/2016 7:33:03 PM	B38136
EPA METHOD 245.1: MERCURY							Analyst: pmf	
Mercury	0.00012	0.000053	0.00020	J	mg/L	1	10/13/2016 11:56:31 AM	28031

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated N	Method Blank		
	D	Sample Diluted Due to Matrix	E	Value above quantitation range			
	Н	Holding times for preparation or analysis exceeded	J	J Analyte detected below quantitation limits			
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 8 of 26		
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	1 age 0 01 20		
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out	t of limit as specified		

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: Address: HALL ENVIRONMENTAL ANALYSIS LAB

Batch #:

161010009

4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109

Project Name:

1610237

Attn:

ANDY FREEMAN

Analytical Results Report

Sample Number

161010009-001

Sampling Date Sampling Time

10/4/2016 5:30 PM

Date/Time Received 10/7/2016 11:45 AM

Client Sample ID Matrix

1610237-001G / EB100416

Water

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	10/14/2016	MER	EPA 335.4	

Authorized Signature

Todd Taruscio, Lab Manager

MCL

EPA's Maximum Contaminant Level

ND PQL Not Detected Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated.

Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Batch #:

161010009

Address:

4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109 Project Name:

1610237

Attn:

ANDY FREEMAN

Analytical Results Report
Quality Control Data

Lab Control San	nple		- 1			•					
Parameter Cyanide		LCS Result 0.516	Units mg/L		Spike 0.5	%Rec 103.2		%Rec 0-110	•	Date /2016	Analysis Date 10/14/2016
Matrix Spike											<u>-</u> -
 .	Parameter Cyanide		Sample Result 0.0273	MS Result 0.504	Unit mg/t		MS Spike 0.5	% Rec 95.3	AR %Rec 90-110	Prep Date 10/14/2016	-
Matrix Spike Du	plicate	<u>,</u>					_				
Parameter Cyanide		MSD Result 0.498	Units mg/L	MSD Spike 0.5	%R 94		%RPD 1.2	AR %RPE 0-20		p Date 14/2016	Analysis Date 10/14/2016
Method Blank											
Parameter Cyanide			Re:	suit D		n its g/L		PQL 0.01		ep Date 14/2016	Analysis Date 10/14/2016

AR

Acceptable Range

ND

Not Detected Practical Quantitation Limit

PQL RPD

Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-A	SampType:	MBLK	Tes	tCode: El	PA Method	200.7: Metals	i		
Client ID: PBW	Batch ID:	A38043	F	RunNo: 3	8043				
Prep Date:	Analysis Date:	10/19/2016	S	SeqNo: 1	186310	Units: mg/L			
Analyte	Result PC	L SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND 0.00	20							
Beryllium	ND 0.00	20							
Cadmium	ND 0.00	20							
Chromium	ND 0.00	60							
Iron	ND 0.0	20							
Manganese	ND 0.00	20							
Nickel	ND 0.0	10							
Silver	ND 0.00	50							
Vanadium	ND 0.0	50							
Zinc	ND 0.0	10							

Sample ID LCS-A	SampType: LCS TestCode: EPA N						200.7: Metals			
Client ID: LCSW	Bato	h ID: A3	8043	F	RunNo: 3	8043				
Prep Date:	Analysis	Date: 10)/19/2016	S	SeqNo: 1	186311	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.50	0.0020	0.5000	0	99.2	85	115			
Beryllium	0.51	0.0020	0.5000	0	102	85	115			
Cadmium	0.50	0.0020	0.5000	0	101	85	115			
Chromium	0.49	0.0060	0.5000	0	98.8	85	115			
Iron	0.49	0.020	0.5000	0	98.5	85	115			
Manganese	0.49	0.0020	0.5000	0	97.6	85	115			
Nickel	0.48	0.010	0.5000	0	96.4	85	115			
Silver	0.099	0.0050	0.1000	0	98.6	85	115			
Vanadium	0.52	0.050	0.5000	0	104	85	115			
Zinc	0.50	0.010	0.5000	0	99.6	85	115			

Sample ID LLLCS-A	Samp	Type: LC	SLL	Tes	tCode: El					
Client ID: BatchQC	Bato	h ID: A3	8043	F	RunNo: 3	8043				
Prep Date:	Analysis	Date: 10	/19/2016	8	SeqNo: 1	186312	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0020	0.0020	0.002000	0	98.0	50	150			J
Beryllium	0.0020	0.0020	0.002000	0	98.0	50	150			J
Cadmium	0.0025	0.0020	0.002000	0	126	50	150			
Chromium	0.0064	0.0060	0.006000	0	106	50	150			
Manganese	0.0020	0.0020	0.002000	0	101	50	150			
Nickel	0.0051	0.010	0.005000	0	102	50	150			J
Silver	0.0052	0.0050	0.005000	0	105	50	150			
Vanadium	0.0099	0.050	0.01000	0	99.0	50	150			J

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1610237

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID LLLCS-A SampType: LCSLL TestCode: EPA Method 200.7: Metals Client ID: **BatchQC** Batch ID: A38043 RunNo: 38043 Prep Date: Analysis Date: 10/19/2016 SeqNo: 1186312 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 0.0054 0.010 0.005000 50 Zinc n 107 150 J

Sample ID LLLCS-A SampType: LCSLL TestCode: EPA Method 200.7: Metals Client ID: **BatchQC** Batch ID: A38043 RunNo: 38043 Units: mg/L Prep Date: Analysis Date: 10/19/2016 SeqNo: 1186465 SPK value SPK Ref Val %RPD **RPDLimit** Analyte Result **PQL** %REC LowLimit HighLimit Qual Iron 0.020 0.20 0.02000 98.5 150 J

Sample ID MB-C SampType: MBLK TestCode: EPA Method 200.7: Metals Client ID: **PBW** Batch ID: C38098 RunNo: 38098 Prep Date: Analysis Date: 10/20/2016 SeqNo: 1188698 Units: mg/L SPK value SPK Ref Val %REC LowLimit HighLimit Analyte Result **PQL** %RPD **RPDLimit** Qual Cobalt ND 0.0060

Sample ID LCS-C SampType: LCS TestCode: EPA Method 200.7: Metals Client ID: Batch ID: C38098 RunNo: 38098 LCSW Prep Date: Analysis Date: 10/20/2016 SeqNo: 1188699 Units: mg/L Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Cobalt 0.46 0.0060 0.5000 92.5 85 115

Sample ID LLLCS-C SampType: LCSLL TestCode: EPA Method 200.7: Metals RunNo: 38098 Client ID: BatchQC Batch ID: C38098 Prep Date: Analysis Date: 10/20/2016 SeqNo: 1188700 Units: mg/L Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Cobalt 0.0059 0.0060 0.006000 98.7 50 150

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range

Reporting Detection Limit

- J Analyte detected below quantitation limits
- P Sample pH Not In Range

RL

Sample container temperature is out of limit as specified

Page 10 of 26

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-A	Samp	Туре: МЕ	BLK	Tes	tCode: El	PA Method	200.7: Dissol	ved Meta	s	
Client ID: PBW	Bato	h ID: A3	8098	F	RunNo: 3	8098				
Prep Date:	Analysis l	Date: 10)/20/2016	S	SeqNo: 1	188611	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Iron	ND	0.020								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Sample ID LLLCS-A	Samp	Type: LC	SLL	Tes	tCode: E l	PA Method	200.7: Dissol	ved Metal	ls	
Client ID: BatchQC	Bato	h ID: A3	8098	F	RunNo: 3	8098				
Prep Date:	Analysis I	Date: 10	0/20/2016	S	SeqNo: 1	188612	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0020	0.0020	0.002000	0	103	50	150			
Beryllium	0.0019	0.0020	0.002000	0	95.5	50	150			J
Cadmium	0.0021	0.0020	0.002000	0	106	50	150			
Chromium	0.0064	0.0060	0.006000	0	106	50	150			
Cobalt	0.0057	0.0060	0.006000	0	94.2	50	150			J
Iron	0.021	0.020	0.02000	0	103	50	150			
Manganese	0.0020	0.0020	0.002000	0	99.5	50	150			J
Nickel	0.0050	0.010	0.005000	0	101	50	150			J
Silver	0.0049	0.0050	0.005000	0	97.2	50	150			J
Vanadium	0.0095	0.050	0.01000	0	95.4	50	150			J
Zinc	0.0055	0.010	0.005000	0	111	50	150			J

Sample ID LCS-A	SampType: LCS TestCode: EPA Method 200.7: Dissolved Metals									
Client ID: LCSW	Batch I	D: A3 8	8098	F	RunNo: 3	8098				
Prep Date:	Analysis Da	te: 10	/20/2016	S	SeqNo: 1	188613	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.48 0	.0020	0.5000	0	95.6	85	115			
Beryllium	0.50 0	.0020	0.5000	0	99.7	85	115			
Cadmium	0.49 0	.0020	0.5000	0	97.3	85	115			
Chromium	0.48 0	.0060	0.5000	0	95.4	85	115			
Cobalt	0.47 0	.0060	0.5000	0	93.1	85	115			
Iron	0.48	0.020	0.5000	0	96.7	85	115			

Qualifiers:

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

Page 11 of 26

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID LCS-A	Samp	SampType: LCS TestCode: EPA Metho						ved Metal	s	
Client ID: LCSW	Bato	ch ID: A3	8098	R	RunNo: 3	8098				
Prep Date:	Analysis	Date: 10)/20/2016	S	SeqNo: 1	188613	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.47	0.0020	0.5000	0	94.2	85	115			
Nickel	0.46	0.010	0.5000	0	91.9	85	115			
Silver	0.095	0.0050	0.1000	0	95.3	85	115			
Vanadium	0.50	0.050	0.5000	0	100	85	115			
Zinc	0.47	0.010	0.5000	0	94.1	85	115			

Qualifiers:

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

Page 12 of 26

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID	LCS	SampType: L	cs	Tes	tCode: El	PA 200.8: N	/letals			
Client ID:	LCSW	Batch ID: E	38136	F	RunNo: 3	8136				
Prep Date:		Analysis Date:	10/21/2016	5	SeqNo: 1	190524	Units: mg/L			
Analyte		Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic		0.024 0.0010		0	97.5	85	115			
Selenium		0.024 0.0010	0.02500	0	96.2	85	115			
Sample ID	LLLCS	SampType: L	CSLL	Tes	tCode: EI	PA 200.8: N	letals .			
Client ID:	BatchQC	Batch ID: E	38136	F	RunNo: 3	8136				
Prep Date:		Analysis Date:	10/21/2016	5	SeqNo: 1	190525	Units: mg/L			
Analyte		Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic		0.00093 0.0010		0	92.6	50	150			J
Selenium		0.00096 0.0010	0.001000	0	96.0	50	150			J
Sample ID	МВ	SampType: N	IBLK	Tes	tCode: EI	PA 200.8: N	letals .			
Client ID:	PBW	Batch ID: E	38136	F	RunNo: 3	8136				
Prep Date:		Analysis Date:	10/21/2016	8	SeqNo: 1	190526	Units: mg/L			
Analyte		Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic		ND 0.0010								
Selenium		ND 0.0010)							
Sample ID	LCS	SampType: L	cs	Tes	tCode: El	PA 200.8: N	letals			
Client ID:	LCSW	Batch ID: A	38180	F	RunNo: 3	8180				
Prep Date:		Analysis Date:	10/24/2016	8	SeqNo: 1	191818	Units: mg/L			
Analyte		Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony		0.024 0.0010		0	98.0	85	115			
Lead		0.012 0.00050	0.01250	0	99.9	85	115			
Sample ID	LLLCS	SampType: L	CSLL	Tes	tCode: El	PA 200.8: N	letals .			
Client ID:	BatchQC	Batch ID: A	38180	F	RunNo: 3	8180				
Prep Date:		Analysis Date:	10/24/2016	8	SeqNo: 1	191820	Units: mg/L			
Analyte		Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony		0.00091 0.0010		0	90.8	50	150	·		J
Lead		0.00052 0.00050	0.0005000	0	104	50	150			
Sample ID	МВ	SampType: N	IBLK	Tes	tCode: EI	PA 200.8: N	letals .			
Client ID:	PBW	Batch ID: A	38180	F	RunNo: 3	8180				
Prep Date:		Analysis Date:	10/24/2016	S	SeqNo: 1	191822	Units: mg/L			
Analyte		Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1610237

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB SampType: MBLK TestCode: EPA 200.8: Metals

PBW Client ID: Batch ID: A38180 RunNo: 38180

Prep Date: Analysis Date: 10/24/2016 SeqNo: 1191822 Units: mg/L

Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

Antimony ND 0.0010 Lead ND 0.00050

Qualifiers:

Value exceeds Maximum Contaminant Level.

Sample Diluted Due to Matrix D

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits R

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range Reporting Detection Limit RL

Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1610237

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Troject:		ource in									
Sample ID	1610237-001EMSI	L Samp	оТуре: М	3	Tes	tCode: E	PA 200.8: I	Dissolved Met	tals		
Client ID:	EB100416	Bat	ch ID: C3	8136	F	RunNo: 3	8136				
Prep Date:		Analysis	Date: 10)/21/2016	5	SeqNo: 1	190536	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony		0.024	0.0010	0.02500	0	95.1	70	130			
Arsenic		0.024	0.0010	0.02500	0	94.2	70	130			
Lead		0.012	0.00050	0.01250	0	95.5	70	130			
Selenium		0.023	0.0010	0.02500	0	92.3	70	130			
Sample ID	LCS	Samp	oType: LC	s	Tes	tCode: E	PA 200.8: [Dissolved Met	tals		
Client ID:	LCSW	Bat	ch ID: C3	8136	F	RunNo: 3	8136				
Prep Date:		Analysis	Date: 10)/21/2016	5	SeqNo: 1	190552	Units: mg/L			
Analyte		Result	PQL		SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony		0.023	0.0010	0.02500	0	93.9	85	115			
Arsenic		0.024	0.0010	0.02500	0	94.6	85	115			
Lead		0.012	0.00050	0.01250	0	94.6	85	115			
Selenium		0.024	0.0010	0.02500	0	97.7	85	115			
Sample ID	LLLCS	Samp	oType: LC	SLL	Tes	tCode: E	PA 200.8: I	Dissolved Met	tals		
Client ID:	BatchQC	Bat	ch ID: C3	8136	F	RunNo: 3	8136				
Prep Date:		Analysis	Date: 10)/21/2016	5	SeqNo: 1	190553	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony		0.00089	0.0010	0.001000	0	89.4	50	150			J
Arsenic		0.00097	0.0010	0.001000	0	96.7	50	150			J
Lead		0.00051	0.00050	0.0005000	0	101	50	150			
Selenium		0.0010	0.0010	0.001000	0	101	50	150			
Sample ID	МВ	Samp	оТуре: МЕ	BLK	Tes	tCode: E l	PA 200.8: I	Dissolved Met	tals		
Client ID:	PBW	Bat	ch ID: C3	8136	F	RunNo: 3	8136				
Prep Date:		Analysis	Date: 10)/21/2016	5	SeqNo: 1	190554	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony		ND	0.0010								
Arsenic		ND	0.0010								
Lead		ND	0.00050								

Qualifiers:

Selenium

- Value exceeds Maximum Contaminant Level.
- Sample Diluted Due to Matrix D
- Η Holding times for preparation or analysis exceeded

ND

0.0010

- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits R
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- Reporting Detection Limit RL
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-28031 SampType: MBLK TestCode: EPA Method 245.1: Mercury

Client ID: PBW Batch ID: 28031 RunNo: 37939

Prep Date: 10/12/2016 Analysis Date: 10/13/2016 SeqNo: 1182330 Units: mg/L

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

Mercury 0.00016 0.00020 J

Sample ID LCS-28031 SampType: LCS TestCode: EPA Method 245.1: Mercury

Client ID: LCSW Batch ID: 28031 RunNo: 37939

Prep Date: 10/12/2016 Analysis Date: 10/13/2016 SeqNo: 1182331 Units: mg/L

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

Mercury 0.0051 0.00020 0.005000 0 101 80 120

Qualifiers:

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

antitation range

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Hall Environmental Analysis Laboratory, Inc.

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WO#: 1610237

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB SampType: mblk TestCode: EPA Method 300.0: Anions Client ID: **PBW** Batch ID: R37783 RunNo: 37783 Prep Date: Analysis Date: 10/6/2016 SeqNo: 1176976 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Fluoride 0.10 ND Chloride ND 0.50 ND 0.50 Sulfate

Sample ID LCS SampType: Ics TestCode: EPA Method 300.0: Anions Client ID: LCSW Batch ID: R37783 RunNo: 37783 Prep Date: Analysis Date: 10/6/2016 SeqNo: 1176977 Units: mg/L Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 0 Fluoride 0.54 0.10 0.5000 107 90 110 Chloride 5.0 0.50 5.000 0 100 90 110

0

104

90

110

Sample ID 1610237-001DMS TestCode: EPA Method 300.0: Anions SampType: ms EB100416 RunNo: 37783 Client ID: Batch ID: R37783 Prep Date: Analysis Date: 10/6/2016 SeqNo: 1177031 Units: mg/L Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Analyte Qual Fluoride 0.49 0.10 0.5000 0 98.2 74.5 121 Chloride 4.3 0.50 5.000 0 86.6 81.9 117 Sulfate 0.50 10.00 0 90.0 83 90 118

Sample ID 1610237-001DMSD TestCode: EPA Method 300.0: Anions SampType: msd Client ID: EB100416 Batch ID: **R37783** RunNo: 37783 Prep Date: Analysis Date: 10/6/2016 SeqNo: 1177032 Units: mg/L Analyte SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Result **PQL** Qual 0.50 0.10 0.5000 100 74.5 121 1.84 20 Fluoride 0 87.5 Chloride 0.50 5.000 81.9 1.00 20 4.4 117 Sulfate 9.1 0.50 10.00 0 91.2 83 118 1.30 20

Qualifiers:

Sulfate

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Η Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

P

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Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: 1610237

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID MB-27938 SampType: MBLK TestCode: EPA Method 8015M/D: Diesel Range Client ID: **PBW** Batch ID: 27938 RunNo: 37769 Analysis Date: 10/7/2016 Prep Date: 10/7/2016 SeqNo: 1177607 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Diesel Range Organics (DRO) ND 1.0 Motor Oil Range Organics (MRO) ND 5.0 Surr: DNOP 1.2 1.000 124 77.1 144

Sample ID LCS-27938 SampType: LCS TestCode: EPA Method 8015M/D: Diesel Range Client ID: LCSW RunNo: 37769 Batch ID: 27938 Analysis Date: 10/7/2016 Prep Date: 10/7/2016 SeqNo: 1177608 Units: mg/L Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Diesel Range Organics (DRO) 1.0 0 63.2 5.3 5.000 107 155 Surr: DNOP 0.51 0.5000 103 77.1 144

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1610237

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID RB SampType: MBLK TestCode: EPA Method 8015D: Gasoline Range

Client ID: **PBW** Batch ID: G37741 RunNo: 37741

Prep Date: Analysis Date: 10/6/2016 SeqNo: 1176215 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 20.00 81.8 66.4 16 120

Sample ID 2.5UG GRO LCS SampType: LCS TestCode: EPA Method 8015D: Gasoline Range

Client ID: LCSW Batch ID: G37741 RunNo: 37741

Prep Date: Analysis Date: 10/6/2016 SeqNo: 1176216 Units: mg/L

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Gasoline Range Organics (GRO) 0.55 0.050 0.5000 110 80 120 20.00 92.6 66.4 Surr: BFB 19 120

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

SampType: MBLK

Batch ID: R37747

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID 100ng Ics	SampT	SampType: LCS TestCode: EPA Method 8260B: VOLATILES								
Client ID: LCSW	Batch	n ID: R3	7747	F	RunNo: 3	7747				
Prep Date:	Analysis D	ate: 10	0/6/2016	8	SeqNo: 1	176309	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	0	113	70	130			
Toluene	19	1.0	20.00	0	93.7	70	130			
Chlorobenzene	18	1.0	20.00	0	89.4	70	130			
1,1-Dichloroethene	20	1.0	20.00	0	101	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	92.0	70	130			
Surr: 1,2-Dichloroethane-d4	9.4		10.00		93.9	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	9.8		10.00		97.8	70	130			
Surr: Toluene-d8	9.0		10.00		89.9	70	130			

Prep Date:	Analysis D	ate: 10	0/6/2016	S	eqNo: 1	176326	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	0.84	3.0								J
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

Sample ID rb

Client ID: PBW

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank

TestCode: EPA Method 8260B: VOLATILES

RunNo: 37747

- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID rb	SampT	ype: M	BLK	Tes	tCode: E l	PA Method	8260B: VOL	ATILES		
Client ID: PBW	Batch	ID: R	37747	F	RunNo: 3	7747				
Prep Date:	Analysis D	ate: 1	0/6/2016	S	SeqNo: 1	176326	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
	ND	2.0								
1,2,3-Trichloropropane	טוו	2.0								

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID rb	SampT	ype: ME	BLK	Tes	tCode: El	ATILES				
Client ID: PBW	Batch	n ID: R3	7747	F	RunNo: 3	7747				
Prep Date:	Analysis D	ate: 10	0/6/2016	8	SeqNo: 1	176326	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.8		10.00		98.1	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130			
Surr: Dibromofluoromethane	11		10.00		109	70	130			
Surr: Toluene-d8	8.8		10.00		87.9	70	130			

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID mb-27939	SampType: MBLK			TestCode: EPA Method 8270C: Semivolatiles						
Client ID: PBW	Batch ID: 27939			RunNo: 37873						
Prep Date: 10/7/2016	Analysis D	ate: 1 0	0/11/2016	SeqNo: 11796		179625	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	5.0	20								J
Benzyl alcohol	ND	10								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	ND	10								
4-Bromophenyl phenyl ether	ND	10								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								
4-Chloro-3-methylphenol	ND	10								
4-Chloroaniline	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
Chrysene	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	10								
Dibenz(a,h)anthracene	ND	10								
Dibenzofuran	ND	10								
1,2-Dichlorobenzene	ND	10								
1,3-Dichlorobenzene	ND	10								
1,4-Dichlorobenzene	ND	10								
3,3´-Dichlorobenzidine	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
2,4-Dichlorophenol	ND	20								
2,4-Dimethylphenol	ND	10								
4,6-Dinitro-2-methylphenol	ND	20								
2,4-Dinitrophenol	ND	20								
_,opo		_3								

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID mb-27939	SampType: MBLK			TestCode: EPA Method 8270C: Semivolatiles							
Client ID: PBW	Batch ID: 27939			RunNo: 37873							
Prep Date: 10/7/2016	Analysis Date: 10/11/2016			S	SeqNo: 1	179625	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		77.2	15	123				
Surr: Phenol-d5	130		200.0		64.4	4.13	124				
Surr: 2,4,6-Tribromophenol	150		200.0		73.5	18.4	134				
Surr: Nitrobenzene-d5	69		100.0		68.6	28.8	134				
Surr: 2-Fluorobiphenyl	60		100.0		59.9	35.9	125				
Surr: 4-Terphenyl-d14	63		100.0		62.7	15	146				
-											

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID Ics-27939	SampT	ype: LC	s	TestCode: EPA Method 8270C: Semivolatiles						
Client ID: LCSW	Batch ID: 27939			RunNo: 37873						
Prep Date: 10/7/2016	Analysis Date: 10/11/2016			S	SeqNo: 1	179626	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	74	10	100.0	0	74.3	35	113			
4-Chloro-3-methylphenol	160	10	200.0	0	78.1	40.7	114			
2-Chlorophenol	150	10	200.0	0	73.2	37.6	113			
1,4-Dichlorobenzene	65	10	100.0	0	64.9	37.7	106			
2,4-Dinitrotoluene	66	10	100.0	0	65.9	37	91			
N-Nitrosodi-n-propylamine	80	10	100.0	0	79.8	45.4	105			
4-Nitrophenol	130	10	200.0	0	67.4	33.4	104			
Pentachlorophenol	130	20	200.0	0	64.8	29.5	94.9			
Phenol	140	10	200.0	0	69.7	30.6	119			
Pyrene	72	10	100.0	0	71.8	26.2	120			
1,2,4-Trichlorobenzene	64	10	100.0	0	63.8	39.9	125			
Surr: 2-Fluorophenol	150		200.0		73.5	15	123			
Surr: Phenol-d5	140		200.0		68.1	4.13	124			
Surr: 2,4,6-Tribromophenol	160		200.0		79.7	18.4	134			
Surr: Nitrobenzene-d5	71		100.0		70.9	28.8	134			
Surr: 2-Fluorobiphenyl	70		100.0		70.1	35.9	125			
Surr: 4-Terphenyl-d14	64		100.0		64.5	15	146			

Sample ID 1610237-001cms	SampT	ype: M \$	3	TestCode: EPA Method 8270C: Semivolatiles						
Client ID: EB100416	Batch ID: 27939 Analysis Date: 10/11/2016			F	RunNo: 3					
Prep Date: 10/7/2016				SeqNo: 1179638			Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	66	10	100.0	0	66.0	27.6	123			
4-Chloro-3-methylphenol	90	10	200.0	0	45.2	29.3	126			
2-Chlorophenol	70	10	200.0	0	35.0	15	133			
1,4-Dichlorobenzene	36	10	100.0	0	36.2	17.6	127			
2,4-Dinitrotoluene	67	10	100.0	0	67.0	38.9	98.5			
N-Nitrosodi-n-propylamine	68	10	100.0	0	68.3	25.9	131			
4-Nitrophenol	57	10	200.0	0	28.5	15	102			
Pentachlorophenol	95	20	200.0	0	47.6	15	120			
Phenol	51	10	200.0	0	25.4	15	100			
Pyrene	76	10	100.0	0	75.5	22.8	126			
1,2,4-Trichlorobenzene	43	10	100.0	0	43.0	15	143			
Surr: 2-Fluorophenol	52		200.0		26.2	15	123			
Surr: Phenol-d5	46		200.0		22.9	4.13	124			
Surr: 2,4,6-Tribromophenol	100		200.0		50.3	18.4	134			
Surr: Nitrobenzene-d5	56		100.0		55.6	28.8	134			
Surr: 2-Fluorobiphenyl	56		100.0		55.8	35.9	125			

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

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WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID 1610237-001cms SampType: MS TestCode: EPA Method 8270C: Semivolatiles

100.0

Client ID: EB100416 Batch ID: 27939 RunNo: 37873

Prep Date: 10/7/2016 Analysis Date: 10/11/2016 SeqNo: 1179638 Units: μg/L

Analyte Result SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 49 Surr: 4-Terphenyl-d14 100.0 48.6 15 146

Sample ID 1610237-001cmsd SampType: MSD TestCode: EPA Method 8270C: Semivolatiles Client ID: EB100416 Batch ID: 27939 RunNo: 37873 Prep Date: 10/7/2016 Analysis Date: 10/11/2016 SeqNo: 1179639 Units: µg/L **PQL** SPK value SPK Ref Val %REC %RPD **RPDLimit** Analyte Result LowLimit HighLimit Qual Acenaphthene 68 10 100.0 0 67.9 27.6 123 2.87 31.3 4-Chloro-3-methylphenol 130 10 200.0 0 65.8 29.3 126 37.0 29 R 0 R 2-Chlorophenol 120 10 200.0 61.4 15 133 54.7 28.4 1,4-Dichlorobenzene 42 10 100.0 0 42.3 17.6 127 15.7 28.2 98.5 2,4-Dinitrotoluene 60 10 100.0 0 59.5 38.9 22.9 11.9 N-Nitrosodi-n-propylamine 71 10 100.0 0 70.8 25.9 131 3.54 28.8 4-Nitrophenol 64 10 200.0 0 31.8 102 41.5 15 11.0 120 20 58.3 Pentachlorophenol 200.0 0 15 120 20.2 45.1 10 0 30.8 15 100 Phenol 62 200.0 19.2 33.9 68 10 100.0 0 68.1 22.8 126 10.4 33.6 Pyrene 1,2,4-Trichlorobenzene 48 10 100.0 0 47.8 15 143 10.4 28.2 200.0 41.5 0 0 Surr: 2-Fluorophenol 83 15 123 Surr: Phenol-d5 55 200.0 27.6 4.13 124 0 0 140 Surr: 2,4,6-Tribromophenol 200.0 70.3 18.4 134 0 0 Surr: Nitrobenzene-d5 63 100.0 63.3 28.8 134 0 0 Surr: 2-Fluorobiphenyl 57 100.0 56.6 35.9 125 0 0

Qualifiers:

Surr: 4-Terphenyl-d14

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range

50.8

15

146

0

- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

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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:	1610237		RcptNo:	1
Received by/date:)	Λ		
Logged By: Ashley Gallegos 10/5/2016 3:40:00 PM		A		
Completed By: Ashley Gallegos 10/5/2016 5:12:39 PM		A	·	
Reviewed By: ColGIL				
Chain of Custody				
1. Custody seals intact on sample bottles?	Yes 🗌	No 🗆	Not Present 🗹	
2. Is Chain of Custody complete?	Yes 🗹	No 🗌	Not Present \square	
3. How was the sample delivered?	<u>Courier</u>			
<u>Log In</u>				
4. Was an attempt made to cool the samples?	Yes 🗸	No 🗆	na 🗆	
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes 🗹	No 🗆	NA 🗆	
6. Sample(s) in proper container(s)?	Yes 🔽	No 🗌		
7. Sufficient sample volume for indicated test(s)?	Yes 🗸	No 🗆		
8. Are samples (except VOA and ONG) properly preserved?	Yes 🗸	No 🗆		
9. Was preservative added to bottles?	Yes	No 🗹	NA 🗌	
10.VOA vials have zero headspace?	Yes 🗹	No 🗆	No VOA Vials	
11. Were any sample containers received broken?	Yes 🗀	No 🗹	# of preserved bottles checked	(
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes 🗹	No 🗆	for pH:	r 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 🗌		05
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:		, cope of the last	- a Marque	
Client Instructions:				
17. Additional remarks:				
18. Cooler Information				
Cooler No Temp °C Condition Seal Intact Seal No	Seal Date	Signed By	i	
1 1.0 Good Yes		MAN . 27 11 11 11 11 11 11 11 11 11 11 11 11 11		

Chain-of-Custody Record	Turn-Around Time:	HALL ENVIRONMENTAL	
Client: WESTERN REFINING SW. INC.	Standard 🗆 Rush	ANALYSIS LABORATORY	
	Project Name:	www.hallenvironmental.com	
essig2 GIANT CROSSING RD	OW-H SCHROE INV.	4901 Hawkins NE - Albuquerque, NM 87109	
	Project #:	Tel. 505-345-3975 Fax 505-345-4107	
9		Analysis Request	
-	Project Manager:	Uly)	
QA/QC Package:		(S) (S) (S)	
☐ Standard X Level 4 (Full Validation)	ED RIEGE	(GS) MIS	
Accreditation	Sampler: TRACY PAYNE	(1.78 (1.78 (1.79) (1.79) (1.79)	(V
□ NELAP □ Other	On Ice: "Yes 🗆 No	T + COH (A(C) (A(C	or i
X EDD (Type) EXCEL	Sample Temperature: [-(f)	BE (GI	火)
Date Time Matrix Sample Request ID	Container Preservative Type and # Type	TEX + MT TEX + MT TPH 8015B TPH (Methorer) TPH's (831P TERA 8 Methorer) TORA 8 Methorer TORA 8 Methorer TORA 8 Methorer TORA 8 Methorer TORA 8 Methorer TORA 8 Methorer TORA 8 Methorer TORA 8 Methorer TORA 8 Methorer TORA 8 Methorer TORA 8 Methorer TORA 8 Methorer TORA 8 Methorer TORA 9 Methor	e∋lddu8 זi
% 1/30 WATER 1=B 100416	HGL HGL		′
	ANBER-2 NEAT		
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	ı	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
→ →	FROM 1 NAOH		
Date: Time: Relinquished by:	Received by: Date Time	Remarks:	_
•	10/5/16		
Date: Time: Relinquished by:	Received by: Date Time		
15/6/547 5-15/			
If necessary, samples submitted to Hall Environmental may be subcontracted to	other/acchedited laboratories. This se	aves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.	

WESTERN REFINING SOUTHWEST, INC. GALLUP REFINERY

OW-14 SOURCE INVESTIGATION - SEPTEMBER 2016

METALS AND CYANIDE ANALYSES FOR GROUNDWATER SAMPLES AND WATER QA/QC SAMPLES

TOTAL METALS ANALYSIS AND DISSOLVED METALS ANALYSIS

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

GENERAL CHEMISTRY PARAMETERS FOR GROUNDWATER SAMPLES AND WATER QA/QC SAMPLES

Analyte	Analytical Method
Chloride	EPA method 300.0
Fluoride	EPA method 300.0
Sulfate	EPA method 300.0



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

November 01, 2016

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

FAX

RE: OW-14 Source Inv OrderNo.: 1610238

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 10 sample(s) on 10/5/2016 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman

Laboratory Manager

andel

4901 Hawkins NE

Albuquerque, NM 87109

Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-2(16-18')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 11:20:00 AM

 Lab ID:
 1610238-001
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANG	E ORGANIC	S					Analyst: TOM	
Diesel Range Organics (DRO)	17	1.8	9.8		mg/Kg	1	10/11/2016 9:49:45 AM	27950
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	10/11/2016 9:49:45 AM	27950
Surr: DNOP	87.2	0	70-130		%Rec	1	10/11/2016 9:49:45 AM	27950
EPA METHOD 8015D: GASOLINE RAN	GE						Analyst: NSB	
Gasoline Range Organics (GRO)	31	3.0	15		mg/Kg	5	10/6/2016 5:34:28 PM	27905
Surr: BFB	95.5	0	68.3-144		%Rec	5	10/6/2016 5:34:28 PM	27905
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0042	0.00058	0.034	J	mg/Kg	1	10/12/2016 9:24:52 AM	27986
EPA METHOD 6010B: SOIL METALS	0.0012	0.00000	0.001	ŭ	g/.vg	•	Analyst: MED	21000
	ND	4.0	٥.۶			4	•	07005
Antimony	ND	1.0	2.5		mg/Kg	1	10/12/2016 2:26:14 PM	
Arsenic	1.6	0.88	2.5	J	mg/Kg	1	10/12/2016 2:26:14 PM	
Barium	200	0.070	0.099		mg/Kg	1	10/12/2016 2:26:14 PM	
Beryllium	0.64	0.034	0.15		mg/Kg	1	10/12/2016 2:26:14 PM	
Cadmium	ND	0.063	0.099		mg/Kg	1	10/12/2016 2:26:14 PM	
Chromium	6.4	0.093	0.30		mg/Kg	1	10/12/2016 2:26:14 PM	
Cobalt	3.2	0.11	0.30		mg/Kg	1	10/12/2016 2:26:14 PM	
Iron	12000	37	120		mg/Kg	50	10/12/2016 6:22:41 PM	
Lead	3.5	0.17	0.25		mg/Kg	1	10/12/2016 2:26:14 PM	
Manganese	210	0.053	0.099		mg/Kg	1	10/12/2016 2:26:14 PM	
Nickel	5.5	0.15	0.49		mg/Kg	1	10/12/2016 2:26:14 PM	
Selenium	ND	1.8	2.5		mg/Kg	1	10/12/2016 2:26:14 PM	27985
Silver	ND	0.062	0.25		mg/Kg	1	10/12/2016 2:26:14 PM	27985
Vanadium	12	0.17	2.5		mg/Kg	1	10/12/2016 2:26:14 PM	27985
Zinc	9.6	0.34	2.5		mg/Kg	1	10/12/2016 2:26:14 PM	27985
EPA METHOD 8270C: SEMIVOLATILES	3						Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Aniline	ND	0.094	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Anthracene	ND	0.066	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	
Benzoic acid	0.11	0.083	0.50	J	mg/Kg	1	10/15/2016 5:00:07 PM	
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 1 of 67

Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-2(16-18')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 11:20:00 AM

 Lab ID:
 1610238-001
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Bis(2-ethylhexyl)phthalate	0.12	0.081	0.50	J	mg/Kg	1	10/15/2016 5:00:07 PM	28021
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Carbazole	ND	0.067	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/15/2016 5:00:07 PM	28021
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/15/2016 5:00:07 PM	28021
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	10/15/2016 5:00:07 PM	28021
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Chrysene	ND	0.085	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Di-n-butyl phthalate	0.27	0.074	0.40	J	mg/Kg	1	10/15/2016 5:00:07 PM	28021
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Diethyl phthalate	0.13	0.10	0.20	J	mg/Kg	1	10/15/2016 5:00:07 PM	28021
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	10/15/2016 5:00:07 PM	28021
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/15/2016 5:00:07 PM	28021
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	10/15/2016 5:00:07 PM	28021
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	10/15/2016 5:00:07 PM	28021
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	10/15/2016 5:00:07 PM	28021
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Fluoranthene	ND	0.057	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Fluorene	ND	0.091	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Isophorone	ND	0.11	0.40		mg/Kg	1	10/15/2016 5:00:07 PM	28021
1-Methylnaphthalene	0.13	0.10	0.20	J	mg/Kg	1	10/15/2016 5:00:07 PM	28021
2-Methylnaphthalene	0.28	0.12	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Page 2 of 67

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-2(16-18')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 11:20:00 AM

 Lab ID:
 1610238-001
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	10/15/2016 5:00:07 PM	28021
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Naphthalene	0.17	0.096	0.20	J	mg/Kg	1	10/15/2016 5:00:07 PM	28021
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/15/2016 5:00:07 PM	28021
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Phenanthrene	ND	0.068	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Phenol	ND	0.075	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Pyrene	ND	0.075	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Pyridine	ND	0.079	0.40		mg/Kg	1	10/15/2016 5:00:07 PM	28021
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Surr: 2-Fluorophenol	59.8	0	35-97.9		%Rec	1	10/15/2016 5:00:07 PM	28021
Surr: Phenol-d5	57.9	0	37.3-105		%Rec	1	10/15/2016 5:00:07 PM	
Surr: 2,4,6-Tribromophenol	61.0	0	35.6-118		%Rec	1	10/15/2016 5:00:07 PM	28021
Surr: Nitrobenzene-d5	54.3		41.2-107		%Rec	1	10/15/2016 5:00:07 PM	28021
Surr: 2-Fluorobiphenyl	54.3		41.9-119		%Rec	1	10/15/2016 5:00:07 PM	28021
Surr: 4-Terphenyl-d14	67.8		15-132		%Rec	1	10/15/2016 5:00:07 PM	28021
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.067	0.023	0.029		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Toluene	0.70	0.0034	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Ethylbenzene	0.41	0.0048	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Methyl tert-butyl ether (MTBE)	ND	0.018	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,2,4-Trimethylbenzene	2.2	0.0043	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,3,5-Trimethylbenzene	0.69	0.0042	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,2-Dichloroethane (EDC)	ND	0.015	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,2-Dibromoethane (EDB)	ND	0.0041	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Naphthalene	0.58	0.0091	0.12		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1-Methylnaphthalene	0.32	0.013	0.23		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
2-Methylnaphthalene	0.61	0.012	0.23		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Acetone	ND	0.075	0.87		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Bromobenzene	ND	0.0047	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-2(16-18')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 11:20:00 AM

 Lab ID:
 1610238-001
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Bromodichloromethane	ND	0.0034	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Bromoform	ND	0.0071	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Bromomethane	ND	0.021	0.17		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
2-Butanone	ND	0.033	0.58		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Carbon disulfide	ND	0.019	0.58		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Carbon tetrachloride	ND	0.0038	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Chlorobenzene	ND	0.0047	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Chloroethane	ND	0.012	0.12		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Chloroform	ND	0.0044	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Chloromethane	ND	0.0052	0.17		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
2-Chlorotoluene	ND	0.0043	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
4-Chlorotoluene	ND	0.0051	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
cis-1,2-DCE	ND	0.0034	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
cis-1,3-Dichloropropene	ND	0.0054	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,2-Dibromo-3-chloropropane	ND	0.018	0.12		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Dibromochloromethane	ND	0.0052	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Dibromomethane	ND	0.0050	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,2-Dichlorobenzene	ND	0.0051	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,3-Dichlorobenzene	ND	0.0048	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,4-Dichlorobenzene	ND	0.0072	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Dichlorodifluoromethane	ND	0.018	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,1-Dichloroethane	ND	0.0031	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,1-Dichloroethene	ND	0.019	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,2-Dichloropropane	ND	0.0049	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,3-Dichloropropane	ND	0.0066	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
2,2-Dichloropropane	ND	0.0033	0.12		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,1-Dichloropropene	ND	0.0046	0.12		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Hexachlorobutadiene	ND	0.0071	0.12		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
2-Hexanone	ND	0.032	0.58		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Isopropylbenzene	0.071	0.0050	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
4-Isopropyltoluene	0.030	0.0052	0.058	J	mg/Kg	2	10/7/2016 7:35:04 PM	S37805
4-Methyl-2-pentanone	ND	0.017	0.58		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Methylene chloride	ND	0.017	0.17		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
n-Butylbenzene	0.23	0.0051	0.17		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
n-Propylbenzene	0.34	0.0045	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
sec-Butylbenzene	0.072	0.0080	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Styrene	ND	0.0052	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
tert-Butylbenzene	ND	0.0048	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,1,1,2-Tetrachloroethane	ND	0.0056	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Analytical ReportLab Order **1610238**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-2(16-18')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 11:20:00 AM

 Lab ID:
 1610238-001
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,1,2,2-Tetrachloroethane	ND	0.0094	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Tetrachloroethene (PCE)	ND	0.0048	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
trans-1,2-DCE	ND	0.016	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
trans-1,3-Dichloropropene	ND	0.0085	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,2,3-Trichlorobenzene	ND	0.0087	0.12		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,2,4-Trichlorobenzene	ND	0.0062	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,1,1-Trichloroethane	ND	0.0035	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,1,2-Trichloroethane	ND	0.0068	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Trichloroethene (TCE)	ND	0.0062	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Trichlorofluoromethane	ND	0.0043	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
1,2,3-Trichloropropane	ND	0.010	0.12		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Vinyl chloride	ND	0.0048	0.058		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Xylenes, Total	2.5	0.011	0.12		mg/Kg	2	10/7/2016 7:35:04 PM	S37805
Surr: Dibromofluoromethane	89.5		70-130		%Rec	2	10/7/2016 7:35:04 PM	S37805
Surr: 1,2-Dichloroethane-d4	86.1		70-130		%Rec	2	10/7/2016 7:35:04 PM	S37805
Surr: Toluene-d8	97.2		70-130		%Rec	2	10/7/2016 7:35:04 PM	S37805
Surr: 4-Bromofluorobenzene	101		70-130		%Rec	2	10/7/2016 7:35:04 PM	S37805

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-2(29-31')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 11:45:00 AM

 Lab ID:
 1610238-002
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Diese Range Organics (DRO)	Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
Monto Oil Range Organics (MRO) ND 48 48 mg/kg 1 10/11/2016 10:11:237 AM 27950	EPA METHOD 8015M/D: DIESEL RANGE	ORGANIC	S					Analyst: TOM	
Monto Oil Range Organics (MRO)	Diesel Range Organics (DRO)	13	1.8	9.6		mg/Kg	1	10/11/2016 10:12:37 AM	И 27950
Surr. DNOP 82.2		ND						10/11/2016 10:12:37 AM	И 27950
Sum: BFR 128		82.2	0	70-130			1	10/11/2016 10:12:37 AM	И 27950
Sum: BFR 128	EPA METHOD 8015D: GASOLINE RANG	E						Analyst: NSB	
Surr: BFB 128	Gasoline Range Organics (GRO)	450	2.6	13		ma/Ka	5	10/6/2016 5:57:53 PM	27905
Mercury									
Mercury 0.0020 0.00057 0.033 J mg/Kg 1 10/12/2016 9:30:09 AM 27986 EPA METHOD 6010B: SOIL METALS									
Antimony ND 1.0 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Arsenic 1.3 0.89 2.5 J mg/Kg 1 10/12/2016 2:30:00 PM 27985 Arsenic 1.3 0.89 2.5 J mg/Kg 1 10/12/2016 2:30:00 PM 27985 Arsenic 1.70 0.071 0.10 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 0.45 0.035 0.15 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0 10/12/2016 2:30:00 PM 27985 Arsenic 1.0		0.0020	0.00057	0.033	.1	ma/Ka	1		27986
Antimony ND 1.0 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Arsenic 1.3 0.89 2.5 J mg/Kg 1 10/12/2016 2:30:00 PM 27985 Barium 170 0.071 0.10 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Beryllium 0.45 0.035 0.15 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Cadmium ND 0.063 0.10 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Chromium 5.0 0.095 0.30 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Chobalt 2.3 0.11 0.30 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Iron 9600 38 130 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Lead 1.6 0.17 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Manganese 370 0.11 0.20		0.0020	0.00001	0.000	0	mg/rtg	•		21300
Arsenic 1.3 0.89 2.5 J mg/Kg 1 10/12/2016 2:30:00 PM 27985 Barlium 170 0.071 0.10 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Beryllium 0.45 0.035 0.15 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Cadmium ND 0.063 0.10 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Chromium 5.0 0.095 0.30 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Cobalt 2.3 0.11 0.30 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Iron 9600 38 130 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Lead 1.6 0.17 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Manganese 370 0.11 0.20 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Selenium ND 0.83 0.25 <t< td=""><td>EPA METHOD 6010B: SOIL METALS</td><td></td><td></td><td></td><td></td><td></td><td></td><td>•</td><td></td></t<>	EPA METHOD 6010B: SOIL METALS							•	
Barium 170 0.071 0.10 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Beryllium 0.45 0.035 0.15 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Cadmium ND 0.063 0.10 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Chromium 5.0 0.095 0.30 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Cobalt 2.3 0.11 0.30 mg/Kg 1 10/12/2016 6:24:14 PM 27985 Iron 9600 38 130 mg/Kg 50 10/12/2016 6:23:00 PM 27985 Iron 9600 38 130 mg/Kg 50 10/12/2016 6:23:00 PM 27985 Iron 9600 38 130 mg/Kg 1 10/12/2016 6:23:00 PM 27985 Manganese 370 0.11 0.20 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Nickel 4.5 0.15 0.50 mg/Kg	•								
Beryllium					J				
Cadmium ND 0.063 0.10 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Chromium 5.0 0.095 0.30 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Cobalt 2.3 0.11 0.30 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Iron 9600 38 130 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Lead 1.6 0.17 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Manganese 370 0.11 0.20 mg/Kg 2 10/12/2016 2:30:00 PM 27985 Nickel 4.5 0.15 0.50 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Selenium ND 1.8 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Silver ND 0.063 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Zinc 8.5 0.35 2.5 mg/Kg 1	Barium			0.10		mg/Kg	1	10/12/2016 2:30:00 PM	
Chromium 5.0 0.095 0.30 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Cobalt 2.3 0.11 0.30 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Iron 9600 38 130 mg/Kg 50 10/12/2016 6:24:14 PM 27985 Lead 1.6 0.17 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Manganese 370 0.11 0.20 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Nickel 4.5 0.15 0.50 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Selenium ND 0.18 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Silver ND 0.063 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Zinc 8.5 0.35 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Zinc 8.5 0.35 2.5 mg/Kg 1	Beryllium	0.45	0.035	0.15		0 0	1	10/12/2016 2:30:00 PM	27985
Cobalt 2.3 0.11 0.30 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Iron 9600 38 130 mg/Kg 50 10/12/2016 6:24:14 PM 27985 Lead 1.6 0.17 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Manganese 370 0.11 0.20 mg/Kg 2 10/12/2016 2:30:00 PM 27985 Nickel 4.5 0.15 0.50 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Selenium ND 1.8 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Silver ND 0.063 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Silver ND 0.083 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Zinc 8.5 0.35 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Zinc 8.5 0.35 2.5 mg/Kg 1	Cadmium	ND	0.063	0.10		mg/Kg	1	10/12/2016 2:30:00 PM	27985
Iron	Chromium	5.0	0.095	0.30		mg/Kg	1	10/12/2016 2:30:00 PM	27985
Lead 1.6 0.17 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Manganese 370 0.11 0.20 mg/Kg 2 10/12/2016 2:31:48 PM 27985 Nickel 4.5 0.15 0.50 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Selenium ND 1.8 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Silver ND 0.063 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Silver ND 0.018 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Silver ND 0.018 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Vanadium 10 0.18 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Zinc 8.5 0.35 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 EPA METHOD 8270C: SEMIVOLATILES T T Analyst Analyst<	Cobalt	2.3	0.11	0.30		mg/Kg	1	10/12/2016 2:30:00 PM	27985
Manganese 370 0.11 0.20 mg/Kg 2 10/12/2016 2:31:48 PM 27985 Nickel 4.5 0.15 0.50 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Selenium ND 1.8 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Silver ND 0.063 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Vanadium 10 0.18 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Zinc 8.5 0.35 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 EPA METHOD 8270C: SEMIVOLATILES *** Tally st: DAM** Acenaphthene ND 0.083 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Acenaphthene ND 0.079 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Acenaphthylene ND 0.092 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021	Iron	9600	38	130		mg/Kg	50	10/12/2016 6:24:14 PM	27985
Nickel 4.5 0.15 0.50 mg/kg 1 10/12/2016 2:30:00 PM 27985 Selenium ND 1.8 2.5 mg/kg 1 10/12/2016 2:30:00 PM 27985 Silver ND 0.063 0.25 mg/kg 1 10/12/2016 2:30:00 PM 27985 Vanadium 10 0.18 2.5 mg/kg 1 10/12/2016 2:30:00 PM 27985 Zinc 8.5 0.35 2.5 mg/kg 1 10/12/2016 2:30:00 PM 27985 EPA METHOD 8270C: SEMIVOLATILES *** Tallow Properties** Tallow Pro	Lead	1.6	0.17	0.25		mg/Kg	1	10/12/2016 2:30:00 PM	27985
Selenium ND 1.8 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Silver ND 0.063 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Vanadium 10 0.18 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Zinc 8.5 0.35 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 EPA METHOD 8270C: SEMIVOLATILES ** ** ** ** ** ** ** ** ** ** ** ** **	Manganese	370	0.11	0.20		mg/Kg	2	10/12/2016 2:31:48 PM	27985
Silver ND 0.063 0.25 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Vanadium 10 0.18 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Zinc 8.5 0.35 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 EPA METHOD 8270C: SEMIVOLATILES Acenaphthene ND 0.083 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Acenaphthene ND 0.079 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Acenaphthylene ND 0.092 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Aniline ND 0.092 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Azobenzene ND 0.12 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(a)pyrene ND 0.084 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021	Nickel	4.5	0.15	0.50		mg/Kg	1	10/12/2016 2:30:00 PM	27985
Vanadium 10 0.18 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 Zinc 8.5 0.35 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 EPA METHOD 8270C: SEMIVOLATILES *** Analyst: DAM** Acenaphthene ND 0.083 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Acenaphthylene ND 0.079 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Aniline ND 0.092 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Anthracene ND 0.064 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Azobenzene ND 0.12 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(a)anthracene ND 0.084 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(a)pyrene ND 0.074 0.19 mg/Kg 1 10/15/2016 6:25:2	Selenium	ND	1.8	2.5		mg/Kg	1	10/12/2016 2:30:00 PM	27985
Zinc 8.5 0.35 2.5 mg/Kg 1 10/12/2016 2:30:00 PM 27985 EPA METHOD 8270C: SEMIVOLATILES Acenaphthene ND 0.083 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Acenaphthylene ND 0.079 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Aniline ND 0.092 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Anthracene ND 0.064 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Azobenzene ND 0.12 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benz(a)anthracene ND 0.084 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(a)pyrene ND 0.074 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(b)fluoranthene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 2	Silver	ND	0.063	0.25		mg/Kg	1	10/12/2016 2:30:00 PM	27985
EPA METHOD 8270C: SEMIVOLATILES Acenaphthene ND 0.083 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Acenaphthylene ND 0.079 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Aniline ND 0.092 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Anthracene ND 0.064 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Azobenzene ND 0.12 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benz(a)anthracene ND 0.084 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(a)pyrene ND 0.074 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(b)fluoranthene ND 0.088 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(k)fluoranthene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 <td>Vanadium</td> <td>10</td> <td>0.18</td> <td>2.5</td> <td></td> <td>mg/Kg</td> <td>1</td> <td>10/12/2016 2:30:00 PM</td> <td>27985</td>	Vanadium	10	0.18	2.5		mg/Kg	1	10/12/2016 2:30:00 PM	27985
Acenaphthene ND 0.083 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Acenaphthylene ND 0.079 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Aniline ND 0.092 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Anthracene ND 0.064 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Azobenzene ND 0.12 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benz(a)anthracene ND 0.084 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(a)pyrene ND 0.074 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(b)fluoranthene ND 0.088 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(k)fluoranthene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzoic acid ND	Zinc	8.5	0.35	2.5		mg/Kg	1	10/12/2016 2:30:00 PM	27985
Acenaphthylene ND 0.079 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Aniline ND 0.092 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Anthracene ND 0.064 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Azobenzene ND 0.12 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benz(a)anthracene ND 0.084 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(a)pyrene ND 0.074 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(b)fluoranthene ND 0.088 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(k)fluoranthene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzoic acid ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021	EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthylene ND 0.079 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Aniline ND 0.092 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Anthracene ND 0.064 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Azobenzene ND 0.12 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benz(a)anthracene ND 0.084 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(a)pyrene ND 0.074 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(b)fluoranthene ND 0.088 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(k)fluoranthene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzoic acid ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021	Acenaphthene	ND	0.083	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Aniline ND 0.092 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Anthracene ND 0.064 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Azobenzene ND 0.12 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benz(a)anthracene ND 0.084 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(a)pyrene ND 0.074 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(b)fluoranthene ND 0.088 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(g,h,i)perylene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(k)fluoranthene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzoic acid ND 0.081 0.49 mg/Kg 1 10/15/2016 6:25:24 PM 28021	•	ND	0.079	0.19				10/15/2016 6:25:24 PM	28021
Anthracene ND 0.064 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Azobenzene ND 0.12 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benz(a)anthracene ND 0.084 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(a)pyrene ND 0.074 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(b)fluoranthene ND 0.088 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(g,h,i)perylene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(k)fluoranthene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzoic acid ND 0.081 0.49 mg/Kg 1 10/15/2016 6:25:24 PM 28021			0.092				1		
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Benz(a)anthracene ND 0.084 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(a)pyrene ND 0.074 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(b)fluoranthene ND 0.088 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(g,h,i)perylene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(k)fluoranthene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzoic acid ND 0.081 0.49 mg/Kg 1 10/15/2016 6:25:24 PM 28021									
Benzo(a)pyrene ND 0.074 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(b)fluoranthene ND 0.088 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(g,h,i)perylene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(k)fluoranthene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzoic acid ND 0.081 0.49 mg/Kg 1 10/15/2016 6:25:24 PM 28021									
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Benzo(g,h,i)perylene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzo(k)fluoranthene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzoic acid ND 0.081 0.49 mg/Kg 1 10/15/2016 6:25:24 PM 28021									
Benzo(k)fluoranthene ND 0.086 0.19 mg/Kg 1 10/15/2016 6:25:24 PM 28021 Benzoic acid ND 0.081 0.49 mg/Kg 1 10/15/2016 6:25:24 PM 28021									
Benzoic acid ND 0.081 0.49 mg/Kg 1 10/15/2016 6:25:24 PM 28021									
	Benzyl alcohol	ND	0.001	0.49		mg/Kg	1	10/15/2016 6:25:24 PM	

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-2(29-31')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 11:45:00 AM

 Lab ID:
 1610238-002
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Bis(2-chloroethoxy)methane	ND	0.11	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Bis(2-chloroethyl)ether	ND	0.071	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Bis(2-chloroisopropyl)ether	ND	0.087	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Bis(2-ethylhexyl)phthalate	0.10	0.079	0.49	J	mg/Kg	1	10/15/2016 6:25:24 PM	28021
4-Bromophenyl phenyl ether	ND	0.093	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Butyl benzyl phthalate	ND	0.086	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Carbazole	ND	0.066	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
4-Chloro-3-methylphenol	ND	0.12	0.49		mg/Kg	1	10/15/2016 6:25:24 PM	28021
4-Chloroaniline	ND	0.11	0.49		mg/Kg	1	10/15/2016 6:25:24 PM	28021
2-Chloronaphthalene	ND	0.076	0.24		mg/Kg	1	10/15/2016 6:25:24 PM	28021
2-Chlorophenol	ND	0.077	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
4-Chlorophenyl phenyl ether	ND	0.11	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Chrysene	ND	0.083	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Di-n-butyl phthalate	0.21	0.073	0.39	J	mg/Kg	1	10/15/2016 6:25:24 PM	28021
Di-n-octyl phthalate	ND	0.083	0.39		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Dibenz(a,h)anthracene	ND	0.079	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Dibenzofuran	ND	0.098	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
1,2-Dichlorobenzene	ND	0.074	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
1,3-Dichlorobenzene	ND	0.075	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
1,4-Dichlorobenzene	ND	0.082	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
3,3'-Dichlorobenzidine	ND	0.072	0.24		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Diethyl phthalate	0.12	0.099	0.19	J	mg/Kg	1	10/15/2016 6:25:24 PM	28021
Dimethyl phthalate	ND	0.095	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
2,4-Dichlorophenol	ND	0.091	0.39		mg/Kg	1	10/15/2016 6:25:24 PM	28021
2,4-Dimethylphenol	ND	0.11	0.29		mg/Kg	1	10/15/2016 6:25:24 PM	28021
4,6-Dinitro-2-methylphenol	ND	0.059	0.39		mg/Kg	1	10/15/2016 6:25:24 PM	28021
2,4-Dinitrophenol	ND	0.064	0.49		mg/Kg	1	10/15/2016 6:25:24 PM	28021
2,4-Dinitrotoluene	ND	0.087	0.49		mg/Kg	1	10/15/2016 6:25:24 PM	28021
2,6-Dinitrotoluene	ND	0.10	0.49		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Fluoranthene	ND	0.056	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Fluorene	ND	0.089	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Hexachlorobenzene	ND	0.077	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Hexachlorobutadiene	ND	0.11	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Hexachlorocyclopentadiene	ND	0.11	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Hexachloroethane	ND	0.083	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Indeno(1,2,3-cd)pyrene	ND	0.076	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Isophorone	ND	0.11	0.39		mg/Kg	1	10/15/2016 6:25:24 PM	28021
1-Methylnaphthalene	ND	0.098	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
2-Methylnaphthalene	ND	0.12	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

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

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-2(29-31')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 11:45:00 AM

 Lab ID:
 1610238-002
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
2-Methylphenol	0.13	0.081	0.39	J	mg/Kg	1	10/15/2016 6:25:24 PM	28021
3+4-Methylphenol	0.14	0.070	0.19	J	mg/Kg	1	10/15/2016 6:25:24 PM	28021
N-Nitrosodi-n-propylamine	ND	0.093	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
N-Nitrosodiphenylamine	ND	0.095	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Naphthalene	0.12	0.093	0.19	J	mg/Kg	1	10/15/2016 6:25:24 PM	28021
2-Nitroaniline	ND	0.10	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
3-Nitroaniline	ND	0.086	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
4-Nitroaniline	ND	0.069	0.39		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Nitrobenzene	ND	0.10	0.39		mg/Kg	1	10/15/2016 6:25:24 PM	28021
2-Nitrophenol	ND	0.096	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
4-Nitrophenol	ND	0.074	0.24		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Pentachlorophenol	ND	0.062	0.39		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Phenanthrene	ND	0.066	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Phenol	0.13	0.073	0.19	J	mg/Kg	1	10/15/2016 6:25:24 PM	28021
Pyrene	ND	0.073	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Pyridine	ND	0.077	0.39		mg/Kg	1	10/15/2016 6:25:24 PM	28021
1,2,4-Trichlorobenzene	ND	0.11	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
2,4,5-Trichlorophenol	ND	0.097	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
2,4,6-Trichlorophenol	ND	0.081	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021
Surr: 2-Fluorophenol	60.4	0	35-97.9		%Rec	1	10/15/2016 6:25:24 PM	28021
Surr: Phenol-d5	69.2	0	37.3-105		%Rec	1	10/15/2016 6:25:24 PM	28021
Surr: 2,4,6-Tribromophenol	64.9	0	35.6-118		%Rec	1	10/15/2016 6:25:24 PM	28021
Surr: Nitrobenzene-d5	63.4		41.2-107		%Rec	1	10/15/2016 6:25:24 PM	28021
Surr: 2-Fluorobiphenyl	64.6		41.9-119		%Rec	1	10/15/2016 6:25:24 PM	28021
Surr: 4-Terphenyl-d14	71.2		15-132		%Rec	1	10/15/2016 6:25:24 PM	28021
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	6.3	0.050	0.063		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Toluene	32	0.075	1.3		mg/Kg	50	10/7/2016 8:03:30 PM	S37805
Ethylbenzene	4.8	0.010	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Methyl tert-butyl ether (MTBE)	0.10	0.040	0.13	J	mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,2,4-Trimethylbenzene	8.5	0.0093	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,3,5-Trimethylbenzene	2.8	0.0091	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,2-Dichloroethane (EDC)	ND	0.033	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,2-Dibromoethane (EDB)	ND	0.0090	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Naphthalene	0.75	0.020	0.25		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1-Methylnaphthalene	0.21	0.028	0.50	J	mg/Kg	5	10/6/2016 11:45:30 PM	S37765
2-Methylnaphthalene	0.46	0.027	0.50	J	mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Acetone	ND	0.16	1.9		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Bromobenzene	ND	0.010	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-2(29-31')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 11:45:00 AM

 Lab ID:
 1610238-002
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Bromodichloromethane	ND	0.0073	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Bromoform	ND	0.015	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Bromomethane	ND	0.046	0.38		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
2-Butanone	ND	0.072	1.3		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Carbon disulfide	ND	0.042	1.3		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Carbon tetrachloride	ND	0.0083	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Chlorobenzene	ND	0.010	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Chloroethane	ND	0.025	0.25		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Chloroform	ND	0.0095	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Chloromethane	ND	0.011	0.38		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
2-Chlorotoluene	ND	0.0093	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
4-Chlorotoluene	ND	0.011	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
cis-1,2-DCE	ND	0.0073	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
cis-1,3-Dichloropropene	ND	0.012	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,2-Dibromo-3-chloropropane	ND	0.039	0.25		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Dibromochloromethane	ND	0.011	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Dibromomethane	ND	0.011	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,2-Dichlorobenzene	ND	0.011	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,3-Dichlorobenzene	ND	0.010	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,4-Dichlorobenzene	ND	0.016	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Dichlorodifluoromethane	ND	0.039	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,1-Dichloroethane	ND	0.0068	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,1-Dichloroethene	ND	0.041	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,2-Dichloropropane	ND	0.011	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,3-Dichloropropane	ND	0.014	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
2,2-Dichloropropane	ND	0.0072	0.25		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,1-Dichloropropene	ND	0.010	0.25		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Hexachlorobutadiene	ND	0.015	0.25		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
2-Hexanone	ND	0.069	1.3		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Isopropylbenzene	0.21	0.011	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
4-Isopropyltoluene	0.049	0.011	0.13	J	mg/Kg	5	10/6/2016 11:45:30 PM	
4-Methyl-2-pentanone	ND	0.037	1.3		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Methylene chloride	ND	0.036	0.38		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
n-Butylbenzene	0.35	0.011	0.38	J	mg/Kg	5	10/6/2016 11:45:30 PM	S37765
n-Propylbenzene	1.3	0.0097	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
sec-Butylbenzene	0.10	0.017	0.13	J	mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Styrene	ND	0.011	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	
tert-Butylbenzene	ND	0.010	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,1,1,2-Tetrachloroethane	ND	0.012	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical ReportLab Order **1610238**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-2(29-31')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 11:45:00 AM

 Lab ID:
 1610238-002
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,1,2,2-Tetrachloroethane	ND	0.020	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Tetrachloroethene (PCE)	ND	0.010	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
trans-1,2-DCE	ND	0.035	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
trans-1,3-Dichloropropene	ND	0.018	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,2,3-Trichlorobenzene	ND	0.019	0.25		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,2,4-Trichlorobenzene	ND	0.013	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,1,1-Trichloroethane	ND	0.0077	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,1,2-Trichloroethane	ND	0.015	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Trichloroethene (TCE)	ND	0.013	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Trichlorofluoromethane	ND	0.0094	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
1,2,3-Trichloropropane	ND	0.022	0.25		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Vinyl chloride	ND	0.010	0.13		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Xylenes, Total	30	0.024	0.25		mg/Kg	5	10/6/2016 11:45:30 PM	S37765
Surr: Dibromofluoromethane	81.9		70-130		%Rec	5	10/6/2016 11:45:30 PM	S37765
Surr: 1,2-Dichloroethane-d4	87.5		70-130		%Rec	5	10/6/2016 11:45:30 PM	S37765
Surr: Toluene-d8	96.2		70-130		%Rec	5	10/6/2016 11:45:30 PM	S37765
Surr: 4-Bromofluorobenzene	104		70-130		%Rec	5	10/6/2016 11:45:30 PM	S37765

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

Qualifiers:

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

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-2(36-38')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 12:15:00 PM

 Lab ID:
 1610238-003
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANG	E ORGANIC	S					Analyst: TOM	
Diesel Range Organics (DRO)	4.4	1.8	9.8	J	mg/Kg	1	10/11/2016 10:35:27 AM	Л 27950
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	10/11/2016 10:35:27 AM	A 27950
Surr: DNOP	90.2	0	70-130		%Rec	1	10/11/2016 10:35:27 AM	A 27950
EPA METHOD 8015D: GASOLINE RANG	GE						Analyst: NSB	
Gasoline Range Organics (GRO)	2.9	0.65	3.1	J	mg/Kg	1	10/6/2016 6:21:21 PM	27905
Surr: BFB	93.6	0	68.3-144		%Rec	1	10/6/2016 6:21:21 PM	27905
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	ND	0.00056	0.033		mg/Kg	1	10/12/2016 9:31:55 AM	27986
EPA METHOD 6010B: SOIL METALS							Analyst: MED	
Antimony	ND	0.98	2.4		mg/Kg	1	10/12/2016 2:33:36 PM	27985
Arsenic	2.7	0.87	2.4		mg/Kg	1	10/12/2016 2:33:36 PM	27985
Barium	300	0.14	0.20		mg/Kg	2	10/12/2016 2:35:33 PM	27985
Beryllium	0.58	0.034	0.15		mg/Kg	1	10/12/2016 2:33:36 PM	27985
Cadmium	ND	0.062	0.098		mg/Kg	1	10/12/2016 2:33:36 PM	27985
Chromium	6.6	0.092	0.29		mg/Kg	1	10/12/2016 2:33:36 PM	27985
Cobalt	2.1	0.11	0.29		mg/Kg	1	10/12/2016 2:33:36 PM	27985
Iron	11000	37	120		mg/Kg	50	10/12/2016 6:25:47 PM	27985
Lead	1.1	0.17	0.24		mg/Kg	1	10/12/2016 2:33:36 PM	27985
Manganese	450	0.10	0.20		mg/Kg	2	10/12/2016 2:35:33 PM	27985
Nickel	6.1	0.15	0.49		mg/Kg	1	10/12/2016 2:33:36 PM	27985
Selenium	ND	1.8	2.4		mg/Kg	1	10/12/2016 2:33:36 PM	27985
Silver	ND	0.061	0.24		mg/Kg	1	10/12/2016 2:33:36 PM	27985
Vanadium	3.5	0.17	2.4		mg/Kg	1	10/12/2016 2:33:36 PM	27985
Zinc	7.0	0.34	2.4		mg/Kg	1	10/12/2016 2:33:36 PM	27985
EPA METHOD 8270C: SEMIVOLATILES	i						Analyst: DAM	
Acenaphthene	ND	0.086	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Acenaphthylene	ND	0.082	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Aniline	ND	0.095	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Anthracene	ND	0.067	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Benz(a)anthracene	ND	0.087	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Benzo(a)pyrene	ND	0.076	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Benzo(b)fluoranthene	ND	0.091	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Benzo(g,h,i)perylene	ND	0.089	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Benzo(k)fluoranthene	ND	0.089	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Benzoic acid	ND	0.083	0.50		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Benzyl alcohol	ND	0.079	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-2(36-38')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 12:15:00 PM

 Lab ID:
 1610238-003
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Bis(2-chloroethyl)ether	ND	0.074	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Bis(2-chloroisopropyl)ether	ND	0.090	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Bis(2-ethylhexyl)phthalate	0.096	0.082	0.50	J	mg/Kg	1	10/15/2016 6:54:03 PM	28021
4-Bromophenyl phenyl ether	ND	0.096	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Butyl benzyl phthalate	ND	0.089	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Carbazole	ND	0.068	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/15/2016 6:54:03 PM	28021
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/15/2016 6:54:03 PM	28021
2-Chloronaphthalene	ND	0.079	0.25		mg/Kg	1	10/15/2016 6:54:03 PM	28021
2-Chlorophenol	ND	0.079	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Chrysene	ND	0.086	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Di-n-butyl phthalate	0.10	0.075	0.40	J	mg/Kg	1	10/15/2016 6:54:03 PM	28021
Di-n-octyl phthalate	ND	0.086	0.40		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
1,2-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
1,3-Dichlorobenzene	ND	0.078	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
1,4-Dichlorobenzene	ND	0.085	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
3,3'-Dichlorobenzidine	ND	0.074	0.25		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Diethyl phthalate	0.13	0.10	0.20	J	mg/Kg	1	10/15/2016 6:54:03 PM	28021
Dimethyl phthalate	ND	0.098	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
2,4-Dichlorophenol	ND	0.094	0.40		mg/Kg	1	10/15/2016 6:54:03 PM	28021
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/15/2016 6:54:03 PM	28021
4,6-Dinitro-2-methylphenol	ND	0.061	0.40		mg/Kg	1	10/15/2016 6:54:03 PM	28021
2,4-Dinitrophenol	ND	0.067	0.50		mg/Kg	1	10/15/2016 6:54:03 PM	28021
2,4-Dinitrotoluene	ND	0.090	0.50		mg/Kg	1	10/15/2016 6:54:03 PM	28021
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Fluoranthene	ND	0.058	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Fluorene	ND	0.092	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Indeno(1,2,3-cd)pyrene	ND	0.079	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Isophorone	ND	0.11	0.40		mg/Kg	1	10/15/2016 6:54:03 PM	28021
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

OW-14 Source Inv

Project:

Client Sample ID: TK569-2(36-38')

Collection Date: 10/4/2016 12:15:00 PM

Lab ID: 1610238-003 **Matrix:** MEOH (SOIL) **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
2-Methylphenol	ND	0.084	0.40		mg/Kg	1	10/15/2016 6:54:03 PM	28021
3+4-Methylphenol	ND	0.073	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
N-Nitrosodi-n-propylamine	ND	0.097	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
N-Nitrosodiphenylamine	ND	0.098	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Naphthalene	ND	0.097	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
3-Nitroaniline	ND	0.089	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
4-Nitroaniline	ND	0.071	0.40		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/15/2016 6:54:03 PM	28021
2-Nitrophenol	ND	0.10	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
4-Nitrophenol	ND	0.077	0.25		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Pentachlorophenol	ND	0.065	0.40		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Phenanthrene	ND	0.068	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Phenol	ND	0.076	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Pyrene	ND	0.076	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Pyridine	ND	0.080	0.40		mg/Kg	1	10/15/2016 6:54:03 PM	28021
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	10/15/2016 6:54:03 PM	28021
Surr: 2-Fluorophenol	79.2	0	35-97.9		%Rec	1	10/15/2016 6:54:03 PM	28021
Surr: Phenol-d5	81.5	0	37.3-105		%Rec	1	10/15/2016 6:54:03 PM	28021
Surr: 2,4,6-Tribromophenol	74.8	0	35.6-118		%Rec	1	10/15/2016 6:54:03 PM	28021
Surr: Nitrobenzene-d5	71.7		41.2-107		%Rec	1	10/15/2016 6:54:03 PM	28021
Surr: 2-Fluorobiphenyl	76.2		41.9-119		%Rec	1	10/15/2016 6:54:03 PM	28021
Surr: 4-Terphenyl-d14	80.8		15-132		%Rec	1	10/15/2016 6:54:03 PM	28021
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
Benzene	13.4	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Toluene	11.1	0.226	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Ethylbenzene	4.07	0.251	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	
Methyl tert-butyl ether (MTBE)	2.54	0.314	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,2,4-Trimethylbenzene	5.51	0.317	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,3,5-Trimethylbenzene	2.87	0.308	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,2-Dichloroethane (EDC)	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,2-Dibromoethane (EDB)	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Naphthalene	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	
1-Methylnaphthalene	0.374	0.212	3.74	J	μg/Kg	1	10/16/2016 5:10:00 PM	28053
2-Methylnaphthalene	ND	0.492	3.74		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Acetone	4.42	0.553	9.35	J	μg/Kg	1	10/16/2016 5:10:00 PM	28053
Bromobenzene	ND	0.190	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-2(36-38')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 12:15:00 PM

 Lab ID:
 1610238-003
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
Bromodichloromethane	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Bromoform	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Bromomethane	ND	0.336	2.80		μg/Kg	1	10/16/2016 5:10:00 PM	28053
2-Butanone	0.925	0.674	9.35	J	μg/Kg	1	10/16/2016 5:10:00 PM	28053
Carbon disulfide	ND	0.691	9.35		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Carbon tetrachloride	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Chlorobenzene	ND	0.214	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Chloroethane	ND	0.345	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Chloroform	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Chloromethane	ND	0.474	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
2-Chlorotoluene	ND	0.318	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
4-Chlorotoluene	ND	0.311	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
cis-1,2-DCE	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
cis-1,3-Dichloropropene	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,2-Dibromo-3-chloropropane	ND	0.199	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Dibromochloromethane	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Dibromomethane	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,2-Dichlorobenzene	ND	0.272	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,3-Dichlorobenzene	ND	0.345	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,4-Dichlorobenzene	ND	0.350	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Dichlorodifluoromethane	ND	1.09	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,1-Dichloroethane	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,1-Dichloroethene	ND	0.306	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,2-Dichloropropane	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,3-Dichloropropane	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
2,2-Dichloropropane	ND	0.236	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,1-Dichloropropene	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Hexachlorobutadiene	ND	0.426	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
2-Hexanone	ND	0.466	9.35		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Isopropylbenzene	1.01	0.235	1.87	J	μg/Kg	1	10/16/2016 5:10:00 PM	28053
4-Isopropyltoluene	0.393	0.351	1.87	J	μg/Kg	1	10/16/2016 5:10:00 PM	28053
4-Methyl-2-pentanone	ND	3.74	9.35		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Methylene chloride	ND	1.87	2.80		μg/Kg	1	10/16/2016 5:10:00 PM	28053
n-Butylbenzene	0.514	0.455	1.87	J	μg/Kg	1	10/16/2016 5:10:00 PM	28053
n-Propylbenzene	1.58	0.335	1.87	J	μg/Kg	1	10/16/2016 5:10:00 PM	28053
sec-Butylbenzene	0.561	0.332	1.87	J	μg/Kg	1	10/16/2016 5:10:00 PM	28053
Styrene	ND	0.239	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
tert-Butylbenzene	ND	0.273	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,1,1,2-Tetrachloroethane	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical ReportLab Order **1610238**

Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-2(36-38')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 12:15:00 PM

 Lab ID:
 1610238-003
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
1,1,2,2-Tetrachloroethane	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Tetrachloroethene (PCE)	ND	0.246	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
trans-1,2-DCE	ND	0.189	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
trans-1,3-Dichloropropene	ND	0.226	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,2,3-Trichlorobenzene	ND	0.452	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,2,4-Trichlorobenzene	ND	0.567	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,1,1-Trichloroethane	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,1,2-Trichloroethane	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Trichloroethene (TCE)	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Trichlorofluoromethane	ND	0.235	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
1,2,3-Trichloropropane	ND	1.87	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Vinyl chloride	ND	0.492	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Xylenes, Total	19.0	0.745	1.87		μg/Kg	1	10/16/2016 5:10:00 PM	28053
Surr: 1,2-Dichloroethane-d4	121	0	70-130		%Rec	1	10/16/2016 5:10:00 PM	28053
Surr: 4-Bromofluorobenzene	98.5	0	70-130		%Rec	1	10/16/2016 5:10:00 PM	28053
Surr: Dibromofluoromethane	109	0	70-130		%Rec	1	10/16/2016 5:10:00 PM	28053
Surr: Toluene-d8	99.7	0	70-130		%Rec	1	10/16/2016 5:10:00 PM	28053

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-1(18-20')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 3:50:00 PM

 Lab ID:
 1610238-004
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS						Analyst: TOM	
Diesel Range Organics (DRO)	5.2	1.8	10	J	mg/Kg	1	10/11/2016 10:58:37 AM	M 27950
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	10/11/2016 10:58:37 AM	1 27950
Surr: DNOP	82.1	0	70-130		%Rec	1	10/11/2016 10:58:37 AM	1 27950
EPA METHOD 8015D: GASOLINE RANG	E						Analyst: NSB	
Gasoline Range Organics (GRO)	ND	0.63	3.1		mg/Kg	1	10/6/2016 6:44:51 PM	27905
Surr: BFB	88.5	0	68.3-144		%Rec	1	10/6/2016 6:44:51 PM	27905
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0019	0.00056	0.032	J	mg/Kg	1	10/12/2016 9:33:44 AM	27986
EPA METHOD 6010B: SOIL METALS							Analyst: MED	
Antimony	ND	0.99	2.5		mg/Kg	1	10/12/2016 2:37:32 PM	27985
Arsenic	1.4	0.88	2.5	J	mg/Kg	1	10/12/2016 2:37:32 PM	27985
Barium	120	0.070	0.099		mg/Kg	1	10/12/2016 2:37:32 PM	27985
Beryllium	0.69	0.034	0.15		mg/Kg	1	10/12/2016 2:37:32 PM	27985
Cadmium	ND	0.063	0.099		mg/Kg	1	10/12/2016 2:37:32 PM	27985
Chromium	5.9	0.093	0.30		mg/Kg	1	10/12/2016 2:37:32 PM	27985
Cobalt	3.0	0.11	0.30		mg/Kg	1	10/12/2016 2:37:32 PM	27985
Iron	12000	37	120		mg/Kg	50	10/12/2016 6:27:27 PM	27985
Lead	2.7	0.17	0.25		mg/Kg	1	10/12/2016 2:37:32 PM	27985
Manganese	190	0.053	0.099		mg/Kg	1	10/12/2016 2:37:32 PM	27985
Nickel	5.4	0.15	0.49		mg/Kg	1	10/12/2016 2:37:32 PM	27985
Selenium	ND	1.8	2.5		mg/Kg	1	10/12/2016 2:37:32 PM	27985
Silver	ND	0.062	0.25		mg/Kg	1	10/12/2016 2:37:32 PM	27985
Vanadium	9.8	0.17	2.5		mg/Kg	1	10/12/2016 2:37:32 PM	27985
Zinc	9.8	0.34	2.5		mg/Kg	1	10/12/2016 2:37:32 PM	27985
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Aniline	ND	0.094	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Anthracene	ND	0.066	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Benz(a)anthracene	ND	0.085	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Benzo(g,h,i)perylene	ND	0.087	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Benzo(k)fluoranthene	ND	0.087	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Benzoic acid	ND	0.082	0.50		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-1(18-20')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 3:50:00 PM

 Lab ID:
 1610238-004
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Bis(2-ethylhexyl)phthalate	0.13	0.081	0.50	J	mg/Kg	1	10/15/2016 7:22:37 PM	28021
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Carbazole	ND	0.067	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/15/2016 7:22:37 PM	28021
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/15/2016 7:22:37 PM	28021
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	10/15/2016 7:22:37 PM	28021
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Chrysene	ND	0.084	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Di-n-butyl phthalate	0.24	0.074	0.40	J	mg/Kg	1	10/15/2016 7:22:37 PM	28021
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Diethyl phthalate	0.13	0.10	0.20	J	mg/Kg	1	10/15/2016 7:22:37 PM	28021
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
2,4-Dichlorophenol	ND	0.092	0.40		mg/Kg	1	10/15/2016 7:22:37 PM	28021
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/15/2016 7:22:37 PM	28021
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	10/15/2016 7:22:37 PM	28021
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	10/15/2016 7:22:37 PM	28021
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	10/15/2016 7:22:37 PM	28021
2,6-Dinitrotoluene	ND	0.10	0.50		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Fluoranthene	ND	0.057	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Fluorene	ND	0.091	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Indeno(1,2,3-cd)pyrene	ND	0.077	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Isophorone	ND	0.11	0.40		mg/Kg	1	10/15/2016 7:22:37 PM	28021
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-1(18-20')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 3:50:00 PM

 Lab ID:
 1610238-004
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	10/15/2016 7:22:37 PM	28021
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
N-Nitrosodi-n-propylamine	ND	0.095	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Naphthalene	ND	0.095	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
3-Nitroaniline	ND	0.087	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/15/2016 7:22:37 PM	28021
2-Nitrophenol	ND	0.098	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Phenanthrene	ND	0.067	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Phenol	ND	0.075	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Pyrene	ND	0.075	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Pyridine	ND	0.079	0.40		mg/Kg	1	10/15/2016 7:22:37 PM	28021
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
2,4,5-Trichlorophenol	ND	0.099	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
2,4,6-Trichlorophenol	ND	0.082	0.20		mg/Kg	1	10/15/2016 7:22:37 PM	28021
Surr: 2-Fluorophenol	72.4	0	35-97.9		%Rec	1	10/15/2016 7:22:37 PM	28021
Surr: Phenol-d5	74.2	0	37.3-105		%Rec	1	10/15/2016 7:22:37 PM	28021
Surr: 2,4,6-Tribromophenol	77.5	0	35.6-118		%Rec	1	10/15/2016 7:22:37 PM	28021
Surr: Nitrobenzene-d5	67.3		41.2-107		%Rec	1	10/15/2016 7:22:37 PM	28021
Surr: 2-Fluorobiphenyl	71.9		41.9-119		%Rec	1	10/15/2016 7:22:37 PM	28021
Surr: 4-Terphenyl-d14	78.2		15-132		%Rec	1	10/15/2016 7:22:37 PM	28021
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
Benzene	17.2	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Toluene	0.444	0.207	1.71	J	μg/Kg	1	10/16/2016 6:00:00 PM	28053
Ethylbenzene	0.402	0.230	1.71	J	μg/Kg	1	10/16/2016 6:00:00 PM	
Methyl tert-butyl ether (MTBE)	ND	0.287	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,2,4-Trimethylbenzene	ND	0.290	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,3,5-Trimethylbenzene	ND	0.282	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,2-Dichloroethane (EDC)	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,2-Dibromoethane (EDB)	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Naphthalene	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1-Methylnaphthalene	0.222	0.194	3.42	J	μg/Kg	1	10/16/2016 6:00:00 PM	
2-Methylnaphthalene	ND	0.450	3.42		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Acetone	4.61	0.506	8.55	J	μg/Kg	1	10/16/2016 6:00:00 PM	28053
Bromobenzene	ND	0.174	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-1(18-20')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 3:50:00 PM

 Lab ID:
 1610238-004
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
Bromodichloromethane	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Bromoform	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Bromomethane	ND	0.308	2.56		μg/Kg	1	10/16/2016 6:00:00 PM	28053
2-Butanone	2.04	0.616	8.55	J	μg/Kg	1	10/16/2016 6:00:00 PM	28053
Carbon disulfide	ND	0.632	8.55		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Carbon tetrachloride	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Chlorobenzene	ND	0.196	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Chloroethane	ND	0.315	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Chloroform	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Chloromethane	ND	0.433	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
2-Chlorotoluene	ND	0.291	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
4-Chlorotoluene	ND	0.284	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
cis-1,2-DCE	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
cis-1,3-Dichloropropene	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,2-Dibromo-3-chloropropane	ND	0.182	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Dibromochloromethane	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Dibromomethane	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,2-Dichlorobenzene	ND	0.249	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,3-Dichlorobenzene	ND	0.316	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,4-Dichlorobenzene	ND	0.320	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Dichlorodifluoromethane	ND	0.998	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,1-Dichloroethane	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,1-Dichloroethene	ND	0.280	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,2-Dichloropropane	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,3-Dichloropropane	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
2,2-Dichloropropane	ND	0.216	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,1-Dichloropropene	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Hexachlorobutadiene	ND	0.390	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
2-Hexanone	ND	0.426	8.55		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Isopropylbenzene	ND	0.215	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
4-Isopropyltoluene	ND	0.321	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
4-Methyl-2-pentanone	ND	3.42	8.55		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Methylene chloride	ND	1.71	2.56		μg/Kg	1	10/16/2016 6:00:00 PM	28053
n-Butylbenzene	ND	0.416	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
n-Propylbenzene	ND	0.306	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
sec-Butylbenzene	ND	0.303	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Styrene	ND	0.218	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
tert-Butylbenzene	ND	0.250	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,1,1,2-Tetrachloroethane	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical ReportLab Order **1610238**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-1(18-20')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 3:50:00 PM

 Lab ID:
 1610238-004
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
1,1,2,2-Tetrachloroethane	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Tetrachloroethene (PCE)	ND	0.225	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
trans-1,2-DCE	ND	0.173	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
trans-1,3-Dichloropropene	ND	0.207	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,2,3-Trichlorobenzene	ND	0.414	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,2,4-Trichlorobenzene	ND	0.518	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,1,1-Trichloroethane	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,1,2-Trichloroethane	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Trichloroethene (TCE)	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Trichlorofluoromethane	ND	0.215	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
1,2,3-Trichloropropane	ND	1.71	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Vinyl chloride	ND	0.450	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Xylenes, Total	ND	0.681	1.71		μg/Kg	1	10/16/2016 6:00:00 PM	28053
Surr: 1,2-Dichloroethane-d4	119	0	70-130		%Rec	1	10/16/2016 6:00:00 PM	28053
Surr: 4-Bromofluorobenzene	104	0	70-130		%Rec	1	10/16/2016 6:00:00 PM	28053
Surr: Dibromofluoromethane	108	0	70-130		%Rec	1	10/16/2016 6:00:00 PM	28053
Surr: Toluene-d8	97.3	0	70-130		%Rec	1	10/16/2016 6:00:00 PM	28053

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

Qualifiers:

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

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-1(24-26')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:00:00 PM

 Lab ID:
 1610238-005
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS	3					Analyst: TOM	
Diesel Range Organics (DRO)	15	1.8	9.5		mg/Kg	1	10/11/2016 11:21:33 AN	M 27950
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	10/11/2016 11:21:33 AM	M 27950
Surr: DNOP	86.2	0	70-130		%Rec	1	10/11/2016 11:21:33 AN	1 27950
EPA METHOD 8015D: GASOLINE RANG	E						Analyst: NSB	
Gasoline Range Organics (GRO)	190	0.54	2.6		mg/Kg	1	10/6/2016 7:08:10 PM	27905
Surr: BFB	892	0	68.3-144	S	%Rec	1	10/6/2016 7:08:10 PM	27905
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0015	0.00056	0.033	J	mg/Kg	1	10/12/2016 9:35:31 AM	27986
EPA METHOD 6010B: SOIL METALS							Analyst: MED	
Antimony	ND	0.98	2.4		mg/Kg	1	10/12/2016 2:46:56 PM	27985
Arsenic	1.6	0.87	2.4	J	mg/Kg	1	10/12/2016 2:46:56 PM	27985
Barium	410	0.14	0.20		mg/Kg	2	10/12/2016 2:48:44 PM	27985
Beryllium	0.57	0.034	0.15		mg/Kg	1	10/12/2016 2:46:56 PM	27985
Cadmium	ND	0.062	0.098		mg/Kg	1	10/12/2016 2:46:56 PM	27985
Chromium	5.1	0.092	0.29		mg/Kg	1	10/12/2016 2:46:56 PM	27985
Cobalt	2.8	0.11	0.29		mg/Kg	1	10/12/2016 2:46:56 PM	27985
Iron	9800	37	120		mg/Kg	50	10/12/2016 6:29:01 PM	27985
Lead	3.2	0.17	0.24		mg/Kg	1	10/12/2016 2:46:56 PM	27985
Manganese	190	0.052	0.098		mg/Kg	1	10/12/2016 2:46:56 PM	27985
Nickel	5.0	0.15	0.49		mg/Kg	1	10/12/2016 2:46:56 PM	27985
Selenium	ND	1.8	2.4		mg/Kg	1	10/12/2016 2:46:56 PM	27985
Silver	ND	0.061	0.24		mg/Kg	1	10/12/2016 2:46:56 PM	27985
Vanadium	10	0.17	2.4		mg/Kg	1	10/12/2016 2:46:56 PM	27985
Zinc	8.3	0.34	2.4		mg/Kg	1	10/12/2016 2:46:56 PM	27985
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.083	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Acenaphthylene	ND	0.079	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Aniline	ND	0.091	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Anthracene	ND	0.064	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Azobenzene	ND	0.12	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Benz(a)anthracene	ND	0.083	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Benzo(a)pyrene	ND	0.073	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Benzo(b)fluoranthene	ND	0.087	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Benzo(g,h,i)perylene	ND	0.085	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Benzo(k)fluoranthene	ND	0.085	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Benzoic acid	0.081	0.080	0.48	J	mg/Kg	1	10/15/2016 7:51:12 PM	28021
Benzyl alcohol	ND	0.076	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-1(24-26')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:00:00 PM

 Lab ID:
 1610238-005
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Bis(2-chloroethoxy)methane	ND	0.11	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Bis(2-chloroethyl)ether	ND	0.071	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Bis(2-chloroisopropyl)ether	ND	0.086	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Bis(2-ethylhexyl)phthalate	ND	0.079	0.48		mg/Kg	1	10/15/2016 7:51:12 PM	28021
4-Bromophenyl phenyl ether	ND	0.093	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Butyl benzyl phthalate	ND	0.086	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Carbazole	ND	0.065	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
4-Chloro-3-methylphenol	ND	0.12	0.48		mg/Kg	1	10/15/2016 7:51:12 PM	28021
4-Chloroaniline	ND	0.11	0.48		mg/Kg	1	10/15/2016 7:51:12 PM	28021
2-Chloronaphthalene	ND	0.076	0.24		mg/Kg	1	10/15/2016 7:51:12 PM	28021
2-Chlorophenol	ND	0.076	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
4-Chlorophenyl phenyl ether	ND	0.11	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Chrysene	ND	0.082	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Di-n-butyl phthalate	0.18	0.072	0.39	J	mg/Kg	1	10/15/2016 7:51:12 PM	28021
Di-n-octyl phthalate	ND	0.083	0.39		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Dibenz(a,h)anthracene	ND	0.078	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Dibenzofuran	ND	0.097	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
1,2-Dichlorobenzene	ND	0.074	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
1,3-Dichlorobenzene	ND	0.075	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
1,4-Dichlorobenzene	ND	0.082	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
3,3'-Dichlorobenzidine	ND	0.071	0.24		mg/Kg	1	10/15/2016 7:51:12 PM	
Diethyl phthalate	ND	0.098	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Dimethyl phthalate	ND	0.095	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
2,4-Dichlorophenol	ND	0.090	0.39		mg/Kg	1	10/15/2016 7:51:12 PM	28021
2,4-Dimethylphenol	ND	0.11	0.29		mg/Kg	1	10/15/2016 7:51:12 PM	28021
4,6-Dinitro-2-methylphenol	ND	0.059	0.39		mg/Kg	1	10/15/2016 7:51:12 PM	28021
2,4-Dinitrophenol	ND	0.064	0.48		mg/Kg	1	10/15/2016 7:51:12 PM	28021
2,4-Dinitrotoluene	ND	0.086	0.48		mg/Kg	1	10/15/2016 7:51:12 PM	28021
2,6-Dinitrotoluene	ND	0.10	0.48		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Fluoranthene	ND	0.056	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Fluorene	ND	0.089	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Hexachlorobenzene	ND	0.076	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Hexachlorobutadiene	ND	0.11	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Hexachlorocyclopentadiene	ND	0.11	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Hexachloroethane	ND	0.083	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Indeno(1,2,3-cd)pyrene	ND	0.076	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Isophorone	ND	0.11	0.39		mg/Kg	1	10/15/2016 7:51:12 PM	28021
1-Methylnaphthalene	ND	0.097	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
2-Methylnaphthalene	ND	0.11	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-1(24-26')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:00:00 PM

 Lab ID:
 1610238-005
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
2-Methylphenol	ND	0.081	0.39		mg/Kg	1	10/15/2016 7:51:12 PM	28021
3+4-Methylphenol	ND	0.070	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
N-Nitrosodi-n-propylamine	ND	0.093	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
N-Nitrosodiphenylamine	ND	0.095	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Naphthalene	ND	0.093	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
2-Nitroaniline	ND	0.10	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
3-Nitroaniline	ND	0.085	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
4-Nitroaniline	ND	0.068	0.39		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Nitrobenzene	ND	0.10	0.39		mg/Kg	1	10/15/2016 7:51:12 PM	28021
2-Nitrophenol	ND	0.096	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
4-Nitrophenol	ND	0.074	0.24		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Pentachlorophenol	ND	0.062	0.39		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Phenanthrene	ND	0.066	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Phenol	ND	0.073	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Pyrene	ND	0.073	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Pyridine	ND	0.077	0.39		mg/Kg	1	10/15/2016 7:51:12 PM	28021
1,2,4-Trichlorobenzene	ND	0.10	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
2,4,5-Trichlorophenol	ND	0.097	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
2,4,6-Trichlorophenol	ND	0.080	0.19		mg/Kg	1	10/15/2016 7:51:12 PM	28021
Surr: 2-Fluorophenol	41.3	0	35-97.9		%Rec	1	10/15/2016 7:51:12 PM	28021
Surr: Phenol-d5	43.0	0	37.3-105		%Rec	1	10/15/2016 7:51:12 PM	28021
Surr: 2,4,6-Tribromophenol	42.8	0	35.6-118		%Rec	1	10/15/2016 7:51:12 PM	28021
Surr: Nitrobenzene-d5	43.4		41.2-107		%Rec	1	10/15/2016 7:51:12 PM	28021
Surr: 2-Fluorobiphenyl	41.5		41.9-119	S	%Rec	1	10/15/2016 7:51:12 PM	28021
Surr: 4-Terphenyl-d14	42.9		15-132		%Rec	1	10/15/2016 7:51:12 PM	28021
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.29	0.011	0.013		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Toluene	1.6	0.0016	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Ethylbenzene	0.73	0.0022	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Methyl tert-butyl ether (MTBE)	ND	0.0083	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,2,4-Trimethylbenzene	1.6	0.0019	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,3,5-Trimethylbenzene	0.60	0.0019	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,2-Dichloroethane (EDC)	ND	0.0068	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,2-Dibromoethane (EDB)	ND	0.0019	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Naphthalene	0.044	0.0041	0.053	J	mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1-Methylnaphthalene	0.028	0.0058	0.11	J	mg/Kg	1	10/7/2016 1:11:17 AM	S37765
2-Methylnaphthalene	0.041	0.0056	0.11	J	mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Acetone	ND	0.034	0.39		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Bromobenzene	ND	0.0021	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-1(24-26')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:00:00 PM

 Lab ID:
 1610238-005
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Bromodichloromethane	ND	0.0015	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Bromoform	ND	0.0032	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Bromomethane	ND	0.0097	0.079		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
2-Butanone	ND	0.015	0.26		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Carbon disulfide	ND	0.0087	0.26		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Carbon tetrachloride	ND	0.0017	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Chlorobenzene	ND	0.0021	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Chloroethane	ND	0.0052	0.053		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Chloroform	ND	0.0020	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Chloromethane	ND	0.0023	0.079		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
2-Chlorotoluene	ND	0.0019	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
4-Chlorotoluene	ND	0.0023	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
cis-1,2-DCE	ND	0.0015	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
cis-1,3-Dichloropropene	ND	0.0024	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,2-Dibromo-3-chloropropane	ND	0.0080	0.053		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Dibromochloromethane	ND	0.0024	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Dibromomethane	ND	0.0023	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,2-Dichlorobenzene	ND	0.0023	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,3-Dichlorobenzene	ND	0.0022	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,4-Dichlorobenzene	ND	0.0033	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Dichlorodifluoromethane	ND	0.0081	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,1-Dichloroethane	ND	0.0014	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,1-Dichloroethene	ND	0.0086	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,2-Dichloropropane	ND	0.0022	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,3-Dichloropropane	ND	0.0030	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
2,2-Dichloropropane	ND	0.0015	0.053		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,1-Dichloropropene	ND	0.0021	0.053		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Hexachlorobutadiene	ND	0.0032	0.053		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
2-Hexanone	ND	0.014	0.26		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Isopropylbenzene	0.23	0.0023	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
4-Isopropyltoluene	0.12	0.0024	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
4-Methyl-2-pentanone	ND	0.0077	0.26		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Methylene chloride	ND	0.0076	0.079		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
n-Butylbenzene	0.14	0.0023	0.079		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
n-Propylbenzene	0.37	0.0020	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
sec-Butylbenzene	0.12	0.0036	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Styrene	ND	0.0023	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
tert-Butylbenzene	0.0084	0.0022	0.026	J	mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,1,1,2-Tetrachloroethane	ND	0.0025	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical ReportLab Order **1610238**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-1(24-26')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:00:00 PM

 Lab ID:
 1610238-005
 Matrix: MEOH (SOIL)
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,1,2,2-Tetrachloroethane	ND	0.0043	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Tetrachloroethene (PCE)	ND	0.0022	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
trans-1,2-DCE	ND	0.0074	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
trans-1,3-Dichloropropene	ND	0.0038	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,2,3-Trichlorobenzene	ND	0.0039	0.053		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,2,4-Trichlorobenzene	ND	0.0028	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,1,1-Trichloroethane	ND	0.0016	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,1,2-Trichloroethane	ND	0.0031	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Trichloroethene (TCE)	ND	0.0028	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Trichlorofluoromethane	ND	0.0020	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
1,2,3-Trichloropropane	ND	0.0045	0.053		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Vinyl chloride	ND	0.0021	0.026		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Xylenes, Total	4.2	0.0050	0.053		mg/Kg	1	10/7/2016 1:11:17 AM	S37765
Surr: Dibromofluoromethane	80.5		70-130		%Rec	1	10/7/2016 1:11:17 AM	S37765
Surr: 1,2-Dichloroethane-d4	89.7		70-130		%Rec	1	10/7/2016 1:11:17 AM	S37765
Surr: Toluene-d8	94.3		70-130		%Rec	1	10/7/2016 1:11:17 AM	S37765
Surr: 4-Bromofluorobenzene	109		70-130		%Rec	1	10/7/2016 1:11:17 AM	S37765

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

Qualifiers:

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

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-1(36-38')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:05:00 PM

 Lab ID:
 1610238-006
 Matrix: SOIL
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RAN	IGE ORGANIC	S					Analyst: TOM	
Diesel Range Organics (DRO)	61	1.8	9.6		mg/Kg	1	10/11/2016 11:44:43 AM	1 27950
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	10/11/2016 11:44:43 AM	1 27950
Surr: DNOP	86.0	0	70-130		%Rec	1	10/11/2016 11:44:43 AM	1 27950
EPA METHOD 8015D: GASOLINE RA	NGE						Analyst: NSB	
Gasoline Range Organics (GRO)	140	1.9	9.4		mg/Kg	2	10/7/2016 2:03:01 PM	27923
Surr: BFB	123	0	68.3-144		%Rec	2	10/7/2016 2:03:01 PM	27923
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	0.0042	0.00056	0.033	J	mg/Kg	1	10/12/2016 9:37:19 AM	27986
EPA METHOD 6010B: SOIL METALS	0.00.1	0.0000	0.000		9/19	·	Analyst: MED	2.000
	ND	1.0	2.5		malka	1	10/12/2016 2:50:49 PM	27985
Antimony Arsenic	ND 2.4	0.89	2.5 2.5	J	mg/Kg mg/Kg	1 1	10/12/2016 2:50:49 PM 10/12/2016 2:50:49 PM	27985 27985
Barium	1500	3.6	5.0	J	mg/Kg	50	10/12/2016 2:30:49 PM 10/12/2016 6:30:36 PM	27985
	0.26	0.035	0.15		mg/Kg	1	10/12/2016 0:50:36 PM 10/12/2016 2:50:49 PM	27985
Beryllium Cadmium	0.26 ND	0.035	0.15		mg/Kg	1		27985
	3.6	0.064	0.10			1	10/12/2016 2:50:49 PM	27985
Chromium	3.0 2.2				mg/Kg		10/12/2016 2:50:49 PM	
Cobalt		0.11	0.30		mg/Kg	1	10/12/2016 2:50:49 PM	27985
Iron	7900	38	130		mg/Kg	50	10/12/2016 6:30:36 PM	27985
Lead	1.2	0.18	0.25		mg/Kg	1	10/12/2016 2:50:49 PM	27985
Manganese	710	2.7	5.0		mg/Kg	50	10/12/2016 6:30:36 PM	27985
Nickel	3.2	0.15	0.50		mg/Kg	1	10/12/2016 2:50:49 PM	27985
Selenium	ND	1.8	2.5		mg/Kg	1	10/12/2016 2:50:49 PM	27985
Silver	ND	0.063	0.25		mg/Kg	1	10/12/2016 2:50:49 PM	27985
Vanadium 	14	0.18	2.5		mg/Kg	1	10/12/2016 2:50:49 PM	27985
Zinc	7.6	0.35	2.5		mg/Kg	1	10/12/2016 2:50:49 PM	27985
EPA METHOD 8270C: SEMIVOLATILE	ES						Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Aniline	ND	0.094	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Anthracene	ND	0.066	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Benzoic acid	ND	0.082	0.50		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-1(36-38')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:05:00 PM

 Lab ID:
 1610238-006
 Matrix: SOIL
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Bis(2-ethylhexyl)phthalate	0.096	0.081	0.50	J	mg/Kg	1	10/15/2016 8:19:46 PM	28021
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Carbazole	ND	0.067	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/15/2016 8:19:46 PM	28021
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/15/2016 8:19:46 PM	28021
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	10/15/2016 8:19:46 PM	28021
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Chrysene	ND	0.085	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Di-n-butyl phthalate	0.087	0.074	0.40	J	mg/Kg	1	10/15/2016 8:19:46 PM	28021
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Diethyl phthalate	ND	0.10	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	10/15/2016 8:19:46 PM	28021
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/15/2016 8:19:46 PM	28021
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	10/15/2016 8:19:46 PM	28021
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	10/15/2016 8:19:46 PM	28021
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	10/15/2016 8:19:46 PM	28021
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Fluoranthene	ND	0.057	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Fluorene	ND	0.091	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Isophorone	ND	0.11	0.40		mg/Kg	1	10/15/2016 8:19:46 PM	28021
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-1(36-38')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:05:00 PM

 Lab ID:
 1610238-006
 Matrix: SOIL
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	10/15/2016 8:19:46 PM	28021
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Naphthalene	ND	0.095	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/15/2016 8:19:46 PM	28021
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Phenanthrene	ND	0.068	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Phenol	ND	0.075	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Pyrene	ND	0.075	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Pyridine	ND	0.079	0.40		mg/Kg	1	10/15/2016 8:19:46 PM	28021
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
2,4,5-Trichlorophenol	ND	0.099	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
2,4,6-Trichlorophenol	ND	0.082	0.20		mg/Kg	1	10/15/2016 8:19:46 PM	28021
Surr: 2-Fluorophenol	69.2	0	35-97.9		%Rec	1	10/15/2016 8:19:46 PM	28021
Surr: Phenol-d5	73.7	0	37.3-105		%Rec	1	10/15/2016 8:19:46 PM	28021
Surr: 2,4,6-Tribromophenol	62.6	0	35.6-118		%Rec	1	10/15/2016 8:19:46 PM	28021
Surr: Nitrobenzene-d5	59.9		41.2-107		%Rec	1	10/15/2016 8:19:46 PM	28021
Surr: 2-Fluorobiphenyl	61.3		41.9-119		%Rec	1	10/15/2016 8:19:46 PM	28021
Surr: 4-Terphenyl-d14	62.1		15-132		%Rec	1	10/15/2016 8:19:46 PM	28021
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.12	0.038	0.047		mg/Kg	2	10/10/2016 12:09:27 PM	1 27923
Toluene	2.5	0.0056	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	1 27923
Ethylbenzene	1.2	0.0077	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	1 27923
Methyl tert-butyl ether (MTBE)	ND	0.030	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	1 27923
1,2,4-Trimethylbenzene	3.8	0.0069	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	1 27923
1,3,5-Trimethylbenzene	1.3	0.0068	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	1 27923
1,2-Dichloroethane (EDC)	ND	0.025	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	1 27923
1,2-Dibromoethane (EDB)	ND	0.0067	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	1 27923
Naphthalene	0.32	0.015	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	1 27923
1-Methylnaphthalene	0.17	0.021	0.38	J	mg/Kg	2	10/10/2016 12:09:27 PM	1 27923
2-Methylnaphthalene	0.30	0.020	0.38	J	mg/Kg	2	10/10/2016 12:09:27 PM	1 27923
Acetone	ND	0.12	1.4		mg/Kg	2	10/10/2016 12:09:27 PM	1 27923
Bromobenzene	ND	0.0076	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	1 27923

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-1(36-38')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:05:00 PM

 Lab ID:
 1610238-006
 Matrix: SOIL
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Bromodichloromethane	ND	0.0055	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Bromoform	ND	0.011	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Bromomethane	ND	0.035	0.28		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
2-Butanone	ND	0.054	0.94		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Carbon disulfide	ND	0.031	0.94		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Carbon tetrachloride	ND	0.0062	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Chlorobenzene	ND	0.0077	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Chloroethane	ND	0.019	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Chloroform	ND	0.0071	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Chloromethane	ND	0.0084	0.28		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
2-Chlorotoluene	ND	0.0069	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
4-Chlorotoluene	ND	0.0083	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
cis-1,2-DCE	ND	0.0055	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
cis-1,3-Dichloropropene	ND	0.0087	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
1,2-Dibromo-3-chloropropane	ND	0.029	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Dibromochloromethane	ND	0.0085	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Dibromomethane	ND	0.0082	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
1,2-Dichlorobenzene	ND	0.0082	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
1,3-Dichlorobenzene	ND	0.0077	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
1,4-Dichlorobenzene	ND	0.012	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Dichlorodifluoromethane	ND	0.029	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	Л 27923
1,1-Dichloroethane	ND	0.0051	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	Л 27923
1,1-Dichloroethene	ND	0.031	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	Л 27923
1,2-Dichloropropane	ND	0.0079	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
1,3-Dichloropropane	ND	0.011	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
2,2-Dichloropropane	ND	0.0054	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
1,1-Dichloropropene	ND	0.0075	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Hexachlorobutadiene	ND	0.012	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
2-Hexanone	ND	0.051	0.94		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Isopropylbenzene	0.089	0.0081	0.094	J	mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
4-Isopropyltoluene	0.035	0.0085	0.094	J	mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
4-Methyl-2-pentanone	ND	0.027	0.94		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Methylene chloride	ND	0.027	0.28		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
n-Butylbenzene	0.21	0.0083	0.28	J	mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
n-Propylbenzene	0.60	0.0073	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
sec-Butylbenzene	0.076	0.013	0.094	J	mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
Styrene	ND	0.0084	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
tert-Butylbenzene	ND	0.0078	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923
1,1,1,2-Tetrachloroethane	ND	0.0090	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	И 27923

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Analytical Report Lab Order 1610238

Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-1(36-38')

Collection Date: 10/4/2016 4:05:00 PM

Project: OW-14 Source Inv Matrix: SOIL Lab ID: 1610238-006 **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,1,2,2-Tetrachloroethane	ND	0.015	0.094		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
Tetrachloroethene (PCE)	ND	0.0078	0.094		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
trans-1,2-DCE	ND	0.026	0.094		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
trans-1,3-Dichloropropene	ND	0.014	0.094		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
1,2,3-Trichlorobenzene	ND	0.014	0.19		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
1,2,4-Trichlorobenzene	ND	0.010	0.094		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
1,1,1-Trichloroethane	ND	0.0057	0.094		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
1,1,2-Trichloroethane	ND	0.011	0.094		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
Trichloroethene (TCE)	ND	0.010	0.094		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
Trichlorofluoromethane	ND	0.0070	0.094		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
1,2,3-Trichloropropane	ND	0.016	0.19		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
Vinyl chloride	ND	0.0077	0.094		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
Xylenes, Total	7.7	0.018	0.19		mg/Kg	2	10/10/2016 12:09:27 P	M 27923
Surr: Dibromofluoromethane	86.4		70-130		%Rec	2	10/10/2016 12:09:27 P	M 27923
Surr: 1,2-Dichloroethane-d4	88.1		70-130		%Rec	2	10/10/2016 12:09:27 P	M 27923
Surr: Toluene-d8	98.4		70-130		%Rec	2	10/10/2016 12:09:27 P	M 27923
Surr: 4-Bromofluorobenzene	103		70-130		%Rec	2	10/10/2016 12:09:27 P	M 27923

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

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RLReporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-1(40-42')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:15:00 PM

 Lab ID:
 1610238-007
 Matrix: SOIL
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	ORGANIC	S					Analyst: TOM	
Diesel Range Organics (DRO)	19	1.8	9.7		mg/Kg	1	10/11/2016 12:07:45 PM	1 27950
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	10/11/2016 12:07:45 PM	1 27950
Surr: DNOP	87.7	0	70-130		%Rec	1	10/11/2016 12:07:45 PM	1 27950
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB	
Gasoline Range Organics (GRO)	13	0.67	3.3		mg/Kg	1	10/7/2016 12:52:36 PM	27923
Surr: BFB	93.9	0	68.3-144		%Rec	1	10/7/2016 12:52:36 PM	27923
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	ND	0.00056	0.033		mg/Kg	1	10/12/2016 9:42:50 AM	27986
EPA METHOD 6010B: SOIL METALS	115	0.00000	0.000		9/119	•	Analyst: MED	27000
Antimony	ND	2.0	5.0		mg/Kg	2	10/12/2016 2:57:08 PM	27985
Arsenic	3.3	1.8	5.0	J	mg/Kg	2	10/12/2016 2:57:08 PM 10/12/2016 2:57:08 PM	27985
Barium	380	0.14	0.20	J	mg/Kg	2	10/12/2016 2:57:08 PM	27985
Beryllium	0.26	0.069	0.20	J	mg/Kg	2	10/12/2016 2:57:08 PM	27985
Cadmium	ND	0.003	0.30	3	mg/Kg	2	10/12/2016 2:57:08 PM	27985
Chromium	3.0	0.19	0.60		mg/Kg	2	10/12/2016 2:57:08 PM	27985
Cobalt	1.2	0.13	0.60		mg/Kg	2	10/12/2016 2:57:08 PM	27985
Iron	4400	15	50		mg/Kg	20	10/12/2016 6:32:15 PM	27985
Lead	1.1	0.35	0.50		mg/Kg	2	10/12/2016 2:57:08 PM	27985
Manganese	1500	1.1	2.0		mg/Kg	20	10/12/2016 6:32:15 PM	27985
Nickel	3.3	0.30	1.0		mg/Kg	2	10/12/2016 2:57:08 PM	27985
Selenium	ND	3.6	5.0		mg/Kg	2	10/12/2016 2:57:08 PM	27985
Silver	ND	0.13	0.50		mg/Kg	2	10/12/2016 2:57:08 PM	27985
Vanadium	9.4	0.35	5.0		mg/Kg	2	10/18/2016 9:50:57 AM	27985
Zinc	4.8	0.70	5.0	J	mg/Kg	2	10/18/2016 9:50:57 AM	27985
EPA METHOD 8270C: SEMIVOLATILES					0 0		Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Aniline	ND	0.094	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Anthracene	ND	0.066	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Benzoic acid	ND	0.082	0.50		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-1(40-42')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:15:00 PM

 Lab ID:
 1610238-007
 Matrix: SOIL
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Bis(2-ethylhexyl)phthalate	0.14	0.081	0.50	J	mg/Kg	1	10/15/2016 8:48:18 PM	28021
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Carbazole	ND	0.067	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/15/2016 8:48:18 PM	28021
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/15/2016 8:48:18 PM	28021
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	10/15/2016 8:48:18 PM	28021
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Chrysene	ND	0.085	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Di-n-butyl phthalate	0.27	0.074	0.40	J	mg/Kg	1	10/15/2016 8:48:18 PM	28021
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Diethyl phthalate	0.12	0.10	0.20	J	mg/Kg	1	10/15/2016 8:48:18 PM	28021
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	10/15/2016 8:48:18 PM	28021
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/15/2016 8:48:18 PM	28021
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	10/15/2016 8:48:18 PM	28021
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	10/15/2016 8:48:18 PM	28021
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	10/15/2016 8:48:18 PM	28021
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Fluoranthene	ND	0.057	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Fluorene	ND	0.091	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Isophorone	ND	0.11	0.40		mg/Kg	1	10/15/2016 8:48:18 PM	28021
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: TK569-1(40-42')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:15:00 PM

 Lab ID:
 1610238-007
 Matrix: SOIL
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	10/15/2016 8:48:18 PM	28021
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Naphthalene	ND	0.095	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/15/2016 8:48:18 PM	28021
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Phenanthrene	ND	0.068	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Phenol	ND	0.075	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Pyrene	ND	0.075	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Pyridine	ND	0.079	0.40		mg/Kg	1	10/15/2016 8:48:18 PM	28021
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	10/15/2016 8:48:18 PM	28021
Surr: 2-Fluorophenol	59.6	0	35-97.9		%Rec	1	10/15/2016 8:48:18 PM	28021
Surr: Phenol-d5	62.7	0	37.3-105		%Rec	1	10/15/2016 8:48:18 PM	28021
Surr: 2,4,6-Tribromophenol	62.2	0	35.6-118		%Rec	1	10/15/2016 8:48:18 PM	28021
Surr: Nitrobenzene-d5	58.6		41.2-107		%Rec	1	10/15/2016 8:48:18 PM	28021
Surr: 2-Fluorobiphenyl	58.2		41.9-119		%Rec	1	10/15/2016 8:48:18 PM	28021
Surr: 4-Terphenyl-d14	65.5		15-132		%Rec	1	10/15/2016 8:48:18 PM	28021
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.026	0.013	0.016		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Toluene	0.26	0.0019	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Ethylbenzene	0.086	0.0027	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Methyl tert-butyl ether (MTBE)	ND	0.010	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,2,4-Trimethylbenzene	0.22	0.0024	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,3,5-Trimethylbenzene	0.076	0.0024	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,2-Dichloroethane (EDC)	ND	0.0085	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,2-Dibromoethane (EDB)	ND	0.0023	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Naphthalene	ND	0.0051	0.065		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1-Methylnaphthalene	ND	0.0073	0.13		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
2-Methylnaphthalene	0.0092	0.0070	0.13	J	mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Acetone	ND	0.042	0.49		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Bromobenzene	ND	0.0026	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
D 0 1 000					1001			

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: TK569-1(40-42')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:15:00 PM

 Lab ID:
 1610238-007
 Matrix: SOIL
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Bromodichloromethane	ND	0.0019	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Bromoform	ND	0.0040	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Bromomethane	ND	0.012	0.098		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
2-Butanone	ND	0.019	0.33		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Carbon disulfide	ND	0.011	0.33		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Carbon tetrachloride	ND	0.0021	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Chlorobenzene	ND	0.0027	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Chloroethane	ND	0.0065	0.065		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Chloroform	ND	0.0025	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Chloromethane	ND	0.0029	0.098		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
2-Chlorotoluene	ND	0.0024	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
4-Chlorotoluene	ND	0.0029	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
cis-1,2-DCE	ND	0.0019	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
cis-1,3-Dichloropropene	ND	0.0030	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,2-Dibromo-3-chloropropane	ND	0.010	0.065		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Dibromochloromethane	ND	0.0029	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Dibromomethane	ND	0.0028	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,2-Dichlorobenzene	ND	0.0028	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,3-Dichlorobenzene	ND	0.0027	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,4-Dichlorobenzene	ND	0.0040	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Dichlorodifluoromethane	ND	0.010	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,1-Dichloroethane	ND	0.0018	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,1-Dichloroethene	ND	0.011	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,2-Dichloropropane	ND	0.0027	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,3-Dichloropropane	ND	0.0037	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
2,2-Dichloropropane	ND	0.0019	0.065		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,1-Dichloropropene	ND	0.0026	0.065		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Hexachlorobutadiene	ND	0.0040	0.065		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
2-Hexanone	ND	0.018	0.33		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Isopropylbenzene	0.0031	0.0028	0.033	J	mg/Kg	1	10/7/2016 6:38:14 PM	S37805
4-Isopropyltoluene	ND	0.0029	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
4-Methyl-2-pentanone	ND	0.0095	0.33		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Methylene chloride	ND	0.0094	0.098		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
n-Butylbenzene	0.013	0.0029	0.098	J	mg/Kg	1	10/7/2016 6:38:14 PM	S37805
n-Propylbenzene	0.037	0.0025	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
sec-Butylbenzene	0.0073	0.0045	0.033	J	mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Styrene	ND	0.0029	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
tert-Butylbenzene	ND	0.0027	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,1,1,2-Tetrachloroethane	ND	0.0031	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company Client Sample ID: TK569-1(40-42')

 Project:
 OW-14 Source Inv
 Collection Date: 10/4/2016 4:15:00 PM

 Lab ID:
 1610238-007
 Matrix: SOIL
 Received Date: 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,1,2,2-Tetrachloroethane	ND	0.0053	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Tetrachloroethene (PCE)	ND	0.0027	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
trans-1,2-DCE	ND	0.0091	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
trans-1,3-Dichloropropene	ND	0.0048	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,2,3-Trichlorobenzene	ND	0.0049	0.065		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,2,4-Trichlorobenzene	ND	0.0035	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,1,1-Trichloroethane	ND	0.0020	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,1,2-Trichloroethane	ND	0.0038	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Trichloroethene (TCE)	ND	0.0035	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Trichlorofluoromethane	ND	0.0024	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
1,2,3-Trichloropropane	ND	0.0056	0.065		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Vinyl chloride	ND	0.0027	0.033		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Xylenes, Total	0.51	0.0062	0.065		mg/Kg	1	10/7/2016 6:38:14 PM	S37805
Surr: Dibromofluoromethane	88.1		70-130		%Rec	1	10/7/2016 6:38:14 PM	S37805
Surr: 1,2-Dichloroethane-d4	84.5		70-130		%Rec	1	10/7/2016 6:38:14 PM	S37805
Surr: Toluene-d8	97.8		70-130		%Rec	1	10/7/2016 6:38:14 PM	S37805
Surr: 4-Bromofluorobenzene	97.7		70-130		%Rec	1	10/7/2016 6:38:14 PM	S37805

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company

Client Sample ID: DUP02

Project: OW-14 Source Inv

Collection Date: 10/4/2016

Lab ID: 1610238-008 **Matrix:** MEOH (SOIL) **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE	E ORGANIC:	s					Analyst: TOM	
Diesel Range Organics (DRO)	11	1.8	9.6		mg/Kg	1	10/11/2016 12:30:50 PM	1 27950
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	10/11/2016 12:30:50 PM	1 27950
Surr: DNOP	84.8	0	70-130		%Rec	1	10/11/2016 12:30:50 PM	1 27950
EPA METHOD 8015D: GASOLINE RANG	Ε						Analyst: NSB	
Gasoline Range Organics (GRO)	24	0.72	3.5		mg/Kg	1	10/7/2016 1:39:27 PM	27923
Surr: BFB	131	0	68.3-144		%Rec	1	10/7/2016 1:39:27 PM	27923
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	ND	0.00057	0.034		mg/Kg	1	10/12/2016 9:44:39 AM	27986
EPA METHOD 6010B: SOIL METALS							Analyst: MED	
Antimony	ND	1.0	2.5		mg/Kg	1	10/12/2016 2:59:13 PM	27985
Arsenic	1.3	0.90	2.5	J	mg/Kg	1	10/12/2016 2:59:13 PM	27985
Barium	160	0.072	0.10		mg/Kg	1	10/12/2016 2:59:13 PM	27985
Beryllium	0.78	0.035	0.15		mg/Kg	1	10/12/2016 2:59:13 PM	27985
Cadmium	ND	0.064	0.10		mg/Kg	1	10/12/2016 2:59:13 PM	27985
Chromium	7.9	0.095	0.30		mg/Kg	1	10/12/2016 2:59:13 PM	27985
Cobalt	3.6	0.11	0.30		mg/Kg	1	10/12/2016 2:59:13 PM	27985
Iron	16000	76	250		mg/Kg	100	10/27/2016 11:30:00 AM	1 27985
Lead	2.8	0.18	0.25		mg/Kg	1	10/12/2016 2:59:13 PM	27985
Manganese	200	0.054	0.10		mg/Kg	1	10/12/2016 2:59:13 PM	27985
Nickel	7.3	0.15	0.50		mg/Kg	1	10/12/2016 2:59:13 PM	27985
Selenium	ND	1.8	2.5		mg/Kg	1	10/12/2016 2:59:13 PM	27985
Silver	ND	0.063	0.25		mg/Kg	1	10/12/2016 2:59:13 PM	27985
Vanadium	14	0.18	2.5		mg/Kg	1	10/12/2016 2:59:13 PM	27985
Zinc	12	0.35	2.5		mg/Kg	1	10/12/2016 2:59:13 PM	27985
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Acenaphthylene	ND	0.081	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Aniline	ND	0.094	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Anthracene	ND	0.066	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Benzoic acid	ND	0.083	0.50		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: DUP02

Project: OW-14 Source Inv Collection Date: 10/4/2016

Lab ID: 1610238-008 **Matrix:** MEOH (SOIL) **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Bis(2-ethylhexyl)phthalate	0.088	0.081	0.50	J	mg/Kg	1	10/15/2016 9:16:51 PM	28021
4-Bromophenyl phenyl ether	ND	0.095	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Butyl benzyl phthalate	ND	0.088	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Carbazole	ND	0.067	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
4-Chloro-3-methylphenol	ND	0.12	0.50		mg/Kg	1	10/15/2016 9:16:51 PM	28021
4-Chloroaniline	ND	0.11	0.50		mg/Kg	1	10/15/2016 9:16:51 PM	28021
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	10/15/2016 9:16:51 PM	28021
2-Chlorophenol	ND	0.079	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Chrysene	ND	0.085	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Di-n-butyl phthalate	ND	0.075	0.40		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Di-n-octyl phthalate	ND	0.085	0.40		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Dibenz(a,h)anthracene	ND	0.081	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Dibenzofuran	ND	0.10	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
1,3-Dichlorobenzene	ND	0.077	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
1,4-Dichlorobenzene	ND	0.084	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Diethyl phthalate	ND	0.10	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
2,4-Dichlorophenol	ND	0.093	0.40		mg/Kg	1	10/15/2016 9:16:51 PM	28021
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/15/2016 9:16:51 PM	28021
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	10/15/2016 9:16:51 PM	28021
2,4-Dinitrophenol	ND	0.066	0.50		mg/Kg	1	10/15/2016 9:16:51 PM	28021
2,4-Dinitrotoluene	ND	0.089	0.50		mg/Kg	1	10/15/2016 9:16:51 PM	28021
2,6-Dinitrotoluene	ND	0.11	0.50		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Fluoranthene	ND	0.057	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Fluorene	ND	0.091	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Hexachlorobenzene	ND	0.079	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Hexachloroethane	ND	0.086	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Indeno(1,2,3-cd)pyrene	ND	0.078	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Isophorone	ND	0.11	0.40		mg/Kg	1	10/15/2016 9:16:51 PM	28021
1-Methylnaphthalene	ND	0.10	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company

Client Sample ID: DUP02

Project: OW-14 Source Inv

Collection Date: 10/4/2016

Lab ID: 1610238-008 **Matrix:** MEOH (SOIL) **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	10/15/2016 9:16:51 PM	28021
3+4-Methylphenol	ND	0.072	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
N-Nitrosodi-n-propylamine	ND	0.096	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
N-Nitrosodiphenylamine	ND	0.097	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Naphthalene	ND	0.096	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
3-Nitroaniline	ND	0.088	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/15/2016 9:16:51 PM	28021
2-Nitrophenol	ND	0.099	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
4-Nitrophenol	ND	0.076	0.25		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Pentachlorophenol	ND	0.064	0.40		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Phenanthrene	ND	0.068	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Phenol	ND	0.075	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Pyrene	ND	0.075	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Pyridine	ND	0.079	0.40		mg/Kg	1	10/15/2016 9:16:51 PM	28021
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
2,4,5-Trichlorophenol	ND	0.10	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
2,4,6-Trichlorophenol	ND	0.083	0.20		mg/Kg	1	10/15/2016 9:16:51 PM	28021
Surr: 2-Fluorophenol	50.9	0	35-97.9		%Rec	1	10/15/2016 9:16:51 PM	28021
Surr: Phenol-d5	49.0	0	37.3-105		%Rec	1	10/15/2016 9:16:51 PM	28021
Surr: 2,4,6-Tribromophenol	46.8	0	35.6-118		%Rec	1	10/15/2016 9:16:51 PM	28021
Surr: Nitrobenzene-d5	50.2		41.2-107		%Rec	1	10/15/2016 9:16:51 PM	28021
Surr: 2-Fluorobiphenyl	49.2		41.9-119		%Rec	1	10/15/2016 9:16:51 PM	28021
Surr: 4-Terphenyl-d14	52.6		15-132		%Rec	1	10/15/2016 9:16:51 PM	28021
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	0.048	0.014	0.018		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Toluene	0.38	0.0021	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Ethylbenzene	0.23	0.0029	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Methyl tert-butyl ether (MTBE)	ND	0.011	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,2,4-Trimethylbenzene	1.4	0.0026	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,3,5-Trimethylbenzene	0.44	0.0025	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,2-Dichloroethane (EDC)	ND	0.0092	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,2-Dibromoethane (EDB)	ND	0.0025	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Naphthalene	0.39	0.0055	0.070		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1-Methylnaphthalene	0.23	0.0078	0.14		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
2-Methylnaphthalene	0.44	0.0075	0.14		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Acetone	ND	0.045	0.53		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Bromobenzene	ND	0.0028	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company

Client Sample ID: DUP02

Project: OW-14 Source Inv

Collection Date: 10/4/2016

Lab ID: 1610238-008 **Matrix:** MEOH (SOIL) **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Bromodichloromethane	ND	0.0020	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Bromoform	ND	0.0043	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Bromomethane	ND	0.013	0.11		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
2-Butanone	ND	0.020	0.35		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Carbon disulfide	ND	0.012	0.35		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Carbon tetrachloride	ND	0.0023	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Chlorobenzene	ND	0.0029	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Chloroethane	ND	0.0070	0.070		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Chloroform	ND	0.0027	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Chloromethane	ND	0.0031	0.11		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
2-Chlorotoluene	ND	0.0026	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
4-Chlorotoluene	ND	0.0031	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
cis-1,2-DCE	ND	0.0020	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
cis-1,3-Dichloropropene	ND	0.0032	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,2-Dibromo-3-chloropropane	ND	0.011	0.070		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Dibromochloromethane	ND	0.0032	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Dibromomethane	ND	0.0030	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,2-Dichlorobenzene	ND	0.0031	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,3-Dichlorobenzene	ND	0.0029	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,4-Dichlorobenzene	ND	0.0044	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Dichlorodifluoromethane	ND	0.011	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,1-Dichloroethane	ND	0.0019	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,1-Dichloroethene	ND	0.012	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,2-Dichloropropane	ND	0.0029	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,3-Dichloropropane	ND	0.0040	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
2,2-Dichloropropane	ND	0.0020	0.070		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,1-Dichloropropene	ND	0.0028	0.070		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Hexachlorobutadiene	ND	0.0043	0.070		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
2-Hexanone	ND	0.019	0.35		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Isopropylbenzene	0.044	0.0030	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
4-Isopropyltoluene	0.020	0.0032	0.035	J	mg/Kg	1	10/7/2016 7:06:40 PM	S37805
4-Methyl-2-pentanone	ND	0.010	0.35		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Methylene chloride	ND	0.010	0.11		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
n-Butylbenzene	0.17	0.0031	0.11		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
n-Propylbenzene	0.21	0.0027	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
sec-Butylbenzene	0.043	0.0049	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Styrene	ND	0.0031	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
tert-Butylbenzene	ND	0.0029	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,1,1,2-Tetrachloroethane	ND	0.0034	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company

Client Sample ID: DUP02

Project: OW-14 Source Inv

Collection Date: 10/4/2016

Lab ID: 1610238-008 **Matrix:** MEOH (SOIL) **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,1,2,2-Tetrachloroethane	ND	0.0057	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Tetrachloroethene (PCE)	ND	0.0029	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
trans-1,2-DCE	ND	0.0098	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
trans-1,3-Dichloropropene	ND	0.0051	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,2,3-Trichlorobenzene	ND	0.0053	0.070		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,2,4-Trichlorobenzene	ND	0.0038	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,1,1-Trichloroethane	ND	0.0021	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,1,2-Trichloroethane	ND	0.0041	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Trichloroethene (TCE)	ND	0.0038	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Trichlorofluoromethane	ND	0.0026	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
1,2,3-Trichloropropane	ND	0.0061	0.070		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Vinyl chloride	ND	0.0029	0.035		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Xylenes, Total	1.4	0.0067	0.070		mg/Kg	1	10/7/2016 7:06:40 PM	S37805
Surr: Dibromofluoromethane	87.7		70-130		%Rec	1	10/7/2016 7:06:40 PM	S37805
Surr: 1,2-Dichloroethane-d4	87.7		70-130		%Rec	1	10/7/2016 7:06:40 PM	S37805
Surr: Toluene-d8	98.7		70-130		%Rec	1	10/7/2016 7:06:40 PM	S37805
Surr: 4-Bromofluorobenzene	100		70-130		%Rec	1	10/7/2016 7:06:40 PM	S37805

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

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: DUP03 **Project:** OW-14 Source Inv Collection Date: 10/4/2016

1610238-009 Lab ID: Matrix: MEOH (SOIL) **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANG	E ORGANIC	S					Analyst: TOM	
Diesel Range Organics (DRO)	3.7	1.9	10	J	mg/Kg	1	10/11/2016 12:53:48 PN	1 27950
Motor Oil Range Organics (MRO)	ND	51	51		mg/Kg	1	10/11/2016 12:53:48 PN	1 27950
Surr: DNOP	86.8	0	70-130		%Rec	1	10/11/2016 12:53:48 PM	1 27950
EPA METHOD 8015D: GASOLINE RANG	GE						Analyst: NSB	
Gasoline Range Organics (GRO)	1.0	0.73	3.5	J	mg/Kg	1	10/6/2016 8:18:08 PM	27905
Surr: BFB	88.7	0	68.3-144		%Rec	1	10/6/2016 8:18:08 PM	27905
EPA METHOD 7471: MERCURY							Analyst: pmf	
Mercury	ND	0.00055	0.032		mg/Kg	1	10/12/2016 9:46:29 AM	27986
EPA METHOD 6010B: SOIL METALS							Analyst: MED	
Antimony	ND	1.0	2.5		mg/Kg	1	10/12/2016 3:03:02 PM	27985
Arsenic	2.5	0.89	2.5	J	mg/Kg	1	10/12/2016 3:03:02 PM	27985
Barium	160	0.071	0.10		mg/Kg	1	10/12/2016 3:03:02 PM	27985
Beryllium	0.63	0.035	0.15		mg/Kg	1	10/12/2016 3:03:02 PM	27985
Cadmium	ND	0.063	0.10		mg/Kg	1	10/12/2016 3:03:02 PM	27985
Chromium	7.2	0.095	0.30		mg/Kg	1	10/12/2016 3:03:02 PM	27985
Cobalt	2.3	0.11	0.30		mg/Kg	1	10/12/2016 3:03:02 PM	27985
Iron	11000	38	130		mg/Kg	50	10/12/2016 6:35:32 PM	27985
Lead	1.0	0.17	0.25		mg/Kg	1	10/12/2016 3:03:02 PM	27985
Manganese	490	0.11	0.20		mg/Kg	2	10/12/2016 3:10:23 PM	27985
Nickel	6.9	0.15	0.50		mg/Kg	1	10/12/2016 3:03:02 PM	27985
Selenium	ND	1.8	2.5		mg/Kg	1	10/12/2016 3:03:02 PM	27985
Silver	ND	0.063	0.25		mg/Kg	1	10/12/2016 3:03:02 PM	27985
Vanadium	3.7	0.18	2.5		mg/Kg	1	10/12/2016 3:03:02 PM	27985
Zinc	8.2	0.35	2.5		mg/Kg	1	10/12/2016 3:03:02 PM	27985
EPA METHOD 8270C: SEMIVOLATILES	;						Analyst: DAM	
Acenaphthene	ND	0.085	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Acenaphthylene	ND	0.080	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Aniline	ND	0.093	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Anthracene	ND	0.066	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Benz(a)anthracene	ND	0.085	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Benzo(b)fluoranthene	ND	0.089	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Benzo(g,h,i)perylene	ND	0.087	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Benzo(k)fluoranthene	ND	0.087	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Benzoic acid	ND	0.082	0.49		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Benzyl alcohol	ND	0.077	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021

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

Qualifiers: Value exceeds Maximum Contaminant Level.

> D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RPD outside accepted recovery limits

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

Ε Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company

Client Sample ID: DUP03

Project: OW-14 Source Inv

Collection Date: 10/4/2016

Lab ID: 1610238-009 **Matrix:** MEOH (SOIL) **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Bis(2-chloroisopropyl)ether	ND	0.088	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Bis(2-ethylhexyl)phthalate	0.11	0.080	0.49	J	mg/Kg	1	10/15/2016 9:45:13 PM	28021
4-Bromophenyl phenyl ether	ND	0.094	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Butyl benzyl phthalate	ND	0.087	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Carbazole	ND	0.067	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
4-Chloro-3-methylphenol	ND	0.12	0.49		mg/Kg	1	10/15/2016 9:45:13 PM	28021
4-Chloroaniline	ND	0.11	0.49		mg/Kg	1	10/15/2016 9:45:13 PM	28021
2-Chloronaphthalene	ND	0.078	0.25		mg/Kg	1	10/15/2016 9:45:13 PM	28021
2-Chlorophenol	ND	0.078	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
4-Chlorophenyl phenyl ether	ND	0.11	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Chrysene	ND	0.084	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Di-n-butyl phthalate	0.11	0.074	0.40	J	mg/Kg	1	10/15/2016 9:45:13 PM	28021
Di-n-octyl phthalate	ND	0.084	0.40		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Dibenz(a,h)anthracene	ND	0.080	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Dibenzofuran	ND	0.099	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
1,2-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
1,3-Dichlorobenzene	ND	0.076	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
1,4-Dichlorobenzene	ND	0.083	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
3,3'-Dichlorobenzidine	ND	0.073	0.25		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Diethyl phthalate	ND	0.10	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Dimethyl phthalate	ND	0.097	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
2,4-Dichlorophenol	ND	0.092	0.40		mg/Kg	1	10/15/2016 9:45:13 PM	28021
2,4-Dimethylphenol	ND	0.11	0.30		mg/Kg	1	10/15/2016 9:45:13 PM	28021
4,6-Dinitro-2-methylphenol	ND	0.060	0.40		mg/Kg	1	10/15/2016 9:45:13 PM	28021
2,4-Dinitrophenol	ND	0.065	0.49		mg/Kg	1	10/15/2016 9:45:13 PM	28021
2,4-Dinitrotoluene	ND	0.088	0.49		mg/Kg	1	10/15/2016 9:45:13 PM	28021
2,6-Dinitrotoluene	ND	0.10	0.49		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Fluoranthene	ND	0.057	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Fluorene	ND	0.090	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Hexachlorobenzene	ND	0.078	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Hexachlorobutadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Hexachlorocyclopentadiene	ND	0.11	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Hexachloroethane	ND	0.085	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Indeno(1,2,3-cd)pyrene	ND	0.077	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Isophorone	ND	0.11	0.40		mg/Kg	1	10/15/2016 9:45:13 PM	28021
1-Methylnaphthalene	ND	0.099	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
2-Methylnaphthalene	ND	0.12	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company

Client Sample ID: DUP03

Project: OW-14 Source Inv

Collection Date: 10/4/2016

Lab ID: 1610238-009 **Matrix:** MEOH (SOIL) **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
2-Methylphenol	ND	0.083	0.40		mg/Kg	1	10/15/2016 9:45:13 PM	28021
3+4-Methylphenol	ND	0.071	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
N-Nitrosodi-n-propylamine	ND	0.095	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
N-Nitrosodiphenylamine	ND	0.096	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Naphthalene	ND	0.095	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
2-Nitroaniline	ND	0.11	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
3-Nitroaniline	ND	0.087	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
4-Nitroaniline	ND	0.070	0.40		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Nitrobenzene	ND	0.10	0.40		mg/Kg	1	10/15/2016 9:45:13 PM	28021
2-Nitrophenol	ND	0.098	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
4-Nitrophenol	ND	0.075	0.25		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Pentachlorophenol	ND	0.063	0.40		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Phenanthrene	ND	0.067	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Phenol	ND	0.074	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Pyrene	ND	0.075	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Pyridine	ND	0.078	0.40		mg/Kg	1	10/15/2016 9:45:13 PM	28021
1,2,4-Trichlorobenzene	ND	0.11	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
2,4,5-Trichlorophenol	ND	0.099	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
2,4,6-Trichlorophenol	ND	0.082	0.20		mg/Kg	1	10/15/2016 9:45:13 PM	28021
Surr: 2-Fluorophenol	80.3	0	35-97.9		%Rec	1	10/15/2016 9:45:13 PM	28021
Surr: Phenol-d5	82.2	0	37.3-105		%Rec	1	10/15/2016 9:45:13 PM	28021
Surr: 2,4,6-Tribromophenol	80.6	0	35.6-118		%Rec	1	10/15/2016 9:45:13 PM	28021
Surr: Nitrobenzene-d5	74.8		41.2-107		%Rec	1	10/15/2016 9:45:13 PM	28021
Surr: 2-Fluorobiphenyl	79.7		41.9-119		%Rec	1	10/15/2016 9:45:13 PM	28021
Surr: 4-Terphenyl-d14	91.8		15-132		%Rec	1	10/15/2016 9:45:13 PM	28021
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
Benzene	5.50	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Toluene	5.91	0.213	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Ethylbenzene	1.89	0.237	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	
Methyl tert-butyl ether (MTBE)	0.688	0.296	1.76	J	μg/Kg	1	10/16/2016 6:25:00 PM	
1,2,4-Trimethylbenzene	2.45	0.299	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,3,5-Trimethylbenzene	1.42	0.291	1.76	J	μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,2-Dichloroethane (EDC)	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,2-Dibromoethane (EDB)	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Naphthalene	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1-Methylnaphthalene	0.326	0.201	3.53	J	μg/Kg	1	10/16/2016 6:25:00 PM	
2-Methylnaphthalene	ND	0.464	3.53		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Acetone	2.53	0.522	8.82	J	μg/Kg	1	10/16/2016 6:25:00 PM	28053
Bromobenzene	ND	0.179	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: DUP03

Project: OW-14 Source Inv Collection Date: 10/4/2016

Lab ID: 1610238-009 **Matrix:** MEOH (SOIL) **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
Bromodichloromethane	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Bromoform	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Bromomethane	ND	0.318	2.65		μg/Kg	1	10/16/2016 6:25:00 PM	28053
2-Butanone	0.970	0.636	8.82	J	μg/Kg	1	10/16/2016 6:25:00 PM	28053
Carbon disulfide	ND	0.652	8.82		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Carbon tetrachloride	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Chlorobenzene	ND	0.202	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Chloroethane	ND	0.326	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Chloroform	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Chloromethane	ND	0.447	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
2-Chlorotoluene	ND	0.300	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
4-Chlorotoluene	ND	0.293	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
cis-1,2-DCE	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
cis-1,3-Dichloropropene	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,2-Dibromo-3-chloropropane	ND	0.188	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Dibromochloromethane	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Dibromomethane	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,2-Dichlorobenzene	ND	0.257	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,3-Dichlorobenzene	ND	0.326	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,4-Dichlorobenzene	ND	0.330	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Dichlorodifluoromethane	ND	1.03	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,1-Dichloroethane	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,1-Dichloroethene	ND	0.289	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,2-Dichloropropane	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,3-Dichloropropane	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
2,2-Dichloropropane	ND	0.223	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,1-Dichloropropene	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Hexachlorobutadiene	ND	0.402	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
2-Hexanone	ND	0.439	8.82		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Isopropylbenzene	0.415	0.222	1.76	J	μg/Kg	1	10/16/2016 6:25:00 PM	28053
4-Isopropyltoluene	ND	0.331	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
4-Methyl-2-pentanone	ND	3.53	8.82		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Methylene chloride	ND	1.76	2.65		μg/Kg	1	10/16/2016 6:25:00 PM	28053
n-Butylbenzene	ND	0.430	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
n-Propylbenzene	0.582	0.316	1.76	J	μg/Kg	1	10/16/2016 6:25:00 PM	28053
sec-Butylbenzene	ND	0.313	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Styrene	ND	0.225	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
tert-Butylbenzene	ND	0.258	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,1,1,2-Tetrachloroethane	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

OW-14 Source Inv

Project:

Client Sample ID: DUP03

Collection Date: 10/4/2016

Lab ID: 1610238-009 **Matrix:** MEOH (SOIL) **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
METHOD 8260B/5035LOW: VOLATILES							Analyst: BCN	
1,1,2,2-Tetrachloroethane	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Tetrachloroethene (PCE)	ND	0.232	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
trans-1,2-DCE	ND	0.178	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
trans-1,3-Dichloropropene	ND	0.214	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,2,3-Trichlorobenzene	ND	0.427	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,2,4-Trichlorobenzene	ND	0.535	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,1,1-Trichloroethane	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,1,2-Trichloroethane	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Trichloroethene (TCE)	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Trichlorofluoromethane	ND	0.222	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
1,2,3-Trichloropropane	ND	1.76	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Vinyl chloride	ND	0.464	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Xylenes, Total	7.66	0.703	1.76		μg/Kg	1	10/16/2016 6:25:00 PM	28053
Surr: 1,2-Dichloroethane-d4	118	0	70-130		%Rec	1	10/16/2016 6:25:00 PM	28053
Surr: 4-Bromofluorobenzene	99.7	0	70-130		%Rec	1	10/16/2016 6:25:00 PM	28053
Surr: Dibromofluoromethane	109	0	70-130		%Rec	1	10/16/2016 6:25:00 PM	28053
Surr: Toluene-d8	99.8	0	70-130		%Rec	1	10/16/2016 6:25:00 PM	28053

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

Qualifiers:

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

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Date Reported: 11/1/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company

Client Sample ID: MeOH Blank

Project: OW-14 Source Inv Collection Date:

Lab ID: 1610238-010 **Matrix:** MEOH BLAN **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
Benzene	ND	0.020	0.025		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Toluene	ND	0.0030	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Ethylbenzene	ND	0.0041	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Methyl tert-butyl ether (MTBE)	ND	0.016	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,2,4-Trimethylbenzene	ND	0.0037	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,3,5-Trimethylbenzene	ND	0.0036	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,2-Dichloroethane (EDC)	ND	0.013	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,2-Dibromoethane (EDB)	ND	0.0036	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Naphthalene	ND	0.0078	0.10		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
2-Methylnaphthalene	ND	0.011	0.20		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Acetone	ND	0.065	0.75		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Bromobenzene	ND	0.0040	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Bromodichloromethane	ND	0.0029	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Bromoform	ND	0.0061	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Bromomethane	ND	0.018	0.15		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
2-Butanone	0.062	0.029	0.50	J	mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Carbon disulfide	ND	0.017	0.50		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Carbon tetrachloride	ND	0.0033	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Chlorobenzene	ND	0.0041	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Chloroethane	ND	0.010	0.10		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Chloroform	ND	0.0038	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Chloromethane	ND	0.0044	0.15		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
2-Chlorotoluene	ND	0.0037	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
4-Chlorotoluene	ND	0.0044	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
cis-1,2-DCE	ND	0.0029	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
cis-1,3-Dichloropropene	ND	0.0046	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,2-Dibromo-3-chloropropane	ND	0.015	0.10		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Dibromochloromethane	ND	0.0045	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Dibromomethane	ND	0.0043	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,2-Dichlorobenzene	ND	0.0044	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,3-Dichlorobenzene	ND	0.0041	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,4-Dichlorobenzene	ND	0.0062	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Dichlorodifluoromethane	ND	0.015	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,1-Dichloroethane	ND	0.0027	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,1-Dichloroethene	ND	0.016	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,2-Dichloropropane	ND	0.0042	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,3-Dichloropropane	ND	0.0057	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
2,2-Dichloropropane	ND	0.0029	0.10		mg/Kg	1	10/7/2016 6:09:43 PM	S37805

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2016

CLIENT: Western Refining Company Client Sample ID: MeOH Blank

Project: OW-14 Source Inv Collection Date:

Lab ID: 1610238-010 **Matrix:** MEOH BLAN **Received Date:** 10/5/2016 3:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: DJF	
1,1-Dichloropropene	ND	0.0040	0.10		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Hexachlorobutadiene	ND	0.0061	0.10		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
2-Hexanone	ND	0.027	0.50		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Isopropylbenzene	ND	0.0043	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
4-Isopropyltoluene	ND	0.0045	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
4-Methyl-2-pentanone	ND	0.015	0.50		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Methylene chloride	ND	0.014	0.15		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
n-Butylbenzene	ND	0.0044	0.15		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
n-Propylbenzene	ND	0.0038	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
sec-Butylbenzene	ND	0.0069	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Styrene	ND	0.0045	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
tert-Butylbenzene	ND	0.0041	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,1,1,2-Tetrachloroethane	ND	0.0048	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,1,2,2-Tetrachloroethane	ND	0.0081	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Tetrachloroethene (PCE)	ND	0.0041	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
trans-1,2-DCE	ND	0.014	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
trans-1,3-Dichloropropene	ND	0.0073	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,2,3-Trichlorobenzene	ND	0.0075	0.10		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,2,4-Trichlorobenzene	ND	0.0053	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,1,1-Trichloroethane	ND	0.0031	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,1,2-Trichloroethane	ND	0.0059	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Trichloroethene (TCE)	ND	0.0054	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Trichlorofluoromethane	ND	0.0037	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
1,2,3-Trichloropropane	ND	0.0086	0.10		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Vinyl chloride	ND	0.0041	0.050		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Xylenes, Total	ND	0.0095	0.10		mg/Kg	1	10/7/2016 6:09:43 PM	S37805
Surr: Dibromofluoromethane	98.5		70-130		%Rec	1	10/7/2016 6:09:43 PM	S37805
Surr: 1,2-Dichloroethane-d4	93.2		70-130		%Rec	1	10/7/2016 6:09:43 PM	S37805
Surr: Toluene-d8	94.9		70-130		%Rec	1	10/7/2016 6:09:43 PM	S37805
Surr: 4-Bromofluorobenzene	96.1		70-130		%Rec	1	10/7/2016 6:09:43 PM	S37805

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

Qualifiers:

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

Page 47 of 67

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Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Address:

4901 HAWKINS NE SUITE D

ALBUQUERQUE, NM 87109

1610238-001C / TK569-2(16-18)

Attn:

ANDY FREEMAN

Batch #:

161010015

Project Name:

1610238

Analytical Results Report

Sample Number Client Sample ID 161010015-001

Sampling Date Sampling Time

10/4/2016 11:20 AM Date/Time Received 10/7/2016 11:45 AM

Matrix

Soil

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.271	10/18/2016	MER	EPA 335.4	
%moisture	12.7	Percent		10/18/2016	MER	%moisture	

Sample Number Client Sample ID 161010015-002

1610238-002C / TK569-2(29-31)

Sampling Date 10/4/2016 Date/Time Received 10/7/2016 11:45 AM

Matrix

Soil

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.237	10/18/2016	MER	EPA 335.4	
%moisture	18.1	Percent		10/18/2016	MER	%moisture	

11:45 AM

Sample Number

161010015-003

Sampling Date

10/4/2016

Date/Time Received 10/7/2016 11:45 AM

Client Sample ID Matrix

1610238-003C / TK569-2(36-38)

Sampling Time

Sampling Time

12:15 PM

Soil

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide %moisture	ND 13.3	mg/Kg Percent	0.269	10/18/2016 10/18/2016	MER MER	EPA 335.4 %moisture	

Sample Number Client Sample ID 161010015-004

Sampling Date 10/4/2016

Date/Time Received 10/7/2016 11:45 AM

Matrix

1610238-004C / TK569-1(18-20) Soil

Sampling Time

3:50 PM

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	0.241	mg/Kg	0.219	10/18/2016	MER	EPA 335.4	
%moisture	17.0	Percent		10/18/2016	MER	%moisture	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Address:

4901 HAWKINS NE SUITE D

ALBUQUERQUE, NM 87109

1610238-005C / TK569-1(24-26)

Attn:

ANDY FREEMAN

Batch #:

161010015

Project Name:

1610238

Analytical Results Report

Sample Number Client Sample ID 161010015-005

Sampling Date 10/4/2016 Sampling Time

Date/Time Received 10/7/2016 11:45 AM

Matrix

Soil

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide %moisture	ND 15.6	mg/Kg Percent	0.281	10/18/2016 10/18/2016	MER '	EPA 335.4 %moisture	

4:00 PM

Sample Number

161010015-006

1610238-006B / TK569-1(36-38)

Sampling Date 10/4/2016 Sampling Time 4:05 PM

Date/Time Received 10/7/2016 11:45 AM

Client Sample ID Matrix

Soil

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.28	10/18/2016	MER	EPA 335.4	
%moisture	11.6	Percent		10/18/2016	MER	%moisture	

Sample Number

161010015-007

Sampling Date 10/4/2016 Date/Time Received 10/7/2016 11:45 AM

Client Sample ID Matrix

1610238-007B / TK569-1(40-42)

Sampling Time 4:15 PM

Soil

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide %moisture	ND 10.9	mg/Kg Percent	0.156	10/18/2016 10/18/2016	MER MER	EPA 335.4 %moisture	

Sample Number

161010015-008

Sampling Date 10/4/2016 Date/Time Received 10/7/2016 11:45 AM

Client Sample ID Matrix

1610238-008C / DUP02 Soil

Sampling Time

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.228	10/18/2016	MER	EPA 335.4	
%moisture	12.3	Percent		10/18/2016	MER	%moisture	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Batch #:

161010015

Address:

4901 HAWKINS NE SUITE D

Project Name:

1610238

,

4901 HAWKINS NE SUITE D

ALBUQUERQUE, NM 87109

Attn:

ANDY FREEMAN

Analytical Results Report

Sample Number

161010015-009

1610238-009C / DUP03

Sampling Date 10/4/2016

Sampling Time

Date/Time Received 10/7/2016 11:45 AM

Client Sample ID Matrix

Soil

S

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.246	10/18/2016	MER	EPA 335.4	
%moisture	13.2	Percent		10/18/2016	MER	%moisture	

Authorized Signature

Todd Taruscio, Lab Manager

MCL

EPA's Maximum Contaminant Level

ND No

Not Detected

PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.

The results reported relate only to the samples indicated.

Soil/solid results are reported on a dry-weight basis unless otherwise noted.

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Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Batch #:

161010015

Address:

4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109 Project Name:

1610238

Attn:

ANDY FREEMAN

Analytical Results Report

Quality Control Data

Lab Control Sample										
Parameter Cyanide	LCS Resul 0.496	t Units mg/kg		Spike '	%Rec 99.2		%Rec -110		Date /2016	Analysis Date 10/19/2016
Matrix Spike										
Sample Number Parameter 161010015-001 Cyanide		Sample Result ND	MS Result 12.5	Units mg/kg		MS Spike 13.6	%Rec 91.9	AR %Rec 70-130	Prep Date 10/19/2016	-
Matrix Spike Duplicate		<u>.</u> .								
Parameter	MSD Result	Units	MSD Spike	%Re	ac	%RPD	AR %RPD	Dro	p Date	Analysis Date
Cyanide	12.9	mg/kg	13.6	94.9		3.1	0-25		9/2016	10/19/2016
Method Blank				-						
Parameter		Re	sult	Uni	its		PQL	Pr	ep Date	Analysis Date
Cyanide		N	D	mg/	Kg		√5	10/	19/2016	10/19/2016

AR ND Acceptable Range

PQL

Not Detected

RPD

Practical Quantitation Limit Relative Percentage Difference

Comments:

Hall Environmental Analysis Laboratory, Inc.

WO#: 1610238

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID LCS-27950 SampType: LCS TestCode: EPA Method 8015M/D: Diesel Range Organics Client ID: LCSS Batch ID: 27950 RunNo: 37845 SeqNo: 1178986 Prep Date: 10/7/2016 Analysis Date: 10/11/2016 Units: mg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Diesel Range Organics (DRO) 10 49 50.00 0 99.0 62.6 124 Surr: DNOP 5.000 96.1 4.8 130

Sample ID MB-27950 SampType: MBLK TestCode: EPA Method 8015M/D: Diesel Range Organics Batch ID: 27950 Client ID: PBS RunNo: 37845 Prep Date: 10/7/2016 Analysis Date: 10/11/2016 SeqNo: 1178987 Units: mg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Diesel Range Organics (DRO) 2.8 10 Motor Oil Range Organics (MRO) ND 50 Surr: DNOP 9.9 10.00 98.7 70 130

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Holding times for preparation or analysis exceeded Η
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1610238

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID MB-27905 SampType: MBLK TestCode: EPA Method 8015D: Gasoline Range Client ID: **PBS** Batch ID: 27905 RunNo: 37740

Prep Date: 10/5/2016 Analysis Date: 10/6/2016 SeqNo: 1176240 Units: mg/Kg

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

Gasoline Range Organics (GRO) ND 5.0

Surr: BFB 860 1000 86.3 68.3 144

Sample ID LCS-27905 SampType: LCS TestCode: EPA Method 8015D: Gasoline Range

Client ID: LCSS Batch ID: 27905 RunNo: 37740

Prep Date: 10/5/2016 Analysis Date: 10/6/2016 SeqNo: 1176241 Units: mg/Kg

Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Gasoline Range Organics (GRO) 5.0 25.00 123 74.6 123

950 Surr: BFB 1000 95.3 68.3 144

Sample ID MB-27923 SampType: MBLK TestCode: EPA Method 8015D: Gasoline Range

Client ID: **PBS** Batch ID: 27923 RunNo: 37778

Prep Date: 10/6/2016 Analysis Date: 10/7/2016 SeqNo: 1177518 Units: mg/Kg

%RPD **RPDLimit** SPK value SPK Ref Val %REC LowLimit Analyte Result **PQL** HighLimit Qual

Gasoline Range Organics (GRO) ND 5.0 Surr: BFB 880 88.1 68.3 1000 144

Sample ID LCS-27923 SampType: LCS TestCode: EPA Method 8015D: Gasoline Range

Client ID: LCSS Batch ID: 27923 RunNo: 37778

Prep Date: 10/6/2016 Analysis Date: 10/7/2016 SeqNo: 1177519 Units: mg/Kg

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Gasoline Range Organics (GRO) 30 5.0 25.00 122 74 6 123

Surr: BFB 950 1000 95.4 68.3 144

Sample ID 1610238-006AMS SampType: MS TestCode: EPA Method 8015D: Gasoline Range

Batch ID: 27923 Client ID: TK569-1(36-38') RunNo: 37778

Prep Date: 10/6/2016 Analysis Date: 10/7/2016 SeqNo: 1177527 Units: mg/Kg

SPK value SPK Ref Val %REC %RPD Analyte Result **PQL** LowLimit HighLimit **RPDLimit** Qual Gasoline Range Organics (GRO) 141.4 59.3 180 96 47.94 85.4 143 Surr: BFB 2600 1918 138 68.3 144

Sample ID 1610238-006AMSD SampType: MSD TestCode: EPA Method 8015D: Gasoline Range

Client ID: TK569-1(36-38') Batch ID: 27923 RunNo: 37778

Prep Date: 10/6/2016 Analysis Date: 10/7/2016 SeqNo: 1177528 Units: mg/Kg

SPK value SPK Ref Val %REC HighLimit %RPD **RPDLimit** Analyte Result LowLimit Qual

Qualifiers:

Value exceeds Maximum Contaminant Level. В Analyte detected in the associated Method Blank

Е D Sample Diluted Due to Matrix Value above quantitation range

J Holding times for preparation or analysis exceeded Analyte detected below quantitation limits Page 49 of 67

> P Sample pH Not In Range

> > RLReporting Detection Limit

Sample container temperature is out of limit as specified

Η

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID 1610238-006AMSD SampType: MSD TestCode: EPA Method 8015D: Gasoline Range

Client ID: TK569-1(36-38') Batch ID: 27923 RunNo: 37778

Prep Date: 10/6/2016 Analysis Date: 10/7/2016 SeqNo: 1177528 Units: mg/Kg

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	180	9.8	49.16	141.4	68.5	59.3	143	4.05	20	
Surr: BFB	2500		1967		126	68.3	144	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

Page 50 of 67

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID Ics-27905	SampT	ype: LC	ss	Tes	tCode: E	PA Method	8260B: Vola	tiles		
Client ID: LCSS	Batch	n ID: 27	905	F	RunNo: 3	7747				
Prep Date: 10/5/2016	Analysis D	ate: 1 0	0/6/2016	S	SeqNo: 1	176297	Units: %Re	С		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	0.57		0.5000		114	70	130			
Surr: 1,2-Dichloroethane-d4	0.50		0.5000		101	70	130			
Surr: Toluene-d8	0.45		0.5000		89.2	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		93.6	70	130			
Sample ID mb-27905	SampT	уре: МІ	BLK	Tes	tCode: E	PA Method	8260B: Vola	tiles		
Client ID: PBS	Batch	n ID: 27	905	F	RunNo: 3	7747				
Prep Date: 10/5/2016	Analysis D	ate: 1 0	0/6/2016	S	SeqNo: 1	176299	Units: %Re	С		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	0.57		0.5000		114	70	130			
Surr: 1,2-Dichloroethane-d4	0.44		0.5000		88.5	70	130			
Surr: Toluene-d8	0.44		0.5000		88.3	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.5000		92.4	70	130			
Sample ID rb9	SampT	уре: МІ	BLK	Tes	tCode: E	PA Method	8260B: Vola	tiles		
Client ID: PBS	Batch	n ID: S3	7765	F	RunNo: 3	7765				
Prep Date:	Analysis D	ate: 1 0	0/6/2016	S	SeqNo: 1	176718	Units: mg/k	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Methyl tert-butyl ether (MTBE)	ND	0.050								
1,2,4-Trimethylbenzene	ND	0.050								
1,3,5-Trimethylbenzene	ND	0.050								
1,2-Dichloroethane (EDC)	ND	0.050								
1,2-Dibromoethane (EDB)	ND	0.050								
Naphthalene	ND	0.10								
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
Acetone	ND	0.75								
Bromobenzene	ND	0.050								
Bromodichloromethane	ND	0.050								
Bromoform	ND	0.050								
Bromomethane	ND	0.15								
2-Butanone	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.050								

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID rb9 SampType: MBLK TestCode: EPA Method 8260B: Volatiles Client ID: **PBS** Batch ID: **S37765** RunNo: 37765 Prep Date: Analysis Date: 10/6/2016 SeqNo: 1176718 Units: mg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Chloroethane ND 0.10 ND 0.050 Chloroform ND Chloromethane 0.15 2-Chlorotoluene ND 0.050 4-Chlorotoluene ND 0.050 cis-1,2-DCE ND 0.050 cis-1,3-Dichloropropene ND 0.050 1,2-Dibromo-3-chloropropane ND 0.10 Dibromochloromethane ND 0.050 ND Dibromomethane 0.050 1,2-Dichlorobenzene ND 0.050 ND 0.050 1,3-Dichlorobenzene 1.4-Dichlorobenzene ND 0.050 Dichlorodifluoromethane ND 0.050 1.1-Dichloroethane ND 0.050 1,1-Dichloroethene ND 0.050 ND 0.050 1,2-Dichloropropane 1,3-Dichloropropane ND 0.050 2,2-Dichloropropane ND 0.10 ND 0.10 1.1-Dichloropropene Hexachlorobutadiene ND 0.10 2-Hexanone ND 0.50 0.050 Isopropylbenzene ND 4-Isopropyltoluene ND 0.050 4-Methyl-2-pentanone ND 0.50 Methylene chloride ND 0.15 n-Butylbenzene ND 0.15 n-Propylbenzene ND 0.050 sec-Butylbenzene ND 0.050 ND 0.050 Styrene ND 0.050 tert-Butylbenzene 1,1,1,2-Tetrachloroethane ND 0.050 1.1.2.2-Tetrachloroethane ND 0.050 Tetrachloroethene (PCE) ND 0.050 trans-1,2-DCE ND 0.050 trans-1,3-Dichloropropene ND 0.050 0.10 ND 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 0.0068 0.050 J 1,1,1-Trichloroethane ND 0.050

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client:	Western Refining Company
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Project: OW-14 Source Inv

Troject. OW-14										
Sample ID rb9	·	Type: ME					8260B: Volat	iles		
Client ID: PBS	Batc	h ID: S3	7765	F	RunNo: 3	7765				
Prep Date:	Analysis [)ate: 10	0/6/2016	S	SeqNo: 1	176718	Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.49		0.5000		97.9	70	130			
Surr: 1,2-Dichloroethane-d4	0.48		0.5000		95.3	70	130			
Surr: Toluene-d8	0.48		0.5000		97.0	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		101	70	130			
Sample ID 100ng lcs2	Samp ⁷	Type: LC	:s	Tes	tCode: El	PA Method	8260B: Volat	iles		
Client ID: LCSS	Batc	h ID: S3	7765	F	tunNo: 3	7765				
Prep Date:	Analysis [)ate: 10	0/6/2016	S	SeqNo: 1	176719	Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	107	70	130			
Toluene	1.1	0.050	1.000	0	112	70	130			
Chlorobenzene	1.1	0.050	1.000	0	106	70	130			
1,1-Dichloroethene	1.1	0.050	1.000	0	112	70	130			
Trichloroethene (TCE)	1.0	0.050	1.000	0	104	70	130			
Surr: Dibromofluoromethane	0.50		0.5000		99.2	70	130			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		98.2	70	130			
Surr: Toluene-d8	0.50		0.5000		99.5	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		102	70	130			
Sample ID rb	Samp	Туре: МЕ	BLK	Tes	tCode: El	PA Method	8260B: Volat	iles		
Client ID: PBS	Batc	h ID: S3	7805	F	lunNo: 3	7805				
Prep Date:	Analysis [)ate: 1 0	0/7/2016	S	eqNo: 1	177632	Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
, and yes		0.025								
	ND	0.025								
Benzene	ND ND	0.025								
Benzene Toluene										
Benzene Toluene Ethylbenzene	ND	0.050								
Benzene Toluene Ethylbenzene Methyl tert-butyl ether (MTBE)	ND ND	0.050 0.050								
Benzene Toluene Ethylbenzene Methyl tert-butyl ether (MTBE) 1,2,4-Trimethylbenzene	ND ND ND	0.050 0.050 0.050								
Benzene Toluene Ethylbenzene Methyl tert-butyl ether (MTBE) 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene	ND ND ND ND	0.050 0.050 0.050 0.050 0.050								
Benzene Toluene Ethylbenzene Methyl tert-butyl ether (MTBE) 1,2,4-Trimethylbenzene	ND ND ND ND ND	0.050 0.050 0.050 0.050								

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID rb SampType: MBLK TestCode: EPA Method 8260B: Volatiles RunNo: 37805 Client ID: **PBS** Batch ID: \$37805 Prep Date: Analysis Date: 10/7/2016 SeqNo: 1177632 Units: mg/Kg Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 1-Methylnaphthalene ND 0.20 ND 2-Methylnaphthalene 0.20 ND 0.75 Acetone Bromobenzene ND 0.050 Bromodichloromethane ND 0.050 Bromoform ND 0.050 Bromomethane ND 0.15 ND 0.50 2-Butanone Carbon disulfide ND 0.50 0.050 Carbon tetrachloride ND Chlorobenzene ND 0.050 ND 0.10 Chloroethane 0.050 Chloroform ND Chloromethane ND 0.15 2-Chlorotoluene ND 0.050 4-Chlorotoluene ND 0.050 cis-1,2-DCE ND 0.050 cis-1,3-Dichloropropene ND 0.050 1,2-Dibromo-3-chloropropane ND 0.10 Dibromochloromethane ND 0.050 Dibromomethane ND 0.050 1.2-Dichlorobenzene ND 0.050 0.050 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND 0.050 Dichlorodifluoromethane ND 0.050 1.1-Dichloroethane ND 0.050 1,1-Dichloroethene ND 0.050 0.050 ND 1,2-Dichloropropane 1,3-Dichloropropane ND 0.050 ND 0.10 2,2-Dichloropropane 1.1-Dichloropropene ND 0.10 Hexachlorobutadiene ND 0.10 2-Hexanone ND 0.50 Isopropylbenzene ND 0.050 4-Isopropyltoluene ND 0.050 4-Methyl-2-pentanone ND 0.50 Methylene chloride ND 0.15 n-Butylbenzene ND 0.15 n-Propylbenzene ND 0.050

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID rb	SampT	ype: ME	BLK	TestCode: EPA Method 8260B: Volatiles						
Client ID: PBS	Batcl	n ID: S3	7805	F	RunNo: 3	7805				
Prep Date:	Analysis D	oate: 10	0/7/2016	S	SeqNo: 1	177632	Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	0.0078	0.050								J
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.48		0.5000		96.3	70	130			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		97.4	70	130			
Surr: Toluene-d8	0.49		0.5000		98.9	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		101	70	130			

Sample ID 100ng Ics	SampT	ype: LC	S	TestCode: EPA Method 8260B: Volatiles						
Client ID: LCSS	Batch	n ID: S3	7805	F	RunNo: 3	7805				
Prep Date:	Analysis D	oate: 10	0/7/2016	8	SeqNo: 1	177633	Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.025	1.000	0	96.2	70	130			
Toluene	1.0	0.050	1.000	0	101	70	130			
Chlorobenzene	0.99	0.050	1.000	0	98.7	70	130			
1,1-Dichloroethene	1.0	0.050	1.000	0	103	70	130			
Trichloroethene (TCE)	0.97	0.050	1.000	0	96.6	70	130			
Surr: Dibromofluoromethane	0.46		0.5000		92.7	70	130			
Surr: 1,2-Dichloroethane-d4	0.48		0.5000		95.1	70	130			
Surr: Toluene-d8	0.48		0.5000		95.9	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		102	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID mb-27923	SampT	ype: MBLK	TestCode: E	PA Method	8260B: Volat	iles		
Client ID: PBS	Batch	h ID: 27923	RunNo: 3	7833				
Prep Date: 10/6/2016	Analysis D	Date: 10/10/2016	SeqNo: 1	178560	Units: mg/K	(g		
Analyte	Result	PQL SPK value	SPK Ref Val %REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025						
Toluene	ND	0.050						
Ethylbenzene	ND	0.050						
Methyl tert-butyl ether (MTBE)	ND	0.050						
1,2,4-Trimethylbenzene	ND	0.050						
1,3,5-Trimethylbenzene	ND	0.050						
1,2-Dichloroethane (EDC)	ND	0.050						
1,2-Dibromoethane (EDB)	ND	0.050						
Naphthalene	ND	0.10						
1-Methylnaphthalene	ND	0.20						
2-Methylnaphthalene	ND	0.20						
Acetone	0.079	0.75						J
Bromobenzene	ND	0.050						
Bromodichloromethane	ND	0.050						
Bromoform	ND	0.050						
Bromomethane	ND	0.15						
2-Butanone	0.057	0.50						J
Carbon disulfide	ND	0.50						
Carbon tetrachloride	ND	0.050						
Chlorobenzene	ND	0.050						
Chloroethane	ND	0.10						
Chloroform	ND	0.050						
Chloromethane	ND	0.15						
2-Chlorotoluene	ND	0.050						
4-Chlorotoluene	ND	0.050						
cis-1,2-DCE	ND	0.050						
cis-1,3-Dichloropropene	ND	0.050						
1,2-Dibromo-3-chloropropane	ND	0.10						
Dibromochloromethane	ND	0.050						
Dibromomethane	ND	0.050						
1,2-Dichlorobenzene	ND	0.050						
1,3-Dichlorobenzene	ND	0.050						
1,4-Dichlorobenzene	ND	0.050						
Dichlorodifluoromethane	ND	0.050						
1,1-Dichloroethane	ND	0.050						
1,1-Dichloroethene	ND	0.050						
1,2-Dichloropropane	ND	0.050						
1,3-Dichloropropane	ND	0.050						
2,2-Dichloropropane	ND	0.10						
z,z-Dichioropropatie	טויו	0.10						

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID mb-27923	SampT	уре: МЕ	BLK	TestCode: EPA Method 8260B: Volatiles							
Client ID: PBS	Batch	n ID: 27 9	923	F	unNo: 3	7833					
Prep Date: 10/6/2016	Analysis D	oate: 10	0/10/2016	S	eqNo: 1	178560	Units: mg/K	(g			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
1,1-Dichloropropene	ND	0.10									
Hexachlorobutadiene	ND	0.10									
2-Hexanone	ND	0.50									
Isopropylbenzene	ND	0.050									
4-Isopropyltoluene	ND	0.050									
4-Methyl-2-pentanone	ND	0.50									
Methylene chloride	ND	0.15									
n-Butylbenzene	ND	0.15									
n-Propylbenzene	ND	0.050									
sec-Butylbenzene	ND	0.050									
Styrene	ND	0.050									
tert-Butylbenzene	ND	0.050									
1,1,1,2-Tetrachloroethane	ND	0.050									
1,1,2,2-Tetrachloroethane	ND	0.050									
Tetrachloroethene (PCE)	ND	0.050									
trans-1,2-DCE	ND	0.050									
trans-1,3-Dichloropropene	ND	0.050									
1,2,3-Trichlorobenzene	ND	0.10									
1,2,4-Trichlorobenzene	ND	0.050									
1,1,1-Trichloroethane	ND	0.050									
1,1,2-Trichloroethane	ND	0.050									
Trichloroethene (TCE)	ND	0.050									
Trichlorofluoromethane	ND	0.050									
1,2,3-Trichloropropane	ND	0.10									
Vinyl chloride	ND	0.050									
Xylenes, Total	ND	0.10									
Surr: Dibromofluoromethane	0.49		0.5000		97.1	70	130				
Surr: 1,2-Dichloroethane-d4	0.46		0.5000		92.8	70	130				
Surr: Toluene-d8	0.49		0.5000		98.2	70	130				
Surr: 4-Bromofluorobenzene	0.48		0.5000		95.4	70	130				
Sample ID Ics-27923	SamnT	ype: LC	· e	Tos	Code: El	DA Mothod	8260B: Volat	tilos			
Client ID: LCSS		ype. LC n ID: 27 9			RunNo: 3		ozoud: vola	uies			
Prep Date: 10/6/2016	Analysis D				SeqNo: 1		Units: mg/K	(a			
							•	•	DDD! !!4	Our	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	

Qualifiers:

Chlorobenzene

Benzene

Toluene

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

1.0

1.1

1.1

0.025

0.050

0.050

1.000

1.000

1.000

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

70

70

70

130

130

130

E Value above quantitation range

104

108

106

J Analyte detected below quantitation limits

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P Sample pH Not In Range

0

0

0

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID Ics-27923 SampType: LCS TestCode: EPA Method 8260B: Volatiles Client ID: LCSS Batch ID: 27923 RunNo: 37833 Prep Date: 10/6/2016 Analysis Date: 10/10/2016 SeqNo: 1178572 Units: mg/Kg Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 1,1-Dichloroethene 0.050 1.000 S 1.4 0 136 70 130 107 Trichloroethene (TCE) 1.1 0.050 1.000 0 70 130 97.4 70 Surr: Dibromofluoromethane 0.49 0.5000 130 Surr: 1,2-Dichloroethane-d4 0.47 0.5000 93.2 70 130 Surr: Toluene-d8 0.48 0.5000 96.2 70 130 Surr: 4-Bromofluorobenzene 0.49 0.5000 97.6 70 130

Sample ID 1610238-006ams SampType: MS TestCode: EPA Method 8260B: Volatiles Client ID: TK569-1(36-38') Batch ID: 27923 RunNo: 37833 Prep Date: 10/6/2016 Analysis Date: 10/10/2016 SeqNo: 1178605 Units: mg/Kg %REC **PQL** SPK value SPK Ref Val LowLimit HighLimit %RPD **RPDLimit** Analyte Result Qual Benzene 0.91 0.048 0.9588 0.1217 81.9 49.2 155 0.096 0.9588 2.467 -57.2 52 154 S Toluene 1.9 97.4 Chlorobenzene 0.93 0.096 0.9588 0 53.2 150 0 101 34.2 1,1-Dichloroethene 0.97 0.096 0.9588 163 Trichloroethene (TCE) 0.90 0.096 0.9588 0 94.4 48.2 151 Surr: Dibromofluoromethane 0.84 0.9588 87.8 70 130 90.1 70 Surr: 1,2-Dichloroethane-d4 0.86 0.9588 130 Surr: Toluene-d8 0.91 0.9588 95.0 70 130 Surr: 4-Bromofluorobenzene 0.97 0.9588 101 70 130

Sample ID 1610238-006amso	I SampT	SampType: MSD TestCode: EPA Method 8260B: Volatiles								
Client ID: TK569-1(36-38')	Batch	ID: 27 9	923	F	RunNo: 3	7833				
Prep Date: 10/6/2016	Analysis D	ate: 10	0/10/2016	S	SeqNo: 1	178616	Units: mg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.049	0.9833	0.1217	82.9	49.2	155	3.18	20	
Toluene	3.8	0.098	0.9833	2.467	139	52	154	66.7	20	R
Chlorobenzene	0.98	0.098	0.9833	0	99.5	53.2	150	4.68	20	
1,1-Dichloroethene	0.96	0.098	0.9833	0	97.6	34.2	163	1.08	20	
Trichloroethene (TCE)	0.89	0.098	0.9833	0	90.3	48.2	151	1.95	20	
Surr: Dibromofluoromethane	0.86		0.9833		87.3	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	0.88		0.9833		89.1	70	130	0	0	
Surr: Toluene-d8	0.95		0.9833		96.5	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.99		0.9833		101	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID Ics-28053	SampType: LCS TestCode: Method 8260B/5035LOW: VOLATILES									
Client ID: LCSS	Batch	n ID: 28	053 RunNo: 37972							
Prep Date: 10/13/2016	Analysis D	ate: 10	0/16/2016	S	eqNo: 1	183301	Units: µg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	10.2	2.00	10.00	0	103	70	130			
Toluene	10.1	2.00	10.00	0	101	70	130			
Chlorobenzene	10.2	2.00	10.00	0	103	70	130			
1,1-Dichloroethene	10.4	2.00	10.00	0	104	68	129			
Trichloroethene (TCE)	10.3	2.00	10.00	0	103	70	130			
Surr: 1,2-Dichloroethane-d4	10.4		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	10.1		10.00		101	70	130			
Surr: Dibromofluoromethane	10.2		10.00		102	70	130			
Surr: Toluene-d8	9.86		10.00		98.6	70	130			

Sample ID Icsd-28053	Samp1	ype: LC	SD	TestCode: Method 8260B/5035LOW: VOLATILES						
Client ID: LCSS02	Batcl	n ID: 28	053	F	RunNo: 3	7972				
Prep Date: 10/13/2016	Analysis D)ate: 10	0/16/2016	8	SeqNo: 1	183302	Units: µg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	10.5	2.00	10.00	0	105	70	130	2.41	20	
Toluene	10.2	2.00	10.00	0	103	70	130	1.38	20	
Chlorobenzene	10.4	2.00	10.00	0	104	70	130	1.74	20	
1,1-Dichloroethene	10.6	2.00	10.00	0	106	68	129	1.33	20	
Trichloroethene (TCE)	10.5	2.00	10.00	0	105	70	130	2.30	20	
Surr: 1,2-Dichloroethane-d4	10.5		10.00		105	70	130	0	0	
Surr: 4-Bromofluorobenzene	10.0		10.00		100	70	130	0	0	
Surr: Dibromofluoromethane	10.3		10.00		103	70	130	0	0	
Surr: Toluene-d8	9.94		10.00		99.4	70	130	0	0	

Sample ID mb-28053	SampType: MBLK			TestCode: Method 8260B/5035LOW: VOLATILES							
Client ID: PBS	Batch ID: 28053			R	RunNo: 3	7972					
Prep Date: 10/13/2016	Analysis Date: 10/16/2016			SeqNo: 1183308			Units: µg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Benzene	ND	2.00									
Toluene	ND	2.00									
Ethylbenzene	ND	2.00									
Methyl tert-butyl ether (MTBE)	ND	2.00									
1,2,4-Trimethylbenzene	ND	2.00									
1,3,5-Trimethylbenzene	ND	2.00									
1,2-Dichloroethane (EDC)	ND	2.00									
1,2-Dibromoethane (EDB)	ND	2.00									
Naphthalene	ND	2.00									
1-Methylnaphthalene	ND	4.00									

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID mb-28053	SampT	ype: MBLK	Tes	TestCode: Method 8260B/5035LOW: VOLATILES							
Client ID: PBS	Batch	n ID: 28053	F	RunNo: 37972							
Prep Date: 10/13/2016	Analysis D	ate: 10/16/2016	;	SeqNo: 1183308		Units: µg/Kg					
Analyte	Result		e SPK Ref Val	%REC Lo	wLimit	HighLimit	%RPD	RPDLimit	Qual		
2-Methylnaphthalene	ND	4.00									
Acetone	ND	10.0									
Bromobenzene	ND	2.00									
Bromodichloromethane	ND	2.00									
Bromoform	ND	2.00									
Bromomethane	ND	3.00									
2-Butanone	ND	10.0									
Carbon disulfide	ND	10.0									
Carbon tetrachloride	ND	2.00									
Chlorobenzene	ND	2.00									
Chloroethane	ND	2.00									
Chloroform	ND	2.00									
Chloromethane	ND	2.00									
2-Chlorotoluene	ND	2.00									
4-Chlorotoluene	ND	2.00									
cis-1,2-DCE	ND	2.00									
cis-1,3-Dichloropropene	ND	2.00									
1,2-Dibromo-3-chloropropane	ND	2.00									
Dibromochloromethane	ND	2.00									
Dibromomethane	ND	2.00									
1,2-Dichlorobenzene	ND	2.00									
1,3-Dichlorobenzene	ND	2.00									
1,4-Dichlorobenzene	ND	2.00									
Dichlorodifluoromethane	ND	2.00									
1,1-Dichloroethane	ND	2.00									
1,1-Dichloroethene	ND	2.00									
1,2-Dichloropropane	ND	2.00									
1,3-Dichloropropane	ND	2.00									
2,2-Dichloropropane	ND	2.00									
1,1-Dichloropropene	ND	2.00									
Hexachlorobutadiene	ND	2.00									
2-Hexanone	ND	10.0									
Isopropylbenzene	ND	2.00									
4-Isopropyltoluene	ND	2.00									
4-Methyl-2-pentanone	ND	10.0									
Methylene chloride	ND	3.00									
n-Butylbenzene	ND	2.00									
n-Propylbenzene	ND	2.00									
sec-Butylbenzene	ND	2.00									
300 Datymonizono	140	2.00									

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID mb-28053	SampType: MBLK TestCode: Method 8260B/5035LOW:						VOLATIL	ES				
Client ID: PBS	Batch	ID: 28 0	053	F	RunNo: 37972							
Prep Date: 10/13/2016	Analysis D	ate: 10)/16/2016	SeqNo: 1183308			Units: µg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Styrene	ND	2.00										
tert-Butylbenzene	ND	2.00										
1,1,1,2-Tetrachloroethane	ND	2.00										
1,1,2,2-Tetrachloroethane	ND	2.00										
Tetrachloroethene (PCE)	ND	2.00										
trans-1,2-DCE	ND	2.00										
trans-1,3-Dichloropropene	ND	2.00										
1,2,3-Trichlorobenzene	ND	2.00										
1,2,4-Trichlorobenzene	ND	2.00										
1,1,1-Trichloroethane	ND	2.00										
1,1,2-Trichloroethane	ND	2.00										
Trichloroethene (TCE)	ND	2.00										
Trichlorofluoromethane	ND	2.00										
1,2,3-Trichloropropane	ND	2.00										
Vinyl chloride	ND	2.00										
Xylenes, Total	ND	2.00										
Surr: 1,2-Dichloroethane-d4	10.5		10.00		105	70	130					
Surr: 4-Bromofluorobenzene	10.0		10.00		100	70	130					
Surr: Dibromofluoromethane	10.3		10.00		103	70	130					
Surr: Toluene-d8	9.89		10.00		98.9	70	130					

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

SampType: MBLK

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID Ics-28021	SampType: LCS TestCode: EPA Method 8270C: Semivolatiles											
Client ID: LCSS	Batch	n ID: 28	021	F	RunNo: 3	7969						
Prep Date: 10/12/2016	Analysis D	oate: 10)/15/2016	SeqNo: 1183224			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Acenaphthene	1.0	0.20	1.670	0	62.5	45.8	99.8					
4-Chloro-3-methylphenol	2.0	0.50	3.330	0	59.3	51.5	103					
2-Chlorophenol	1.9	0.20	3.330	0	56.8	46.5	105					
1,4-Dichlorobenzene	0.87	0.20	1.670	0	52.2	45.5	103					
2,4-Dinitrotoluene	0.91	0.50	1.670	0	54.5	36	87.2					
N-Nitrosodi-n-propylamine	0.91	0.20	1.670	0	54.7	47.3	104					
4-Nitrophenol	1.9	0.25	3.330	0	57.4	47.3	95.3					
Pentachlorophenol	1.5	0.40	3.330	0	46.4	38.7	89.3					
Phenol	1.9	0.20	3.330	0	57.7	47.8	106					
Pyrene	1.1	0.20	1.670	0	63.2	33.4	105					
1,2,4-Trichlorobenzene	0.91	0.20	1.670	0	54.4	50.4	115					
Surr: 2-Fluorophenol	1.8		3.330		52.8	35	97.9					
Surr: Phenol-d5	1.9		3.330		56.0	37.3	105					
Surr: 2,4,6-Tribromophenol	1.7		3.330		51.8	35.6	118					
Surr: Nitrobenzene-d5	0.91		1.670		54.5	41.2	107					
Surr: 2-Fluorobiphenyl	0.96		1.670		57.3	41.9	119					
Surr: 4-Terphenyl-d14	1.0		1.670		62.0	15	132					

Client ID: PBS	Batch	n ID: 28	021	F	RunNo: 3	7969				
Prep Date: 10/12/2016	Analysis Date:		10/15/2016		SeqNo: 1183227			(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	0.20								
Acenaphthylene	ND	0.20								
Aniline	ND	0.20								
Anthracene	ND	0.20								
Azobenzene	ND	0.20								
Benz(a)anthracene	ND	0.20								
Benzo(a)pyrene	ND	0.20								
Benzo(b)fluoranthene	ND	0.20								
Benzo(g,h,i)perylene	ND	0.20								
Benzo(k)fluoranthene	ND	0.20								
Benzoic acid	ND	0.50								
Benzyl alcohol	ND	0.20								
Bis(2-chloroethoxy)methane	ND	0.20								
Bis(2-chloroethyl)ether	ND	0.20								
Bis(2-chloroisopropyl)ether	ND	0.20								
Bis(2-ethylhexyl)phthalate	0.10	0.50								J

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Sample ID mb-28021

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

D. Complement Not by Donne

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P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

TestCode: EPA Method 8270C: Semivolatiles

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

J

01-Nov-16

Client: Western Refining Company

SampType: MBLK

Project: OW-14 Source Inv

Sample ID mb-28021

 Client ID:
 PBS
 Batch ID:
 28021
 RunNo:
 37969

 Prep Date:
 10/12/2016
 Analysis Date:
 10/15/2016
 SeqNo:
 1183227
 Units: mg/Kg

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

4-Bromophenyl phenyl ether ND 0.20

Butyl benzyl phthalate ND 0.20

TestCode: EPA Method 8270C: Semivolatiles

Carbazole	ND	0.20	
4-Chloro-3-methylphenol	ND	0.50	
4-Chloroaniline	ND	0.50	
2-Chloronaphthalene	ND	0.25	
2-Chlorophenol	ND	0.20	
4-Chlorophenyl phenyl ether	ND	0.20	
Chrysene	ND	0.20	
Di-n-butyl phthalate	0.19	0.40	
Di-n-octyl phthalate	ND	0.40	
Dibenz(a,h)anthracene	ND	0.20	
Dibenzofuran	ND	0.20	
1,2-Dichlorobenzene	ND	0.20	
1,3-Dichlorobenzene	ND	0.20	
1,4-Dichlorobenzene	ND	0.20	
3,3´-Dichlorobenzidine	ND	0.25	
Diethyl phthalate	ND	0.20	
Dimethyl phthalate	ND	0.20	
2,4-Dichlorophenol	ND	0.40	
2,4-Dimethylphenol	ND	0.30	
4,6-Dinitro-2-methylphenol	ND	0.40	
2,4-Dinitrophenol	ND	0.50	
2,4-Dinitrotoluene	ND	0.50	
2,6-Dinitrotoluene	ND	0.50	
Fluoranthene	ND	0.20	
Fluorene	ND	0.20	
Hexachlorobenzene	ND	0.20	
Hexachlorobutadiene	ND	0.20	
Hexachlorocyclopentadiene	ND	0.20	
Hexachloroethane	ND	0.20	
Indeno(1,2,3-cd)pyrene	ND	0.20	
Isophorone	ND	0.40	
1-Methylnaphthalene	ND	0.20	
2-Methylnaphthalene	ND	0.20	
2-Methylphenol	ND	0.40	
3+4-Methylphenol	ND	0.20	
N-Nitrosodi-n-propylamine	ND	0.20	
N-Nitrosodiphenylamine	ND	0.20	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID mb-28021	SampType: MBLK TestCode: EPA Method 8270C: Semivolatiles									
Client ID: PBS	Batch	n ID: 28 0	021	F	RunNo: 3					
Prep Date: 10/12/2016	Analysis D	Analysis Date: 10		5	SeqNo: 1183227		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.20								
2-Nitroaniline	ND	0.20								
3-Nitroaniline	ND	0.20								
4-Nitroaniline	ND	0.40								
Nitrobenzene	ND	0.40								
2-Nitrophenol	ND	0.20								
4-Nitrophenol	ND	0.25								
Pentachlorophenol	ND	0.40								
Phenanthrene	ND	0.20								
Phenol	ND	0.20								
Pyrene	ND	0.20								
Pyridine	ND	0.40								
1,2,4-Trichlorobenzene	ND	0.20								
2,4,5-Trichlorophenol	ND	0.20								
2,4,6-Trichlorophenol	ND	0.20								
Surr: 2-Fluorophenol	2.3		3.330		70.5	35	97.9			
Surr: Phenol-d5	2.3		3.330		67.6	37.3	105			
Surr: 2,4,6-Tribromophenol	2.2		3.330		67.2	35.6	118			
Surr: Nitrobenzene-d5	1.0		1.670		62.1	41.2	107			
Surr: 2-Fluorobiphenyl	1.1		1.670		65.4	41.9	119			
Surr: 4-Terphenyl-d14	1.2		1.670		71.6	15	132			

Sample ID 1610238-001ams	Sampi	ype: MS	5	l es	Code: El	A Method	8270C: Semi	volatiles		
Client ID: TK569-2(16-18')	Batch ID: 28021 Analysis Date: 10/15/2016			RunNo: 37969						
Prep Date: 10/12/2016				SeqNo: 1183238			Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.1	0.20	1.666	0	67.6	24.7	111			
4-Chloro-3-methylphenol	2.2	0.50	3.321	0	66.4	21.7	108			
2-Chlorophenol	2.0	0.20	3.321	0	60.5	21.9	103			
1,4-Dichlorobenzene	0.94	0.20	1.666	0	56.3	15.8	93.9			
2,4-Dinitrotoluene	0.91	0.50	1.666	0	54.6	19.9	101			
N-Nitrosodi-n-propylamine	1.1	0.20	1.666	0	65.0	17.7	100			
4-Nitrophenol	2.0	0.25	3.321	0	61.2	19.3	112			
Pentachlorophenol	1.9	0.40	3.321	0	56.7	20.5	105			
Phenol	2.1	0.20	3.321	0	64.7	23.1	101			
Pyrene	1.2	0.20	1.666	0	71.1	18.3	113			
1,2,4-Trichlorobenzene	0.99	0.20	1.666	0	59.7	21.8	108			
Surr: 2-Fluorophenol	1.9		3.321		58.2	35	97.9			

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID 1610238-001ams SampType: MS TestCode: EPA Method 8270C: Semivolatiles Client ID: TK569-2(16-18') Batch ID: 28021 RunNo: 37969 Prep Date: 10/12/2016 Analysis Date: 10/15/2016 SeqNo: 1183238 Units: mg/Kg Analyte Result SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Surr: Phenol-d5 2.0 59.4 37.3 3.321 105 Surr: 2,4,6-Tribromophenol 2.0 3.321 61.6 35.6 118 55.6 Surr: Nitrobenzene-d5 0.93 1.666 41.2 107 Surr: 2-Fluorobiphenyl 0.92 1.666 55.1 41.9 119 Surr: 4-Terphenyl-d14 1.1 1.666 68.7 15 132

Sample ID 1610238-001amsd SampType: MSD TestCode: EPA Method 8270C: Semivolatiles Client ID: TK569-2(16-18') Batch ID: 28021 RunNo: 37969 10/12/2016 Prep Date: Analysis Date: 10/15/2016 SeqNo: 1183239 Units: mg/Kg Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 2.57 1.2 0.20 1.659 n 69.6 24.7 111 30.2 Acenaphthene 4-Chloro-3-methylphenol 2.3 0.50 3.309 0 68.7 21.7 108 2.94 37.2 0.20 3.309 0 58.6 21.9 103 3.56 48 2-Chlorophenol 1.9 56.4 1.4-Dichlorobenzene 0.94 0.20 1.659 0 15.8 93.9 0.152 40.6 0 60.4 9.74 47.7 2,4-Dinitrotoluene 1.0 0.50 1.659 19.9 101 N-Nitrosodi-n-propylamine 0.20 1.659 0 63.3 17.7 100 3.07 52.5 1.0 4-Nitrophenol 2.0 0.25 3.309 0 61.1 19.3 112 0.512 36.6 0 59.6 20.5 105 4.75 65.5 Pentachlorophenol 2.0 0.40 3.309 2.1 0.20 3.309 0 64.5 23.1 101 0.659 44 Phenol 0.20 0 0.780 42.1 Pyrene 1.2 1.659 71.9 18.3 113 0.99 0.20 0 59.4 21.8 108 0.868 31.5 1,2,4-Trichlorobenzene 1.659 Surr: 2-Fluorophenol 1.9 3.309 58.2 35 97.9 0 0 37.3 Surr: Phenol-d5 2.0 3.309 59.3 105 0 0 65.1 35.6 0 0 Surr: 2,4,6-Tribromophenol 22 3.309 118 Surr: Nitrobenzene-d5 0.93 1.659 56.0 41.2 107 0 0 60.3 Surr: 2-Fluorobiphenyl 1.0 1.659 41.9 119 0 0 Surr: 4-Terphenyl-d14 1.2 1.659 71.3 15 132 0 0

Qualifiers:

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

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID MB-27986 SampType: MBLK TestCode: EPA Method 7471: Mercury

Client ID: PBS Batch ID: 27986 RunNo: 37872

Prep Date: 10/10/2016 Analysis Date: 10/12/2016 SeqNo: 1179566 Units: mg/Kg

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

Mercury ND 0.033

Sample ID LCS-27986 SampType: LCS TestCode: EPA Method 7471: Mercury

Client ID: LCSS Batch ID: 27986 RunNo: 37872

Prep Date: 10/10/2016 Analysis Date: 10/12/2016 SeqNo: 1179567 Units: mg/Kg

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

Mercury 0.17 0.033 0.1667 0 100 80 120

Sample ID 1610238-001BMS SampType: MS TestCode: EPA Method 7471: Mercury

Client ID: TK569-2(16-18') Batch ID: 27986 RunNo: 37872

Prep Date: 10/10/2016 Analysis Date: 10/12/2016 SeqNo: 1179569 Units: mg/Kg

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

Mercury 0.16 0.032 0.1635 0.004171 97.4 75 129

Sample ID 1610238-001BMSD SampType: MSD TestCode: EPA Method 7471: Mercury

Client ID: TK569-2(16-18') Batch ID: 27986 RunNo: 37872

Prep Date: 10/10/2016 Analysis Date: 10/12/2016 SeqNo: 1179570 Units: mg/Kg

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

Mercury 0.17 0.033 0.1665 0.004171 101 75 125 5.07 20

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

Page 66 of 67

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

SampType: LCS

WO#: **1610238** *01-Nov-16*

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID	MB-27985	SampT	уре: МЕ	BLK	Tes	tCode: El	PA Method	6010B: Soil	Metals		
Client ID:	PBS	Batch	1D: 27	985	F	RunNo: 3	7883				
Prep Date:	10/10/2016	Analysis D	ate: 10	0/12/2016	S	SeqNo: 1	180046	Units: mg/K	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony		ND	2.5								
Arsenic		ND	2.5								
Barium		ND	0.10								
Beryllium		ND	0.15								
Cadmium		ND	0.10								
Chromium		ND	0.30								
Cobalt		ND	0.30								
Iron		1.4	2.5								J
Lead		ND	0.25								
Manganese		ND	0.10								
Nickel		ND	0.50								
Selenium		ND	2.5								
Silver		ND	0.25								
Vanadium		ND	2.5								
Zinc		0.57	2.5								J

Client ID: LCSS	Batch	1D: 27	985	F	RunNo: 3	7883				
Prep Date: 10/10/2016	Analysis D	ate: 10	0/12/2016	S	SeqNo: 1	180047	Units: mg/K	ίg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	24	2.5	25.00	0	94.3	80	120			
Arsenic	24	2.5	25.00	0	97.9	80	120			
Barium	24	0.10	25.00	0	95.7	80	120			
Beryllium	25	0.15	25.00	0	100	80	120			
Cadmium	24	0.10	25.00	0	95.6	80	120			
Chromium	24	0.30	25.00	0	96.3	80	120			
Cobalt	23	0.30	25.00	0	92.0	80	120			
Iron	25	2.5	25.00	0	102	80	120			
Lead	23	0.25	25.00	0	92.2	80	120			
Manganese	24	0.10	25.00	0	95.2	80	120			
Nickel	24	0.50	25.00	0	94.4	80	120			
Selenium	23	2.5	25.00	0	90.9	80	120			
Silver	4.9	0.25	5.000	0	97.7	80	120			
Vanadium	26	2.5	25.00	0	103	80	120			
Zinc	24	2.5	25.00	0	95.5	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix

Sample ID LCS-27985

- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank

TestCode: EPA Method 6010B: Soil Metals

- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Page 67 of 67



rtati Environmental Analysis Laboratory

4901 Hawkins NE

Sample Log-In Check List Albuquerque, NM 87109 TEL: 505-345-3975 FAX: 505-345-4107 Website: www.hallenvironmental.com

Citen	it Name:	Western Re	fining Gallup	Work C	rder Numbe	r: 16102	238			RcptNo:	1
Recei	ived by/dat	e:(4								
Logge	ed B <u>y</u> :	Ashley Gal	legos	10/5/2016	3:40:00 PN	Л		A			
Comp	leted By:	Ashley Gal	legos		5:30:02 PN	Λ		A			
Revie	wed By:	الله الله	7	1016	116			V			
<u>Chair</u>	n of Cus	tody									
1. C	ustody sea	ils intact on sa	imple bottles?			Yes		No 🗆] No	t Present 🗹	
2. Is	Chain of 0	Custody comp	lete?			Yes	✓	No 🗆] No	t Present 🗌	
3. H	ow was the	e sample deliv	ered?			Cour	<u>ier</u>				
<u>Log</u>	<u>In</u>										
4. w	Vas an atte	empt made to	cool the sample	s?		Yes	✓	No [NA 🗆	
5. W	/ere all sar	mples received	d at a temperatu	ire of >0° C f	to 6.0°C	Yes	✓	No 🗆]	NA \square	
6. s	ample(s) i	n proper conta	niner(s)?			Yes	Y	No [
7. Si	ufficient sa	mple volume	for indicated tes	it(s)?		Yes	V	No			
8. Ar	re samples	(except VOA	and ONG) prop	erly preserve	ed?	Yes	Y	No 🗆			
9. W	as preser	ative added to	o bottles?			Yes		No ₩	•	NA 🗆	
10.v	OA vials ha	ave zero head	space?			Yes		No 🗆] No V	OA Vials 🗹	
11. W	Vere any s	ample contain	ers received bro	oken?		Yes		No S	# of	preserved	·····
12.D	oes papen	work match bo	ttle labels?			Yes	y	No 🗆		es checked H:	
			ain of custody)					_		•	or >12 unless noted)
			ntified on Chain			Yes	✓	No 🗆]	Adjusted? _	<u>.</u>
		=	ere requested?		•	Yes	V	No L	J -	Oh a alea d been	
		ding times abl customer for a				Yes	✓	No L	J	Checked by:	
Spec	<u>ial Hano</u>	lling (if app	olicable)								
16. W	as client n	otified of all di	iscrepancies wil	th this order?		Yes		No [NA 🗹	-
	Perso	n Notified:			Date			· · · · · · · · · · · · · · · · · · ·	-		
	By Wh	nom:			Via:	☐ eMa	iil 🗌	Phone F	ax 🗌 In	Person	
	Regar	- 2			. N						
L	Client	Instructions:									
17. A	Additional r	emarks:									
18. <u>c</u>	Cooler Info										
	Cooler N	o Temp ºC 1.0		Seal Intact Yes	Seal No	Seal Da	ate	Signed By	-		
		14.47									

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	f necessary,	, samples sub	If necessary, samples submitted to Hall Environmental may be subcontracted to other acc	ontracted to other	dredited laboratories.	ss. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.	possibility	. Any sı	b-contra	cted dat	a will be	clearly r	otated o	n the ar	alytical	report.		l

WESTERN REFINING SOUTHWEST, INC. GALLUP REFINERY

OW-14 SOURCE INVESTIGATION - SEPTEMBER 2016

METALS AND CYANIDE ANALYSES FOR SOIL SAMPLES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
lron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020



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

November 21, 2016

Ed Riege

Western Refining Southwest, Gallup 92 Giant Crossing Road Gallup, NM 87301

TEL: (505) 722-3833 FAX (505) 722-0210

RE: OW-14 Source Inv. OrderNo.: 1610355

Dear Ed Riege:

Hall Environmental Analysis Laboratory received 4 sample(s) on 10/7/2016 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman

Laboratory Manager

andel

4901 Hawkins NE

Albuquerque, NM 87109

Lab Order: 1610355

Date Reported: 11/21/2016

Hall Environmental Analysis Laboratory, Inc.

Western Refining Southwest, Gallup Client Sample ID: TK-569-1-GW

Project: OW-14 Source Inv. Collection Date: 10/5/2016 1:55:00 PM

Lab ID: 1610355-001A **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	_
Benzene	34000	48	500		μg/L	500	10/11/2016 5:18:00 PM	R37866
Toluene	41000	59	500		μg/L	500	10/11/2016 5:18:00 PM	R37866
Ethylbenzene	2700	5.6	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Methyl tert-butyl ether (MTBE)	1100	11	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,2,4-Trimethylbenzene	1500	5.5	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,3,5-Trimethylbenzene	410	5.8	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,2-Dichloroethane (EDC)	ND	5.8	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,2-Dibromoethane (EDB)	ND	5.6	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Naphthalene	320	4.6	100		μg/L	50	10/11/2016 5:42:00 PM	R37866
1-Methylnaphthalene	61	10	200	J	μg/L	50	10/11/2016 5:42:00 PM	R37866
2-Methylnaphthalene	82	7.9	200	J	μg/L	50	10/11/2016 5:42:00 PM	R37866
Acetone	1500	250	500		μg/L	50	10/11/2016 5:42:00 PM	R37866
Bromobenzene	ND	4.9	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Bromodichloromethane	ND	7.0	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Bromoform	ND	5.1	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Bromomethane	ND	39	150		μg/L	50	10/11/2016 5:42:00 PM	R37866
2-Butanone	830	37	500		μg/L	50	10/11/2016 5:42:00 PM	R37866
Carbon disulfide	ND	30	500		μg/L	50	10/11/2016 5:42:00 PM	R37866
Carbon Tetrachloride	ND	5.4	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Chlorobenzene	ND	5.7	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Chloroethane	ND	9.6	100		μg/L	50	10/11/2016 5:42:00 PM	R37866
Chloroform	ND	4.4	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Chloromethane	ND	11	150		μg/L	50	10/11/2016 5:42:00 PM	R37866
2-Chlorotoluene	ND	20	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
4-Chlorotoluene	ND	6.4	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
cis-1,2-DCE	ND	6.2	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
cis-1,3-Dichloropropene	ND	5.3	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,2-Dibromo-3-chloropropane	ND	12	100		μg/L	50	10/11/2016 5:42:00 PM	R37866
Dibromochloromethane	ND	4.3	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Dibromomethane	ND	6.0	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,2-Dichlorobenzene	ND	20	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,3-Dichlorobenzene	ND	7.2	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,4-Dichlorobenzene	ND	7.1	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Dichlorodifluoromethane	ND	18	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,1-Dichloroethane	ND	5.4	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,1-Dichloroethene	ND	5.4	50		μg/L	50	10/11/2016 5:42:00 PM	
1,2-Dichloropropane	ND	5.5	50		μg/L	50	10/11/2016 5:42:00 PM	
1,3-Dichloropropane	ND	7.8	50		μg/L	50	10/11/2016 5:42:00 PM	
2,2-Dichloropropane	ND	8.3	100		μg/L	50	10/11/2016 5:42:00 PM	
1,1-Dichloropropene	ND	6.7	50		μg/L	50	10/11/2016 5:42:00 PM	

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

Qualifiers:

CLIENT:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- Page 1 of 49
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: TK-569-1-GW

Project: OW-14 Source Inv. Collection Date: 10/5/2016 1:55:00 PM

Lab ID: 1610355-001A **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Hexachlorobutadiene	ND	9.9	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
2-Hexanone	ND	42	500		μg/L	50	10/11/2016 5:42:00 PM	R37866
Isopropylbenzene	53	5.2	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
4-Isopropyltoluene	9.7	7.0	50	J	μg/L	50	10/11/2016 5:42:00 PM	R37866
4-Methyl-2-pentanone	200	21	500	J	μg/L	50	10/11/2016 5:42:00 PM	R37866
Methylene Chloride	ND	9.4	150		μg/L	50	10/11/2016 5:42:00 PM	R37866
n-Butylbenzene	20	8.0	150	J	μg/L	50	10/11/2016 5:42:00 PM	R37866
n-Propylbenzene	190	6.6	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
sec-Butylbenzene	11	6.2	50	J	μg/L	50	10/11/2016 5:42:00 PM	R37866
Styrene	ND	5.5	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
tert-Butylbenzene	ND	5.8	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,1,1,2-Tetrachloroethane	ND	5.6	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,1,2,2-Tetrachloroethane	ND	6.4	100		μg/L	50	10/11/2016 5:42:00 PM	R37866
Tetrachloroethene (PCE)	ND	7.6	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
trans-1,2-DCE	ND	20	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
trans-1,3-Dichloropropene	ND	5.2	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,2,3-Trichlorobenzene	ND	5.6	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,2,4-Trichlorobenzene	ND	6.6	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,1,1-Trichloroethane	ND	4.6	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,1,2-Trichloroethane	ND	6.4	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Trichloroethene (TCE)	ND	8.8	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Trichlorofluoromethane	ND	10	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
1,2,3-Trichloropropane	ND	10	100		μg/L	50	10/11/2016 5:42:00 PM	R37866
Vinyl chloride	ND	9.8	50		μg/L	50	10/11/2016 5:42:00 PM	R37866
Xylenes, Total	15000	180	750		μg/L	500	10/11/2016 5:18:00 PM	R37866
Surr: 1,2-Dichloroethane-d4	84.7	0	70-130		%Rec	50	10/11/2016 5:42:00 PM	R37866
Surr: 4-Bromofluorobenzene	96.3	0	70-130		%Rec	50	10/11/2016 5:42:00 PM	R37866
Surr: Dibromofluoromethane	92.4	0	70-130		%Rec	50	10/11/2016 5:42:00 PM	R37866
Surr: Toluene-d8	101	0	70-130		%Rec	50	10/11/2016 5:42:00 PM	R37866

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range

Page 2 of 49

- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: TK-569-1-GW

Project: OW-14 Source Inv. **Collection Date:** 10/5/2016 1:55:00 PM

Lab ID: 1610355-001B **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual Units	DF	Date Analyzed I	Batch ID
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB	
Gasoline Range Organics (GRO)	260	13	25	mg/L	500	10/11/2016 11:17:09 AM	G37864
Surr: BFB	83.8	0	66.4-120	%Rec	500	10/11/2016 11:17:09 AM	G37864

Oualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated Method	Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range	
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	S
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 3 of 49
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	1 age 3 of 47
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of lin	nit as specified

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: TK-569-1-GW

Project: OW-14 Source Inv. Collection Date: 10/5/2016 1:55:00 PM

Lab ID: 1610355-001C **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual Units	DF	Date Analyzed Batch I	D
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: TOM	
Diesel Range Organics (DRO)	22	0.69	1.0	mg/L	1	10/11/2016 11:56:47 AM 27993	3
Motor Oil Range Organics (MRO)	ND	5.0	5.0	mg/L	1	10/11/2016 11:56:47 AM 27993	3
Surr: DNOP	129	0	77.1-144	%Rec	1	10/11/2016 11:56:47 AM 27993	3

Oualifiers:	*	Value exceeds Maximum Contaminant Level.	В	B Analyte detected in the associated Method Blank					
	D Sample Diluted Due to Matrix			Value above quantitation range					
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits					
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 4 of 49				
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	1 4 90 4 01 47				
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of lin	nit as specified				

Lab Order: 1610355

Date Reported: 11/21/2016

Hall Environmental Analysis Laboratory, Inc.

Western Refining Southwest, Gallup Client Sample ID: TK-569-1-GW

Project: OW-14 Source Inv. Collection Date: 10/5/2016 1:55:00 PM

Lab ID: 1610355-001D **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Acenaphthylene	ND	2.4	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Aniline	ND	2.4	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Anthracene	ND	2.5	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Azobenzene	ND	2.7	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Benz(a)anthracene	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Benzo(a)pyrene	ND	2.7	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Benzo(b)fluoranthene	ND	2.9	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Benzo(g,h,i)perylene	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Benzo(k)fluoranthene	ND	3.0	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Benzoic acid	43	2.6	20		μg/L	1	10/20/2016 1:03:05 PM	27995
Benzyl alcohol	ND	3.0	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Bis(2-chloroethoxy)methane	ND	2.8	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Bis(2-chloroethyl)ether	ND	2.7	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Bis(2-chloroisopropyl)ether	ND	1.9	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Bis(2-ethylhexyl)phthalate	12	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	27995
4-Bromophenyl phenyl ether	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Butyl benzyl phthalate	ND	2.5	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Carbazole	ND	2.3	10		μg/L	1	10/20/2016 1:03:05 PM	27995
4-Chloro-3-methylphenol	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	27995
4-Chloroaniline	ND	2.7	10		μg/L	1	10/20/2016 1:03:05 PM	27995
2-Chloronaphthalene	ND	2.3	10		μg/L	1	10/20/2016 1:03:05 PM	27995
2-Chlorophenol	ND	2.2	10		μg/L	1	10/20/2016 1:03:05 PM	27995
4-Chlorophenyl phenyl ether	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Chrysene	ND	2.8	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Di-n-butyl phthalate	ND	2.4	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Di-n-octyl phthalate	6.8	2.0	10	J	μg/L	1	10/20/2016 1:03:05 PM	27995
Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Dibenzofuran	ND	2.5	10		μg/L	1	10/20/2016 1:03:05 PM	27995
1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	10/20/2016 1:03:05 PM	27995
1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	10/20/2016 1:03:05 PM	27995
1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	10/20/2016 1:03:05 PM	
3,3'-Dichlorobenzidine	ND	2.4	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Diethyl phthalate	ND	2.7	10		μg/L	1	10/20/2016 1:03:05 PM	27995
Dimethyl phthalate	26	2.4	10		μg/L	1	10/20/2016 1:03:05 PM	27995
2,4-Dichlorophenol	ND	2.3	20		μg/L	1	10/20/2016 1:03:05 PM	
2,4-Dimethylphenol	33	3.0	10		μg/L	1	10/20/2016 1:03:05 PM	
4,6-Dinitro-2-methylphenol	ND	1.8	20		μg/L	1	10/20/2016 1:03:05 PM	
2,4-Dinitrophenol	ND	2.8	20		μg/L	1	10/20/2016 1:03:05 PM	
2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	10/20/2016 1:03:05 PM	

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

Qualifiers:

CLIENT:

- * Value exceeds Maximum Contaminant Level.
- Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- Page 5 of 49
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: **1610355**

Date Reported: 11/21/2016

Hall Environmental Analysis Laboratory, Inc.

Western Refining Southwest, Gallup Client Sample ID: TK-569-1-GW

Project: OW-14 Source Inv. Collection Date: 10/5/2016 1:55:00 PM

Lab ID: 1610355-001D **Matrix:** Aqueous

Analyses	Result	MDI	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	_
2,6-Dinitrotoluene	ND	2.7	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Fluoranthene	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Fluorene	ND	2.7	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Hexachlorobenzene	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Hexachlorobutadiene	ND	2.2	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Hexachlorocyclopentadiene	ND	2.3	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Hexachloroethane	ND	2.4	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Indeno(1,2,3-cd)pyrene	ND	3.0	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Isophorone	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
1-Methylnaphthalene	71	2.9	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
2-Methylnaphthalene	76	2.9	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
2-Methylphenol	68	2.5	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
3+4-Methylphenol	110	2.3	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
N-Nitrosodi-n-propylamine	ND	2.4	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
N-Nitrosodimethylamine	ND	2.2	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
N-Nitrosodiphenylamine	ND	2.3	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Naphthalene	210	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
2-Nitroaniline	ND	2.8	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
3-Nitroaniline	ND	2.9	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
4-Nitroaniline	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Nitrobenzene	ND	2.8	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
2-Nitrophenol	ND	2.4	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
4-Nitrophenol	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Pentachlorophenol	ND	2.3	20		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Phenanthrene	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Phenol	69	2.0	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Pyrene	ND	3.1	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Pyridine	ND	2.2	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
1,2,4-Trichlorobenzene	ND	2.6	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
2,4,5-Trichlorophenol	ND	2.2	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
2,4,6-Trichlorophenol	ND	2.4	10		μg/L	1	10/20/2016 1:03:05 PM	1 27995
Surr: 2-Fluorophenol	6.31	0	15-123	S	%Rec	1	10/20/2016 1:03:05 PM	1 27995
Surr: Phenol-d5	38.5	0	15-124		%Rec	1	10/20/2016 1:03:05 PM	1 27995
Surr: 2,4,6-Tribromophenol	36.0	0	18.4-134		%Rec	1	10/20/2016 1:03:05 PM	1 27995
Surr: Nitrobenzene-d5	45.8	0	28.8-134		%Rec	1	10/20/2016 1:03:05 PM	1 27995
Surr: 2-Fluorobiphenyl	49.4	0	35.9-125		%Rec	1	10/20/2016 1:03:05 PM	1 27995
Surr: 4-Terphenyl-d14	34.3	0	15-146		%Rec	1	10/20/2016 1:03:05 PM	1 27995

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

Qualifiers:

CLIENT:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range

Page 6 of 49

- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: 1610355

Date Reported: 11/21/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Lab ID: 1610355-001E

Client Sample ID: TK-569-1-GW

 $\textbf{Collection Date:}\ 10/5/2016\ 1:55:00\ PM$

Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Fluoride	ND	0.25	0.50		mg/L	5	10/11/2016 3:31:09 PM	R37871
Chloride	140	1.0	10		mg/L	20	10/11/2016 3:43:33 PM	R37871
Sulfate	0.99	0.71	2.5	J	mg/L	5	10/11/2016 3:31:09 PM	R37871

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated Method	l Blank			
•	D	Sample Diluted Due to Matrix	E	Value above quantitation range				
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits				
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 7 of 49			
	R RPD outside accepted recovery limits		RL	Reporting Detection Limit	1 age / 01 47			
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of lin	nit as specified			

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: TK-569-1-GW

Project: OW-14 Source Inv. **Collection Date:** 10/5/2016 1:55:00 PM

Lab ID: 1610355-001F **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed 1	Batch ID
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	8.7	0.013	0.020	*	mg/L	10	11/1/2016 5:54:01 PM	28269
Beryllium	0.0017	0.00036	0.0020	J	mg/L	1	10/27/2016 7:09:55 PM	28269
Cadmium	ND	0.0015	0.0020		mg/L	1	10/27/2016 7:09:55 PM	28269
Chromium	0.014	0.0027	0.0060		mg/L	1	10/27/2016 7:09:55 PM	28269
Cobalt	0.0094	0.0017	0.0060		mg/L	1	10/27/2016 7:09:55 PM	28269
Iron	28	1.0	1.0	*	mg/L	50	11/1/2016 5:55:54 PM	28269
Manganese	4.2	0.0016	0.010	*	mg/L	5	11/1/2016 3:48:08 PM	28269
Nickel	0.057	0.0031	0.010		mg/L	1	10/27/2016 7:09:55 PM	28269
Silver	ND	0.0028	0.0050		mg/L	1	10/27/2016 7:09:55 PM	28269
Vanadium	0.031	0.0013	0.050	J	mg/L	1	10/27/2016 7:09:55 PM	28269
Zinc	0.061	0.0027	0.010		mg/L	1	10/27/2016 7:09:55 PM	28269
EPA 200.8: METALS							Analyst: JLF	
Antimony	ND	0.0024	0.0050		mg/L	5	11/7/2016 8:58:28 PM	28468
Arsenic	0.016	0.0011	0.0050	*	mg/L	5	10/31/2016 6:31:00 PM	28269
Lead	0.021	0.00017	0.00050	*	mg/L	1	10/26/2016 3:05:34 PM	28269
Selenium	0.014	0.0042	0.020	J	mg/L	20	10/26/2016 6:16:39 PM	28269
EPA METHOD 245.1: MERCURY							Analyst: pmf	
Mercury	0.00021	0.000053	0.00020		mg/L	1	10/13/2016 12:26:39 PM	1 28031

Oualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated N	Method Blank
C	D	Sample Diluted Due to Matrix	E	Value above quantitation range	
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation	n limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 8 of 49
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	rage of or 47
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is ou	t of limit as specified

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: TK-569-1-GW

Project: OW-14 Source Inv. Collection Date: 10/5/2016 1:55:00 PM

Lab ID: 1610355-001G **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed B	atch ID
EPA METHOD 200.7: DISSOLVED ME	TALS						Analyst: MED	
Barium	6.3	0.013	0.020	*	mg/L	10	10/24/2016 3:09:42 PM	A38164
Beryllium	ND	0.00031	0.0020		mg/L	1	10/21/2016 6:05:07 PM	B38141
Cadmium	ND	0.00075	0.0020		mg/L	1	10/21/2016 6:05:07 PM	B38141
Chromium	ND	0.0018	0.0060		mg/L	1	10/21/2016 6:05:07 PM	B38141
Cobalt	0.0035	0.00074	0.0060	J	mg/L	1	10/21/2016 6:05:07 PM	B38141
Iron	7.9	0.20	0.20	*	mg/L	10	10/24/2016 3:09:42 PM	A38164
Manganese	2.6	0.0032	0.020	*	mg/L	10	10/24/2016 3:09:42 PM	A38164
Nickel	0.050	0.0024	0.010		mg/L	1	10/21/2016 6:05:07 PM	B38141
Silver	ND	0.0028	0.0050		mg/L	1	10/21/2016 6:05:07 PM	B38141
Vanadium	0.0048	0.0013	0.050	J	mg/L	1	10/21/2016 6:05:07 PM	B38141
Zinc	0.022	0.0028	0.010		mg/L	1	10/21/2016 6:05:07 PM	B38141
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/28/2016 11:50:32 AM	A38300
Arsenic	0.014	0.00069	0.0050	*	mg/L	5	10/28/2016 4:17:14 PM	C38300
Lead	0.00017	0.00017	0.00050	J	mg/L	1	10/25/2016 7:47:22 PM	B38214
Selenium	0.0097	0.0042	0.020	J	mg/L	20	10/28/2016 4:20:17 PM	C38300
EPA METHOD 245.1: MERCURY							Analyst: DBD	
Mercury	ND	0.000053	0.00020		mg/L	1	10/28/2016 10:38:15 AM	28337

Oualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated Met	thod Blank		
C	D	Sample Diluted Due to Matrix	E	Value above quantitation range			
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits			
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 9 of 49		
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	1 age 7 01 47		
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of	f limit as specified		

Lab Order: 1610355

Date Reported: 11/21/2016

Hall Environmental Analysis Laboratory, Inc.

Western Refining Southwest, Gallup Client Sample ID: TK-569-2-GW

Project: OW-14 Source Inv. **Collection Date:** 10/5/2016 3:00:00 PM

Lab ID: 1610355-002A **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Benzene	23000	48	500		μg/L	500	10/11/2016 6:54:00 PM	R37866
Toluene	25000	59	500		μg/L	500	10/11/2016 6:54:00 PM	R37866
Ethylbenzene	2000	5.6	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Methyl tert-butyl ether (MTBE)	1000	11	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,2,4-Trimethylbenzene	1000	5.5	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,3,5-Trimethylbenzene	300	5.8	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,2-Dichloroethane (EDC)	ND	5.8	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,2-Dibromoethane (EDB)	ND	5.6	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Naphthalene	88	4.6	100	J	μg/L	50	10/11/2016 7:18:00 PM	R37866
1-Methylnaphthalene	26	10	200	J	μg/L	50	10/11/2016 7:18:00 PM	R37866
2-Methylnaphthalene	31	7.9	200	J	μg/L	50	10/11/2016 7:18:00 PM	R37866
Acetone	770	250	500		μg/L	50	10/11/2016 7:18:00 PM	R37866
Bromobenzene	ND	4.9	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Bromodichloromethane	ND	7.0	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Bromoform	ND	5.1	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Bromomethane	ND	39	150		μg/L	50	10/11/2016 7:18:00 PM	R37866
2-Butanone	740	37	500		μg/L	50	10/11/2016 7:18:00 PM	R37866
Carbon disulfide	ND	30	500		μg/L	50	10/11/2016 7:18:00 PM	R37866
Carbon Tetrachloride	ND	5.4	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Chlorobenzene	ND	5.7	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Chloroethane	ND	9.6	100		μg/L	50	10/11/2016 7:18:00 PM	R37866
Chloroform	ND	4.4	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Chloromethane	ND	11	150		μg/L	50	10/11/2016 7:18:00 PM	R37866
2-Chlorotoluene	ND	20	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
4-Chlorotoluene	ND	6.4	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
cis-1,2-DCE	ND	6.2	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
cis-1,3-Dichloropropene	ND	5.3	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,2-Dibromo-3-chloropropane	ND	12	100		μg/L	50	10/11/2016 7:18:00 PM	R37866
Dibromochloromethane	ND	4.3	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Dibromomethane	ND	6.0	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,2-Dichlorobenzene	ND	20	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,3-Dichlorobenzene	ND	7.2	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,4-Dichlorobenzene	ND	7.1	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Dichlorodifluoromethane	ND	18	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,1-Dichloroethane	ND	5.4	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,1-Dichloroethene	ND	5.4	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,2-Dichloropropane	ND	5.5	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,3-Dichloropropane	ND	7.8	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
2,2-Dichloropropane	ND	8.3	100		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,1-Dichloropropene	ND	6.7	50		μg/L	50	10/11/2016 7:18:00 PM	R37866

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

Qualifiers:

CLIENT:

- * Value exceeds Maximum Contaminant Level.
- Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- Page 10 of 49
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: **1610355**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: TK-569-2-GW

Project: OW-14 Source Inv. Collection Date: 10/5/2016 3:00:00 PM

Lab ID: 1610355-002A **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Hexachlorobutadiene	ND	9.9	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
2-Hexanone	ND	42	500		μg/L	50	10/11/2016 7:18:00 PM	R37866
Isopropylbenzene	160	5.2	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
4-Isopropyltoluene	26	7.0	50	J	μg/L	50	10/11/2016 7:18:00 PM	R37866
4-Methyl-2-pentanone	160	21	500	J	μg/L	50	10/11/2016 7:18:00 PM	R37866
Methylene Chloride	ND	9.4	150		μg/L	50	10/11/2016 7:18:00 PM	R37866
n-Butylbenzene	22	8.0	150	J	μg/L	50	10/11/2016 7:18:00 PM	R37866
n-Propylbenzene	180	6.6	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
sec-Butylbenzene	26	6.2	50	J	μg/L	50	10/11/2016 7:18:00 PM	R37866
Styrene	ND	5.5	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
tert-Butylbenzene	ND	5.8	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,1,1,2-Tetrachloroethane	ND	5.6	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,1,2,2-Tetrachloroethane	ND	6.4	100		μg/L	50	10/11/2016 7:18:00 PM	R37866
Tetrachloroethene (PCE)	ND	7.6	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
trans-1,2-DCE	ND	20	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
trans-1,3-Dichloropropene	ND	5.2	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,2,3-Trichlorobenzene	ND	5.6	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,2,4-Trichlorobenzene	ND	6.6	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,1,1-Trichloroethane	ND	4.6	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,1,2-Trichloroethane	ND	6.4	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Trichloroethene (TCE)	ND	8.8	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Trichlorofluoromethane	ND	10	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
1,2,3-Trichloropropane	ND	10	100		μg/L	50	10/11/2016 7:18:00 PM	R37866
Vinyl chloride	ND	9.8	50		μg/L	50	10/11/2016 7:18:00 PM	R37866
Xylenes, Total	10000	18	75		μg/L	50	10/11/2016 7:18:00 PM	R37866
Surr: 1,2-Dichloroethane-d4	84.0	0	70-130		%Rec	50	10/11/2016 7:18:00 PM	R37866
Surr: 4-Bromofluorobenzene	98.1	0	70-130		%Rec	50	10/11/2016 7:18:00 PM	R37866
Surr: Dibromofluoromethane	92.1	0	70-130		%Rec	50	10/11/2016 7:18:00 PM	R37866
Surr: Toluene-d8	101	0	70-130		%Rec	50	10/11/2016 7:18:00 PM	R37866

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- Page 11 of 49
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: TK-569-2-GW

Project: OW-14 Source Inv. **Collection Date:** 10/5/2016 3:00:00 PM

Lab ID: 1610355-002B **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANG	Ε					Analyst: NSB	
Gasoline Range Organics (GRO)	160	13	25	mg/L	500	10/11/2016 12:30:13	PM G37864
Surr: BFB	87.5	0 6	66.4-120	%Rec	500	10/11/2016 12:30:13	PM G37864

Oualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated Method Blank		
	D	Sample Diluted Due to Matrix	E	Value above quantitation range		
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits		
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 12 of 49	
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	1 ugc 12 01 4)	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified		

Lab Order: 1610355

Date Reported: 11/21/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Lab ID: 1610355-002C

Client Sample ID: TK-569-2-GW

Collection Date: 10/5/2016 3:00:00 PM

Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGI	E					Analyst: TOM	
Diesel Range Organics (DRO)	14	0.69	1.0	mg/L	1	10/11/2016 12:18:31	PM 27993
Motor Oil Range Organics (MRO)	ND	5.0	5.0	mg/L	1	10/11/2016 12:18:31	PM 27993
Surr: DNOP	131	0	77.1-144	%Rec	1	10/11/2016 12:18:31	PM 27993

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated Method Blank Value above quantitation range Analyte detected below quantitation limits		
	D	Sample Diluted Due to Matrix	E			
	Н	Holding times for preparation or analysis exceeded	J			
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 13 of 49	
R		RPD outside accepted recovery limits	RL	Reporting Detection Limit	1 age 13 01 47	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified		

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: TK-569-2-GW

Project: OW-14 Source Inv. Collection Date: 10/5/2016 3:00:00 PM

Lab ID: 1610355-002D **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Acenaphthylene	ND	2.4	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Aniline	ND	2.4	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Anthracene	ND	2.5	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Azobenzene	ND	2.7	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Benz(a)anthracene	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Benzo(a)pyrene	ND	2.7	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Benzo(b)fluoranthene	ND	2.9	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Benzo(g,h,i)perylene	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Benzo(k)fluoranthene	ND	3.0	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Benzoic acid	43	2.6	20		μg/L	1	10/20/2016 2:26:59 PM	27995
Benzyl alcohol	ND	3.0	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Bis(2-chloroethoxy)methane	ND	2.8	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Bis(2-chloroethyl)ether	ND	2.7	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Bis(2-chloroisopropyl)ether	ND	1.9	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Bis(2-ethylhexyl)phthalate	7.1	2.6	10	J	μg/L	1	10/20/2016 2:26:59 PM	27995
4-Bromophenyl phenyl ether	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Butyl benzyl phthalate	ND	2.5	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Carbazole	ND	2.3	10		μg/L	1	10/20/2016 2:26:59 PM	27995
4-Chloro-3-methylphenol	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	27995
4-Chloroaniline	ND	2.7	10		μg/L	1	10/20/2016 2:26:59 PM	27995
2-Chloronaphthalene	ND	2.3	10		μg/L	1	10/20/2016 2:26:59 PM	27995
2-Chlorophenol	ND	2.2	10		μg/L	1	10/20/2016 2:26:59 PM	27995
4-Chlorophenyl phenyl ether	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Chrysene	ND	2.8	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Di-n-butyl phthalate	ND	2.4	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Di-n-octyl phthalate	6.8	2.0	10	J	μg/L	1	10/20/2016 2:26:59 PM	27995
Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Dibenzofuran	ND	2.5	10		μg/L	1	10/20/2016 2:26:59 PM	27995
1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	10/20/2016 2:26:59 PM	27995
1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	10/20/2016 2:26:59 PM	27995
1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	10/20/2016 2:26:59 PM	27995
3.3´-Dichlorobenzidine	ND	2.4	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Diethyl phthalate	ND	2.7	10		μg/L	1	10/20/2016 2:26:59 PM	27995
Dimethyl phthalate	18	2.4	10		μg/L	1	10/20/2016 2:26:59 PM	27995
2,4-Dichlorophenol	ND	2.3	20		μg/L	1	10/20/2016 2:26:59 PM	27995
2,4-Dimethylphenol	46	3.0	10		μg/L	1	10/20/2016 2:26:59 PM	27995
4,6-Dinitro-2-methylphenol	ND	1.8	20		μg/L	1	10/20/2016 2:26:59 PM	27995
2,4-Dinitrophenol	ND	2.8	20		μg/L	1	10/20/2016 2:26:59 PM	27995
2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	10/20/2016 2:26:59 PM	

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- Page 14 of 49
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: TK-569-2-GW

Project: OW-14 Source Inv. Collection Date: 10/5/2016 3:00:00 PM

Lab ID: 1610355-002D Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	_
2,6-Dinitrotoluene	ND	2.7	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Fluoranthene	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Fluorene	ND	2.7	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Hexachlorobenzene	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Hexachlorobutadiene	ND	2.2	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Hexachlorocyclopentadiene	ND	2.3	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Hexachloroethane	ND	2.4	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Indeno(1,2,3-cd)pyrene	ND	3.0	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Isophorone	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
1-Methylnaphthalene	59	2.9	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
2-Methylnaphthalene	ND	2.9	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
2-Methylphenol	80	2.5	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
3+4-Methylphenol	130	2.3	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
N-Nitrosodi-n-propylamine	ND	2.4	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
N-Nitrosodimethylamine	ND	2.2	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
N-Nitrosodiphenylamine	ND	2.3	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Naphthalene	47	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
2-Nitroaniline	ND	2.8	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
3-Nitroaniline	ND	2.9	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
4-Nitroaniline	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Nitrobenzene	ND	2.8	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
2-Nitrophenol	ND	2.4	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
4-Nitrophenol	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Pentachlorophenol	ND	2.3	20		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Phenanthrene	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Phenol	96	2.0	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Pyrene	ND	3.1	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Pyridine	ND	2.2	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
1,2,4-Trichlorobenzene	ND	2.6	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
2,4,5-Trichlorophenol	ND	2.2	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
2,4,6-Trichlorophenol	ND	2.4	10		μg/L	1	10/20/2016 2:26:59 PM	1 27995
Surr: 2-Fluorophenol	15.2	0	15-123		%Rec	1	10/20/2016 2:26:59 PM	1 27995
Surr: Phenol-d5	40.2	0	15-124		%Rec	1	10/20/2016 2:26:59 PM	1 27995
Surr: 2,4,6-Tribromophenol	63.7	0	18.4-134		%Rec	1	10/20/2016 2:26:59 PM	1 27995
Surr: Nitrobenzene-d5	49.5	0	28.8-134		%Rec	1	10/20/2016 2:26:59 PM	1 27995
Surr: 2-Fluorobiphenyl	56.3	0	35.9-125		%Rec	1	10/20/2016 2:26:59 PM	1 27995
Surr: 4-Terphenyl-d14	51.5	0	15-146		%Rec	1	10/20/2016 2:26:59 PM	1 27995

Ω_{110}	1:4:	030	

- Value exceeds Maximum Contaminant Level.
- Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
 - Page 15 of 49 Reporting Detection Limit
- RL
- Sample container temperature is out of limit as specified

Lab Order: 1610355

Date Reported: 11/21/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Lab ID: 1610355-002E

Client Sample ID: TK-569-2-GW

Collection Date: 10/5/2016 3:00:00 PM

Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Fluoride	ND	0.25	0.50		mg/L	5	10/11/2016 3:55:58 PM	R37871
Chloride	170	1.0	10		mg/L	20	10/11/2016 4:08:23 PM	R37871
Sulfate	0.96	0.71	2.5	J	mg/L	5	10/11/2016 3:55:58 PM	R37871

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated Method Blank Value above quantitation range Analyte detected below quantitation limits		
	D	Sample Diluted Due to Matrix	E			
	Н	Holding times for preparation or analysis exceeded	J			
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 16 of 49	
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	ruge 10 or 47	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified		

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: TK-569-2-GW

Project: OW-14 Source Inv. Collection Date: 10/5/2016 3:00:00 PM

Lab ID: 1610355-002F **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	4.9	0.0066	0.010	*	mg/L	5	11/1/2016 3:51:34 PM	28269
Beryllium	0.00043	0.00036	0.0020	J	mg/L	1	10/27/2016 7:11:45 PM	28269
Cadmium	ND	0.0015	0.0020		mg/L	1	10/27/2016 7:11:45 PM	28269
Chromium	0.014	0.0027	0.0060		mg/L	1	10/27/2016 7:11:45 PM	28269
Cobalt	0.0076	0.0017	0.0060		mg/L	1	10/27/2016 7:11:45 PM	28269
Iron	17	1.0	1.0	*	mg/L	50	11/3/2016 6:54:48 PM	28269
Manganese	3.4	0.0016	0.010	*	mg/L	5	11/1/2016 3:51:34 PM	28269
Nickel	0.054	0.0031	0.010		mg/L	1	10/27/2016 7:11:45 PM	28269
Silver	ND	0.0028	0.0050		mg/L	1	10/27/2016 7:11:45 PM	28269
Vanadium	0.0086	0.0013	0.050	J	mg/L	1	10/27/2016 7:11:45 PM	28269
Zinc	0.015	0.0027	0.010		mg/L	1	10/27/2016 7:11:45 PM	28269
EPA 200.8: METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	11/7/2016 12:02:06 PM	28468
Arsenic	0.010	0.0011	0.0050	*	mg/L	5	10/31/2016 6:36:09 PM	28269
Lead	0.0035	0.00017	0.00050		mg/L	1	10/26/2016 3:10:43 PM	28269
Selenium	0.016	0.0011	0.0050		mg/L	5	10/26/2016 6:26:59 PM	28269
EPA METHOD 245.1: MERCURY							Analyst: pmf	
Mercury	0.00016	0.000053	0.00020	J	mg/L	1	10/13/2016 12:28:43 PM	1 28031

Qualifiers:	Oualifiers: * Value exceeds Maximum Contaminant Level.		В	Analyte detected in the associated Method Blank			
C	D	Sample Diluted Due to Matrix	E	Value above quantitation range			
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits			
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 17 of 49		
R		RPD outside accepted recovery limits	RL	Reporting Detection Limit	1 age 17 01 47		
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out	of limit as specified		

Lab Order: 1610355

Date Reported: 11/21/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup Client Sample ID: TK-569-2-GW

Project: OW-14 Source Inv. Collection Date: 10/5/2016 3:00:00 PM

Lab ID: 1610355-002G **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed B	atch ID
EPA METHOD 200.7: DISSOLVED ME	TALS						Analyst: MED	
Barium	5.1	0.013	0.020	*	mg/L	10	10/24/2016 3:15:40 PM	A38164
Beryllium	ND	0.00031	0.0020		mg/L	1	10/21/2016 6:16:02 PM	B38141
Cadmium	ND	0.00075	0.0020		mg/L	1	10/21/2016 6:16:02 PM	B38141
Chromium	ND	0.0018	0.0060		mg/L	1	10/21/2016 6:16:02 PM	B38141
Cobalt	0.0068	0.00074	0.0060		mg/L	1	10/21/2016 6:16:02 PM	B38141
Iron	0.55	0.020	0.020	*	mg/L	1	10/24/2016 3:13:45 PM	A38164
Manganese	3.1	0.0032	0.020	*	mg/L	10	10/24/2016 3:15:40 PM	A38164
Nickel	0.061	0.0024	0.010		mg/L	1	10/21/2016 6:16:02 PM	B38141
Silver	ND	0.0028	0.0050		mg/L	1	10/21/2016 6:16:02 PM	B38141
Vanadium	0.0044	0.0013	0.050	J	mg/L	1	10/21/2016 6:16:02 PM	B38141
Zinc	0.0069	0.0028	0.010	J	mg/L	1	10/21/2016 6:16:02 PM	B38141
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/28/2016 11:55:41 AM	A38300
Arsenic	0.010	0.00069	0.0050	*	mg/L	5	10/28/2016 4:23:21 PM	C38300
Lead	ND	0.00017	0.00050		mg/L	1	10/25/2016 7:50:25 PM	B38214
Selenium	0.011	0.0042	0.020	J	mg/L	20	10/28/2016 4:35:02 PM	C38300
EPA METHOD 245.1: MERCURY							Analyst: DBD	
Mercury	0.00010	0.000053	0.00020	J	mg/L	1	10/28/2016 10:40:16 AM	28337

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated M	ethod Blank	
D Sa		Sample Diluted Due to Matrix	E	Value above quantitation range		
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits		
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 18 of 49	
R		RPD outside accepted recovery limits	RL	Reporting Detection Limit	1 age 10 01 47	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out	of limit as specified	

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT:Western Refining Southwest, GallupClient Sample ID: DUP-GWProject:OW-14 Source Inv.Collection Date: 10/5/2016Lab ID:1610355-003AMatrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Benzene	35000	48	500		μg/L	500	10/11/2016 7:42:00 PM	1 R37866
Toluene	43000	59	500		μg/L	500	10/11/2016 7:42:00 PM	1 R37866
Ethylbenzene	2800	5.6	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Methyl tert-butyl ether (MTBE)	1100	11	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,2,4-Trimethylbenzene	1600	5.5	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,3,5-Trimethylbenzene	440	5.8	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,2-Dichloroethane (EDC)	ND	5.8	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,2-Dibromoethane (EDB)	ND	5.6	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Naphthalene	330	4.6	100		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1-Methylnaphthalene	58	10	200	J	μg/L	50	10/11/2016 8:05:00 PM	1 R37866
2-Methylnaphthalene	83	7.9	200	J	μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Acetone	1400	250	500		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Bromobenzene	ND	4.9	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Bromodichloromethane	ND	7.0	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Bromoform	ND	5.1	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Bromomethane	ND	39	150		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
2-Butanone	840	37	500		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Carbon disulfide	ND	30	500		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Carbon Tetrachloride	ND	5.4	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Chlorobenzene	ND	5.7	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Chloroethane	ND	9.6	100		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Chloroform	ND	4.4	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Chloromethane	ND	11	150		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
2-Chlorotoluene	ND	20	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
4-Chlorotoluene	ND	6.4	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
cis-1,2-DCE	ND	6.2	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
cis-1,3-Dichloropropene	ND	5.3	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,2-Dibromo-3-chloropropane	ND	12	100		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Dibromochloromethane	ND	4.3	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Dibromomethane	ND	6.0	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,2-Dichlorobenzene	ND	20	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,3-Dichlorobenzene	ND	7.2	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,4-Dichlorobenzene	ND	7.1	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
Dichlorodifluoromethane	ND	18	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,1-Dichloroethane	ND	5.4	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,1-Dichloroethene	ND	5.4	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,2-Dichloropropane	ND	5.5	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,3-Dichloropropane	ND	7.8	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
2,2-Dichloropropane	ND	8.3	100		μg/L	50	10/11/2016 8:05:00 PM	1 R37866
1,1-Dichloropropene	ND	6.7	50		μg/L	50	10/11/2016 8:05:00 PM	1 R37866

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- O Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- Page 19 of 49
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: **1610355**

Hall Environmental Analysis Laboratory, Inc. Date Reported: 11/21/2016

CLIENT:Western Refining Southwest, GallupClient Sample ID: DUP-GWProject:OW-14 Source Inv.Collection Date: 10/5/2016Lab ID:1610355-003AMatrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Hexachlorobutadiene	ND	9.9	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
2-Hexanone	320	42	500	J	μg/L	50	10/11/2016 8:05:00 PM	R37866
Isopropylbenzene	57	5.2	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
4-Isopropyltoluene	10	7.0	50	J	μg/L	50	10/11/2016 8:05:00 PM	R37866
4-Methyl-2-pentanone	180	21	500	J	μg/L	50	10/11/2016 8:05:00 PM	R37866
Methylene Chloride	ND	9.4	150		μg/L	50	10/11/2016 8:05:00 PM	R37866
n-Butylbenzene	22	8.0	150	J	μg/L	50	10/11/2016 8:05:00 PM	R37866
n-Propylbenzene	210	6.6	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
sec-Butylbenzene	12	6.2	50	J	μg/L	50	10/11/2016 8:05:00 PM	R37866
Styrene	ND	5.5	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
tert-Butylbenzene	ND	5.8	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
1,1,1,2-Tetrachloroethane	ND	5.6	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
1,1,2,2-Tetrachloroethane	ND	6.4	100		μg/L	50	10/11/2016 8:05:00 PM	R37866
Tetrachloroethene (PCE)	ND	7.6	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
trans-1,2-DCE	ND	20	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
trans-1,3-Dichloropropene	ND	5.2	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
1,2,3-Trichlorobenzene	ND	5.6	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
1,2,4-Trichlorobenzene	ND	6.6	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
1,1,1-Trichloroethane	ND	4.6	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
1,1,2-Trichloroethane	ND	6.4	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
Trichloroethene (TCE)	ND	8.8	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
Trichlorofluoromethane	ND	10	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
1,2,3-Trichloropropane	ND	10	100		μg/L	50	10/11/2016 8:05:00 PM	R37866
Vinyl chloride	ND	9.8	50		μg/L	50	10/11/2016 8:05:00 PM	R37866
Xylenes, Total	15000	180	750		μg/L	500	10/11/2016 7:42:00 PM	R37866
Surr: 1,2-Dichloroethane-d4	84.8	0	70-130		%Rec	50	10/11/2016 8:05:00 PM	R37866
Surr: 4-Bromofluorobenzene	96.6	0	70-130		%Rec	50	10/11/2016 8:05:00 PM	R37866
Surr: Dibromofluoromethane	90.9	0	70-130		%Rec	50	10/11/2016 8:05:00 PM	R37866
Surr: Toluene-d8	100	0	70-130		%Rec	50	10/11/2016 8:05:00 PM	R37866

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- Page 20 of 49
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT:Western Refining Southwest, GallupClient Sample ID: DUP-GWProject:OW-14 Source Inv.Collection Date: 10/5/2016Lab ID:1610355-003BMatrix: Aqueous

Analyses	Result	MDL	PQL	Qual Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANG	GE					Analyst: NSB	
Gasoline Range Organics (GRO)	270	13	25	mg/L	500	10/11/2016 12:54:23 P	M G37864
Surr: BFB	83.3	0 6	66.4-120	%Rec	500	10/11/2016 12:54:23 P	M G37864

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated Meth-	od Blank	
	D	Sample Diluted Due to Matrix	E	Value above quantitation range		
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits		
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 21 of 49	
	R RPD outside accepted recovery limits		RL	Reporting Detection Limit	1 uge 21 01 47	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified		

Lab Order: 1610355

Date Reported: 11/21/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT:Western Refining Southwest, GallupClient Sample ID: DUP-GWProject:OW-14 Source Inv.Collection Date: 10/5/2016Lab ID:1610355-003CMatrix: Aqueous

Analyses	Result	MDL	PQL	Qual Units	DF	Date Analyzed Batch ID
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: TOM
Diesel Range Organics (DRO)	23	0.69	1.0	mg/L	1	10/11/2016 12:40:05 PM 27993
Motor Oil Range Organics (MRO)	ND	5.0	5.0	mg/L	1	10/11/2016 12:40:05 PM 27993
Surr: DNOP	122	0	77.1-144	%Rec	1	10/11/2016 12:40:05 PM 27993

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated Metho	od Blank	
C	D	Sample Diluted Due to Matrix	E	Value above quantitation range		
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits		
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	Page 22 of 49	
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	1 age 22 of 47	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified		

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT:Western Refining Southwest, GallupClient Sample ID: DUP-GWProject:OW-14 Source Inv.Collection Date: 10/5/2016Lab ID:1610355-003DMatrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
Acenaphthene	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Acenaphthylene	ND	2.4	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Aniline	ND	2.4	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Anthracene	ND	2.5	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Azobenzene	ND	2.7	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Benz(a)anthracene	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Benzo(a)pyrene	ND	2.7	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Benzo(b)fluoranthene	ND	2.9	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Benzo(g,h,i)perylene	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Benzo(k)fluoranthene	ND	3.0	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Benzoic acid	85	2.6	20		μg/L	1	10/20/2016 2:55:10 PM	27995
Benzyl alcohol	ND	3.0	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Bis(2-chloroethoxy)methane	ND	2.8	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Bis(2-chloroethyl)ether	ND	2.7	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Bis(2-chloroisopropyl)ether	ND	1.9	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Bis(2-ethylhexyl)phthalate	7.6	2.6	10	J	μg/L	1	10/20/2016 2:55:10 PM	27995
4-Bromophenyl phenyl ether	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Butyl benzyl phthalate	ND	2.5	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Carbazole	ND	2.3	10		μg/L	1	10/20/2016 2:55:10 PM	27995
4-Chloro-3-methylphenol	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PM	27995
4-Chloroaniline	ND	2.7	10		μg/L	1	10/20/2016 2:55:10 PM	27995
2-Chloronaphthalene	ND	2.3	10		μg/L	1	10/20/2016 2:55:10 PM	27995
2-Chlorophenol	ND	2.2	10		μg/L	1	10/20/2016 2:55:10 PM	27995
4-Chlorophenyl phenyl ether	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Chrysene	ND	2.8	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Di-n-butyl phthalate	ND	2.4	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Di-n-octyl phthalate	6.9	2.0	10	J	μg/L	1	10/20/2016 2:55:10 PM	27995
Dibenz(a,h)anthracene	ND	2.7	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Dibenzofuran	ND	2.5	10		μg/L	1	10/20/2016 2:55:10 PM	27995
1,2-Dichlorobenzene	ND	2.3	10		μg/L	1	10/20/2016 2:55:10 PM	27995
1,3-Dichlorobenzene	ND	2.3	10		μg/L	1	10/20/2016 2:55:10 PM	27995
1,4-Dichlorobenzene	ND	2.4	10		μg/L	1	10/20/2016 2:55:10 PM	27995
3,3'-Dichlorobenzidine	ND	2.4	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Diethyl phthalate	ND	2.7	10		μg/L	1	10/20/2016 2:55:10 PM	27995
Dimethyl phthalate	27	2.4	10		μg/L	1	10/20/2016 2:55:10 PM	27995
2,4-Dichlorophenol	ND	2.3	20		μg/L	1	10/20/2016 2:55:10 PM	27995
2,4-Dimethylphenol	39	3.0	10		μg/L	1	10/20/2016 2:55:10 PM	
4,6-Dinitro-2-methylphenol	ND	1.8	20		μg/L	1	10/20/2016 2:55:10 PM	
2,4-Dinitrophenol	ND	2.8	20		μg/L	1	10/20/2016 2:55:10 PM	
2,4-Dinitrotoluene	ND	3.1	10		μg/L	1	10/20/2016 2:55:10 PM	

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
 - Sample pH Not In Range Page 23 of 49
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: DUP-GW **Project:** OW-14 Source Inv. Collection Date: 10/5/2016 Lab ID: 1610355-003D Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: DAM	
2,6-Dinitrotoluene	ND	2.7	10		μg/L	1	10/20/2016 2:55:10 PN	A 27995
Fluoranthene	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PN	A 27995
Fluorene	ND	2.7	10		μg/L	1	10/20/2016 2:55:10 PM	A 27995
Hexachlorobenzene	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PM	A 27995
Hexachlorobutadiene	ND	2.2	10		μg/L	1	10/20/2016 2:55:10 PM	A 27995
Hexachlorocyclopentadiene	ND	2.3	10		μg/L	1	10/20/2016 2:55:10 PM	A 27995
Hexachloroethane	ND	2.4	10		μg/L	1	10/20/2016 2:55:10 PM	A 27995
Indeno(1,2,3-cd)pyrene	ND	3.0	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
Isophorone	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
1-Methylnaphthalene	66	2.9	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
2-Methylnaphthalene	45	2.9	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
2-Methylphenol	83	2.5	10		μg/L	1	10/20/2016 2:55:10 PM	A 27995
3+4-Methylphenol	120	2.3	10		μg/L	1	10/20/2016 2:55:10 PM	A 27995
N-Nitrosodi-n-propylamine	ND	2.4	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
N-Nitrosodimethylamine	ND	2.2	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
N-Nitrosodiphenylamine	ND	2.3	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
Naphthalene	150	2.6	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
2-Nitroaniline	ND	2.8	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
3-Nitroaniline	ND	2.9	10		μg/L	1	10/20/2016 2:55:10 PM	A 27995
4-Nitroaniline	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
Nitrobenzene	ND	2.8	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
2-Nitrophenol	ND	2.4	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
4-Nitrophenol	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
Pentachlorophenol	ND	2.3	20		μg/L	1	10/20/2016 2:55:10 PM	1 27995
Phenanthrene	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
Phenol	61	2.0	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
Pyrene	ND	3.1	10		μg/L	1	10/20/2016 2:55:10 PM	1 27995
Pyridine	ND	2.2	10		μg/L	1	10/20/2016 2:55:10 PN	A 27995
1,2,4-Trichlorobenzene	ND	2.6	10		μg/L	1	10/20/2016 2:55:10 PN	A 27995
2,4,5-Trichlorophenol	ND	2.2	10		μg/L	1	10/20/2016 2:55:10 PN	A 27995
2,4,6-Trichlorophenol	ND	2.4	10		μg/L	1	10/20/2016 2:55:10 PN	A 27995
Surr: 2-Fluorophenol	11.6	0	15-123	S	%Rec	1	10/20/2016 2:55:10 PN	1 27995
Surr: Phenol-d5	32.0	0	15-124		%Rec	1	10/20/2016 2:55:10 PN	1 27995
Surr: 2,4,6-Tribromophenol	51.3	0	18.4-134		%Rec	1	10/20/2016 2:55:10 PN	A 27995
Surr: Nitrobenzene-d5	35.6	0	28.8-134		%Rec	1	10/20/2016 2:55:10 PN	1 27995
Surr: 2-Fluorobiphenyl	0	0	35.9-125	S	%Rec	1	10/20/2016 2:55:10 PN	
Surr: 4-Terphenyl-d14	38.0	0	15-146		%Rec	1	10/20/2016 2:55:10 PN	1 27995

Ω_{110}	1:4:	030

- Value exceeds Maximum Contaminant Level.
- Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
 - Page 24 of 49
- RL Reporting Detection Limit
- Sample container temperature is out of limit as specified

Lab Order: **1610355**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT:Western Refining Southwest, GallupClient Sample ID: DUP-GWProject:OW-14 Source Inv.Collection Date: 10/5/2016Lab ID:1610355-003EMatrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: MRA	_
Fluoride	ND	0.25	0.50		mg/L	5	10/11/2016 4:20:48 PM	R37871
Chloride	150	1.0	10		mg/L	20	10/11/2016 4:33:13 PM	R37871
Sulfate	1.0	0.71	2.5	J	mg/L	5	10/11/2016 4:20:48 PM	R37871

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

Value exceeds Maximum Contaminant Level. Analyte detected in the associated Method Blank Qualifiers: Sample Diluted Due to Matrix Е Value above quantitation range Н Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits P ND Not Detected at the Reporting Limit Sample pH Not In Range Page 25 of 49 R RPD outside accepted recovery limits RL Reporting Detection Limit % Recovery outside of range due to dilution or matrix Sample container temperature is out of limit as specified

Lab Order: **1610355**

Hall Environmental Analysis Laboratory, Inc. Date Reported: 11/21/2016

CLIENT:Western Refining Southwest, GallupClient Sample ID: DUP-GWProject:OW-14 Source Inv.Collection Date: 10/5/2016Lab ID:1610355-003FMatrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: METALS							Analyst: MED	
Barium	9.5	0.013	0.020	*	mg/L	10	11/1/2016 5:50:04 PM	28269
Beryllium	0.0022	0.00036	0.0020		mg/L	1	10/27/2016 7:13:25 PM	28269
Cadmium	ND	0.0015	0.0020		mg/L	1	10/27/2016 7:13:25 PM	28269
Chromium	0.016	0.0027	0.0060		mg/L	1	10/27/2016 7:13:25 PM	28269
Cobalt	0.010	0.0017	0.0060		mg/L	1	10/27/2016 7:13:25 PM	28269
Iron	30	1.0	1.0	*	mg/L	50	11/1/2016 5:51:51 PM	28269
Manganese	4.6	0.0016	0.010	*	mg/L	5	11/1/2016 3:53:28 PM	28269
Nickel	0.058	0.0031	0.010		mg/L	1	10/27/2016 7:13:25 PM	28269
Silver	ND	0.0028	0.0050		mg/L	1	10/27/2016 7:13:25 PM	28269
Vanadium	0.034	0.0013	0.050	J	mg/L	1	10/27/2016 7:13:25 PM	28269
Zinc	0.064	0.0027	0.010		mg/L	1	10/27/2016 7:13:25 PM	28269
EPA 200.8: METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	11/7/2016 12:17:32 PM	28468
Arsenic	0.015	0.0011	0.0050	*	mg/L	5	10/31/2016 6:41:18 PM	28269
Lead	0.025	0.00084	0.0025	*	mg/L	5	10/26/2016 6:52:46 PM	28269
Selenium	0.015	0.0011	0.0050		mg/L	5	10/26/2016 6:52:46 PM	28269
EPA METHOD 245.1: MERCURY							Analyst: pmf	
Mercury	0.00014	0.000053	0.00020	J	mg/L	1	10/13/2016 12:30:47 PM	1 28031

Oualifiers:	walifiers: * Value exceeds Maximum Contaminant Level.		B Analyte detected in the associated Method Blank				
•	D	Sample Diluted Due to Matrix	E	Value above quantitation range			
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits			
	ND	Not Detected at the Reporting Limit	P Sample pH Not In Range Page		Page 26 of 49		
	R	RPD outside accepted recovery limits	RL Reporting Detection Limit		1 age 20 01 47		
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified			

Lab Order: **1610355**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT:Western Refining Southwest, GallupClient Sample ID: DUP-GWProject:OW-14 Source Inv.Collection Date: 10/5/2016Lab ID:1610355-003GMatrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed B	atch ID
EPA METHOD 200.7: DISSOLVED ME	TALS						Analyst: MED	
Barium	6.3	0.013	0.020	*	mg/L	10	10/24/2016 3:17:37 PM	A38164
Beryllium	ND	0.00031	0.0020		mg/L	1	10/21/2016 6:17:58 PM	B38141
Cadmium	ND	0.00075	0.0020		mg/L	1	10/21/2016 6:17:58 PM	B38141
Chromium	ND	0.0018	0.0060		mg/L	1	10/21/2016 6:17:58 PM	B38141
Cobalt	0.0033	0.00074	0.0060	J	mg/L	1	10/21/2016 6:17:58 PM	B38141
Iron	7.9	0.20	0.20	*	mg/L	10	10/24/2016 3:17:37 PM	A38164
Manganese	2.6	0.0032	0.020	*	mg/L	10	10/24/2016 3:17:37 PM	A38164
Nickel	0.049	0.0024	0.010		mg/L	1	10/21/2016 6:17:58 PM	B38141
Silver	ND	0.0028	0.0050		mg/L	1	10/21/2016 6:17:58 PM	B38141
Vanadium	0.0050	0.0013	0.050	J	mg/L	1	10/21/2016 6:17:58 PM	B38141
Zinc	0.021	0.0028	0.010		mg/L	1	10/21/2016 6:17:58 PM	B38141
EPA 200.8: DISSOLVED METALS							Analyst: JLF	
Antimony	ND	0.00047	0.0010		mg/L	1	10/28/2016 12:00:50 PM	A38300
Arsenic	0.013	0.00069	0.0050	*	mg/L	5	10/28/2016 4:38:06 PM	C38300
Lead	ND	0.00017	0.00050		mg/L	1	10/25/2016 7:53:28 PM	B38214
Selenium	0.010	0.0042	0.020	J	mg/L	20	10/28/2016 4:41:09 PM	C38300
EPA METHOD 245.1: MERCURY							Analyst: DBD	
Mercury	0.000079	0.000053	0.00020	J	mg/L	1	10/28/2016 10:42:19 AM	28337

Oualifiers:	*	Value exceeds Maximum Contaminant Level.		Analyte detected in the associated Method Blank				
•	D	Sample Diluted Due to Matrix		Value above quantitation range				
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation	nalyte detected below quantitation limits			
	ND Not Detected at the Reporting Limit		P	Sample pH Not In Range	Page 27 of 49			
R		RPD outside accepted recovery limits	RL	Reporting Detection Limit				
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified				

Analytical Report

Lab Order: 1610355

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: Trip Blank

Project: OW-14 Source Inv. **Collection Date:**

Lab ID: 1610355-004A Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANG	GE						Analyst: NSB	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	10/11/2016 1:18:42 PM	G37864
Surr: BFB	86.3	0	66.4-120		%Rec	1	10/11/2016 1:18:42 PM	G37864
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
Benzene	0.16	0.096	1.0	J	μg/L	1	10/11/2016 8:53:00 PM	R37866
Toluene	0.28	0.12	1.0	J	μg/L	1	10/11/2016 8:53:00 PM	
Ethylbenzene	ND	0.11	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Methyl tert-butyl ether (MTBE)	ND	0.21	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,2,4-Trimethylbenzene	0.15	0.11	1.0	J	μg/L	1	10/11/2016 8:53:00 PM	R37866
1,3,5-Trimethylbenzene	0.13	0.12	1.0	J	μg/L	1	10/11/2016 8:53:00 PM	R37866
1,2-Dichloroethane (EDC)	ND	0.12	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,2-Dibromoethane (EDB)	ND	0.11	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Naphthalene	0.50	0.093	2.0	J	μg/L	1	10/11/2016 8:53:00 PM	R37866
1-Methylnaphthalene	0.82	0.20	4.0	J	μg/L	1	10/11/2016 8:53:00 PM	R37866
2-Methylnaphthalene	0.85	0.16	4.0	J	μg/L	1	10/11/2016 8:53:00 PM	R37866
Acetone	ND	4.9	10		μg/L	1	10/11/2016 8:53:00 PM	R37866
Bromobenzene	ND	0.098	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Bromodichloromethane	ND	0.14	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Bromoform	ND	0.10	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Bromomethane	ND	0.78	3.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
2-Butanone	ND	0.74	10		μg/L	1	10/11/2016 8:53:00 PM	R37866
Carbon disulfide	ND	0.60	10		μg/L	1	10/11/2016 8:53:00 PM	R37866
Carbon Tetrachloride	ND	0.11	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Chlorobenzene	ND	0.11	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Chloroethane	ND	0.19	2.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Chloroform	ND	0.089	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Chloromethane	ND	0.21	3.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
2-Chlorotoluene	ND	0.40	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
4-Chlorotoluene	ND	0.13	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
cis-1,2-DCE	ND	0.12	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
cis-1,3-Dichloropropene	ND	0.11	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,2-Dibromo-3-chloropropane	ND	0.23	2.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Dibromochloromethane	ND	0.087	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Dibromomethane	ND	0.12	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,2-Dichlorobenzene	ND	0.40	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,3-Dichlorobenzene	ND	0.14	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,4-Dichlorobenzene	ND	0.14	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Dichlorodifluoromethane	ND	0.36	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,1-Dichloroethane	ND	0.11	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,1-Dichloroethene	ND	0.11	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866

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

Qualifiers:	Value exceeds Maximum	Contaminant	Level.
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- Sample Diluted Due to Matrix
- Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- % Recovery outside of range due to dilution or matrix
- Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
 - Page 28 of 49
- RL Reporting Detection Limit
- Sample container temperature is out of limit as specified

Analytical Report

Lab Order: **1610355**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/21/2016

CLIENT: Western Refining Southwest, Gallup Client Sample ID: Trip Blank

Project: OW-14 Source Inv. **Collection Date:**

Lab ID: 1610355-004A **Matrix:** Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: BCN	
1,2-Dichloropropane	ND	0.11	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,3-Dichloropropane	ND	0.16	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
2,2-Dichloropropane	ND	0.17	2.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,1-Dichloropropene	ND	0.13	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Hexachlorobutadiene	0.31	0.20	1.0	J	μg/L	1	10/11/2016 8:53:00 PM	R37866
2-Hexanone	ND	0.84	10		μg/L	1	10/11/2016 8:53:00 PM	R37866
Isopropylbenzene	0.12	0.10	1.0	J	μg/L	1	10/11/2016 8:53:00 PM	R37866
4-Isopropyltoluene	ND	0.14	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
4-Methyl-2-pentanone	ND	0.43	10		μg/L	1	10/11/2016 8:53:00 PM	R37866
Methylene Chloride	ND	0.19	3.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
n-Butylbenzene	0.20	0.16	3.0	J	μg/L	1	10/11/2016 8:53:00 PM	R37866
n-Propylbenzene	ND	0.13	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
sec-Butylbenzene	ND	0.12	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Styrene	ND	0.11	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
tert-Butylbenzene	ND	0.12	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,1,1,2-Tetrachloroethane	ND	0.11	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,1,2,2-Tetrachloroethane	ND	0.13	2.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Tetrachloroethene (PCE)	ND	0.15	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
trans-1,2-DCE	ND	0.40	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
trans-1,3-Dichloropropene	ND	0.10	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,2,3-Trichlorobenzene	0.34	0.11	1.0	J	μg/L	1	10/11/2016 8:53:00 PM	R37866
1,2,4-Trichlorobenzene	ND	0.13	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,1,1-Trichloroethane	ND	0.091	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,1,2-Trichloroethane	ND	0.13	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Trichloroethene (TCE)	ND	0.18	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Trichlorofluoromethane	ND	0.20	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
1,2,3-Trichloropropane	ND	0.20	2.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Vinyl chloride	ND	0.20	1.0		μg/L	1	10/11/2016 8:53:00 PM	R37866
Xylenes, Total	0.46	0.37	1.5	J	μg/L	1	10/11/2016 8:53:00 PM	R37866
Surr: 1,2-Dichloroethane-d4	84.8	0	70-130		%Rec	1	10/11/2016 8:53:00 PM	R37866
Surr: 4-Bromofluorobenzene	96.7	0	70-130		%Rec	1	10/11/2016 8:53:00 PM	R37866
Surr: Dibromofluoromethane	91.8	0	70-130		%Rec	1	10/11/2016 8:53:00 PM	R37866
Surr: Toluene-d8	98.1	0	70-130		%Rec	1	10/11/2016 8:53:00 PM	R37866

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range

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- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Address:

4901 HAWKINS NE SUITE D

ALBUQUERQUE, NM 87109

Attn:

ANDY FREEMAN

Batch #:

161012021

Project Name:

1610355

Analytical Results Report

Sample Number

161012021-001

Sampling Date 1610355-001H / TK-569-1-GW Sampling Time

10/5/2016 1:55 PM

Date/Time Received 10/11/2016 11:00 AM

Client Sample ID Matrix

Water

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method
Cyanide	ND	mg/L	0.01	10/19/2016	MER	EPA 335.4

Sample Number

161012021-002

Water

Sampling Date

10/5/2016

Qualifier

Client Sample ID Matrix

1610355-002H / TK-569-2-GW Sampling Time

3:00 PM

Date/Time Received 10/11/2016 11:00 AM

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	0.0115	mg/L	0.01	10/19/2016	MER	EPA 335.4	

Sample Number

161012021-003

1610355-003H / DUP-GW

Sampling Date 10/5/2016 Sampling Time

Date/Time Received 10/11/2016 11:00 AM

Client Sample ID Matrix

Water

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	10/19/2016	MER	EPA 335.4	

Authorized Signature

Todd Taruscio, Lab Manager

MCL EPA's Maximum Contaminant Level

ND Not Detected

PQL **Practical Quantitation Limit**

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated.

Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:

HALL ENVIRONMENTAL ANALYSIS LAB

Batch #:

161012021

Address:

4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109

Project Name:

1610355

Attn:

ANDY FREEMAN

Analytical Results Report

Quality Control Data

Lab Control Sample									
Parameter Cyanide	LCS Result	t Unit		•				Date /2016	Analysis Date 10/19/2016
Matrix Spike				, 	. <u></u>		_		
Sample Number Parameter 161011059-001 Cyanide		Sample Result ND	MS Result 0.517	Units mg/L	MS Spike 0.5	%Rec 103.4	AR %Rec 90-110	Prep Date 10/19/2016	-
Matrix Spike Duplicate									
Parameter Cyanide	MSD Result 0.513	Units mg/L	MSD Spike 0.5	%Rec 102.6	%RPD 0.8	AR %RPD 0-20	- 1	p Date 9/2016	Analysis Date 10/19/2016
Method Blank									
Parameter Cyanide			sult 1D	Units mg/L		PQL 0.01		e p Date 19/2016	Analysis Date 10/19/2016

ar Nd Acceptable Range

PQL

Not Detected

RPD

Practical Quantitation Limit Relative Percentage Difference

Comments:

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID MB-28269 SampType: MBLK TestCode: EPA Method 200.7: Metals

Client ID: PBW Batch ID: 28269 RunNo: 38294

Prep Date: 10/25/2016	Analysis I	Date: 10)/27/2016	S	SeqNo: 1 1	195095	Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Barium	ND	0.0020									
Beryllium	ND	0.0020									
Cadmium	ND	0.0020									
Chromium	ND	0.0060									
Cobalt	ND	0.0060									
Iron	ND	0.020									
Manganese	ND	0.0020									
Nickel	ND	0.010									
Silver	ND	0.0050									
Vanadium	ND	0.050									
Zinc	ND	0.010									

Sample ID LLLCS-28269	Samp	Type: LC	SLL	Tes	tCode: El	PA Method	200.7: Metals	;		
Client ID: BatchQC	Bato	h ID: 28	269	F	RunNo: 3	8294				
Prep Date: 10/25/2016	Analysis I	Date: 1 0)/27/2016	S	SeqNo: 1	195096	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0021	0.0020	0.002000	0	105	50	150			
Beryllium	0.0018	0.0020	0.002000	0	92.5	50	150			J
Cadmium	0.0020	0.0020	0.002000	0	97.5	50	150			J
Chromium	0.0054	0.0060	0.006000	0	90.0	50	150			J
Cobalt	0.0052	0.0060	0.006000	0	87.0	50	150			J
Iron	0.021	0.020	0.02000	0	107	50	150			
Manganese	0.0017	0.0020	0.002000	0	83.5	50	150			J
Nickel	0.0045	0.010	0.005000	0	90.6	50	150			J
Silver	0.0047	0.0050	0.005000	0	94.0	50	150			J
Vanadium	0.0090	0.050	0.01000	0	90.0	50	150			J
Zinc	0.0047	0.010	0.005000	0	94.8	50	150			J

Sample ID LCS-28269	SampType: L	cs	Tes	PA Method	200.7: Metals			·	
Client ID: LCSW	Batch ID: 28	3269	F	RunNo: 3	8294				
Prep Date: 10/25/2016	Analysis Date: 1	0/27/2016	8	SeqNo: 1	195097	Units: mg/L			
Analyte	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.45 0.0020	0.5000	0	90.3	85	115			
Beryllium	0.47 0.0020	0.5000	0	94.0	85	115			
Cadmium	0.46 0.0020	0.5000	0	92.1	85	115			
Chromium	0.45 0.0060	0.5000	0	89.4	85	115			
Cobalt	0.43 0.0060	0.5000	0	86.7	85	115			
Iron	0.46 0.020	0.5000	0	91.8	85	115			

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

Page 30 of 49

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID LCS-28269 SampType: LCS TestCode: EPA Method 200.7: Metals LCSW Client ID: Batch ID: 28269 RunNo: 38294 SeqNo: 1195097 Prep Date: 10/25/2016 Analysis Date: 10/27/2016 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Manganese 0.44 0.0020 0.5000 0 88.3 85 115 Nickel 0.43 0.010 0.5000 0 85.1 85 115 93.5 0.093 0.0050 0.1000 0 85 Silver 115 94.8 Vanadium 0.47 0.050 0.5000 0 85 115 86.5 Zinc 0.43 0.010 0.5000 0 85 115

Qualifiers:

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

entitation range

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Hall Environmental Analysis Laboratory, Inc.

ND

ND

0.050

0.010

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID MB-B SampType: MBLK TestCode: EPA Method 200.7: Dissolved Metals PBW Client ID: Batch ID: **B38141** RunNo: 38141 Prep Date: Analysis Date: 10/21/2016 SeqNo: 1190207 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Beryllium ND 0.0020 Cadmium ND 0.0020 0.0060 Chromium ND Cobalt ND 0.0060 Nickel ND 0.010 Silver ND 0.0050

Sample ID LLLCS-B	Samp	Type: LC	SLL	Tes	tCode: E	PA Method	d 200.7: Dissolved Metals					
Client ID: BatchQC	Bato	h ID: B3	8141	F	RunNo: 3	8141						
Prep Date:	Analysis Date: 10/21/2016			SeqNo: 1190211			Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Beryllium	0.0022	0.0020	0.002000	0	109	50	150					
Cadmium	0.0017	0.0020	0.002000	0	84.5	50	150			J		
Chromium	0.0062	0.0060	0.006000	0	103	50	150					
Cobalt	0.0064	0.0060	0.006000	0	106	50	150					
Nickel	0.0048	0.010	0.005000	0	96.6	50	150			J		
Silver	0.0050	0.0050	0.005000	0	99.4	50	150			J		
Vanadium	0.011	0.050	0.01000	0	105	50	150			J		
7inc	0.0052	0.010	0.005000	0	105	50	150			.1		

Sample ID LCS-B	Samp	Type: LC	S	Test	tCode: El	PA Method	200.7: Dissol	Ived Metai	Is		
Client ID: LCSW	Bato	h ID: B3	8141	R	RunNo: 38141						
Prep Date:	Analysis	Date: 10	0/21/2016	S	SeqNo: 1190212			Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Beryllium	0.53	0.0020	0.5000	0	105	85	115	<u> </u>			
Cadmium	0.52	0.0020	0.5000	0	104	85	115				
Chromium	0.50	0.0060	0.5000	0	101	85	115				
Cobalt	0.49	0.0060	0.5000	0	97.8	85	115				
Nickel	0.48	0.010	0.5000	0	96.3	85	115				
Silver	0.10	0.0050	0.1000	0	99.9	85	115				
Vanadium	0.53	0.050	0.5000	0	107	85	115				
Zinc	0.49	0.010	0.5000	0	97.9	85	115				

Qualifiers:

Vanadium

Zinc

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID 161	10355-003GMS	Samp	SampType: MS TestCode: EPA Method 200.7: Dissolved Metals								
Client ID: DUF	P-GW	Bato	h ID: B3	8141	F	RunNo: 38141					
Prep Date:		Analysis [Date: 10	/21/2016	S	SeqNo: 1	190226	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium		0.52	0.0020	0.5000	0	104	70	130			
Cadmium		0.50	0.0020	0.5000	0	101	70	130			
Chromium		0.49	0.0060	0.5000	0	97.2	70	130			
Cobalt		0.47	0.0060	0.5000	0.003330	93.0	70	130			
Nickel		0.51	0.010	0.5000	0.04888	91.4	70	130			
Silver		0.092	0.0050	0.1000	0	91.9	70	130			
Vanadium		0.53	0.050	0.5000	0.005050	105	70	130			
Zinc		0.48	0.010	0.5000	0.02143	92.5	70	130			

Sample ID	1610355-003GMSD	Samp	Туре: МЅ	SD	Tes	tCode: EI	PA Method	200.7: Dissol	ved Meta	ls	
Client ID:	DUP-GW	Bato	h ID: B3	8141	F	RunNo: 3	8141				
Prep Date:		Analysis l	Date: 10	/21/2016	S	SeqNo: 1	190227	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium		0.52	0.0020	0.5000	0	104	70	130	0.695	20	
Cadmium		0.50	0.0020	0.5000	0	101	70	130	0.176	20	
Chromium		0.49	0.0060	0.5000	0	97.0	70	130	0.196	20	
Cobalt		0.47	0.0060	0.5000	0.003330	93.1	70	130	0.102	20	
Nickel		0.51	0.010	0.5000	0.04888	91.5	70	130	0.0454	20	
Silver		0.092	0.0050	0.1000	0	91.8	70	130	0.120	20	
Vanadium		0.53	0.050	0.5000	0.005050	105	70	130	0.0852	20	
Zinc		0.48	0.010	0.5000	0.02143	92.3	70	130	0.203	20	

Sample ID MB-A	Samp	Type: ME	BLK	Tes	tCode: E l	PA Method	200.7: Disso	Ived Metal	ls	
Client ID: PBW	Bato	h ID: A3	8164	F	RunNo: 3	8164				
Prep Date:	Analysis [Date: 10	0/24/2016	S	SeqNo: 1	191047	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Iron	ND	0.020								

Sample ID LCS-A	Samp	Type: LC	S	TestCode: EPA Method 200.7: Dissolved Metals								
Client ID: LCSW	Bato	h ID: A3	8164	F	RunNo: 3	8164						
Prep Date:	Analysis	Date: 10	/24/2016	S	SeqNo: 1	191048	Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Barium	0.51	0.0020	0.5000	0	102	85	115					
Iron	0.50	0.020	0.5000	0	99.2	85	115					
Manganese	0.50	0.0020	0.5000	0	99.1	85	115					

Qualifiers:

Manganese

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded

ND

0.0020

- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: 1610355

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID LLLCS-A SampType: LCSLL TestCode: EPA Method 200.7: Dissolved Metals Client ID: BatchQC Batch ID: A38164 RunNo: 38164 SeqNo: 1191049 Prep Date: Analysis Date: 10/24/2016 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Barium 0.0019 0.0020 0.002000 0 95.5 50 150 J 0.0020 0.0020 0.002000 0 99.5 50 150 J Manganese

Sample ID LLLCS-A	SampT	ype: LC	SLL	Test	TestCode: EPA Method 200.7: Dissolved Metals						
Client ID: BatchQC	Batch	ID: A3	8164	R	tunNo: 3	8164					
Prep Date:	Analysis D	ate: 10)/24/2016	S	SeqNo: 1	191614	Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Iron	0.021	0.020	0.02000	0	106	50	150				

Qualifiers:

- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits R
- S % Recovery outside of range due to dilution or matrix
- Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- Sample container temperature is out of limit as specified

Value exceeds Maximum Contaminant Level. В

Page 34 of 49

Hall Environmental Analysis Laboratory, Inc.

WO#: 1610355

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID MB-28269 SampType: MBLK TestCode: EPA 200.8: Metals

Client ID: **PBW** Batch ID: 28269 RunNo: 38247

SeqNo: 1193707 10/25/2016 Analysis Date: 10/26/2016 Prep Date: Units: mg/L

Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

0.00050 Lead ND Selenium ND 0.0010

Sample ID MSLCS-28269 SampType: LCS TestCode: EPA 200.8: Metals

Client ID: **LCSW** Batch ID: 28269 RunNo: 38247

Prep Date: 10/25/2016 Analysis Date: 10/26/2016 SeqNo: 1193709 Units: mg/L

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

Lead 0.012 0.00050 0.01250 0 98.7 85 115 Selenium 0.023 0.0010 0.02500 n 92.1 85 115

Sample ID MSLLLCS-28269 SampType: LCSLL TestCode: EPA 200.8: Metals

Client ID: **BatchQC** Batch ID: 28269 RunNo: 38247

Prep Date: 10/25/2016 Analysis Date: 10/26/2016 SeqNo: 1193711 Units: mg/L

%RPD SPK value SPK Ref Val **RPDLimit** Analyte Result PQL %REC LowLimit HighLimit Qual Lead 0.00050 0.0005000 74.5 50 150 J

0.00088 0.0010 0 88.2 Selenium 0.001000 50 150

Sample ID MB-28269 TestCode: EPA 200.8: Metals SampType: MBLK

Client ID: RunNo: 38356 **PBW** Batch ID: 28269

Analysis Date: 10/31/2016 SeqNo: 1197518 Prep Date: 10/25/2016 Units: mg/L

Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

0.00029 0.0010 Arsenic Л

Sample ID MSLCS-28269 TestCode: EPA 200.8: Metals SampType: LCS

Client ID: Batch ID: 28269 **LCSW** RunNo: 38356

Prep Date: 10/25/2016 Analysis Date: 10/31/2016 SeqNo: 1197520 Units: mg/L

%RPD **RPDLimit PQL** SPK value SPK Ref Val %REC HighLimit Analyte Result LowLimit Qual

0.026 0.0010 0.02500 102 85 Arsenic 115

Sample ID MSLLLCS-28269 SampType: LCSLL TestCode: EPA 200.8: Metals

Client ID: **BatchQC** Batch ID: 28269 RunNo: 38356

Prep Date: 10/25/2016 Analysis Date: 10/31/2016 SeqNo: 1197524 Units: mg/L

Analyte PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Result

Arsenic 0.0013 0.0010 0.001000 0 125 50 150

Qualifiers:

Value exceeds Maximum Contaminant Level. В Analyte detected in the associated Method Blank

Sample Diluted Due to Matrix Е Value above quantitation range

J Holding times for preparation or analysis exceeded Analyte detected below quantitation limits Page 35 of 49

> P Sample pH Not In Range

Reporting Detection Limit RL

Sample container temperature is out of limit as specified

D

Η

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

WO#: 1610355

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID 1610355-002FMSDL SampType: MSDLL TestCode: EPA 200.8: Metals

Client ID: TK-569-2-GW Batch ID: 28468 RunNo: 38518

Prep Date: 11/3/2016 Analysis Date: 11/7/2016 SeqNo: 1203004 Units: mg/L

Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

0.024 0.0010 0.02500 98.0 70 4.68 Antimony n 130 20

Sample ID 1610355-002FMSLL SampType: MSLL TestCode: EPA 200.8: Metals

Client ID: TK-569-2-GW Batch ID: 28468 RunNo: 38518

Prep Date: 11/3/2016 Analysis Date: 11/7/2016 SeqNo: 1203005 Units: mg/L

SPK value SPK Ref Val %RPD **RPDLimit** Analyte Result **PQL** %REC LowLimit HighLimit Qual

Antimony 0.023 0.0010 0.02500 93.5 130

Sample ID MB-28468 TestCode: EPA 200.8: Metals SampType: MBLK

Client ID: **PBW** Batch ID: 28468 RunNo: 38518

Analysis Date: 11/7/2016 Units: mg/L Prep Date: 11/3/2016 SeqNo: 1203031

SPK value SPK Ref Val %REC LowLimit **PQL** %RPD **RPDLimit** Analyte Result HighLimit Qual

ND 0.0010 Antimony

Sample ID MSLCS-28468 SampType: LCS TestCode: EPA 200.8: Metals

Client ID: Batch ID: 28468 RunNo: 38518 **LCSW**

Prep Date: 11/3/2016 Analysis Date: 11/7/2016 SeqNo: 1203033 Units: mg/L

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

Antimony 0.026 0.0010 0.02500 106 85 115

Sample ID MSLLLCS-28468 SampType: LCSLL TestCode: EPA 200.8: Metals

RunNo: 38518 Client ID: **BatchQC** Batch ID: 28468

Prep Date: Analysis Date: 11/7/2016 SeqNo: 1203036 11/3/2016 Units: mg/L

Analyte **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

0.0010 0.0010 0.001000 105 50 150 Antimony

Sample ID 1610355-001FMSLL SampType: MSLL TestCode: EPA 200.8: Metals

Batch ID: 28468 Client ID: TK-569-1-GW RunNo: 38518

Prep Date: 11/3/2016 Analysis Date: 11/7/2016 SeqNo: 1203045 Units: mg/L

%RPD **PQL** SPK value SPK Ref Val %REC HighLimit **RPDLimit** Analyte Result LowLimit Qual 0.0055 70 Antimony 0.0050 0.02500 22 0 130

Qualifiers:

R

Value exceeds Maximum Contaminant Level. В Analyte detected in the associated Method Blank

Е D Sample Diluted Due to Matrix Value above quantitation range

J Η

Holding times for preparation or analysis exceeded Analyte detected below quantitation limits Page 36 of 49

ND Not Detected at the Reporting Limit P Sample pH Not In Range Reporting Detection Limit RPD outside accepted recovery limits RL

% Recovery outside of range due to dilution or matrix Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID LCS SampType: LCS TestCode: EPA 200.8: Dissolved Metals

Client ID: LCSW Batch ID: B38214 RunNo: 38214

Prep Date: Analysis Date: 10/25/2016 SeqNo: 1192768 Units: mg/L

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

Lead 0.012 0.00050 0.01250 0 95.6 85 115

Sample ID LLLCS SampType: LCSLL TestCode: EPA 200.8: Dissolved Metals

Client ID: BatchQC Batch ID: B38214 RunNo: 38214

Prep Date: Analysis Date: 10/25/2016 SeqNo: 1192770 Units: mg/L

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

Lead 0.00051 0.00050 0.0005000 0 101 50 150

Sample ID MB SampType: MBLK TestCode: EPA 200.8: Dissolved Metals

Client ID: PBW Batch ID: B38214 RunNo: 38214

Prep Date: Analysis Date: 10/25/2016 SeqNo: 1192772 Units: mg/L

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

Lead ND 0.00050

Sample ID LCS SampType: LCS TestCode: EPA 200.8: Dissolved Metals

Client ID: LCSW Batch ID: A38300 RunNo: 38300

Prep Date: Analysis Date: 10/28/2016 SeqNo: 1195760 Units: mg/L

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

Antimony 0.024 0.0010 0.02500 0 95.2 85 115

Sample ID LLLCS SampType: LCSLL TestCode: EPA 200.8: Dissolved Metals

Client ID: BatchQC Batch ID: A38300 RunNo: 38300

Prep Date: Analysis Date: 10/28/2016 SeqNo: 1195761 Units: mg/L

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

Antimony 0.0010 0.0010 0.001000 0 100 50 150

Sample ID MB SampType: MBLK TestCode: EPA 200.8: Dissolved Metals

Client ID: PBW Batch ID: A38300 RunNo: 38300

Prep Date: Analysis Date: 10/28/2016 SeqNo: 1195762 Units: mg/L

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

Antimony ND 0.0010

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

Page 37 of 49

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: 1610355

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID LCS SampType: LCS TestCode: EPA 200.8: Dissolved Metals Client ID: LCSW Batch ID: C38300 RunNo: 38300 Prep Date: Analysis Date: 10/28/2016 SeqNo: 1196237 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 0.025 0.0010 0 85 Arsenic 0.02500 102 115

0.027 Selenium 0.0010 0.02500 110 85 115

Sample ID LLLCS SampType: LCSLL TestCode: EPA 200.8: Dissolved Metals Client ID: BatchQC Batch ID: C38300 RunNo: 38300 Prep Date: SeqNo: 1196238 Analysis Date: 10/28/2016 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Arsenic 0.00074 0.0010 0.001000 0 73.8 50 150 0.0010 0.0010 0.001000 0 Selenium 103 50 150

Sample ID MB SampType: MBLK TestCode: EPA 200.8: Dissolved Metals Client ID: PBW Batch ID: C38300 RunNo: 38300 Analysis Date: 10/28/2016 Prep Date: SeqNo: 1196239 Units: mg/L SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Analyte Result Qual

Arsenic 0.0010 ND 0.0010 Selenium

Qualifiers:

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Holding times for preparation or analysis exceeded Η

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Page 38 of 49

P Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID MB-28031 SampType: MBLK TestCode: EPA Method 245.1: Mercury

Client ID: PBW Batch ID: 28031 RunNo: 37939

Prep Date: 10/12/2016 Analysis Date: 10/13/2016 SeqNo: 1182330 Units: mg/L

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

Mercury 0.00016 0.00020 J

Sample ID LCS-28031 SampType: LCS TestCode: EPA Method 245.1: Mercury

Client ID: LCSW Batch ID: 28031 RunNo: 37939

Prep Date: 10/12/2016 Analysis Date: 10/13/2016 SeqNo: 1182331 Units: mg/L

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

Mercury 0.0051 0.00020 0.005000 0 101 80 120

Sample ID MB-28337 SampType: MBLK TestCode: EPA Method 245.1: Mercury

Client ID: PBW Batch ID: 28337 RunNo: 38301

Prep Date: 10/27/2016 Analysis Date: 10/28/2016 SeqNo: 1195499 Units: mg/L

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

Mercury ND 0.00020

Sample ID LCS-28337 SampType: LCS TestCode: EPA Method 245.1: Mercury

Client ID: LCSW Batch ID: 28337 RunNo: 38301

Prep Date: 10/27/2016 Analysis Date: 10/28/2016 SeqNo: 1195500 Units: mg/L

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

Mercury 0.0053 0.00020 0.005000 0 105 80 120

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

Page 39 of 49

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

0.52

4.9

10

0.10

0.50

0.50

0.5000

5.000

10.00

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID MB	SampType: mblk	TestCode: EPA Method 300.0: Anions	•
Client ID: PBW	Batch ID: R37871	RunNo: 37871	
Prep Date:	Analysis Date: 10/11/2016	SeqNo: 1179468 Units: mg/L	
Analyte	Result PQL SPK value S	PK Ref Val %REC LowLimit HighLimit	%RPD RPDLimit Qual
Fluoride	ND 0.10		
Chloride	ND 0.50		
Sulfate	ND 0.50		
Sample ID LCS	SampType: Ics	TestCode: EPA Method 300.0: Anions	.
Client ID: LCSW	Batch ID: R37871	RunNo: 37871	
Prep Date:	Analysis Date: 10/11/2016	SeqNo: 1179469 Units: mg/L	
Analyte	Result PQL SPK value S	PK Ref Val %REC LowLimit HighLimit	%RPD RPDLimit Qual

Sample ID MB	SampT	SampType: mblk				TestCode: EPA Method 300.0: Anions						
Client ID: PBW	Batch	ID: R3	7871	F	RunNo: 3	7871						
Prep Date:	Analysis D	ate: 1 0)/12/2016	8	SeqNo: 1	179540	Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Fluoride	ND	0.10										
Chloride	ND	0.50										
Sulfate	ND	0.50										

0

0

0

104

97.1

100

90

90

90

110

110

110

Sample ID LCS	SampT	ype: Ics	3	Tes	tCode: El	PA Method	300.0: Anion	s		
Client ID: LCSW	Batch	n ID: R3	7871	F	RunNo: 3	7871				
Prep Date:	Analysis D)ate: 10	0/12/2016	8	SeqNo: 1	179541	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.50	0.10	0.5000	0	100	90	110			
Chloride	4.5	0.50	5.000	0	90.2	90	110			
Sulfate	9.3	0.50	10.00	0	92.5	90	110			

Qualifiers:

Fluoride

Chloride

Sulfate

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

Page 40 of 49

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: 1610355

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID LCS-27993 SampType: LCS TestCode: EPA Method 8015M/D: Diesel Range Client ID: LCSW Batch ID: 27993 RunNo: 37844 SeqNo: 1179035 Prep Date: 10/11/2016 Analysis Date: 10/11/2016 Units: mg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 5.9 1.0 5.000 0 63.2 117 155

Diesel Range Organics (DRO) Surr: DNOP 0.58 0.5000 77.1 115 144

TestCode: EPA Method 8015M/D: Diesel Range Sample ID MB-27993 SampType: MBLK

1.000

Batch ID: 27993 Client ID: PBW RunNo: 37844

1.3

Prep Date: Analysis Date: 10/11/2016 SeqNo: 1179036 10/11/2016 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

126

77.1

144

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Η Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Ε Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- Sample container temperature is out of limit as specified

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Surr: DNOP

Hall Environmental Analysis Laboratory, Inc.

WO#: 1610355

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID RB SampType: MBLK TestCode: EPA Method 8015D: Gasoline Range

Client ID: **PBW** Batch ID: G37864 RunNo: 37864

Prep Date: Analysis Date: 10/11/2016 SeqNo: 1179283 Units: mg/L

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

Gasoline Range Organics (GRO) ND 0.050

20.00 87.2 Surr: BFB 17 66.4 120

Sample ID 2.5UG GRO LCS SampType: LCS TestCode: EPA Method 8015D: Gasoline Range

Client ID: LCSW Batch ID: G37864 RunNo: 37864

Prep Date: Analysis Date: 10/11/2016 SeqNo: 1179286 Units: mg/L

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual

Gasoline Range Organics (GRO) 0.54 0.050 0.5000 0 107 80 120 Surr: BFB 18 20.00 89.7 66.4 120

Sample ID 1610355-001BMS SampType: MS TestCode: EPA Method 8015D: Gasoline Range

Client ID: TK-569-1-GW Batch ID: G37864 RunNo: 37864

Prep Date: Analysis Date: 10/11/2016 SeqNo: 1179288 Units: mg/L

PQL SPK value SPK Ref Val %RPD **RPDLimit** Analyte Result %REC LowLimit HighLimit Qual

Gasoline Range Organics (GRO) 490 25 250.0 259.5 93.6 70 130 Surr: BFB 8900 10000 88.9 120 66.4

Sample ID 1610355-001BMSD SampType: MSD TestCode: EPA Method 8015D: Gasoline Range

Client ID: TK-569-1-GW Batch ID: G37864 RunNo: 37864

Analysis Date: 10/11/2016 Prep Date: SeqNo: 1179289 Units: mg/L

%REC Analyte Result **PQL** SPK value SPK Ref Val LowLimit HighLimit %RPD **RPDLimit** Qual Gasoline Range Organics (GRO) 480 25 250.0 259 5 88.7 70 130 2.50 20 Surr: BFB 8900 10000 88.7 66.4 120 0 0

Qualifiers:

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Holding times for preparation or analysis exceeded Η

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J

Analyte detected below quantitation limits

Page 42 of 49

P Sample pH Not In Range

RLReporting Detection Limit

Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID 100ng Ics	SampT	ype: LC	S	Test	tCode: El	PA Method	8260B: VOL	ATILES		
Client ID: LCSW	Batch	n ID: R3	7866	R	RunNo: 37	7866				
Prep Date:	Analysis D	ate: 10	0/11/2016	S	SeqNo: 1'	179427	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	100	70	130			
Toluene	21	1.0	20.00	0	105	70	130			
Chlorobenzene	22	1.0	20.00	0	108	70	130			
1,1-Dichloroethene	20	1.0	20.00	0	99.3	70	130			
Trichloroethene (TCE)	17	1.0	20.00	0	87.0	70	130			
Surr: 1,2-Dichloroethane-d4	8.8		10.00		88.5	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.2	70	130			
Surr: Dibromofluoromethane	9.4		10.00		94.0	70	130			
Surr: Toluene-d8	9.8		10.00		98.0	70	130			

Sample ID rb	SampT	ype: M	BLK	Tes	tCode: El	PA Method	8260B: VOL	ATILES		
Client ID: PBW	Batch	n ID: R3	7866	F	RunNo: 3	7866				
Prep Date:	Analysis D	Date: 10	0/11/2016	5	SeqNo: 1	179428	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	0.13	1.0								J
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	0.30	2.0								J
1-Methylnaphthalene	0.43	4.0								J
2-Methylnaphthalene	0.50	4.0								J
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	0.14	1.0								J
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID rb	SampT	ype: ME	BLK	Tes	tCode: El	PA Method	8260B: VOL	ATILES		
Client ID: PBW	Batch	1D: R3	7866	F	RunNo: 3	7866				
Prep Date:	Analysis D	ate: 10	0/11/2016	5	SeqNo: 1	179428	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	1.4	10								J
Methylene Chloride	0.21	3.0								J
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	0.17	1.0								J
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID rb SampType: MBLK TestCode: EPA Method 8260B: VOLATILES Client ID: **PBW** Batch ID: R37866 RunNo: 37866 Prep Date: Analysis Date: 10/11/2016 SeqNo: 1179428 Units: µg/L Analyte SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Vinyl chloride ND 1.0 Xylenes, Total ND 1.5 89.3 70 Surr: 1,2-Dichloroethane-d4 8.9 10.00 130 Surr: 4-Bromofluorobenzene 9.7 10.00 97.4 70 130 Surr: Dibromofluoromethane 9.3 10.00 93.2 70 130 Surr: Toluene-d8 9.8 10.00 97.8 70 130

Sample ID 1610355-001AMS SampType: MS TestCode: EPA Method 8260B: VOLATILES Client ID: TK-569-1-GW Batch ID: R37866 RunNo: 37866 Prep Date: Analysis Date: 10/11/2016 SeqNo: 1179612 Units: µg/L %REC Result **PQL** SPK value SPK Ref Val HighLimit %RPD **RPDLimit** Analyte LowLimit Qual Benzene 34000 50 1000 33230 81.8 70 130 Ε 39000 50 1000 38590 45.3 70 130 ES Toluene 50 1000 98.4 70 Chlorobenzene 980 0 130 860 50 1000 0 85.8 70 1,1-Dichloroethene 130 Trichloroethene (TCE) 790 50 1000 0 79.4 70 130 Surr: 1,2-Dichloroethane-d4 430 500.0 86.7 70 130 480 500.0 95.5 70 Surr: 4-Bromofluorobenzene 130 Surr: Dibromofluoromethane 470 500.0 93.5 70 130 490 500.0 Surr: Toluene-d8 98.8 70 130

Sample ID 1610355-001AMSI	D SampT	ype: MS	SD	Tes	tCode: El	PA Method	8260B: VOL	ATILES		
Client ID: TK-569-1-GW	Batch	1D: R3	7866	F	RunNo: 3	7866				
Prep Date:	Analysis D	ate: 10	0/11/2016	S	eqNo: 1	179613	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	34000	50	1000	33230	80.3	70	130	0.0429	20	E
Toluene	39000	50	1000	38590	48.7	70	130	0.0860	20	ES
Chlorobenzene	990	50	1000	0	99.2	70	130	0.840	20	
1,1-Dichloroethene	870	50	1000	0	87.2	70	130	1.67	20	
Trichloroethene (TCE)	780	50	1000	0	78.3	70	130	1.43	20	
Surr: 1,2-Dichloroethane-d4	440		500.0		88.8	70	130	0	0	
Surr: 4-Bromofluorobenzene	490		500.0		97.7	70	130	0	0	
Surr: Dibromofluoromethane	480		500.0		95.1	70	130	0	0	
Surr: Toluene-d8	510		500.0		101	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID 1610355-001dms	SampT	ype: MS	3	Tes	tCode: El	PA Method	8270C: Semi	volatiles		
Client ID: TK-569-1-GW	Batch	n ID: 27 9	995	F	RunNo: 3	8101				
Prep Date: 10/11/2016	Analysis D	ate: 10	0/20/2016	8	SeqNo: 1	188816	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	57	10	100.0	0	56.5	27.6	123			
4-Chloro-3-methylphenol	84	10	200.0	0	42.1	29.3	126			
2-Chlorophenol	ND	10	200.0	0	0	15	133			S
1,4-Dichlorobenzene	45	10	100.0	0	44.7	17.6	127			
2,4-Dinitrotoluene	59	10	100.0	0	58.6	38.9	98.5			
N-Nitrosodi-n-propylamine	93	10	100.0	0	93.4	25.9	131			
4-Nitrophenol	52	10	200.0	0	26.2	15	102			
Pentachlorophenol	81	20	200.0	0	40.6	15	120			
Phenol	130	10	200.0	68.62	29.7	15	100			
Pyrene	52	10	100.0	0	51.8	22.8	126			
1,2,4-Trichlorobenzene	43	10	100.0	0	43.4	15	143			
Surr: 2-Fluorophenol	11		200.0		5.73	15	123			S
Surr: Phenol-d5	76		200.0		37.8	4.13	124			
Surr: 2,4,6-Tribromophenol	80		200.0		40.0	18.4	134			
Surr: Nitrobenzene-d5	43		100.0		43.1	28.8	134			
Surr: 2-Fluorobiphenyl	51		100.0		51.2	35.9	125			
Surr: 4-Terphenyl-d14	170		100.0		166	15	146			S

Sample ID 1610355-001dmsd	SampT	ype: MS	D	Test	tCode: El	PA Method	8270C: Semi	volatiles		
Client ID: TK-569-1-GW	Batch	ID: 27 9	995	R	RunNo: 38	3101				
Prep Date: 10/11/2016	Analysis Da	ate: 10)/20/2016	S	SeqNo: 1	188817	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	69	10	100.0	0	68.5	27.6	123	19.2	31.3	
4-Chloro-3-methylphenol	92	10	200.0	0	46.2	29.3	126	9.38	29	
2-Chlorophenol	ND	10	200.0	0	0	15	133	0	28.4	S
1,4-Dichlorobenzene	50	10	100.0	0	50.1	17.6	127	11.4	28.2	
2,4-Dinitrotoluene	64	10	100.0	0	63.9	38.9	98.5	8.59	22.9	
N-Nitrosodi-n-propylamine	86	10	100.0	0	86.3	25.9	131	7.90	28.8	
4-Nitrophenol	50	10	200.0	0	24.9	15	102	5.09	41.5	
Pentachlorophenol	99	20	200.0	0	49.7	15	120	20.2	45.1	
Phenol	130	10	200.0	68.62	28.8	15	100	1.35	33.9	
Pyrene	58	10	100.0	0	57.6	22.8	126	10.6	33.6	
1,2,4-Trichlorobenzene	48	10	100.0	0	48.2	15	143	10.4	28.2	
Surr: 2-Fluorophenol	13		200.0		6.58	15	123	0	0	S
Surr: Phenol-d5	76		200.0		37.8	4.13	124	0	0	
Surr: 2,4,6-Tribromophenol	99		200.0		49.5	18.4	134	0	0	
Surr: Nitrobenzene-d5	49		100.0		49.2	28.8	134	0	0	
Surr: 2-Fluorobiphenyl	59		100.0		59.1	35.9	125	0	0	

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID 1610355-001dmsd SampType: MSD TestCode: EPA Method 8270C: Semivolatiles

Client ID: **TK-569-1-GW** Batch ID: **27995** RunNo: **38101**

SampType: MBLK

Prep Date: 10/11/2016 Analysis Date: 10/20/2016 SeqNo: 1188817 Units: μg/L

Analyte Result SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual Surr: 4-Terphenyl-d14 39 100.0 39.4 15 146 0

Sample ID Ics-27995	SampT	ype: LC	s	Tes	tCode: El	PA Method	8270C: Semi	volatiles		
Client ID: LCSW	Batch	n ID: 27	995	F	RunNo: 3	8101				
Prep Date: 10/11/2016	Analysis D)ate: 10	0/20/2016	8	SeqNo: 1	188820	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	65	10	100.0	0	64.8	35	113			
4-Chloro-3-methylphenol	160	10	200.0	0	79.6	40.7	114			
2-Chlorophenol	130	10	200.0	0	65.9	37.6	113			
1,4-Dichlorobenzene	54	10	100.0	0	53.7	37.7	106			
2,4-Dinitrotoluene	61	10	100.0	0	61.5	37	91			
N-Nitrosodi-n-propylamine	67	10	100.0	0	67.4	45.4	105			
4-Nitrophenol	100	10	200.0	0	51.9	33.4	104			
Pentachlorophenol	120	20	200.0	0	62.3	29.5	94.9			
Phenol	110	10	200.0	0	56.0	30.6	119			
Pyrene	62	10	100.0	0	62.0	26.2	120			
1,2,4-Trichlorobenzene	58	10	100.0	0	57.6	39.9	125			
Surr: 2-Fluorophenol	120		200.0		59.6	15	123			
Surr: Phenol-d5	120		200.0		57.7	4.13	124			
Surr: 2,4,6-Tribromophenol	150		200.0		75.5	18.4	134			
Surr: Nitrobenzene-d5	63		100.0		63.0	28.8	134			
Surr: 2-Fluorobiphenyl	60		100.0		60.0	35.9	125			
Surr: 4-Terphenyl-d14	65		100.0		65.3	15	146			

Client ID: PBW	Batch	ID: 27 9	995	F	RunNo: 3	8101				
Prep Date: 10/11/2016	Analysis D	ate: 10)/20/2016	S	SeqNo: 1	188821	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								

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Sample ID mb-27995

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

TestCode: EPA Method 8270C: Semivolatiles

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RE Reporting Detection LimitW Sample container temperature is out of limit as specified

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID mb-27995	SampTyp	oe: MBLK	TestCode: E	PA Method	8270C: Semi	volatiles		
Client ID: PBW	Batch I	D: 27995	RunNo: 3	8101				
Prep Date: 10/11/2016	Analysis Dat	te: 10/20/2016	SeqNo: 1	188821	Units: µg/L			
Analyte			SPK Ref Val %REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzoic acid	8.5	20						J
Benzyl alcohol	ND	10						
Bis(2-chloroethoxy)methane	ND	10						
Bis(2-chloroethyl)ether	ND	10						
Bis(2-chloroisopropyl)ether	ND	10						
Bis(2-ethylhexyl)phthalate	ND	10						
4-Bromophenyl phenyl ether	ND	10						
Butyl benzyl phthalate	2.7	10						J
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	6.7	10						J
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						
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 1 1 1								

Qualifiers:

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

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Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID mb-27995 SampType: MBLK TestCode: EPA Method 8270C: Semivolatiles Client ID: **PBW** Batch ID: 27995 RunNo: 38101 Analysis Date: 10/20/2016 Prep Date: 10/11/2016 SeqNo: 1188821 Units: µg/L Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit %RPD **RPDLimit** Qual 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 ND Naphthalene 10 2-Nitroaniline ND 10 ND 10 3-Nitroaniline 4-Nitroaniline ND 10 ND 10 Nitrobenzene 10 2-Nitrophenol ND 4-Nitrophenol ND 10 Pentachlorophenol ND 20 Phenanthrene ND 10 Phenol ND 10 Pyrene ND 10 10 Pyridine ND ND 10 1.2.4-Trichlorobenzene 10 2,4,5-Trichlorophenol ND 2,4,6-Trichlorophenol ND 10 Surr: 2-Fluorophenol 200.0 52.8 15 123 110 200.0 Surr: Phenol-d5 98 49.0 4.13 124 200.0 57.7 Surr: 2,4,6-Tribromophenol 120 18.4 134 Surr: Nitrobenzene-d5 55 100.0 54.6 28.8 134 Surr: 2-Fluorobiphenyl 49 100.0 49.2 35.9 125 Surr: 4-Terphenyl-d14 47 100.0 46.5 15 146

Qualifiers:

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

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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:	1610355		RcptNo:	1
Received by/dat	te: A7 1010	1116	·		,	
Logged By:	Anne Thorne	10/7/2016 9:25:00 AM		anne Sta		
Completed By:	Anne Thorne	10/7/2016		anne Am	_	
Reviewed By:	as	10/10/16				
Chain of Cus	stody					
1. Custody sea	als intact on sample bottles	?	Yes 🗸	No 🗌	Not Present	
2. Is Chain of 0	Custody complete?		Yes 🗹	No 🗌	Not Present	
3. How was the	e sample delivered?		Client			
<u>Log In</u>						
4. Was an atte	empt made to cool the sam	ples?	Yes 🗹	No 🗆	NA \square	
5. Were all sar	mples received at a temper	ature of >0° C to 6.0°C	Yes 🗹	No 🗆	na 🗀	
6. Sample(s) i	n proper container(s)?		Yes 🗹	No 🗆		
7. Sufficient sa	ample volume for indicated	test(s)?	Yes 🔽	No 🗆		
8. Are samples	s (except VOA and ONG) p	roperly preserved?	Yes 🗹	No 🗆		
9. Was presen	vative added to bottles?		Yes 🗌	No 🗸	NA \square	
10.VOA vials ha	ave zero headspace?		Yes 🔽	No 🗆	No VOA Vials	
11, Were any s	ample containers received	broken?	Yes	No 🗹	# of preserved	
40 -			🗖		bottles checked	1, Z
	work match bottle labels? epancies on chain of custod	v)	Yes 🗸	No ∐	for pH:	(12 unless noted)
	s correctly identified on Cha		Yes 🗹	No 🗆	Adjusted?	20
14. Is it clear wh	nat analyses were requeste	d?	Yes 🗸	No 🗆	•	-
	ding times able to be met?		Yes 🗸	No 🗆	Checked by:	
(If no, notify	customer for authorization.)		Ĺ		1
Special Hand	iling (if applicable)					·
16. Was client n	notified of all discrepancies	with this order?	Yes 🗌	No 🗆	NA 🗹	
Perso	n Notified:	Date				
By Wr	nom:	Via:	eMail 🗆	Phone Fax	☐ In Person	
Regar	ding:	to the second se				
Client	Instructions:	The second section is a second and the second secon	TEST OF THE STATE	and state to desire where or later and the series and the	property of the second second second	
17. Additional r	emarks:				<u> </u>	J
18. <u>Cooler Info</u>	ormation					
Cooler N		Seal Intact Seal No 5	Seal Date	Signed By		
1	1.0 Good	Yes				

HALL ENVIRONMENTAL	ANALYSIS LABORATORY	mental.com	Albuquerque, NM 87109	505-345-4107	Analysis Request		ocB.	32 F	308	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	oide (A)	i Pesti OV) B(VO meS) (808 8270 0 C 4	>	<u> </u>		>	\ \frac{1}{2}	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		>					arly notated on the analytical report.
	ANALYSI	www.hallenvironmental.com	4901 Hawkins NE - Albuq	Tel. 505-345-3975 Fax	Analysis	NEO)	MS)	2HC] / C (1.4 (1.4) 270	s נו 8: לו 8: לו או	9) (G oq (G (G	TM + X TM + X 32108 htteM) htteM) htteM) tre8) e' N 8 As	ВТЕ НЧТ ЕDВ ВОЭ НАЧ	>		_								Remarks:		possibility. Any sub-contracted data will be cle
Turn-Around Time:	Standard 🗆 Rush	Project Name:	OM-14 SOURCE INV.	Project #:		Project Manager:	ĵ	W)	TRACY PAY	On Ice: 📈 Yes 💳 🗇 No	Sample Temperature: $\mathcal{L}_{\mathcal{L}}$	Pre	I ype and # I ype I b I n SSS	461	NEAT	1	1	HWOZ	1650	4	Spinster NACH -COI			Received M: Time Month	Received by: Date Time	If necessary samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.
Chain-of-Custody Record	Client: WESTERN REFINING SW, INC.		GROSSING RD	2/	217	-ax#: FD. RIEGE @ WNR. COM	VQC Package:	☐ Standard Level 4 (Full Validation)	uo	□ NELAP □ Other □	XEDD (Type) EXCEL	Date Time Matrix Sample Request ID		10/5/16/355 WITH TK 56.9-1-6W							> ->			Date: Time: Relinquished by:	Date: Time: Refinquished by:	If necessary, samples submitted to Hall Environmental may be subci

ENVISORMENTAL	ANALYSIS LABORATORY	www.hallenvironmental.com	4901 Hawkins NE - Albuquerque, NM 87109	Tel. 505-345-3975 Fax 505-345-4107	Analysis Request	() () () () () () () () () ()	is or	. O.F. MIS	H9T (1),((1,4) (1	+ . +	(G) old (G) ol	BTEX + MT BTEX + MT TPH 8015B TPH (Methorensons (F,C) BOB1 (Pestical Sections (F,C) BOB1 Pestical Secti									Remarks:		And the second s
Turn-Around Time:	X Standard Rush	Project Name:	OM-14 SOURCE INV	Project #:		froject Manager:		Ed Riese	r. TRZALY	On Ice: 📈 Yes ⁻ ⁻ No	Sample Temperature: (0)	Container Preservative HEAL No. Type and # Type	40 MC HCL 702	NEXT	NEAT	HND-3	H-304	RASKY NAOH 102			Received by: (16/07/1/07/1/07/1/07/1/07/1/07/1/07/1/07	Received by: Date Time	
Chain-of-Custody Record	Client: WESTERN REFINING 9W, INC.		CROSSING RO	105181	Phone #: 505-722-02/7	-ax#:		☐ Standard ☐ Level 4 (Full Validation)	no	□ NELAP □ Other □	□ EDD (Type)	Date Time Matrix Sample Request ID	10/5/16 1500 WATER TK 569-2-GW					~ ~			Relinquished by:	Refinquished by:	

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NESTER	WESTERN RETAINS SW, TWC, X Standard	Standard	□ Rush				V	AL	ANALYSIS	S	AB	0	Ĭ	LABORATORY	>
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Mailing Addres	Mailing Address 2 Grant CROSSING RD	DW-14	Source	E INV.	4	4901 Hawkins NE	wkins	- IJ	Albuquerque, NM 87109	nerque	N.	8710	6		
		Project #:			_	Tel. 505-345-3975	-345-3	975	Fax		505-345-4107	107			
Phone #: 5 (-0217							Ā	Analysis Request	Req	ıest				
email or Fax#:	Benail or Fax#: ED, RIESE @ WNR, COM	Project Manager:							(10				<u>, ac</u>		
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Date Time	Matrix Sample Request ID	Container Pre Type and #	Preservative Type	HEAL NO.	M + X3T8 M + X3T8	2108 H9T	TPH (Meti	£8) a'HA⊂	RCRA 8 N	tseq 1808	8260B (VC	nə2) 0728	<u>2147314</u> 0 432	CYANI	elddu8 זiA
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If necessar	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.	ontracted to other accred	ited laboratories.	This serves as notice of this	ossibility.	Any sub-	contracte	d data v	ill be cle	urly notat	ed on th	ne analy	ical repo	넕	

WESTERN REFINING SOUTHWEST, INC. GALLUP REFINERY

OW-14 SOURCE INVESTIGATION - SEPTEMBER 2016

METALS AND CYANIDE ANALYSES FOR GROUNDWATER SAMPLES AND WATER QA/QC SAMPLES

TOTAL METALS ANALYSIS AND DISSOLVED METALS ANALYSIS

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

GENERAL CHEMISTRY PARAMETERS FOR GROUNDWATER SAMPLES AND WATER QA/QC SAMPLES

Analyte	Analytical Method
Chloride	EPA method 300.0
Fluoride	EPA method 300.0
Sulfate	EPA method 300.0

Appendix I
Quality Assurance/Quality Control Review

DATA VALIDATION INTRODUCTION

This summary presents data validation results for soil and groundwater samples collected from soil boring and monitoring wells installed during OW-14 Source Area Investigation at the Gallup Refinery. The data review was performed in accordance with Provision IV.J.3.b (Review of Field and Laboratory QA/QC Data) of the RCRA Permit issued by NMED in October 2013, USEPA Functional Guidelines for Organic and Inorganic Data Review, and quality assurance and control parameters set by the project laboratory Hall Environmental Analysis Laboratory, Inc. (HEAL).

A total of 27 soil samples and 6 groundwater samples (excluding QA samples) were collected from September 21, 2016 through October 5, 2016 in accordance with the OW-14 Source Area Investigation Work Plan (DiSorbo, 2016). Soil and groundwater samples were submitted to HEAL for the following parameters in accordance with the approved Work Plan:

- Volatile organic compounds (VOCs) by USEPA Method 8260B;
- Semi-volatile organic compounds (SVOCs) by USEPA Method 8270C;
- Gasoline, diesel, and motor oil range organics by SW-846 Method 8015B;
- Total recoverable and dissolved metals (Antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, iron, manganese, lead, nickel, selenium, silver, vanadium, and zinc) by EPA Method 6010B for soil samples and EPA Methods 200.7 and 200.8 for water samples;
- Cyanide by EPA 335.4 for water samples;
- Mercury by EPA Method 7471 for soil samples and Method 245.1 for water samples; and
- Fluoride, chloride and sulfate by EPA Method 300.0 for water samples.

Additionally, 14 quality assurance samples consisting of trip blanks, methanol blanks, equipment rinsate blanks, and field duplicates were collected and analyzed as part of the investigation activities. Table A-1 presents a summary of the field sample identifications, laboratory sample identifications, and sample collection dates.

QUALITY CONTROL PARAMETERS REVIEWED

Sample results were subject to a Level II data review that includes an evaluation of the following quality control (QC) parameters:

- Chain-of-Custody;
- Sample Preservation and Temperature Upon Laboratory Receipt;
- Holding Times;
- Blank Contamination (method blanks, trip blanks, field blanks, and equipment rinsate blanks);
- Surrogate Recovery (for organic parameters);
- Laboratory Control Sample (LCS) Recovery and Relative Percent Difference (RPD);
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recovery and RPD;
- Duplicates (field duplicate, laboratory duplicate); and
- Other Applicable QC Parameters.

The data qualifiers used to qualify the analytical results associated with QC parameters outside of the established data quality objectives are defined below:

- J+ The analyte was positively identified; however, the result should be considered an estimated value with a potential high bias.
- J- The analyte was positively identified; however, the result should be considered an estimated value with a potential low bias.
- UJ The reporting limit for a constituent that was not detected is considered an estimated value.
- R Quality control indicates that the data is not usable.

Results qualified as "J+", "J-", or "UJ" are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per EPA guidelines.

Results for the performance monitoring events that required qualification based on the data verification are summarized in Table A-2.

CHAIN-OF-CUSTODY

The chain-of-custody documentation associated with project samples was found to be complete. Chain-of-custodies included sample identifications, date and time of collection, requested parameters, and relinquished/received signatures.

SAMPLE PRESERVATION AND TEMPERATURE UPON LABORATORY RECEIPT

Samples collected were received preserved and intact by HEAL. Samples were received by the laboratory at a temperature of 6.0 degrees Celsius or lower. The sample bottle for the total metals analyses for sample TK 570-1-GW (1610091-004) was apparently received with a pH outside the desired range, thus the lab added one milliliter of HNO3 and held the sample for 24 hours prior to analysis to ensure no metals had precipitated in the sample. The associated sample results for dissolved cobalt and selenium were flagged as detected below quantitation limits.

HOLDING TIMES

All samples were extracted and analyzed within method-specified holding time limits.

BLANK CONTAMINATION

Method Blank

Method blanks were analyzed at the appropriate frequency. Target compounds were not detected in the method blanks, with the exception of the following:

HEAL Report 1609E26

- Manganese was detected in the blank for Batch ID B37965 below quantitation limits. No qualifications were required.
- DRO was detected in the method blanks for Batch ID 27746 (5.8 mg/kg) and Batch ID
 27772 (5.8 mg/kg) below quantitation limits. Two samples listed in Table A-2 were qualified.
- Acetone was detected in the method blank for Batch ID S37546 below the quantitation limit and not associated sample results are qualified.
- 1-methylnaphthalene (0.38 ug/kg) and acetone (0.69 ug/kg) were detected in the method blank for Batch ID 27868 below quantitation limits. One sample was qualified in Table A-2 based on the detection of 1-methylnaphthalene.
- Benzene, naphthalene, 4-methyl-2-pentanone, 1,2,4-trichlorobenzene were detected in the method blank for Batch ID R37500 below quantitation limits. No samples were qualified.
- Bis(2-ethylhexyl)phthalate (0.14 mg/kg), di-n-butyl phthalate (0.1 mg/kg), and diethyl phthalate (0.14 mg/kg) were detected in the method blank for Batch ID 27733 below quantitation limits. Eight samples were qualified in Table A-2.
- Benzoic acid and 2,4,-dinitrophenol were detected in the method blank for Batch ID 27764
 below quantitation limits. One sample was qualified in Table A-2.

 Zinc was detected in the method blank (0.37 mg/kg) for Batch ID 27710 below quantitation limit. No qualifications were required.

HEAL Report 1609G57

- Manganese was detected in the method blank (0.00058 mg/L) for Batch ID B37965 below quantitation limit. One sample was qualified in Table A-2.
- Mercury was detected in the method blank (0.000059 mg/L) for Batch ID 27871 below quantitation limit. Two samples were qualified in Table A-2.
- Chloride was detected in the method blank (0.082 mg/L) for Batch ID R37589 below quantitation limit. Two samples were qualified in Table A-2.
- Methylene chloride was detected in the method blank (0.85 ug/L) for Batch ID R37576 below quantitation limit. Methylene chloride was not detected in the samples. No samples were qualified.
- Benzoic acid, bis(2-ethylhexyl)phthalate, and 2,4-dinitrophenol were detected in the method blank for Batch ID 27882 below quantitation limits. Four samples were qualified in Table A-2.

HEAL Report 1609G64

- 2-Butanone was detected in the method blank (0.050 mg/kg) for Batch ID 27796 below quantitation limit. One sample was qualified in Table A-2.
- 1-Methylnaphthalene (0.380 ug/kg) and acetone (0.690 ug/kg) were detected in the method blank for Batch ID 27868 below quantitation limits. One sample was qualified in Table A-2.
- Bis (2-ethylhexyl) phthalate (0.12 mg/kg), di-n-butyl phthalate (0.17 mg/kg), and 2,4-dinitrophenol (0.12 mg/kg) were detected in the method blank for Batch ID 27836 below quantitation limits. Fourteen samples were qualified in Table A-2.
- Iron (1.1 mg/kg) and manganese (0.091 mg/kg) were detected in the method blank for Batch ID 27843 below quantitation limits. No qualifications were required.

HEAL Report 1610091

- Arsenic was detected in the method blank (0.00042 mg/L) for Batch ID 28061 below quantitation limit. No qualifications were required.
- Mercury was detected in the method blank (0.00015 mg/L) for Batch ID 27928 below quantitation limit. Six samples were qualified in Table A-2.

- The following VOCS were detected in the method blank for Batch ID R37724 below quantitation limits:
 - o Toluene 0.22 ug/L;
 - o 1,2,4-Trimethylbenzene 0.14 ug/L;
 - Naphthalene 0.33 ug/L;
 - o 1-Methylnaphthalene 0.43 ug/L;
 - o 2-Methylnaphthalene 0.51 ug/L;
 - o 2-Methyl-2-pentanone 1.4 ug/L;
 - o 1,2,3-Trichlorobenzene 0.13 ug/L;
 - o 1,2,4-Trichlorobenzene 0.18 ug/L; and
 - o Xylenes 0.42 ug/L.

Four samples were qualified in Table A-2 due to the detection of toluene, 1,2,4-trimethylbenzene, naphthalene, and 2-methylnaphthalene in the method blank and in the sample "TRIP BLANK".

Benzoic acid (11 ug/L), bis(2-ethylhexyl)phthalate (3.2 ug/L), and 2,4,-dinitrophenol (7.5 ug/L) were detected in the method blank for Batch ID 27882 below quantitation limits. Nine samples were qualified in Table A-2.

HEAL Report 1610237

- Mercury was detected in the method blank (0.00016 mg/L) for Batch ID 28031 below quantitation limit. Two samples were qualified in Table A-2.
- Bromomethane was detected in the method blank (0.84 ug/L) for Batch ID R37747 below quantitation limit. No samples were required to be qualified.
- Benzoic acid was detected in the method blank (5.0 ug/L) for Batch ID 27939 below quantitation limit. One sample was qualified in Table A-2.

HEAL Report 1610238

- DRO was detected in the method blank (2.8 mg/kg) for Batch ID 27950 below quantitation limit. Three samples were qualified in Table A-2.
- 1,2,4-trichlorobenzene was detected in the method blanks for Batch ID S37765 (0.0068 mg/kg) and Batch ID S37805 (0.0078 mg/kg) below quantitation limits. No samples were required to be qualified.

- Acetone (0.079 mg/kg) and 2-butanone (0.057 mg/kg) were detected in the method blank for Batch ID 27923 below quantitation limits. No samples were required to be qualified.
- Bis (2-ethylhexyl) phthalate (0.10 mg/kg) and di-n-butyl phthalate (0.19 mg/kg) were
 detected in the method blank for Batch ID 28021 below quantitation limits. Thirteen
 samples were qualified in Table A-2.
- Iron (1.4 mg/kg) and zinc (0.57 mg/kg) were detected in the method blank for Batch ID
 27985 below quantitation limits. No samples were required to be qualified.

HEAL Report 1610355

- Arsenic was detected in the method blank (0.00029 mg/L) for Batch ID 28269 below quantitation limit. No samples were required to be qualified.
- Mercury was detected in the method blank (0.00016 mg/L) for Batch ID 28031 below quantitation limit. Three samples were qualified in Table A-2.
- The following VOCS were detected in the method blank for Batch ID R37866 below quantitation limits:
 - o 1,2,4-Trimethylbenzene 0.13 ug/L;
 - Naphthalene 0.30 ug/L;
 - o 1-Methylnaphthalene 0.43 ug/L;
 - 2-Methylnaphthalene 0.50 ug/L;
 - o Chlorobenzene 0.14 ug/L;
 - o 4-Methyl-2-pentanone 1.4 ug/L;
 - Methylene chloride 0.21 ug/L; and
 - o Styrene 0.17 ug/L.

Four samples were qualified in Table A-2 due to the detection of 1,2,4-trimethylbenzene, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene in the method blank and in the sample "Trip Blank".

Benzoic acid (8.5 ug/L), butyl benzyl phthalate (2.7 ug/L), and di-n-octyl phthalate (6.7 ug/L) were detected in the method blank for Batch ID 27995 below quantitation limits. Three samples were qualified in Table A-2.

Trip Blank

Trip blanks were analyzed at the appropriate frequency as specified in the Permit. Target compounds were not detected in the trip blanks with the following exceptions:

<u>HEAL Report 1610091</u> – The following VOCs were detected in the sample TRIP BLANK (HEAL Sample ID 1610091-007);

- Benzene 0.15 J ug/L;
- Toluene 0.20 J ug/L;
- 1,2,4-Trimethylbenzene 0.11 J ug/L;
- Naphthalene 0.28 J ug/L; and
- 2-Methylnaphthalene 0.40 J ug/L.

This sample was qualified in Table A-2. The sample was qualified "JH" due to being biased high as the method blank (Batch ID R37724) reported concentrations for all five of these target compounds.

<u>HEAL Report 1610355</u> – The following VOCs were detected in the sample Trip Blank (HEAL Sample ID 1610355-004A):

- Benzene 0.16 J ug/L;
- Toluene 0.28 J ug/L;
- 1,2,4-Trimethylbenzene 0.15 J ug/L;
- 1,3,5-Trimethylbenzene 0.13 J ug/L;
- Naphthalene 0.50 J ug/L;
- 1-Methylnaphthalene 0.82 J ug/L;
- 2-Methylnaphthalene 0.40 J ug/L;
- Hexachlorobutadiene 0.31 J ug/L;
- Isopropylbenzene 0.12 J ug/L;
- N-Butylbenzene 0.20 J ug/L;
- 1,2,3-Trichlorobenzene 0.34 ug/L; and
- Xylenes 0.46 ug/L.

This sample was qualified in Table A-2. The sample was qualified "JH" due to being biased high as the method blank (Batch ID R37866) reported concentrations for 1,2,4-trimethylbenzene, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Field Blanks/Equipment Rinsate Blank

Field and equipment rinsate blanks were collected as specified in the OW-14 Source Area Investigation Work Plan and the Permit. The following constituents were detected in equipment rinsate blanks:

EB092116 (HEAL Sample ID 1609E26-003)

- Chloride 0.10 J mg/L;
- Manganese 0.00046 J mg/L;
- Benzoic acid 6.2 J ug/L;
- Bis(2-ethylhexyl)phthalate 2.7 J ug/L; and
- Toluene 0.12 J ug/L.

EB092216 (HEAL Sample ID 1609E26-003)

- Chloride 0.091 J mg/L;
- Manganese 0.00061 J mg/L;
- Benzoic acid 5.0 J ug/L;
- Benzene 0.19 J ug/L;
- Toluene 0.39 J ug/L; and
- Acetone 6.6 J ug/L.

EB092716 (HEAL Sample ID 1609G57-001)

- Chloride 0.19 J mg/L;
- Mercury 0.000057 J mg/L;
- Benzoic acid 11 J ug/L; and
- Bis(2-ethylhexyl)phthalate 2.7 J ug/L.

EB092816 (HEAL Sample ID 1609E26-003)

- Chloride 0.11 J mg/L;
- Manganese 0.00089 J mg/L;
- Mercury 0.000055 J mg/L;

- Benzoic acid 11 J ug/L; and
- Bis(2-ethylhexyl)phthalate 2.8 J ug/L.

EB100416 (HEAL Sample ID 1610237-001C)

- Benzoic acid 11 J ug/L;
- Benzyl alcohol 3.1 J ug/L
- Iron 0.037 mg/L;
- Manganese 0.00058 J mg/L; and
- Mercury 0.00012 J mg/L.

As the concentrations are generally below the associated reported concentration and/or the affected samples are already qualified based on the presence in other QC samples (e.g., method blanks) no results are qualified based on these detections.

Common Laboratory Contaminants

Per USEPA guidelines, common laboratory contaminants for VOC analysis are acetone, 2-butanone (MEK), cyclohexane, chloromethane, and methylene chloride. Common laboratory contaminants for SVOC analysis include phthalates. Data qualification was required for samples with acetone, 2-butanone and phthalates since there were detection in blanks and field analytical results were detected at concentrations less than 10 times the blank concentration in field samples. See Table A-2 for qualified data.

Methanol Blanks

Methanol blanks provided by the laboratory were analyzed for VOCs. The following constituents were detected in methanol blanks:

- Methanol Blank (HEAL Sample ID 1609e26-013a) There were no analytes detected in the methanol blanks above the respective laboratory reporting limits;
- MEOH BLANK (HEAL Sample ID 1609G64-004A) 2-Butanone 0.053 J mg/kg. 2-butanone
 was detected below quantitation limits. The sample is biased high as the method blank was
 reported to contain a concentration of 0.050 mg/kg 2-butanone. This sample was qualified in
 Table A-2; and
- MeOH Blank (HEAL Sample ID 1610238-010a) 2-Butanone 0.062 J mg/kg.

SURROGATE RECOVERY

Surrogate recoveries for the organic and inorganic analyses were performed at the required frequency and were within laboratory acceptance limits, with the following exceptions:

HEAL Report 1609E26

- Surrogate recovery for DNOP (Method 8015) was low for field sample TK-568-1 (12-14')
 (HEAL Sample ID 1609E26-008). Batch ID 27746 reported the analyte detected in the method blank at 5.8 mg/kg. The surrogate recovery for DNOP in the LCS was within the limits. The DRO sample was qualified in Table A-2 with a potential high bias;
- Surrogate recovery for the following surrogates (Method 8270C Batch ID 27733) were low for field sample TK-568-1 (12-14') (HEAL Sample ID 1609E26-008); and
 - 2-Fluorophenol;
 - Phenol-d5:
 - 2,4,6-Tribromophenol;
 - Nitrobenzene-d5:
 - 2-Fluorobiphenyl; and
 - 4-Terphenyl-d14.

The surrogate recovery for the method blank and the LCS within Batch ID 27733 were within acceptable limits. The associated results are not qualified.

- Surrogate recovery for the following surrogates (Method 8270C Batch ID 27733) were low for field sample DUP01 (HEAL Sample ID 1609E26-011).
 - 2-Fluorophenol;
 - Phenol-d5: and
 - Nitrobenzene-d5.

The surrogate recovery for the method blank and the LCS within Batch ID 27733 were within acceptable limits. The associated results are not qualified.

HEAL Report 1609G64

Surrogate recovery for DNOP (Method 8015 – Batch ID 27809) was low for field sample TK-570-1 (32-34') (HEAL Sample ID 1609G64-006). The surrogate recovery for the method blank and the LCS within Batch ID 27809 were within acceptable limits. The associated results are not qualified.

- Surrogate recovery for the following surrogates (Method 8270C Batch ID 27836) were low for field sample TK-570-1 (32-34') (HEAL Sample ID 1609G64-006);
 - 2-Fluorophenol; and
 - Phenol-d5.

The surrogate recovery for the method blank and the LCS within Batch ID 27836 were within acceptable limits. The associated results are not qualified.

- Surrogate recovery for DNOP (Method 8015 Batch ID 27809) was low for field sample TK-569-3 (24-26') (HEAL Sample ID 1609G64-009). The surrogate recovery for the method blank and the LCS within Batch ID 27836 were within acceptable limits. The associated results are not qualified; and
- Surrogate recovery for the following surrogates (Method 8270C) were low for field sample TK-569-3 (24-26') (HEAL Sample ID 1609G64-009);
 - 2-Fluorophenol; and
 - Phenol-d5.

The surrogate recovery for the method blank and the LCS within Batch ID 27836 were within acceptable limits. The associated results are not qualified.

HEAL Report 1610091

- Surrogate recovery for 2-fluorophenol (Method 8270C Batch ID 27882) was low for the following field samples:
 - TK-568-1-GW (HEAL Sample ID 1610091-001);
 - TK-568-2-GW (HEAL Sample ID 1610091-002); and
 - TK-569-3-GW (HEAL Sample ID 1610091-003).

The surrogate recovery for the method blank and the LCS within Batch ID 27882 were within acceptable limits. The associated results are not qualified.

Surrogate recovery for DNOP (Method 8015 – Batch ID 27867) was low for field sample TK-570-1-GW (HEAL Sample ID 1610091-004). The surrogate recovery for the method blank and the LCS within Batch ID 27867 were within acceptable limits. The associated results are not qualified.

HEAL Report 1610238

- Surrogate recovery for bromofluorobenzene (BFB) (Method 8015 Batch ID 27950) was low for field sample TK-569-1 (24-26') (HEAL Sample ID 1610238-005). The surrogate recovery for the method blank and the LCS within Batch ID 27950 were within acceptable limits. The associated results are not qualified.
- Surrogate recovery for 2-fluorophenol (Method 8270C Batch ID 28021) was low for field sample TK-569-1 (24-26') (HEAL Sample ID 1610238-005). The surrogate recovery for the method blank and the LCS within Batch ID 28021 were within acceptable limits. The associated results are not qualified.

HEAL Report 1610355-001

- Surrogate recovery for 2-fluorobiphenyl (Method 8270C Batch ID 27995) was low for field sample TK-569-1-GW (HEAL Sample ID 1610355-001). The surrogate recovery for the method blank and the LCS within Batch ID 27995 were within acceptable limits. The associated results are not qualified.
- Surrogate recovery for 2-fluorophenol and 2-fluorobiphenyl (Method 8270C Batch ID 27995) were low for field sample DUP-GW (HEAL Sample ID 1610355-003). The surrogate recovery for the MS/MSD samples in Batch ID 27995 for 2-fluorophenol were low. The surrogate recovery for the MS sample in Batch ID 27995 for 4-terphenyl-d14 was high. The surrogate recovery for four of the six surrogates included in Method 8270C were within limits. The associated sample results for semi-volatile organic compounds are not qualified.

LCS RECOVERY AND RELATIVE PERCENT DIFFERENCE

Laboratory control samples (LCS)/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for the LCS or LCS duplicate, but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for the LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified "J+" to account for a potential high bias.

• If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified ("UJ" for non-detects and "J-" for detected results) to account for a potential low bias.

LCS/LCSD percent recoveries and relative percent differences (RPDs) were within acceptance limits and no qualification was required, except as noted below:

HEAL Report 1610238

The LCS recovery for 1,1-dichloroethene was above the acceptance limit in Batch ID 27923.
 1-1-dichloroethene was not detected in the associated batch, data qualification was not required.

MS/MSD RECOVERY AND RELATIVE PERCENT DIFFERENCE

Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples were performed at the required frequency and were evaluated by the following criteria:

- If the MS or MSD recovery for an analyte was above acceptance limits but the analyte was not detected in the associated analytical batch, then data qualification was not required.
- If the MS or MSD recovery for an analyte was above acceptance limits and the analyte was detected in the associated analytical batch, then analyte results were qualified "J+" to account for a potential high bias.
- Low MS/MSD recoveries for organic or inorganic parameters result in sample qualification of the associated analytical batch with a "J-".
- Results were not qualified based on non-project specific MS/MSD (i.e., batch QC) recoveries.

MS/MSD percent recoveries and RPDs were within acceptance limits except for the following:

HEAL Report 1609E26

 The MSD recovery for diesel range organics was above the acceptance limit in Batch ID 27772. The RPD was outside the accepted recovery limit in this batch. Diesel range organics were detected in the associated analytical batch. The results were qualified "J+" in Table A-2 to account for a potential high bias.;

- The RPD (MSD sample) for gasoline range organics was outside the accepted recovery limit
 in Batch ID AG37567. Gasoline range organics were not detected in the associated analytical
 batch. The results were not qualified.
- The MS recovery for N-nitrosodi-n-propylamine was above the acceptance limit in Batch ID 27733. N-nitrosodi-n-propylamine was not detected in the associated analytical batch. The results were not qualified.
- The RPD (MSD sample) for the following SVOCs was above outside the accepted RPD limit in Batch ID 27764;
 - o Acenaphthene;
 - 4-Chloloro-3-methylphenol;
 - o 2-Chlorophenol;
 - o 1,4-Dichlorobenzene;
 - o 2.4-Dinitrotoluene:
 - o N-Nitrosodi-n-propylamine;
 - o Phenol; and
 - o 1,2,4-Trichlorobenzene.

None of the SVOCs were detected in the associated analytical batch. The results were not qualified.

HEAL Report 1610091

- The MS recoveries for benzene and toluene were above the acceptance limit in Batch ID R377724. The values were also above the quantitation range. Both VOCs were detected in the associated analytical batch. The results were qualified "J+" in Table A-2 to account for a potential high bias.;
- The MSD recoveries for chlorobenzene and 1,1-dichloroethene were above the acceptance limit in Batch ID R377724. The RPDs were outside accepted recovery limits. Chlorobenzene and 1,1-dichloroethene were not detected in the associated analytical batch. The results were not qualified; and
- The RPD (MSD sample) for trichloroethene was outside the accepted recovery limit in Batch ID R377724. Trichloroethene was not detected in the associated analytical batch. The results were not qualified.

HEAL Report 1610237

 The RPDs (MSD sample) for SVOCs 4-chloro-3-methylphenol and 2-chlorophenol were outside the accepted recovery limit in Batch ID 27939. 4-Chloro-3-methylphenol and 2chlorophenol were detected in the associated analytical batch. The results were not qualified.

HEAL Report 1610238

 The MSD recovery for toluene was below the acceptance limit in Batch ID 27923. The RPDs (MSD sample) for toluene was outside the accepted recovery limit in Batch ID 27923. The results were qualified "J-"in Table A-2.

HEAL Report 1610355

- The MS Low Level (LL) recovery for antimony was below the acceptance limit in Batch ID
 28468. Antimony was not detected in the analytical batch. The results were not qualified.
- The MS/MSD recovery for toluene was below the acceptance limit in Batch ID R37866. The
 values for toluene and benzene were reported above quantitation range in Batch ID R37866.
 The results for toluene were qualified "J-" in Table A-2. The results for benzene were not
 qualified.
- The MS/MSD recovery for 2-chlorophenol was below the acceptance limit in Batch ID 28468 for SVOCs. 2-Chlorophenol was not detected in the analytical batch. The results were not qualified.

DUPLICATES

Field Duplicates

Field duplicates were collected at a rate as stated in the approved Investigation Work Plan. The RPDs between the field duplicate and its associated sample were calculated and are presented in Table A-3. The field duplicates were evaluated by the following criteria:

 If an analyte was detected at a concentration greater than five times the method reporting limit, the RPD should be less than 35 percent for soil and 25 percent for groundwater samples.

- If an analyte was detected at a concentration that is less than five times the method reporting limit, then the difference between the sample and the field duplicate should not exceed the method reporting limit.
- Duplicate RPDs are calculated by dividing the difference of the concentrations by the average
 of the concentrations.

Field duplicate RPDs were within acceptance limits with the exception of the soil sample TK-568-1 (30-32'). The diesel range organics result for this sample was reported to be 11 mg/kg. The reported concentration for the duplicate sample (DUPO1) was reported to be 430 mg/kg. The calculated RPD was 47.5%. See Table A-3 for a field duplicate summaries.

COMPLETENESS SUMMARY

The following equation was used to calculate the technical completeness:

The technical completeness attained for Investigation activities was 100 percent. The completeness results are provided in Table A-4. The analytical results for the required analytes per the approved Work Plan were considered usable for the intended purposes and the project DQOs have been met.

Sample ID	Lab ID	Date Collected	Sample Type		
OW-57 (16-18')	1609E26-001A	09/21/16	N		
OW-57 (25-27')	1609e26-002a	09/21/16	N		
EB092116	1609e26-003a	09/21/16	EB		
OW-58 (10-12)	1609e26-004a	09/22/16	N		
OW-58 (22-24')	1609e26-005a	09/22/16	N		
OW-58 (28-29')	1609e26-006a	09/22/16	N		
OW-58 (48-48.5')	1609e26-007a	09/22/16	N		
TK-568-1 (12-14')	1609e26-008a	09/23/16	N		
TK-568-1 (30-32')	1609e26-009a	09/23/16	N		
TK-568-1 (48-49')	1609e26-010a	09/23/16	N		
DUP01	1609e26-011a	09/23/16	FD		
EB092216	1609e26-012a	09/22/16	EB		
Methanol Blank	1609e26-013a	NA	MB		
EB092716	1609g57-001a	09/27/16	EB		
EB092816	1609g57-002a	09/28/16	EB		
TK 568-2 (22-24')	1609g64-001a	09/27/16	N		
TK 568-2 (28-30')	1609g64-002a	09/27/16	N		
TK 568-2 (36-37')	1609g64-003a	09/27/16	N		
MEOH BLANK	1609G64-004A	NA	MB		
TK 570-1 (10-12')	1609G64-005A	09/27/16	N		
TK 570-1 (32-34')	1609g64-006a	09/27/16	N		
TK 570-1 (44-45')	1609g64-007a	09/27/16	N		
TK 569-3 (16-18')	1609g64-008a	09/28/16	N		
TK 569-3 (24-26')	1609g64-009a	09/28/16	N		
TK 569-3 (38-39')	1609g64-010a	09/28/16	N		
TK 568-1-GW	1610091-001a	10/02/16	GW		
TK 568-2-GW	1610091-002a	10/02/16	GW		
TK 569-3-GW	1610091-003a	10/02/16	GW		
TK 570-1-GW	1610091-004a	09/30/16	GW		
OW-57	1610091-005a	10/01/16	GW		
0W-58	1610091-006a	09/30/16	GW		
TRIP BLANK	1610091-007a	NA	TB		
EB100416	1610237-001a	10/04/16	EB		
TK569-2(16-18')	1610238-001a	10/04/16	N		
TK569-2(29-31')	1610238-002a	10/04/16	N		
TK569-2(36-38')	1610238-003a	10/04/16	N		
TK569-1(18-20')	1610238-004a	10/04/16	N		
TK569-1(24-26')	1610238-005a	10/04/16	N		
TK569-1(36-38')	1610238-006a	10/04/16	N		
TK569-1(40-42')	1610238-007a	10/04/16	N		

Sample ID	Lab ID	Date Collected	Sample Type
DUP02	1610238-008a	10/04/16	FD
DUP03	1610238-009a	10/04/16	FD
MeOH Blank	1610238-010a	NA	MB
TK-569-1-GW	1610355-001A	10/05/16	N
TK-569-2-GW	1610355-002A	10/05/16	N
DUP-GW	1610355-003A	10/05/16	FD-GW
Trip Blank	1610355-004A	NA	TB

Notes:

N=Normal field soil sample TB = Trip blank

FD = Field duplicate EB = Equipment blank

FB = Field blank GW = Groundwater sample

NA = Not applicable MB = Methanol blank

Sample ID	Lab Sample ID	Date Collected	Parameter Name	Result	Units	Matrix	Qualifier	Comments
Sample ID							-	Analyte detected below quantitation limits and is biased high as
OW-57 (16-18')	1609E26-001A	09/21/16	Bis(2-ethylhexyl)phthalate	0.13	mg/kg	Soil	J+	method blank contained 0.14 mg/kg
OW-57 (16-18')	1609E26-001A	09/21/16	Diethyl phthalate	0.14	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as
	1000110 0017	00, 21, 10	Diotry: prictical	0.2.	8/8			method blank contained 0.14 mg/kg
OW-57 (16-18')	1609E26-001A	09/21/16	Di-n-butyl phthalate	0.16	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.1 mg/kg
								Analyte detected below quantitation limits and is biased high as
OW-57 (25-27')	1609e26-002a	09/21/16	1-Methylnaphthalene	0.281	μg/Kg	Soil	J+	method blank contained 0.38 ug/kg
OW-57 (25-27')	1609e26-002a	09/21/16	Bis(2-ethylhexyl)phthalate	0.11	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as
		33, ==, =3	(V			_	method blank contained 0.14 mg/kg
OW-57 (25-27')	1609E26-002A	09/21/16	Diesel Range Organics (DRO)	5.9	mg/kg	Soil	J+	Analyte detected below quantitation limits and potentially biased high as method blank contained 5.8 mg/kg DRO
								Analyte detected below quantitation limits and is biased high as
OW-57 (25-27')	1609e26-002a	09/21/16	Diethyl phthalate	0.17	mg/kg	Soil	J+	method blank contained 0.14 mg/kg
OW-57 (25-27')	1609e26-002a	09/21/16	Di-n-butyl phthalate	0.15	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as
(20 21)		33, ==, =3		0.20			_	method blank contained 0.1 mg/kg
EB092116	1609e26-003	09/21/16	Benzoic acid	6.2	ug/kg	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 4.7 mg/kg
								Analyte detected below quantitation limits and is biased high as
OW-58 (10-12)	1609e26-004a	09/22/16	Bis(2-ethylhexyl)phthalate	0.12	mg/kg	Soil	J+	method blank contained 0.14 mg/kg
OW-58 (10-12)	1609e26-004a	09/22/16	Diethyl phthalate	0.12	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as
,		, ,						method blank contained 0.14 mg/kg
OW-58 (10-12)	1609e26-004a	09/22/16	Di-n-butyl phthalate	0.14	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.1 mg/kg
	1000 00 007	22/22/12	-	2.10		2 "		Analyte detected below quantitation limits and is biased high as
OW-58 (22-24')	1609e26-005a	09/22/16	Bis(2-ethylhexyl)phthalate	0.12	mg/kg	Soil	J+	method blank contained 0.14 mg/kg
OW-58 (22-24')	1609e26-005a	09/22/16	Diethyl phthalate	0.14	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as
,		, ,						method blank contained 0.14 mg/kg
OW-58 (22-24')	1609e26-005a	09/22/16	Di-n-butyl phthalate	0.15	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.1 mg/kg
014/ 50 (00 00)	1000 00 000	00/00/40	D: (0 11 II II II II II	0.44	.// .	0 '1	1.	Analyte detected below quantitation limits and is biased high as
OW-58 (28-29')	1609e26-006a	09/22/16	Bis(2-ethylhexyl)phthalate	0.14	mg/kg	Soil	J+	method blank contained 0.14 mg/kg
OW-58 (48-48.5')	1609e26-007a	09/22/16	Bis(2-ethylhexyl)phthalate	0.12	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as
,		, ,	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \					method blank contained 0.14 mg/kg
OW-58 (48-48.5')	1609e26-007a	09/22/16	Diethyl phthalate	0.16	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.14 mg/kg
OM 50 (40 40 51)	4000-00-007	00/00/40	Di n hutul mhth al-t-	0.45	100 mg // 1 mg	0-:1	1.	Analyte detected below quantitation limits and is biased high as
OW-58 (48-48.5')	1609e26-007a	09/22/16	Di-n-butyl phthalate	0.15	mg/kg	Soil	J+	method blank contained 0.1 mg/kg
TK-568-1 (12-14')	1609e26-008a	09/23/16	DRO	300	mg/kg	soil	J+	Analyte detected in method blank at 5.8 mg/kg and low surrogate
` ,					<u> </u>			recovery for DNOP

Sample ID	Lab Sample ID	Date Collected	Parameter Name	Result	Units	Matrix	Qualifier	Comments
TK-568-1 (30-32')	1609e26-009a		DRO	11	mg/kg	soil	J+	Analyte detected in method blank at 5.8 mg/kg. The MSD recovery was above the acceptance limit. The RPD was outside the accepted recovery limit in this batch.
TK-568-1 (30-32')	1609e26-009a	09/23/16	Bis(2-ethylhexyl)phthalate	0.12	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.14 mg/kg
TK-568-1 (30-32')	1609e26-009a	09/23/16	Diethyl phthalate	0.16	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.14 mg/kg
TK-568-1 (30-32')	1609e26-009a	09/23/16	Di-n-butyl phthalate	0.15	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.1 mg/kg
TK-568-1 (48-49')	1609E26-010A	09/23/16	Diesel Range Organics (DRO)	8.4	mg/kg	Soil	J+	Analyte detected below quantitation limits and potentially biased high as method blank contained 5.8 mg/kg DRO
TK-568-1 (48-49')	1609e26-010a	09/23/16	Diethyl phthalate	0.16	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.14 mg/kg
TK-568-1 (48-49')	1609e26-010a	09/23/16	Di-n-butyl phthalate	0.2	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.1 mg/kg
EB092716	1609G57-001	09/27/16	Mercury	0.000057	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00059 mg/kg
EB092716	1609G57-001	09/27/16	Chloride	0.19	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.082 mg/L
EB092716	1609G57-001	09/27/16	Benzoic acid	11	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 11 ug/L
EB092716	1609G57-001	09/27/16	Bis(2-ethylhexyl)phthalate	2.7	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 3.2 ug/L
EB092816	1609G57-002	09/28/16	Manganese	0.00089	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00058 mg/kg
EB092816	1609G57-002	09/28/16	Mercury	0.000055	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00059 mg/kg
EB092816	1609G57-002	09/28/16	Chloride	0.11	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.082 mg/L
EB092816	1609G57-002	09/27/16	Benzoic acid	11	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 11 ug/L
EB092816	1609G57-002	09/27/16	Bis(2-ethylhexyl)phthalate	2.8	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 3.2 ug/L
TK 568-2 (22-24')	1609g64-001a	09/27/16	1-Methylnaphthalene	0.249	µg/Kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.380 mg/kg
TK 568-2 (22-24')	1609G64-001A	09/27/16	Di-n-butyl phthalate	0.094	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.17 mg/kg
TK 568-2 (28-30')	1609G64-002A	09/27/16	Di-n-butyl phthalate	0.12	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.17 mg/kg
TK 568-2 (36-37')	1609g64-003a	09/27/16	1-Methylnaphthalene	0.282	µg/Kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.380 mg/kg

Sample ID	Lab Sample ID	Date Collected	Parameter Name	Result	Units	Matrix	Qualifier	Comments
TK 568-2 (36-37')	1609G64-003A	09/27/16	Bis(2-ethylhexyl)phthalate	0.12	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.12 mg/kg
TK 568-2 (36-37')	1609G64-003A	09/27/16	Di-n-butyl phthalate	0.14	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.17 mg/kg
MEOH Blank	1609G64-004	09/27/16	2-Butanone	0.053	mg/kg	MeOH	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.050 mg/kg
TK 570-1 (10-12')	1609G64-005A	09/27/16	Bis(2-ethylhexyl)phthalate	0.11	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.12 mg/kg
TK 570-1 (10-12')	1609G64-005A	09/27/16	Di-n-butyl phthalate	0.13	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.17 mg/kg
TK 570-1 (32-34')	1609G64-006A	09/27/16	Bis(2-ethylhexyl)phthalate	0.14	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.12 mg/kg
TK 570-1 (32-34')	1609G64-006A	09/27/16	Di-n-butyl phthalate	0.24	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.17 mg/kg
TK 570-1 (44-45')	1609G64-007A	09/27/16	Bis(2-ethylhexyl)phthalate	0.12	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.12 mg/kg
TK 570-1 (44-45')	1609G64-007A	09/27/16	Di-n-butyl phthalate	0.24	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.17 mg/kg
TK 569-3 (16-18')	1609G64-008A	09/28/16	Bis(2-ethylhexyl)phthalate	0.11	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.12 mg/kg
TK 569-3 (16-18')	1609G64-008A	09/28/16	Di-n-butyl phthalate	0.22	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.17 mg/kg
TK 569-3 (38-39')	1609G64-010A	09/28/16	Bis(2-ethylhexyl)phthalate	0.12	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.12 mg/kg
TK 569-3 (38-39')	1609G64-010A	09/28/16	Di-n-butyl phthalate	0.23	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.17 mg/kg
TK 568-1-GW	1610091-001c	10/02/16	Benzene	16000	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
TK 568-1-GW	1610091-001c	10/02/16	Benzoic acid	41	ug/L	Water	J+	Biased high as method blank contained 11 ug/L.
TK 568-1-GW	1610091-001c	10/02/16	Bis(2-ethylhexyl)phthalate	6	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 3.2 ug/L.
TK 568-1-GW	1610091-001F	10/02/16	Mercury	0.00016	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00015 mg/L.
TK 568-1-GW	1610091-001c	10/02/16	Toluene	10000	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
TK 568-2-GW	1610091-002c	10/02/16	Benzene	28000	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
TK 568-2-GW	1610091-002c	10/02/16	Benzoic acid	45	ug/L	Water	J+	Biased high as method blank contained 11 ug/L.
TK 568-2-GW	1610091-002F	10/02/16	Mercury	0.00015	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00015 mg/L.
TK 568-2-GW	1610091-002c	10/02/16	Toluene	9300	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
TK 569-3-GW	1610091-003c	10/02/16	Benzene	24000	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
TK 569-3-GW	1610091-003c	10/02/16	Benzoic acid	68	ug/L	Water	J+	Biased high as method blank contained 11 ug/L.

Sample ID	Lab Sample ID	Date Collected	Parameter Name	Result	Units	Matrix	Qualifier	Comments
TK 569-3-GW	1610091-003c	10/02/16	Bis(2-ethylhexyl)phthalate	7.8	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 3.2 ug/L.
TK 569-3-GW	1610091-003F	10/02/16	Mercury	0.00012	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00015 mg/L.
TK 569-3-GW	1610091-003c	10/02/16	Toluene	20000	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
TK 570-1-GW	1610091-004c	09/30/16	Benzene	23000	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
TK 570-1-GW	1610091-004F	09/30/16	Mercury	0.00018	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00015 mg/L.
TK 570-1-GW	1610091-004c	09/30/16	Toluene	25000	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
OW-57	1610091-005c	10/01/16	Benzene	11000	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
OW-57	1610091-005c	10/01/16	Benzoic acid	32	ug/L	Water	J+	Biased high as method blank contained 11 ug/L.
OW-57	1610091-005c	10/01/16	Bis(2-ethylhexyl)phthalate	4.2	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 3.2 ug/L.
OW-57	1610091-005F	10/01/16	Mercury	0.00014	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00015 mg/L.
OW-57	1610091-005c	10/01/16	Toluene	54	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
OW-58	1610091-006c	09/30/16	Benzene	32000	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
0W-58	1610091-006c	09/30/16	Benzoic acid	16	ug/L	Water	J+	Analyte detected below quantitaion limits and is biased high as method blank contained 11 ug/L.
0W-58	1610091-006c	09/30/16	Bis(2-ethylhexyl)phthalate	2.8	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 3.2 ug/L.
0W-58	1610091-006F	09/30/16	Mercury	0.00013	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00015 mg/L.
OW-58	1610091-006c	09/30/16	Toluene	6600	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
TRIP BLANK	1610091-007a	09/30/16	Benzene	0.15	ug/L	Water	J+	Biased high as MS recoveries were above the acceptance limit.
TRIP BLANK	1610091-007a	09/30/16	Toluene	0.20	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.22 ug/L.
TRIP BLANK	1610091-007a	09/30/16	1,2,4-Trimethylbenzene	0.11	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.14 ug/L.
TRIP BLANK	1610091-007a	09/30/16	Naphthalene	0.28	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.33 ug/L.
TRIP BLANK	1610091-007a	09/30/16	2-Methylnaphthalene	0.40	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.51 ug/L.
EB100416	1610237-001	10/04/16	Mercury	0.00012	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00016 mg/L.
EB100416	1610237-001	10/04/16	Mercury (dissolved)	0.00012	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00016 mg/L.
EB100416	1610237-001	10/04/16	Benzoic acid	9.5	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 5.0 ug/L.
TK569-2(16-18')	1610238-001a	10/04/16	Bis(2-ethylhexyl)phthalate	0.12	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.10 mg/kg

Sample ID	Lab Sample ID	Date Collected	Parameter Name	Result	Units	Matrix	Qualifier	Comments
TK569-2(16-18')	1610238-001a	10/04/16	Di-n-butyl phthalate	0.27	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.19 mg/kg
TK569-2(29-31')	1610238-002a	10/04/16	Bis(2-ethylhexyl)phthalate	0.10	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.10 mg/kg
TK569-2(29-31')	1610238-002a	10/04/16	Di-n-butyl phthalate	0.21	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.19 mg/kg
TK569-2(36-38')	1610238-003a	10/04/16	Bis(2-ethylhexyl)phthalate	0.096	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.10 mg/kg
TK569-2(36-38')	1610238-003A	10/04/16	Diesel Range Organics (DRO)	4.4	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 2.8 mg/kg.
TK569-2(36-38')	1610238-003a	10/04/16	Di-n-butyl phthalate	0.1	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.19 mg/kg
TK569-1(18-20')	1610238-004a	10/04/16	Bis(2-ethylhexyl)phthalate	0.13	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.10 mg/kg
TK569-1(18-20')	1610238-004A	10/04/16	Diesel Range Organics (DRO)	5.2	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 2.8 mg/kg.
TK569-1(18-20')	1610238-004a	10/04/16	Di-n-butyl phthalate	0.24	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.19 mg/kg
TK569-1(24-26')	1610238-005a	10/04/16	Di-n-butyl phthalate	0.18	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.19 mg/kg
TK569-1(36-38')	1610238-006a	10/04/16	Bis(2-ethylhexyl)phthalate	0.096	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.10 mg/kg
TK569-1(36-38')	1610238-006a	10/04/16	Di-n-butyl phthalate	0.087	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.19 mg/kg
TK569-1(36-38')	1610238-006a	10/04/16	Toluene	2.5	mg/kg	Soil	J-	Analyte detected below quantitation limits and is biased low as the MDS recovery was below the acceptance limit.
TK569-1(40-42')	1610238-007a	10/04/16	Bis(2-ethylhexyl)phthalate	0.14	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.10 mg/kg
TK569-1(40-42')	1610238-007a	10/04/16	Di-n-butyl phthalate	0.27	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.19 mg/kg
DUP03	1610238-009A	10/04/16	Diesel Range Organics (DRO)	3.7	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 2.8 mg/kg.
TK-569-1-GW	1610355-001d	10/05/16	Di-n-octyl phthalate	6.8	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 6.7 ug/L.
TK-569-1-GW	1610355-001G	10/05/16	Mercury	0.00021	mg/L	Water	J+	Biased high as method blank contained 0.00016 mg/L.
TK-569-1-GW	1610355-001a	10/05/16	Toluene	41000	ug/L	Water	J-	Biased low as the MS/MSD recovery was below the aceptance limit.
TK-569-2-GW	1610355-002d	10/05/16	Di-n-octyl phthalate	6.8	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 6.7 ug/L.
TK-569-2-GW	1610355-002F	10/05/16	Mercury	0.00016	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00016 ug/L.

Sample ID	Lab Sample ID	Date Collected	Parameter Name	Result	Units	Matrix	Qualifier	Comments
DUP-GW	1610355-003d	10/05/16	Di-n-octyl phthalate	6.9	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 6.7 ug/L.
DUP-GW	1610355-003F	10/05/16	Mercury	0.00014	mg/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.00016 ug/L.
Trip Blank	1610355-004a	10/05/16	1,2,4-Trimethylbenzene	0.15	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.13 ug/L.
Trip Blank	1610355-004a	10/05/16	Naphthalene	0.50	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.30 ug/L.
Trip Blank	1610355-004a	10/05/16	1-Methylnaphthalene	0.82	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.43 ug/L.
Trip Blank	1610355-004a	10/05/16	2-Methylnaphthalene	0.85	ug/L	Water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.50 ug/L.

	TK-568-1 (30-32')	•	DUP01		
Parameter	1609E26-0	09	1609E26-0	11	RPD
	9/23/201		9/23/201		%
Metals (mg/kg)	0, 20, 202		0, 20, 202		,,
Antimony	< 0.9808	u	< 1.0074	u	NC
Arsenic	1.6	J	1.6	J	0.0
Barium	180	٧	210	V	3.8
Beryllium	0.74	٧	0.62	V	4.4
Cadmium	< 0.0618	u	< 0.0635	u	NC
Chromium	7.6	٧	6.4	٧	4.3
Cobalt	3.3	٧	3	٧	2.4
Cyanide	< 0.25	u	< 0.25	u	NC
Iron	12000	٧	10000	٧	4.5
Lead	3.9	٧	6	٧	10.6
Manganese	290	٧	300	٧	0.8
Mercury	0.0028	J	0.0045	J	11.6
Nickel	5.9	٧	5.2	٧	3.2
Selenium	< 1.7733	u	< 1.8214	u	NC
Silver	< 0.061	u	< 0.0627	u	NC
Vanadium	14	٧	12	٧	3.8
Zinc	11	٧	9.4	٧	3.9
Volatiles (mg/kg)					
1,1,1,2-Tetrachloroethane	< 0.0288	u	< 0.0044	u	NC
1,1,1-Trichloroethane	< 0.0184	u	< 0.016	u	NC
1,1,2,2-Tetrachloroethane	< 0.0487	u	< 0.0425	u	NC
1,1,2-Trichloroethane	< 0.0355	u	< 0.0309	u	NC
1,1-Dichloroethane	< 0.0163	u	< 0.0142	u	NC
1,1-Dichloroethene	< 0.0985	u	< 0.0859	u	NC
1,1-Dichloropropene	< 0.0239	u	< 0.0208	u	NC
1,2,3-Trichlorobenzene	< 0.045	u	< 0.0392	u	NC
1,2,3-Trichloropropane	< 0.052	u	< 0.0453	u	NC
1,2,4-Trichlorobenzene	< 0.0322	u	< 0.028	u	NC
1,2,4-Trimethylbenzene	5.5	٧	5.3	٧	0.9
1,2-Dibromo-3-chloropropane	< 0.0921	u	< 0.0803	u	NC
1,2-Dibromoethane (EDB)	< 0.0214	u	< 0.0186	u	NC
1,2-Dichlorobenzene	< 0.0262	u	< 0.0229	u	NC
1,2-Dichloroethane (EDC)	< 0.0784	u	< 0.0684	u	NC
1,2-Dichloropropane	< 0.0252	u	< 0.022	u	NC
1,3,5-Trimethylbenzene	1.9	٧	1.8	٧	1.4
1,3-Dichlorobenzene	< 0.0247	u	< 0.0215	u	NC
1,3-Dichloropropane	< 0.0341	u	< 0.0297	u	NC
1,4-Dichlorobenzene	< 0.0373	u	< 0.0325	u	NC
1-Methylnaphthalene	0.23	J	0.19	J	4.8
2,2-Dichloropropane	< 0.0172	u	< 0.015	u	NC
2-Butanone	< 0.1719	u	< 0.1498	u	NC

Parameter		TK-568-1 (30-32')		DUP01		
9/23/2016 9/23/2016 %	Parameter		na	1609F26-0	11	BBD
2-Chlorotoluene < 0.0222						
2-Hexanone < 0.1637	2 Chlorotoluene					
2-Methylnaphthalene 0.55 J 0.47 J 3.9 4-Chlorotoluene < 0.0266			-			
4-Chlorotoluene < 0.0266 u < 0.0232 u NC 4-Isopropyltoluene < 0.027			_			
4-Isopropyltoluene < 0.027	-					
4-Methyl-2-pentanone < 0.0877						
Acetone < 0.3892 u < 0.3392 u NC Benzene 0.26 v 0.39 v 10.0 Bromobenzene < 0.0242			-			
Benzene	• •					
Bromobenzene < 0.0242 u < 0.0211 u NC Bromodichloromethane < 0.0175						
Bromodichloromethane						
Bromoform						
Bromomethane < 0.1108			_			
Carbon disulfide < 0.0993 u < 0.0865 u NC Carbon tetrachloride < 0.0197						
Carbon tetrachloride < 0.0197 u < 0.0172 u NC Chlorobenzene < 0.0245						
Chlorobenzene < 0.0245						
Chloroethane < 0.06 u < 0.0523 u NC Chloroform < 0.0227			u		u	
Chloroform < 0.0227 u < 0.0198 u NC Chloromethane < 0.0268			u		u	
Chloromethane < 0.0268			u		u	
cis-1,2-DCE < 0.0175			u		u	
cis-1,3-Dichloropropene < 0.0277			u		u	
Dibromochloromethane < 0.0272 u < 0.0237 u NC Dibromomethane < 0.0261		< 0.0175	u	< 0.0152	u	
Dibromomethane < 0.0261 u < 0.0227 u NC Dichlorodifluoromethane < 0.0931	cis-1,3-Dichloropropene	< 0.0277	u	< 0.0242	u	NC
Dichlorodifluoromethane < 0.0931 u < 0.0811 u NC Ethylbenzene 1.5 v 1.5 v 0.0 Hexachlorobutadiene < 0.0368	Dibromochloromethane	< 0.0272	u	< 0.0237	u	NC
Ethylbenzene 1.5 v 1.5 v 0.0 Hexachlorobutadiene < 0.0368	Dibromomethane	< 0.0261	u	< 0.0227	u	NC
Hexachlorobutadiene	Dichlorodifluoromethane	< 0.0931	u	< 0.0811	u	NC
Sopropylbenzene	•	1.5	٧	1.5	٧	0.0
Methyl tert-butyl ether (MTBE) 1 v 1.1 v 2.4 Methylene chloride < 0.0867	Hexachlorobutadiene	< 0.0368	u	< 0.0321	u	NC
Methylene chloride < 0.0867 u < 0.0756 u NC Naphthalene 0.61 v 0.58 v 1.3 n-Butylbenzene 0.37 J 0.34 J 2.1 n-Propylbenzene 0.83 v 0.81 v 0.6 sec-Butylbenzene 0.11 J 0.11 J 0.0 Styrene < 0.0269	Isopropylbenzene	0.11	J	0.11	J	0.0
Naphthalene 0.61 v 0.58 v 1.3 n-Butylbenzene 0.37 J 0.34 J 2.1 n-Propylbenzene 0.83 v 0.81 v 0.6 sec-Butylbenzene 0.11 J 0.11 J 0.0 Styrene < 0.0269	Methyl tert-butyl ether (MTBE)	1	٧	1.1	٧	2.4
n-Butylbenzene 0.37 J 0.34 J 2.1 n-Propylbenzene 0.83 v 0.81 v 0.6 sec-Butylbenzene 0.11 J 0.11 J 0.0 Styrene < 0.0269	Methylene chloride	< 0.0867	u	< 0.0756	u	NC
n-Propylbenzene 0.83 v 0.81 v 0.6 sec-Butylbenzene 0.11 J 0.11 J 0.0 Styrene < 0.0269	Naphthalene	0.61	٧	0.58	٧	1.3
sec-Butylbenzene 0.11 J 0.11 J 0.0 Styrene < 0.0269	n-Butylbenzene	0.37	J	0.34	J	2.1
Styrene < 0.0269 u < 0.0234 u NC tert-Butylbenzene < 0.0249	n-Propylbenzene	0.83	٧	0.81	٧	0.6
tert-Butylbenzene < 0.0249 u < 0.0217 u NC Tetrachloroethene (PCE) < 0.0249	sec-Butylbenzene	0.11	J	0.11	J	0.0
Tetrachloroethene (PCE) < 0.0249 u < 0.0217 u NC Toluene 0.4 v 0.46 v 3.5 trans-1,2-DCE < 0.0842	Styrene	< 0.0269	u	< 0.0234	u	NC
Toluene 0.4 v 0.46 v 3.5 trans-1,2-DCE < 0.0842	tert-Butylbenzene	< 0.0249	u	< 0.0217	u	NC
trans-1,2-DCE < 0.0842	Tetrachloroethene (PCE)	< 0.0249	u	< 0.0217	u	NC
trans-1,2-DCE < 0.0842	Toluene	0.4	٧	0.46	٧	3.5
trans-1,3-Dichloropropene < 0.044	trans-1,2-DCE	< 0.0842	u	< 0.0734	u	NC
Trichloroethene (TCE) < 0.0322 u < 0.0281 u NC Trichlorofluoromethane < 0.0225	trans-1,3-Dichloropropene		u		u	
Trichlorofluoromethane < 0.0225						
Vinyl chloride < 0.0246 u < 0.0214 u NC			u		u	
Xylenes, Total 9.1 v 9.2 v 0.3	Xylenes, Total	9.1		9.2		0.3

	TK-568-1		DUP01		
Parameter	(30-32')		D01 01		
i arameter	1609E26-0	09	1609E26-0	11	RPD
	9/23/201	.6	9/23/201	6.	%
Semi-volatiles (mg/kg)					
1,2,4-Trichlorobenzene	< 0.1076	u	< 0.1073	u	NC
1,2-Dichlorobenzene	< 0.0762	u	< 0.076	u	NC
1,3-Dichlorobenzene	< 0.0769	u	< 0.0767	u	NC
1,4-Dichlorobenzene	< 0.0841	u	< 0.0839	u	NC
1-Methylnaphthalene	< 0.1	u	1.6	٧	NC
2,4,5-Trichlorophenol	< 0.0996	u	< 0.0993	u	NC
2,4,6-Trichlorophenol	< 0.0826	u	< 0.0823	u	NC
2,4-Dichlorophenol	< 0.0928	u	< 0.0925	u	NC
2,4-Dimethylphenol	< 0.1081	u	< 0.1077	u	NC
2,4-Dinitrophenol	< 0.066	u	< 0.0658	u	NC
2,4-Dinitrotoluene	< 0.0889	u	< 0.0886	u	NC
2,6-Dinitrotoluene	< 0.1053	u	< 0.1049	u	NC
2-Chloronaphthalene	< 0.0783	u	< 0.0781	u	NC
2-Chlorophenol	< 0.0784	u	< 0.0782	u	NC
2-Methylnaphthalene	< 0.1181	u	3.7	٧	NC
'2-Methylphenol (cresol,o-)	< 0.0832	u	< 0.0829	u	NC
2-Nitroaniline	< 0.1073	u	< 0.1069	u	NC
2-Nitrophenol	< 0.0987	u	< 0.0984	u	NC
3,3´-Dichlorobenzidine	< 0.0733	u	< 0.073	u	NC
3+4-Methylphenol	< 0.072	u	< 0.0718	u	NC
3-Nitroaniline	< 0.0877	u	< 0.0874	u	NC
4,6-Dinitro-2-methylphenol	< 0.0602	u	< 0.06	u	NC
4-Bromophenyl phenyl ether	< 0.0951	u	< 0.0948	u	NC
4-Chloro-3-methylphenol	< 0.1187	u	< 0.1183	u	NC
4-Chloroaniline	< 0.1082	u	< 0.1078	u	NC
4-Chlorophenyl phenyl ether	< 0.1137	u	< 0.1133	u	NC
4-Nitroaniline	< 0.0702	u	< 0.0699	u	NC
4-Nitrophenol	< 0.0758	u	< 0.0756	u	NC
Acenaphthene	< 0.0853	u	< 0.085	u	NC
Acenaphthylene	< 0.081	u	< 0.0807	u	NC
Aniline	< 0.094	u	< 0.0937	u	NC
Anthracene	< 0.0661	u	< 0.0658	u	NC
Azobenzene	< 0.1213	u	< 0.1209	u	NC
Benz(a)anthracene	< 0.0857	u	< 0.0854	u	NC
Benzo(a)pyrene	< 0.0753	u	< 0.0751	u	NC
Benzo(b)fluoranthene	< 0.0899	u	< 0.0896	u	NC
Benzo(g,h,i)perylene	< 0.0877	u	< 0.0875	u	NC
Benzo(k)fluoranthene	< 0.0877	u	< 0.0874	u	NC
Benzoic acid	< 0.0825	u	< 0.0822	u	NC
Benzyl alcohol	< 0.0779	u	< 0.0776	u	NC
Bis(2-chloroethoxy)methane	< 0.108	u	< 0.1076	u	NC

Parameter	TK-568-1 (30-32')	•	DUP01		
Parameter	1609E26-0	09	1609E26-0	11	RPD
	9/23/201	.6	9/23/201	.6	%
Bis(2-chloroethyl)ether	< 0.0731	u	< 0.0729	u	NC
Bis(2-chloroisopropyl)ether	< 0.0888	u	< 0.0886	u	NC
Bis(2-ethylhexyl)phthalate	0.12	J	0.15	J	5.6
Butyl benzyl phthalate	< 0.0881	u	< 0.0878	u	NC
Carbazole	< 0.0672	u	< 0.067	u	NC
Chrysene	< 0.0847	u	< 0.0845	u	NC
Dibenz(a,h)anthracene	< 0.0805	u	< 0.0802	u	NC
Dibenzofuran	< 0.1001	u	< 0.0997	u	NC
Diethyl phthalate	0.16	J	0.17	J	1.5
Dimethyl phthalate	< 0.0973	u	< 0.097	u	NC
Di-n-butyl phthalate	0.15	J	0.17	J	3.1
Di-n-octyl phthalate	< 0.0849	u	< 0.0846	u	NC
Fluoranthene	< 0.0573	u	< 0.0571	u	NC
Fluorene	< 0.0911	u	< 0.0908	u	NC
Hexachlorobenzene	< 0.0785	u	< 0.0782	u	NC
Hexachlorobutadiene	< 0.1121	u	< 0.1118	u	NC
Hexachlorocyclopentadiene	< 0.1138	u	< 0.1134	u	NC
Hexachloroethane	< 0.0855	u	< 0.0852	u	NC
Indeno(1,2,3-cd)pyrene	< 0.0777	u	< 0.0774	u	NC
Isophorone	< 0.11	u	< 0.1096	u	NC
Naphthalene	< 0.0955	u	4.2	٧	NC
Nitrobenzene	< 0.1027	u	< 0.1023	u	NC
N-Nitrosodi-n-propylamine	< 0.0956	u	< 0.0953	u	NC
N-Nitrosodiphenylamine	< 0.0972	u	< 0.0968	u	NC
Pentachlorophenol	< 0.064	u	< 0.0637	u	NC
Phenanthrene	< 0.0676	u	< 0.0674	u	NC
Phenol	< 0.0749	u	< 0.0747	u	NC
Pyrene	< 0.0752	u	< 0.0749	u	NC
Pyridine	< 0.0789	u	< 0.0786	u	NC
Total Petroleum Hydrocarbons (m	ng/kg)				
Gasoline Range Organics (GRO)	330	٧	340	٧	0.7
Diesel Range Organics (DRO)	11	٧	430	٧	47.5
Motor Oil Range Organics (MRO)	< 48	u	< 48	u	NC

NC - not calculated due to one or both results being non-detect RPD = $((result - duplicate \ value) / ((result + duplicate \ value)/2)) \times 100$

	TK569-2						
	(16-18')		DUP02				
Parameter	<u> </u>		,			1610238-008	
	10/4/201		10/4/2016		RPD %		
Metals (mg/kg)	10/ 4/ 201		10/ 4/ 201		70		
Antimony	< 0.9951	u	< 1.0148	u	NC		
Arsenic	1.6	J	1.3	J	5.2		
Barium	200	۷	160	۷	5.6		
Beryllium	0.64	V	0.78	V	4.9		
Cadmium	< 0.0427		< 0.064		NC		
Chromium	6.4	u	7.9	u	5.2		
	3.2	V	3.6	V			
Cobalt		V		V	2.9		
Cyanide	< 0.271	u	< 0.228	u	NC		
Iron	12000	V	16000	V	7.1		
Lead	3.5	V	2.8	V	5.6		
Manganese	210	٧	200	V	1.2		
Mercury	0.0042	J	< 0.0006	u	NC		
Nickel	5.5	V	7.3	V	7.0		
Selenium	< 1.7993	u	< 1.8348	u	NC		
Silver	< 0.0619	u	< 0.0631	u	NC		
Vanadium	12	٧	14	٧	3.8		
Zinc	9.6	٧	12	V	5.6		
Volatiles (mg/kg)	ı						
1,1,1,2-Tetrachloroethane	< 0.0056	u	< 0.0034	u	NC		
1,1,1-Trichloroethane	< 0.0035	u	< 0.0021	u	NC		
1,1,2,2-Tetrachloroethane	< 0.0094	u	< 0.0057	u	NC		
1,1,2-Trichloroethane	< 0.0068	u	< 0.0041	u	NC		
1,1-Dichloroethane	< 0.0031	u	< 0.0019	u	NC		
1,1-Dichloroethene	< 0.019	u	< 0.0115	u	NC		
1,1-Dichloropropene	< 0.0046	u	< 0.0028	u	NC		
1,2,3-Trichlorobenzene	< 0.0087	u	< 0.0053	u	NC		
1,2,3-Trichloropropane	< 0.01	u	< 0.0061	u	NC		
1,2,4-Trichlorobenzene	< 0.0062	u	< 0.0038	u	NC		
1,2,4-Trimethylbenzene	2.2	٧	1.4	٧	11.1		
1,2-Dibromo-3-chloropropane	< 0.0178	u	< 0.0108	u	NC		
1,2-Dibromoethane (EDB)	< 0.0041	u	< 0.0025	u	NC		
1,2-Dichlorobenzene	< 0.0051	u	< 0.0031	u	NC		
1,2-Dichloroethane (EDC)	< 0.0151	u	< 0.0092	u	NC		
1,2-Dichloropropane	< 0.0049	u	< 0.0029	u	NC		
1,3,5-Trimethylbenzene	0.69	٧	0.44	٧	11.1		
1,3-Dichlorobenzene	< 0.0048	u	< 0.0029	u	NC		
1,3-Dichloropropane	< 0.0066	u	< 0.004	u	NC		
1,4-Dichlorobenzene	< 0.0072	u	< 0.0044	u	NC		
1-Methylnaphthalene	0.32	٧	0.23	٧	8.2		
2,2-Dichloropropane	< 0.0033	u	< 0.002	u	NC		
2-Butanone	< 0.0332	u	< 0.0201	u	NC		

	TK569-2		DUP02		
Parameter –	(16-18')		4040000	555	
	1610238-001		1610238-0		RPD
0.011	10/4/201		10/4/201	1	%
2-Chlorotoluene	< 0.0043	u	< 0.0026	u	NC
2-Hexanone	< 0.0316	u	< 0.0191	u	NC
2-Methylnaphthalene	0.61	V	0.44	V	8.1
4-Chlorotoluene	< 0.0051	u	< 0.0031	u	NC
4-Isopropyltoluene	0.03	J	0.02	J	10.0
4-Methyl-2-pentanone	< 0.0169	u	< 0.0102	u	NC
Acetone	< 0.0752	u	< 0.0455	u	NC
Benzene	0.067	V	0.048	٧	8.3
Bromobenzene	< 0.0047	u	< 0.0028	u	NC
Bromodichloromethane	< 0.0034	u	< 0.002	u	NC
Bromoform	< 0.0071	u	< 0.0043	u	NC
Bromomethane	< 0.0214	u	< 0.0129	u	NC
Carbon disulfide	< 0.0192	u	< 0.0116	u	NC
Carbon tetrachloride	< 0.0038	u	< 0.0023	u	NC
Chlorobenzene	< 0.0047	u	< 0.0029	u	NC
Chloroethane	< 0.0116	u	< 0.007	u	NC
Chloroform	< 0.0044	u	< 0.0027	u	NC
Chloromethane	< 0.0052	u	< 0.0031	u	NC
cis-1,2-DCE	< 0.0034	u	< 0.002	u	NC
cis-1,3-Dichloropropene	< 0.0054	u	< 0.0032	u	NC
Dibromochloromethane	< 0.0052	u	< 0.0032	u	NC
Dibromomethane	< 0.005	u	< 0.003	u	NC
Dichlorodifluoromethane	< 0.018	u	< 0.0109	u	NC
Ethylbenzene	0.41	٧	0.23	٧	14.1
Hexachlorobutadiene	< 0.0071	u	< 0.0043	u	NC
Isopropylbenzene	0.071	٧	0.044	٧	11.7
Methyl tert-butyl ether (MTBE)	< 0.0183	u	< 0.011	u	NC
Methylene chloride	< 0.0168	u	< 0.0101	u	NC
Naphthalene	0.58	٧	0.39	٧	9.8
n-Butylbenzene	0.23	٧	0.17	٧	7.5
n-Propylbenzene	0.34	٧	0.21	٧	11.8
sec-Butylbenzene	0.072	٧	0.043	٧	12.6
Styrene	< 0.0052	u	< 0.0031	u	NC
tert-Butylbenzene	< 0.0048	u	< 0.0029	u	NC
Tetrachloroethene (PCE)	< 0.0048	u	< 0.0029	u	NC
Toluene	0.7	V	0.38	٧	14.8
trans-1,2-DCE	< 0.0163	u	< 0.0098	u	NC
trans-1,3-Dichloropropene	< 0.0085	u	< 0.0051	u	NC
Trichloroethene (TCE)	< 0.0062	u	< 0.0038	u	NC
Trichlorofluoromethane	< 0.0043	u	< 0.0026	u	NC
Vinyl chloride	< 0.0048	u	< 0.0029	u	NC
Xylenes, Total	2.5	V	1.4	V	14.1

	TK569-2				
	(16-18')		DUP02		
Parameter	1610238-0	Ω1	1610229.0	RPD	
			1610238-008		
Comi volotilos (mg/kg)	10/4/201	٥.	10/4/201	. o	%
Semi-volatiles (mg/kg)	< 0.1077		< 0.1070	Τ	NO
1,2,4-Trichlorobenzene	< 0.1077	u	< 0.1078	u	NC
1,2-Dichlorobenzene	< 0.0763	u	< 0.0763	u	NC
1,3-Dichlorobenzene	< 0.077	u	< 0.077	u	NC
1,4-Dichlorobenzene	< 0.0842	u	< 0.0843	u	NC
1-Methylnaphthalene	0.13	J	< 0.1002	u	NC
2,4,5-Trichlorophenol	< 0.0997	u	< 0.0998	u	NC
2,4,6-Trichlorophenol	< 0.0826	u	< 0.0827	u	NC
2,4-Dichlorophenol	< 0.0929	u	< 0.093	u	NC
2,4-Dimethylphenol	< 0.1081	u	< 0.1082	u	NC
2,4-Dinitrophenol	< 0.066	u	< 0.0661	u	NC
2,4-Dinitrotoluene	< 0.0889	u	< 0.089	u	NC
2,6-Dinitrotoluene	< 0.1054	u	< 0.1055	u	NC
2-Chloronaphthalene	< 0.0784	u	< 0.0785	u	NC
2-Chlorophenol	< 0.0785	u	< 0.0786	u	NC
2-Methylnaphthalene	0.28	٧	< 0.1183	u	NC
'2-Methylphenol (cresol,o-)	< 0.0832	u	< 0.0833	u	NC
2-Nitroaniline	< 0.1073	u	< 0.1074	u	NC
2-Nitrophenol	< 0.0988	u	< 0.0989	u	NC
3,3´-Dichlorobenzidine	< 0.0733	u	< 0.0734	u	NC
3+4-Methylphenol	< 0.0721	u	< 0.0722	u	NC
3-Nitroaniline	< 0.0878	u	< 0.0879	u	NC
4,6-Dinitro-2-methylphenol	< 0.0602	u	< 0.0603	u	NC
4-Bromophenyl phenyl ether	< 0.0952	u	< 0.0953	u	NC
4-Chloro-3-methylphenol	< 0.1188	u	< 0.1189	u	NC
4-Chloroaniline	< 0.1083	u	< 0.1084	u	NC
4-Chlorophenyl phenyl ether	< 0.1138	u	< 0.1139	u	NC
4-Nitroaniline	< 0.0702	u	< 0.0703	u	NC
4-Nitrophenol	< 0.0759	u	< 0.0759	u	NC
Acenaphthene	< 0.0854	u	< 0.0855	u	NC
Acenaphthylene	< 0.081	u	< 0.0811	u	NC
Aniline	< 0.0941	u	< 0.0942	u	NC
Anthracene	< 0.0661	u	< 0.0662	u	NC
Azobenzene	< 0.1213	u	< 0.1215	u	NC
Benz(a)anthracene	< 0.0857	u	< 0.0858	u	NC
Benzo(a)pyrene	< 0.0754	u	< 0.0755	u	NC
Benzo(b)fluoranthene	< 0.0899	u	< 0.09	u	NC
Benzo(g,h,i)perylene	< 0.0878	u	< 0.0879	u	NC
Benzo(k)fluoranthene	< 0.0877	u	< 0.0878	u	NC
Benzoic acid	0.11	J	< 0.0878	u	NC
Benzyl alcohol	< 0.0779	u	< 0.0820	u	NC
Bis(2-chloroethoxy)methane	< 0.108		< 0.1082		NC
Dis(∠-chiloroethoxy)methane	< 0.108	u	< U.1U82	u	INC

Darameter	TK569-2 (16-18')	TK569-2 (16-18') DUP02			
Parameter	1610238-001		1610238-008		RPD
	10/4/201	.6	10/4/201	10/4/2016	
Bis(2-chloroethyl)ether	< 0.0732	u	< 0.0732	u	NC
Bis(2-chloroisopropyl)ether	< 0.0889	u	< 0.089	u	NC
Bis(2-ethylhexyl)phthalate	0.12	J	0.088	J	7.7
Butyl benzyl phthalate	< 0.0882	u	< 0.0882	u	NC
Carbazole	< 0.0672	u	< 0.0673	u	NC
Chrysene	< 0.0848	u	< 0.0849	u	NC
Dibenz(a,h)anthracene	< 0.0805	u	< 0.0806	u	NC
Dibenzofuran	< 0.1001	u	< 0.1002	u	NC
Diethyl phthalate	0.13	J	< 0.1011	u	NC
Dimethyl phthalate	< 0.0974	u	< 0.0975	u	NC
Di-n-butyl phthalate	0.27	J	< 0.0745	u	NC
Di-n-octyl phthalate	< 0.0849	u	< 0.085	u	NC
Fluoranthene	< 0.0574	u	< 0.0574	u	NC
Fluorene	< 0.0911	u	< 0.0912	u	NC
Hexachlorobenzene	< 0.0785	u	< 0.0786	u	NC
Hexachlorobutadiene	< 0.1122	u	< 0.1123	u	NC
Hexachlorocyclopentadiene	< 0.1138	u	< 0.114	u	NC
Hexachloroethane	< 0.0855	u	< 0.0856	u	NC
Indeno(1,2,3-cd)pyrene	< 0.0778	u	< 0.0778	u	NC
Isophorone	< 0.1101	u	< 0.1102	u	NC
Naphthalene	0.17	J	< 0.0957	u	NC
Nitrobenzene	< 0.1028	u	< 0.1029	u	NC
N-Nitrosodi-n-propylamine	< 0.0957	u	< 0.0958	u	NC
N-Nitrosodiphenylamine	< 0.0972	u	< 0.0973	u	NC
Pentachlorophenol	< 0.064	u	< 0.0641	u	NC
Phenanthrene	< 0.0676	u	< 0.0677	u	NC
Phenol	< 0.075	u	< 0.0751	u	NC
Pyrene	< 0.0752	u	< 0.0753	u	NC
Pyridine	< 0.0789	u	< 0.079	u	NC
Total Petroleum Hydrocarbons (m	ng/kg)				
Gasoline Range Organics (GRO)	31	٧	24	٧	6.4
Diesel Range Organics (DRO)	17	٧	11	٧	10.7
Motor Oil Range Organics (MRO)	< 48	u	< 48	u	NC

NC - not calculated due to one or both results being non-detect RPD = $((result - duplicate \ value) / ((result + duplicate \ value)/2)) \times 100$

Parameter	TK569-2 (36-38')	TK569-2 (36-38')			
Lab ID	1610238-003		1610238-00	RPD	
Sample Date	10/4/2016		10/4/2016		%
Metals (mg/kg)	, ,		, ,		
Antimony	< 0.9847	u	< 1.0072	u	NC
Arsenic	2.7	V	2.5	J	1.9
Barium	300	٧	160	٧	15.2
Beryllium	0.58	٧	0.63	٧	2.1
Cadmium	< 0.0621	u	< 0.0635	u	NC
Chromium	6.6	٧	7.2	٧	2.2
Cobalt	2.1	٧	2.3	٧	2.3
Cyanide	< 0.269	u	< 0.246	u	NC
Iron	11000	٧	11000	٧	0.0
Lead	1.1	٧	1	٧	2.4
Manganese	450	٧	490	٧	2.1
Mercury	< 0.0006	u	< 0.0005	u	NC
Nickel	6.1	V	6.9	V	3.1
Selenium	< 1.7804	u	< 1.8211	u	NC
Silver	< 0.0613	u	< 0.0627	u	NC
Vanadium	3.5	V	3.7	V	1.4
Zinc	7	V	8.2	V	3.9
Volatiles (mg/kg)	I				
1,1,1,2-Tetrachloroethane	<0.0019	u	<0.0018	u	NC
1,1,1-Trichloroethane	<0.0019	u	<0.0018	u	NC
1,1,2,2-Tetrachloroethane	<0.0019	u	<0.0018	u	NC
1,1,2-Trichloroethane	<0.0019	u	<0.0018	u	NC
1,1-Dichloroethane	<0.0019	u	<0.0018	u	NC
1,1-Dichloroethene	<0.0003	u	<0.0003	u	NC
1,1-Dichloropropene	<0.0019	u	<0.0018	u	NC
1,2,3-Trichlorobenzene	<0.0005	u	<0.0004	u	NC
1,2,3-Trichloropropane	<0.0019	u	<0.0018	u	NC
1,2,4-Trichlorobenzene	<0.0006	u	<0.0005	u	NC
1,2,4-Trimethylbenzene	0.0055	٧	0.0025	٧	18.8
1,2-Dibromo-3-chloropropane	<0.0002	u	<0.0002	u	NC
1,2-Dibromoethane (EDB)	<0.0019	u	<0.0018	u	NC
1,2-Dichlorobenzene	<0.0003	u	<0.0003	u	NC
1,2-Dichloroethane (EDC)	<0.0019	u	<0.0018	u	NC
1,2-Dichloropropane	<0.0019	u	<0.0018	u	NC
1,3,5-Trimethylbenzene	0.0029	V	0.0014	J	17.4
1,3-Dichlorobenzene	<0.0003	u	<0.0003	u	NC
1,3-Dichloropropane	<0.0019	u	<0.0018	u	NC
1,4-Dichlorobenzene	<0.0003	u	<0.0003	u	NC
1-Methylnaphthalene	0.0004	J	0.0003	J	7.1
2,2-Dichloropropane	<0.0002	u	<0.0002	u	NC
2-Butanone	0.0009	J	0.001	J	2.6

Parameter	TK569-2 (36-38')		DUP03		
Lab ID	1610238-00)3	1610238-00	RPD	
Sample Date	10/4/2016	3	10/4/2016	3	%
2-Chlorotoluene	<0.0003	u	<0.0003	u	NC
2-Hexanone	<0.0005	u	<0.0004	u	NC
2-Methylnaphthalene	<0.0005	u	<0.0005	u	NC
4-Chlorotoluene	<0.0003	u	<0.0003	u	NC
4-Isopropyltoluene	0.0004	J	<0.0003	u	NC
4-Methyl-2-pentanone	<0.0037	u	<0.0035	u	NC
Acetone	0.0044	J	0.0025	J	13.8
Benzene	0.0134	V	0.0055	V	20.9
Bromobenzene	<0.0002	u	<0.0002	u	NC
Bromodichloromethane	<0.0019	u	<0.0018	u	NC
Bromoform	<0.0019	u	<0.0018	u	NC
Bromomethane	<0.0003	u	<0.0003	u	NC
Carbon disulfide	<0.0007	u	<0.0007	u	NC
Carbon tetrachloride	<0.0019	u	<0.0018	u	NC
Chlorobenzene	<0.0013	u	<0.0010	u	NC
Chloroethane	<0.0002	u	<0.0002	u	NC
Chloroform	<0.0003	u	<0.0018	u	NC
Chloromethane	<0.0019	u	<0.0018	u	NC
cis-1,2-DCE	<0.0003	u	<0.0004	u	NC
cis-1,3-Dichloropropene	<0.0019		<0.0018		NC
Dibromochloromethane	<0.0019	u 	<0.0018	u	NC
Dibromomethane	<0.0019	u 	<0.0018	u	NC
Dichlorodifluoromethane	<0.0019	u 	<0.0018	u	NC
		u		u	
Ethylbenzene Hexachlorobutadiene	0.0041	V	0.0019	V	18.3
	<0.0004	u	<0.0004	u	NC
Isopropylbenzene	0.001	J	0.0004	J	21.4
Methyl tert-butyl ether (MTBE)	0.0025	V	0.0007	J	28.1
Methylene chloride	<0.0019	u	<0.0018	u	NC
Naphthalene	<0.0019	u	<0.0018	u	NC
n-Butylbenzene	0.0005	J	<0.0004	u	NC
n-Propylbenzene	0.0016	J	0.0006	J	22.7
sec-Butylbenzene	0.0006	J	<0.0003	u	NC
Styrene	<0.0002	u	<0.0002	u	NC
tert-Butylbenzene	<0.0003	u	<0.0003	u	NC
Tetrachloroethene (PCE)	<0.0002	u	<0.0002	u	NC
Toluene	0.0111	V	0.0059	٧	15.3
trans-1,2-DCE	<0.0002	u	<0.0002	u	NC
trans-1,3-Dichloropropene	<0.0002	u	<0.0002	u	NC
Trichloroethene (TCE)	<0.0019	u	<0.0018	u	NC
Trichlorofluoromethane	<0.0002	u	<0.0002	u	NC
Vinyl chloride	<0.0005	u	<0.0005	u	NC
Xylenes, Total	0.019	V	0.0077	٧	21.2

Parameter	TK569-2 (36-38')		DUP03		
Lab ID	1610238-003		1610238-00	RPD	
Sample Date	10/4/2016	3	10/4/2016	3	%
Semi-volatiles (mg/kg)		•		,	
1,2,4-Trichlorobenzene	< 0.1088	u	< 0.1068	u	NC
1,2-Dichlorobenzene	< 0.077	u	< 0.0756	u	NC
1,3-Dichlorobenzene	< 0.0777	u	< 0.0763	u	NC
1,4-Dichlorobenzene	< 0.085	u	< 0.0835	u	NC
1-Methylnaphthalene	< 0.1011	u	< 0.0992	u	NC
2,4,5-Trichlorophenol	< 0.1007	u	< 0.0988	u	NC
2,4,6-Trichlorophenol	< 0.0834	u	< 0.0819	u	NC
2,4-Dichlorophenol	< 0.0938	u	< 0.0921	u	NC
2,4-Dimethylphenol	< 0.1092	u	< 0.1072	u	NC
2,4-Dinitrophenol	< 0.0667	u	< 0.0655	u	NC
2,4-Dinitrotoluene	< 0.0898	u	< 0.0882	u	NC
2,6-Dinitrotoluene	< 0.1064	u	< 0.1045	u	NC
2-Chloronaphthalene	< 0.0792	u	< 0.0777	u	NC
2-Chlorophenol	< 0.0793	u	< 0.0778	u	NC
2-Methylnaphthalene	< 0.1193	u	< 0.1171	u	NC
'2-Methylphenol (cresol,o-)	< 0.0841	u	< 0.0825	u	NC
2-Nitroaniline	< 0.1084	u	< 0.1064	u	NC
2-Nitrophenol	< 0.0998	u	< 0.0979	u	NC
3,3´-Dichlorobenzidine	< 0.0741	u	< 0.0727	u	NC
3+4-Methylphenol	< 0.0728	u	< 0.0715	u	NC
3-Nitroaniline	< 0.0887	u	< 0.087	u	NC
4,6-Dinitro-2-methylphenol	< 0.0608	u	< 0.0597	u	NC
4-Bromophenyl phenyl ether	< 0.0962	u	< 0.0944	u	NC
4-Chloro-3-methylphenol	< 0.12	u	< 0.1178	u	NC
4-Chloroaniline	< 0.1093	u	< 0.1073	u	NC
4-Chlorophenyl phenyl ether	< 0.1149	u	< 0.1128	u	NC
4-Nitroaniline	< 0.0709	u	< 0.0696	u	NC
4-Nitrophenol	< 0.0766	u	< 0.0752	u	NC
Acenaphthene	< 0.0862	u	< 0.0847	u	NC
Acenaphthylene	< 0.0818	u	< 0.0803	u	NC
Aniline	< 0.095	u	< 0.0933	u	NC
Anthracene	< 0.0668	u	< 0.0655	u	NC
Azobenzene	< 0.1226	u	< 0.1203	u	NC
Benz(a)anthracene	< 0.0866	u	< 0.085	u	NC
Benzo(a)pyrene	< 0.0762	u	< 0.0748	u	NC
Benzo(b)fluoranthene	< 0.0908	u	< 0.0892	u	NC
Benzo(g,h,i)perylene	< 0.0887	u	< 0.087	u	NC
Benzo(k)fluoranthene	< 0.0886	u	< 0.087	u	NC
Benzoic acid	< 0.0834	u	< 0.0818	u	NC
Benzyl alcohol	< 0.0787	u	< 0.0773	u	NC
Bis(2-chloroethoxy)methane	< 0.1091	u	< 0.1071	u	NC

Parameter	TK569-2 (36-38')		DUP03		
Lab ID	1610238-003		1610238-00	RPD	
Sample Date	10/4/2016	3	10/4/2016	3	%
Bis(2-chloroethyl)ether	< 0.0739	u	< 0.0725	u	NC
Bis(2-chloroisopropyl)ether	< 0.0898	u	< 0.0881	u	NC
Bis(2-ethylhexyl)phthalate	0.096	J	0.11	J	3.4
Butyl benzyl phthalate	< 0.089	u	< 0.0874	u	NC
Carbazole	< 0.0679	u	< 0.0667	u	NC
Chrysene	< 0.0856	u	< 0.0841	u	NC
Dibenz(a,h)anthracene	< 0.0813	u	< 0.0798	u	NC
Dibenzofuran	< 0.1012	u	< 0.0993	u	NC
Diethyl phthalate	0.13	J	< 0.1001	u	NC
Dimethyl phthalate	< 0.0984	u	< 0.0966	u	NC
Di-n-butyl phthalate	0.1	J	0.11	J	2.4
Di-n-octyl phthalate	< 0.0858	u	< 0.0842	u	NC
Fluoranthene	< 0.0579	u	< 0.0569	u	NC
Fluorene	< 0.0921	u	< 0.0904	u	NC
Hexachlorobenzene	< 0.0793	u	< 0.0778	u	NC
Hexachlorobutadiene	< 0.1133	u	< 0.1112	u	NC
Hexachlorocyclopentadiene	< 0.115	u	< 0.1129	u	NC
Hexachloroethane	< 0.0864	u	< 0.0848	u	NC
Indeno(1,2,3-cd)pyrene	< 0.0785	u	< 0.0771	u	NC
Isophorone	< 0.1112	u	< 0.1091	u	NC
Naphthalene	< 0.0966	u	< 0.0948	u	NC
Nitrobenzene	< 0.1038	u	< 0.1019	u	NC
N-Nitrosodi-n-propylamine	< 0.0967	u	< 0.0949	u	NC
N-Nitrosodiphenylamine	< 0.0982	u	< 0.0964	u	NC
Pentachlorophenol	< 0.0646	u	< 0.0634	u	NC
Phenanthrene	< 0.0683	u	< 0.0671	u	NC
Phenol	< 0.0757	u	< 0.0744	u	NC
Pyrene	< 0.076	u	< 0.0746	u	NC
Pyridine	< 0.0797	u	< 0.0783	u	NC
Total Petroleum Hydrocarbons	(mg/kg)				
Gasoline Range Organics (GRO)	2.9	J	1	J	24.4
Diesel Range Organics (DRO)	4.4	J	3.7	J	4.3
Motor Oil Range Organics (MRO	< 48	u	< 51	u	NC

NC - not calculated due to one or both results being non-detect RPD = $((result - duplicate \ value) / ((result + duplicate \ value)/2)) \times 100$

Parameter	TK-569-1-G\	TK-569-1-GW DUP-GW			
Lab ID	1610355-00			3	RPD
Sample Date	10/5/2016	3	10/5/2016		%
Metals (ug/l) TOTAL		•			
Antimony	<2.36	u	<0.47	u	NC
Arsenic	16	Ζ	15	Z	1.6
Barium	8700	Ζ	9500	Z	2.2
Beryllium	1.7	J	2.2	V	6.4
Cadmium	<1.48	u	<1.48	u	NC
Chromium	14	٧	16	V	3.3
Cobalt	9.4	٧	10	V	1.5
Cyanide	<10	u	<10	u	NC
Iron	28000	Ζ	30000	Z	1.7
Lead	21	Ζ	25	Z	4.3
Manganese	4200	Z	4600	Z	2.3
Mercury	0.21	v	0.14	J	10.0
Nickel	57	v	58	v	0.4
Selenium	14	J	15	V	1.7
Silver	<2.75	u	<2.75	u	NC
Vanadium	31	J	34	IJ	2.3
Zinc	61	v	64	v	1.2
Chloride	140000	v	150000	v	1.7
Fluoride	<250	u	<250	u	NC
Sulfate	990	J	1000	IJ	0.3
Metals (ug/l) DISSOLVED					
Antimony (D)	<0.47	u	<0.47	u	NC
Arsenic (D)	14	Z	13	Z	1.9
Barium (D)	6300	Z	6300	Z	0.0
Beryllium (D)	<0.31	u	<0.31	u	NC
Cadmium (D)	<0.75	u	<0.75	u	NC
Chromium (D)	<1.75	u	<1.75	u	NC
Cobalt (D)	3.5	J	3.3	J	1.5
Iron (D)	7900	Z	7900	Z	0.0
Lead (D)	<0.00013	J	<0.17	u	NC
Manganese (D)	2600	Z	2600	Z	0.0
Nickel (D)	50	V	49	V	0.5
Selenium (D)	9.7	J	10	J	0.8
Silver (D)	<2.75	u	<2.75	u	NC
Vanadium (D)	4.8	J	5	J	1.0
Zinc (D)	22	V	21	v	1.2
Volatiles (ug/l)	I				
1,1,1,2-Tetrachloroethane	<5.57	u	<5.57	u	NC
1,1,1-Trichloroethane	<4.57	u	<4.57	u	NC
1,1,2,2-Tetrachloroethane	<6.41	u	<6.41	u	NC
1,1,2-Trichloroethane	<6.37	u	<6.37	u	NC
1,1-Dichloroethane	<5.4	u	<5.4	u	NC
1,1-Dichloroethene	<5.36	u	<5.36	u	NC
1,1-Dichloropropene	<6.66	u	<6.66	u	NC
1,2,3-Trichlorobenzene	<5.64	u	<5.64	u	NC
1,2,3-Trichloropropane	<10.1	u	<10.1	u	NC

Parameter	TK-569-1-GW		DUP-GW		
Lab ID	1610355-001		1610355-003		RPD
Sample Date	10/5/2016	3	10/5/2016		%
1,2,4-Trichlorobenzene (V)	<6.64	u	<6.64	u	NC
1,2,4-Trimethylbenzene	1500	v	1600	v	1.6
1,2-Dibromo-3-chloropropane	<11.72	u	<11.72	u	NC
1,2-Dibromoethane (EDB)	<5.59	u	<5.59	u	NC
1,2-Dichlorobenzene (V)	<20	u	<20	u	NC
1,2-Dichloroethane (EDC)	<5.75	u	<5.75	u	NC
1,2-Dichloropropane	<5.49	u	<5.49	u	NC
1,3,5-Trimethylbenzene	410	V	440	v	1.8
1,3-Dichlorobenzene (V)	<7.16	u	<7.16	u	NC
1,3-Dichloropropane	<7.79	u	<7.79	u	NC
1,4-Dichlorobenzene (V)	<7.13	u	<7.13	u	NC
1-Methylnaphthalene (V)	61	J	58	IJ	1.3
2,2-Dichloropropane	<8.33	u	<8.33	u	NC
2-Butanone	830	V	840	V	0.3
2-Chlorotoluene	<20	u	<20	u	NC
2-Hexanone	<41.99	u	320	J	NC
2-Methylnaphthalene (V)	82	J	83	J	0.3
4-Chlorotoluene	<6.41	u	<6.41	u	NC
4-Isopropyltoluene	9.7	J	10	J	0.8
4-Methyl-2-pentanone	200	J	180	J	2.6
Acetone	1500	V	1400	v	1.7
Benzene	34000	v	35000	v	0.7
Bromobenzene	<4.89	u	<4.89	u	NC
Bromodichloromethane	<6.99	u	<6.99	u	NC
Bromoform	<5.11	u	<5.11	u	NC
Bromomethane	<38.99	u	<38.99	u	NC
Carbon disulfide	<29.87	u	<29.87	u	NC
Carbon Tetrachloride	<5.41	u	<5.41	u	NC
Chlorobenzene	<5.72	u	<5.72	u	NC
Chloroethane	<9.55	u	<9.55	u	NC
Chloroform	<4.44	u	<4.44	u	NC
Chloromethane	<10.64	u	<10.64	u	NC
cis-1,2-DCE	<6.21	u	<6.21	u	NC
cis-1,3-Dichloropropene	<5.33	u	<5.33	u	NC
Dibromochloromethane	<4.34	u	<4.34	u	NC
Dibromomethane	<5.96	u	<5.96	u	NC
Dichlorodifluoromethane	<17.87	u	<17.87	u	NC
Ethylbenzene	2700	V	2800	v	0.9
Hexachlorobutadiene (V)	<9.93	u	<9.93	u	NC
Isopropylbenzene	53	V	57	V	1.8
Methyl tert-butyl ether (MTBE)	1100	V	1100	v	0.0
Methylene Chloride	<9.37	u	<9.37	u	NC
Naphthalene (V)	320	V	330	v	0.8
n-Butylbenzene	20	J	22	J	2.4
n-Propylbenzene	190	V	210	v	2.5
sec-Butylbenzene	11	J	12	J	2.2
Styrene	<5.5	u	<5.5	u	NC
Styrene	<5.5	u	<5.5	u	NC

Tetrachloroethene (PCE)	% u NC u NC v 1.2 u NC u NC u NC u NC u NC u NC u NC
tert-Butylbenzene <5.75 u <5.75 u Tetrachloroethene (PCE) <7.6 u <7.6 u Toluene 41000 v 43000 v trans-1,2-DCE <20 u <20 u trans-1,3-Dichloropropene <5.16 u <5.16 u Trichloroethene (TCE) <8.75 u <8.75 u Trichlorofluoromethane <10.22 u <10.22 u Vinyl chloride <9.77 u <9.77 u Xylenes, Total 15000 v 15000 v Semi-volatiles (ug/l) 1,2,4-Trichlorobenzene <2.62 u <2.62 u 1,2-Dichlorobenzene <2.29 u <2.29 u	NC U NC V 1.2 U NC U NC U NC U NC U NC U NC U NC U NC
tert-Butylbenzene <5.75 u <5.75 u Tetrachloroethene (PCE) <7.6 u <7.6 u Toluene 41000 v 43000 v trans-1,2-DCE <20 u <20 u trans-1,3-Dichloropropene <5.16 u <5.16 u Trichloroethene (TCE) <8.75 u <8.75 u Trichlorofluoromethane <10.22 u <10.22 u Vinyl chloride <9.77 u <9.77 u Xylenes, Total 15000 v 15000 v Semi-volatiles (ug/l) 1,2,4-Trichlorobenzene <2.62 u <2.62 u 1,2-Dichlorobenzene <2.29 u <2.29 u	u NC v 1.2 u NC u NC u NC u NC u NC u NC v NC
Tetrachloroethene (PCE) <7.6	1.2 u NC u NC u NC u NC u NC u NC u NC
Toluene 41000 v 43000 v trans-1,2-DCE <20	u NC u NC u NC u NC u NC u NC
trans-1,3-Dichloropropene <5.16	u NC u NC u NC u NC v O.O
trans-1,3-Dichloropropene <5.16	u NC u NC u NC v 0.0
Trichloroethene (TCE) <8.75	u NC u NC v 0.0
Trichlorofluoromethane <10.22	u NC v 0.0
Vinyl chloride <9.77	v 0.0
Xylenes, Total 15000 v 15000 v Semi-volatiles (ug/l) 4	
Semi-volatiles (ug/l) 1,2,4-Trichlorobenzene <2.62 u <2.62 u 1,2-Dichlorobenzene <2.29 u <2.29 u	II NC
1,2,4-Trichlorobenzene <2.62	II NC
1,2-Dichlorobenzene <2.29 u <2.29 u	ui NG
	u NC
1,3-Dichlorobenzene <2.26 u <2.26 u <2.26	u NC
	u NC
	v 1.8
	u NC
	u NC
	u NC
	v 4.2
	u NC
	v 12.8
	v 5.0
	u NC
	u NC
	u NC
	v 2.2
	u NC
1011	u NC
	u NC
4.00	u NC
	u NC

Parameter	TK-569-1-G\	V	DUP-GW 1610355-003		
Lab ID	1610355-00	1			1610355-003
Sample Date	10/5/2016	;	10/5/2016		%
Benzo(k)fluoranthene	<3	u	<3	u	NC
Benzoic acid	43	٧	85	٧	16.4
Benzyl alcohol	<3.01	u	<3.01	u	NC
Bis(2-chloroethoxy)methane	<2.81	u	<2.81	u	NC
Bis(2-chloroethyl)ether	<2.67	u	<2.67	u	NC
Bis(2-chloroisopropyl)ether	<1.91	u	<1.91	u	NC
Bis(2-ethylhexyl)phthalate	12	٧	7.6	J	11.2
Butyl benzyl phthalate	<2.48	u	<2.48	u	NC
Carbazole	<2.29	u	<2.29	u	NC
Chrysene	<2.78	u	<2.78	u	NC
Dibenz(a,h)anthracene	<2.66	u	<2.66	u	NC
Dibenzofuran	<2.49	u	<2.49	u	NC
Diethyl phthalate	<2.71	u	<2.71	u	NC
Dimethyl phthalate	26	٧	27	٧	0.9
Di-n-butyl phthalate	<2.44	u	<2.44	u	NC
Di-n-octyl phthalate	6.8	J	6.9	J	0.4
Fluoranthene	<2.61	u	<2.61	u	NC
Fluorene	<2.72	u	<2.72	u	NC
Hexachlorobenzene	<2.63	u	<2.63	u	NC
Hexachlorobutadiene	<2.18	u	<2.18	u	NC
Hexachlorocyclopentadiene	<2.28	u	<2.28	u	NC
Hexachloroethane	<2.37	u	<2.37	u	NC
Indeno(1,2,3-cd)pyrene	<2.96	u	<2.96	u	NC
Isophorone	<2.62	u	<2.62	u	NC
Naphthalene	210	٧	150	٧	8.3
Nitrobenzene	<2.75	u	<2.75	u	NC
N-Nitrosodimethylamine	<2.16	u	<2.16	u	NC
N-Nitrosodi-n-propylamine	<2.39	u	<2.39	u	NC
N-Nitrosodiphenylamine	<2.32	u	<2.32	u	NC
Phenanthrene	<2.59	u	<2.59	u	NC
Pentachlorophenol	<2.34	u	<2.34	u	NC
Phenol	69	٧	61	٧	3.1
Pyrene	<3.09	u	<3.09	u	NC
Pyridine	<2.16	u	<2.16	u	NC
Total Petroleum Hydrocarbons (mg/l)					
Gasoline Range Organics (GRO)	260	٧	270	٧	0.9
Diesel Range Organics (DRO)	22	٧	23	٧	1.1
Motor Oil Range Organics (MRO)	< 5	u	< 5	u	NC

NC - not calculated due to one or both results being non-detect RPD = $((result - duplicate \ value) / ((result + duplicate \ value)/2)) \times 100$

	Parameter	Total Number of Results	Number of Usable Results	Percent Technical Compliance
TPH:	Diesel Range Organics (DRO)	42	42	100
	Motor Oil Range Organics (MRO)	42	42	100
	Gasoline Range Organics (GRO)	45	45	100
VOCs:	All VOC Analytes	47	47	100
SVOCs:	All SVOC Analytes	42	42	100
Metals (total):	Skinner List	42	42	100
Metals (dissolved):	Skinner List	14	14	100
Anions	Chloride, fluoride, and sulfate	14	14	100

Notes:

Number of samples used in completeness calculations includes soil samples and groundwater samples, excludes additional QC samples Percent Technial Compliance = (Number of usable results / Number of reported results) * 100

Appendix J Tank Inspection Records



EQUIPMENT INSPECTION REPORT

ITEM: TK-568

DESCRIPTION: DHT Tank

UNIT: Tank farm

DATE: 01-31-2011

REPORT#: 2011-066

INSPECTION TYPE: EXTERNAL ⊠

INTERNAL [

N.D.E.

Introduction:

On January 31, 2011 an external visual API 653 inspection was performed on TK-568 DHT storage tank. The external inspection showed the stairs, platform and ground wire are intact and secure. This tank is insulated no signs of CUI noted at time of inspection. No ultrasonic thickness readings taken. There is some vegetation in the dike area.

Recommendations:

- Cut TML Holes
- Remove all vegetation.

Signature:

Thomas Hankins API 653 # 30216 CISI Inc. Date: 01-31-2011



Consulting Inspection Services, Inc 1707 E Main St., Olney, IL 62450 (618) 392-4677

Company Name:	Western Refining
Location:	Gallup NM
Inspection Date:	2/1/2011

	IN-SERVICE TANK	INSPECTION REP	ORT	Page 1
CLIENT: Western Refini	ng FACILITY LOCATION:	Gallup NM	TANK #:_	TK-568
	GENERAL INFO	RMATION		
TANK LOCATION:	Tank farm	TYPE:	Stora	age
LIQUID CONTENTS:	MTBE	HEIGHT 24'	CAPACITY:	5000 Barrels
DIAMETER: 25'	ROOF TYPE: FLAT	BOTTOM TYPE:FLAT		
TANK SUPPORT TYPE F	LAT	MATER	IAL: STE	EL
TANK MATERIAL AND T	YPE OF CONSTRUCTION:		A36	
NAME PLATE INFORMA	TION	YES		

INSPECTION CHECKLIST

ITEM	Inspection Task	ACC	NA	Comments & Observations
	Inspect anchor bolts & nuts for corrosion,			
1.1 Foundation	straightness, tightness & full thread engagement	X		
1.2	Inspect for broken concrete, spalling, cracks and	X		
1.3	Inspect for indications of bottom leakage	X		
1.4	Inspect steel for corrosion, pitting & paint failure		X	Insulated
1.5	Inspect for plumb, level and buckling		X	Insulated
1.6	Inspect for drainage away from the tank	X		
1.7	Inspect for signs of settlement	X		
1.8	Inspect area for flammables, trash & vegetation			Dike area has some veggitation
2.1 Bottom	Inspect interior/exterior of leg/skirt for paint failure, corrosion or pitting		X	Insulated
2.2	Inspect leg/skirt-to-shell connection for weld failure		X	Insulated
2.3	Inspect for buckling, corrosion & thinning		X	Insulated
2.4	Inspect & describe flat spots, patches & type of welds			Insulated
3.1 Shell	Inspect for paint failure, pitting & corrosion		X	Insulated
3.2	Inspect shell-to-bottom connection for weld failure		X	Insulated
3.3	Inspect & describe flat spots, buckles or distortions		X	Insulated
3.4	Record location & size of patches & type of welds		X	Insulated
3.5	Inspect insulation for cracks, leaks or wet material	X		
4.1 Shell Attachments	Inspect manways, nozzles & reinforcing plates for cracks ro leakage at weld joints		X	Insulated
4.2	Inspect for shell plate dimpling around nozzles			Insulated
4.3	Inspect for leaks or loose bolting at flanges			Insulated
4.4	Inspect sealing of insulation around manways & nozzles	X		
4.5	Inspect manway mounted equipment for leaks		X	
4.6	Inspect mixer mounting for proper support		X	



Consulting Inspection Services, Inc 1707 E Main St., Olney, IL 62450 (618) 392-4677

Company Name:	Western Refining		
Location:	Gallup NM		
Inspection Date:	2/1/2011		

	IN-SERVICE TANK INSPECTION REPORT				Page 2
CLIENT:	Western Refining	FACILITY LOCATION:	Gallup NM	TANK #:	TK-568
_					

INSPECTION CHECKLIST

ITEM	Inspection Task	Acc	N/A	Comments & Observations
4.7	Inspect for mixer flange or shell distortion		X	
4.8	If running, check for excessive vibration		X	
4.9	Inspect heater drain or other lines to the first		X	
4.10.	Inspect overflow for corrosion & adequate		X	
4.11	Inspect operation of any level gauging	X		
4.12	Inspect stairway, ladder, cage & handrail-to-		X	Insulated
4.13	Inspect for paint failure & corrosion		X	Insulated
	Inspect for paint failure, corrosion or pitting			
5.1 Roof	(gauge)	X		
5.2	Check for indications of standing water	X		
5.3	Inspect insulation for cracks, leaks or wet	X		
6.1 Roof	Inspect nozzles for flange leaks, cracked			
Attachments	welds, loose bolts and plate dimpling	X		
6.2	Inspect hatches for corrosion and paint	X		
6.3	Verify hatch gasket is in place & cover is	X		
6.4	Inspect general condition of breathing	X		
6.5	Inspect breathing valves & vents for	X		
6.6	Inspect condition of flame arrester/pres/vac.		X	
6.7	Inspect condition of platform frame, grating	X		
6.8	Inspect platform for paint failure, pitting &	X		
6.9	Inspect platform welds and/or bolts for	X		
6.10.	Inspect grating clips for correct attachment	X		

API #:	Inspector Name:
30216	Thomas Hankins

Date:	
2/1/2011	



Western Refining Company API 653 Tank External Inspection

Equipment#: Tank 568	Inspection Report #: 2014-635	
Equipment Name: Ammonium Thiosulfate	Unit Name: Tank Farm	
Date: 12/12/2014	Inspector: B. Eddie Luna	
Headline: API 653 External/UT Inspection		

Summary:

Overall the tank is in good condition and it suitable for continued service. Below are some of the issues found during the inspection.

- The foundation is severely washed out from the northeast to west side of the tank.
- The projection plate is covered with dirt/gravel from the east to southwest side of the tank.
- A valve on the south side is showing signs of a possible leak and the support concrete support underneath is deteriorating (possibly from the product).
- The original name plate may be under the insulation above the cleanout manway.
- Roof: there is severe corrosion on the access hatch cover and neck.
- Roof: There is no bird screen on the center vent.

Attached to this report are the ultrasonic readings for the shell; as well as the calculations per API 653, next inspection intervals, foundation settlement survey, and API Checklist.

History:

- 7/1997: helium test was performed on the tank bottom; new internal coating
- 2/2006: MFE by BLD, one indication found
- 2/2006: repairs performed include shell vents removed and inserted, new tank overflow, new internal coating

Recommendations: (W/O# 624998/ IR# 2015-125)

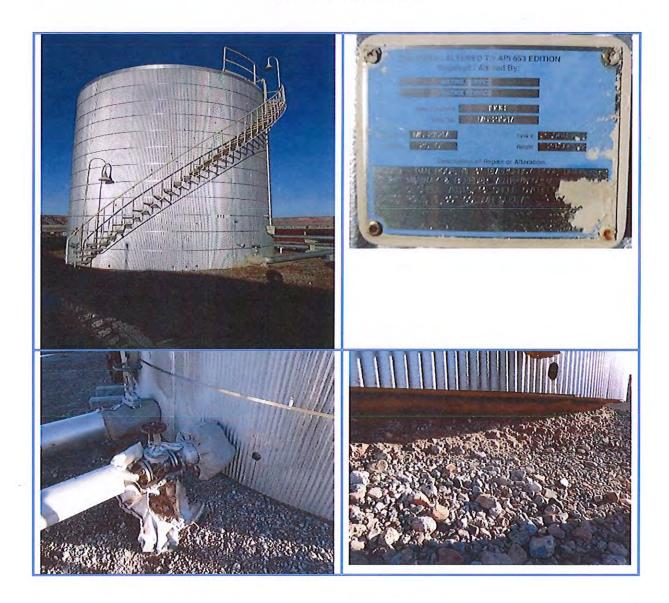
- The projection plate should be kept clean
- ✓ The foundation needs to be regarded and filled underneath the tank
 - Install appropriate UT ports in the holes that were cut in the insulation
- Valve on the south side should be cleaned to determine the source of the leak and the concrete pipe support should be further evaluated
- Consider removing the insulation above the cleanout, at the next out of service, in order
 to expose the original nameplate



Western Refining Company API 653 Tank External Inspection

Equipment#: Tank 568	Inspection Report #: 2014-635
Equipment Name: Ammonium Thiosulfate	Unit Name: Tank Farm
Date: 12/12/2014	Inspector: B. Eddie Luna
Headline: API 653 External/UT Inspection	

Reference Photographs



Signature:

Date:

Bran Eddie Luna, API 653 #33623

Client:

Western Refining

Date

December 19, 2014

Tank Number:

568



Inspection Intervals

Routine in-service Inspection
Performed by Terminal Personnel

January 2015

Shell External Visual Inspection

*Performed by an authorized inspector Minimum of RCA/4N or 5 yrs

Shell Ultrasonic Thickness Inspection

*Performed by an authorized inspector Minimum of RCA/2N or 15 yrs December 2019

December 2029

Corrosion Rate

0.0001

in/yr

Client:

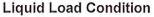
Western Refining

Date:

December 19, 2014

Tank Number:

568



Mechanical Parameters

Design code	API 12C			
Tank Type	IFRT			
Shell main Material	A 283 Grade C			
Year of construction	DOB	yr	1957	
Tank diameter	D	ft	25.00	
Tank height	Н	ft	24.00	
No. shell courses			4	
Temp. correction factor	φ	Note 1	1.000	
Nominal capacity	Vbrut	bbls	2098	
Riveted tank	Note 3	y/n	No	
Joint Efficiency	E		0.85	
Evaluation method	Note 5	1-	foot	



API653, Section 4.3.3 and 4.3.4

The following formulas are used in calculating the required minimal thickness of shell courses:

$$\begin{split} t_d &= \frac{2.6D(H-1)G}{E.\varphi.S_d} \\ t_t &= \frac{2.6D(H-1)}{E.S_t} \end{split}$$

Note 1: Use API650, Appendix M in case of operation at elevated temperature (Default is 1.0).

Note 2: If material is unknown use Y=30000/T=55000 and if E is unknown use table 4-2 of API653.

Note 3: For riveted tanks use S = 21000 PSI unless otherwise specified.

Note 4: Allowable stress S is calculated according to API653, sections 4.3.3.1 and 4.3.3.2.

Note 5:

Recommended evaluation method:

1-foot

1. The 1-foot method calculates the thickness required at design points (1 ft. above the bottom of each shell course).

2. The 1-foot method shall not be used for tanks with D > 200 ft.

Product Conditions (t_d)

Specific Gravity	G	[-]	1.324
Filling height	h	feet	22.00
Maximum safe filling height	h	feet	22.00

Course	Course	Product	Material	Material	Allowable	Joint	Minimum	Minimum	Measured	Integrity
No.	height	height	Yield	Tensile	Stress	Efficiency	calculated	allowable	t	check
			Y	T	S	Factor	t	t	min	
	[feet]	[feet]	[PSI]	[PSI]	[PSI]	E	[inch]	[inch]	[inch]	
4	6.00	4.00	30000	55000	25960	0.85	0.012	0.100	0.185	OK
3	6.00	10.00	30000	55000	25960	0.85	0.035	0.100	0.182	ОК
2	6.00	16.00	30000	55000	23595	0.85	0.064	0.100	0.183	ОК
1	6.00	22.00	30000	55000	23595	0.85	0.090	0.100	0.181	ОК

Client:

Western Refining

Date:

December 19, 2014

Tank Number:

568



Shell Assessment (Minimum Allowable Shell thickness)

Mechanical Parameters

Installation date DOB year 1957 Last Inspection Date LID year 2014

Minimum allowable shell thickness for loadcase liquid load and roof load.

Course No.	min t allowable roofload	min t allowable liq.load	min allowable	min thickness measured	Integrity check
	[inch]	[inch]	[inch]	[inch]	
4	0.041	0.100	0.100	0.185	ОК
3	0.041	0.100	0.100	0.182	ОК
2	0.041	0.100	0.100	0.183	OK
1	0.041	0.100	0.100	0.181	ОК

Note 1. Minimum allowable thickness for roof load has been calculated for fa=Fa

Conclusion:

Minimum uniform thickness as measured for the individual shell courses are greater than as required for the liquid load and uniform roof load. Thus OK.

Remaining Life assessment and Inspection Frequency

API653, section 6.3.2 - External Inspection

All tanks shall be given a visual external inspection by an authorized inspector. This inspection shall be called the external inspection and must be conducted at least every 5 years or CA /4 CR years (where CA is the difference between the measured shell thickness and the minimum required thickness in inch, and CR is the shell corrosion rate in mm per year) whichever is less. Tanks may be in operation during this inspection.

API653, section 6.3.3 - Ultrasonic Thickness Inspection

External, ultrasonic thickness measurements of the shell can be a means of determining a rate of uniform general corrosion while the tank is in service, and can provide an indication of the integrity of the shell. When used, the ultrasonic thickness measurements shall be made at intervals not to exceed the following:

When the corrosion rate is known, the maximum interval shall be the smaller of CA/2CR years (where CA is the difference between the measured shell thickness and the minimum required thickness in mm, and CR is the shell corrosion rate in inch per year) or 15 years.

Course No.	Original WT (in) Assumed	min. WT meas. [in]	CR meas. [in/y]	Wt min. allowable [in]	CA [in]	RL (CA/CRmax) (years)	External Inspection [years]	UT Inspection [years]	Recommendations: Since the intended next service period is years, the following interval is to be considered.
									Next External inspection by an authorized inspector should be carried out not later than: 2019.
									Next External UT inspection of the shell (and roof) should be carried out not later than: 2029.
4	0.188	0.185	0.000	0.100	0.085	745	484.5	969.0	NB: Local regulations/conditions may have affect on the above
3	0.188	0.182	0.000	0.100	0.082	719	212.5	424.9	recommendations.
2	0.188	0.183	0.000	0.100	0.083	728	262.8	525.7	
1	0.188	0.181	0.000	0.100	0.081	710	177.6	355.2	
	Max	imum CR:	0.000114		Minimu	m Allowable:	5.0	15.0	



EXTERNAL TANK INSPECTION REPORT

UNIT	Tank Farm	REPORT#	2019-145
TANK#	Z71-TK-568.1	SERVICE	ATS

GENERAL CONDITION

ITEM	INSP.	COMMENTS
SHELL	□ N/A □ GOOD □ FAIR □ POOR	New Tank. No Issues.
COATING	▼ N/A 「 GOOD 「 FAIR 「 POOR	New tank. Stainless steel construction not coated.
INSULATION	□ N/A □ GOOD □ FAIR □ POOR	New Tank. No Issues.
FLOOR	□ N/A ☑ GOOD □ FAIR □ POOR	Inspected during construction.
FOUNDATION	□ N/A □ GOOD □ FAIR □ POOR	New Tank. No Issues.
SUPPORTS	□ N/A ☑ GOOD □ FAIR □ POOR	New Tank. No Issues.
STRUCTURAL	□ N/A ☑ GOOD ☐ FAIR ☐ POOR	New Tank. No Issues.
LADDERS/PLATFORMS	□ N/A □ GOOD □ FAIR □ POOR	New Tank. No Issues.
ROOF DRAIN & APPURT'S	□ N/A ☑ GOOD □ FAIR □ POOR	New Tank. No Issues.
FLOATING ROOF (INT-EXT)	▼ N/A 「 GOOD 「 FAIR 「 POOR	External Cone Roof, no floating roof.
PONTOONS	▼ N/A 「 GOOD 「 FAIR	External Cone Roof, no floating roof.
GUIDE POLE, INSTRUMENTS	▼ N/A 「 GOOD 「 FAIR 「 POOR	External Cone Roof, no floating roof.
VACUUM BREAKER	▼ N/A 「 GOOD 「 FAIR 「 POOR	VTA
SEALS	▼ N/A 「 GOOD 「 FAIR 「 POOR	External Cone Roof, no internal floating roof.
NOZZLES	□ N/A ☑ GOOD ☐ FAIR ☐ POOR	New Tank. No Issues.
ATTACHED PIPING	□ N/A ▼ GOOD □ FAIR □ POOR	New Tank. No Issues.
PRD'S	▼ N/A 「GOOD 「FAIR 「POOR	VTA
GROUND WIRE	□ N/A ▼ GOOD □ FAIR □ POOR	Securely attached.
OTHER:	□ N/A □ GOOD □ FAIR □ POOR	

INSPECTOR:	Gary Shelton	API#:	6399	DATE:	2/5/2019
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EXTERNAL TANK INSPECTION REPORT

ADDITIONAL COMMENTS

No Recommendations.

Reference Photographs





EXTERNAL TANK INSPECTION REPORT







Ladder and Roof Appurtenances

Signature:

Inspector & API #
Gary J. Shelton
API-653 Cort

Date: 2/5/2019



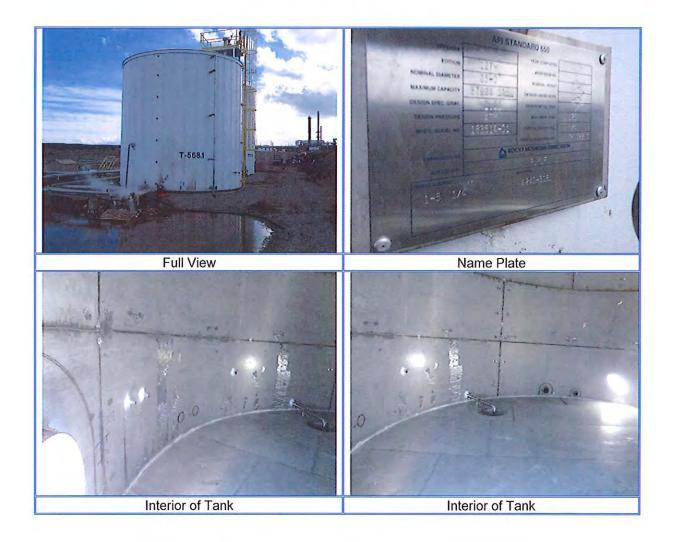
Marathon Petroleum Company LP API 653 History Brief

Equipment#: Z71-TK-568.1	Inspection Report #: 2019-144	
Equipment Name: ATS Storage Tank	Unit Name: Tank Farm	
Date: 2/5/2019	Inspector: Gary Shelton	
Headline: Replacement Tank Built for TK	(-568.	

Summary:

Tank 568.1 is a field erected tank built to replace the ATS Tank 568 that was built in the summer of 2018. It was put into service in January of 2019. It is a 25' diameter tank that is 24' high. It holds approximately 2000 bbls. and is constructed of 316 stainless steel.

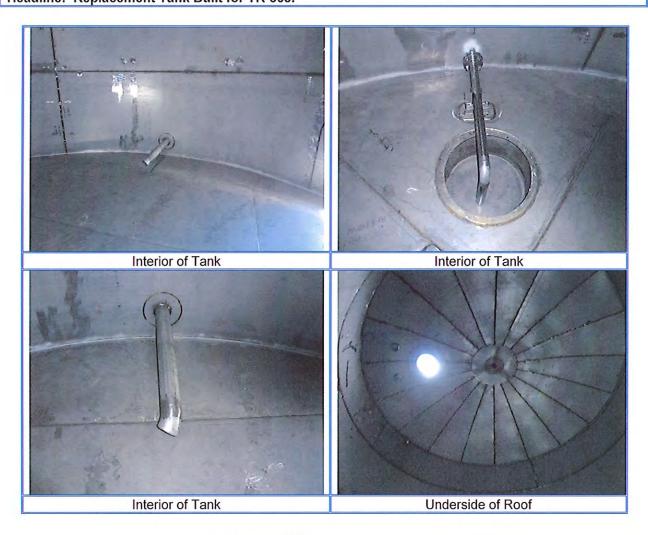
Reference Photographs





Marathon Petroleum Company LP API 653 History Brief

Equipment#: Z71-TK-568.1	Inspection Report #: 2019-144	
Equipment Name: ATS Storage Tank	Unit Name: Tank Farm	
Date: 2/5/2019	Inspector: Gary Shelton	
Headline: Replacement Tank Built for TK	C-568	



Signature:

Inspector & API # Gary J. Shelton API-653 Cert. #6399

Date: 2/5/2019



EQUIPMENT INSPECTION REPORT

ITEM: Tank 569

DESCRIPTION: 83 Octane Storage Tank

UNIT: Tank Farm

DATE: 06-21-2010

REPORT: 2010-257

INSPECTION TYPE: EXTERNAL⊠

INTERNAL

N.D.E. ⊠ VISUAL ⊠

Introduction: On or about 06-08-2010 Offsites reported that the Floating roof had sprung a leak. After Offsites locked out and tagged out this tank Western Maintenance proceeded to remove the exposed Hydro carbons and tar. An API 653 External Visual inspection was performed on the Floating Roof in conjunction with a Vacuum Box test that revealed pinhole leaks in five areas on the south side of the roof (see attached photos). Western Maintenance cleaned off these areas to bare metal with a non-flammable Marine paint remover; then applied Steel Seam (a two part epoxy resin) to the effected areas and let set for forty eight hours. A visual Inspection was performed on the repairs. The temporary repairs appear to be suitable until the tank can be removed from service and an inspection can be performed to determine the extent of damage to the weld seams.

Recommendations: The last API 653 Internal Inspection was performed in 1997; Schedule this Tank for an outage to perform an API 653 Internal and External Inspection. Make permanent repairs to the External Floating Roof at this scheduled outage.

Signature:

Jay White

Senior Plant Inspector

Western Refining Southwest, Inc.

Date: 06-21-2010





EQUIPMENT INSPECTION REPORT

ITEM: Tank 569

DESCRIPTION: 83 Octane Storage Tank

UNIT: Tank Farm

DATE: 10-06-2010

REPORT: 2010-257

INSPECTION TYPE: EXTERNAL⊠ INTERNAL ⊠ N.D.E. ⊠ VISUAL ⊠

Introduction: On or about 06-30-2010 this tank was removed from service to make repairs to the floating roof and to perform an API 653 internal and external inspection. The tank was locked out, blinded and made gas free. This is an above ground storage tank with an external floating roof; the diameter is sixty seven feet and forty feet tall with a capacity of twenty five thousand barrels. Per MOC 2010-032 a Parabolic Radar gauge was installed with a flat target welded to the floating roof. A visual inspection was performed and no issues were noted.

Shell: In the spring of 2009 Maintenance pressure washed and coated the external shell with Acrylon (Alpaca brown). A UT survey was performed on the shell and all attached nozzles with no material loss noted. The bottom plate extension (chime) is in good condition no deterioration was noted. The internal shell had light general pitting that was arrested by installing a liner. WMFT was performed on the floor to shell attaching weld, all nozzle attaching welds, and the first course "T" joints, no issues were noted.

Floor: Inspections performed on the floor were Vacuum box testing, MFE, UT thickness testing, and an edge settlement survey. No indications were found in the weld seams. There were four pits that were found that are below the minimum specified thickness in accordance with API 653, Section 4.4.6.5, table 4.4. These areas were repaired with .25" A516-70 carbon steel plate with a minimum radius of six inches and a two pass fillet weld. These were visually inspected followed up with vacuum box testing with no issues noted. An edge settlement survey was performed and no deficiencies were noted.

Roof: This is an external floating roof with built in pontoons around the parameter. All pontoons were visually inspected internally and no issues were noted. The primary and secondary seals are in satisfactory condition and no gaps were noted between the shell and seal. Western Maintenance grit blasted the roof and fourteen separate locations were found to have pin holes, these holes were repaired with .25 inch flat plate (A516-70 carbon steel) with six inch by six inch minimum dimensions and rounded corners with a two inch radius. The fillet weld is a two pass .25 inch weld that was visually inspected and followed with a vacuum box test, no issues were noted.

Recommendations: None at this time

Conclusion: Western Maintenance performed the grit blast and coating on the internal shell and the external area of the floating roof. Internal lining consisted of Phenicon HS, White. The dry thickness coating was approximately 12 mils. Holiday testing was performed on the floor and four feet up the internal shell, nine areas were found to have deficiencies and were repaired by Western Maintenance. The closure form was signed by Off Sites, Maintenance, and Inspection. This tank was found to be fit for continued service.

Signature: 15 W

Jay White

Senior Plant Inspector

Western Refining Southwest, Inc.

Date: 10-07-2010



Title: **PSM 510** Procedure No: 1 of 1 Page: Attachment 510P - MECHANICAL INTEGRITY Revision: 00 **FORM - PIPING** Effective Date: 04/01/2008 Required section completed by MOC Owner MOC Owner Kenysmichez MOC Title TANK Fare 2010-052 Radro gauge & Trager Required section completed by Gallup Pipe Dept. The inspection aspects of the above MOC were verified by Inspection Report(s)/N.D.E. Request for the above MOC is filed in: عبر مركب المراج ال INCLUDED IN INSPECTION FILE IWR⁽¹⁾ No. NO N.D.E. File YES EQUIPMENT FILE Equip. No. YES NO X-RAY; N.D.E. No. IWR No. YES NO TYPE NDE PERFORMED: P.T. P.W.H.T. M.T. B.H.N. R.T. ALLOW I.D./P.M.I. U.T. **HYDROTEST** V.T. **CODE PACKAGE** Piping & Equipment Test Package & Punch List Transmittal Notice Piping System Pressure Test Piping or Equipment Punch List Piping or Equipment Pressure Test Restoration List Non-Pressure Underground Piping Record **Exchanger Hydrotest** Steam Trace Tubing Release/Acceptance ☐ Insulation Release/Checklist Restoration Work List/Checklist H-P-10 Vessel Inspection/Final Closure **REMARKS** Print Inspector's Name & Company

Chief Inspector's Signature

Date



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Attachment 510P - Mechanical Integrity Form - Piping & Equipment Inspection Test Plan.

Procedure No:	508.03
Page:	1
Revision:	0
Effective Date:	09/02/09

	Dat	e:	06-25-2010				
	Uni		Tank Farm	Line or Equipment #:	Tank :	569	
	— —	E#:					
)# or PO#:					
	<u> </u>	C Owner:					
Code: □ASN Code: □NBI	 ME B31	.3 □ASME F		VIII D1 □API 620 ☒ ☑API 653 □	API 65	60	
,ode: □I4BI		□API 510		MAP 1003 L			· - · · · ·
Technique	Complete?	Extent		Technique	Complete?	Extent	
⊠ RT		100% of Re	pairs to shell	□РМІ) 		
⊠ UT	ZÝ ON	UT floor, 1st	UT floor, 1 st Shell course, & Roof		N N		
□РТ	□ _V			☐ FLIR	20		
☐ MT ☑ WFMT	2 2 3 3	Internal Noz	hell course, "T" Joint zle Att. Welds, & Sho	s, Preheat			
		To Bottom "T" Joint		☐ PWHT			
⊠ vī	200	⊠internal		⊠External	⊠External		
K3I ₹ î	□N	API 653		API 653			
☐ Boroscope	<u></u>						
☐ Jeep testing	E E						
·		Extent	Partial				Test Pressure
☐ Hydrostatic	□N	Y Extent					
☐ Hydrostatic ☐ Pneumatic	□Y □X						Test Pressure

Vacuum Box test all floor seams and roof seams. MFE floor plate. Perform a level survey.

Sand blast external floating roof seams and all attachments and welds, Vacuum box test, Penetrant test, & Diesel test as required. Internal inspection of floating roof Primary and secondary seals. Internal inspection of pontoons. Repair all reverse siphon drains on floating Roof. Sand blast the internal chime area, all vertical weld seams on the first shell course up to the floating roof, nozzle attachment welds,

Upon completion of repairs coat the internal shell first course, floor and the top side of the floating roof in accordance with the PIP Specification Jeep Test coating in accordance with NACE Specifications.

(Pre-Work) Inspector: Jay White John Vo	Date: 06-25-2010
(Post-Work) Inspection Report(s)/NDE request for the above MOC is filed in:	
(Post Work:) The Inspection aspects of the above work or MOC were verified by: Chief Inspector:	Date: 10-8-10



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Date:

Attachment 510P – Mechanical Integrity Form – Piping & Equipment Inspection Test Plan.

09-02-2010

Procedure No:	508.03
Page:	1
Revision:	0
Effective Date:	09/02/09

Code:	NBIC	☐API 510			⊠API 653 □]Olher:_ 			
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□ PŢ					□FLIR				
☐ MT ☐ WFM	T DY				☐ Preheat	Y		-	·
⊠VT	□Y □N	□Internal			⊠External				
☐ Boroscope	□ _Y	-							
☐ Jeep testing	UN UN								
Hydrostatic	₽Y	Extent						Test P	ressure
☐ Pneumatic		Extent						Test P	ressure .
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W	Western
	Refining

Title:	Procedure No:	508.03
Title.	Page:	1
Attachment 510P – Mechanical Integrity Form – Piping	Revision:	0
& Equipment Inspection Test Plan.	Effective Date:	09/02/09

Date:	09-01 -2 010				
Unit:	Tank Farm	Line or Equipment #:	Tank 569	Peuf	MYLEON
AFE #:					
WO# or PO#:					
MOC Owner:					
MOC Number:					

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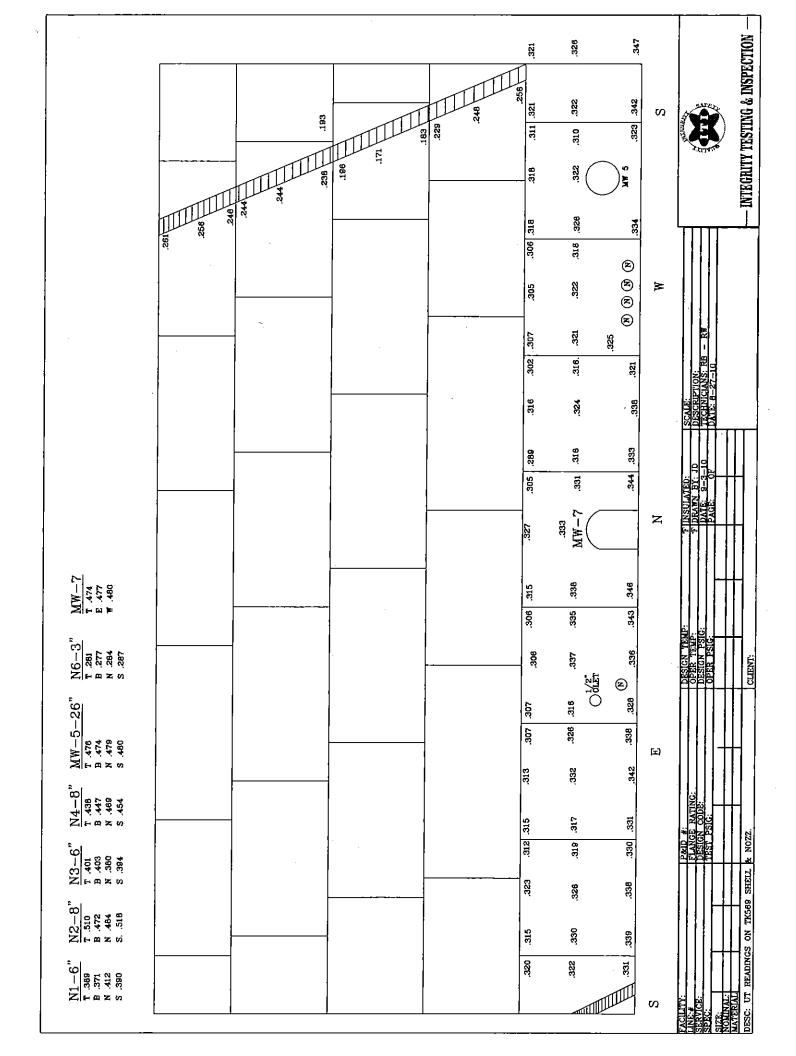
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Title:		Procedure	
Attachment 510N – MO	C Rotating Equip., Fixe		rage: 1 of 1 sion: 02
Equip. Piping Closure	Form	Effective I	I I
EQUIPMENT #: TANK	569	UNIT:	TANKFARM
SERVICE DESCRIPTION:	83 octuse AG Sto	prage Tark	_ DATE: <u>/07</u> 73
Has Punch List / Recommenda		ES NO 🗆	NA Waived
Has leveling and alignment bee	n completed and tested: Y	ES NO 🗆	NA Waived
Has vibration analysis been cor	apleted: Y	ES 🗌 NO 🗌	NA Waived [
Has overspeed trip test been con	npleted: Y	ES NO	NA Waived
	artial 🔲 Part neumatic 🗍 Wai		
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Test Pressure:	Psig, Medium: Wo	Hold Time:	Ambient Temp:vr_ °F
RESPONSIBILITIES	Closure form or-	ity	
Maintenance/ Contactor:	Will ensure that the equipapproved drawing/revision		ether as per the current
2) Engineering:			ng loading/unloading. Catalyst pproved loading Diagram.
3) Inspection:	Will ensure all Testings as continuous service.	re completed and certif	y the equipment for
4) Operations/	Will ensure prior to closin	g the equipment that it	is clean and free of any debris
Terminal:	internally. It should also be source of energy that was		scaffolding or any other
5) Refinery Manager:	If applicable will sign off	the waiver.	
1. Styphen Dardoval	Date: / いっっこ 2	•	Date:
Maintenance/Contractor	Date: 10-11/10 4	Engineering	016 Date: 10-1-10
Inspection	Dato, to the	Operations-Proce	
	Date		
Refinery Manager (for waiver	Date:		•
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— INTEGRITY TESTING & INSPECTION —

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					Single Crysta	I	Dual Crystal	SonoTest Ultra	agel-II		
	Pulse Echo	Angle-Beam	Other	Frequency	Size		Angle	1			İ
Type of	V			5 MHz	0.3125"		0"				
Inspection				Flat	Сопсаче		Convex				1
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	l	_		Standard		Material	Notch depth		Serial No).	
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	S/N 06140920	99		Step Wedge Tube Wedg		Material CS	Thickness Ran	ge	Serial No 06-347		
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					BRIAN HIN	ES		David Mitche	ell / Rayn	Woo	odring
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NOTICE:

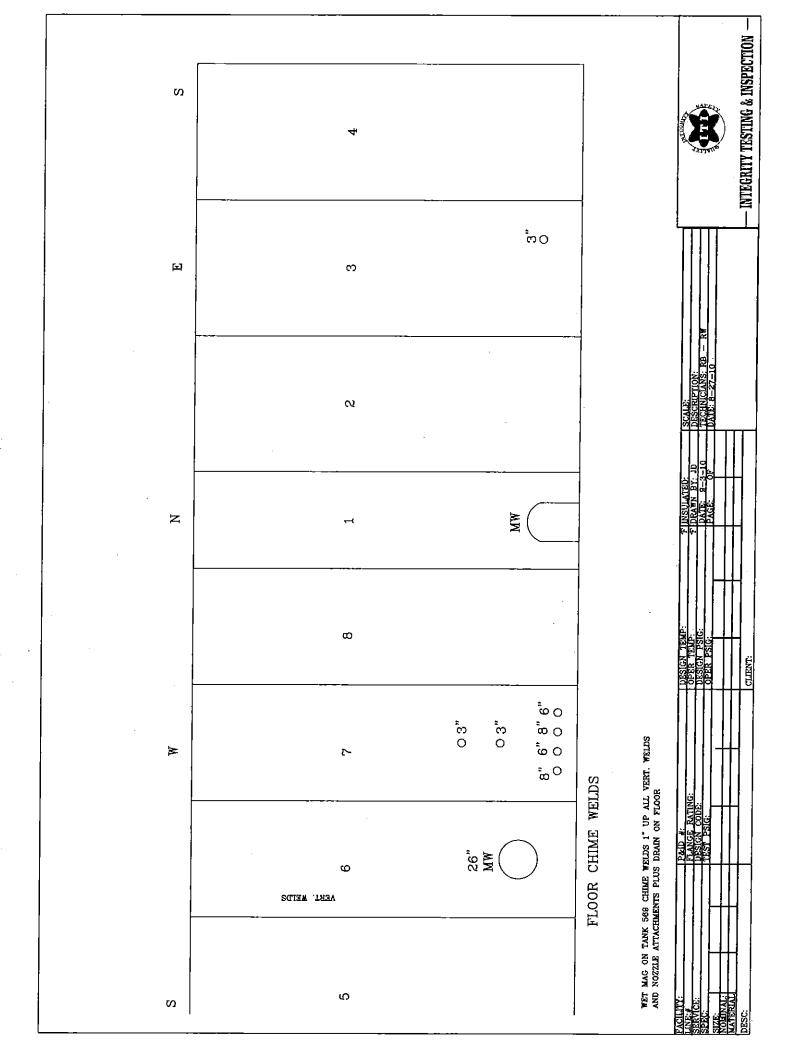




— INTEGRITY TESTING & INSPECTION -

MAGNET	IC PARTICI	LE EXAM	INATION R	EPORT				Nuclear	7	Non-Nuclear	
То						From		Date			
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			WELD, 1' UF	ALL VERT		•	ZLE ATTAC	HMENTS PLUS	DRAIN ON FL	LOOR	
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	14AM GREE	-14			✓ See		NA				
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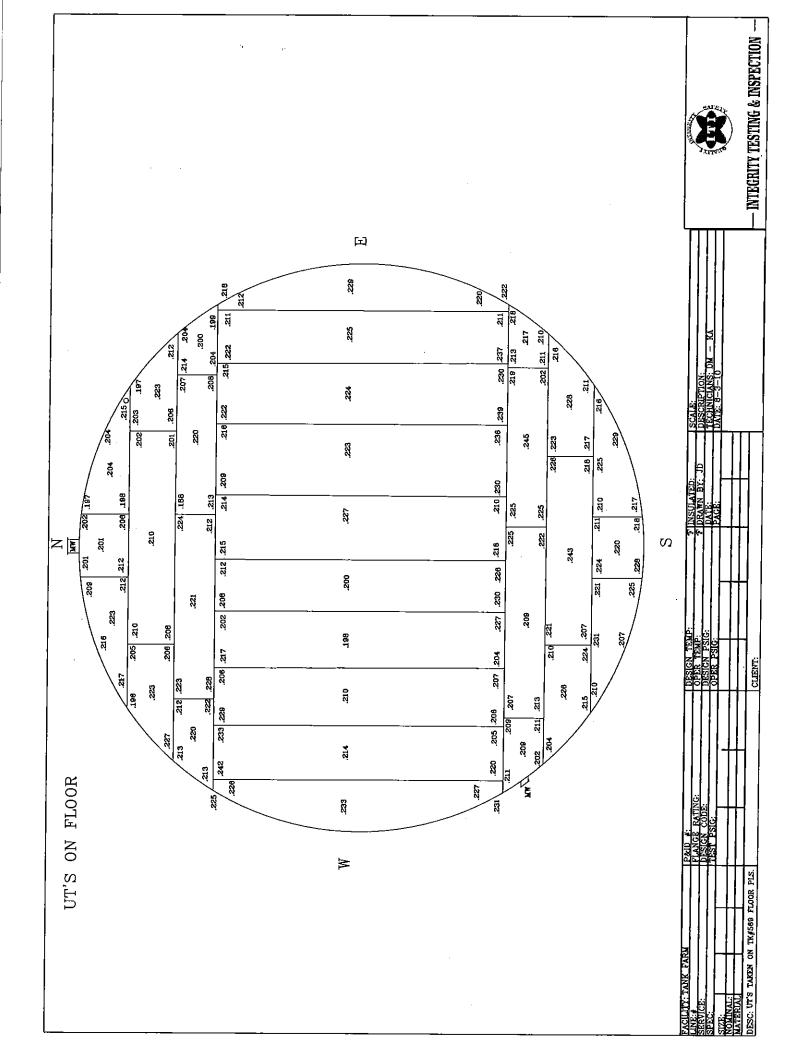




— INTEGRITY TESTING & INSPECTION —

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	Pulse Echo	Angle-Beam	Other	Frequency	Size		Angle	1		
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	37 DL PLUS	3		N/A_		CS	N/A		N/A	
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Reference: Si	ummary				☐ See	Altachment	Results of Insp	ection		
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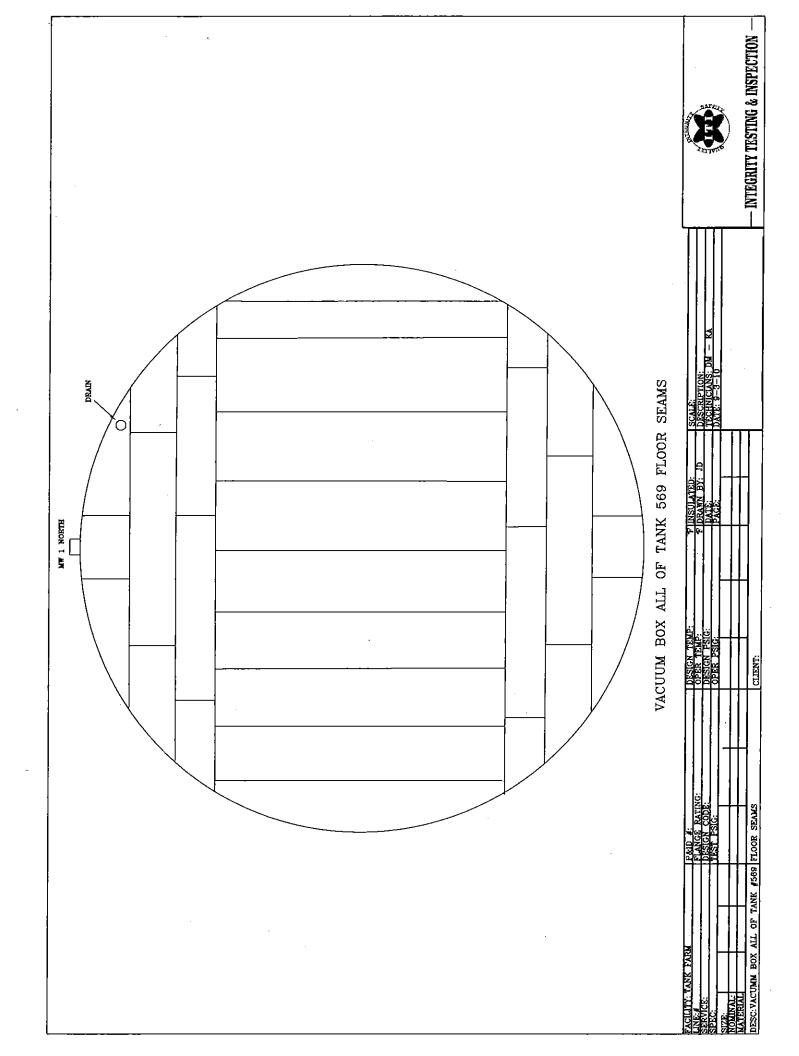




— INTEGRITY TESTING & INSPECTION —

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Acceptance	WESTERN RE	FINING, GAI	LLUP, NM.			Procedure	<u> </u>				
Stanmdards		API 653				Tioccadio	LT QCP 90	00 RF	V. 0		
0.000	VACUUM BOX TESTED ALL TANK FLOOR SEAMS. FOUND NO REJECTABLE OR RELEVANT INDICATIONS.										
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Results of								•			
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90.00					•						
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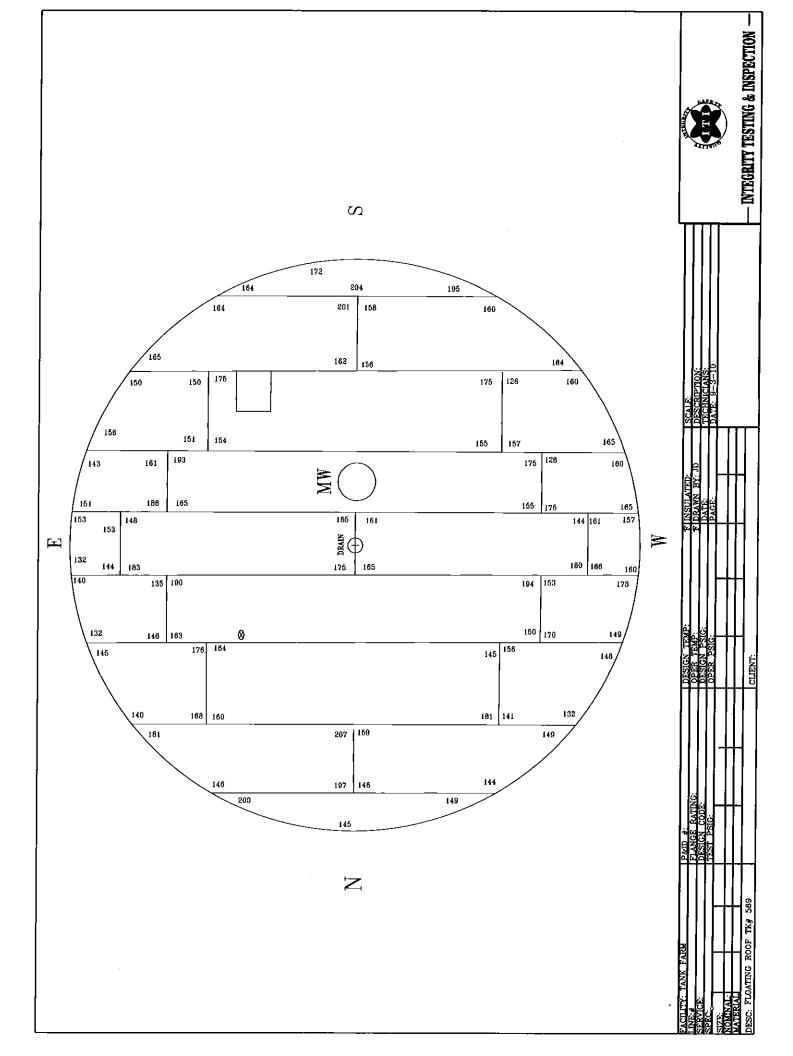




— INTEGRITY TESTING & INSPECTION —

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	Non-Weld	Plate	Pipe	Bar	Casting	Mach, Parts	N/A	Other:	_			
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					Single Crysta	I	Dual Crystal	SonoTest Ultragel-II				
	Pulse Echo	Angle-Beam	Other	Frequency	Size	Angle]				
Type of	V			5 MHz	0.3125"		0"					
Inspection				Flat	Concave		Convex					
	UT Equipment/Model											
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	S/N 061409209				Step Wedge 🗸		Thickness Ran					
				Tube Wed	ge 🗌	CS	.500100		06-3474			
Reference: S	Summary				See	Attachment	Results of Insp	action				
							PERFORM	PERFORMED UT THICKNESS				
•					ROOF SEE ATTA			MENTS ON TANK 569 FLOATING				
								CHMENT FOR LOCATIONS AND				
								SS READINGS				
Сору То:					Requested By	:		Reported By (Tech	inician)	131500		
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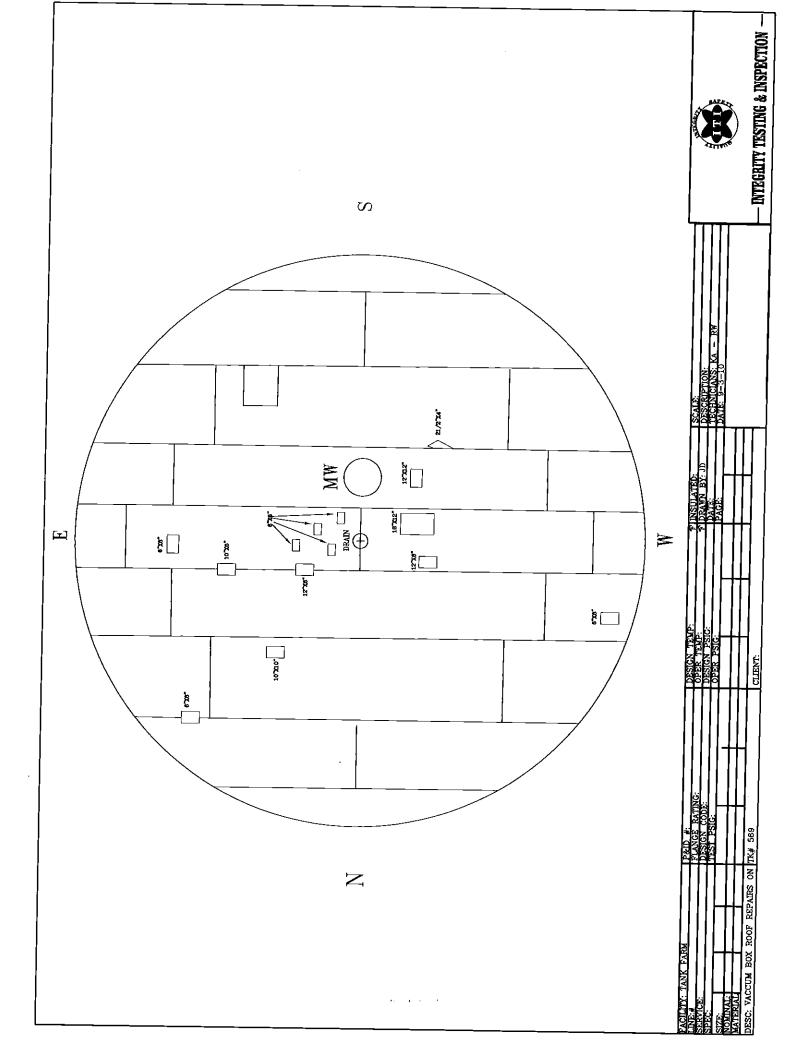
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- INTEGRITY TESTING & INSPECTION —

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Contract No. o	or Purchase Ord	der No.			Integrity Tes	ting Report #	·				_
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llem -	Weld	Structural	Casting	Machinery	Mach, Parts	Pipe	- N/A	Other:			
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					Customer	Specifications		NDT Sup	ervisor:		
,					✓ Accept	Reject		<u>ROLA</u> N	D COLE	MAN	

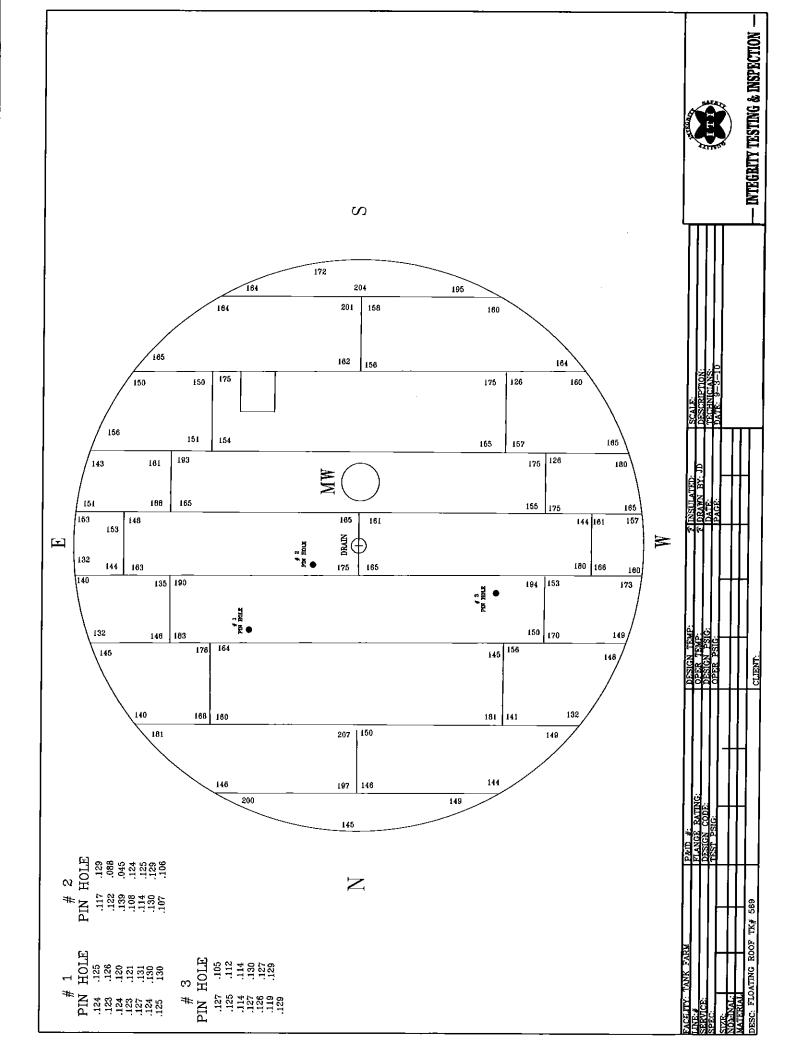




— INTEGRITY TESTING & INSPECTION —

				Nuclea	r 🗸	Non-Nuclear		
То								
WESTERN REFINING Project								
						•		
TING ROOF			PIN HOLES					
	Integrity Test	•						
	<u> </u>							
Machinery Mach. Parts		Pipe	N/A □	Other:		•		
Bar	Casting	Mach. Parts	N/A	Other:				
		Type of F	iller Material	Weld /	N/A	Idod		
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N.M.		TANK 569						
		Procedure						
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Flat	Concave		Convex					
Slandard		Material	Notch depth	olch depth				
N/A		CS	N/A		N/A			
Step Wedge			Thickness Ran	ge	Serial No.			
Tube Wedo			.500100		06-3474			
	☐ See	Attachment	Results of Insp					
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				SEE ATTACHMENT FOR LOCATIONS AND				
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	Requested By	 :	L	Reported By (Tech	nician):			
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•	Machinery Bar CS N.M. Transducer Frequency 5 MHz Flat V Standard N/A Step Wedge Tube Wedge	TING ROOF AROUND 1 Integrity Test Machinery	Transducer Transducer Single Crystal Frequency Standard N/A Step Wedge Tube Wedge Tube Wedge Requested By: BRIAN HINES Integrity Testing Job No. 2010-0010i Machinery Mach. Parts Pipe Mach. Parts Pipe Type of Fase Metal Type of Fase Metal Type of Fase Metal Type of Fase Metal Type of Fase Metal Tank 569 Procedure Single Crystal Frequency Size Standard Material N/A CS Step Wedge	From I.T.I. TING ROOF AROUND THE THREE PIN HOLES Integrity Testing Job No. 2010-00108 Machinery Mach. Parts Pipe N/A Bar Casting Mach. Parts N/A CS N.M. TANK 569 Procedure Transducer Single Crystal Dual Crystal Frequency Size Angle 5 MHz 0.3125" 0" Flat Concave Convex Standard N/A CS N/A Step Wedge J Material Thickness Ran Tube Wedge Material CS .500100 See Attachment Results of Insp. PERFORMI MEASURE: ROOF ARO SEE ATTAC THICKNESS Requested By: BRIAN HINES Customer Specifications	From	From		

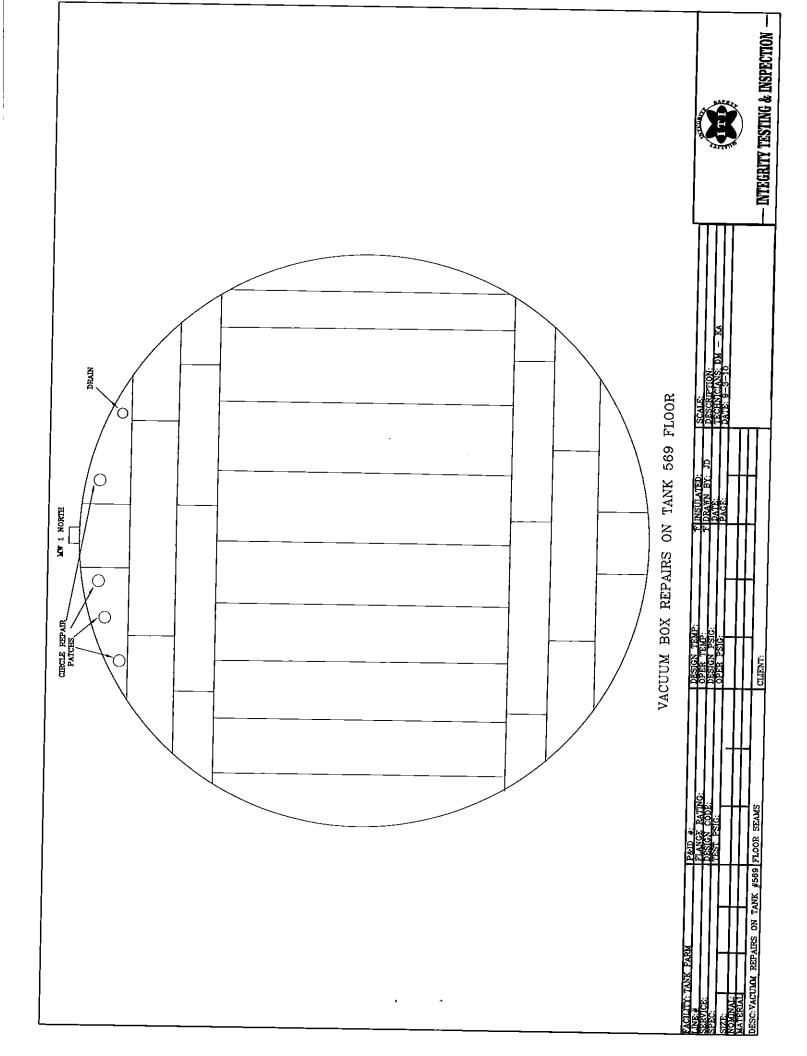
NOTICE:





— INTEGRITY TESTING & INSPECTION —

VISUAL E	XAMINATI	ON REPO	ORT						Nuclear	Image: section of the	Non-Nuclea
То						From		Date	-		 -
	WESTERN REFINING							8	3/2/2010		
Project						I.T.I.	<u> </u>	<u> </u>		,	
			PATCHES (ON TANK F	LOOR & R	OOF. TANK	569				
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o trasa reparturado do 185					<u> </u>		2010-000	2			
ltem	Weld ☑	Structural	Casting	Machinery	Mach, Parts	Pipe	N/A	Other: N/A	-		
制制	Non-Weld	Plate	Pipe	8ar	Casti⊓g ☐	Mach. Parts	N/A	Other: N/A	-		
Material	Size		No. of Pieces	Type of 2	ase Metal	Type of Fil	ler Material	Weld		N/A	
为被支持基础	67' D X 40' H n/a CS					CS ☐ Smooth ☑ As Welded					ded
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Acceptance	•					Procedure					-
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Results of			 .					<u> </u>			
Inspection										<u> </u>	.
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ору То:				F	Requested By:			Reported	By (Technicia	an):	
				Į.	BRIAN HINE	ES		I	loodring/ K		strong
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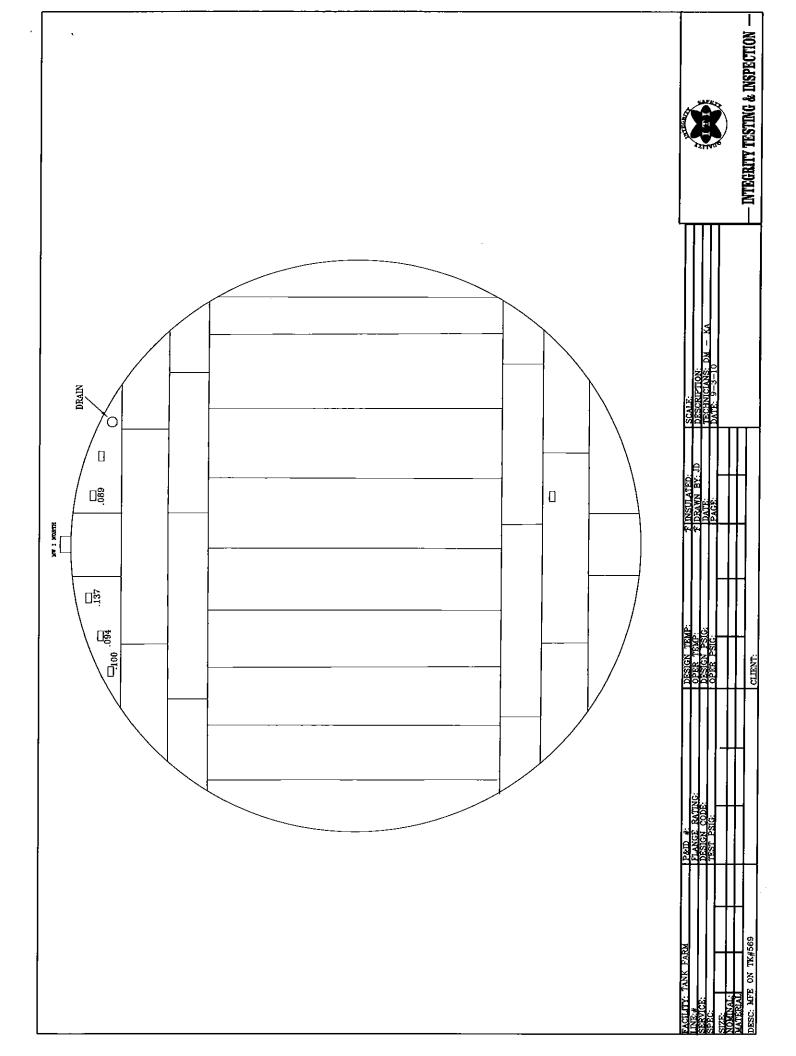
3861 Vincent Station Drive Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

M.F.E. EX	AMINATIO	ON REPOR	RT					Nuclear		Non-Nuclea
То						From		Date		
WESTERN	REFINING	}]I.T.I.		8/27/2010		
Project					·-					
TANK 569										
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						2010-0002				
Item	Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other:	·	
	Non-Weld	Plale	Pipe	Bar	Casting	Mach. Parts	N/A	Other		
Material	Size 67' D X 40'	'H	No. of Pieces 30	Type of E CS	Base Metal		ller Material	Weld [✓ N/A As Weld	ded
Location	Location WESTERN	<u> </u> REFINING	G, GALLUP N	I.M.		Syslem TANK 569		·		
Acceptance S	tandards					Procedure				
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	Longilu	udinal	Coil		DC Probe		Conlinuous	Olher:		
Type of	☐Wet	7	Dry		Direct Contac	et 🗌	Residual		•	
Inspection	Circula	.r 🗀	AC Prod		Yoke			<u> </u>		
			ACTIO			lo (p		1		
	M.F.E. Equipr					Surface Prepar				
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					BRIAN HINES	3		David Mitchell/ I	Ryan Woodrin	<u>ıg</u>
					Custome	r Specifications	i	NDT Supervisor		
					☑Accept	Reject	•	ROLAND COLE	MAN	

NOTICE:

THIS EXAMINATION REPORT IS A REPORT OF THE RESULTS OF THE NDT PROCEDURE ACTUALLY PERFORMED BY THIS COMPANY IT IS SUBJECT TO THE LIMITATIONS OF THE TESTING SPECIFICATIONS AND PROCEDURES WHICH WERE UTILIZED. BY FURNISHING THIS REPORT, INTEGRITY TESTING & INSPECTION DOES NOT GUARANTEE ANY CONDITION OF THE TESTED SPECIMEN.





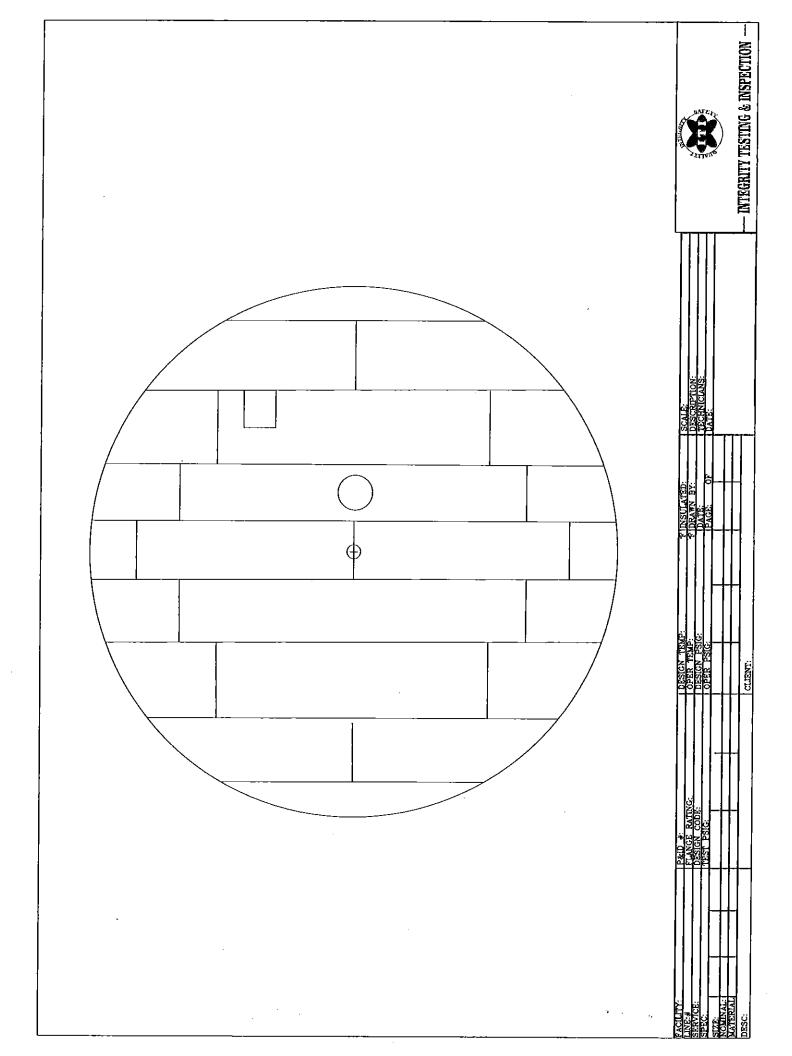
3861 Vincent Station Drive Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

VISUAL E	XAMINATION	ON REPO	PRT						Nuclear	V	Non-Nuclear
То		·				From		Date			
	1	WESTERN	REFINING			I.T.I.		<u>L</u>	8/2/2010		
Project				_							
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ltem	Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other: N/A			
	Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Othe N/A	r:		•
Material	Size 67' D X 40' I	Н	No. of Pieces 21	Type of E	Base Metal	Type of Fill C		Weld S	□ mooth □	N/A As Weld	ded
Location	WESTERN RE					System TANK FARM		. —	-	-	
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Stanmdards	/	API 653					LT QCP 90	00 RE	V. 0		
100000000000000000000000000000000000000			L TANK ROOF	SEAMS. FO	UND NO REJ	CTABLE OR F					
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Inspection						<u> </u>					
											
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EXTERNAL TANK INSPECTION REPORT

UNIT	Tank Farm	AREA	Z71C
TANK#	569	SERVICE	83 Unleaded Gasoline

GENERAL CONDITION

ITEM	INSP.	COMMENTS
SHELL	□ N/A ▼ GOOD □ FAIR □ POOR	See attached API 653 Inspection Report
COATING	□ N/A ▼ GOOD □ FAIR □ POOR	
INSULATION	▼ N/A □ GOOD □ FAIR □ POOR	
FLOOR	□ N/A ▼ GOOD □ FAIR □ POOR	See attached API 653 Inspection Report
FOUNDATION	□ N/A □ GOOD ☑ FAIR □ POOR	See attached API 653 Inspection Report
SUPPORTS	▼ N/A □ GOOD □ FAIR □ POOR	
STRUCTURAL	□ N/A ▼ GOOD □ FAIR □ POOR	
LADDERS/PLATFORMS	□ N/A ▼ GOOD □ FAIR □ POOR	
ROOF DRAIN & APPURT'S	▼ N/A ☐ GOOD ☐ FAIR ☐ POOR	
FLOATING ROOF (INT-EXT)	□ N/A ▼ GOOD □ FAIR □ POOR	Visual only
PONTOONS	▼ N/A ☐ GOOD ☐ FAIR ☐ POOR	
GUIDE POLE, INSTRUMENTS	▼ N/A □ GOOD □ FAIR □ POOR	
VACUUM BREAKER	▼ N/A □ GOOD □ FAIR □ POOR	
SEALS	▼ N/A □ GOOD □ FAIR □ POOR	
NOZZLES	□ N/A ▼ GOOD □ FAIR □ POOR	See attached API 653 Inspection Report
ATTACHED PIPING	□ N/A ▼ GOOD □ FAIR □ POOR	
PRD'S	▼ N/A ☐ GOOD ☐ FAIR ☐ POOR	
GROUND WIRE	□ N/A ▼ GOOD □ FAIR □ POOR	Only 1 ground wire
OTHER:	▼ N/A ☐ GOOD ☐ FAIR ☐ POOR	

CTOR: B. Eddie Luna	API#:	33623	DATE:	07/22/2014	
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ADDITIONAL COMMENTS

Additional comments, recommendations, and thickness readings results on all accessible components are included in the attached API 653 Inspection Report.



Tank 569 Unleaded Gas (83) External Inspection



Jamestown, New Mexico

Bran Eddie Luna		Sentinel Integrity
API 653 Cert #33623	July 22, 2014	Solutions
Inspector	Date	Company



INTRODUCTION

Western Refining contracted Sentinel Integrity Solutions to provide an In-Service inspection on tank 569 an Unleaded Gasoline (83) tank. The tank is located at the Gallup facility in Jamestown, New Mexico.

The API 653 Inspection Services included:

- ➤ Complete Visual Inspection of all accessible components
- ➤ Thickness readings on all accessible components (by ITI): shell, roof, and nozzles
- > Documentation of all components, which include dimensional measurements and layouts

This report documents the findings of the visual and ultrasonic inspection performed on July 22, 2014.

Sentinel Integrity provided the following personnel:

API 653 Inspector – Bran Eddie Luna API 653 Cert # 33623



Table of Contents

1.0	TANK DETAILS	4
2.0	NDT INSPECTION	5
3.0	RECOMMENDATIONS	6
4.0	SCOPE	7
5.0	EXTERNAL INSPECTION	8
6.0	FOUNDATION	10
7.0	ROOF	11
8.0	ADDITIONAL PICTURES	12
9.0	WARRANTY	13

APPENDICES

- > INSPECTION INTERVALS
- > BOTTOM INSPECTION RESULTS
 - o **PROJECTION PLATE**
- > DIFFERENTIAL SETTLEMENT (API 653)
- > SHELL INSPECTION RESULTS
 - LIQUID LOAD CONDITION
 - SHELL ASSESSMENT (MINIMUM ALLOWABLE SHELL THICKNESS)
 - SHELL THICKNESS MEASUREMENTS
 - o SHELL LAYOUT
 - o SHELL NOZZLES
 - SHELL APPURTENANCES AND VERTICAL WELDS
- > ROOF INSPECTION RESULTS
 - o ROOF LAYOUT
- > ITI REPORTS
- > API CHECKLIST



1.0 TANK DETAILS

TANK SPECIFIC

Tank Number	569
Туре	<u>EFRT</u>
Product Storage	83 Unleaded Gasoline
Product Specific Gravity	0.80
Nameplate Present	Yes
Operating Temperature (F)	<u>Ambient</u>

DIMENSIONS

Diameter	<u>67 ft.</u>
Height	40 ft.
Safe Filling Height	36 ft. (assumed)
Capacity (nominal)	25,000 bbls

CONSTRUCTION DATA

Year Built	<u>1957</u>
Design Standard	<u>API</u>
Manufacturer	Horton Tank & CBI
Design Specific Gravity	1.0 (assumed)
Foundation	Earthen
Secondary Containment	<u>No</u>
Bottom & Material	Lap welded-Carbon Steel
Shell & Material	Butt welded-Carbon Steel
Roof & Material	Lap welded-Carbon Steel
Bottom Coated	Yes-1997 (repair in 2010)



2.0 NDT INSPECTION

Non-destructive inspection services and equipment were provided by ITI. See Appendices for ITI reports, which includes equipment used and personnel who performed the examinations.

2.1 NDT Inspection Scope

- > External Inspection
 - o UT's on shell, 4 drops with 4 readings taken per course
 - o UT's on the projection plate, minimum of 8
 - o UT's on the shell nozzle neck, reinforcing pad, flange, and cover
 - O UT's on the roof
 - Floating Roof
 - No access was given for the roof



3.0 **RECOMMENDATIONS**

Deficiencies with Recommendations:

- 1. Threaded plugs on the shell should be seal welded at the next out of service (approximately 9, located at various locations on the shell).
- 2. At the next out of service, modification to the reinforcing pad of MW2 will need to be assessed.
- (W/O# 611587)3. Remove the blind on the upstream side of the valve, for nozzle N9 (roof drain); unless it was installed because of issues with the valve.
- (W/O# 611587) 4. Consider reworking the grade around the bottom water draw nozzle (N10) and ensuring that the nozzle is sufficiently insulated for the winter.
 - 5. Projection plate should be kept clean.
- (W/O# 611587) 6. Re-work grade in order to fill in the gaps underneath the tank bottom, particularly on the west, south, and northeast side of the tank.
 - 7. All threaded shell nozzles should be seal welded externally (N1, N2, N7, and N8).
 - 8. Since the thickness readings taken on the 2nd and 3rd shell courses show significant amount of metal loss compared to the nominal thickness (per the records), thickness readings should be taken on the shell at the July 2019 External Inspection in order to establish a short term corrosion rate.
 - 9. At the next out of service, the foam system should be tested at 100 psi.

NOTE: There are shell nozzles that do not meet **current** weld spacing and dimensional standards per API. The current measurements have been noted and recorded in this report. Since the tank and nozzles have proven a satisfactory service history and the nozzles were likely installed according to the as-built standard, no action is required. If modifications are made to the nozzles, shell, and/or bottom, then these weld spacing issues will have to be re-evaluated to determine if further modification have to be made to meet current weld spacing standards per API.



4.0 SCOPE

API 653 in-service inspection was performed on tank 569. The evaluation of the tank roof, shell, and components were performed in accordance with following codes, standards, and specifications:

- API 653, 4th edition, 2012 Addendum 2; "Above Ground Storage Tank Inspection, Repair, Alteration, and Reconstruction"
- API 650 Twelfth Edition, July 2013 Errata; "Welded Steel Tanks for Oil Storage"
- API 575 Second Edition; "Inspection of Atmospheric and Low-Pressure Storage Tanks"
- OSHA 29 CFR 1480.119 (J) (4); "Process Safety Management of Highly Hazardous Chemicals; Inspection and Testing of Process Equipment"

All Western Refining and Sentinel's Safety Procedures were followed.

4.1 Prior History

- ➤ 6/1998: internal liner installed; new roof seals
- ➤ 6/2010: internal inspection performed by ITI; records show that the internal liner was repaired (lap welds, cornerweld, and shell). Western Chief Inspector is satisfied with the information to give this tank a 20 year inspection interval
- > October 2012: last 5 year primary seal inspection; next one due on October 2017
- March 2014: last annual secondary seal inspection; next one due on March 2015

4.2 Access

The external inspection was performed at ground level and the roof inspection was performed from the gauging platform. No direct access to the top of the floating roof was given.



5.0 EXTERNAL INSPECTION

5.1 Shell Plate

Overall the shell coating is in good condition. The ultrasonic survey did not reveal any significant thinning of the shell courses.

There are approximately (9) 3/8" threaded plugs throughout the tank shell. Considering the nature in which they were installed and to prevent any future leakage, these should be seal welded at the next out of service.





5.2 Shell Nozzles

No significant issues were found with the nozzles. Manway 2 reinforcing pad should be changed to a tombstone shape if, at the next out of service, the bottom requires any repairs at the cornerweld at this area. Otherwise, since it has operated successfully as is, no action will be required.







5.3 Shell Appurtenances

No significant issues were found with the stairway and shell attachments.





5.4 Tank Bottom Projection Plate

No significant issues were found with the projection plate. The bottom projection plate should be kept clean on a regular basis.







6.0 FOUNDATION

Overall the foundation is in good condition. The differential settlement survey showed a critical deflection of 1.2", which is within acceptable standards, per API. Consider re-working the grade and filling in the voids underneath the tank bottom, particularly on the west, south, and northeast side.







7.0 ROOF

7.1 Roof Deck

Operations did not allow access to the roof, so the inspection was a visual only from the gauging platform. Overall the roof coating appeared to be in good condition. No significant issues were identified from the platform.

7.4 Roof Drain System

The roof drain system should be opened up periodically during heavy rainstorms.

7.5 Rolling Ladder

No issues were observed.



8.0 ADDITIONAL PICTURES





9.0 WARRANTY

Sentinel Integrity Solutions, has appraised the condition of this tank based on the inspections and measurements made by the Sentinel Integrity Solutions' Tank Inspector. Whereas our evaluation correctly describes the condition of the tank and tank appurtenances at the time of inspection, the tank owner/operator has ultimate responsibility assessing the inspection information / report provided by Sentinel Integrity Solutions and any conclusions reached by the tank owner/operator and any action taken or excluded are the sole responsibility of the owner / operator. With respect to inspection and testing, Sentinel Integrity Solutions warrants only that the services have been performed in accordance with accepted industry practice. If any such services fail to meet the foregoing warranty, Sentinel Integrity Solutions shall re-perform the service to the same extent and on the same conditions as the original service.

The preceding paragraph sets forth the restricted remedy for claims based on failure or of defect in materials or services, whether such claim is made in contract or tort (including negligence) and however instituted, and, upon expiration of the warranty period, all such liability shall terminate. The foregoing warranty is exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. No implied warranty of merchantability or Fitness for Purpose shall apply, nor shall Sentinel Integrity Solutions be liable for any loss or damage whatsoever by reason of its failure to discover, report, repair or modify latent defects or defects inherent in the design of any tank inspected. In no event, whether a result of breach of contract, warranty or tort (including negligence) shall Sentinel Integrity Solutions be liable for any substantial or supplementary I damages including, but not limited to, loss of profit or revenues, loss of use of equipment tested or services by Sentinel Integrity Solutions or any associated damage to facilities, down-time costs or claims of other damages.

Client: Western Refining

Date 7/22/2014

Revision Number: 1 Project no: 569

Site: Jamestown, NM



Routine in-service Inspection

Performed by Terminal Personnel

August 2014

Shell External Visual Inspection

*Performed by an authorized inspector Minimum of RCA/4N or 5 yrs

Shell Ultrasonic Thickness Inspection

*Performed by an authorized inspector Minimum of RCA/2N or 15 yrs

July 2019

September 2026

Corrosion Rate

0.001526

in/yr

Out-of-Service Inspection Interval

per last internal inspection by ITI and Western Chief Inspector

Bottom Inspection Interval

June 2020

With Coating

Tank Number: 569

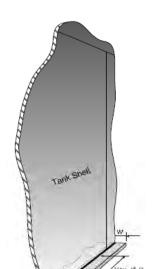
Projection Plate

Tank Diameter: D 67.00 ft

Number of measurements: 8

Distance between mp: 26.3 ft

Distance is < 16 ft, not acceptable.



lose as possible to the weldtoe



Loc.	WT
LUC.	t [in]
1	0.250
2	0.250
3	0.240
4	0.246
5	0.249
6	0.247
7	0.246
8	0.250

Note: Measurements initiated from the manway entrance and continued in the clockwise orientation.

Projection as per API653, section 4.4.5.7

 $\label{eq:minimum thickness measured} \qquad \qquad \text{inch} \qquad \qquad 0.240 \qquad > 0.10 \text{ inch thus OK}.$

Revision Number: 1
Project Number: 569

Site: Jamestown, NM

Differential Settlement (API653)

Mechanical Data

Tank diameter D feet 67.00 Tank height feet 40.00 Min. number of settlement points [-] 8 No. settlement points used [-] 8 Location of 1st Measurement Point degrees 0 Distance between settlement points feet 26.31

Material Yield Y PSI 31183 Youngh Modulus E PSI 30022813



Maximum 32 feet

Differential settlement API653, Appendix B

Location	Settlement	Relative	Planar	Settlement	Deflection
	Readings	Elevation	Tilt		
[Deg]	[inch]	[inch]	[inch]	[inch]	[inch]
0	46.56	0.36	0.2	0.1	0.2
45	46.56	0.36	0.3	0.1	0.1
90	46.44	0.24	0.3	-0.1	-0.1
135	46.56	0.36	0.3	0.0	0.2
180	46.32	0.12	0.3	-0.2	-0.3
225	46.68	0.48	0.2	0.3	0.4
270	46.32	0.12	0.2	-0.1	-0.1
315	46.20	0.00	0.2	-0.2	-0.2

The following formula is used in calculating maximum permissible deflection:

$$|S| = \frac{L^2 * Y * 11}{2 * E * H} * 12$$

where

S = Critical deflection [inch]

L = Arc Length [feet]

E = Young's modulus [PSI]

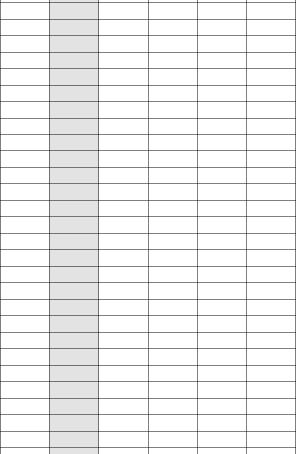
Y = Yield strength [PSI]

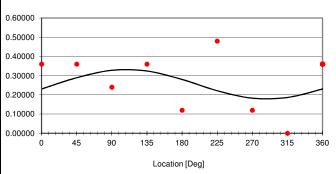
H = Tank height [feet]

Critical deflection [inch]:

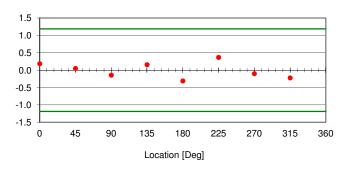
1.2 **OK**

Shell Settlement Elevation Graph [inch]





Shell Settlement Deflection Graph [inch]



Revision Number: 1 Project no: 569

Site: Jamestown, NM



Design code		API650	
Tank Type		EFRT	
Shell main Material		Unknown	
Year of construction	DOB	yr	1957
Tank diameter	D	ft	67.00
Tank height	Н	ft	40.00
No. shell courses			5
Temp. correction factor	φ	Note 1	1.000
Nominal capacity	Vbrut	bbls	25118
Riveted tank	Note 3	y/n	No
Joint Efficiency	Ε		0.85
Evaluation method	Note 5	1-	foot



API653, Section 4.3.3 and 4.3.4

The following formulas are used in calculating the required minimal thickness of shell courses:

$$t_{d} = \frac{2.6D(H-1)G}{E.\varphi.S_{d}}$$
$$t_{t} = \frac{2.6D(H-1)}{E.S.}$$

Note 1: Use API650, Appendix M in case of operation at elevated temperature (Default is 1.0).

Note 2: If material is unknown use Y=30000/T=55000 and if E is unknown use table 4-2 of API653.

Note 3: For riveted tanks use S = 21000 PSI unless otherwise specified.

Note 4: Allowable stress S is calculated according to API653, sections 4.3.3.1 and 4.3.3.2.

Note 5:

Recommended evaluation method: 1-foot

1. The 1-foot method calculates the thickness required at design points (1 ft. above the bottom of each shell course).

2. The 1-foot method shall not be used for tanks with D > 200 ft.

Product Conditions (t_d)

Specific Gravity	G	[-]	0.800
Filling height	h	feet	36.00
Maximum safe filling height	h	feet	36.00

Course	Course	Product	Material	Material	Allowable	Joint	Minimum	Minimum	Measured	Integrity
No.	height	height	Yield	Tensile	Stress	Efficiency	calculated	allowable	t	check
			Υ	T	S	Factor	t	t	min	
	[feet]	[feet]	[PSI]	[PSI]	[PSI]	Е	[inch]	[inch]	[inch]	
5	8.30	4.33	30000	55000	25960	0.85	0.021	0.100	0.246	OK
4	8.30	12.63	30000	55000	25960	0.85	0.073	0.100	0.167	OK
3	8.30	20.93	30000	55000	25960	0.85	0.126	0.126	0.148	OK
2	7.75	28.68	30000	55000	23595	0.85	0.192	0.192	0.210	OK
1	7.32	36.00	30000	55000	23595	0.85	0.243	0.243	0.317	OK

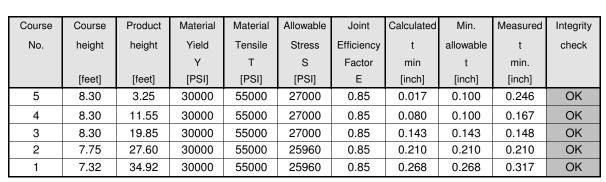
Revision Number: 1 Project no: 569

Site: Jamestown, NM

Liquid Load Condition, cont'd

Hydrotest Conditions (t_t)

Specific Gravity G [-] 1.00 Max fill height for hydrotest h ft 34.92



Yield Strength Reduction factors (API650 - Appendix M)

For operating temperatures above 200 °F, the allowable stress shall be multiplied by the applicable reduction factor as given in the following table :

		Minimum	specified Yield Stren	igth [PSI]
Temp	٥.	< 45000	≥ 45000 to < 55000	≥ 55000
[°F]		PSI	PSI	PSI
201		0.91	0.88	0.92
300)	0.88	0.81	0.87
400)	0.85	0.75	0.83
500)	0.80	0.70	0.79

Linear interpolation shall be applied for intermediate values

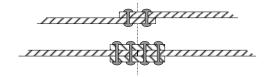
Joint efficiency factors

			_
Type of	No.	Е	But welded tanks
joint	rivets		Lap-welded tanks
Lap	1	0.45 [0.60]	
Lap	2	0.60 [0.73]	Riveted tanks
Lap	3	0.70 [0.73]	
Lap	4	0.75	
Butt	2	0.75	
Butt	3	0.85	
Butt	4	0.90 [0.87]	
Butt	5	0.91 [0.91]	
Butt	6	0.92	

Butt: i.e. number of rows on each side of joint center line

Use table 4-2 of API653 or use E=0.75

Use following table (Conform of API653 Table 4-3)





Revision Number: 1 Project no: 569

Site: Jamestown, NM



Shell Assessment (Minimum Allowable Shell thickness)

Mechanical Parameters

Installation date DOB year 1957 Last Inspection Date LID 2014 year

Minimum allowable shell thickness for loadcase liquid load and roof load.

Course	min t	min t	min	min	Integrity].
No.	allowable	allowable	allowable	thickness	check	N
	roofload	liq.load		measured		fa
	[inch]	[inch]	[inch]	[inch]		
						c
5	0.000	0.100	0.100	0.246	OK	Ν
4	0.000	0.100	0.100	0.167	OK	a
3	0.000	0.126	0.126	0.148	OK	ľ
2	0.000	0.192	0.192	0.210	OK	
1	0.000	0.243	0.243	0.317	OK	

Note 1. Minimum allowable thickness for roof load has been calculated for a=Fa

Conclusion:

Minimum uniform thickness as measured for the individual shell courses are greater than as required for the liquid load and uniform roof load. Thus DK.

Remaining Life assessment and Inspection Frequency

API653, section 6.3.2 - External Inspection

All tanks shall be given a visual external inspection by an authorized inspector. This inspection shall be called the external inspection and must be conducted at least every 5 years or CA /4 CR years (where CA is the difference between the measured shell thickness and the minimum required thickness in inch, and CR is the shell corrosion rate in mm per year) whichever is less. Tanks may be in operation during this inspection.

API653, section 6.3.3 - Ultrasonic Thickness Inspection

External, ultrasonic thickness measurements of the shell can be a means of determining a rate of uniform general corrosion while the tank is in service, and can provide an indication of the integrity of the shell. When used, the ultrasonic thickness measurements shall be made at intervals not to exceed the following:

When the corrosion rate is known, the maximum interval shall be the smaller of CA/2CR years (where CA is the difference between the measured shell thickness and the minimum required thickness in mm, and CR is the shell corrosion rate in inch per year) or 15 years.

Course No.	Original WT [in] Assumed	min. WT meas. [in]	CR meas. [in/y]	Wt min. allowable [in]	CA [in]	RL (CA/CRmax) [years]	External Inspection [years]	UT Inspection [years]	Recommendations: Since the intended next service period is years, the following interval is to be considered.
									Next External inspection by an authorized inspector should be carried out not later than: 2019.
									Next External UT inspection of the shell (and roof) should be carried out not later than: 2026.
5 4 3	0.281 0.250 0.250	0.252 0.208 0.163	0.001 0.001 0.002	0.100 0.100 0.126	0.152 0.108 0.037	100 71 24	74.1 36.6 6.1	148.1 73.3 12.2	NB: Local regulations/conditions may have affect on the above recommendations.
1	0.313 0.375	0.237 0.323 imum CR:	0.001 0.001 0.001526	0.192 0.243	0.045 0.080	29 52 m Allowable:	8.4 21.9 5.0	16.9 43.7 12.2	

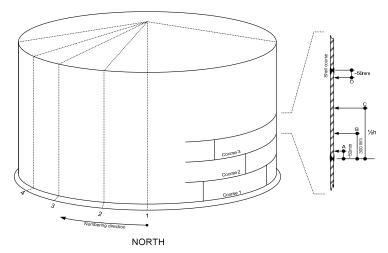
Tank Number: 569



Height

40.00

Shell Thickness Measurements



	[ft]
5	8.30
4	8.30
3	8.30
2	7.75
1	7.35

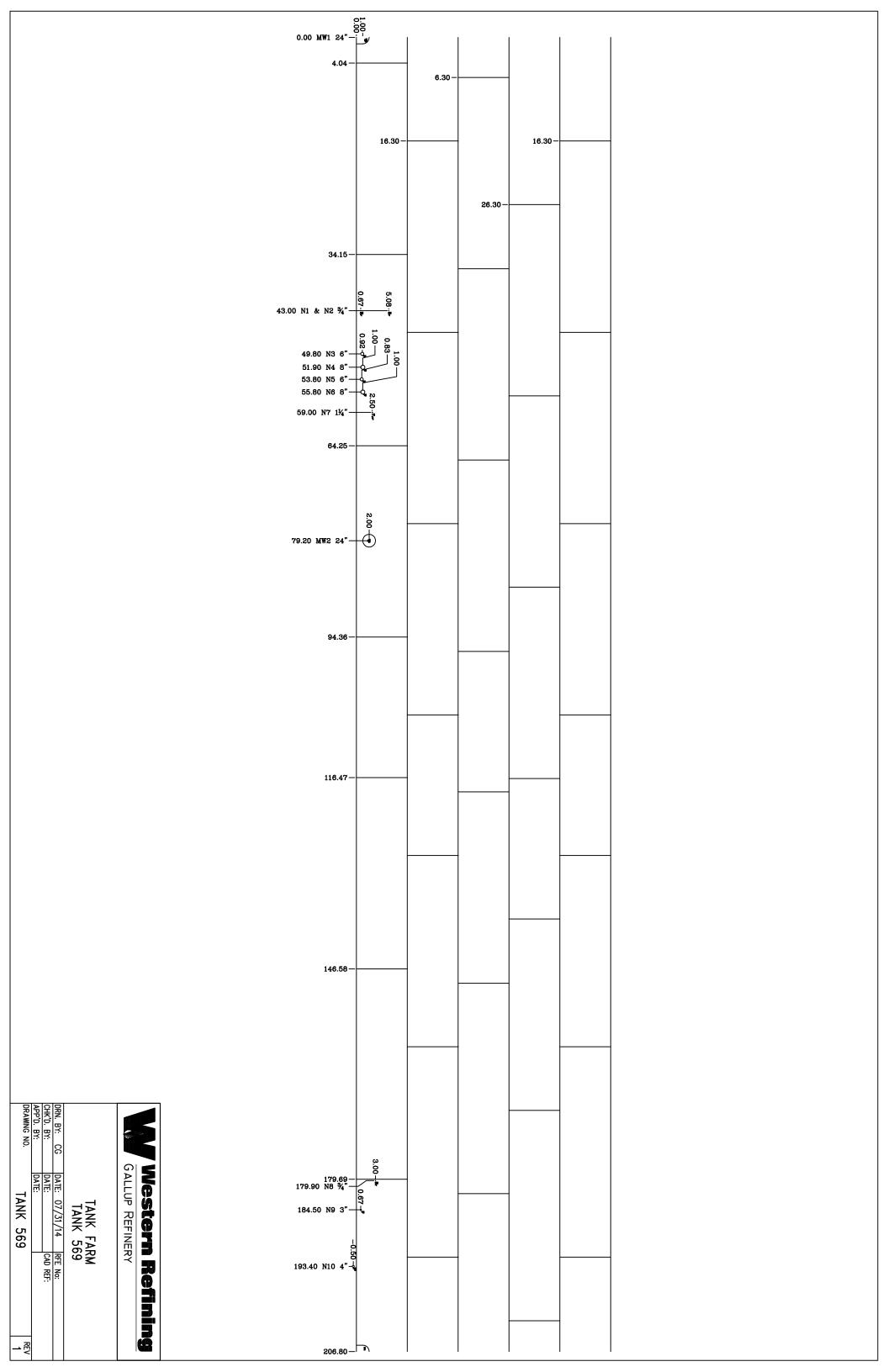
Height

Number of courses:

Course

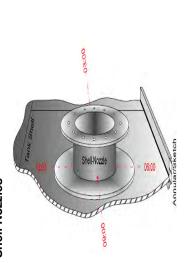
Shell thickness Stairway

Loca	ation	N	W	S	Е		
Course	WT	[in]	[in]	[in]	[in]		
	Α	0.246	0.240	0.251	0.249	Min	0.235
5	В	0.249	0.238	0.250	0.245	Max	0.257
3	С	0.255	0.236	0.243	0.240	Average	0.244
	D	0.257	0.235	0.240	0.237	STDEV	0.007
	Α	0.167	0.233	0.243	0.234	Min	0.167
4	В	0.198	0.225	0.243	0.227	Max	0.247
4	С	0.220	0.219	0.228	0.219	Average	0.221
	D	0.247	0.205	0.220	0.206	STDEV	0.020
	Α	0.155	0.192	0.208	0.203	Min	0.142
3	В	0.148	0.193	0.195	0.186	Max	0.208
3	С	0.154	0.173	0.188	0.175	Average	0.179
	D	0.196	0.142	0.181	0.171	STDEV	0.020
	Α	0.248	0.261	0.247	0.246	Min	0.210
2	В	0.249	0.261	0.262	0.254	Max	0.262
_	С	0.240	0.250	0.254	0.248	Average	0.248
	D	0.210	0.231	0.248	0.257	STDEV	0.013
	Α	0.330	0.297	0.309	0.305	Min	0.297
1	В	0.323	0.337	0.319	0.299	Max	0.337
'	С	0.321	0.334	0.328	0.314	Average	0.320
	D	0.317	0.337	0.335	0.322	STDEV	0.013









					NoW		Rei	Reinforcing Pad	ad			Nozzle WT	TW e				
□	Function		Station	CL Elev.	Spacing	Width	Height		Tell-tale	WT [in]	12:00	03:00	00:90	00:60	Flange	Cover	
		Size [in]	[ft]	[in]	. [in]	[in]	[in]	Shape	[y/n]]	[in]	[in]	[in]	[in]	WT [in]	WT [in]	Comments
MW1	Cleanout	24x24	0.0	12	-	72	36	D	λ	0.518	0.502	0.471	0.448	0.465	0.494	0.464	
N	Gauge Coupling	3/4	43.0	61	-	-	-	-	-	-	-	-	-	-	-	-	9
N2	Gauge Coupling	3/4	43.0	8	-	-	-	-	-	-	-	-	-	-	-	-	9
N3	Transfer	9	49.8	11	2 1/4						0.368	0.384	0.390	0.378	0.809	-	6
N4	Sales	8	51.9	12	2 1/4	5	Ç	<	;	300.0	0.578	0.580	0.580	0.579	0.810	-	6
N5	Circ. Discharge	9	53.8	10	2 1/4	t 1	<u> </u>	ζ	>	0.00	0.490	0.492	0.488	0.492	1.006	-	6
N6	Circ. Suction	8	55.8	12	2 1/4						0.438	0.501	0.460	0.475	1.082	-	6
N7	II.	1 1/4	29.0	30		-	-	-	•	1	-	1	1		-	-	9
MW2	Manway	24	79.2	24	0	09	48	٧	У	0.448	0.475	0.474	0.477	0.477	1.937	2.035	1
N8	Sample	3/4	179.9	36												,	9
6N	Roof Drain	3	184.5	8	2	14	11	С	У	0.247	0.268	0.259	0.273	0.264	0.810	-	
N10	Water Draw	4	193.4	9-	-	-	-	-	-	-	-	-	-	-	-	-	8
					Stations a	re measur	ed in feet	counter-c	lockwise	is are measured in feet counter-clockwise from MW1 (station 0.0)	(station (0.0)					
Repad Shape	A	В		O		Ш		Ш	σ					٦			
]]	
								Comments	SI								
1-Inadequ	I-Inadequate weld spacing per current API	r current A	Ы	4- No tell	4- No tell tale present	+			7- Corrosi	7- Corrosion/coating failure on nuts/bolts	failure on 1	nuts/bolts		10-			
2- No rein	2- No reinforcing pad			5- Coating	5- Coating failure (neck, repad, and/or flange	ck, repad,	and/or fla		8- Tank bc	8- Tank bottom penetration	tration			11-			
3- Plugged tell tale	d tell tale			6-Threaded conr	ed connection	on			9-Shared	9-Shared reinforcing pad	pad			12-			

Tank Number: 569

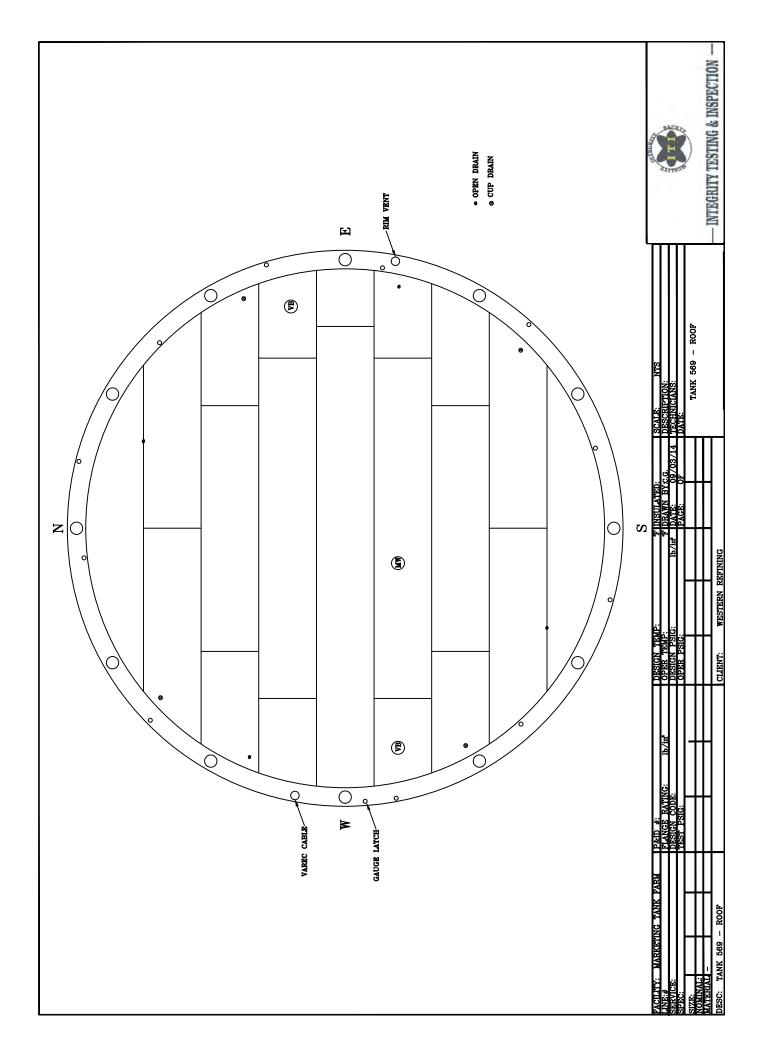
Shell Appurtenances and Vertical Welds



Function	Station [ft]	CL Elev.	Comments
Foam Line	54.80	-	travels parallel to tank shell
Varec Instrument	57.45	60"	
Gauging Platform	63.00	45'	
Grounding	106.50	0	
Stairway	109.80	10"	Start of the stairway

Vertical W	eld Seam	Location o	f Course 1				
1	2	3	4	5	6	7	8
4.04	34.15	64.25	94.36	116.47	146.58	179.69	206.8

Vertical Weld Offset for Courses 2, 3, 4, 5, etc.				
2	3	4	5	
16.3	6.3	26.3	16.3	





3861 Vincent Station Dr. Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

	NIC EXAMINATI	ON REPO	RT					Nuclear	✓ Non-Nuclear
То						From		Date	
WESTERN I	REFINING					J.Gonzalez/ J. Mo	organ	7/22/2014	
Project									
UT Thickne	ss readings take	en on tank	569.		1				
					Integrity Testi	=			
	107-1-1	01	01	N. d. a. d. C. a. a. a. a.	2014-0161		N1/A	lout	
Item	Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other	
item	Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other	
		V		V	J				
Material	Size		No. of Pieces		Base Metal	Type of Filler I	Material	Weld	✓ N/A
	0		0	CS				Smooth	As Welded
Location	IAMESTOWN I	AIR#				System Tople Form			
Acceptance	JAMESTOWN, I	AIVI				Tank Farm Procedure			
Standards	Info Only					UT QCP 620	REV 0		
Standards	_			Transducer		01 001 020	IILV. U		Couplant
	Soundness	Thickness	Bond				7		·
	_	_	_		Single Crysta	I	Dual C	Crystal	Sono Test Ultra Gel
	Pulse Echo	Angle-Beam	Other	Freq	uency	Size		Angle	
					5 MHZ	0.500"		0°	
Type of	UT Equipment/Mode				<u>la</u> t	Concave		Convex	
Inspection	Panametric DL 37 P	lus		L	7				
	SN:071455702			Standard		Material	No	otch Depth	Serial No.
	1/3/2015			v					
				Step Wedge		Material	1	kness Range	Serial No.
				Tube Wedg		C/S	.10	00"500"	12-4061
Reference: Sum	•	_			V	See Attachment		of Inspection	
UT's taken o	on shell, shell n	ozzies, and	projection	plate.			UI INICI	kness reading t	aken on tank 569.
								I	
Сору То:					Requested By			Reported By (T	
					Tom Lewi	s er Specifications		J.Gonzalez/ J. I	
					Accept	Reject		MARVIN FI	

NOTICE:

THIS EXAMINATION REPORT IS A REPORT OF THE RESULTS OF THE NDT PROCEDURE ACTUALLY PERFORMED BY THIS COMPANY IT IS SUBJECT TO THE LIMITATIONS OF THE TESTING SPECIFICATIONS AND PROCEDURES WHICH WERE UTILIZED. BY FURNISHING THIS REPORT, INTEGRITY TESTING & INSPECTION DOES NOT GUARANTEE ANY CONDITION OF THE TESTED SPECIMEN.



TANK 569

NOTE: Any additional comments or finding will be further elaborated under the appropriate section of the formal report.

1.0 TANK DATA

Tank Diameter:

Tank Height:

Tank Type:

Date of Tank Construction:

40 ft. External Floating Roof

1.1 **FOUNDATION**

Was foundation levelness and bottom elevations measured? (See API-653 - Appendix B for extent of measurements).

1.1.1 Concrete Ring

a. **///**# Did the concrete ring have broken concrete, spalling and cracks, particularly under the backup bars used in welding

butt welded annular rings under the shell?

Did the drain openings in the ring, back of water draw basins and top surface of the ring have indications of bottom

leakage? If yes, explain.

Were there cavities under the foundation and/or vegetation against the bottom of the tank?

Was the runoff rainwater from the shell draining away from the tank? If no, explain.

Was there settlement around the perimeter of the tank? If yes, describe.

1.1.2 Asphalt

Was the tank settling into the asphalt base, which directs runoff rain water under the tank rather than away from it? If

Were there areas of leaching of oil has left rock filler exposed, which indicates a hydrocarbon leak?

1.1.3 Oiled Dirt or Sand

Was the tank settling into the foundation base, which directs runoff rain water under the tank rather than away from it?

If yes, explain.

1.1.4

a. (1) Was there presence of crushed rock under the steel bottom? (Usually results in severe underside corrosion). Make a note to do additional bottom plate examination (ultrasonic, hammer testing, or turning of coupons) when the tank is out

of service.

Site Drainage

Was the site drainage away from the tank and associated piping and manifolds? If no, explain.

Was the operating condition of the dike drains in good condition? If no, explain.

1.1.6 Housekeeping

a. N Did the area around the tank have trash, vegetation, and/or other inflammables built up? If yes, explain.

1.1.7 Cathodic Protection

a. NA Was the Cathodic Protection potential readings reviewed?



	CHELL
1.2 1.2.1	SHELL External Visual Inspection
	Were there any signs of paint failure, pitting, and/or corrosion? If yes, explain.
a. <u>//</u> b. <u>//</u>	Were there any signs of corrosion and/or thinning on the plate and bottom corner weld after the bottom angle was
	cleaned? If yes, explain.
c.NA	Was the bottom to foundation seal in satisfactory condition? If no, describe condition.
C.	was the bottom to foundation sear in satisfactory condition? If no, describe condition.
1.2.2	Internal (Floating Roof Tank)
a. NA	Were there indications of grooving, corrosion, pitting, and/or coating failures? If yes, describe.
a. /	were there indications of grooving, corrosion, pitting, and/of coating failures: If yes, describe.
1.2.4	Windgirder (Floating Roof Tanks)
a. //	Was there corrosion damage (paint failure, pitting, corrosion product build up), especially at tack welded junctions,
	and/or broken welds on the windgirder or handrail? If yes, explain.
b. <u>N</u>	Were there any signs of pitting on the support welds to shell, especially on shell plates? If yes, explain.
c NA	Did the supports have reinforcing pads welded to the shell?
c. <u>/</u> 0/ .	but the supports have reinforcing plats welded to the shell.
1.3	SHELL APPURTENANCES
1.3.1	Manways and Nozzles
a. N	Were there cracks or signs of leakage on weld joints at nozzles, manways, and reinforcement plates? If yes, describe.
b. N	Was the shell plate dimpling around the nozzles, caused by excessive pipe deflection? If yes, describe.
c. N	Were there any flange leaks or leaks around the bolting? If yes, describe.
d.NA	Was the insulation sealed properly around the manways and nozzles? If no, explain.
e.NA	Was the manway flange and cover thickness on the mixer manways adequate?
71,	,
1.3.2	Shell and Nozzles Ultrasonic Thickness Survey
a. Y	Were UT measurements taken on the shell and nozzles? Were these readings accurately mapped?
1.3.3	Tank Piping Manifolds
a. N b. NA	Were there any signs of leakage on manifold piping, flanges, and/or valves? If yes, explain.
b. NA	Was the fire fighting system components in satisfactory condition? If no, explain. No visual performed
c. N	Was there any anchored piping which would be hazardous to the tank shell or bottom connections during earth
	movement? If yes, explain.
d Y	Was there adequate thermal pressure relief of piping to the tank? If no, explain.
e.NA	Was the operation of regulators for tanks with purge gas systems in satisfactory condition? If no, explain.
f. N	Were there any signs of leaks on the sample connections? If yes, explain.
h//_	Were there any signs of damage to the temperature indicator? If yes, explain.
J. NA	Were the welds on shell-mounted davit clips above valves six (6) inches and larger in satisfactory condition? If no,
	explain.
1.3.4	Autogauge System
a. <u>N</u> b. <u>N</u>	Were there leaks found on the autogauge tape guide and/or lower sheave housing (floating swings)? If yes, describe.
b. N	Was there damage to the autogauge head? If yes, describe.
c. NA	Was there proper movement of the tape when the checker on the autogauge was bumped?
d. NH	Was the size and construction materials of the autogauge tape (floating roof tanks) documented?
11-	Size: Construction material:
e. 100	Has operations had any problems with the tape hanging up (floating roof tanks) during roof movement?
h.///	Was the board in good condition and legible (on board type autogauge)? If no, explain.
i. /// /*	Was there freedom of movement of the marker and float? If no, explain.



569

TANK IN-SERVICE INSPECTION CHECKLIST

1.3.5 Shell-Mounted Sample Station

a. New Were there indications of plugging on the sample lines, including the drain or return-to-tank line? If yes, explain.

Did the valves function properly on the sample lines, including the drain or return-to-tank line? If no, explain. Not tested

1.3.6 Heater (Shell Manway Mounted)

a. NA Was there any indication of oil around the condensate drain, indicating leakage? If yes, explain.

1.3.7 Mixer

a. A Did the mixer have the proper mounting flange and support?

b. Were there any indications of leakage? If yes, describe.

c. NA Were the power lines and the connections to the mixer in good condition? If no, explain.

1.4 ROOFS

1.4.2 Deck Plate External Corrosion

a. Were there any visual signs of paint failure, holes, pitting, and corrosion on the roof? If yes, explain.

1.4.3 Roof Deck Drainage

were there any indications of standing water on the roof? (Significant sagging of fixed roof deck indicates potential rafter failure. Large areas of standing water on a floating roof indicate inadequate drainage design or, if to one side, an unlevel roof with possible leaking pontoons). If yes, explain.

1.4.4 Level of Floating Roof

a. At several locations, was the distance measured from the roof rim to a horizontal weld seam above the roof? If the roof is not level document findings. (A variance in the readings indicates a non level roof with possible shell out-of-round, out-of-plumb, leaking pontoons or hang-up. On small diameter tanks, an unlevel condition can indicate unequal loading at that level).

1.4.6 Roof Insulation

a. Were cracks or leaks found visually in the insulation weather coat where runoff rain water could penetrate the insulation? If yes, describe.

b. **MA** Was there evidence of wet insulation under the weather coat? If yes, describe.

c. NA Were there any signs of corrosion and/or holes near the edge of the insulated area after small test sections of insulation were removed? If yes, explain.

1.4.7 Floating Roof Seal System

a. Was the seal fabric on the primary shoe seals pulling shoes away from the shell (fabric not wide enough)?

b. MA Were there signs of deterioration, holes, tears, or cracks in the fabric? If yes, describe.

c. Were there any visible signs of corrosion and wear on the metallic parts? If yes, describe.

d. Were there any openings in the seals that would permit vapor emissions? If yes, describe.

e. Were there any protruding bolts or rivets heads against the shell? If yes, explain.

f. NA Were the primary and secondary seals pulled back all around the shell to check their operation? If no, explain.

g. Were there any signs of buckling and/or indications that the angle with the shell is too shallow on the secondary seals?

If yes, explain.

h. VA Did the wedge-type wiper seals show signs of flexibility and resilience? If no, explain.

i. No Were there any signs of cracks and/or tears on the wedge-type wiper seal? If yes, explain.



1.4.9	Floating Roof Ultrasonic Thickness Survey
a. WA	
b. NA	
c. NA	
	with the rim space vapor area, approximately 180 degrees apart?
	The time of the option area, approximately 100 degrees upart.
1.5	ROOF APPURTENANCE
1.5.1	Sample Hatch
h NA	On tanks governed by Air Quality Monitoring District rules, was the seal inside the hatch cover in satisfactory
0	condition? If no, explain.
c NA	Were there signs of corrosion or plugging on the thief and gauge hatch cover? If yes, explain.
d AIA	Where the cample botch is used to real gauge stock level, was there a marker and tak static a lead of \$150.000 ft.
d. 1071	Where the sample hatch is used to reel gauge stock level, was there a marker and tab stating hold off distance? If no,
a. NA b. NA c. NA d. NA e. NA f. NA g. NA h. NA	explain.
6.14	Was there a reinforcing pad where the sample hatch pipe penetrates the roof deck?
I. NH	On floating roof sample hatch and recoil systems, was the recoil reel and condition of rope in good condition and
NA	operating properly? If no, explain.
g. 7074	Was operation of the system tested?
h. Wr	t 1
	inside the sample hatch in good condition?
2623	
1.5.2	Gauge Well
a. NH	Were there any signs of thinning on the visible portion of the gauge pipe? If yes, explain.
a. NA b. NA c. NA	Was the size of the slots measured and recorded? size of slots.
c. /UH	Was the cover of the gauge well in satisfactory condition? If no, explain.
d. MA	Was the hold off distance marker and tab with hold off distance in satisfactory condition and legible? If no, explain.
e. IVA	On floating roofs, was the roof guide for the gauge well in satisfactory condition? If no, explain.
f. NA	On floating roofs, did the rollers show signs of grooving on the roof guide for the gauge well? If yes, explain.
g. NA	If accessible, was the distance from the gauge well pipe to the tank shell measured and documented at different levels'
h. NA	If the tank has a gauge well washer, was there any signs of leakage and/or presence of a bull plug or blind flange? If
	yes, explain.
1.5.5	Autogauge: Float Well Cover
a. NA	Was corrosion found on the float well cover? If yes, explain.
b. NA	Was there wear and/or fraying on the cable, caused by rubbing on the cover? If yes, explain.
1.5.9	Emergency Roof Drains
a.NA	On vapor plugs for emergency drain, were the seal fabric discs slightly smaller than the pipe ID and the fabric seal
	above the liquid level? If no, explain.
1.5.10	Removable Roof Leg Racks
a. NA	Were there roof leg racks on the roof? Document their condition.
-	
1.5.11	Vacuum Breakers
a.NA	If high legs are set, was the setting of mechanical vacuum breaker in high leg position?
1.5.12	Rim Vents
a. NA	Were the screens on the rim vent covers in satisfactory condition? If no, explain.
-	- The same same same same same same same sam



1.5.15	Fontoon hispection Hatches
a. NA	Did any pontoons show visual signs of leakage, after removal of inspection hatch cover? If yes, explain.
b. NA	Were pontoons checked for explosive gases? (An indicator of vapor space leaks.)
c. NA	Were the pontoons equipped with locked down covers? Describe condition.
d. NA	Did the pontoons with locked down covers have vent tubes?
e. NA	Were the pontoon vent tubes plugged? If yes, explain.
f. NA	Did the lock down covers operate properly and in satisfactory condition? If no, explain.
1011	But the fock down covers operate property and in satisfactory condition: 11 no, explain.
1.6	ACCESS STRUCTURES
1.6.1	Handrails
1.0.1	
a	Was the type (steel pipe, galvanized pipe, square tube, angle etc.) and size of handrails identified? Type:
1	Size:
b. //	Was there any pitting, holes, or paint failures? If yes, explain.
c	Were the attachment welds in good condition? If no, explain.
d//_	Were there any cold joints and sharp edges on the handrails or midrails? If yes, describe.
c. NA	Did the safety drop bar or safety chain have corrosion? If yes, explain.
f. NA	Did the safety drop bar or safety chain function properly? What was the length?
g/V	Did the handrail between the rolling ladder and the gauging platform have a hazardous opening when the floating roof
	was at its lowest level?
1.6.2	Platform Frame
a. N	Was there any corrosion and paint failure on the platform frame? If yes, explain.
b. N	Was there corrosion and/or weld failure found on the attachment of frame to supports and supports to tank? If yes,
	describe.
c.NA	Were the reinforcing pads where the supports are attached to the shell or roof in satisfactory condition? If no, explain.
d. 1/	Did the surface that the deck plate or grating rests on show signs of thinning and/or have holes? If yes, describe.
e. NA	Was the flat surface to flat surface juncture seal welded? If no, explain.
	This are the current to the current bear related. It no, explains
1.6.3	Deck Plate and Grating
a. N	Did the deck plate have holes (not drain holes) or thinning caused by corrosion? If yes, explain.
b. /	Did the deck plate show signs of paint failure? If yes, explain.
c. N	Was there rust scale build up on the plate to frame weld? If yes, describe.
d. N	
	Was there corrosion-caused thinning of bars and failure of welds on the grating? If yes, describe.
e. NA	Were grating tie down clips checked? Where grating has been retrofitted to replace plate, measure the rise of the step
	below and above the grating surface and compare with other risers on the stairway.
1.6.4	Stairway Stringers
a. NA	Was there corrosion, paint failures, and/or weld failures on the stairway stringers? If yes, explain.
b. NA	Were the attachment of stairway treads to stringer in good condition? If no, explain.
c. NA	Were the stairway supports to shell welds and reinforcing pads in satisfactory condition? If no, explain.
d.NA	Was there corrosion on the steel support attachment to concrete base? If yes, explain.
1.6.5	Rolling Ladder
a. /V	Was corrosion found on rolling ladder stringer? If yes, describe.
b	Were the ladder fixed rungs identified? (square bar, round bar, angles etc.)
c. N_	Was there corrosion on the ladder fixed rungs, particularly where the angle rungs are welded to the stringers? If yes,
	describe.



d. <u>N</u>	Were there signs of corrosion and/or wear on the rolling ladder where it attaches to the gauging platform? If yes, describe,
e. N#	Were there signs of wear on the pivot bar? If yes, explain.
f. Y	Was the pivot bar secure? If no, explain.
g. NA	Were the self-leveling stairway treads operating properly? If no, explain.
h. N	Was there corrosion and/or wear found on moving parts? If yes, describe.
	Did the rolling ladder wheels have freedom of movement? If no, explain.
	Did the rolling ladder wheels have flat spots? If yes, describe.
	Did the rolling ladder axles show signs of wear? If yes, explain.
_	Was the rolling ladder aligned with the roof rack? If no, explain.
	On the top surface of the rolling ladder track, was there signs of wear by wheels to assure at least 18" of unworn track
	(track long enough)? If no, explain.
n	Was there corrosion on the rolling ladder track welds? If yes, describe.
	Did the track supports on the roof have reinforcing pads seal welded to the deck plate?
	Was the maximum angle of the rolling ladder checked by dimensioning when the roof was on low legs? Max Angle:
	If the rolling ladder track extends to within five feet of the edge of the roof on the far side, was there a handrail on the top of the shell on that side?
NOTE: Y	Y = YES $N = NO$ $N/A = NOT APPLICABLE$
REPORT	
- 1	Inspector/Certification #: B. Eddie Luna #33623 Date: 7-22-14
j	Inspector /Certification #: Date:



UNIT Tank Farm REPORT#		REPORT#	2017-842		
TANK#	569	SERVICE	83.0 Unleaded Regular		

GENERAL CONDITION

ITEM	INSP.	COMMENTS
SHELL	□ N/A 🔽 GOOD □ FAIR □ POOR	Shell is in good condition. See additional comments
COATING	□ N/A □ GOOD □ FAIR ▼ POOR	Coating on inside of tank is failing. See photos.
INSULATION	▼ N/A · □ GOOD □ FAIR □ POOR	Not Insulated
FLOOR	□ N/A □ GOOD ▼ FAIR □ POOR	Pitting found throughout. See additional comments
FOUNDATION	▼ N/A 「 GOOD 「 FAIR 「 POOR	Soil Foundation
SUPPORTS	▼ N/A □ GOOD □ FAIR □ POOR	No supports. Tank is at grade.
STRUCTURAL	▼ N/A 「 GOOD 「 FAIR 「 POOR	There are no Structural components
LADDERS/PLATFORMS	□ N/A □ GOOD ▼ FAIR □ POOR	Coating failure. See additional comments
ROOF DRAIN & APPURT'S	□ N/A □ GOOD □ FAIR □ POOR	Drain is in good condition.
FLOATING ROOF (INT-EXT)	□ N/A □ GOOD ▼ FAIR □ POOR	2 holes found in pontoon. See additional comments
PONTOONS	□ N/A □ GOOD ▼ FAIR □ POOR	See floating roof.
GUIDE POLE, INSTRUMENTS	□ N/A □ GOOD □ FAIR □ POOR	See additional comments
VACUUM BREAKER	□ N/A □ GOOD ▼ FAIR □ POOR	There is coating failure on interior roof with scale to 1/16" and corrosion.
SEALS	□ N/A □ GOOD □ FAIR ▼ POOR	See additional comments
NOZZLES	□ N/A ☑ GOOD □ FAIR □ POOR	Perform media blast and recoat nozzles
ATTACHED PIPING	□ N/A 🔽 GOOD □ FAIR □ POOR	Perform media blast and recoat piping
PRD'S	₩ N/A GOOD FAIR POOR	Tank is atmospherically vented
GROUND WIRE	□ N/A 🔽 GOOD □ FAIR □ POOR	Ground is securely attached to south side of tank.
OTHER:	₩ N/A F GOOD F FAIR F POOR	

INSPECTOR: Richard Ramsey	API#:	48072	DATE:	06-29-2017
---------------------------	-------	-------	-------	------------



ADDITIONAL COMMENTS

Shell: Hex head bolts found in shell at seemingly random locations. Bolts penetrate shell and could be causing damage to seal from repeated contact with varying levels of product.

Floor: Limited inspection due to coating. Pitting found and noted throughout up to 3/16" on product side. Small hole with product leaking after media blast noted in striker plate to floor weld on south side of striker plate 16. One striker plate has erosion and pitting up to 1/8" deep.

Ladders / Platforms: The internal ladder had coating failure on approximately 40% of the surface. External stairs in good condition. 2 bars under the rolling ladder have holes in them from corrosion.

Floating Roof: 2 holes found in pontoon vertical welds. One hole found between pontoon 1 and 2, and one in pontoon 3. Existing patches on roof were not recoated on the underside.

Guide Pole, Instruments: The guide bar associated with the roof was distorted inward approximately $\frac{1}{4}$ " from the shell. Guide plate was corroded and thinning.

Seals: The roof seal was cracked and falling apart around the roof perimeter. See photos. Seal replaced.

Reference Photographs









Coating failure on ladder and inside of shell



Corrosion and coating failure on roof platform support



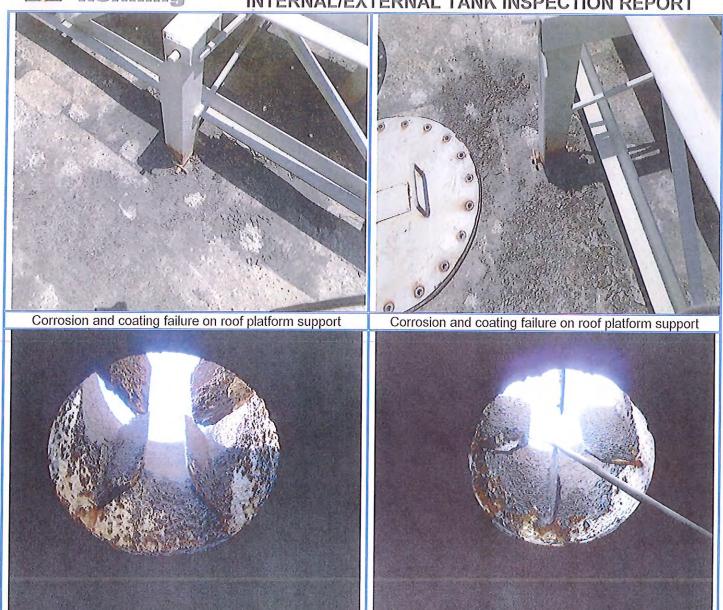
Corrosion and coating failure on roof platform support



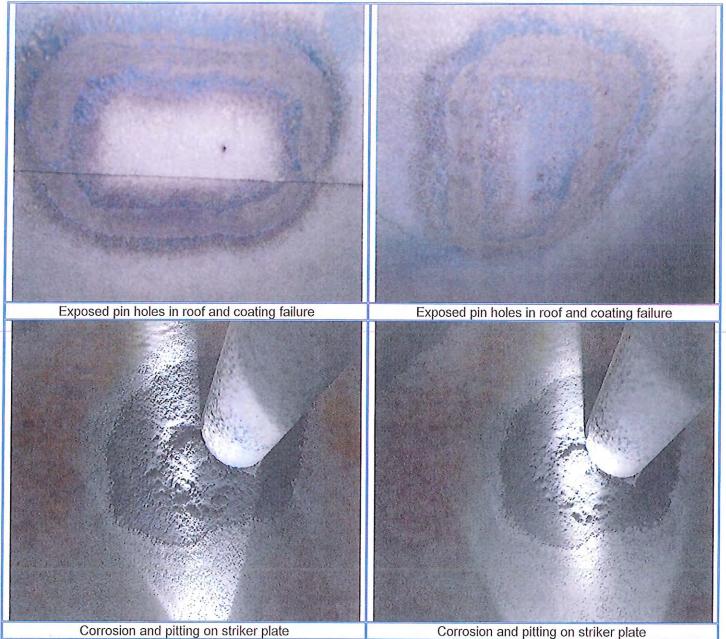
Coating failure and corrosion on vortex breaker

INTERNAL/EXTERNAL TANK INSPECTION REPORT

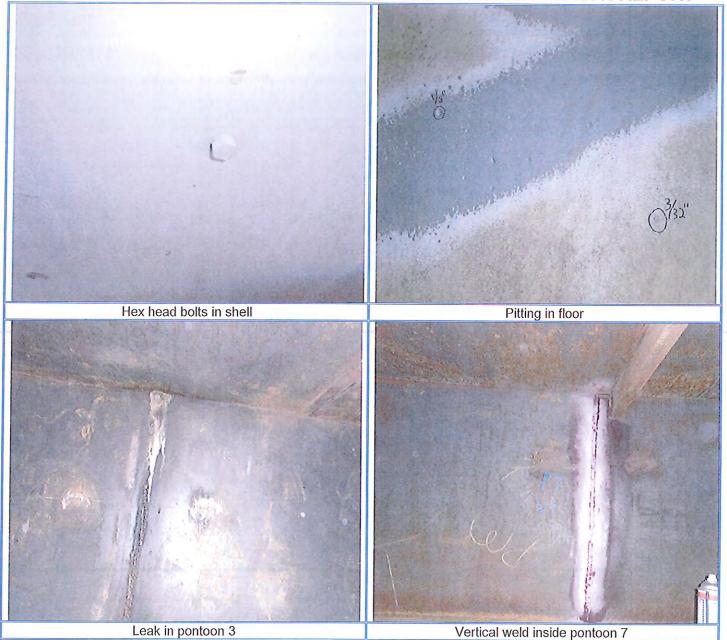
Coating failure and corrosion on vortex breaker





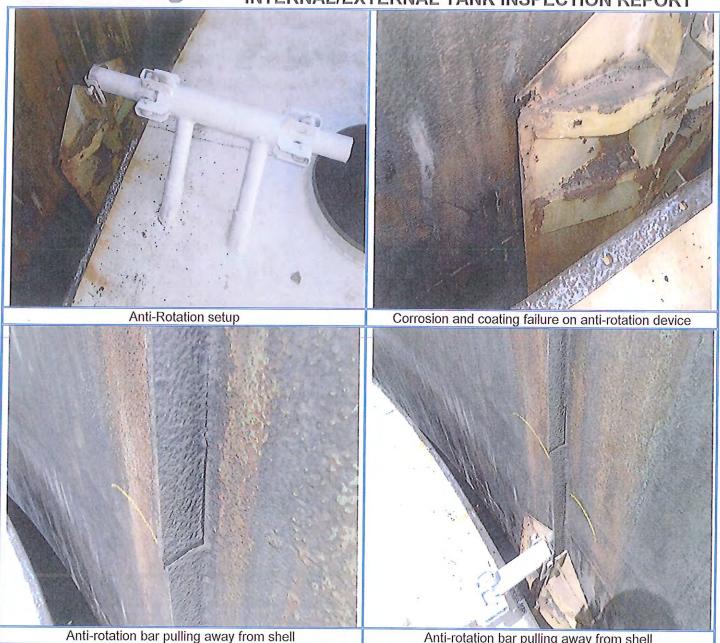








Anti-rotation bar pulling away from shell

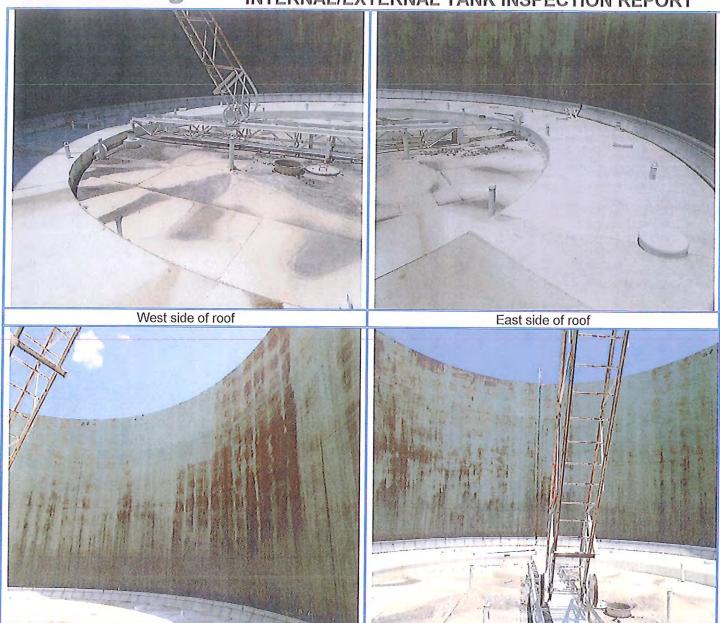




Internal shell condition above roof

INTERNAL/EXTERNAL TANK INSPECTION REPORT

Internal shell condition above roof and underside of ladder

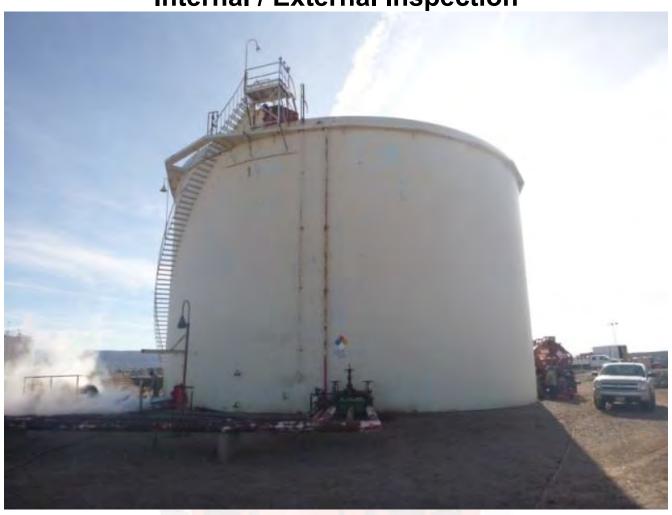








83 Unleaded Gasoline Storage Tank TK-570 Internal / External Inspection





Gallup, New Mexico

Keith Angell API 653 Cert #30340	3/25/15	Sentinel Integrity Solutions
Inspector	Date	Company



Equipment#: TK-569	Inspection Report #: 2017-1206	
Equipment Name: Unleaded Gasoline Storage	Unit Name: Tank Farm	
Date: 8/3/2017	Inspector: Gary Shelton	
Headline: Tank 569 Final Inspection before		

Summary:

On August 3, 2017, an API-653 internal and external inspection was performed on TK-569, Unleaded Gasoline Storage Tank by Western Inspection Personnel. The tank is a 25,000 bbl. tank that is 67' Dia. X 40' High, with an internal floating roof and siphon. This inspection was done after an initial inspection and after repairs were made. UT measurements were made on the bottom shell course, roof, nozzles and floor of the tank then the repairs were made. The repairs consisted of four (4) patches on the floor to cover the coupons that were cut out to check for underside corrosion and numerous areas of weld metal build up also on the floor of the tank.

Floor:

The floor was sand blasted then pit depth measurements were taken. Those that were deeper than 0.090", which there were numerous were filled in with weld metal. The hole in the floor striker plate was repaired and an area on the striker plate that had deep erosion was also repaired with weld metal build up. The floor was then recoated along with the floating siphon and all other associated piping on the tank floor.

Shell:

There were several bolts or screws driven into the tank shell. These were ground flush on the inside and seal welded on the outside. The tank shell was then coated with the floor up to about 8' on the sides. The exterior of the tank was also recoated.

Floating Roof:

The holes in the pontoons were repaired as recommended. The anti-rotation plate was repaired along with the anti-rotation plate that touched the shell wall. The seals were replaced with new ones. Then the roof and interior of the vacuum breakers were sand blasted and recoated.

Ladders/Platforms:

The rolling bars under the ladder were repaired then the ladder and all of the supports were blasted and recoated.

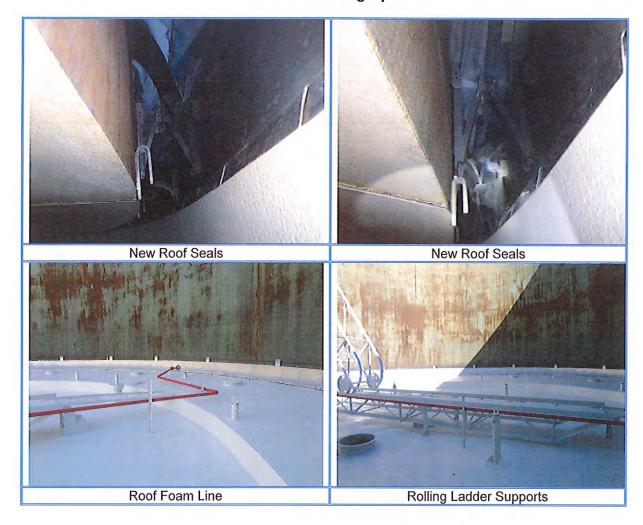
Recommendations:

None at this time.



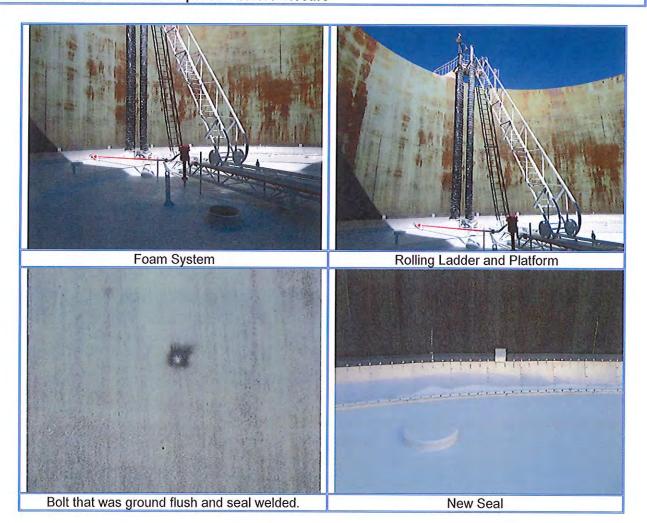
Equipment#: TK-569	Inspection Report #: 2017-1206	
Equipment Name: Unleaded Gasoline Storage	Unit Name: Tank Farm	
Date: 8/3/2017	Inspector: Gary Shelton	
Headline: Tank 569 Final Inspection before	ore Closure	

Reference Photographs





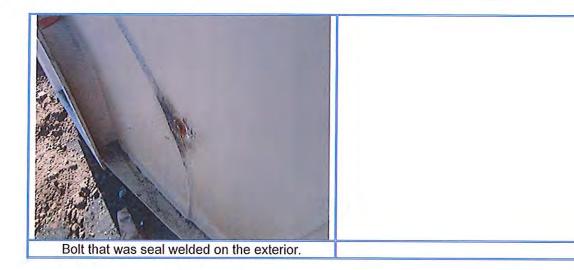
Equipment#: TK-569	Inspection Report #: 2017-1206	
Equipment Name: Unleaded Gasoline Storage	Unit Name: Tank Farm	
Date: 8/3/2017	Inspector: Gary Shelton	
Headline: Tank 569 Final Inspection before	ore Closure	





Date: 8/17/2017

Equipment#: TK-569	Inspection Report #: 2017-1206	
Equipment Name: Unleaded Gasoline Storage	Unit Name: Tank Farm	
Date: 8/3/2017	Inspector: Gary Shelton	
Headline: Tank 569 Final Inspection before	ore Closure	



Signature:

Jacq Selt Inspector & API #
Gary J. Shelton

API-653 Cert. #6399

Western Refining **Gallup Refinery Tank Shell Calculations**

Visual Insp 06/30/2017

UT Insp.

06/21/2017

DATE: 08/24/2017

TANK: TK-569

INSPECTOR: Gary Shelton

BBLS:

25,000

TYPE OF ROOF:

External Floating Roof

DATE BUILT: 1957

SERVICE: 83 Octane Unleaded Gasoling

PRIOR UT INSP. (Yr.): 07/22/2014

BUILT BY: Chigago Bridge and Iron

LATEST UT INSP. (Yr.): 06/21/2017

VISUAL INSP. (Yr.): 07/22/2014

· Minimum thickness - (min t) = 2.6(H-1)DG / SE · Corrosion Rate = previous t - actual t / years between actual t and previous t

· Remaining Life = actual t - t min / corrosion rate

D = Nominal diameter of tank, in feet

G = Highest specific gravity of the contents.

E = Original joint efficiency for the tank

H = Height, in feet, from the bottom in each shell course to the maximum design liquid level

S = Maximum allowable stress in pounds per square inch.

Diameter (D) 67

Joint Eff. (E) 0.85

Gravity
(G)
0.8

	1 st course	2 nd course	3 rd course	4th course	5 th course
Tensile	55,000	55,000	55,000	55,000	55,000
T Stress	23595	23595	25960	25960	25960
Yield	30,000	30,000	30,000	30,000	30,000
Y Stress	24000	24000	26400	26400	26400
Allowable Stress (S)	23595	23595	25960	25960	25960
Height (H)	40.00	32.00	24.00	16.00	8.00
Course Height	8	8	8	8	8

Shell Course	UT Reading (inches)*	Previous Thickness (inches)	Corrosion Rate (inches)	Minimum Thickness (inches)	Remaining Life (Yrs.)	MAX FILL HEIGHT (FT)	Hydro Max Test Height (FT)	Visual External Due (Yrs.)	Shell Due for UT's (Yrs.)
First	0.314	0.317	0.00000	0.271	15266	46.2	35.3	5	15
Second	0.24	0.262	0.00002	0.215	1190	43.5	36.3	5	15
Third	0.18	0.195	0.00001	0.145	2467	45.5	36.1	5	15
Fourth	0.204	0.233	0.00003	0.100	3819	57.3	38.2	5	15
Fifth	0.231	0.246	0.00001	0.100	9301	69.6	46.2	5	15

Shell is due for External Visual Inspection:

07/01/2022

Shell is due for UT Inspection readings:

06/01/2032

COMMENTS:

Tank Bottom Calculation Sheet

TANK: **TK-569**

TYPE OF ROOF: <u>External Floating Roof</u>

SERVICE: 83 Octane Unleaded Gasoline

PRIOR INSP (Yr): 07/17/1997

DATE: <u>08/24/17</u>

INSPECTOR: Gary Shelton

DATE BUILT: 1957

NEW BOTTOM INSTALLED: No

LATEST INSP (Yr): 2010

DOES TANK HAVE SECONDARY CONTAINMENT? no

BOTTOM FORMULA CALCULATIONS

MRT = (Minimum of RTbc or Rtip) - Or (StPr + UPr)

MRT = Minimum remaining thickness at the end of interval Or. This value must meet the requirements of API 653 Table 4-4 and Paragraph 6.4.2.

	0.25	Original plate thickness, in inches
RTbc	0.188	Minimum remaining thickness from bottom side corrosion after repairs
Rtip	0.208	Minimum remaining thickness from internal corrosion after repairs
	0.062	Maximum depth of underside pitting after repairs.
	0.08	Max depth of int. pitting after repairs are completed, in inches, measured from the orig. thickness
StPr=	0	Max internal pitting rate, in inches per year; StPr = 0 if the tank bottom is internally lined.
UPr=	0.00117	Max underside pitting rate, in inches per year; UPr = 0 if tank bottom is cathodically protected.
Or=	20	Anticipated in-service period of operation (normally 10 years).

MRT = 0.164604 Minimum remaining thickness at the end of the in-service period of operation, in inches.

Tank is due for Internal Inspection in

Monday, August 24, 2037

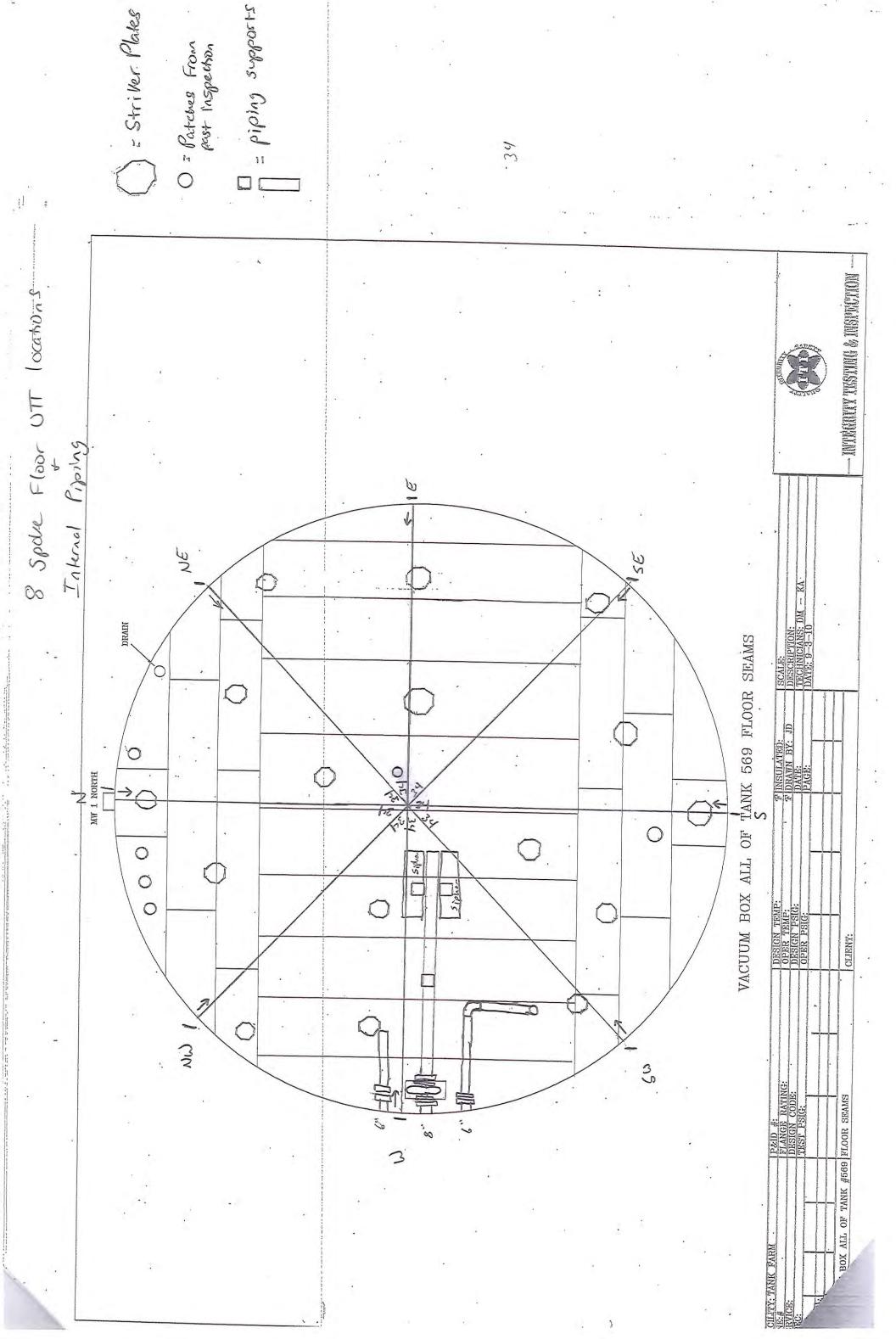
COMMENTS:



— INTEGRITY TESTING & INSPECTION —

Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 Floor Readings
Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

Floor Locations	North	NE	East	SE	South	SW	West	NW	
1	0.208	0.235	0.257	0.252	0.248	0.238	0.243	0.232	
2	0.227	0.228	0.252	0.255	0.236	0.254	0.239	0.220	
3	0.223	0.242	0.252	0.254	0.234	0.254	0.252	0.237	
4	0.226	0.242	0.240	0.249	0.245	0.249	0.253	0.237	
5	0.241	0.245	0.248	0.252	0.258	0.256	0.255	0.253	
6	0.244	0.250	0.249	0.250	0.260	0.240	0.251	0.237	
7	0.252	0.258	0.243	0.255	0.271	0.235	0.254	0.242	
8	0.237	0.255	0.249	0.262	0.274	0.235	0.259	0.247	
9	0.240	0.247	0.241	0.262	0.271	0.247	0.260	0.254	
10	0.242	0.248	0.259	0.263	0.272	0.237	0.253	0.242	
11	0.245	0.259	0.259	0.261	0.271	0.243	0.251	0.254	
12	0.263	0.249	0.260	0.266	0.268	0.210	0.250	0.249	
13	0.244	0.253	0.260	0.264	0.256	0.226	0.253	0.255	
14	0.255	0.253	0.259	0.263	0.263	0.239	0.255	0.246	
15	0.251	0.256	0.260	0.260	0.259	0.236	0.233	0.244	
16	0.247	0.257	0.269	0.263	0.257	0.238	0.230	0.245	
17	0.247	0.254	0.262	0.262	0.256	0.246	0.224	0.257	
18	0.231	0.258	0.253	0.267	0.259	0.244	0.229	0.249	
19	0.229	0.252	0.255	0.260	0.255	0.246	0.228	0.251	
20	0.211	0.259	0.250	0.265	0.250	0.238	0.225	0.236	
21	0.222	0.234	0.249	0.259	0.256	0.243	0.215	0.212	
22	0.230	0.235	0.239	0.266	0.251	0.244	0.229	0.244	
23	0.231	0.233	0.249	0.266	0.243	0.241	0.229	0.225	
24	0.220	0.247	0.241	0.257	0.250	0.239	0.243	0.237	
25	0.220	0.245	0.230	0.258	0.249	0.246	0.222	0.228	
26	0.222	0.243	0.249	0.254	0.240	0.238	0.237	0.234	
27	0.245	0.235	0.234	0.258	0.238	0.241	0.238	0.235	
28	0.225	0.237	0.255	0.270	0.239	0.237	0.244	0.245	
29	0.175	0.236	0.246	0.279	0.236	0.234	0.233	0.175	
30	0.254	0.243	0.263	0.276	0.233	0.235	0.221	0.241	
31	0.244	0.242	0.267	0.272	0.240	0.248	0.230	0.253	
32	0.235	0.246	0.266	0.257	0.237	0.242	0.232	0.250	
33	0.244	0.250	0.251	0.265	0.246	0.260	0.224	0.250	





3861 Vincent Station Dr. Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

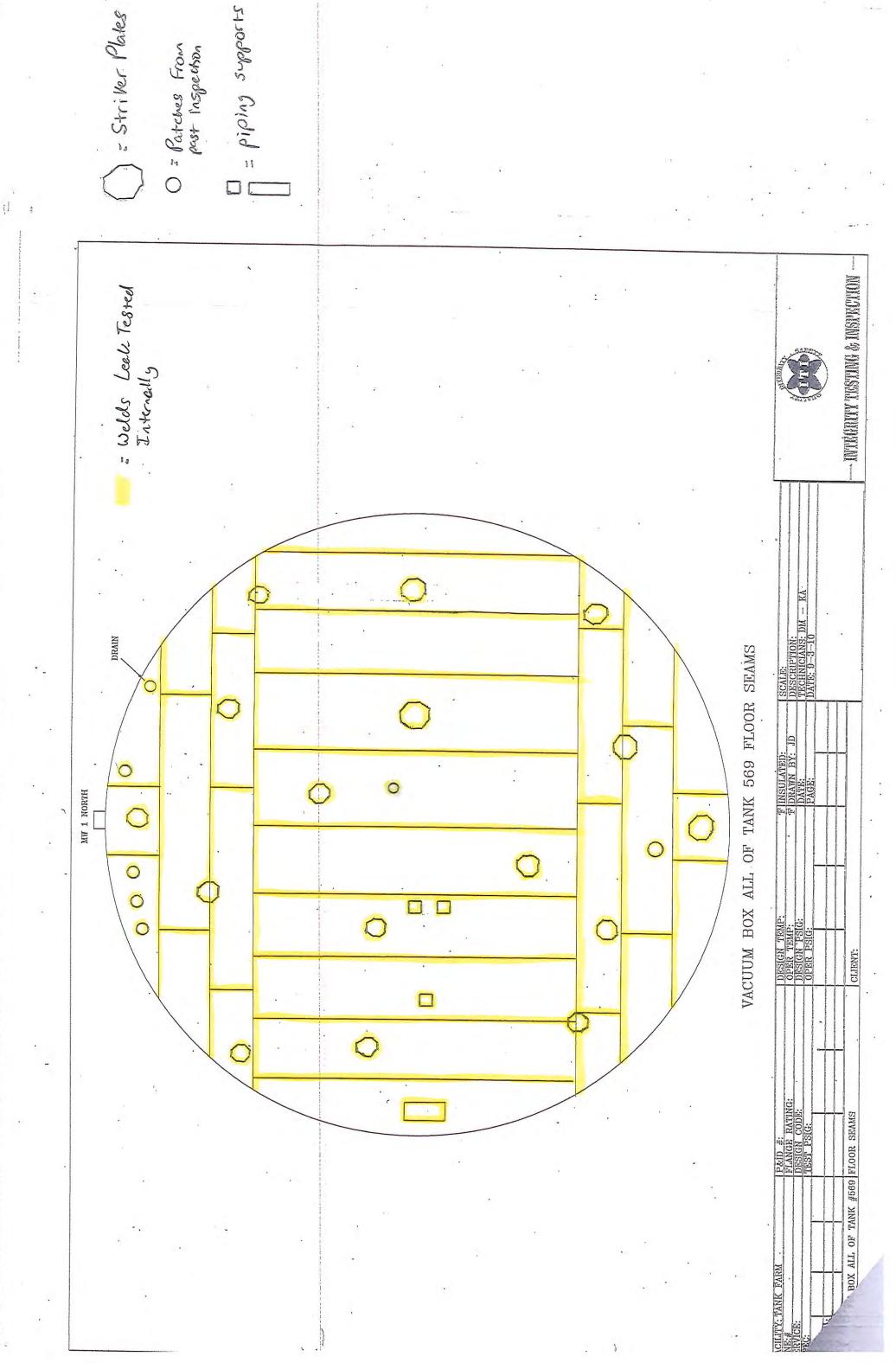
INTEGRITY TESTING & INSPECTION —

LEAK TESTING / VACCUM BOX REPORT

	Weste	ern Refining		From Richard Ramsey			Date 06/29/2017	
Project:	Wood	The thinning			Titlena	id italiisey	1 0	0/23/2017
Tank 569 Fl	oor Plate Seam We	ds and Chime	Weld					
urchase Order				Integrity Tes	ting Job No.			
						201	17-0002	
	Weld Structu	ral Casting	Machinery	Mach. Parts	Pipe	N/A	Other:	
Item	✓						-	N/A
Material	Size:	No. of Pieces		Base Metal	Type of	Filler Material	Weld	N/A
The same of the	Various	1 Floor		CS	L	CS	Smooth 2	As Welded
Type of	BLT (Vacuum) Test	Pneuma	tic Test I	Hyd	ro Test	Other Testin	g Type	
Leak Test Pressure					Holding Tin	100	Inspection Mediu	m/lf any used)
ricasure		18" Hg				econds	Inspection Media	Snoop
Location					System		-	
	Westerr	Refining/Jame	stown, NN	Л			Tank Farm	
Acceptance	1				Procedure			
Standards	Cus	stomer Specific	ations				QCP 900 Rev.	1
	ITI was asked to p			nov leak to	et on tank			
Doculle	weld.	orioriii iiiterilai	vacuumi	JON IGAN LE	ot on talk	goo noor b	iale sealli Well	us and chille
Results of		7.55	- 1					
Inspection	No indications for	ind at time of in	spection.					
	-						~	
							~ 	
eference: Sum	many			[J] Soo	Attachmont			
eference: Sum	mary			✓ See	Attachment			
eference: Sum	mary			✓ See	Attachment			
eference: Sum	mary			✓ See	Attachment			
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deference: Sum	ımary			✓ See	Attachment			
Reference: Sum	mary			✓ See	Attachment			
	mary			Requested By	r:		Reported By (Tec	
Reference: Sum	mary			Requested By				hnician): sey / F. Ramirez

NOTICE:

THIS EXAMINATION REPORT IS A REPORT OF THE RESULTS OF THE NDT PROCEDURE ACTUALLY PERFORMED BY THIS COMPANY IT IS SUBJECT TO THE LIMITATIONS OF THE TESTING SPECIFICATIONS AND PROCEDURES WHICH WERE UTILIZED. BY FURNISHING THIS REPORT, INTEGRITY TESTING & INSPECTION DOES NOT GUARANTEE ANY CONDITION OF THE TESTED SPECIMEN.



Western Refining Company Z N9 03, N8 03/4" H = Chime weld onea lead tested (5.21)4.21 3.21 (2.21)1.21(4.23) (2.23) (3.23)(1.23) STORU T.U 4.22 5.22 (2.22) 4.24 1.24 TK-569 83 UNLEADED GASOLINE S (5.31) $\left(4.31\right)$ (3.31)2.31 (4.33)(3.33)(2.33)Corner Vac Box (Leal Test) sqoad .r.u 🕥 (5.32) 4.34 3.34 (1.32)WESTERN REFINING 1.34 S CLIENT: N4 N5 N6 8 6 N6 0 0 08" NG (0.0) 5.41 (4.41 (4.43)(3.43)(5.43)(2.43) (1.43)lb/in³ API 653 STORE T.U > 4.44 4.42 (3.42)3.44 (7.04) (7.04) FLANGE RATING: DESIGN CODE: TEST PSIG: -2" FROM TOP WELD N SERVICE: 83 UNLEADED GASOLINE SPEC: -1, FROM -2" FROM -CENTER FACILITY: TANK FARM TK-569 (1.12)(5.11)(4.11)(2.11)3.11 (3.13)(2.13) Gold not Z u.r. props SIZE; NOMINAL: MATERIAL DESC: (3.12)



3861 Vincent Station Dr. Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

INTEGRITY TESTING & INSPECTION

LIQUID F	PENETRANT EXAMIN	NATION REP	ORT		11		☐ Nuclea	r 🗸	Non-Nucle	
То					From		Date			
	N REFINING				R.R. / F	.R.		06/29/201	7	
Project	3.2 cm (4.1.2 miles)								+	
	al Verts welds in Pont	oons								
Contract No.	or Purchase Order No.			Integrity Test	ing Job No.					
	W.O.#						17-0120			
Item	Weld Structural	Casting	Machinery	Mach. Parts		N/A	A Other: N/A			
	Non-Weld Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other:	N/A		
Material	Size 24in	No. of Pieces		Base Metal	Type of Filler SMAV		Weld Smooth	☐ N/A ✓ As W	elded	
Location	Location				System					
	Western Refining Ja	mestown NM					Tank -569			
Acceptance S	Standards	140			Procedure					
		ier Spec.					Γ-QCO-400 R	ev 8		
Type of Check	Initial Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day		Final	
	[v	Color Contrast				Fluores	cent Penetrant			
	Pre-Test Cleansing Method	/ Solution		•	Penetrant Applic	ation Me	thod / Penetrant			
Type of	Spray	& wipe / SK	C-S	Spray / SKL-SP1						
Inspection	Penetrant Removal Method	/ Remover			Penetrant Time		Specimen / Surface Temperature			
		Wipe/ SKC-S			20 Min		Ambient			
	Penetrant Emulsifier Metho	d / Emulsifier			Developer Applic	cation Me	thod / Develope	r		
		NA					Spray / SKC-	D		
	Developing Time				Final Cleaning M	Method / Solution				
		10 Min					Spray & Wip	е		
Reference					ee Attachment	Results	of Inspection			
Tank 569. I and HOLE	ked to perform PT"s o Pontoon 1 pinholes ar upper rigth coner, Po n (rigth side), Pontoor	nd HOLE uppe ntoon 3 LEAM	er left con	er, Pontoo	n 2 pinholes	4 relavinspec	vent indication	ons found	at time of	
				Requested By			Reported By (To	echnician);		
				1	om Lewis	R. Ramsey / F, Ramirez				
				✓ Custome	Specifications					
				Accept	Reject		Ca	leb Morga	ın	

NOTICE:
THIS EXAMINATION REPORT IS A REPORT OF THE RESULTS OF THE NDT PROCEDURE ACTUALLY PERFORMED BY THIS COMPANY IT IS SUBJECT TO THE LIMITATIONS OF THE TESTING SPECIFICATIONS AND PROCEDURES WHICH WERE UTILIZED. BY FURNISHING THIS REPORT, INTEGRITY TESTING & INSPECTION DOES NOT GUARANTEE ANY CONDITION OF THE TESTED SPECIMEN.



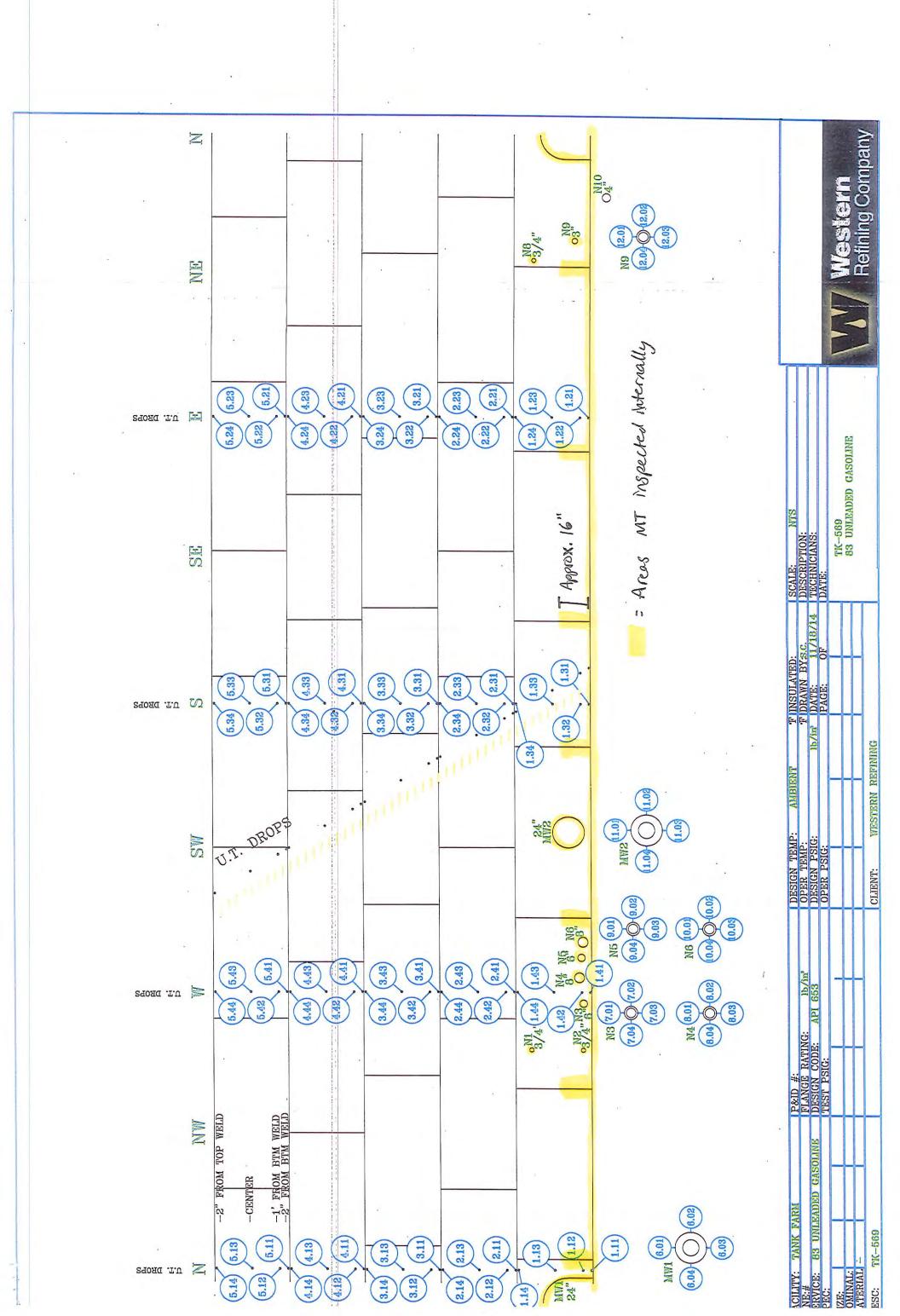
730 East 18th Street Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

То					From		Date	ar 🗸 Non-N
/Western	Refining				R P	/ F. R.	Duto	06/29/2017
Project					10.10	71.11.		0012912011
Tank Farr	n Tk-569 Internal I	nspection						
Contract No.	or Purchase Order No.			Integrity Tes	ting Job No.			
	W.C).#			•	20	17-0026	
Item	Weld Struc	tural Casting	Machinery	Mach. Parts	Pipe	N/A	Other:	Market V
	Non-Weld Pla	te Pipe	Bar	Casting	Mach. Parts	N/A	Other	MT Final
Material	Size	No. of Pieces		Base Metal	Type of Fill		Weld	N/A N/A
Transport of the same of the s	Various	12	С	/S	SM	AW	Smooth	As Welded
Location	Location	0.11			System			
Assent O	Western Refining	g Gallup NIVI					Tank -569	
Acceptance S					Procedure			
400		stomer Spec.		× 1			QCP 500 F	Rev.5
Type of Check	Initial Plate E	dge In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final 🗸
	✓ Longitudinal	Coil		DC Probe		Continuous	Other:	
Inspection	☐ Circular	AC Prod	✓,	Yoke				
	MT Equipment/Model				Surface Prepar	ation Method		
		400 Contour Prol	be S/N 174	131			Sand Blaste	d
3	Inspection Medium/Cold	or .		1	Demagnetizatio			u
	V 1 = 1	Flourescent					N/A	
eference: S	Summary			✓ See A	ttachment R	Results of Ins		
	ed to perform an In			< -569,	IN			s found at time of
	zzles back welds ar				**			s round at time of
	cccessible for inspe		1.			nspection	-	
		_		*				
ру То:	H		R	equested By:		1.	Daniel In	
20.00				om Lewis			Reported By (Te	
			1				R. Ramsey /	
			1 1	Customer 8	Specifications	1	NDT Supervisor:	
				✓ Accept	Reject		15	eb Morgan

1111

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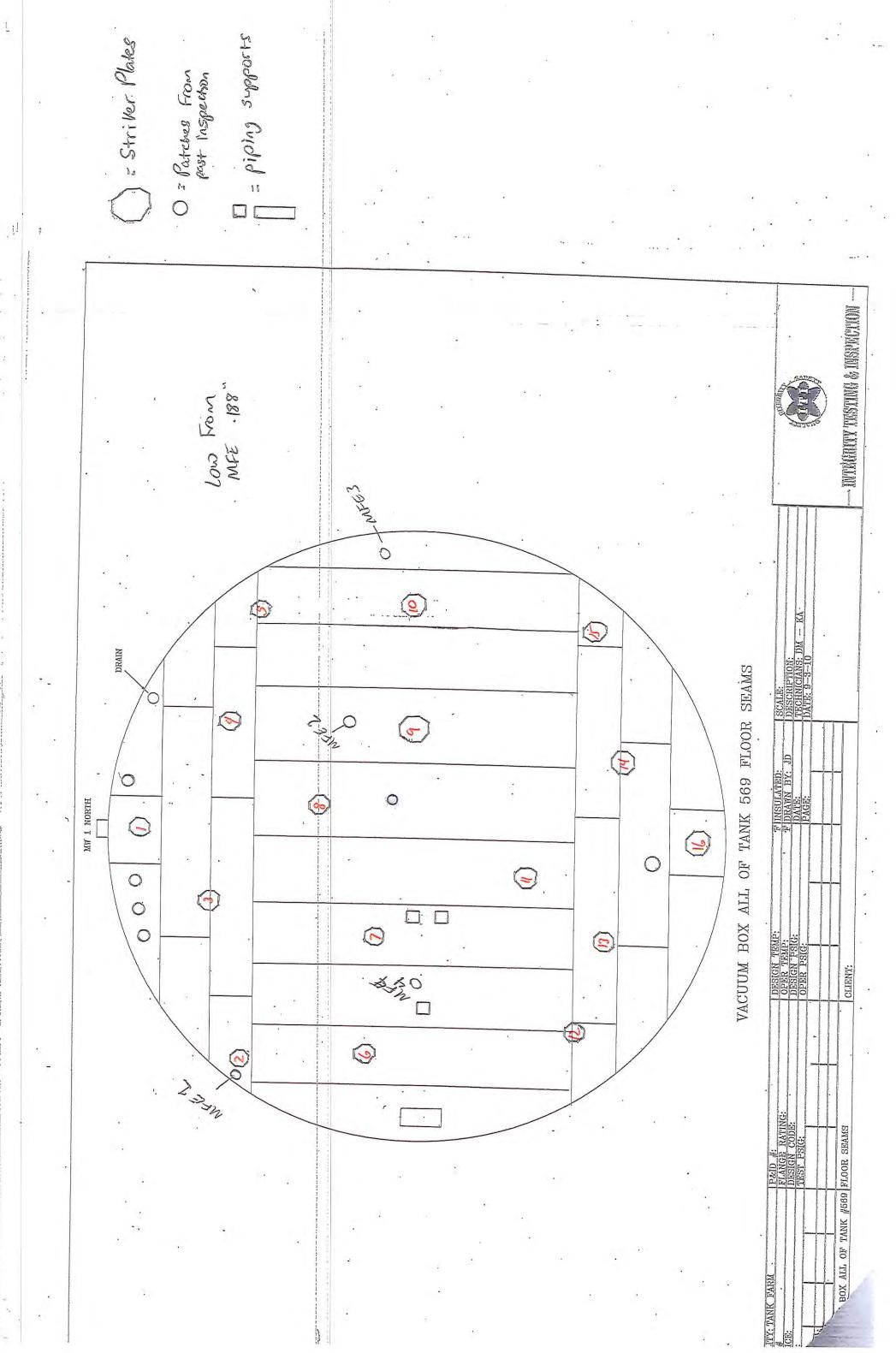


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INTEGRITY TESTING & INSPECTION

M.F.E. E	XAMINATIO	ON REPOI	RT					Nuclear	✓ Non-N	
То						From		Date		
	REFINING					Richard	d Ramsey	06/29/2017		
Project	A									
MFE Scar	Performed	on Tank 5	69 Floor							
						sting Job No.				
	Mold	Claustinal	0		2017-002			Ten		
Item	Weld	Structural	Casting	Machinery	Mach, Parts	S Pipe	N/A	Other: N/A		
11.5111	Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other		
		1						N/A		
Material	Size		No. of Pieces	Type of I	Base Metal	Type of F	iller Material	Weld 🗸	N/A	
	67' Diam		1 Floor	C	CIS	C	C/S	Smooth	As Welded	
Location	Location	. 1621.				System				
	Jamestow	n, NM				Tank Farm	1			
cceptance S						Procedure				
	Customer					MT QCP 50				
Type of	Initial	Plate	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Daý	Final	
Check		V						Tou .	✓	
	Longitu	ıdinal	Coil	2	DC Probe	V	Continuous	Other:	N/A	
Inspection	Circula	r 🗆	AC Prod		Yoke	(1)	-		*	
	M.F.E. Equipn	nent/Model				Surface Prepa	ration Method			
	Mark 4 Tar	k Floor Sc	anner	-		Water Blas		4.	**	
	SERIAL NUME	BER				CALIBRATION				
	MK4-0007-	A-TFS				Before Use	•			
eference:	Summary				✓ Se	ee Attachment	Results of In	spection	-	
ΓI was ask	ed to perform	n MFE exa	mination on T	ank 569 fl	loor plates.		TOTAL STREET		ates. Suspect	
									vith UTT during	
							inspection		vien of Fauring	
							mopootion			
		4					Son attack	ned drawings f	or additional	
								and information		
							locations	and illiornialic	т.	
ору То:					Requested By	<i>r</i> :		Reported By (Tech	nnician):	
10 E 10 C					Tom Lewis					
						r Specifications		Richard Ramsey / Francisco Ramirez NDT Supervisor:		
					Accept	Reject		Caleb Morgan		
				1	Ducceht	Livelect		Caleb Morgan		

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INTEGRITY TESTING & INSPECTION —

ULTRASO	NIC EXAMINATION I	REPORT					☐ Nuclear	Non-Nuclear	
To <mark>Western R</mark> e	efinina				From		Date		
roject	, illing				Richard F	kamsey	06/29/2017		
ank 569 fl	oor, critical zone, and	internal pipi	ng.						
Vork Order Nu	umber N/A			Integrity Test					
Item	Weld Structural	Casting	Machinery	Mach. Parts		N/A	Other	N/A	
	Non-Weld Plate	Pipe	Bar				Other	N/A	
Material	Size Various	No. of Pieces 1 Floor		Base Metal	Type of Fille		Weld Smooth	✓ N/A ☐ As Welded	
Location	JAMESTOWN, NM				System Tank Farm		, omeon		
Acceptance Standards	Customer Specs.				Procedure UTT QCP-6	20 Rev.	0		
	Soundness Thickness	Bond	Transducer	Single Crysta		V		Couplant Sono Test Ultra Gel	
	Pulse Echo Angle-Beam	Other	Frequency 5 MHz		Size	Angle 0°			
Type of Inspection	UT Equipment/Model 37 DL Plus		FI	lat Z	Concave .		Convex		
	SN: 119271-01		Standard N/A		Material	Notch Depth N/A		Serial No.	
	Cal Due: 2-2-18 D790 5MHL: 561343				N/A			N/A	
	D790 SMHL. 361343		Step Wedge Tube Wedge		Material C/S	Thickness Range .100500		Serial No. 12-4059	
ference: Sum I was aske ates, pipin	^{mary} d to performe UT Thic g, along with the critic	kness intern al zone.	al inspecti	☑ sion on Tanl	ee Attachment k 569 floor	See at	s of Inspecti tached repor and location	on: ts and drawings fo ns of inspection.	
			F	Requested By: T	om Lewis		Reported By (Te Richard Ram:	sey / Francisco Ramirez	
TICE:				Customer Accept	Specifications Reject		NDT Supervisor:	leb Morgan	

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— INTEGRITY TESTING & INSPECTION —

Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 Floor Readings
Technician: R. Ramsey / F. Ramirez

Date: 06/29/2017

Floor Locations	North	NE	East	SE	South	SW	West	NW		
1	0.208	0.235	0.257	0.252	0.248	0.238	0.243	0.232		
2	0.227	0.228	0.252	0.255	0.236	0.254	0.239	0.220		
3	0.223	0.242	0.252	0.254	0.234	0.254	0.252	0.237		
4	0.226	0.242	0.240	0.249	0.245	0.249	0.253	0.237		
5	0.241	0.245	0.248	0.252	0.258	0.256	0.255	0.253		
6	0.244	0.250	0.249	0.250	0.260	0.240	0.251	0.237		
7	0.252	0.258	0.243	0.255	0.271	0.235	0.254	0.242		
8	0.237	0.255	0.249	0.262	0.274	0.235	0.259	0.247		
9	0.240	0.247	0.241	0.262	0.271	0.247	0.260	0.254		
10	0.242	0.248	0.259	0.263	0.272	0.237	0.253	0.242		
11	0.245	0.259	0.259	0.261	0.271	0.243	0.251	0.254		
12	0.263	0.249	0.260	0.266	0.268	0.210	0.250	0.249		
13	0.244	0.253	0.260	0.264	0.256	0.226	0.253	0.255		
14	0.255	0.253	0.259	0.263	0.263	0.239	0.255	0.246		
15	0.251	0.256	0.260	0.260	0.259	0.236	0.233	0.244		
16	0.247	0.257	0.269	0.263	0.257	0.238	0.230	0.245		
17	0.247	0.254	0.262	0.262	0.256	0.246	0.224	0.257		
18	0.231	0.258	0.253	0.267	0.259	0.244	0.229	0.249		
19	0.229	0.252	0.255	0.260	0.255	0.246	0.228	0.251	7	
20	0.211	0.259	0.250	0.265	0.250	0.238	0.225	0.236		
21	0.222	0.234	0.249	0.259	0.256	0.243	0.215	0.212		
22	0.230	0.235	0.239	0.266	0.251	0.244	0.229	0.244		
23	0.231	0.233	0.249	0.266	0.243	0.241	0.229	0.225		
24	0.220	0.247	0.241	0.257	0.250	0.239	0.243	0.237		
25	0.220	0.245	0.230	0.258	0.249	0.246	0.222	0.228		
26	0.222	0.243	0.249	0.254	0.240	0.238	0.237	0.234	4	
27	0.245	0.235	0.234	0.258	0.238	0.241	0.238	0.235		
28	0.225	0.237	0.255	0.270	0.239	0.237	0.244	0.245		
29	0.175	0.236	0.246	0.279	0.236	0.234	0.233	0.175		-
30	0.254	0.243	0.263	0.276	0.233	0.235	0.233	0.173		
31	0.244	0.242	0.267	0.272	0.240	0.248	0.230	0.253		
32	0.235	0.246	0.266	0.257	0.237	0.242	0.232	0.250		
33	0.244	0.250	0.251	0.265	0.246	0.260	0.232	0.250		
34	0.227	0.249	0.242	0.259	0.246	0.257	0.224	0.234		



— INTEGRITY TESTING & INSPECTION —

Company: Western Refining
Address: Jamestown, NM

Description: Tank 569 Chime Readings

Technician: R. Ramsey / F. Ramirez

Date:

hime Locations	1	2	3	4	5	6	7	8	9	10
MW-1	0.554	0.557	0.548	0.557	0.554	0.549	0.217	0.234	0.210	0.23
	11	12	13	14	15	16	17	18	19	20
	0.230	0.248	0.248	0.213	0.242	0.235	0.234	0.231	0.226	0.218
	21	22	23	24	25	26	27	28	29	30
	0.222	0.216	0.212	0.218	0.227	0.224	0.234	0.220	0.241	0.237
	31	32	33	34	35	36	37	38	39	40
	0.238	0.227	0.217	0.226	0.228	0.235	0.234	0.219	0.222	0.216
	41	42	43	44	45	46	47	48	49	50
	0.217	0.248	0.235	0.227	0.238	0.228	0.222	0.242	0.223	0.224
	51	52	53	54	55	56	57	58	59	60
	0.245	0.235	0.249	0.231	0.240	0.237	0.240	0.243	0.245	0.238
	61	62	63	64	65	66	67	68	69	70
	0.247	0.242	0.239	0.232	0.246	0.242	0.245	0.241	0.247	0.243
East	71	72	73	74	75	76	77	78	79	80
	0.241	0.240	0.238	0.229	0.254	0.246	0.248	0.249	0.245	0.239
	81	82	83	84	85	86	87	88	89	90
	0.246	0.238	0.254	0.249	0.254	0.252	0.240	0.253	0.249	0.246
	91	92	93	94	95	96	97	98	99	100
	0.247	0.245	0.253	0.238	0.236	0.240	0.233	0.242	0.249	0.230
	101	102	103	104	105	106	107	108	109	110
	0.237	0.238	0.232	0.227	0.250	0.255	0.241	0.246	0.246	0.238
	111	112	113	114	115	116	117	118	119	120
	0.240	0.248	0.233	0.241	0.242	0.244	0.234	0.244	0.246	0.238
South	121	122	123	124	125	126	127	128	129	130
	0.247	0.263	0.256	0.228	0.253	0.244	0.249	0.245	0.254	0.243
	131	132	133	134	135	136	137	138	139	140
	0.249	0.240	0.241	0.243	0.242	0.243	0.255	0.248	0.225	0.235
	141	142	143	144	145	146	147	148	149	150
	0.248	0.249	0.254	0.245	0.236	0.248	0.234	0.238	0.249	0.252
	151	152	153	154	155	156	157	158	159	160
	0.248	0.248	0.246	0.236	0.242	0.242	0.245	0.242	0.247	0.253
	161	162	163	164	165	166	167	168	169	170
	0.247	0.260	0.254	0.258	0.257	0.260	0.260	0.263	0.254	0.258



Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 Chime Readings
Technician: R. Ramsey / F. Ramirez

Date:

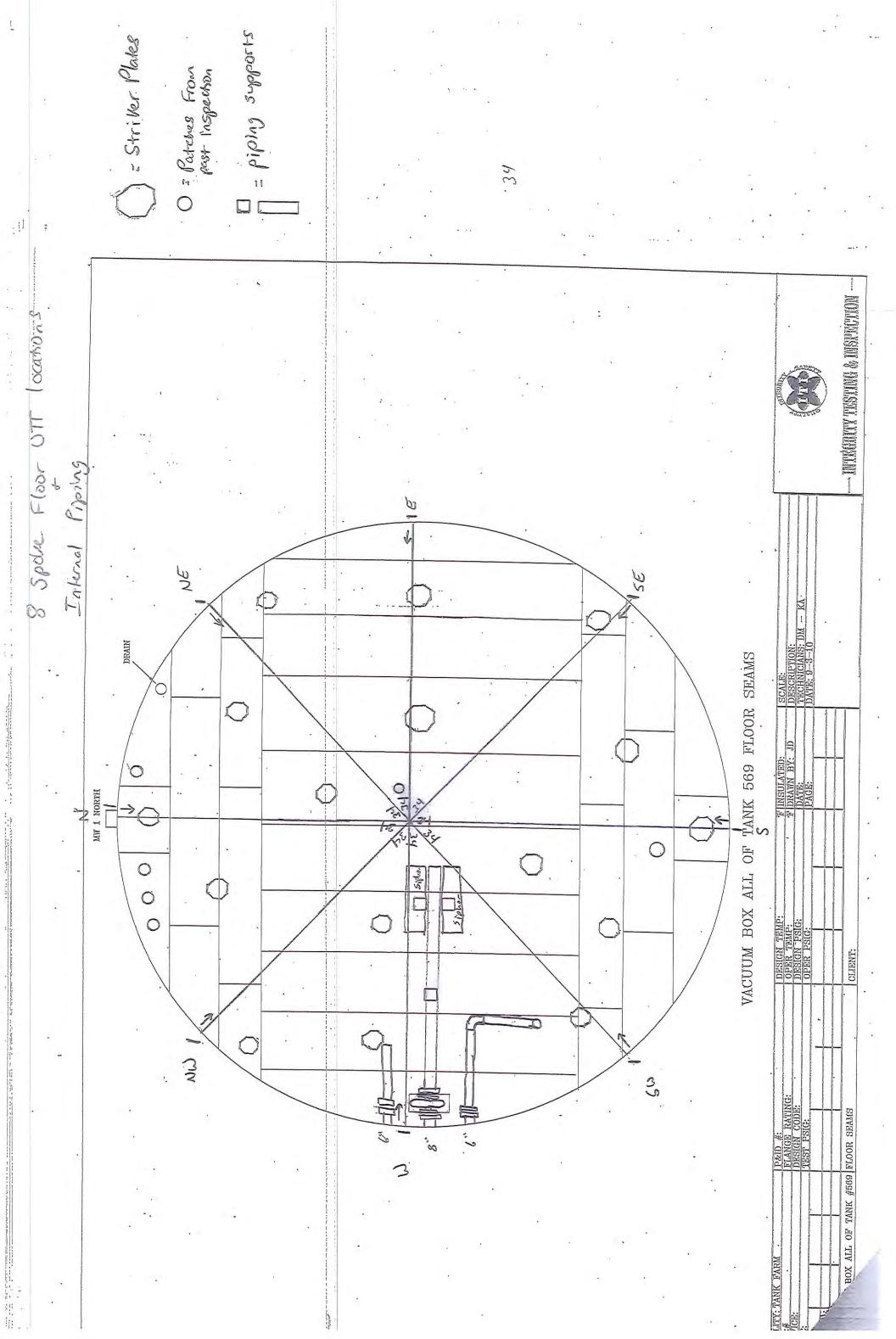
Chime Locations	171	172	173	174	175	176	177	178	179	180
West	0.254	0.253	0.251	0.259	0.258	0.257	0.254	0.257	0.25	0.253
	181	182	183	184	185	186	187	188	189	190
	0.253	0.257	0.239	0.248	0.252	0.244	0.243	0.258	0.253	0.252
	191	192	193	194	195	196	197	198	199	200
	0.249	0.248	0.238	0.232	0.25	0.254	0.252	0.262	0.245	0.249
	201	202	203	204	205	206	207	208	209	210
	0.253	0.243	0.242	0.244	0.235	0.232	0.224	0.244	0.248	0.257
	211	212	213	214	215	216	217	218	219	220
	0.243	0.247	0.244	0.239	0.236	0.238	0.233	0.233	0.23	0.216
	221	222	223	224	225					
MW-1	0.545	0.554	0.566	0.557	0.559					
								***		-
									5	
									11	
		-0								-
					-					
	-17									

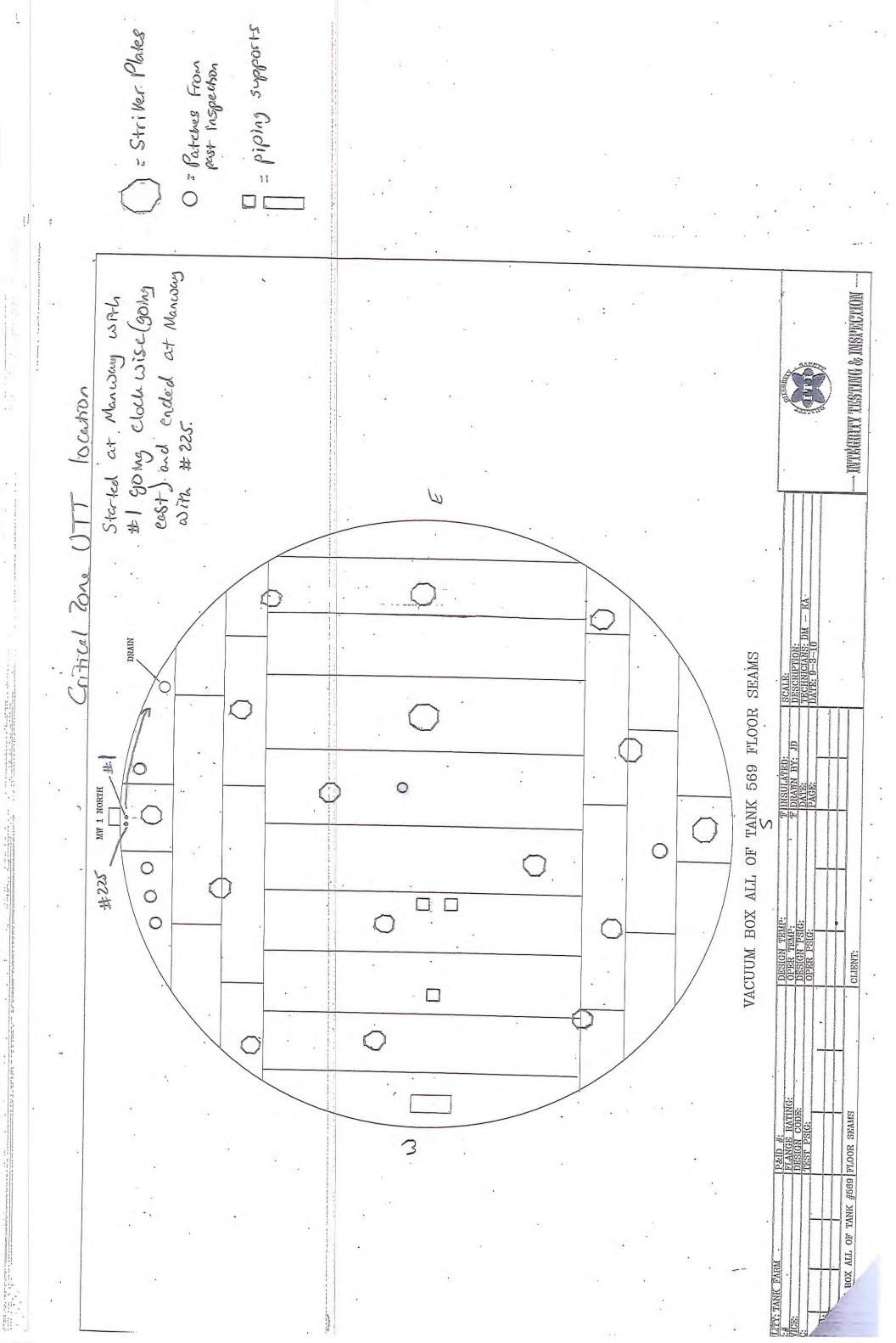


Company: Western Refining
Address: Jamestown, NM

Description: Tank 569 internal Piping
Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

Locations	0/Тор	90/Right	180/Btm	270/Left				
Nozzle 3	0.262	0.222	0.258	0.238				
Nozzle 4	0.295	0.253	0.262	0.260				
Nozzle 5	0.224	0.237	0.256	0.237				
Nozzle 9	0.225	0.231	0.251	0.249				
							1 3	
						-		
* W								
							-	-
								-
		-			-			
						-		
	= 4							
						1		





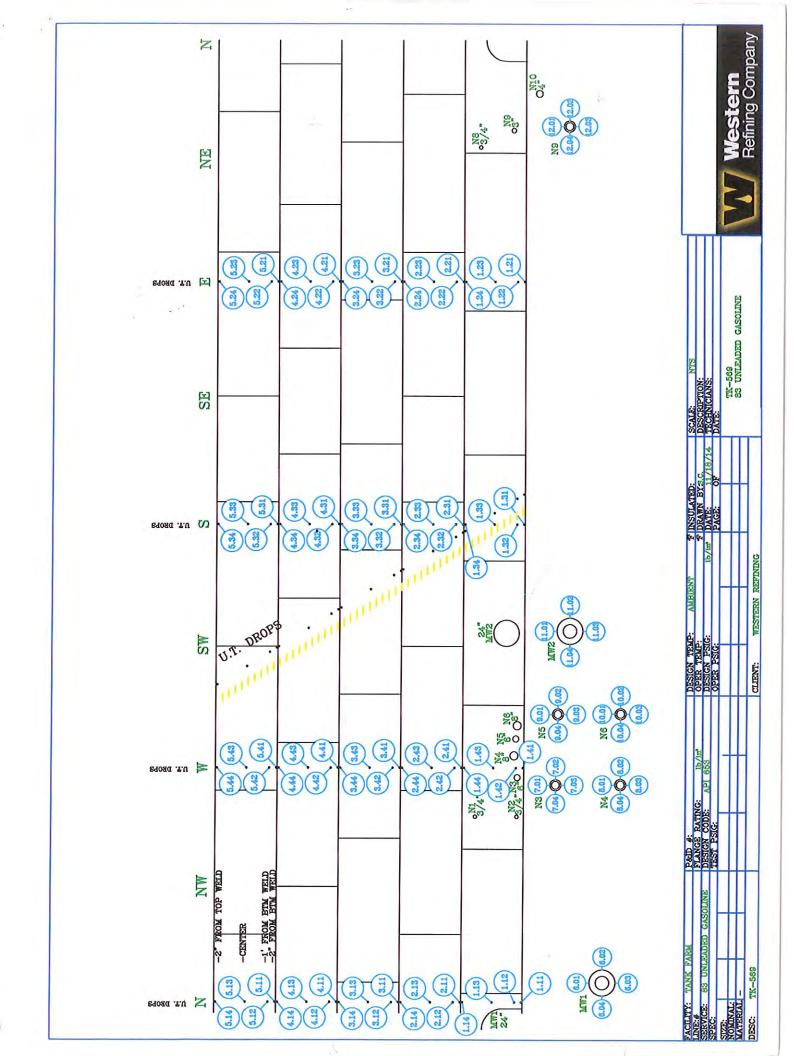


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— INTEGRITY TESTING & INSPECTION —

ULTRASO	NIC EXAMI	NATION F	REPORT					☐ Nuclear	✓ Non-Nuclear
Го						From		Date	
Vestern Re	efining					Richard R	amsey	06/29/2017	
roject									
	xternal Shell	and Nozz	les						
ork Order Nu	ımber	Co.			Integrity Tes	ACCES TO SECURITY SAFETY			
	1 1100	N/A			2017-0038				
Item	Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other	N/A
	Non-Weld	Plate ✓	Pipe	Bar	Casting	Mach. Parts	N/A	Other	N/A
Material	Size Vari	ous	No. of Pieces Various		Base Metal /S	Type of Filler N/A		Weld Smooth	✓ N/A ☐ As Welded
Location	JAMESTOV	VN, NM				System Tank Farm			
Acceptance						Procedure			
Standards	Customer \$	Specs.				UTT QCP-62	20 Rev.	0	
	Soundness	Thickness	<u>Bond</u>	Transducer	-				Couplant
		V					1	1	2.00(2.00.20 - 0.0
					Single Crysta	ſ.	Dual	Crystal	Sono Test Ultra Ge
	Pulse Echo	Angle-Beam	Other	Frequ	uency	Size		Angle	
	V	П			5 MHZ	.5"		00	
Type of Inspection	UT Equipment 37 DL Plus	/Model		FI	at 2	Concave		Convex	
	SN: 119271	-01		Standard		Material	N	otch Depth	Serial No.
	Cal Due: 2-2			N.	Α	N/A		N/A	N/A
	D790 5MHL	.: 561343		Step Wedge	• 🗸	Material		kness Range	Serial No.
				Tube Wedg	e 🗌	C/S	.1	100500	12-4059
ference: Sum was aske d nozzles	d to perform	ned UT Thi	ckness insp	ection on		ee Attachment xternal shell	See at		on: rts and drawings fo ns of inspection.
					Requested By			Reported By (To	
				-		r Specifications		Richard Ran NDT Superviso	nsey / Francisco Ramire
					Accept	Reject			aleb Morgan
TICE.				L	- AUTO PAR			- 00	alon morgan

NOTICE



Page:1

Western Refining Southwest, Inc. Gallup Refinery UltraPIPE Inspection Data Management

Corrosion Monitoring Survey - Columns Report

(Thickness in inches)

Unit: TK FARM
Eq/Circ ID: TK-569
Eq Type: TANK
Class:
RBI:

Report Date: 07/17/2017 15:07:21

TML No	Location	07/22/2014	05/05/2017	11-12-9	1-92-1				
1.11	H	0.330	Empty	222.	5				
1.12	SHLCRS 1 N-CTR	0.321	Empty	.321					
1.13	Н	0.317	Emoty	3/17					
1.21	SHLCRS 1 E-BIM	0.299	Empty	3/5	S				
1.22	SHLCRS 1 E-CTR	0.314	Empty	3/0					
1.23	SHLCRS 1 E-TOP	0.322	Empty	100	. 217. CAN				
1.31	SHLCRS 1 S-BIM	0.319	Empty	2194					
1.32	Н	0.328	Empty	. 733"					
1.33	SHLCRS 1 S-TOP	0.335	Emptv	7000	, 2754 CM				
1.41	SHICRS 1 W-BIM	0.337	Emptv	2370	2000				
1.42	SHLCRS 1 W-CTR	0.334	Emoty	1010	2200	(
1.43	SHLCRS 1 W-TOP	0.337	Empty	100	2				
1.51	14.3	Emptv	0.356	226	1000				
1.52	SHLCRS 1 NW-CTR	Emptv	0.357	100	2000				
1.53		Empty	0.367	TITO I	27,10	-	1000		
1.61	1	Fmn+v	272	The state of the s	17		1		
1 62	,	Daniel Cy	2000	1202	2000	1			
20.1	1 -	EMICO	0.000	bor.	Y		1000		
D . L	1	Empry	0.347	1	13755	1			
T / T	71	Empty	0.371	、中で、	.371.9				
1.72		Empty	0.375	1447	375.04	-			
1.73		Empty	0.381	1334	.370.01	_			
1.81		Empty	0.358	Total I	W.858.	1			
1.82	Н	Empty	0.343	2012				1	
1.83	SHLCRS 1 NE-TOP	Empty	0.352		.30"cm				
2.11	SHLCRS 2 N-BIM	0.248	Empty	· 256.					
2.12	SHLCRS 2 N-BIM	0.249	Empty	2660	7.7				
2.13	SHLCRS 2 N-CTR	0.240	Empty	., 55 6	100				
2.14	SHLCRS 2 N-TOP	0.210	Empty	2675					
2.21	SHICRS 2 E-BIM	0.246	Empty	2000					
2.22	SHLCRS 2 E-BIM	0.254	Empty	2000					
2.23	SHLCRS 2 E-CTR	0.248	Emptv	200					
2.24	SHLCRS 2 E-TOP	0.257	Emptv	2500					
2.31	SHICRS 2 S-BIM	0.247	Empty	ってひて					
2.32	SHLCRS 2 S-BIM	0.262	Empty	700%	CM				
2.33	SHLCRS 2 S-CTR	0.254	Empty	7455					
2.34	SHLCRS 2 S-TOP	0.248	Empty	222	-2 49-CM				
2.41	SHLCRS 2 W-BIM	0.261	Empty	· tro	2/1/2				
2.42	SHICRS 2 W-BIM	0.261	Empty	:4:	1.116				
2.43	SHLCRS 2 W-CTR		Empty	.250	100				
2.44	SHLCRS 2 W-TOP		Empty	2450					
3.11	SHLCRS 3 N-BIM		Empty	. 175.	,	1	00.100		
3.12	SHLCRS 3 N-BTM		Emotv	196	301	0	- Charles		
3.13	SHLCRS 3 N-CTR	0.154	Empty	187	1				
3.14			Empty	190					
3.21	SHLCRS 3 E-BIM		Empty	185	14				
3.22	SHLCRS 3 E-BIM	0.186	Empty	1.661					
				-					

Page:2

Western Refining Southwest, Inc.
Gallup Refinery
UltraPIPE Inspection Data Management

E-CTR	0.175	Empty Cot	1020	<		
- E	0.171	Empty	, 201	1		
TM	0.208	Empty	165			
BTM	0.195	Empty	081:	620		
CTR	0.188	Empty	164	-381	W 2	
-TOP	0.181	Empty	- 051	r		
3 W-BIM	0.192	Empty	151.	_		
-BTM	0.193	Empty	.183	1		
	0.173	Empty	191.	3	2	
	0.142	Empty	.205			
	0.167	Empty	.211			
	0.198	Empty	.228	1		
	0.220	Empty	.237			
	0.247	Empty	1337			
	0.234	Empty	218	CM		
	0.227	Empty	.236			
	0.219	Empty	.243	LCM SONG	ok low	
	0.206	Empty	242			
	0.243	Empty	195	.243"	~~	
	0.243	Empty	016.	240"	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
	0.228	Empty	. 224			
	0.220	Empty	.231			
	0.233	Empty	.204	.229.0	C.W.	
	0.225	Empty	.221			
	0.219	Empty	. 236	3		
	0.205	Empty	. 2.31	3		
	0.246	Empty	.231			
	0.249	Empty	.241			3
	0.255	Empty	.243			
	0.257	Empty	.240	3		
	0.249	Empty	2004			
SHICRS 5 E-BIM	0.245	Empty	545			
	0.240	Empty	.254	·240 cr	~	
	0.237	Empty	453	, 2350	1	
	0.251	Empty	. 236	3		
	0.250	Empty	543			
	0.243	Empty	.250			
	0.240	Empty	.25%			
	0.240	Empty	, 254			
	0.238	Empty	246			
	0.236	Empty	かったい			4
	0.235	Empty	·246			
	0.502	Empty	0170	3		
	0.471	Empty	15.			
	0.465	Empty	01 5		,	
	0.368	Empty	700	17 4.0	1. Open	
	0.384	Empty	28.00			
	0.390	Empty	1 1772.			
	0.378	Empty	600	1385 CA		
	0.578	Emptv	2005	V.)		
	0.580	Empty	1000	1		
	0.580	Emotiv	1	7000	\$	
	0.579	Empty	100	2		
N5 6" NOZ 12:00	0.490	Empty	10/17	010	1	
	0 492	Fmntv	The in	-		
				1		

Western Refining Southwest, Inc. Gallup Refinery UltraPIPE Inspection Data Management

9.04	N5 6" NOZ 9:00	0.492	Thurt v	3077	2027/₩	
NO.	-	, 100/00/10		3		
24 1	DOCACLOIL	01/22/2014	1702/50/50	100 100		
10.01	N6 8" NOZ 12:00	0.438	Empty	Z**Z		
10.02	N6 8" NOZ 3:00	0.501	Empty	10.0	472:	
10.03	N6 8" NOZ 6:00	0.460	Empty	133.		
10.04	N6 8" NOZ 9:00	0.475	Empty	CL8.		
11.01	24" MW2 12:00	0.475	Empty	171		
11.02	24" MW2 3:00	0.474	Empty	027		
11.03	24" MW2 6:00	0.477	Empty	えるで、		
11.04	24" MW2 9:00	0.477	Empty	455		
12.01	N9 3" NOZ 12:00	0.268	Empty	. 262		
12.02	N9 3" NOZ 3:00	0.259	Empty	576.		
12.03	N9 3" NOZ 6:00	0.273	Empty	.742		
12.04	N9 3" NOZ 9:00	0.264	Empty	.261		



3861 Vincent Station Dr. Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

- Integrity testing & inspection -

NIC EXAMI	NATION F	REPORT					☐ Nuclear	✓ Non-Nuclear
					From		Date	
fining					Richard R	amsey	06/29/2017	
	toon Read	ings						
mber								
Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other	N/A
Non-Weld	Plate ✓	Pipe	Bar	Casting	Mach. Parts	N/A	Other	N/A
Size Vari	ous	No. of Pieces 1 Roof				Material	Weld Smooth	✓ N/A ☐ As Welded
JAMESTO\	NN, NM				System Tank Farm			
					Procedure			
Customer	Specs.				UTT QCP-62	0 Rev.	0	
Soundness	Thickness	Bond	Transducer					Couplant
	✓ V					1		April Colonia Colonia
				Single Crysta	1	Dual (Crystal	Sono Test Ultra Ge
	Angle-Beam	Other	Freq	uency	Size		Angle	
V				5 MHZ	.5"		00	
UT Equipment	/Model				Concave		Carried Control	
37 DL Plus								
					1000000	No		Serial No.
Account to the second s								N/A
D790 5MHL	: 561343	-	1.634		10.00	1.		Serial No.
			Tube Wedg		C/S	.1	00500	12-4059
d to perforn						See at	tached repor	rts and drawings for
								echnician): nsey / Francisco Ramire
					r Specifications			
				☐ Accept	☐ Reject		Ca	aleb Morgan
	fining Dof and Pone Meld Non-Weld Size Vari JAMESTON Customer: Soundness Pulse Echo UT Equipment 37 DL Plus SN: 119271 Cal Due: 2-: D790 5MHL mary d to perform	fining pof and Pontoon Read mber N/A Weld Structural Non-Weld Plate Various JAMESTOWN, NM Customer Specs. Soundness Thickness Pulse Echo Angle-Beam UT Equipment/Model 37 DL Plus SN: 119271-01 Cal Due: 2-2-18 D790 5MHL: 561343	fining pof and Pontoon Readings mber N/A Weld Structural Casting Non-Weld Plate Pipe Various 1 Roof JAMESTOWN, NM Customer Specs. Soundness Thickness Bond Pulse Echo Angle-Beam Other VIT Equipment/Model 37 DL Plus SN: 119271-01 Cal Due: 2-2-18 D790 5MHL: 561343	N/A Weld Structural Casting Machinery Non-Weld Plate Pipe Bar Size No. of Pieces Type of B Various 1 Roof C JAMESTOWN, NM Customer Specs. Soundness Thickness Bond Pulse Echo Angle-Beam Other VT Equipment/Model 37 DL Plus SN: 119271-01 Cal Due: 2-2-18 D790 5MHL: 561343 Machinery Pipe Bar Transducer Type of B Transducer Freq Standard Step Wedge Tube Wedge	pof and Pontoon Readings Size	fining From Richard Record and Pontoon Readings	From Richard Ramsey	From Richard Ramsey Date 06/29/2017

NOTICE:



Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 Pontoon MW Readings

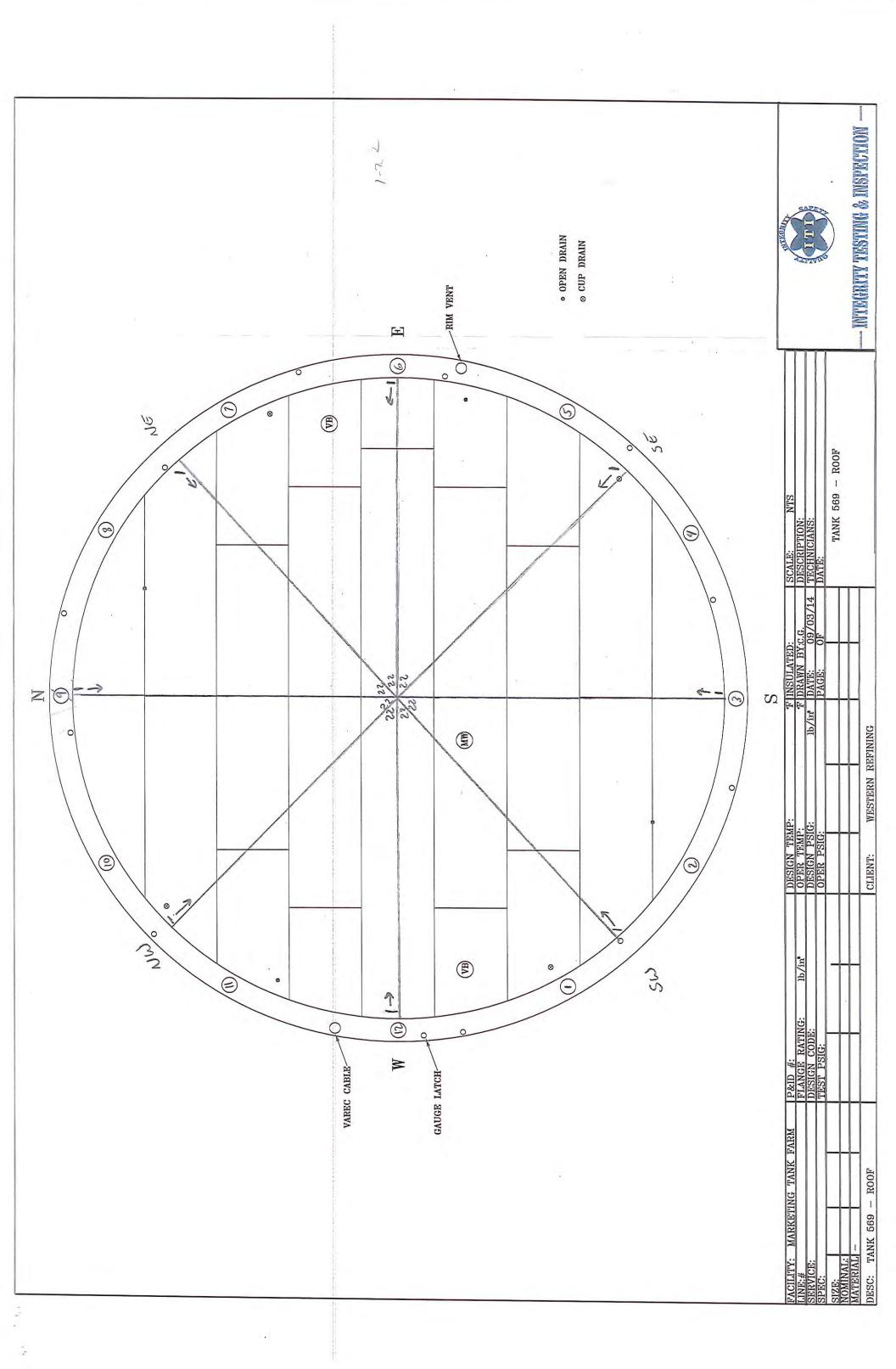
Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

Floor Locations	North	East	South	West				
1	0.187	0.186	0.186	0.187				
2	0.194	0.193	0.190	0.192				
3	0.184	0.184	0.187	0.186				
4	0.180	0.182	0.180	0.181				
5	0.180	0.182	0.182	0.181				
6	0.180	0.183	0.180	0.181				
7	0.193	0.190	0.192	0.184				
8	0.186	0.190	0.191	0.188				
9	0.190	0.193	0.194	0.192				
10	0.182	0.183	0.185	0.184			-	
11	0.183	0.182	0.185	0.184				
12	0.183	0.181	0.182	0.178				
		14						
		2						
		-						
		-						
							7	
			-					
						-		



Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 Roof Readings
Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

Roof Locations	North	NE	East	SE	South	SW	West	NW	
1	0.132	0.127	0.135	0.132	0.139	0.120	0.128	0.134	
2	0.130	0.123	0.122	0.133	0.134	0.105	0.126	0.129	
3	0.133	0.131	0.131	0.124	0.147	0.122	0.128	0.136	
4	0.128	0.126	0.124	0.121	0.128	0.132	0.130	0.137	
5	0.134	0.134	0.122	0.129	0.136	0.129	0.131	0.126	
6	0.131	0.128	0.119	0.107	0.132	0.131	0.123	0.128	
7	0.132	0.132	0.121	0.131	0.132	0.134	0.123	0.129	
8	0.139	0.129	0.113	0.127	0.128	0.122	0.123	0.121	
9	0.121	0.126	0.123	0.120	0.121	0.133	0.124	0.131	
10	0.121	0.120	0.118	0.134	0.128	0.144	0.124	0.121	
11	0.122	0.130	0.134	0.129	0.127	0.141	0.122	0.128	
12	0.129	0.135	0.112	0.132	0.121	0.145	0.132	0.124	
13	0.115	0.131	0.116	0.123	0.120	0.128	0.145	0.122	
14	0.133	0.125	0.118	0.120	0.127	0.136	0.146	0.131	
15	0.123	0.127	0.125	0.128	0.127	0.135	0.130	0.130	
16	0.137	0.123	0.112	0.131	0.127	0.129	0.125	0.130	
17	0.131	0.132	0.123	0.131	0.110	0.123	0.132	0.123	
18	0.124	0.134	0.124	0.115	0.126	0.130	0.120	0.121	
19	0.132	0.132	0.129	0.119	0.131	0.130	0.121	0.124	
20	0.118	0.110	0.123	0.115	0.128	0.124	0.122	0.130	
21	0.118	0.128	0.113	0.127	0.121	0.116	0.123	0.120	
22	0.134	0.122	0.126	0.127	0.120	0.118	0.117	0.124	
					: 1				
			<u> </u>						





Comments:

— INTEGRITY TESTING & INSPECTION —

Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 Roof to Pontoon Plate
Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

Roof Locations	North	NE	East	SE	South	SW	West	NW		
Тор	0.247	0.248	0.250	0.252	0.251	0.247	0.247	0.248		
Center	0.248	0.249	0.250	0.251	0.251	0.247	0.244	0.249		
Bottom	0.248	0.249	0.251	0.251	0.251	0.246	0.244	0.247		
				A						
									12 11 20 20	
		-								
	-									
				3.60						
					* 11					



Company: Western Refining

Address: Jamestown, NM

Description: Tank 569 Pontoon/Rim Plate Readings

Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

Pontoon 1	1	2	3	4	5		
Тор	0.147	0.151	0.157	0.158	0.151		
С	0.182	0.198	0.194	0.194	0.191	Rim Plate	
ВТМ	0.133	0.144	0.136	0.135	0.142		
OR	0.172	0.163	0.155	0.158	0.155		
С	0.152	0.153	0.135	0.142	0.147		
IR	0.170	0.149	0.136	0.137	0.149		
Pontoon 2							
Тор	0.151	0.151	0.155	0.163	0.157		
С	0.177	0.190	0.191	0.191	0.190	Rim Plate	
BTM	0.156	0.135	0.132	0.138	0.147		
OR	0.143	0.141	0.144	0.146	0.143		
С	0.156	0.144	0.154	0.143	0.146		
IR	0.149	0.148	0.158	0.143	0.146		
Pontoon 3							
Тор	0.160	0.142	0.159	0.154	0.162		
С	0.183	0.184	0.187	0.187	0.187	Rim Plate	
ВТМ	0.133	0.134	0.131	0.132	0.115		
OR	0.167	0.151	0.140	0.142	0.147		
С	0.145	0.146	0.147	0.139	0.144		
IR	0.166	0.158	0.146	0.151	0.154		
Pontoon 4							
Тор	0.156	0.155	0.162	0.146	0.157		
С	0.186	0.184	0.189	0.189	0.191	Rim Plate	
ВТМ	0.134	0.113	0.135	0.136	0.137		
OR	0.154	0.143	0.147	0.138	0.137		
С	0.144	0.151	0.139	0.153	0.155		
IR	0.155	0.139	0.147	0.146	0.164		
Pontoon 5							
Тор	0.159	0.174	0.143	0.165	0.160		
С	0.191	0.194	0.191	0.196	0.187	Rim Plate	
ВТМ	0.138	0.112	0.129	0.135	0.134		
OR	0.138	0.140	0.139	0.142	0.145		-
С	0.136	0.148	0.136	0.143	0.151		



Company: Western Refining
Address: Jamestown, NM

Description: Tank 569 Pontoon/Rim Plate Readings

Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

Pontoon 6	1	2	3	4	5		
Тор	0.168	0.176	0.178	0.176	0.172		
С	0.194	0.194	0.196	0.197	0.192	Rim Plate	
BTM	0.126	0.137	0.139	0.128	0.112		
OR	0.137	0.155	0.144	0.138	0.136		
С	0.128	0.136	0.149	0.138	0.139		
IR	0.122	0.139	0.140	0.139	0.135		
Pontoon 7						+	
Тор	0.173	0.177	0.176	0.182	0.184		
С	0.190	0.194	0.194	0.197	0.195	Rim Plate	
BTM	0.122	0.132	0.136	0.133	0.138		
OR	0.124	0.139	0.140	0.142	0.146		
С	0.145	0.152	0.161	0.134	0.128		
IR	0.145	0.143	0.130	0.133	0.116		
Pontoon 8							
Тор	0.178	0.123	0.173	0.172	0.178		
С	0.193	0.193	0.194	0.194	0.193	Rim Plate	
BTM	0.131	0.180	0.126	0.129	0.124		
OR	0.152	0.144	0.136	0.138	0.141		
С	0.147	0.147	0.152	0.148	0.136		
IR	0.140	0.144	0.144	0.127	0.149		
Pontoon 9							
Тор	0.185	0.189	0.184	0.176	0.182		
С	0.196	0.198	0.196	0.196	0.195	Rim Plate	
ВТМ	0.127	0.128	0.133	0.128	0.118		
OR	0.142	0.138	0.135	0.141	0.146		6
С	0.152	0.143	0.135	0.132	0.133		
IR	0.152	0.146	0.140	0.144	0.140		
Pontoon 10			100				
Тор	0.180	0.181	0.180	0.175	0.186	•	
С	0.191	0.194	0.197	0.194	0.196	Rim Plate	
ВТМ	0.138	0.139	0.138	0.128	0.126		
OR	0.137	0.148	0.145	0.141	0.148		
С	0.143	0.130	0.135	0.147	0.139		

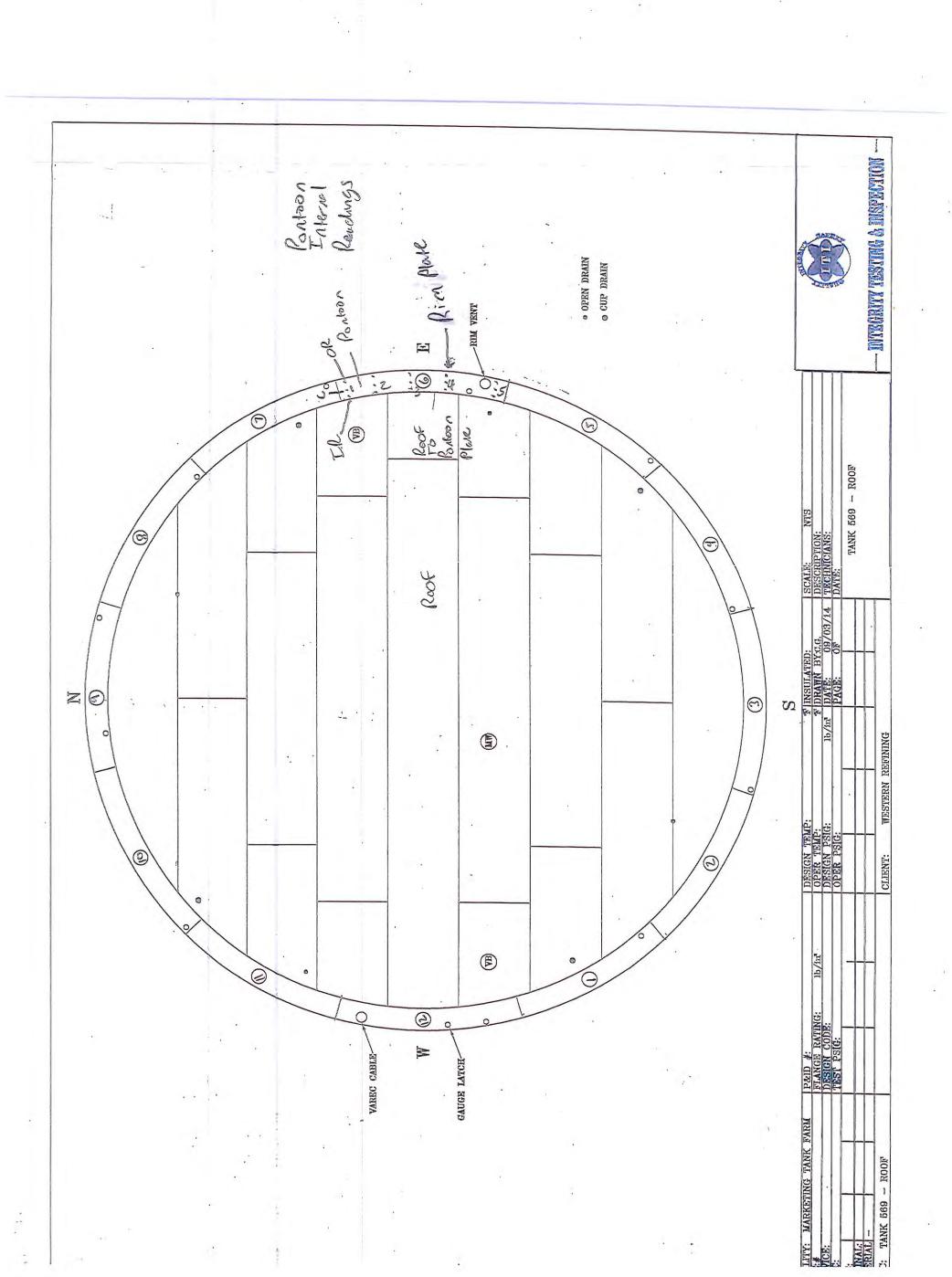


Company: Western Refining
Address: Jamestown, NM

Description: Tank 569 Pontoon/Rim Plate Readings
Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

Ponton 11	1	2	3	4	5			
Тор	0.174	0.165	0.166	0.172	0.176			
С	0.194	0.196	0.195	0.196	0.197	Rim Plate		
BTM	0.140	0.143	0.140	0.137	0.130			
OR	0.146	0.148	0.145	0.142	0.145			
С	0.138	0.148	0.144	0.143	0.148			
IR	0.143	0.138	0.135	0.125	0.141			
Pontoon 12								
Тор	0.153	0.167	0.157	0.148	0.156			
С	0.190	0.194	0.192	0.195	0.198	Rim Plate		
ВТМ	0.126	0.154	0.141	0.134	0.140			
OR	0.143	0.129	0.137	0.148	0.155			
С	0.145	0.142	0.148	0.151	0.145			
IR	0.136	0.145	0.153	0.140	0.129			
								-
	-							
							-	
								-

Joj.	Cate Shell Side		MTEGRITY TESTING & INSPECTION —
Cosk to Top	Roof Side Side		LINE#: EQUIPMENT: T-S69 Roof Batos DESCRIPTION: OTT POINT CONTRA
			DRAWN BY: RR/FR DATE: G-29-17 UNIT: Tank Form





Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 Top Pontoon plate readings
Technician: R. Ramsey / F. Ramirez

Date: 06/29/2017

	Α	В	С	D	E			1		
4 (41)						-			-	
1 (N)	0.186	0.186	0.181	0.186	0.188				-	-
2	0.186	0.183	0.186	0.182	0.186					-
3	0.186	0.186	0.185	0.184	0.186			<u> </u>		
4	0.189	0.189	0.189	0.187	0.189			-		
5	0.194	0.191	0.190	0.187	0.190			-		
6	0.192	0.193	0.194	0.188	0.187		-			
7	0.199	0.197	0.197	0.192	0.194					
8	0.193	0.193	0.195	0.191	0.189				4	
9	0.185	0.181	0.188	0.185	0.187					
10 (E)	0.190	0.189	0.186	0.187	0.187					
11	0.189	0.187	0.187	0.184	0.188					
12	0.186	0.186	0.187	0.182	0.184					
13	0.192	0.190	0.191	0.186	0.186					
14	0.184	0.184	0.185	0.182	0.185					
15	0.199	0.192	0.193	0.190	0.194					
16	0.187	0.188	0.188	0.186	0.185					
17	0.196	0.192	0.193	0.196	0.197					
18	0.195	0.194	0.194	0.194	0.193					
19	0.187	0.187	0.191	0.191	0.194					
20 (S)	0.186	0.186	0.186	0.186	0.189					
21	0.187	0.186	0.190	0.189	0.191					
22	0.187	0.185	0.187	0.185	0.188				-	
23	0.195	0.194	0.193	0.189	0.190					
24	0.190	0.192	0.191	0.188	0.188					
25	0.191	0.190	0.192	0.189	0.191					
26	0.189	0.188	0.188	0.188	0.188					
27	0.191	0.191	0.193	0.191	0.192					
28 (W)	0.191	0.192	0.190	0.184	0.186					
29	0.191	0.188	0.187	0.182	0.184					
30	0.188	0.187	0.187	0.182	0.184					
31	0.189	0.185	0.189	0.189	0.191					
32	0.187	0.188	0.191	0.187	0.189					
33	0.189	0.190	0.137	0.188	0.186					
34	0.189	0.188	0.191	0.185	0.188					



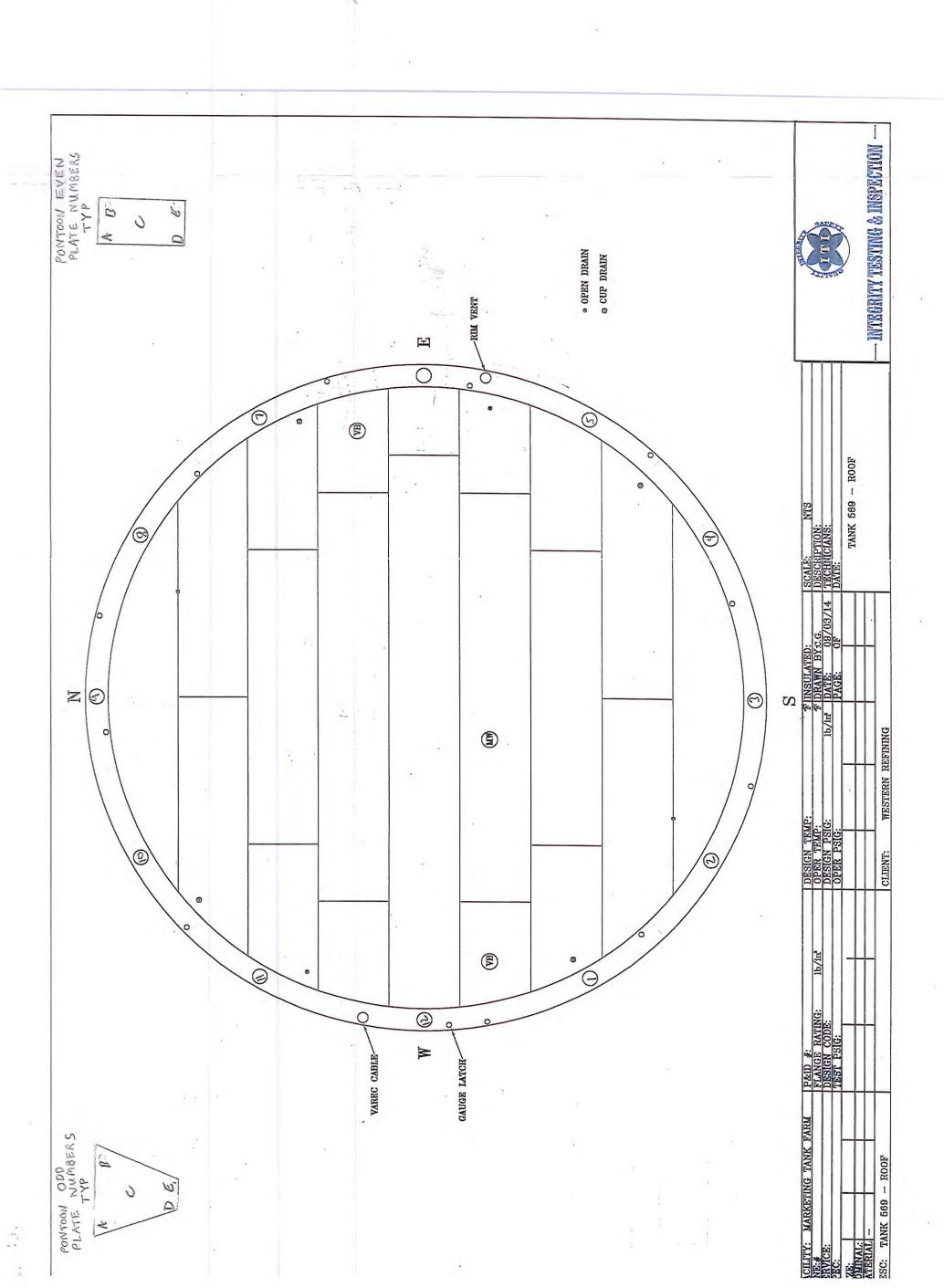
Company: Western Refining

Address: Jamestown, NM

Description: Tank 569 Top Pontoon plate readings
Technician: R. Ramsey / F. Ramirez

Date: 06/29/2017

	Α	В	С	D	E			
35	0.191	0.189	0.187	0.186	0.188			
36	0.185	0.185	0.186	0.183	0.188			
*								





3861 Vincent Station Dr. Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

ULTRASO	NIC EXAMIN	ATION I	REPORT					Nuclear	✓ Non-Nuclear	
To Western Re	efining/RMF					From J.Morgan/J.T	orrez	Date 07/10/2017		
Project	, mingritum					omorgamor,	OTTOL	0111012011	- Approximate to the second	
	UTT Cutline o	n Tank 5	69							
Work Order#					Integrity Test	ing Job No.				
26229685					2017-0041					
Item	Weld	Structural	Casting	Machinery		Pipe	N/A	Other	à	
	Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	N/A Other		
Material	Size		No. of Pieces		Base Metal	Type of Filler		Weld	☑ N/A	
Leastion	3		2		S/S	N/A		- Smooth -	As Welded	
Location	Western Ref	lining				System				
Acceptance	western ive	iiiiig				Tank Farm Procedure				
Standards	Info Only						0.0			
Standards	inio Only			Transducer		UT QCP 62	0 Rev.0		Cassalant	
	Soundness	Thickness	Bond	Transducci	П		1	1	Couplant	
		Ľ			Cinala Causta				Sono Test Ultra gel II	
	B. E		45.00	-	Single Crysta		Dual	Crystal	oono root oma gurn	
	Pulse Echo A	ngle-Beam	Other		uency	Size		Angle		
				2	1Hz	0.5"		0°		
Type of Inspection	38DL PLUS		F E	lat ✓	Concave		Convex			
	SN: 1511759			Standard		Material	No	otch Depth	Serial No.	
	Cal Due: 10/	07/2017		N	/A	N/A		N/A	N/A	
				Step Wedge	e 🗸	Material	Thick	ness Range	Serial No.	
				Tube Wedg	е 🗌	C/S	.10	0"500"	12-4061	
Reference: Sum	mary				✓ s	ee Attachment	Results	of Inspection		
Performed Upenetration	JTT Cutline or points.	1 Tank 56	69 for new f	oam and di	rain line ins	stallation at	North Hi: .36 Lo: .34 South Hi: .35 Lo: .33	0" 5" <u>Cutline</u> 7"		
Сору То:								Reported By (Te J.Morgan/J.To NDT Supervisor:	rrez	
				1	☐ Accept	Reject		Caleb Morga		

NOTICE:



N.D.E. REQUEST FORM

Wélder I.D.	Drawing Number/	N.D.E.	1	Line Numba Materia				Reguest 7-10-2016
24804	Line Number	Required UT/PT/RT Brinell/ PMI	Pipe Size	Weld Map	Pipe Spec	Code Work Y/N	Moc Required Y/N	Location of Welds/piping sp
	PRE-CUT SHEW	UT	311	No				
•	PRE-CUT SHELL	UT	311	No	-			FORM LINE PRE-CUT
	PT BOOT PASS	PT	311	Na				DRAIN LINE PRE CU
	PT POOT PASS	PT	311	No				ROOT OF FOAM LIA
				M 0.				ROOT OF DRAIN LIN
	Comments: UT SHE PT ROOT PASS 0	LL DE	TK-56	9 047	PENETR	PATION	POINTS.	
	PT ROT PASS O	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	- DRA	LNT	FOAK L	-INE	SHELL PE	NETRATIONS.
	work, and any associated drawing with request		. "				-	



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– INTEGRITY TESTING & INSPECTION —

LIQUID P	ENETRAN	T EXAMIN	NATION REF	PORT				☐ Nuclea	ar 🗸	Non-Nucle
То	4.70					From		Date	Jack Jack Street & S.	
	Refinery/ RN	/IF				Storm.S/Fr	ank.G		07/12/2017	
Project	- H00		300.2	2000						
			velds for the	Drain and						
Jontract No.	or Purchase O				Integrity Test	ting Job No.	44.			
		TK-569	0 "			2,-		7-0127		
Item	Weld	Structural	Casting	Machinery	Mach. Parts		N/A	Other:	N/A	
	Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other:	N/A	
Material	Size	3"	No. of Pieces 6		Base Metal	Type of Filler C/S	Material	Weld Smooth	□ N/A ✓ As Weld	led
Location	Location Western F	Refining Ja	mestown NN			System		Tank Farn	(*)	
Acceptance S						Procedure				
		AP	653			N 1 0-1	РТ	-QCO-400 F	Rev 8	
Type of Check	Initial	Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Fir	
		4	Color Contrast				Fluoresc	ent Penetrant		
	Pre-Test Clea	ansing Method	/ Solution			Penetrant Applic	ation Met	thod / Penetrant		
Type of		Carlot Anna Carlot	& wipe / Sk	C-S				pray / SKL-S		
Inspection	Penetrant Re	moval Method				Penetrant Time				ature
			Wipe/ SKC-S			20 Min			nbient	
	Penetrant Em	nulsifier Metho	d / Emulsifier			Developer Applic	cation Me	thod / Develope	er	
			NA					Spray / SKC	-D	
	Developing T	ime				Final Cleaning M	lethod / S	olution		
			10 Min					Spray & Wip	oe	
Reference						ee Attachment	Results	of Inspection		
TI perform and Foam		finals on Ta	ank 569's pe	netration v	velds for th	ne Drain line		levant Indica	ations found	d at time
					Requested By	<i>y</i> : oel Carlson		Reported By (1	rm.S/ Frank	.G
					_	er Specifications		NDT Superviso		
					Accept	Reject			aleb Morgan	i.

NOTICE:



N.D.E. REQUEST FORM

Welder I.D.	Drawing Number/ Line Number	N.D.E. Required UT/PT/RT	Pipe Size	Weld Map	Pipe Spec	Code work Y/N	MOC Required	Location of Welds/piping spoc
EB		Brinell/ PMI				2/30	AM	
KD		PT	3"	No				
1		PT	3"	No				FORM LINE
							-	DRAIN LINE
Co	mments:							
	FINAL PT	ON FINI	SHED	PENET	0.00			
				LIVETY	CALDIG	WELDS		
Plas	no. Di							
WOL	es: Please attach weld map rk, and any associated wing with request		.,5					

Rocky Mountain Fabrication, Inc.

1125 West 2300 North — PO Box 16409 — Salt Lake City, UT 84116
Toll Free: .800-801-4RMF — Phone: 801-598-2400 — Fax: 801-322-2702
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INTEGRITY TESTING & INSPECTION —

efinery/ RMF ass on both Drain an				From		☐ Nuclear	Non-N
ass on both Drain an						Date	
				Storm.S/ F	rank.G	07	7/12/2017
	d Foam line p	enetration	ı welds.				
r Purchase Order No.			Integrity Test	ing Job No.			
TK-569	1.50				201	7-0126	
Weld Structural	Casting	Machinery		Pipe	N/A	Other:	N/A
Non-Weld Plate	Pipe	Bar	Casting .	Mach. Parts	N/A	Other:	N/A
Size 3"	No. of Pieces					Weld Smooth	N/A ✓ As Welded
Location				System			
	mestown NM					Tank Farm	*****
andards				Procedure			
					PT	-QCO-400 Rev	7 8
Initial Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final
V	Color Contrast				Fluoresc	cent Penetrant	
Pre-Test Cleansing Method	d / Solution			Penetrant Applic	ation Met	thod / Penetrant	
		C-S		· onought ppin			1
		H 100 H 100		Penetrant Time			
	Wipe/ SKC-S				I Choud		for a contract of the contract
					cation Me		GIIC
	NA			Developer / tppii			
Developing Time	10.1			Final Cleaning N			
	10 Min						
ed PT's on the root n	asses for the	Drain and					6 1 -4.65
s.	acces for the	Diam and	i i vam inie	SHEII .			ns round at th
		Į.	The second secon				nnician): S/ Frank.G
						NDT Supervisor:	o Morgan
-	3" Location Western Refining Ja andards AP Initial Plate Edge Pre-Test Cleansing Method Spra Penetrant Removal Method Penetrant Emulsifier Method Developing Time	3" 8 Location Western Refining Jamestown NM andards API 653 Initial Plate Edge In Process Color Contrast Pre-Test Cleansing Method / Solution Spray & wipe / SK Penetrant Removal Method / Remover Wipe/ SKC-S Penetrant Emulsifier Method / Emulsifier NA Developing Time 10 Min	3" 8 C Location Western Refining Jamestown NM andards API 653 Initial Plate Edge In Process Back Gouge Color Contrast Pre-Test Cleansing Method / Solution Spray & wipe / SKC - S Penetrant Removal Method / Remover Wipe/ SKC-S Penetrant Emulsifier Method / Emulsifier NA Developing Time 10 Min and PT's on the roof passes for the Drain and Sa.	3" 8 C/S Location Western Refining Jamestown NIM andards API 653 Initial Plate Edge In Process Back Gouge Root Pass Color Contrast Pre-Test Cleansing Method / Solution Spray & wipe / SKC - S Penetrant Removal Method / Remover Wipe/ SKC-S Penetrant Emulsifier Method / Emulsifier NA Developing Time 10 Min Set PT's on the root passes for the Drain and Foam line in the state of the st	3" 8 C/S C/S Location Western Refining Jamestown NIVI andards API 653 Initial Plate Edge In Process Back Gouge Root Pass Repair Color Contrast Pre-Test Cleansing Method / Solution Spray & wipe / SKC - S Penetrant Removal Method / Remover Wipe/ SKC-S Penetrant Emulsifier Method / Emulsifier NA Developing Time 10 Min See Attachment and Foam line shell	3" 8 C/S System System Sy	System



n.d.e. request form

Eddipmer Wélder				Lite Kumba Materia	r I		-	By SOEL CARLSON Reguest 7-10-2016
Z.D.	Diawing Number/ Line Number	N.D.E. Required UT/PT/RT Brinell/ PMI	Pipe Size	Weld	Pips Spec	Work Work	Moc Required Y/N	Lecation of Welds/piping spot
	PRE-CUT SHELL		32)	No				town
EB	PT BOOT PASS	PT .	311	No				DRAIN LINE PRE-CUT
(D)	PT POOT PASS	1.1	711	No I				ROOT OF FORM LINE
-	Comments:							ROOT OF DRAIN LINE
M M	otes: Please attach weld map	L AK	DRAE	IN + F	PENETA OAXX I	CATION -INE	POINTS.	ENETRATIONS.
d)	ork, and any associated ork, and any associated owing with request		. 5					

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— INTEGRITY TESTING & INSPECTION —

ULTRASO	NIC EXAMIN	IATION I	REPORT					☐ Nuclear	✓ Non-Nuclear		
То						From		Date			
	efining / RM	F				Storm. S/Fra	nk.6	7/17/17			
Project		0	1	. 0	1.0						
AUT	Scan was	performe	ed on Tank	569 for	two 1/2"	nozzles to b	se adde	ط.			
Work Order#					Integrity Test						
	i				2017-00			Lau			
Item	Weld	Structural	Casting	Machinery		Pipe	N/A	Other			
	Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other Tank 569			
Material	Size		No. of Pieces	Type of I	Base Metal	Type of Filler	Material	Weld Smooth	N/A As Welded		
Location						System					
	Western Re	fining				Tank Farm					
Acceptance						Procedure					
Standards	API 653			2172.00		UT QCP 620	Rev.0				
	Soundness	Thickness	Bond	Transducer					Couplant		
		1					4		Cana Taat Illitra mal li		
					Single Crysta		Dual (Crystal	Sono Test Ultra gel I		
	Pulse Echo A	ngle-Beam	Other	Freq	uency	Size		Angle	-		
	V	Ш		5N	ЛHz	0.5"		0°			
Type of	UT Equipment/N	/lodel			lat	Concave		Convex			
Inspection	38DL PLUS				V						
	SN: 1511758			Standard		Material	No	tch Depth	Serial No.		
	Cal Due: 10/	07/2017			I/A	N/A		N/A	N/A		
	1			Step Wedg	A Committee of the	Material	1 0 0 0 A C	ness Range	Serial No.		
				Tube Wedg	је 🗌	C/S	.10	0"500"	12-4061		
Reference: Sum	nmary				✓ S	ee Attachment		of Inspection			
AUTTS	can was per	formed	on Tank 5	169 for fu	70 1/2" NOS	zles	1st area	on existing	nozzle		
to be ad	nmary ear was per deal for Ther	no-couples	· .				L: 311"				
			4				nnh	d .			
								a for new no	1.		
							Z'nd are	a for new no	5771L		
							L: 312"				
							H: 330°				
		(4)									
Conu Tar					Populated D.			Donastad D. /T-	abnisian):		
Сору То:			-		Requested By	elson		Reported By (Te	Frank 6		
						r Specifications		Storm. 5 / NDT Supervisor			
					Z Accept	Reject		Caleb Morga	an		

NOTICE:



N.D.E. REQUEST FORM

	T		No.	ine Number. Material		2		W <u>Jobl Carlson</u> equest 7-17-2017
Ælder L.D.	Drawing Number/ Line Number	N.D.E. Required UT/PT/RT Brinell/ PMI	Pipe Size	WELD MAP	Pipe Spec	Code work Y/N	MOC Required Y/N	Location of Welds/piping spoo
	PRE-CUT	UT	1-1/29	NO			· · · · · · · · · · · · · · · · · · ·	,
	ROOT PASS	PT	1-1/211	[V6		-	, , , , , , , , , , , , , , , , , , , 	Two-1-1/2" THERNO-COUR
	ETNAL	P	1-1/2"					(1
134		1.	1-12	NO				11
			700		3 3			
	Comments:	<u> </u>		<u> </u>				
								
· · ·								· · · · · · · · · · · · · · · · · · ·
	Notes: Please attach weld map			***				The state of the s
	work , and any associated drawing with request		• #				· · · · · · · · · · · · · · · · · · ·	,

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— INTEGRITY TESTING & INSPECTION —

LIQUID P	ENETRANT EXAMINATION REPORT		☐ Nuclear ☑ Non-Nuclear
TO RM	F/western Refinery	From 17-1	Date 7-18 -17
Project			
	Perform PT on New Nozzle	s on T-569 (Themo-couples)
Contract No.	26229685	egrity Testing Job No. 2017-0130	
Item		ach. Parts Pipe	N/A Other: NOZZIC
		Casting Mach. Parts	N/A Other:
Material	Size 11/2" No. of Pieces Type of Base	Metal Type of Filler	Material Weld □ N/A □ Smooth □ As Welded
Location	Location Western Refining Jamestown NM	System Tan	k farm
Acceptance S	Standards A. T.	Procedure	
	1-11-1 653		PT-QCP-400 Rev 8
Type of Check	Initial Plate Edge In Process Back Gouge R	oot Pass Repair	24 Hr. 7 Day Final
	✓ Color Contrast		Fluorescent Penetrant
	Pre-Test Cleansing Method / Solution	Penetrant Applic	eation Method / Penetrant
Type of	Spray & wipe / SKC - S		Spray / SKL-SP1
Inspection	Penetrant Removal Method / Remover		Penetrant Specimen / Surface Temperature
	Wipe/ SKC-S	20 Min	Ambient
	Penetrant Emulsifier Method / Emulsifier	Developer Appli	cation Method / Developer
	NA Developing Time	Final Cleaning N	Spray / SKC-D
	10 Min	I mai oleaning i	Spray & Wipe
Reference		See Attachment	Results of Inspection
PT (uns performed on T-569's two to-couples. (11/12") Root passes.	' new	No Relevant indications were found at the fine of this inspection.
	Rec	quested By:	Reported By (Technician):
		Soel Cadson	F. Gonzales / S. Suita
		Customer Specifications	NDT Supervisor:
		Accept Reject	Caleb Morgan

NOTICE



N.D.E. REQUEST FORM

Welder I.D.	Drawing Number/	N.D.E.	Pipe	INCEL O	T	<u>S</u>	7	
2101	Line Number	Required UT/PT/RT Brinell/ PMI	Size	Weld Map	Pipe Spac	Code Work Y/N	Moc Required Y/N	Location of Welds/piping spo
	PRE-CUT	107	1-1/2"	NO				, , , , , , , , , , , , ,
	ROOT PASS	PT	1-1/2"	146				Two-1-1/2" THERING-COU
	FINAL	PT	1-1/2"	140		-		(1)
			1-14	142				11
	Comments:			<u> </u>				

	Notes: Please attach weld map work , and any associated		. 5					
	work , and any associated drawing with request		٠,5					

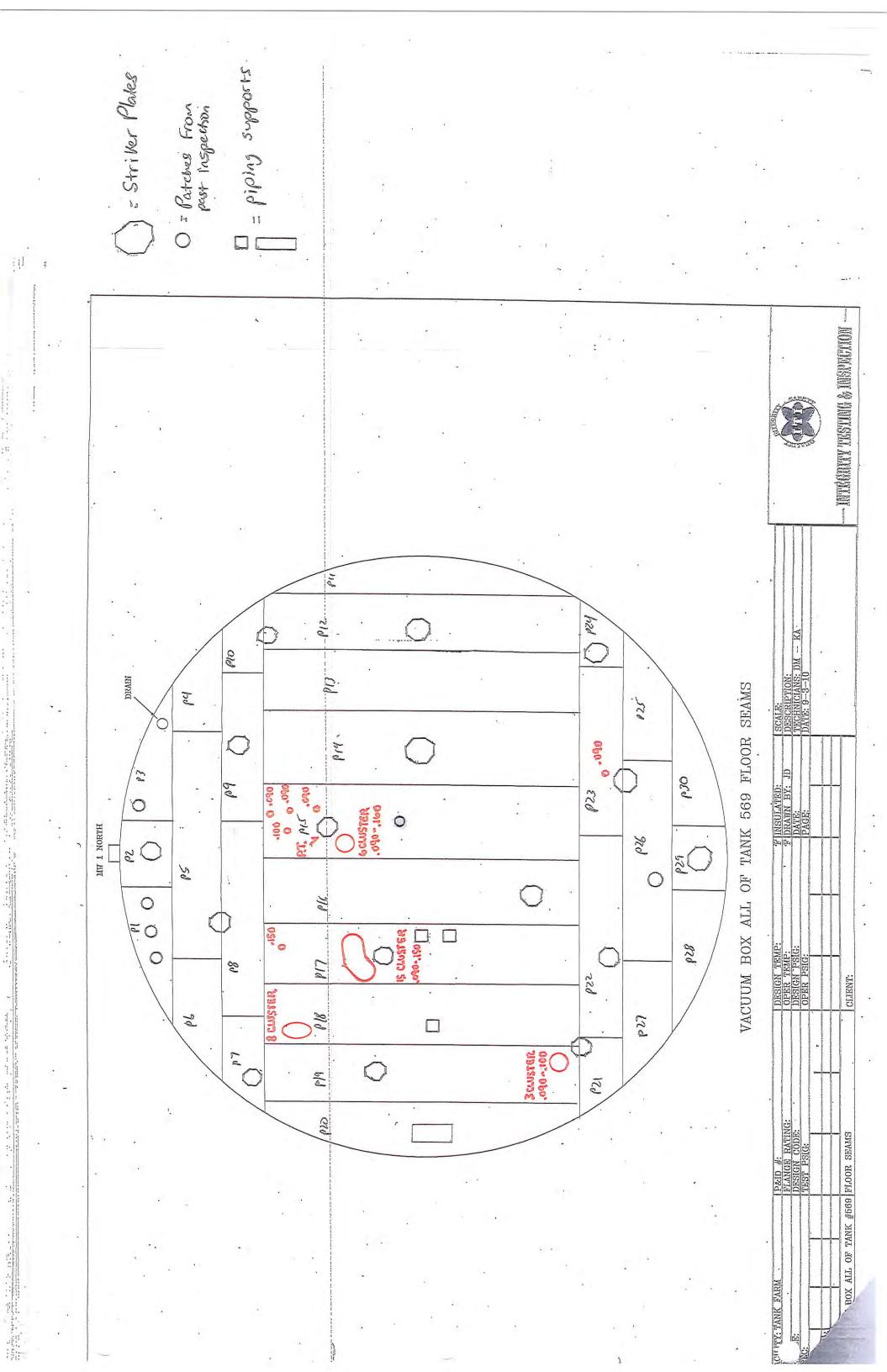


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— INTEGRITY TESTING & INSPECTION —

LIQUID P	ENETRAN	NT EXAMIN	IATION REF	PORT				☐ Nuclea	r 🗸 Non-Nucl	
To WESTERN	I/RMF					From V.Willie/J.Mo	organ	Date 07/20/2017		
Project										
Performed	I PT Finals	on Weld B	uild Up Tank	569 Interr	nal Floor P	lates				
Work Order#						ntegrity Testing Job No. 2017-0133				
Item	Weld	Structural	Casting	Machinery	Mach. Parts		N/A	Other:		
	Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other:		
Material	Size Va	rious	No. of Pieces 39		Base Metal	Type of Filler		Weld Smooth	☐ N/A ☑ As Welded	
Location	Location JAMESTO	OWN, NM				System Tank Farm				
Acceptance S	tandards					Procedure				
API 653						QCP-400 Re	ev 7			
Type of Check	Initial	Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final 🗸	
		1	Color Contrast			Fluoresc	ent Penetrant			
Type of Inspection	Pre-Test Cle	ansing Method	/ Solution		Penetrant Appli	cation Met	hod / Penetrant	-		
		Vipe / SKC			Spray / SKL					
		emoval Method			Penetrant Time		nt Specimen / St	urface Temperature		
	Wipe/ SK	C-5			20 Min	Ambie		1		
	Penetrant En	nulsifier Method	d / Emulsifier		11.17 3.17.1		thod / Developer			
	N/A				Spray / SKC					
	Developing T	ime			Final Cleaning N		olution			
	10 Min					Spray & Wip	е			
	PT Final o	on Weld Bui PT testing	ld Up on Flo	or Plates i		ee Attachment	NO RE		DICATIONS FOUND NSPECTION.	
					Requested By	stensen		Reported By (T	lorgan	
						r Specifications		NDT Superviso		
					✓ Accept	Reject		Caleb Morg	an	

NOTICE



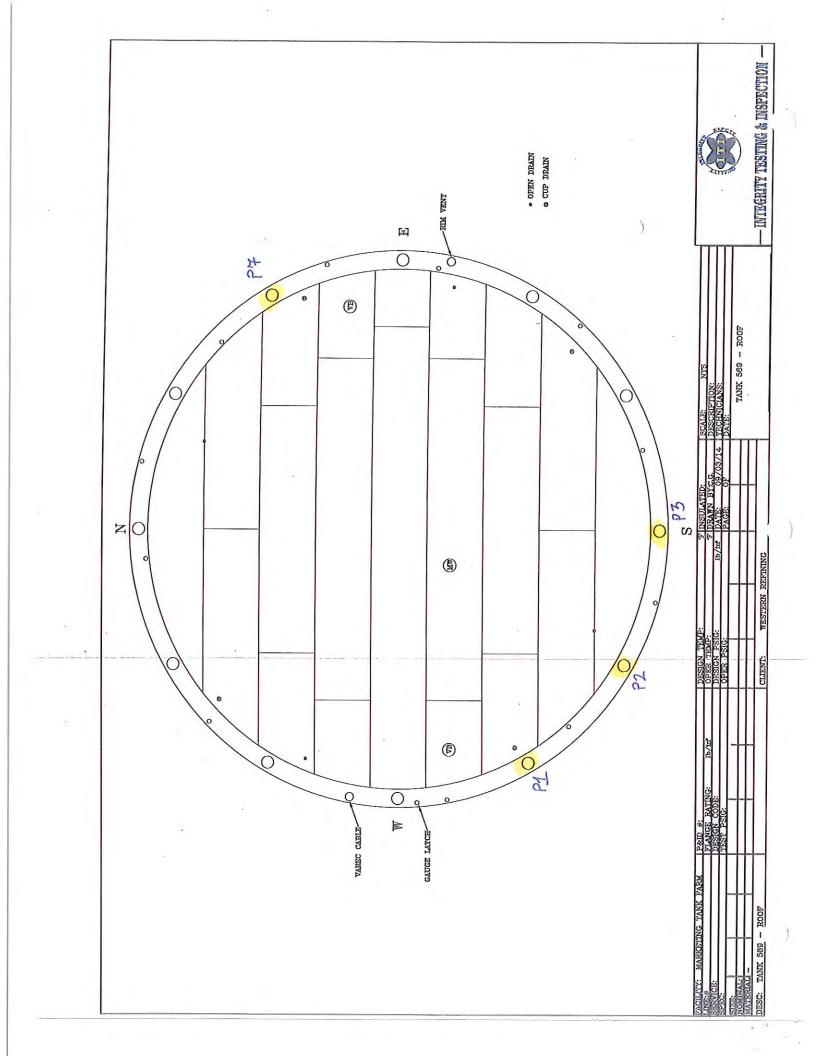


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— INTEGRITY TESTING & INSPECTION —

To WESTERN REFINING/RMF Project PT Internal Vertical Weld Repairs in Tank 569 Pontoons Contract No. or Purchase Order No. Integrity Testing Job No.	LIQUID P	ENETRAN	TEXAMIN	IATION REF	PORT				☐ Nuclea	ar 🗸	Non-Nuclea
Project PT Internal Vertical Weld Repairs in Tank 569 Pontoons Contract No. or Purchase Order No. Item Weld Structural Casting Machinery Mach. Parts Pipe N/A Other: N/A Non-Weld Plate Pipe Bar Casting Mach. Parts N/A Other: N/A Material Size No. of Pieces Type of Base Metal C/S C/S System Location Western Refining Jamestown NM Tank Farm Acceptance Standards Customer Spec. Type of Check Pre-Test Cleansing Method / Solution Type of Inspection Type of Inspection Type of Developing Time Penetrant Emulsifier Method / Emulsifier Developing Time Reference: Y See Attachment Performed Liquid Penetrant Testing on the repair welds for Internal Vertical Integrity Testing Job No. 2017-0136 Author Contract Pipe N/A Other: N/A Other: N/A Other: N/A N/A Other: N/A Other: N/A N/A N/A System Tank Farm Procedure PT-QCO-400 Rev 8 PT-QCO-400 Rev 8 PT-QCO-400 Rev 8 Penetrant Application Method / Penetrant Penetrant Application Method / Penetrant Spray / SKL-SP1 Penetrant Emulsifier Method / Emulsifier Developer Application Method / Developer Spray / SKC-D Final Cleaning Method / Solution Spray & Wipe Reference: Y See Attachment Results of Inspection No Relevant Indications Found at 1	То						From		Date	11.	
Contract No. or Purchase Order No. Integrity Testing Job No.	WESTER	N REFINING	G/RMF				J.Morgan/V	.Willie		07/27/2017	
Integrity Testing Job No. 2017-0136	Project										
Type of Initial Plate Edge In Process Back Gouge Root Pass Repair Cleaning Method / Solution Spray & wipe / SKC-S Spray / SKC-S Spray / SKC-S Spray / SKC-D	PT Interna	I Vertical W	leld Repair	s in Tank 56	9 Pontoon	IS					
Item	Contract No.	or Purchase O	rder No.			Integrity Test	ing Job No.	,-			
Item								201	7-0136		
Material Size	Item		Structural	Casting	Machinery		Pipe	N/A			
Various 5 C/S C/S System Location Western Refining Jamestown NM Acceptance Standards Customer Spec. Type of Gheck Type of Initial Plate Edge In Process Back Gouge Root Pass Repair 24 Hr. 7 Day Final Various Fluorescent Penetrant Pre-Test Cleansing Method / Solution Spray & wipe / SKC - S Penetrant Removal Method / Remover Wipe/ SKC-S Penetrant Emulsifier Method / Emulsifier NA Developing Time Reference: Various 5 C/S System Tank Farm Procedure Procedure Pr-QCO-400 Rev 8 Procedure Pr-QCO-400 Rev 8 Fluorescent Penetrant Pluorescent Penetrant Penetrant Application Method / Penetrant Spray / SKL-SP1 Penetrant Application Method / Penetrant Specimen / Surface Temperature 20 Min Ambient Developer Application Method / Developer Spray / SKC-D Final Cleaning Method / Solution Spray & Wipe Results of Inspection Performed Liquid Penetrant Testing on the repair welds for Internal Vertical No Relevant Indications Found at Testing Process Spray / No Relevant Indications Found at Testing Process Spray / No Relevant Indications Found at Testing Process Spray / No Relevant Indications Found at Testing Process Spray / No Relevant Indications Found at Testing Process Spray / Skc-D Spray & Wipe Reference: Security Spray / Skc-D Procedure Proce		Non-Weld		Pipe	Bar	Casting	Mach. Parts	N/A	Other:	N/A	
Western Refining Jamestown NIM Acceptance Standards Customer Spec. Type of Gheck Type of Ghe	Material		ious	Service Control of the Control of the	30 30 50 70 70 70 70 70 70 70 70 70 70 70 70 70			Material			ded
Acceptance Standards Customer Spec. Type of Gheck Type of Gheck Type of Gheck Type of Gheck Type of Gheck Type of Gheck Type of Gheck Type of Gheck Type of Gheck Type of Gheck Type of Gheck Type of Gheck Type of Gheck Type of Type of Inspection Type of Type of Type of Inspection Type of Type	Location		Aug Confer	U - UA - U-1 - 1 - 1 - 1							
Type of Check			ketining Ja	mestown NN				3 2			
Type of Check Initial Plate Edge In Process Back Gouge Root Pass Repair 24 Hr. 7 Day Final Imitial Plate Edge In Process Back Gouge Root Pass Repair 24 Hr. 7 Day Final Imitial Plate Edge In Process Back Gouge Root Pass Repair 24 Hr. 7 Day Final Imitial Plate Edge In Process Back Gouge Root Pass Repair 24 Hr. 7 Day Final Imitial Plate Edge In Process Back Gouge Root Pass Repair 24 Hr. 7 Day Final Imitial Plate Edge In Process Back Gouge Root Pass Repair 24 Hr. 7 Day Final Imitial Plate Edge In Process Back Gouge Root Pass Repair 24 Hr. 7 Day Final Cleanity Final Cleanity Final Cleanity Final Cleanity Final Cleanity Final Cleanity Final Cleanity Final Cleanity Method / Penetrant Specimen / Surface Temperature Penetrant Emulsifier Method / Emulsifier Penetrant Time Penetrant Time Penetrant Specimen / Spray / SKC-D Developing Time Developer Application Method / Developer Spray / SKC-D Final Cleaning Method / Solution Spray & Wipe Penetrant Testing On the repair welds for Internal Vertical No Relevant Indications Found at Testing Penetrant Testing On the repair welds for Internal Vertical No Relevant Indications Found at Testing Penetrant Testing P							a contract of the contract of				
Color Contrast	1000		DI L E L	T. B.	D 10	5 15					
Type of Inspection Penetrant Removal Method / Solution Spray & wipe / SKC - S Spray / SKL-SP1 Penetrant Removal Method / Remover Wipe/ SKC-S Penetrant Emulsifier Method / Emulsifier Developer Application Method / Developer NA Spray / SKC-D Developing Time Penetrant Time Penetrant Specimen / Surface Temperature 20 Min Ambient Developer Application Method / Developer Spray / SKC-D Final Cleaning Method / Solution Spray & Wipe Reference: See Attachment Results of Inspection No Relevant Indications Found at Temperature No Results of Inspection No Relevant Indications Found at Temperature No Results of Inspection No Relevant Indications Found at Temperature No Results of Inspection No Relevant Indications Found at Temperature No Results of Inspection No Relevant Indications Found at Temperature No Results of Inspection No Relevant Indications Found at Temperature No Results of Inspection No Relevant Indications Found at Temperature No Results of Inspection No Relevant Indications Found at Temperature No Results of Inspection No Relevant Indications Found at Temperature No Results of Inspection No Relevant Indications Found at Temperature No Results of Inspection No Relevant Indications Found at Temperature No Results of Inspection No Relevant Indications Found At Temperature No Results of Inspection No Relevant Indications Found At Temperature No Results of Inspection No Relevant Indications Found At Temperature No Results of Inspection No Relevant Indications Found At Temperature No Results of Inspection No Relevant Indications Found At Temperature No Results of Inspection No Relevant Indications Found At Temperature No Results of Inspection No Relevant Indications Found At Temperature No Results of Inspection No Relevant Indications Found At Temperature No Results No Relevant Indications Found At Temperature No Results No Relevant Indications Found At Temperature No Results No Relevant Indications Found At Temperature No Results No Results No Results No Results No Results No Results No Results No Results No	Control of the Control	Initial	Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day		<u>-</u>
Type of Inspection			Color Contrast		Fluoresc	ent Penetrant					
Penetrant Removal Method / Remover Wipe/ SKC-S Penetrant Emulsifier Method / Emulsifier NA Developing Time Penetrant Emulsifier Penetrant Emulsifier NA Developing Time Penetrant Time 20 Min Developer Application Method / Developer Spray / SKC-D Final Cleaning Method / Solution Spray & Wipe Performed Liquid Penetrant Testing on the repair welds for Internal Vertical No Relevant Indications Found at Testing on the repair welds for Internal Vertical		Pre-Test Clea	/ Solution	Penetrant Applic	ation Met	hod / Penetran	t				
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	Reference:					✓ s	ee Attachment	Results	of Inspection		
Weld Seams in Pontoons for Tank 569. PT'ed the Vertical Welds seams inside of Inspection. Pontoons 1, 2, 3, and 7.	Weld Sean	ns in Ponto	ons for Tai							ations Four	nd at Time
										Control of the same	
Requested By: Reported By (Technician): Grant Christensen J.Morgan/V.Willie						Francisco Company					
Requested By: Grant Christensen Gustomer Specifications Reported By (Technician): J.Morgan/V.Willie NDT Supervisor:						✓ Accept	Reject		Caleb Morg		

NOTICE:







83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

INTRODUCTION

Western Refining contracted with Sentinel Integrity Solutions to provide API 653 Inspection Services for 83 Unleaded Gasoline Storage Tank # TK-570. The tank is located at the Western Refining Facility in Gallup, New Mexico.

The API 653 Inspection Services included:

- MFL of the Bottom Floor Plates with Ultrasonic Thickness prove-up (verification)
- Vacuum Box of the Bottom Lap and Corner Welds
- Ultrasonic Thickness of the Floor
- Ultrasonic Thickness of the Shell in accessible areas
- Ultrasonic Thickness of the Nozzles
- Ultrasonic Thickness of the Floating Roof
- Ultrasonic Thickness of the Roof Pontoons
- Ultrasonic Thickness of the Roof support legs

This report documents the findings of the API 653 Internal / External Inspections performed on March 25, 2015.

Sentinel Integrity provided the following personnel:

API 653 Inspector – Keith Angell API 653 Cert # 30340

NDE Level II – Jesse Tennyson NDE Level II – Justin Jimenez





83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

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83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

API 653 INTERNAL INSPECTION SUMMARY

TANK SPECIFIC

Tank Number	<u>TK-570</u>
Owner	Western Refining
Product Storage	83 Unleaded Gasoline
Specific Gravity	0.80
Nameplate Present	Yes
Operating Temperature (F)	<u>Ambient</u>

DIMENSIONS

Diameter	<u>67 ft.</u>
Height	40 ft.
Capacity (nominal)	25,000 bbls
Safe Fill Height	36 ft. (assumed)

CONSTRUCTION DATA

Year Built /	1957
Design Standard	API
Secondary Containment	<u>NO</u>
Foundation	Earthen
Bottom & Material	Lap Welded-Carbon Steel
Shell & Material	Butt Welded- Carbon Steel
Fixed Roof & Material	N/A
Floating Roof & Material	Lap Welded-Carbon Steel





83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

2.0 NDT INSPECTION

2.1 NDT Inspection Scope

- A. MFL was performed on the entire bottom in all accessible areas. Performed in accordance with Sentinel Integrity Solutions UT Procedure SIS-MF-001.
- B. Ultrasonic Thickness measurements (UT's) were taken every one foot along the floor circumference and within two (2) inches of the corner weld as recommended by Western Refining. As requested UT Scrubs were not performed in these locations. UT's performed in accordance with Sentinel Integrity Solutions UT Procedure SIS-UT-001.
- C. Vacuum Box Testing was performed to the bottom lap welds and internal corner welds. Performed in accordance with Sentinel Integrity Solutions Vacuum Box Procedure SIS-VB-001.
- D. Visual inspection (VT) of areas for the detection of anomalies, corrosion, peaking, banding, distortions, welding or other items that would affect the mechanical integrity. Performed in accordance with Sentinel Integrity Solutions Visual Procedures SIS-VT-001 and SIS-VT-002.
- E. Random UT's on the shell, shell nozzles, floor plates, roof plates, roof pontoons, and roof support legs. Performed in accordance with Sentinel Integrity Solutions UT Procedure SIS-UT-001.

3.0 FINDINGS AND RECOMMENDATIONS

Preliminary Deficiencies with Recommendations in bold:

Mechanical Inspection

- 1. Indications below the threshold of 0.100" were found in the bottom floor plates of the tank. Two (2) areas were found with through wall holes measuring ¼" in diameter. Given the location it appears to be the same areas that were drilled and repaired with epoxy back in August of 1994. The previous repairs were not performed per code.
 - Weld repair the holes and surrounding corroded areas.
 - Grind the repaired areas flush.
 - Perform magnetic particle or liquid penetrant examination followed by a vacuum box test.
 - In addition (recommended but not required) install a 0.25" welded-on patch pate per API 653 guidelines.
 - An additional option would be to take a floor sample from this location and repair per API 653 guidelines.





- 2. Visually the floor had a generally rough surface with corrosion throughout measured up to 0.080" in depth. A previous inspection noted the same general corrosion with scattered pitting measuring up to 0.120" in depth. The full extent of the corrosion depths could not be determined visually due to the internal coating that filled in the corroded/pitted voids. Ultrasonic Thickness measurements were taken on each floor plate at five points, one at each corner and one in the center. The thickness readings ranged from 0.201" to 0.248". There were three (3) locations from the MFL prove-up that had lower thickness readings. These measurements were 0.176", 0.172" and 0.155".
 - Based on the current inspection findings and past history it was recommended to cut 6" in diameter coupon sections from the floor in each quadrant and one location from the center of the tank to inspect for soil-side corrosion. Repair the areas per API 653 guidelines.
- 3. The internal paint coating on the floor and shell was compromised. There were several areas with blistering, cracking and flaking. Moisture was seen leaching out of the paint blisters. There were small areas of paint damage where you could see the floor base metal.
 - Renew the internal coating on the floor and the bottom shell course.
 - After the coating is removed, visually reassess the condition of the floor. Excessive coating thickness along with the general surface roughness could have potentially masked findings.
- 4. Both the vacuum breakers and the pipe guides have heavy external corrosion at the liquid level. The ends of the piping are knifed-edge.
 - Replace the vacuum breakers, seals and guides in kind.
- 5. The internal pontoons were not attached to the floating suction line. The pontoons were free to float around the tank during service and the suction line could not be operated as intended.
 - Install the pontoon or remove the pontoon and suction line if no longer in use by operations.
- 6. Three (3) of the striker pads located under the roof support legs had severe corrosion where the legs come into contact with the pads. The corrosion on one of the pads measured 0.375" in depth.
 - Weld repair or install a patch plate over the corroded areas.
- 7. The holes in the shell for nozzles N5 and N6 (level gauge) and nozzle N1 (sample point) are only ¼" in diameter and were plugged. The holes in the shell were not adequate for its intended purpose and can become obstructed easily. This would make it difficult to draw samples or utilize the level gauge.
 - Enlarge the openings in the shell to the inside diameter of the couplings.
- 8. On nozzles N1, N5, N6 and N7 the pipe nipples between the shell nozzles/couplings and the first block valve had threaded connections and were not seal welded. There were approximately ten (10) 3/8" threaded plugs throughout the tank shell that were not seal welded.
 - Based on the service it was recommended to seal weld all threaded connections.





- 9. The secondary roof seal had missing and loose hardware throughout.
 - Replace all loose and missing hardware on the seal.
 - Perform a new seal inspection once the tank is back in service.
- 10. The three (3) old style roof drains with internal catch pans were blinded off and no longer in service. The tank has a center roof drain along with three (3) emergence roof drains.
 - Remove the old roof drains that are no longer in service. This will eliminate any future problems that may arise.
- 11. The three (3) emergency roof drains are open to the atmosphere with no covering.
 - The three (3) emergency roof drains need to be sealed with a slit fabric seal or similar device that covers at least 90% of the openings. This will reduce the product-exposed surfaces from rain water.
- 12. The base plates under the suction piping swing joint and the inlet "Y" were not seal welded. Access under the base plates were not made available for inspection at the time of this report.
 - It was recommended to remove the base plates for inspection. These areas still need to be evaluated. An opportune time would be during the internal coating of the floor.





83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

4.0 SCOPE

API 653 Internal inspection was performed on the Tank. Inspection included MFL of the bottom with UT prove-up, UT readings on the shell, shell nozzles, floating roof, roof support legs and roof pontoons. The Internal inspection and evaluation of the tank floor, shell, floating roof, foundation, and appurtenances was performed in accordance with following codes, standards, and specifications. An Out-of-Service Checklist was performed per API 653 and can be found in this report.

- API 653 2012 Addendum 2; "Above Ground Storage Tank Inspection, Repair, Alteration, and Reconstruction"
- API 650 Eleventh Edition; "Welded Steel Tanks for Oil Storage"
- API 575 Second Edition; "Inspection of Atmospheric and Low-Pressure Storage Tanks"
- OSHA 29 CFR 1480.119 (J) (4); "Process Safety Management of Highly Hazardous Chemicals; Inspection and Testing of Process Equipment"

Internal inspection was performed after the tank was cleaned and gas freed. All Western Refining's and Sentinel's Safety Procedures for confined space entry were followed.

4.1 Prior History

- > 1998: New center roof deck (primary deck)
- > 1995: Last internal inspection performed with no record of UT or MFE
- ➤ 2002: New roof seal and roof drain system installed
- ➤ 2014: Last external inspection performed along with UT survey on shell
- ➤ 2012: 5 year primary seal inspection performed
- ➤ 2013: Annual secondary seal inspection performed

4.2 Access

The tank was internally inspected by ingress / egress through the 24" Shell manway and access manway on the floating roof. Access was not granted internally on the roof pontoons during this inspection. The external shell was inspected by walking around the tank and going up the attached stairway.





83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

5.0 TANK BOTTOM

The tank bottom is Carbon Steel with the nominal thickness of 0.250" when constructed. The tank bottom plates were inspected with MFL and UT prove-up along with a visual inspection. MFL of the bottom did reveal two (2) areas that were below the threshold of 0.100". These two (2) areas had through wall corrosion that could visually been seen. In addition to the holes there were three (3) areas found below 0.200". The UT prove-up verified the remaining wall thickness to be 0.155", 0.172" and 0.176".

The vacuum box of the internal corner weld and bottom lap welds was performed with no leaks noted.

Visually the floor had a generally rough surface with corrosion throughout measured up to 0.080" in depth. A previous inspection noted the same general corrosion with scattered pitting measuring up to 0.120" in depth. The full extent of the corrosion depths could not be determined visually due to the internal coating that filled in the corroded/pitted voids.

Three (3) of the striker pads located under the roof support legs had severe corrosion where the legs come into contact with the pads. The corrosion on one of the pads measured 0.375" in depth. It was recommended during the outage to weld repair or install a patch plate over the corroded areas.

Ultrasonic Thickness measurements were taken on each floor plate at five points, one at each corner and one in the center. The thickness readings ranged from 0.201" to 0.248". UT measurements were also taken next to the floor to shell corner weld at one foot intervals. The lowest thickness measurement obtained was 0.234".

The internal paint coating on the floor was compromised. There were several areas with blistering, cracking and flaking. Moisture was seen leaching out of the paint blisters. There were small areas of paint damage where you could see the floor base metal.

No buckling, or bulging of the floor was observed. The external chime was flat with no distortion.

Bottom Calculations were performed and specified that if all areas are repaired per this report recommendations the tank meets the requirements of API 653 to obtain a 20 year run cycle.

API 653 Bottom Calculations revealed the tank is due for Internal Inspection 3/1/2035 – ATTACHED.





83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

6.0 FOUNDATION

The foundation was found in overall good condition. There was one location at the 24" shell manway that had a void under the manway and external chime. This area is used for collection during tank cleaning utilizing a barrel that's installed under the manway. No recommendations were required to repair/ fill in this void. A differential settlement survey was not requested or performed during this tank outage. Last survey was performed July of 2014.

7.0 SHELL

7.1 Shell Plate

There was no original construction drawings for the shell provided during this inspection. Based on the inspection history it appears the nominal thickness of the shell courses when constructed were as follows; 1st shell course 0.375", 2nd course 0.313" and 3rd, 4th and 5th course 0.250".

There were approximately ten (10) 3/8" threaded plugs throughout the tank shell. Considering the process service and to prevent any future leakage it was recommended to seal weld the plugs during this outage.

Externally the shell coating was in overall fair condition. There were several areas of general coating failure on the projection plate, scattered areas on shell courses, shell support brackets for the Varec and foam line, nozzle necks, and wind girder. Recommendation was to evaluate coating condition during the next scheduled external inspection interval.

Internally the paint coating on the shell was compromised. Based on the floor condition and past history it was recommended the costing be renewed internally on the bottom shell course.

Ultrasonic Thickness readings were taken on the shell courses at accessible locations. The UT's were taken in the same locations as the July 2014 survey. The readings were comparable to the previous survey. The same thinning was noted on the 2^{nd} and 3^{rd} shell courses. It was recommended to continue to monitor these areas; no repairs were required at the time of inspection.

Visual inspection of the shell found the shell plates to have no peaking and banding at the welds.

API 653 Shell Calculations revealed the tank is due for Formal External Inspection 3/16 -ATTACHED

API 653 Shell Calculations revealed the tank is due for Shell UT Inspection 3/16 - ATTACHED





83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

7.2 Shell Nozzles/Internal piping

The holes in the shell for nozzles N5 and N6 (level gauge) and nozzle N1 (sample point) are only ¼" in diameter and were plugged. The holes in the shell were not adequate for its intended purpose and can become obstructed easily. This would make it difficult to draw samples or utilize the level gauge. It was recommended during the outage to enlarge the openings in the shell to the inside diameter of the couplings.

On nozzles N1, N5, N6 and N7 the pipe nipples between the shell nozzles/couplings and the first block valve had threaded connections and were not seal welded. It was recommended during the outage to seal weld the threaded connections.

The base plates under the suction piping swing joint and the inlet "Y" were not seal welded. Access under the base plates were not made available for inspection at the time of this report. It was recommended during the outage to remove the base plates for inspection.

The internal pontoons were not attached to the floating suction line. The pontoons were free to float around the tank during service and the suction line could not be operated as intended. It was recommended during the outage to Install the pontoons or remove the pontoons and suction line if no longer in use by operations.

7.3 Shell Appurtenances

The support clips along with the foam line and Varec had paint failure with surface oxidation. One of the clips attachment welds has broken loose. These clips and lines should be painted to prevent further corrosion. The support clip with the broken attachment weld should be repaired or one of the additional clips not in use should be installed in its place.

7.4 Rolling Ladder/Stairway

The tank has an attached stairway that and a rolling ladder for roof access. The ground wire for the rolling ladder was attached with no issues. There were no adverse conditions found on the ladder or stairway.





83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

8.0 FLOATING ROOF

Access to the roof was made from inside the tank utilizing the roof manway. The coating on the roof had areas coating failure. Recommendation was to keep debris off the roof. This will help keep roof drain clear and prolong the life of the roof. The underside of the plates and associated components were inspected from the floor of the tank. The underside had complete coating failure with a light surface oxidation.

Ultrasonic Thickness measurements were taken on each roof plate at five points, one at each corner and one in the center. The thickness readings ranged from 0.134" to 0.180". Visual inspection of the lap welds found the welding to be full profile with no defects or discontinuities.

8.1 Roof Nozzles

Both the vacuum breakers and the pipe guides had heavy external corrosion at the liquid level. The ends of the piping were knifed-edge. It was recommended during the outage to replace the vacuum breakers, seals and guides in kind.

The three (3) old style roof drains with internal catch pans were blinded off and no longer in service. The tank has a center roof drain along with three (3) emergence roof drains. It was recommended during the outage to remove the old roof drains that are no longer in service. This will eliminate any future problems that may arise.

The three (3) emergency roof drains were open to the atmosphere with no covering. It was recommended during the outage that the emergency roof drains need to be sealed with a slit fabric seal or similar device that covers at least 90% of the openings. This will reduce the product-exposed surfaces from rain water.

8.2 Roof Pontoons

Internal access was not granted at the time of this inspection report. Externally the paint coating was in overall satisfactory condition for continued service. Internally the coating condition on the pontoons was at complete failure with heavy surface oxidation and scale approximately 0.100" thick in some areas. Ultrasonic Thickness measurements were taken on each pontoon from inside the tank. The thickness measurements ranged from 0.143" to 0.204". Ultrasonic Thickness measurements were taken on each pontoon (topside) at five points, one at each corner and one in the center. One thickness reading was 0.116" and the remaining thickness readings ranged from 0.133" to 0.205".

8.3 Roof Support Legs

The roof legs had complete paint failure with a light surface oxidation. Ultrasonic Thickness measurements were taken on the support legs and the pipe guides. The thickness measurements on the legs ranged from 0.226" to 0.284" and the reading on the guides ranged from 0.123" to 0.281".



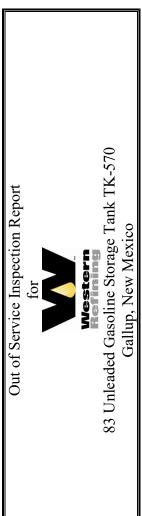


83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

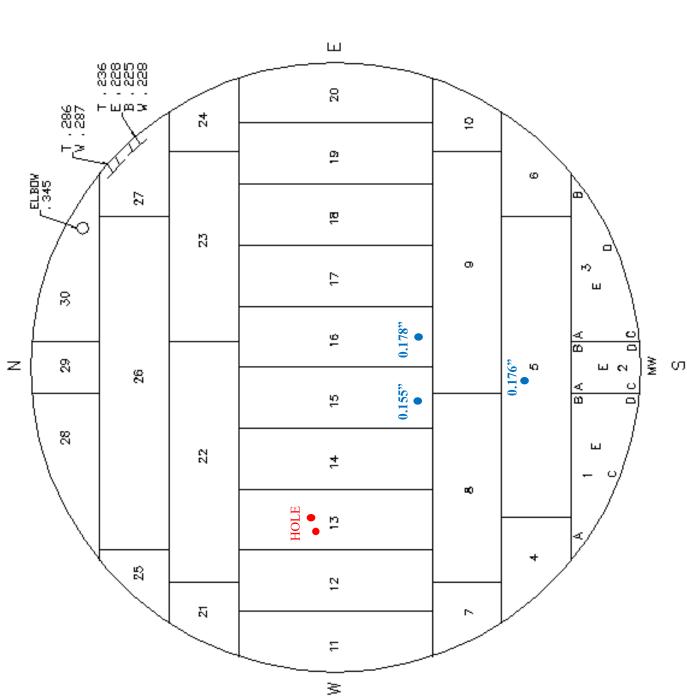
8.4 Roof Seals

The secondary roof seal had missing and loose hardware throughout. It was recommended during the outage to replace all loose and missing hardware on the seal. It was also recommended to perform new seal inspections after the tank is placed back into service. Excluding the missing and loose hardware the seals were found "as in new condition".





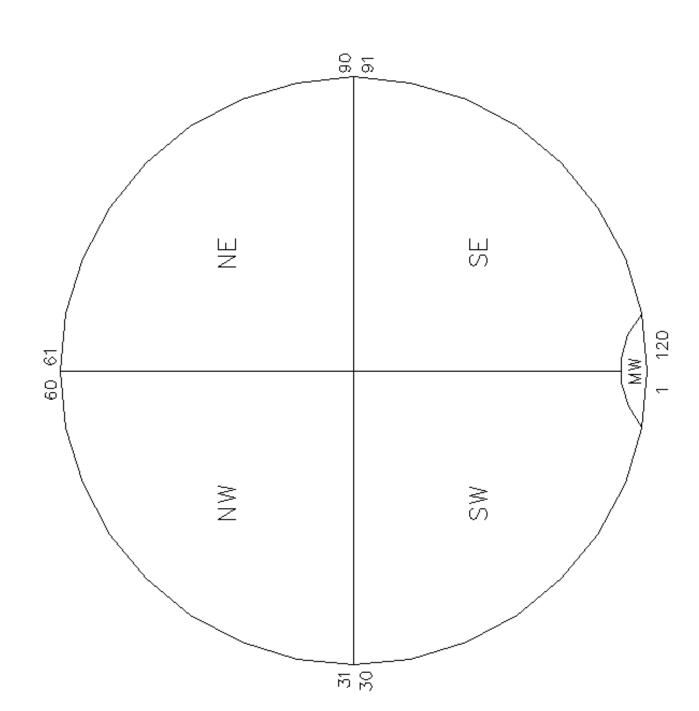
9.0 BOTTOM FLOOR DRAWING AND DATA



	CML	4	В	С	Q	Е
	1	0.244"	0.234"	0.233"	0.219"	0.246"
	2	0.231"	0.215"	0.212"	0.222"	0.224"
	8	0.237"	0.214"	0.239"	0.233"	0.239"
	4	0.238"	0.244"	0.237"	0.235"	0.242"
	2	0.250"	0.240"	0.241"	0.235"	0.248"
	9	0.238"	0.227"	0.218"	0.214"	0.228"
900	7	0.245"	0.238"	0.249"	0.238"	0.247"
ກູເ	8	0.234"	0.241"	0.237"	0.231"	0.248"
S S	6	0.245"	0.231"	0.246"	0.218"	0.243"
	10	0.202"	0.211"	0.214"	0.227"	0.221"
	11	0.244"	0.238"	0.238"	0.240"	0.241"
	12	0.237"	0.236"	0.247"	0.243"	0.231"
	13	0.235"	0.235"	0.235"	0.250"	0.215"
	14	0.208"	0.232"	0.246"	0.248"	0.232"
	15	0.223"	0.231"	0.244"	0.246"	0.232"
	16	0.232"	0.235"	0.235"	0.230"	0.223"
	17	0.227"	0.232"	0.235"	0.218"	0.221"
Ш	18	0.236"	0.242"	0.234"	0.220"	0.236"
	19	0.238"	0.236"	0.231"	0.220"	0.239"
	20	0.224"	0.220"	0.216"	0.222"	0.236"
	21	0.235"	0.234"	0.232"	0.241"	0.237"
	22	0.212"	0.231"	0.222"	0.231"	0.229"
_	23	0.232"	0.237"	0.233"	0.235"	0.240"
	24	0.225"	0.213"	0.222"	0.219"	0.201"
	25	0.220"	0.217"	0.221"	0.204"	0.216"
	56	0.220"	0.232"	0.221"	0.232"	0.221"
	27	0.242"	0.231"	0.242"	0.229"	0.232"
•	28	0.234"	0.220"	0.204"	0.228"	0.236"
1	53	0.226"	0.237"	0.231"	0.247"	0.237"
	30	0.230"	0.240"	0.239"	0.230"	0.240"



BOTTOM FLOOR DRAWING AND DATA (UT'S AT CORNER WELD) 9.1



1 2 8 4 3 5 6	0.677"	31	0.279"		"1000	,	-
				61	0.234	91	0.268"
	0.663"	32	0.286"	62	0.281"	92	0.292"
	0.298"	33	0.286"	63	0.288"	93	0.294"
	0.296"	34	0.294"	64	0.296"	94	0.256"
	0.328"	35	0.263"	9	0.299"	95	0.272"
	0.298"	36	0.263"	99	0.287"	96	0.273"
	0.281"	37	0.290"	67	0.294"	97	0.289"
	0.282"	38	0.276"	89	0.299"	98	0.270"
	0.288"	39	0.280"	69	0.295"	66	0.255"
10	0.299"	40	0.295"	20	0.279"	100	0.281"
11	0.298"	41	0.265"	71	0.296"	101	0.289"
12	0.297"	42	0.258"	72	0.278"	102	0.255"
13 (0.291"	43	0.265"	73	0.276"	103	0.264"
14	0.274"	44	0.293"	74	0.253"	104	0.275"
15	0.284"	45	0.267"	75	0.239"	105	0.293"
16	0.277"	46	0.292"	92	0.264"	106	0.264"
17 (0.278"	47	0.275"	77	0.238"	107	0.283"
18	0.299"	48	0.279"	78	0.280"	108	0.281"
19	0.269"	49	0.286"	79	0.252"	109	0.274"
20	0.286"	50	0.289"	80	0.234"	110	0.286"
21 (0.288"	51	0.260"	81	0.263"	111	0.259"
22	0.280"	52	0.280"	82	0.275"	112	0.275"
23 (0.289"	53	0.296"	83	0.274"	113	0.284"
24	0.280"	54	0.299"	84	0.281"	114	0.280"
25	0.266"	55	0.294"	85	0.272"	115	0.284"
26	0.268"	56	0.284"	98	0.291"	116	0.270"
27	0.265"	57	0.285"	87	0.292"	117	0.266"
28	0.269"	58	0.298"	88	0.270"	118	0.296"
29	0.265"	59	0.286"	88	0.269"	119	0.670"
30	0.290"	09	0.294"	06	0.282"	120	0.671"

Prairieville (225) 313-4617

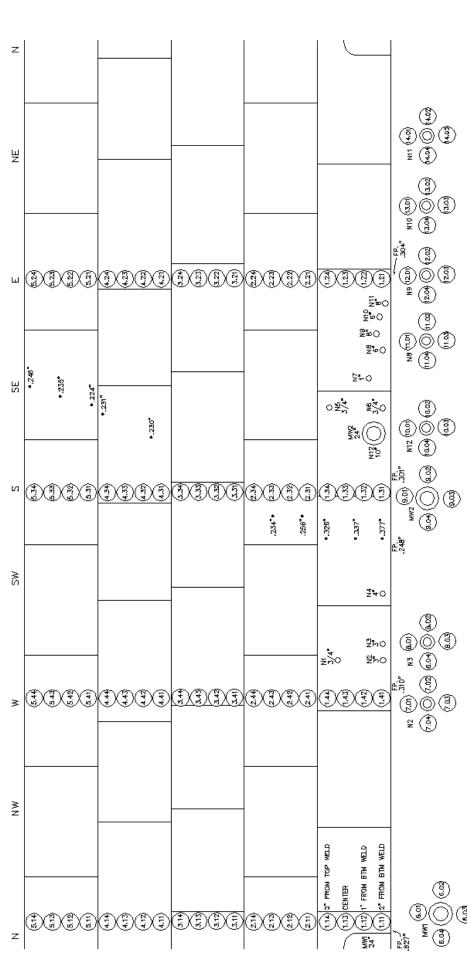
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Refining 83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

SHELL DRAWING AND DATA 10.0

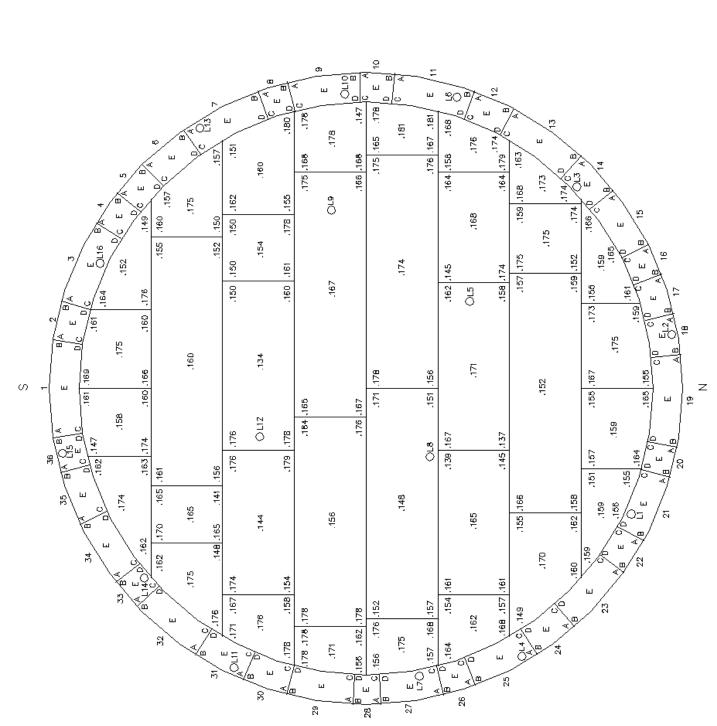


CML	READING	CML	READING
1.11	.365"	8.01	.283"
1.12	.348"	8.02	.288"
1.13	.347"	8.03	027
1.14	.331"	8.04	277
1.21	.290"	9.01	"498"
1.22	.319"	9.02	.485
1.23	.335"	9.03	.488"
1.24	.336"	9.04	"774"
1.31	.333"	11.01	868:
1.32	.342"	11.02	688:
1.33	.340"	11.03	068`
1.34	.355"	11.04	.370"
1.41	.343"	12.01	.474"
1.42	.343"	12.02	.467"
1.43	.338"	12.03	.434"
1.44	.345"	12.04	.458"
3.31	.207"	13.01	.392"
3.32	.194"	13.02	.389"
3.33	.188"	13.03	.361"
3.34	.205"	13.04	.391"
4.32	.202"	14.01	005
7.01	.212"	14.02	.483"
7.02	.220"	14.03	.495"
7.03	.228"	14.04	.479"
7.04	.214"		



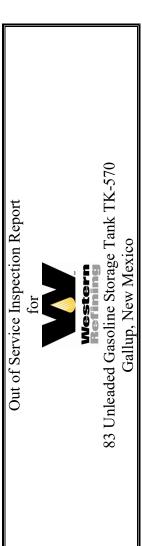
83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

11.0 FLOATING ROOF AND PONTOON DRAWING

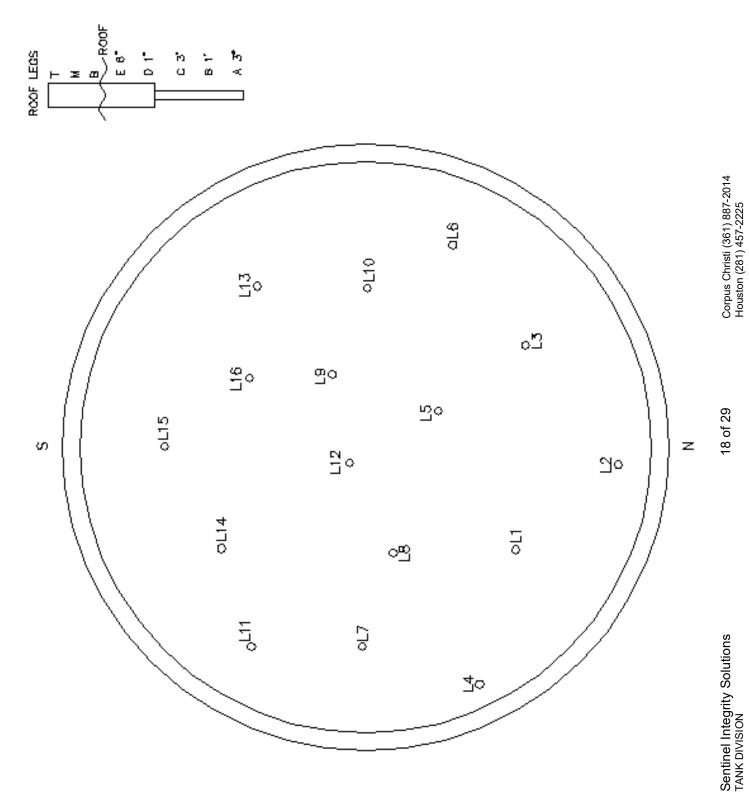


0.173"
0.177
0.174"
0.187"
0.186"
0.180"
0.181"
0.172"
0.179"
0.177"
0.190"
0.177"
0.200"
0.201"
0.194"
0.195"
0.189"
0.182"
0.196"
0.198"
0.172"
0.179"
0.170"
0.172"
0.187"
0.197"
0.201
0.205"
0.191
0.189"
0.200"
0.179"
0.177"
0.183"
0.13

Prairieville (225) 313-4617



12.0 ROOF SUPPORT LEG DRAWING



CML	Α	В	С	D	E
L1	0.280"	0.281"	0.251"	0.144"	0.151"
L2	0.258"	0.282"	0.236"	0.123"	0.124"
L3	0.253"	0.254"	0.226"	0.144"	0.154"
L4	0.262"	0.259"	0.253"	0.163"	0.153"
LS	0.243"	0.248"	0.238"	0.165"	0.139"
97	0.283"	0.253"	0.251"	0.159"	0.139"
L7	0.244"	0.267"	0.262"	0.142"	0.155"
R3	0.281"	0.270"	0.227"	0.155"	0.151"
67	0.243"	0.259"	0.253"	0.154"	0.130"
L10	0.235"	0.281"	0.277"	0.156"	0.140"
L11	0.248"	0.277"	0.270"	0.169"	0.147"
L12	0.244"	0.226"	0.262"	0.155"	0.159"
L13	0.253"	0.247"	0.250"	0.163"	0.132"
L14	0.261"	0.284"	0.281"	0.158"	0.152"
L15	0.281"	0.270"	0.275"	0.176"	0.170"
L16	0.274"	0.263"	0.264"	0.163"	0.151"





83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

13.0 **CALCULATIONS**

13.1 **Shell Calculations**

Visual Insp **3/25/2015** UT Insp. 3/25/2015 DATE: 3/25/2015

TANK: **TK-570** INSPECTOR: K. Angell BBLS: 25,000

TYPE OF ROOF: **EXT. Floating Roof** DATE BUILT: 1957

PRIOR UT INSP. (Yr.): 2014 SERVICE: 83 Unleaded Gasloline BUILT BY: Horton Tank & CBI LATEST UT INSP. (Yr.): 2015

VISUAL INSP. (Yr.): 2015

 $\cdot \ Minimum \ thickness \ - \ (min \ t) = 2.6 (H-1) DG \ / \ SE \\ \cdot \ Corrosion \ Rate = previous \ t \ - \ actual \ t \ / \ years \ between \ actual \ t \ and \ previous \ t$

· Remaining Life = actual t - t min / corrosion rate

- D = Nominal diameter of tank, in feet
- G = Highest specific gravity of the contents.
- E = Original joint efficiency for the tank
- H = Height, in feet, from the bottom in each shell course to the maximum design liquid level
- S = Maximum allow able stress in pounds per square inch.

Diameter
(D)
67

1	Joint Eff.
	(E)
	0.85

Gravity
(G)
0.8

	1st course	2 nd course	3 rd course	4 th course	5 th course
Tensile	55,000	55,000	55,000	55,000	55,000
T Stress	23595	23595	25960	25960	25960
Yield	30,000	30,000	30,000	30,000	30,000
Y Stress	24000	24000	26400	26400	26400
Allowable					
Stress (S)	23595	23595	25960	25960	25960
Height (H)	36.00	28.65	20.90	12.60	4.30
Course					
Height	7.35	7.75	8.3	8.3	8.3

Shell Course	UT Reading (inches)*	Previous Thickness (inches)	Corrosion Rate (inches)	Minimum Thickness (inches)	Remaining Life (Yrs.)	MAX FILL HEIGHT (FT)	Hydro Max Test Height (FT)	Visual External Due (Yrs.)	Shell Due for UT's (Yrs.)
First	0.29	0.306	0.01600	0.243	3	42.7	31.8	1	1
Second	0.25	0.256	0.00600	0.192	10	44.3	32.7	2	5
Third	0.194	0.199	0.00500	0.126	14	46.8	32.7	3	7
Fourth	0.202	0.204	0.00200	0.100	51	56.4	37.6	5	15
Fifth	0.246	0.25	0.00400	0.100	37	71.7	45.9	5	15

Shell is due for External Visual Inspection: 3/1/2016

Shell is due for UT Inspection readings: 3/1/2016

COMMENTS:

Recommend to take thickness readings in March of 2016.





83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

13.2 Bottom Calculations

MRT = (Minimum of RTbc or Rtip) - Or (StPr +UPr)

MRT = Minimum remaining thickness at the end of interval Or. This value must meet the requirements of API 653 Table 4-4 and Paragraph 6.4.2.

	0.25	Original plate thickness, in inches
RTbc	0.172	Minimum remaining thickness from bottom side corrosion after repairs
Rtip	0.13	Minimum remaining thickness from internal corrosion after repairs
	0.078	Maximum depth of underside pitting after repairs.
	0.12	Max depth of int. pitting after repairs are completed, in inches, measured from the orig. thickness
StPr =	0	Max internal pitting rate, in inches per year; StPr = 0 if the tank bottom is internally lined.
UPr =	0.00134	Max underside pitting rate, in inches per year; UPr = 0 if tank bottom is cathodically protected.
Or =	20	Anticipated in-service period of operation (normally 10 years).

MRT = 0.1031 Minimum remaining thickness at the end of the in-service period of operation, in inches.

Tank is due for Internal Inspection in

03/2035

COMMENTS: Bottom was MFL tested with a threshold of 0.100".

Table 4.4—Bottom Plate Minimum Thickness					
Minimum Bottom					
Plate Thickness at	Tank Bottom/				
Next Inspection	Foundation Design				
(in.)					
0.1	Tank bottom/foundation design with no means				
0.1	for detection and containment of a bottom leak.				
	Tank bottom/foundation design with means to				
0.05	provide detection and containment of a bottom				
	leak.				
	Applied tank bottom reinforced lining,				
0.05	> 0.05 in. thick, in accordance with				
	API 652.				





83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

14.0 TANK OUT-OF-SERVICE INSPECTION CHECKLIST

TANK OUT-OF-SERVICE INSPECTION CHECKLIST

TANK: TK-570

TANK DATA 2.0

Tank Capacity 25,000 bbls 67'-0" Ft/In Tank Diameter Tank Height 40'-0" Ft/In

Tank Type (Cone, Int Floater, Ext Floater External Floating Roof

Tank Construction (Welded or Riveted) WELDED Date of Tank Construction 1957 Floating Roof (Steel or Aluminum) C/Steel

Product Storage 83 Unleaded Gasoline

OVERVIEW 2.1

- a. Y Was the tank cleaned, gas freed, and safe for entry?
- b. <u>Y</u> Was the tank completely isolated from product lines, all electrical power, and steam lines?
- d. N Was there the presence of falling object hazards, such as corroded-through roof rafters, asphalt stalactites, and trapped hydrocarbons in unopened or plugged equipment or appurtenances, ledges, etc.?
- Were there any slipping hazards on the bottom and roof decks? e. N

2.2 TANK EXTERIOR

- Were appurtenances opened during cleaning such as lower floating swing sheave assemblies, nozzle interiors (after removal of a. <u>N</u> the valves) inspected? ALL VALVES NOT REMOVED
- b. <u>Y</u> Were UT measurements taken on the floating roof (5 readings on each plate) and nozzles and were these measurements accurately sketched?
- d. <u>Y</u> Were UT measurements taken on the shell and nozzles (each plate on the bottom course and one plate on each course up the radial ladder)? Were these readings accurately sketched? AS PER CLIENTS REQUEST.

2.3 **BOTTOM INTERIOR SURFACES**

- Were UT measurements taken on the tank bottom (5 reading on each plate) and were these measurements accurately sketched? a. Y Explain results: SEE ATTACHED DRAWING OF BOTTOM.
- b. <u>Y</u> Was a MFL floor scan performed on the tank bottom and the measurements recorded and sketched? Explain findings. SEE ATTACHED REPORT.
- c. Y With a flashlight held close to and parallel to the bottom plates, and using the bottom plate layout as a guide, was the entire bottom visually inspected and hammer tested?
- d. <u>Y</u> Was the depth of pitting measured and documented?
- Were the areas marked requiring patching or further inspection?
- e. <u>Y</u> g. <u>N</u> h. <u>Y</u> Were there any leaks or corrosion noted in the welds especially the shell-to-bottom welds? If yes, explain.
- Were there any signs of corrosion on the sketch plates? If yes, explain. SEE ATACHED FINDINGS
- k. Y Were the bottom lap welds vacuum box tested?
- m. <u>Y</u> Were there reinforcing pads under all bottom attached clips, brackets, and supports?
- u. <u>N</u> Were the sumps hammer tested and UT measurements taken on the bottom plate? Explain results. **BOTTOM NOZZLE** DIRECTLY WELDED TO FLOOR / NO SUMP WITH BOTTOM PLATE. UT'S TAKEN ON NOZZLE

2.4 SHELL SEAMS AND PLATE

- Was the depth of pitting measured on each course? Explain findings. SEE ATTACHED FINDINDS b. <u>Y</u>
- f. <u>Y</u> Were there any signs of damage, deterioration, and/or disbanding to the existing protective coating? If yes, explain. COATING AT FAILURE, SEE ATTACHED FINDINGS
- Were there indications of leakage in the shell plates or seams? If yes, explain. h. <u>N</u>
- Was the shell surveyed to check for roundness and plumb? NOT REQUIRED BY CLIENT k. <u>N</u>



for

83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

- 2.6 ROOF INTERIOR SURFACE
- 2.6.1 General
- Were there any holes, scale build up, and/or pitting on the underside surface of the plates? If yes, explain.
- a. <u>N</u> b. <u>Y</u> Was the vapor space of the floating roof and or at the edge of roof on a cone roof tank ultrasonically examined or hammer tested for thin spots?
- 2.11.3 **Shell Nozzles**
- Were there any signs of pitting and/or thinning on the shell nozzles? If yes, explain. a. <u>N</u>
- 2.12 **EMERGENCY ROOF DRAINS**
- a. <u>Y</u> Were seal fabric discs slightly smaller than the pipe ID and the fabric seal? NO FABRIC; SEE ATTACHED FINDINGS
- **Pontoon Inspection Hatches** 2.13
- a. N/A Did any pontoons show visual signs of leakage, after removal of inspection hatch cover? ACCESS WAS NOT GRANTED

NOTE: $Y = YES \quad N = NO$

PARTS OF THE CHECKLIST THAT WERE NOT APPLICABLE WERE NOT INCLUDED ON THIS LIST

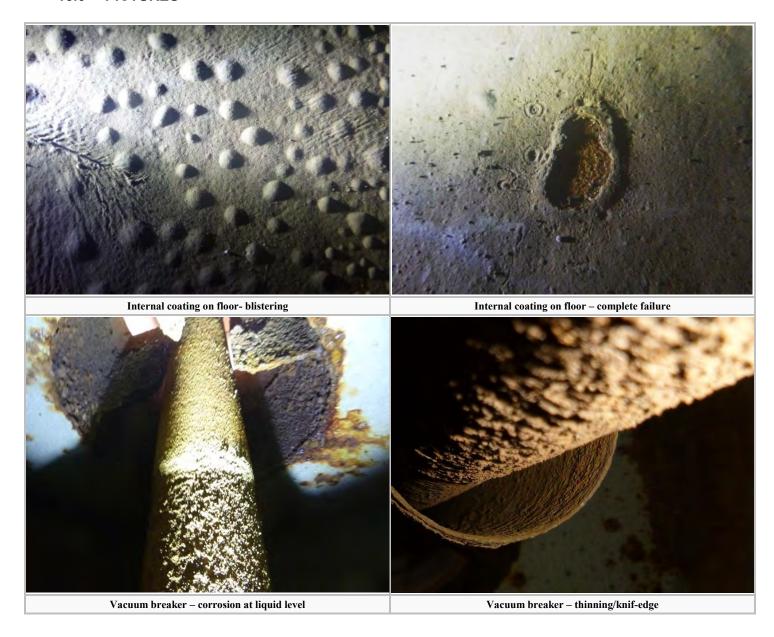
Inspector: Keith Angell Date: 3/30/2015





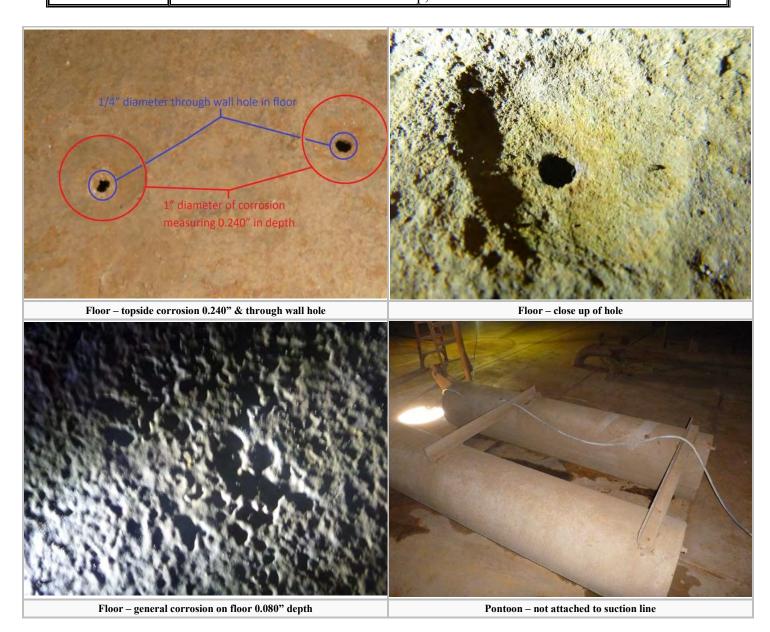
83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

15.0 PICTURES

















for Western



Roof Seal - loose and missing hardware.



Roof Seal - loose and missing hardware.



Swing Joint (Suction Line) - Support not seal welded



Swing Joint (Suction Line) - Close-up



for Western











for

83 Unleaded Gasoline Storage Tank TK-570 Gallup, New Mexico

16.0 INSPECTION EQUIPMENT

16.1 MFL

The MFL equipment utilized for the inspection was a MFE Enterprise Mark III MFL Machine. The calibration block utilized was the MFE Enterprise Calibration Plate.

16.2 Ultrasonic

The UT equipment utilized for the inspection was a Panametrics EPOCH XT Flaw Detector. The transducer utilized was a KBA Model FH2E-WR, 7.5 MHz, 0.375 inch dual element. The calibration block utilized was a 4 step, Carbon Steel test block.

Ultragel was used as a couplant.

16.3 Vacuum Box

The LT/BT equipment utilized for the inspection was a Uniweld Hummvac Tester, Series TSP 30FBFlex (Flat) and Corner Box.

16.4 PIT GAUGE

The pit gauge utilized was a W.R. Thorpe Co. standard pipe pit gauge.

17.0 WARRANTY

Sentinel Integrity Solutions, has appraised the condition of this tank based on the inspections and measurements made by the Sentinel Integrity Solutions' Tank Inspector. Whereas our evaluation correctly describes the condition of the tank and tank appurtenances at the time of inspection, the tank owner/operator has ultimate responsibility assessing the inspection information / report provided by Sentinel Integrity Solutions and any conclusions reached by the tank owner/operator and any action taken or excluded are the sole responsibility of the owner / operator. With respect to inspection and testing, Sentinel Integrity Solutions warrants only that the services have been performed in accordance with accepted industry practice. If any such services fail to meet the foregoing warranty, Sentinel Integrity Solutions shall re-perform the service to the same extent and on the same conditions as the original service.

The preceding paragraph sets forth the restricted remedy for claims based on failure or of defect in materials or services, whether such claim is made in contract or tort (including negligence) and however instituted, and, upon expiration of the warranty period, all such liability shall terminate. The foregoing warranty is exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. No implied warranty of merchantability or Fitness for Purpose shall apply, nor shall Sentinel Integrity Solutions be liable for any loss or damage whatsoever by reason of its failure to discover, report, repair or modify latent defects or defects inherent in the design of any tank inspected. In no event, whether a result of breach of contract, warranty or tort (including negligence) shall Sentinel Integrity Solutions be liable for any substantial or supplementary I damages including, but not limited to, loss of profit or revenues, loss of use of equipment tested or services by Sentinel Integrity Solutions or any associated damage to facilities, down-time costs or claims of other damages.



Western Refining Company API 653 History Brief

Equipment#: TK-570	Inspection Report #: 2015-536
Equipment Name:	Unit Name: Tank Farm
Date: 5-13-2015	Inspector: Ronnie Crutcher
Headline: TK-570 Completed Repa	irs

Summary: During the internal inspection of TK-570, the following repair recommendations were made and completed:

- 1. Renew the internal coating on the floor and the bottom shell course.
- Replace the vacuum breakers, gasket seals and pipe guides.
- 3. Cut three (3) 6" diameter coupon sections from the floor in each quadrant and one location from the center of the tank to inspect for soil-side corrosion
- 4. Weld repair the two (2) holes in the floor and install an eight (8) inch patch plate over the area with a minimum of two (2) inch radius corners.
- 5. Install the pontoon and suction line.
- 6. Install three (3) new striker plates were old plates are corroded..
- 7. Enlarge the openings in the shell at nozzles N1, N5 and N6 to the inside diameter of the couplings.
- 8. Seal weld the pipe nipples at nozzles N1, N5, N6 and N7.
- 9. Seal weld the ten (10) 3/8" threaded plugs.
- Replace and tighten all loose hardware on the roof seals.
- 11. Remove the old style roof drains with the internal catch pans. The three (3) emergency roof drains need to be sealed with a slit fabric seal or similar device that covers at least 90% of the openings. This will reduce the product-exposed surfaces from rain water.
- 12. Base plates under the suction piping knuckle and inlet "Y" need to be seal weld.

Scope work:

Added two slotted gauge poles, one for radar gauging and one for hand gauging. These gauge poles are slotted and covered with an accordion bellows for emission control. Added a 4" emergency roof drain and removed old catch pan emergency drains. Added a 1 1/2" 150# nozzle for a thermowell to the tank shell.

Recommendations: None.

Reference Photogra	aphs
Signature: Signature: Crutcher #42499	Date: 5/13/2015



EXTERNAL TANK INSPECTION REPORT

UNIT	Tank Farm	REPORT#	2016-339
TANK#	570	SERVICE	83 Unleaded Gasoline

GENERAL CONDITION

ITEM	INSP.	COMMENTS
SHELL	□ N/A ▼ GOOD □ FAIR □ POOR	
COATING	□ N/A □ GOOD □ FAIR □ POOR	Newly painted shell
INSULATION	▼ N/A ☐ GOOD ☐ FAIR ☐ POOR	
FLOOR	▼ N/A 「 GOOD 「 FAIR	
FOUNDATION	▼ N/A 「GOOD 「FAIR 「POOR	No concrete foundation seen, sitting on Earth no erosion
SUPPORTS	□ N/A □ GOOD □ FAIR □ POOR	
STRUCTURAL	□ N/A □ GOOD □ FAIR □ POOR	
LADDERS/PLATFORMS	□ N/A □ GOOD □ FAIR □ POOR	Ground wire present and secure
ROOF DRAIN & APPURT'S	□ N/A □ GOOD □ FAIR □ POOR	
FLOATING ROOF (INT-EXT)	□ N/A □ GOOD □ FAIR □ POOR	Roof had scattered oxidation
PONTOONS	□ N/A □ GOOD □ FAIR □ POOR	
GUIDE POLE, INSTRUMENTS	□ N/A □ GOOD □ FAIR □ POOR	
VACUUM BREAKER	□ N/A □ GOOD □ FAIR □ POOR	
SEALS	□ N/A ▼ GOOD □ FAIR □ POOR	
NOZZLES	□ N/A ☑ GOOD □ FAIR □ POOR	
ATTACHED PIPING	□ N/A □ GOOD □ FAIR □ POOR	
PRD'S	▼ N/A 「GOOD 「FAIR 「POOR	
GROUND WIRE	□ N/A ♥ GOOD □ FAIR □ POOR	Tank ground wire present and secure
OTHER:	□ N/A □ GOOD □ FAIR □ POOR	

INSPECTOR: Travis York	API#:	58126	DATE:	3-21-2016
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ADDITIONAL COMMENTS

Recommendations:

-Remove debris from under stairs on wind girder (No W/O)



Western Refining Company API-653 EXTERNAL TANK INSPECTION

Reference Photographs







EQUIPMENT INSPECTION REPORT

ITEM: TK-571

DESCRIPTION: 87 Unleaded Regular storage tank

UNIT: Tank Farm

DATE: 11-16-2010

REPORT#: 2010-492

INSPECTION TYPE: EXTERNAL ⊠

INTERNAL 🖂

N.D.E.

Introduction:

On November 16,2010 the TK-571 storage tank was filled 2/3rds of the way full for a floating roof seal gap inspection. During the inspection it was found that the secondary wiper seal on the west side is cracked and torn 15". This does not meet code requirements. Also during the inspection it was found that the rim vent cap is broken off. The external inspection found the tank to be in overall good condition with no repairs required at this time.

Recommendations:

Repair the secondary wiper seal within 45 days per code requirements. Repair the rim vent on the west side.

Signature: Di Helm A

Darwin Helms

CISI Inc.

Senior Refinery Inspector

Date: 11-16-2010



EQUIPMENT INSPECTION REPORT

ITEM: TK-571

DESCRIPTION: Gasoline Tank

UNIT: Tank farm

DATE: 01-31-2011

REPORT#: 2011-063

INSPECTION TYPE: EXTERNAL ⊠

INTERNAL [

N.D.E.

Introduction:

On January 31, 2011 an external visual API 653 inspection was performed on TK-571 Gasoline storage tank. The external inspection showed moderate coating failure. The stairs, platform and ground wire are intact and secure. The ultrasonic thickness readings taken show no significant metal loss on the shell. There was some standing water noted on the floating roof. All valves on the tank show signs of prior leakage. It was also noted the fire suppressant piping on this tank is has severe corrosion and coating failure. There is some vegetation in the dike area.

Recommendations:

- All associated valves should be replaced and /or repaired.
- Fire suppressant piping should be replaced and/or blasted, recoated and hydro tested to conform integrity.
- Remove all vegetation.
- Blast and recoat as per western refining coating specs.

Signature:

Date: 01-31-2011

Thomas Hankins API 653 # 30216 CISI Inc.



Consulting Inspection Services, Inc 1707 E Main St., Olney, IL 62450 (618) 392-4677

Company Name: Western Refining
Location: Gallup NM
Inspection Date: 1/31/2011

		IN-SERVICE TANK	K INSPE	CTION REP	ORT		Page 1
CLIENT: Western Ref	fining	FACILITY LOCATION:	Gall	up NM		TANK #:_	TK-571
		GENERAL INFO	ORMATIO	N			
TANK LOCATION:		Tank farm		TYPE:		Stora	age
LIQUID CONTENTS:		Gasoline	HE	IGHT 40'	CAP	ACITY:	25000 Barrels
DIAMETER: 6	57'	ROOF TYPE: FLOATING	G	BOTTOM	1 TYPE	FLAT	
TANK SUPPORT TYPE	FLAT			MATER	IAL:	STE	EL
TANK MATERIAL AN	D TYPE	OF CONSTRUCTION:			A36		
NAME PLATE INFORM	MATION			YES			

INSPECTION CHECKLIST

T/D/23 /	INSPECTION CHEC		NT 4	
ITEM	Inspection Task	ACC	NA	Comments & Observations
	Inspect anchor bolts & nuts for corrosion,			
1.1 Foundation	straightness, tightness & full thread engagement		X	
1.2	Inspect for broken concrete, spalling, cracks and		X	
1.3	Inspect for indications of bottom leakage	X		
1.4	Inspect steel for corrosion, pitting & paint failure		X	Moderate coating failure
1.5	Inspect for plumb, level and buckling	X		
1.6	Inspect for drainage away from the tank	X		
1.7	Inspect for signs of settlement	X		
1.8	Inspect area for flammables, trash & vegetation			Dike area has some veggitation
2.1 Bottom	Inspect interior/exterior of leg/skirt for paint failure, corrosion or pitting	X		
2.1 DOUOIII	corrosion or pitting	Λ		
2.2	Inspect leg/skirt-to-shell connection for weld failure	X		
2.3	Inspect for buckling, corrosion & thinning	X		
2.4	Inspect & describe flat spots, patches & type of welds	X		
3.1 Shell	Inspect for paint failure, pitting & corrosion			Moderate coating failure
3.2	Inspect shell-to-bottom connection for weld failure	X		
3.3	Inspect & describe flat spots, buckles or distortions	X		
3.4	Record location & size of patches & type of welds	X		
3.5	Inspect insulation for cracks, leaks or wet material		X	
4.1 Shell	Inspect manways, nozzles & reinforcing plates for			
Attachments	cracks ro leakage at weld joints	X		
4.2	Inspect for shell plate dimpling around nozzles	X		
4.3	Inspect for leaks or loose bolting at flanges			Valves show signs of leakage
4.4	Inspect sealing of insulation around manways & nozzles		X	
4.5	Inspect manway mounted equipment for leaks		X	
4.6	Inspect mixer mounting for proper support		X	



Consulting Inspection Services, Inc 1707 E Main St., Olney, IL 62450 (618) 392-4677

Company Name:	Western Refining
Location:	Gallup NM
Inspection Date:	1/31/2011

		IN-SERVICE TAI	NK INSPECTION R	REPORT	Page 2
CLIENT:	Western Refining	FACILITY LOCATION:	Gallup NM	TANK #:	TK-571
	_				

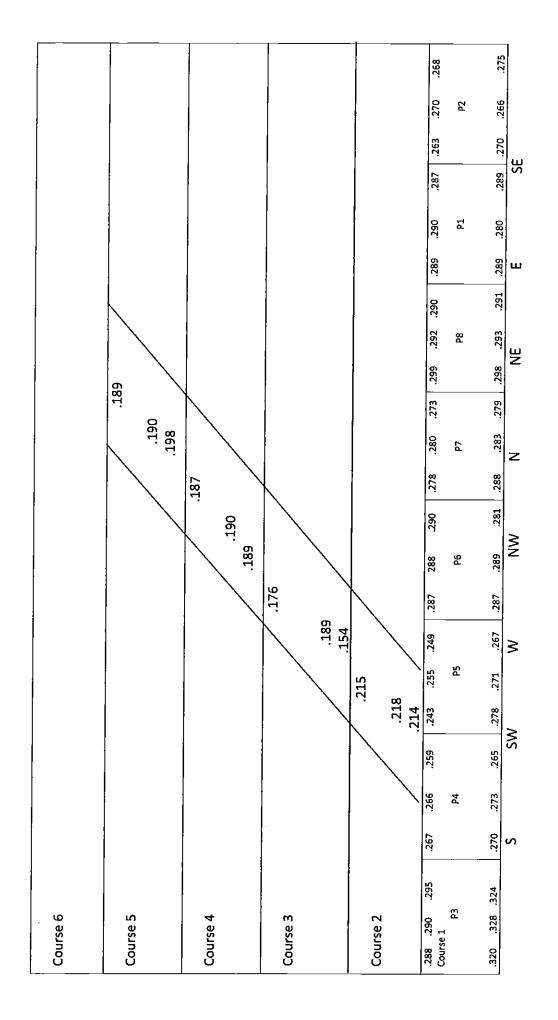
INSPECTION CHECKLIST

ITEM	Inspection Task	Acc	N/A	Comments & Observations
4.7	Inspect for mixer flange or shell distortion	X		
4.8	If running, check for excessive vibration	X		
4.9	Inspect heater drain or other lines to the first	X		
4.10.	Inspect overflow for corrosion & adequate	X		
4.11	Inspect operation of any level gauging	X		
4.12	Inspect stairway, ladder, cage & handrail-to-	X		
4.13	Inspect for paint failure & corrosion	X		
	Inspect for paint failure, corrosion or pitting			
5.1 Roof	(gauge)	X		
5.2	Check for indications of standing water		X	Stading water on the roof.
5.3	Inspect insulation for cracks, leaks or wet		X	
6.1 Roof	Inspect nozzles for flange leaks, cracked			
Attachments	welds, loose bolts and plate dimpling	X		
6.2	Inspect hatches for corrosion and paint	X		
6.3	Verify hatch gasket is in place & cover is	X		
6.4	Inspect general condition of breathing	X		
6.5	Inspect breathing valves & vents for	X		
6.6	Inspect condition of flame arrester/pres/vac.		X	
6.7	Inspect condition of platform frame, grating	X		
6.8	Inspect platform for paint failure, pitting &	X		
6.9	Inspect platform welds and/or bolts for	X		
6.10.	Inspect grating clips for correct attachment	X		

API#:	Inspector Name:
30216	Thomas Hankins

Date:	
1/31/2011	

Mest	Date: 1/31/2011 Location: Western Refining Gallup NM
Nozzle 8 10" 7.516 8.520 E.512 W.515	Tank: TK-571 Tech: Brad Alspach level 11
Nozzle 7 32" T.490 B.495 E.491 W.494	Nozzle 4 8"
Nozzle 5 4" Nozzle 6 30" T.278 T.433 B.271 N/A E.276 E.441 W.280 W.439	Nozzle 3 6"
Nozzle 4 8" T.540 T.540 T.548 E.544 E.544 W.541	Nozzle 1 6" Nozzle 2 8"
Nozzle 3 6" T.279 B.270 E.276 W.280	30°, C(0
Nozzle 2 2" T.345 B.340 E.343 W.340	ozzle 6 32"
Nozzle 1 6" T.451 B.459 E.453 W.449	Nozzle 7



Tank: TK-571	Date:	1/31/2011
Tech: Brad Alspach level II	Location	1: Western Refining Gallup NM



EXTERNAL TANK INSPECTION REPORT

UNIT	Tank Farm (Z71C)	REPORT#	2014-480
TANK #	571	SERVICE	89 Unleaded Gasoline

GENERAL CONDITION

ITEM	INSP.	COMMENTS
SHELL	□ N/A ♥ GOOD □ FAIR □ POOR	See attached API 653 Inspection Report
COATING	□ N/A □ GOOD ▼ FAIR □ POOR	See attached API 653 Inspection Report
INSULATION	▼ N/A 「 GOOD 「 FAIR	
FLOOR	□ N/A □ GOOD □ FAIR □ POOR	See attached API 653 Inspection Report
FOUNDATION	□ N/A □ GOOD ▼ FAIR □ POOR	See attached API 653 Inspection Report
SUPPORTS	▼ N/A ☐ GOOD ☐ FAIR ☐ POOR	
STRUCTURAL	□ N/A □ GOOD □ FAIR □ POOR	
LADDERS/PLATFORMS	□ N/A □ GOOD □ FAIR □ POOR	
ROOF DRAIN & APPURT'S	□ N/A □ GOOD ▼ FAIR □ POOR	See attached API 653 Inspection Report
FLOATING ROOF (INT-EXT)	□ N/A □ GOOD ▼ FAIR □ POOR	Visual only. See attached API 653 Inspection Report
PONTOONS	▼ N/A 「 GOOD 「 FAIR	֥
GUIDE POLE, INSTRUMENTS	▼ N/A ☐ GOOD ☐ FAIR ☐ POOR	
VACUUM BREAKER	V N/A □ GOOD □ FAIR □ POOR	
SEALS	V N/A □ GOOD □ FAIR □ POOR	
NOZZLES	□ N/A ♥ GOOD □ FAIR □ POOR	See attached API 653 Inspection Report
ATTACHED PIPING	□ N/A ♥ GOOD □ FAIR □ POOR	
PRD'S	▼ N/A 「 GOOD 「 FAIR POOR	
GROUND WIRE	□ N/A ♥ GOOD □ FAIR □ POOR	Only 1 ground wire
OTHER:	▼ N/A □ GOOD □ FAIR □ POOR	

INSPECTOR: B. Eddie Luna	API#:	33623	DATE:	07/25/2014
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ADDITIONAL COMMENTS

Additional comments, recommendations, and thickness readings results on all accessible components are included in the attached API 653 Inspection Report.



Tank 571 Unleaded Gas (89) External Inspection



Jamestown, New Mexico

Bran Eddie Luna API 653 Cert #33623	July 25, 2014	Sentinel Integrity Solutions
Inspector	Date	Company



INTRODUCTION

Western Refining contracted Sentinel Integrity Solutions to provide an In-Service inspection on tank 571 an Unleaded Gasoline (89) tank. The tank is located at the Gallup facility in Jamestown, New Mexico.

The API 653 Inspection Services included:

- ➤ Complete Visual Inspection of all accessible components
- ➤ Thickness readings on all accessible components (by ITI): shell, roof, and nozzles
- > Documentation of all components, which include dimensional measurements and layouts

This report documents the findings of the visual and ultrasonic inspection performed on July 25, 2014.

Sentinel Integrity provided the following personnel:

API 653 Inspector – Bran Eddie Luna API 653 Cert # 33623



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2.0	NDT INSPECTION	5
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APPENDICES

- > INSPECTION INTERVALS
- > BOTTOM INSPECTION RESULTS
 - o **PROJECTION PLATE**
- > DIFFERENTIAL SETTLEMENT (API 653)
- > SHELL INSPECTION RESULTS
 - LIQUID LOAD CONDITION
 - SHELL ASSESSMENT (MINIMUM ALLOWABLE SHELL THICKNESS)
 - SHELL THICKNESS MEASUREMENTS
 - o SHELL LAYOUT
 - o SHELL NOZZLES
 - SHELL APPURTENANCES AND VERTICAL WELDS
- > ROOF INSPECTION RESULTS
 - o ROOF LAYOUT
- > ITI REPORTS
- > API CHECKLIST



1.0 TANK DETAILS

TANK SPECIFIC

Tank Number	<u>571</u>
Туре	<u>EFRT</u>
Product Storage	89 Unleaded Gasoline
Product Specific Gravity	<u>0.80 (SDS)</u>
Nameplate Present	Yes
Operating Temperature (F)	<u>Ambient</u>

DIMENSIONS

Diameter	<u>67 ft.</u>
Height	40 ft.
Safe Filling Height	36 ft. (assumed)
Capacity (nominal)	25,000 bbls

CONSTRUCTION DATA

Year Built	<u>1957</u>
Design Standard	<u>API</u>
Manufacturer	Horton Tank & CBI
Design Specific Gravity	1.0 (assumed)
Foundation	Earthen
Secondary Containment	<u>No</u>
Bottom & Material	Lap welded-Carbon Steel
Shell & Material	Butt welded-Carbon Steel
Roof & Material	Lap welded-Carbon Steel
Bottom Coated	<u>Yes-2004</u>



2.0 NDT INSPECTION

Non-destructive inspection services and equipment were provided by ITI. See Appendices for ITI reports, which includes equipment used and personnel who performed the examinations.

2.1 NDT Inspection Scope

- > External Inspection
 - o UT's on shell, 4 drops with 4 readings taken per course
 - o UT's on the projection plate, minimum of 8
 - o UT's on the shell nozzle neck, reinforcing pad, flange, and cover
 - o UT's on the roof
 - Floating Roof
 - No access was given for the roof



3.0 RECOMMENDATIONS

In-Service Recommendations:

- 1. The shell coating should be monitored to determine when recoating is necessary. As a short term solution, consider applying a maintenance coat on the bottom shell course and nozzles.
- (W/O# 611581) 2. Consider reworking the grade around the bottom water draw nozzle (N8) and ensuring that the nozzle is sufficiently insulated for the winter.
 - 3. Projection plate should be kept clean.
- (W/O# 611581) 4. Re-work grade in order to fill in the gaps underneath the tank bottom, particularly on the north to west and southwest to south side of the tank.
 - 5. Since the thickness readings taken on the 1st, 2nd, and 3rd shell courses show significant amount of metal loss compared to the nominal thickness (per the records), thickness readings should be taken on the shell at the May 2015 External Inspection in order to establish a short term corrosion rate.
 - 6. The roof drain system should be opened up periodically during heavy rainstorms.
 - The roof deck should be cleaned of all debris/sand in order to prevent the drain system from clogging.

Out-of-Service Recommendations:

- 8. Threaded plugs on the shell should be seal welded at the next out of service (approximately 10, located at various locations on the shell).
- 9. At the next out of service, modification to the reinforcing pad of MW2 will need to be assessed.
- 10. All threaded shell nozzles should be seal welded externally (N1, N2, N3, and N10).
- 11. At the next out of service, the foam system should be tested at 100 psi.

NOTE: There are shell nozzles that do not meet **current** weld spacing and dimensional standards per API. The current measurements have been noted and recorded in this report. Since the tank and nozzles have proven a satisfactory service history and the nozzles were likely installed according to the as-built standard, no action is required. If modifications are made to the nozzles, shell, and/or bottom, then these weld spacing issues will have to be re-evaluated to determine if further modification have to be made to meet current weld spacing standards per API.



4.0 SCOPE

API 653 in-service inspection was performed on tank 571. The evaluation of the tank roof, shell, and components were performed in accordance with following codes, standards, and specifications:

- API 653, 4th edition, 2012 Addendum 2; "Above Ground Storage Tank Inspection, Repair, Alteration, and Reconstruction"
- API 650 Twelfth Edition, July 2013 Errata; "Welded Steel Tanks for Oil Storage"
- API 575 Second Edition; "Inspection of Atmospheric and Low-Pressure Storage Tanks"
- OSHA 29 CFR 1480.119 (J) (4); "Process Safety Management of Highly Hazardous Chemicals; Inspection and Testing of Process Equipment"

All Western Refining and Sentinel's Safety Procedures were followed.

4.1 Prior History

- ➤ 2003: last internal inspection; records indicate a new roof seal was installed; new center roof deck and nozzles
- ➤ 2004: new bottom liner
- > 1/2011: last external inspection with UT's taken on shell
- > October 2012: last 5 year primary seal inspection; next one due on October 2017
- > January 2014: last annual secondary seal inspection; next one due on January 2015

4.2 Access

The external inspection was performed at ground level and the roof inspection was performed from the gauging platform. No direct access to the top of the floating roof was given.



5.0 EXTERNAL INSPECTION

5.1 Shell Plate

Overall the shell coating is in fair condition. There are several failures on the projection plate, lower 2"-3" of the bottom course, the shell supports for the Varec & foam line, nozzle necks, wind girder, and the upper courses.

The ultrasonic survey did reveal significant thinning of the 1st, 2nd and 3rd shell course. Thickness readings should be taken at the next external inspection interval in order to determine a short term corrosion rate.

There are approximately (10) 3/8" threaded plugs throughout the tank shell. Considering the nature in which they were installed and to prevent any future leakage, these should be seal welded at the next out of service.





5.2 Shell Nozzles

No significant issues were found with the nozzles. Manway 2 reinforcing pad should be changed to a tombstone shape if, at the next out of service, the bottom requires any repairs at the cornerweld at this area. Otherwise, since it has operated successfully as is, no action will be required.



API 653 Inspection Report Tank 571 Jamestown, New Mexico July 25, 2014





5.3 Shell Appurtenances

No significant issues were found with the stairway. The shell supports for the foam line and Varec should be painted to prevent further corrosion at those areas.







5.4 Tank Bottom Projection Plate

No significant issues were found with the projection plate. The bottom projection plate should be kept clean on a regular basis.







6.0 FOUNDATION

Overall the foundation is in good condition. The differential settlement survey showed a critical deflection of 1.2", which is within acceptable standards, per API. Consider re-working the grade and filling in the voids underneath the tank bottom, particularly on the north to west and southwest to south side of the tank.







7.0 ROOF

7.1 Roof Deck

Operations did not allow access to the roof, so the inspection was a visual only from the gauging platform. Overall the roof coating appeared to be in fair condition. The majority of paint failures are on the primary deck. No other significant issues were identified from the platform.

7.4 Roof Drain System

The roof drain system should be opened up periodically during heavy rainstorms.

7.5 Rolling Ladder

No issues were observed.



8.0 ADDITIONAL PICTURES





9.0 WARRANTY

Sentinel Integrity Solutions, has appraised the condition of this tank based on the inspections and measurements made by the Sentinel Integrity Solutions' Tank Inspector. Whereas our evaluation correctly describes the condition of the tank and tank appurtenances at the time of inspection, the tank owner/operator has ultimate responsibility assessing the inspection information / report provided by Sentinel Integrity Solutions and any conclusions reached by the tank owner/operator and any action taken or excluded are the sole responsibility of the owner / operator. With respect to inspection and testing, Sentinel Integrity Solutions warrants only that the services have been performed in accordance with accepted industry practice. If any such services fail to meet the foregoing warranty, Sentinel Integrity Solutions shall re-perform the service to the same extent and on the same conditions as the original service.

The preceding paragraph sets forth the restricted remedy for claims based on failure or of defect in materials or services, whether such claim is made in contract or tort (including negligence) and however instituted, and, upon expiration of the warranty period, all such liability shall terminate. The foregoing warranty is exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. No implied warranty of merchantability or Fitness for Purpose shall apply, nor shall Sentinel Integrity Solutions be liable for any loss or damage whatsoever by reason of its failure to discover, report, repair or modify latent defects or defects inherent in the design of any tank inspected. In no event, whether a result of breach of contract, warranty or tort (including negligence) shall Sentinel Integrity Solutions be liable for any substantial or supplementary I damages including, but not limited to, loss of profit or revenues, loss of use of equipment tested or services by Sentinel Integrity Solutions or any associated damage to facilities, down-time costs or claims of other damages.

Tank Number: 571



Inspection Intervals

Routine in-service Inspection
Performed by Terminal Personnel

August 2014

Shell External Visual Inspection

*Performed by an authorized inspector Minimum of RCA/4N or 5 yrs

May 2015

Shell Ultrasonic Thickness Inspection

*Performed by an authorized inspector Minimum of RCA/2N or 15 yrs February 2016

Corrosion Rate

0.002193

in/yr

Out-of-Service Inspection Interval

per records, last internal inspection was July 2003

Bottom Inspection Interval

July 2013

With Coating

Tank Number: 571

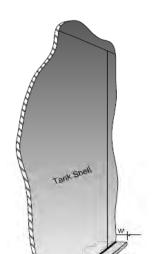
Projection Plate

Tank Diameter: D 67.00 ft

Number of measurements: 8

Distance between mp: 26.3 ft

Distance is < 16 ft, not acceptable.



lose as possible to the weldtoe



Loc.	WT
200.	t [in]
1	0.242
2	0.250
3	0.249
4	0.245
5	0.250
6	0.254
7	0.253
8	0.246

Note: Measurements initiated from the manway entrance and continued in the clockwise orientation.

Projection as per API653, section 4.4.5.7

 $\label{eq:minimum thickness measured} \qquad \qquad \text{inch} \qquad \qquad 0.242 \qquad > 0.10 \text{ inch thus OK}.$

Tank Number: 571



Differential Settlement (API653)

Mechanical Data

Tank diameter D feet 67.00 Tank height feet 40.00 Min. number of settlement points [-] 8 No. settlement points used [-] 8 Location of 1st Measurement Point degrees 0 Distance between settlement points feet 26.31

Material Yield Y PSI 31183 Youngh Modulus E PSI 30022813

Differential settlement API653, Appendix B

			-, -		
Location	Settlement	Relative	Planar	Settlement	Deflection
	Readings	Elevation	Tilt		
[Deg]	[inch]	[inch]	[inch]	[inch]	[inch]
0	65.88	2.40	1.9	0.5	8.0
45	64.32	0.84	1.0	-0.1	-0.2
90	63.48	0.00	0.4	-0.4	-0.5
135	64.20	0.72	0.3	0.4	0.7
180	64.20	0.72	0.9	-0.2	-0.5
225	65.52	2.04	1.8	0.2	0.4
270	65.76	2.28	2.4	-0.2	-0.1
315	65.64	2.16	2.5	-0.3	-0.5

The following formula is used in calculating maximum permissible deflection:

Maximum 32 feet

$$|S| = \frac{L^2 * Y * 11}{2 * E * H} * 12$$

where

S = Critical deflection [inch]

L = Arc Length [feet]

E = Young's modulus [PSI]

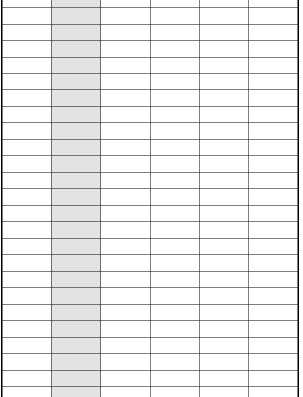
Y = Yield strength [PSI]

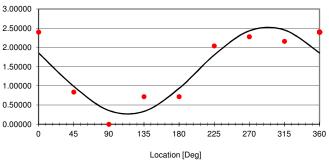
H = Tank height [feet]

Critical deflection [inch]:

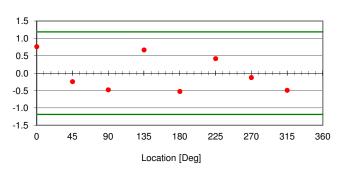
1.2 **OK**

Shell Settlement Elevation Graph [inch]





Shell Settlement Deflection Graph [inch]



Tank Number: 571

SENTINEL

Liquid Load Condition

Mechanical Parameters

Design code	API650			
Tank Type	EFRT			
Shell main Material	Unknown			
Year of construction	DOB	yr	1957	
Tank diameter	D	ft	67.00	
Tank height	Н	ft	40.00	
No. shell courses			5	
Temp. correction factor	φ	Note 1	1.000	
Nominal capacity	Vbrut	bbls	25118	
Riveted tank	Note 3	y/n	No	
Joint Efficiency	Е		0.85	
Evaluation method	Note 5	1-	foot	

API653, Section 4.3.3 and 4.3.4

The following formulas are used in calculating the required minimal thickness of shell courses:

$$t_{d} = \frac{2.6D(H-1)G}{E.\varphi.S_{d}}$$
$$t_{t} = \frac{2.6D(H-1)}{E.S_{t}}$$

Note 1: Use API650, Appendix M in case of operation at elevated temperature (Default is 1.0).

Note 2: If material is unknown use Y=30000/T=55000 and if E is unknown use table 4-2 of API653.

Note 3: For riveted tanks use S = 21000 PSI unless otherwise specified.

Note 4: Allowable stress S is calculated according to API653, sections 4.3.3.1 and 4.3.3.2.

Note 5:

Recommended evaluation method: 1-foot

1. The 1-foot method calculates the thickness required at design points (1 ft. above the bottom of each shell course).

2. The 1-foot method shall not be used for tanks with D > 200 ft.

Product Conditions (t_d)

Specific Gravity	G	[-]	0.800
Filling height	h	feet	36.00
Maximum safe filling height	h	feet	36.00

Course	Course	Product	Material	Material	Allowable	Joint	Minimum	Minimum	Measured	Integrity
No.	height	height	Yield	Tensile	Stress	Efficiency	calculated	allowable	t	check
			Υ	Т	S	Factor	t	t	min	
	[feet]	[feet]	[PSI]	[PSI]	[PSI]	Е	[inch]	[inch]	[inch]	
5	8.30	4.30	30000	55000	25960	0.85	0.021	0.100	0.227	OK
4	8.30	12.60	30000	55000	25960	0.85	0.073	0.100	0.215	OK
3	8.30	20.90	30000	55000	25960	0.85	0.126	0.126	0.172	OK
2	7.75	28.65	30000	55000	23595	0.85	0.192	0.192	0.211	OK
1	7.35	36.00	30000	55000	23595	0.85	0.243	0.243	0.250	OK

Tank Number: 571



Liquid Load Condition, cont'd

Hydrotest Conditions (t_t)

Specific Gravity G [-] 1.00 Max fill height for hydrotest h ft 32.67

Course	Course	Product	Material	Material	Allowable	Joint	Calculated	Min.	Measured	Integrity
No.	height	height	Yield	Tensile	Stress	Efficiency	t	allowable	t	check
			Υ	Т	S	Factor	min	t	min.	
	[feet]	[feet]	[PSI]	[PSI]	[PSI]	Е	[inch]	[inch]	[inch]	
5	8.30	0.97	30000	55000	27000	0.85	0.000	0.100	0.227	OK
4	8.30	9.27	30000	55000	27000	0.85	0.063	0.100	0.215	OK
3	8.30	17.57	30000	55000	27000	0.85	0.126	0.126	0.172	OK
2	7.75	25.32	30000	55000	25960	0.85	0.192	0.192	0.211	OK
1	7.35	32.67	30000	55000	25960	0.85	0.250	0.250	0.250	OK

Yield Strength Reduction factors (API650 - Appendix M)

For operating temperatures above 200 $^{\circ}$ F, the allowable stress shall be multiplied by the applicable reduction factor as given in the following table :

	Minimum	specified Yield Stren	igth [PSI]		
Temp.	< 45000	≥ 45000 to < 55000	≥ 55000		
[°F]	PSI	PSI	PSI		
201	0.91	0.88	0.92		
300	0.88	0.81	0.87		
400	0.85	0.75	0.83		
500	0.80	0.70	0.79		

Linear interpolation shall be applied for intermediate values

Joint efficiency factors

Type of	No.	E	But welded tanks	Use table 4-2 of API653
joint	rivets		Lap-welded tanks	Use table 4-2 of API653 or use E=0.75
Lap	1	0.45 [0.60]		
Lap	2	0.60 [0.73]	Riveted tanks	Use following table (Conform of API653 Table 4-3)
Lap	3	0.70 [0.73]		
Lap	4	0.75		
Butt	2	0.75		
Butt	3	0.85		SK TYTE
Butt	4	0.90 [0.87]		
Butt	5	0.91 [0.91]		
Butt	6	0.92		

Butt: i.e. number of rows on each side of joint center line

Tank Number: 571



Shell Assessment (Minimum Allowable Shell thickness)

Mechanical Parameters

Installation date DOB year 1957 Last Inspection Date LID 2014 year

Minimum allowable shell thickness for loadcase liquid load and roof load.

Course	min t	min t	min	min	Integrity	
No.	allowable	allowable	allowable	thickness	check	Note 1. Minimum allowable thickness for roof load has been calculated for
	roofload	liq.load		measured		fa=Fa
	[inch]	[inch]	[inch]	[inch]		
						Conclusion:
5	0.000	0.100	0.100	0.227	OK	Minimum uniform thickness as measured for the individual shell courses
4	0.000	0.100	0.100	0.215	OK	are greater than as required for the liquid load and uniform roof load. Thus
3	0.000	0.126	0.126	0.172	OK	OK.
2	0.000	0.192	0.192	0.211	OK	
1	0.000	0.243	0.243	0.250	OK	

Conclusion:

Remaining Life assessment and Inspection Frequency

API653, section 6.3.2 - External Inspection

All tanks shall be given a visual external inspection by an authorized inspector. This inspection shall be called the external inspection and must be conducted at least every 5 years or CA /4 CR years (where CA is the difference between the measured shell thickness and the minimum required thickness in inch, and CR is the shell corrosion rate in mm per year) whichever is less. Tanks may be in operation during this inspection.

API653, section 6.3.3 - Ultrasonic Thickness Inspection

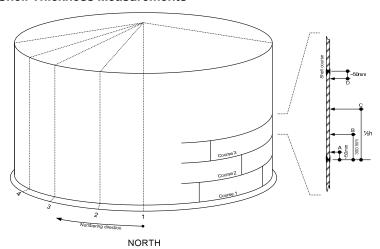
External, ultrasonic thickness measurements of the shell can be a means of determining a rate of uniform general corrosion while the tank is in service, and can provide an indication of the integrity of the shell. When used, the ultrasonic thickness measurements shall be made at intervals not to exceed the following:

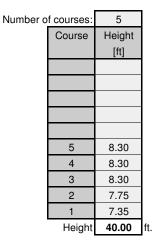
When the corrosion rate is known, the maximum interval shall be the smaller of CA/2CR years (where CA is the difference between the measured shell thickness and the minimum required thickness in mm, and CR is the shell corrosion rate in inch per year) or 15 years.

Course No.	Original WT [in] Assumed	min. WT meas. [in]	CR meas. [in/y]	Wt min. allowable [in]	CA [in]	RL (CA/CRmax) [years]	External Inspection [years]	UT Inspection [years]	Recommendations: Since the intended next service period is years, the following interval is to be considered.
									Next External inspection by an authorized inspector should be carried out not later than: 2015.
									Next External UT inspection of the shell (and roof) should be carried out not later than: 2016.
5	0.250 0.250	0.227 0.215	0.000404 0.000614	0.100 0.100	0.127 0.115	58 52	78.7 46.8	157.4 93.6	NB: Local regulations/conditions may have affect on the above
3	0.250	0.172	0.001368	0.126	0.046	21	8.5	16.9	recommendations.
2	0.313	0.211	0.001781	0.192	0.019	9	2.6	5.3	
1	0.375 Max	0.250 imum CR:	0.002193	0.243	0.007 Minimu	3 m Allowable:	0.8	1.5 1.5	

Tank Number: 571

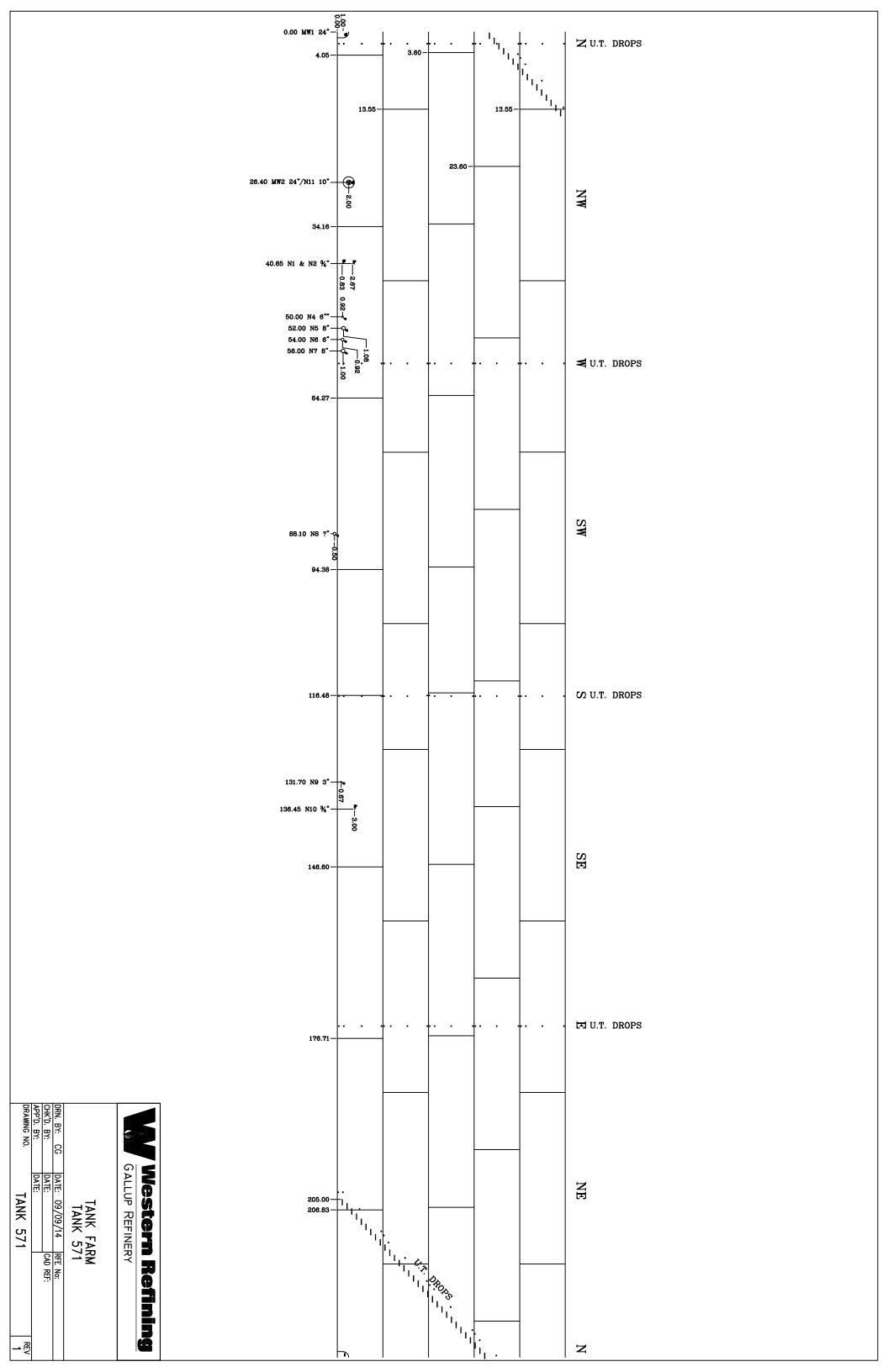






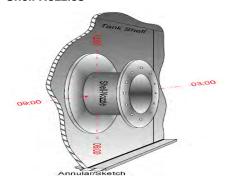
Shell thickness Stairway

Loca	ation	W	N	S	Е		
Course	WT	[in]	[in]	[in]	[in]		
	Α	0.255	0.243	0.227	0.250	Min	0.227
5	В	0.256	0.241	0.241	0.252	Max	0.256
3	С	0.248	0.239	0.251	0.245	Average	0.245
	D	0.242	0.235	0.246	0.245	STDEV	0.008
	Α	0.248	0.235	0.215	0.235	Min	0.215
4	В	0.244	0.237	0.217	0.238	Max	0.248
7	С	0.231	0.226	0.236	0.217	Average	0.230
	D	0.227	0.220	0.240	0.215	STDEV	0.011
	Α	0.240	0.225	0.172	0.220	Min	0.172
3	В	0.221	0.224	0.199	0.216	Max	0.240
3	С	0.204	0.197	0.208	0.192	Average	0.207
	D	0.196	0.192	0.214	0.193	STDEV	0.017
	Α	0.245	0.250	0.247	0.248	Min	0.211
2	В	0.235	0.265	0.246	0.245	Max	0.265
	С	0.211	0.222	0.254	0.220	Average	0.236
	D	0.211	0.242	0.216	0.217	STDEV	0.017
	Α	0.250	0.310	0.320	0.270	Min	0.250
1	В	0.287	0.343	0.320	0.296	Max	0.360
	С	0.290	0.360	0.306	0.316	Average	0.310
	D	0.309	0.360	0.296	0.331	STDEV	0.030



Tank Number: 571

Shell Nozzles





					Weld		Reinforcing Pad					Nozz	le WT				
ID	Function		Station	CL Elev.	Spacing		Height		Tell-tale	WT [in]	12:00	03:00	06:00	09:00	Flange	Cover	
		Size [in]	[ft]	[in]		Width [in]		Shape	[y/n]	** 1 [111]	[in]	[in]	[in]	[in]	WT [in]	WT [in]	Comments
MW1	Cleanout	24x24	0.0	12	-	72	36	D	у	0.524	0.479	0.496	0.500	0.507	0.606	0.453	-
MW2	Manway	24	26.4	24	0	60	48	Α	у	0.428	0.488	0.464	0.506	0.485	1.847	1.904	1
N11	BF Nozzle	10	26.4	24	-	-	-	-	-	-	0.537	0.589	0.600	0.571	1.221	1.194	8
N1	Low Level Indicator	3/4	40.65	57	-	-	-	-	-	-	-	-	-	-	-	-	6
N2	Low Level Indicator	3/4	40.65	10	-	-	-	-	-	-	-	-	-	-	-	-	6
N3	TI	1	44.9	32	-	-	-	-	-	-	-	-	-	-	-	-	6
N4	Circ. Discharge	6	50.0	11	2 3/8						0.397	0.398	0.382	0.395	1.017	-	-
N5	Circ. Suction	8	52.0	13	2 3/8	94	19	Α	.,	0.381	0.478	0.463	0.465	0.428	1.109	-	-
N6	Transfer	6	54.0	11	2 3/8	94	19	Α	У	0.361	0.394	0.372	0.374	0.374	0.808	-	-
N7	Sales	8	56.0	12	2 3/8						0.505	0.558	0.479	0.481	0.809	-	-
N8	Water Draw	4	88.1	-6	-	-	-	-	-	-	-	-	-	-	-	-	9
N9	Roof Drain	3	131.7	8	1 3/4	14	11	С	У	0.394	0.307	0.264	0.291	0.270	1.104	-	-
N10	Sample	3/4	136.45	36	-	-	-	-	-	-	-	1	-	-	-	-	6
					Stations	are measu	red in fee	t counter-	clockwise	from MW1	(station 0	.0)					
Repad Shape	Repad C C C C C C C C C C C C C C C C C C C											L					
								Comme	nts								
1-Inadequ	1-Inadequate weld spacing per current API 4- No tell tale present								7- Corrosion/coating failure on nuts/bolts				10-				
2- No rein	2- No reinforcing pad 5- Coating failure (neck, repad, and/or flange							ge	8- Nozzle on cover of MW2				11-				
3- Plugged	tell tale			6-Threade	ed connecti	on			9-Tank Bo	ttom Pene	tration			12-			

Tank Number: 571

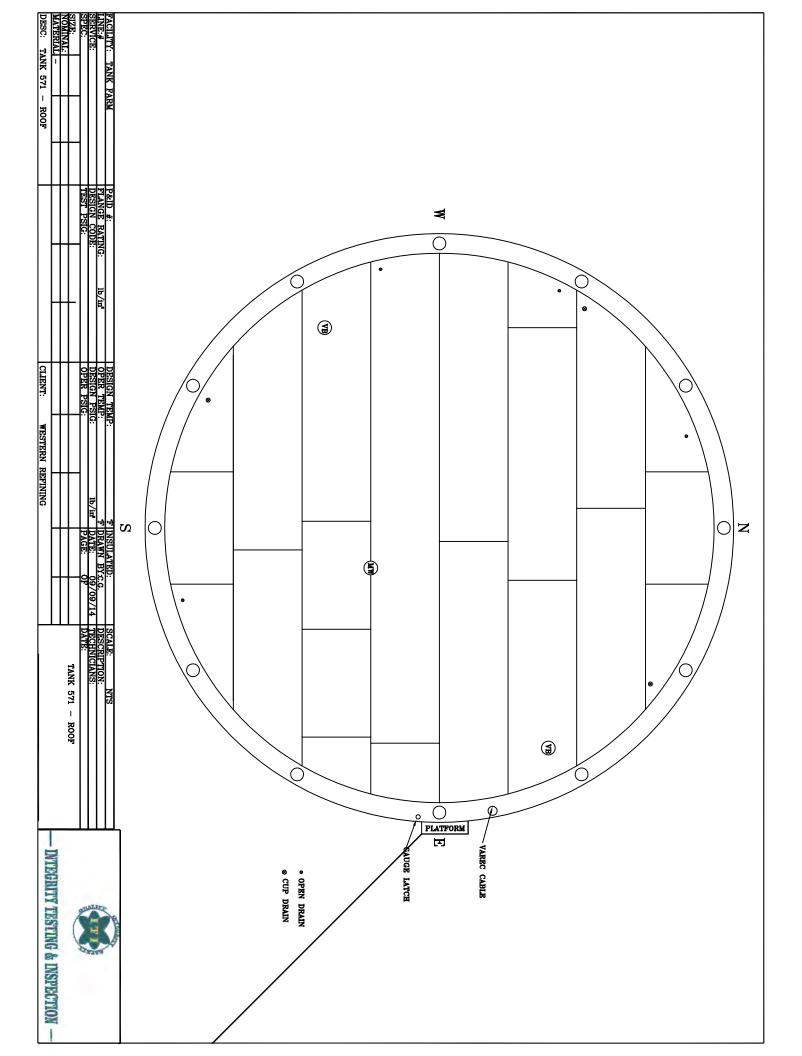
Shell Appurtenances and Vertical Welds



Function	Station [ft]	CL Elev.	Comments
Gauging Platform	43.00	45'	
Varec	47.80	60"	
Foam Pipe	51.00	-	
Stairway	205.00	10"	Start of
Grounding	206.25	0	

Vertical W	eld Seam	Location o					
1	2	3	6	7	8		
4.05	34.16	64.27	94.38	116.48	146.6	176.71	206.83

Vertical Weld Offset for Courses 2, 3, 4, 5, etc.						
2	3	4	5			
13.55	3.6	23.6	13.55			





3861 Vincent Station Dr. Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

	NIC EXAMINATI	ON REPO	RT					■ Nuclear	✓ Non-Nuclear
То						From		Date	
WESTERN REFINING					J.Gonzalez/ J. Mo	organ	7/25/2014		
Project						•		•	
	ss readings take	en on tank	571.						
Integrity Testing Job No.									
					2014-0161				
Item	Weld	Structural 🗸	Casting	Machinery	Mach. Parts	Pipe	N/A	Other	
	Non-Weld	Plate 🗸	Pipe	Bar 🗸	Casting	Mach. Parts	N/A	Other	
Material	Size 0		No. of Pieces	Type of B	ase Metal	Type of Filler I	Vlaterial	Weld ☐Smooth	☑ N/A ☐ As Welded
Location	JAMESTOWN, N	NM				System Tank Farm			
Acceptance						Procedure			
Standards	Info Only					UT QCP 620	REV. 0		
	Soundness	Thickness	Bond	Transducer		•			Couplant
		√ ✓					√		
					Single Crysta	I	Dual C	Crystal	Sono Test Ultra Gel
	Pulse Echo	Angle-Beam	Other	Frequ	iency	Size		Angle]
	⊔	Ш			5 MHZ	0.500"		0°	
Type of	UT Equipment/Model			FL		Concave		Convex	
Inspection	Panametric DL 37 P	lus			<u> </u>				
	SN:071455702			Standard		Material	No	otch Depth	Serial No.
	1/3/2015			····					
				Step Wedge		Material	1	kness Range	Serial No.
				Tube Wedge		C/S	.10	00"500"	12-4061
Reference: Sum					✓ :	See Attachment		of Inspection	
UT's taken	on shell, shell no	ozzles, and	projection	plate.			UT Thick	kness reading to	aken on tank 571.
Copy To:					Requested By	<i>ı</i> .	1	Reported By /T	echnician).
оору то.			Tom Lewis			Reported By (Technician): J.Gonzalez/ J. Morgan			
			Customer Specifications			NDT Supervisor:			
					☐ Accept	☐ Reject		MARVIN FI	GUEROA

NOTICE:

THIS EXAMINATION REPORT IS A REPORT OF THE RESULTS OF THE NDT PROCEDURE ACTUALLY PERFORMED BY THIS COMPANY IT IS SUBJECT TO THE LIMITATIONS OF THE TESTING SPECIFICATIONS AND PROCEDURES WHICH WERE UTILIZED. BY FURNISHING THIS REPORT, **INTEGRITY TESTING & INSPECTION** DOES NOT GUARANTEE ANY CONDITION OF THE TESTED SPECIMEN.



TANK 571

NOTE: Any additional comments or finding will be further elaborated under the appropriate section of the formal report.

1.0 TANK DATA

Tank Diameter:

Tank Height:

Tank Type:

Date of Tank Construction:

1.1 FOUNDATION

a. Y Was foundation levelness and bottom elevations measured? (See API-653 - Appendix B for extent of measurements).

1.1.1 Concrete Ring

a. Did the concrete ring have broken concrete, spalling and cracks, particularly under the backup bars used in welding butt welded annular rings under the shell?

b. Mt Did the drain openings in the ring, back of water draw basins and top surface of the ring have indications of bottom leakage? If yes, explain.

c. Mere there cavities under the foundation and/or vegetation against the bottom of the tank?

d. NA Was the runoff rainwater from the shell draining away from the tank? If no, explain.

e. MY Was there settlement around the perimeter of the tank? If yes, describe.

1.1.2 Asphalt

a. NA Was the tank settling into the asphalt base, which directs runoff rain water under the tank rather than away from it? If yes, explain.

b. Were there areas of leaching of oil has left rock filler exposed, which indicates a hydrocarbon leak?

1.1.3 Oiled Dirt or Sand

a. Was the tank settling into the foundation base, which directs runoff rain water under the tank rather than away from it? If yes, explain.

1.1.4 Rock

Was there presence of crushed rock under the steel bottom? (Usually results in severe underside corrosion). Make a note to do additional bottom plate examination (ultrasonic, hammer testing, or turning of coupons) when the tank is out of service.

1.1.5 Site Drainage

Was the site drainage away from the tank and associated piping and manifolds? If no, explain.

b. ___ Was the operating condition of the dike drains in good condition? If no, explain. Not tested

1.1.6 Housekeeping

a. N Did the area around the tank have trash, vegetation, and/or other inflammables built up? If yes, explain.

1.1.7 Cathodic Protection

a.NA Was the Cathodic Protection potential readings reviewed?





1.2	SHELL
1.2.1	
a. Y	External Visual Inspection Were there any signs of paint failure, pitting, and/or corrosion? If yes, explain. Paint failure thinning of St. Were there any signs of correspond and/or thinning on the plate and better correspond about the better and leave the plate and better correspond to the plate and better correspond to the plate and better correspond to the plate and better correspond to the plate and better correspond to the plate and better correspond to the plate and better correspond to the plate and better correspond to the plate and
b. N	were there any signs of corrosion and/or thinning on the plate and bottom corner weld after the bottom angle was
	cleaned? If yes, explain. Surface rust due to paint failure
c. NA	Was the bottom to foundation seal in satisfactory condition? If no, describe condition.
1.2.2	Internal (Floating Roof Tank)
a. NA	Were there indications of grooving, corrosion, pitting, and/or coating failures? If yes, describe.
1.2.4	Windgirder (Floating Roof Tanks)
a. Y	Was there corrosion damage (paint failure, pitting, corrosion product build up), especially at tack welded junctions,
	and/or broken welds on the windgirder or handrail? If yes, explain.
b. N	Were there any signs of pitting on the support welds to shell, especially on shell plates? If yes, explain.
c. N	Did the supports have reinforcing pads welded to the shell?
4.0	
1.3	SHELL APPURTENANCES
1.3.1 a. /\	Manways and Nozzles
b. 1	Were there cracks or signs of leakage on weld joints at nozzles, manways, and reinforcement plates? If yes, describe.
	Was the shell plate dimpling around the nozzles, caused by excessive pipe deflection? If yes, describe.
C. N	Were there any flange leaks or leaks around the bolting? If yes, describe.
d. NA e. NA	Was the insulation sealed properly around the manways and nozzles? If no, explain.
e. 1411	Was the manway flange and cover thickness on the mixer manways adequate?
1.3.2	Shell and Nozzles Ultrasonic Thickness Survey
a	Were UT measurements taken on the shell and nozzles? Were these readings accurately mapped?
1.3.3	Tank Piping Manifolds
a. N	Were there any signs of leakage on manifold piping, flanges, and/or valves? If yes, explain.
b	Was the fire fighting system components in satisfactory condition? If no, explain. no+ ins pected
c. N	Was there any anchored piping which would be hazardous to the tank shell or bottom connections during earth
	movement? If yes, explain.
d	Was there adequate thermal pressure relief of piping to the tank? If no, explain. At inspected
c	Was the operation of regulators for tanks with purge gas systems in satisfactory condition? If no, explain. not inspected
f. N	Were there any signs of leaks on the sample connections? If yes, explain.
h <i>N</i>	Were there any signs of damage to the temperature indicator? If yes, explain.
NA	Were the welds on shell-mounted davit clips above valves six (6) inches and larger in satisfactory condition? If no,
	explain.
1.3.4	Autogauge System
a. N	Were there leaks found on the autogauge tape guide and/or lower sheave housing (floating swings)? If yes, describe.
b. N	Was there damage to the autogauge head? If yes, describe.
c. Y	Was there proper movement of the tape when the checker on the autogauge was bumped?
d. N	Was the size and construction materials of the autogauge tape (floating roof tanks) documented?
-	Size: Construction material:
e. N	Has operations had any problems with the tape hanging up (floating roof tanks) during roof movement?
h.NA	Was the board in good condition and legible (on board type autogauge)? If no, explain.
AVA	Was there freedom of movement of the marker and float? If no, explain



1.3.5 Shell-Mounted Sample Station a. N Were there indications of plugging on the sample lines, including the drain or return-to-tank line? If yes, explain.

b. Did the valves function properly on the sample lines, including the drain or return-to-tank line? If no, explain.

1.3.6 Heater (Shell Manway Mounted)

a. NA Was there any indication of oil around the condensate drain, indicating leakage? If yes, explain.

1.3.7 Mixer

a. NA Did the mixer have the proper mounting flange and support?

b. Were there any indications of leakage? If yes, describe.

c. MA Were the power lines and the connections to the mixer in good condition? If no, explain.

1.4 ROOFS

1.4.2 Deck Plate External Corrosion

a. Y Were there any visual signs of paint failure, holes, pitting, and corrosion on the roof? If yes, explain.

1.4.3 Roof Deck Drainage

a. Were there any indications of standing water on the roof? (Significant sagging of fixed roof deck indicates potential rafter failure. Large areas of standing water on a floating roof indicate inadequate drainage design or, if to one side, an unlevel roof with possible leaking pontoons). If yes, explain.

1.4.4 Level of Floating Roof

a. \(\text{\text{\$\sc V}}\) At several locations, was the distance measured from the roof rim to a horizontal weld seam above the roof? If the roof is not level document findings. (A variance in the readings indicates a non level roof with possible shell out-of-round, out-of-plumb, leaking pontoons or hang-up. On small diameter tanks, an unlevel condition can indicate unequal loading at that level).

1.4.6 Roof Insulation

a. Mere cracks or leaks found visually in the insulation weather coat where runoff rain water could penetrate the insulation? If yes, describe.

b. **NA** Was there evidence of wet insulation under the weather coat? If yes, describe.

c. Were there any signs of corrosion and/or holes near the edge of the insulated area after small test sections of insulation were removed? If yes, explain.

1.4.7 Floating Roof Seal System

a. What was the seal fabric on the primary shoe seals pulling shoes away from the shell (fabric not wide enough)?

b. Were there signs of deterioration, holes, tears, or cracks in the fabric? If yes, describe.

c. Were there any visible signs of corrosion and wear on the metallic parts? If yes, describe.

d. WH Were there any openings in the seals that would permit vapor emissions? If yes, describe.

e. **M** Were there any protruding bolts or rivets heads against the shell? If yes, explain.

f. 1/14 Were the primary and secondary seals pulled back all around the shell to check their operation? If no, explain.

g. Were there any signs of buckling and/or indications that the angle with the shell is too shallow on the secondary seals?
If yes, explain.

h Me Did the wedge-type wiper seals show signs of flexibility and resilience? If no, explain.

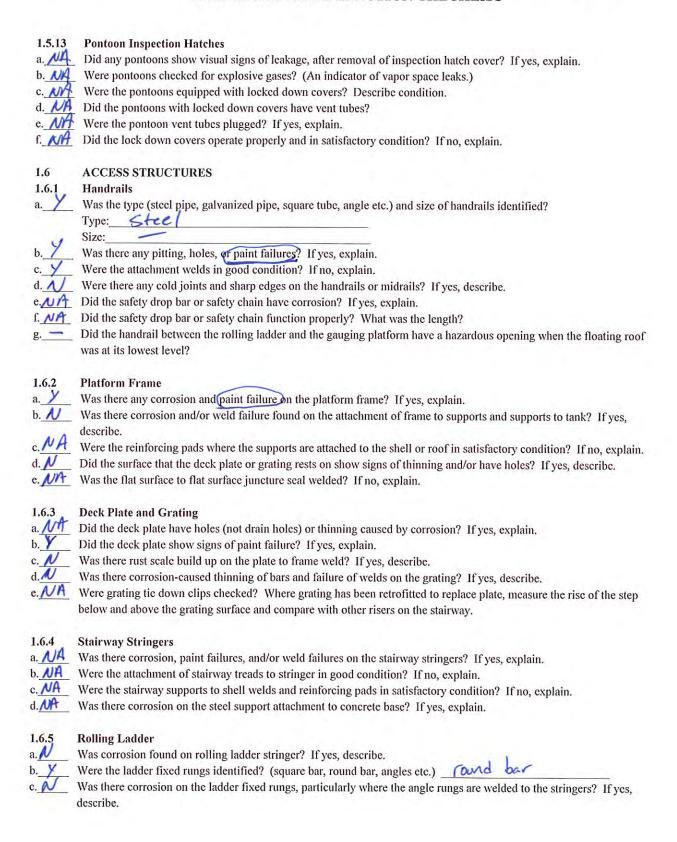
i. Mere there any signs of cracks and/or tears on the wedge-type wiper seal? If yes, explain.



1.4.9	Floating Roof Ultrasonic Thickness Survey
a. NA	Were UT measurements taken on the floating roof? Were these measurements accurately sketched?
b. NA	
c. NA	Were two spot UT measurements taken inside the pontoon, on the outside rim plate in the area normally associated
	with the rim space vapor area, approximately 180 degrees apart?
1.5	ROOF APPURTENANCE
1.5.1	
MA	Did the sample hatch cover function properly and in good condition? If no, explain.
a. NA b. NA	On tanks governed by Air Quality Monitoring District rules, was the seal inside the hatch cover in satisfactory
c.MA d.NA	Were there signs of corrosion or plugging on the thief and gauge hatch cover? If yes, explain.
d. NA	Where the sample hatch is used to reel gauge stock level, was there a marker and tab stating hold off distance? If no,
e.NA f.NA	explain.
e. NA	Was there a reinforcing pad where the sample hatch pipe penetrates the roof deck?
f. NA	On floating roof sample hatch and recoil systems, was the recoil reel and condition of rope in good condition and
	operating properly? If no, explain.
g. NA h. NA	Was operation of the system tested?
h. IVM	
	inside the sample hatch in good condition?
1.5.2	Gauge Well
a. NA	Were there any signs of thinning on the visible portion of the gauge pipe? If yes, explain.
b. NA	Was the size of the slots measured and recorded? size of slots.
c. NA	Was the cover of the gauge well in satisfactory condition? If no, explain.
d. NA	Was the hold off distance marker and tab with hold off distance in satisfactory condition and legible? If no, explain.
e. NA	On floating roofs, was the roof guide for the gauge well in satisfactory condition? If no, explain.
f. NA	On floating roofs, did the rollers show signs of grooving on the roof guide for the gauge well? If yes, explain.
g. NA	If accessible, was the distance from the gauge well pipe to the tank shell measured and documented at different levels'
h. 1014	If the tank has a gauge well washer, was there any signs of leakage and/or presence of a bull plug or blind flange? If
	yes, explain.
1.5.5	Autogauge: Float Well Cover
a. NA	Was corrosion found on the float well cover? If yes, explain.
b. NA	Was there wear and/or fraying on the cable, caused by rubbing on the cover? If yes, explain.
	,
1.5.9	Emergency Roof Drains
a.NH	On vapor plugs for emergency drain, were the seal fabric discs slightly smaller than the pipe ID and the fabric seal
	above the liquid level? If no, explain.
1.5.10	Removable Roof Leg Racks
a. N A	Were there roof leg racks on the roof? Document their condition.
a./V/ 1	were there foot leg facks on the foot? Document their condition.
1.5.11	Vacuum Breakers
aNA	If high legs are set, was the setting of mechanical vacuum breaker in high leg position?
1.5.12	Rim Vents
a///	Were the screens on the rim vent covers in satisfactory condition? If no, explain.



571





d N	Were there signs of corrosion and/or wear on the rolling ladder	where it attaches to the gauging platform? If yes,
	describe.	
c. N	Were there signs of wear on the pivot bar? If yes, explain.	
f. V	Was the pivot bar secure? If no, explain.	
f. V g. NA	Were the self-leveling stairway treads operating properly? If no	o, explain.
h. NA		
	Did the rolling ladder wheels have freedom of movement? If n	o, explain, appear to
j. —	Did the rolling ladder wheels have flat spots? If yes, describe.	
	Did the rolling ladder axles show signs of wear? If yes, explain	
	현 교통이 아이를 했다고 하는 것이 바로 하면 아이를 하는데 하는데 되었다. 그들은 사람이 되었다면 하는데 하는데 하는데 하는데 하는데 하는데 하는데 하는데 하는데 하는데	
	그 사람들이 내가 그리고 있었다면 하다 하나 하나 하나 하는 것이 되었다.	
	(track long enough)? If no, explain.	walk of missis to assure it least to of annom track
	Was there corrosion on the rolling ladder track welds? If yes, d	escribe
	Was the maximum angle of the rolling ladder checked by dimer	
P'	This the mannam ungle of the forming mader effected by unifor	isloning when the root was on low legs: wax Angle.
	If the rolling ladder track extends to within five feet of the edge top of the shell on that side?	of the roof on the far side, was there a handrail on the
NOTE: Y	Y = YES $N = NO$ $N/A = NOT APPLICA$	BLE
REPORT		
	Inspector/Certification#: B. Eddie Luna #	33623 Date: 7-25-14
	Inspector /Certification #:	Date:



SENTINEL INTEGRITY SOLUTIONS



INSPECTION WORK REQUEST

UNIT: TANK FARM Western Refining – Gallup DATE: 06-08-2015

Western Refining – Gallup, NM		Inspection Work Request
Equipment Number:	TK-571	IMD # 004
Equipment Name:	83 Unleaded Gasoline	IWR # 001

FINDINGS

An internal visual inspection of the 83 Unleaded Gasoline Tank (TK-571) revealed the following conditions which warrant repair recommendations at this time:

- 1. The internal paint coating on the floor, shell and roof have areas of coating failure. The areas of past coating repairs have disbonded from the coating beneath. The coating at the vacuum breaker guides is at complete failure. The internal coating is in such a condition that credit cannot be given to for an internal liner for the bottom formula calculations. This will result in assuming an internal corrosion rate which in turn will shorten the next internal inspection interval.
- 2. The vacuum breaker guides for the piping have coating failure with surface corrosion. It is not recommended to replace or repair the guides but to clean and coat.
- 3. The top side of the floor has a generally rough surface with corrosion throughout measured up to 0.080" in depth. The corrosion was arrested during the last internal inspection in 2003. There was no additional corrosion found. The generally rough surfaces along with the corrosion/pitting being filled with a thick layer of paint resulted in areas with skewed data from the Magnetic Flux Leakage (MFL) testing. A good assessment of bottom side corrosion could not be established.
- 4. Three (3) of the striker pads located under the roof support legs have severe corrosion where the legs come into contact with the plates. The corrosion on one of the plates measures 0.140" in depth.
- 5. There are threaded 3/8" plugs throughout the tank shell that are not seal welded.
- 6. There are five (5) emergency roof drains with internal catch pans that are no longer in service. In addition there are what appears to be open ended roof vents or additional emergency roof drains. The current addition of API 650 (C.3.8.2 Emergency Roof Drains) states that emergency drains are prohibited on a single-deck floating roof.
- 7. Base plates under the suction piping knuckle and inlet "Y" were found stitch welded.
- 8. The external floating roof has no primary drain.
- 9. This roof also has no Out-of-Service Supplementary drain. If a primary roof drain is installed consideration should also be given to the installation of a supplementary drain. They are designed to be used if the primary roof drain becomes plugged.
- 10. Air Test the internal pontoon at 5 psi.



SENTINEL INTEGRITY SOLUTIONS



INSPECTION WORK REQUEST

UNIT: TANK FARM Western Refining – Gallup DATE: 06-08-2015

RECOMMENDATIONS

The following recommendations were made as a result of the findings from this inspection:

- 1. Renew the internal coating on the floor, bottom shell course, and bottom side of the roof. This will help prolong the life of the tank and extend the next internal inspection interval.
- 2. If the bottom side of the roof is not painted then at a minimum the vacuum breaker guides need to be clean and coated.
- 3. Cut 4-6" in diameter coupon sections from the floor in each quadrant and one location from the center of the tank to inspect for soil-side corrosion. This needs to be done to establish an underside corrosion rate for the bottom floor calculations. This will help define the next internal inspection interval/bottom floor life.
- 4. Weld repair (pad weld) or install a patch plate over the corroded areas on the three (3) striker plates.
- 5. Seal weld the threaded plugs internally.
- 6. Remove the old style roof drains with the internal catch pans. These are blinded and no longer in service. Repair the roof where removed. Evaluate the need for the additional open ended vents/drains. If a new primary roof drain is installed then I don't see how these are needed. If these open ended pipes are left in place they need to be sealed with a slit fabric seal or similar device that covers at least 90% of the openings. This will reduce the product-exposed surfaces from rain water.
- 7. Seal weld the base plates under the suction piping knuckle and inlet "Y".
- 8. Install a roof sump with a primary drain.
- 9. Install an Out-of-Service Supplementary drain. Threaded pipe couplings and plugs with a 600-mm (24-in.) extension "T-bar" handle shall be provided as supplementary drains when the roof is resting on its legs and when the primary drains are inoperative. The number of drains shall be based on the specified rainfall rate (see Line 33 of the Data Sheet) and tank size. Fittings shall be at least NPS 4. Plugs shall have threads coated with a non-stick coating or anti-seize. One supplementary drain shall be located adjacent to the ladder track.
- 10. Air test internal pontoon. Need to drill/tap threaded hole to install fitting for test. Seal weld plug after testing.

Inspector:	Keith Angell		Photos Attached:	Yes 🖂	No 🗌
Repair Auth	orized:	Repair Deferred:	Change Order Required:	Yes 🗌	No 🗌



SENTINEL INTEGRITY SOLUTIONS



INSPECTION WORK REQUEST

UNIT: TANK FARM

Western Refining – Gallup

DATE:

06-08-2015

INSPECTION PHOTOS









Floor - General corrosion 0.080" depth.



SENTINEL INTEGRITY SOLUTIONS



INSPECTION WORK REQUEST

UNIT: TANK FARM

Western Refining - Gallup

DATE:

06-08-2015



Striker Pates (3) – corrosion up to 0.140" in depth, install new pad over old



Piping Knuckle/Inlet "Y" - Pads under support are stitch welded.



3/8" threaded plugs in shell – plugs not seal welded



Old Style roof drains & catch pans (5) - no longer in use



89 Unleaded Gasoline Tank TK-571 Internal / External Inspection





Gallup, New Mexico

	Keith Angell	
API	653 Cert #30340	

06/09/15

Sentinel Integrity
Solutions

Inspector Date Company





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

INTRODUCTION

Western Refining contracted with Sentinel Integrity Solutions to provide API 653 Inspection Services for 89 Unleaded Gasoline Tank # TK-571. The tank is located at the Western Refining Facility in Gallup, New Mexico.

The API 653 Inspection Services included:

- MFL of the Bottom Floor Plates with Ultrasonic Thickness prove-up (verification)
- Vacuum Box of the Bottom Lap and Corner Welds
- Ultrasonic Thickness of the Floor
- Ultrasonic Thickness of the Shell in accessible areas
- Ultrasonic Thickness of the Nozzles
- Ultrasonic Thickness of the Floating Roof
- Ultrasonic Thickness of the Roof Pontoons
- Ultrasonic Thickness of the Roof support legs

This report documents the findings of the API 653 Internal / External Inspections performed on June 9, 2015.

Sentinel Integrity provided the following personnel:

API 653 Inspector – Keith Angell API 653 Cert # 30340

NDE Level II – Chris Casilas NDE Level II – Jeff Johnson





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

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	API 653 - INTERNAL INSPECTION SUMMARY





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

API 653 INTERNAL INSPECTION SUMMARY

TANK SPECIFIC

1111111	<u> TECHTC</u>
Tank Number	<u>TK-571</u>
Owner	Western Refining
Product Storage	89 Unleaded Gasoline
Specific Gravity	<u>0.80 (SDS)</u>
Nameplate Present	Yes
Operating Temperature (F)	<u>Ambient</u>

DIMENSIONS

Diameter	<u>67 ft.</u>
Height	<u>40 ft.</u>
Capacity (nominal)	25,000 bbls
Safe Fill Height	36 ft. (assumed)

CONSTRUCTION DATA

Year Built /	<u>1957</u>
Design Standard	API 650
Secondary Containment	<u>NO</u>
Foundation	Earthen
Bottom & Material	Lap Welded- Carbon Steel
Shell & Material	Butt Welded- Carbon Steel
Fixed Roof & Material	<u>N/A</u>
Floating Roof & Material	Lap Welded- Carbon Steel
Bottom Coated	<u>Yes- 2003</u>





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

2.0 NDT INSPECTION

2.1 NDT Inspection Scope

- A. MFL was performed on the entire bottom in all accessible areas. Performed in accordance with Sentinel Integrity Solutions UT Procedure SIS-MF-001.
- B. Ultrasonic Thickness measurements (UT's) were taken every one foot along the floor circumference and within two (2) inches of the corner weld as recommended by Western Refining. As requested UT Scrubs were not performed in these locations. UT's performed in accordance with Sentinel Integrity Solutions UT Procedure SIS-UT-001.
- C. Vacuum Box Testing was performed to the bottom lap welds and internal corner welds. Performed in accordance with Sentinel Integrity Solutions Vacuum Box Procedure SIS-VB-001.
- D. Visual inspection (VT) of areas for the detection of anomalies, corrosion, peaking, banding, distortions, welding or other items that would affect the mechanical integrity. Performed in accordance with Sentinel Integrity Solutions Visual Procedures SIS-VT-001 and SIS-VT-002.
- E. Random UT's on the shell, shell nozzles, floor plates, roof plates, roof pontoons, and roof support legs. Performed in accordance with Sentinel Integrity Solutions UT Procedure SIS-UT-001.

3.0 FINDINGS AND RECOMMENDATIONS

Preliminary Deficiencies with Recommendations in bold:

Mechanical Inspection

- 1. The internal paint coating on the floor, shell, and roof had areas of coating failure. A few of the areas with past coating repairs have disbonded from the coating beneath. The coating at the vacuum breaker guides was at complete failure.
 - Abrasive blast and coat the internal surfaces of the tank.
- 2. Three (3) of the striker pads located under the roof support legs have severe corrosion where the legs come into contact with the plates. The corrosion on one of the plates measured 0.140" in depth.
 - Weld repair (pad weld) the corroded striker pads.
- 3. Previously holes were drilled in the shell course and 3/8" plugs were installed. These plugs are threaded and not seal welded.
 - Seal weld all the 3/8" plugs.

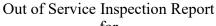




83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

- 4. There are five (5) emergency roof drains with internal catch pans that are no longer in service. In addition there were what appears to be open ended roof vents or additional emergency roof drains installed in the roof. The current addition of API 650 (C .8.8.2) states that emergency drains are prohibited on a single-deck roof.
 - Remove the old style roof drains with internal catch pans; they are no longer in service. Evaluate the need for the additional open ended vents/drains. If a new primary roof drain is installed then I don't see how these are needed. If the open ended pipes are left in place they need to be sealed with a slit fabric seal or similar device that covers at least 90% of the openings. This will reduce the product-exposed surfaces from rain water.
- 5. The roof has no primary roof drain or out-of-service supplementary drain. If a new primary roof drain is installed then consideration should be given for the installation of a supplementary drain.
 - Install a primary roof drain with a sump and an out-of-service supplementary drain. Threaded pipe couplings and plugs with a 600-mm (24-in.) extension "T-bar" handle shall be provided as supplementary drains when the roof is resting on its legs and when the primary drains are inoperative. The number of drains shall be based on the specified rainfall rate and tank size. Fittings shall be at least NPS 4. Plugs shall have threads coated with a non-stick coating or antiseize. One supplementary drain shall be located adjacent to the ladder track.
- 6. The base plates under the suction piping knuckle and inlet "Y" were stitched welded.
 - Seal weld both support base plates.
- 7. There was no ground cable from the rolling ladder to the roof deck.
 - Install a ground cable.
- 8. The internal pontoons were in over good condition.
 - It is recommended to air test the pontoons at 5 psi.

NOTE: For hydrostatic testing the use of "pond/fire" water is not recommended unless the water has been tested. The ponds could have microorganisms that cause Microbiologically-Influenced Corrosion (MIC); as seen in this tank. Use of this water without the proper testing could result in a less than a 20 year life. The next inspection interval was based on corrosion rates, proper internal coating/liner, and operating the tank within operating parameters.







83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

4.0 SCOPE

API 653 Internal inspection was performed on the Tank. Inspection included MFL of the bottom with UT prove-up, UT readings on the shell, shell nozzles, floating roof, roof support legs and roof pontoons. The Internal inspection and evaluation of the tank floor, shell, floating roof, foundation, and appurtenances was performed in accordance with following codes, standards, and specifications. An Out-of-Service Checklist was performed per API 653 and can be found in this report.

- API 653 2013 Addendum 3; "Above Ground Storage Tank Inspection, Repair, Alteration, and Reconstruction"
- API 650 Eleventh Edition; "Welded Steel Tanks for Oil Storage"
- API 575 Second Edition; "Inspection of Atmospheric and Low-Pressure Storage Tanks"
- OSHA 29 CFR 1480.119 (J) (4); "Process Safety Management of Highly Hazardous Chemicals; Inspection and Testing of Process Equipment"

Internal inspection was performed after the tank was cleaned and gas freed. All Western Refining's and Sentinel's Safety Procedures for confined space entry were followed.

4.1 Prior History

- ➤ 2003: Last internal inspection; records indicate a new roof seal and new center roof deck was installed
- ➤ 2012: 5 year primary seal inspection performed
- ➤ 2014: Least external inspection performed

4.2 Access

The tank was internally inspected by ingress / egress through the 24" Shell manway and access manway on the floating roof. Access was not granted internally in the pontoons during this inspection. The pontoon lids were removed and an inspection was done from outside the openings. The external shell was inspected by walking around the tank and going up the attached stairway.

5.0 TANK BOTTOM

The tank bottom is Carbon Steel with the nominal thickness of 0.250" when constructed. The tank bottom plates were inspected with MFL and UT prove-up along with a visual inspection.

The bottom tank floor had areas of top side corrosion and pitting scattered throughout measuring up to 0.080" in depth. This corrosion was mitigated during the 2003 internal inspection. At the time of this inspection there was no active top side corrosion on the bottom floor plates. The generally rough surfaces along with the corrosion





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

and pitting being filled with a thick layer of paint resulted in skewed data from the Magnetic Flux Leakage (MFL) test. A good assessment of the bottom side corrosion could not be established so an IWR (IWR#1) was submitted to remove five (5) floor samples to visually inspect for bottom side corrosion. A coupon sample was taken from each quadrant and one was taken near the center of the tank. The samples did not have any underside corrosion. There were seven (7) existing patch plates found on the floor and an additional five (5) patch plates were installed to repair the areas where samples were taken. The floor had spot (puddle) welding throughout where repairs were made in the past.

Three (3) of the striker pads located under the roof support legs have severe corrosion where the legs come into contact with the plates. The corrosion on one of the plates measures 0.140" in depth. An IWR (IWR #1) was submitted to weld repair (pad weld) the corroded pads.

The base plates under the suction piping knuckle and inlet "Y" were found stitch welded. An IWR (IWR #1) was submitted to seal weld both the support plates.

The vacuum box of the internal corner weld and bottom lap welds was performed with no leaks detected.

Ultrasonic Thickness measurements were taken on each floor plate at five points, one at each corner and one in the center. The thickness readings ranged from 0.230" to 0.312". UT measurements were also taken next to the floor to shell corner weld on the annular ring at one foot intervals. The lowest thickness measurement obtained was 0.208".

The internal paint coating on the floor had areas of coating failure. A few of the areas with past coating repairs have disbonded from the coating beneath. An IWR (IWR #1) was submitted to abrasive blast and apply a new coating. This work was followed by others.

Bottom Calculations were performed and specified that if all areas are repaired per this report recommendations the tank meets the requirements of API 653 to obtain a 20 year run cycle.

API 653 Bottom Calculations revealed the tank is due for Internal Inspection 6/01/2035 – ATTACHED.





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

6.0 FOUNDATION

The foundation was found in overall good condition. No recommendations were required. A differential settlement survey was not requested or performed during this tank outage.

7.0 SHELL

7.1 Shell Plate

There was no original construction drawings for the shell provided during this inspection. Based on the inspection history provided it appears the nominal thickness of the shell courses when constructed were as follows; 1st shell course 0.375", 2nd course 0.313", and 3^{rd, /}4th 5th course 0.250".

Visually the internal shell wall had scattered pitting 0.015" to 0.040" with isolated areas up to 0.080" in depth. All of the pitting and corrosion was mitigated from the internal coating system. The shell weld seams were found at full profile with no corrosion or visual defects. Visual inspection of the shell found the shell plates to have no peaking and banding at the welds.

There were isolated areas of paint failure where the past coating repairs had come disbonded from the coating beneath. An IWR (IWR #1) was submitted to abrasive blast and coat the bottom shell course.

Externally the shell coating was in overall fair condition. There were a few areas of general coating failure with no surface corrosion. Recommendation was to evaluate coating condition during the next scheduled external inspection interval.

Previously holes were drilled in the shell course and 3/8" plugs were installed. These plugs were threaded and not seal welded. An IWR (IWR #1) was submitted to seal weld all of the 3/8" plugs.

Ultrasonic Thickness readings were taken on the shell courses at accessible locations. Based on the assumed nominal thickness there was some wall loss noted. The 1st shell course had a minimum thickness of 0.218" with a loss of 0.157" from the original thickness. The 2nd shell course had a minimum thickness of 0.224" with a loss of 0.089" from the original thickness. The 3rd shell course had a minimum thickness of 0.200" with a loss of 0.050" from the original thickness. The flowing calculations were from the current thickness data obtained from this inspection.

API 653 Shell Calculations revealed the tank is due for Formal External Inspection 06/2020 API 653 Shell Calculations revealed the tank is due for Shell UT Inspection 06/2024

NOTE: Thickness Readings taken for calculations were independent of Western's corrosion monitoring program. Calculations were based from build date with current thickness readings and a long term corrosion rate. New





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

coating was installed on bottom shell course. Thickness readings from 2nd course to top shell course were taken from the ladder off the tank. * Recommended to take a full thickness survey and enter into UltraPipe/Western's corrosion monitoring program.

7.2 Shell Nozzles/Internal piping

There are shell nozzles that do not meet the current weld spacing and dimensional standards per the current addition of API. Since the tank and nozzles have proven a satisfactory service history and the nozzles were likely installed according to the as-built standard, no action was required at the time of inspection. If modifications are made to the nozzles, shell, and/or bottom then the weld spacing issues will need to be re-evaluated.

Internally all the nozzles were free and clear of obstructions. The nozzle attachment welds were at full profile with no visual defects. There were no adverse conditions found.

The internal pontoons were in overall good condition with no pitting or corrosion noted.

7.3 Shell Appurtenances

The support clips and external piping had scattered areas of paint failure with a light surface corrosion. There were no recommendations required at the time of inspection. Reevaluate conditions during the next external inspection interval.

7.4 Rolling Ladder/Stairway

The tank has an attached stairway that and a rolling ladder for roof access. There was no ground wire for the rolling ladder. An IWR (IWR#1) was submitted to install a ground wire from the ladder to the roof deck.

8.0 FLOATING ROOF

Access to the roof was made from inside the tank utilizing the roof manway. The coating on the roof had scattered areas of coating failure with a light surface oxidation. There was a small amount of debris on the roof. The roof was cleaned during this outage. Some residue still remained but the roof was accessible for inspection. The underside of the roof and associated components were inspected from the floor of the tank. The underside coating had isolated areas of coating failure with a light surface oxidation. An IWR (IWR# 1) was submitted to abrasive blast and coat the internal surfaces.

Ultrasonic Thickness measurements were taken on each roof plate at five points, one at each corner and one in the center. The thickness readings ranged from 0.197" to 0.223". Visual inspection of the lap welds found the welding to be full profile with no defects or discontinuities.





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

8.1 Roof Nozzles

There were five (5) emergency roof drains with internal catch pans that are no longer in service. In addition there were what appeared to be open ended roof vents or additional emergency roof drains. The current addition of API 650 (C.3.8.2 Emergency Roof Drains) states that emergency drains are prohibited on a single-deck floating roof. This roof has no primary roof drain or Out-of-Service Supplementary drain. An IWR (IWR #1) was submitted to address all roof drains. The following recommendations were to remove the old style roof drains with internal catch pans; they are no longer in service. Evaluate the need for the additional open ended vents/drains. If a new primary roof drain is installed then I don't see how these are needed. If the open ended pipes are left in place they need to be sealed with a slit fabric seal or similar device that covers at least 90% of the openings. This will reduce the product-exposed surfaces from rain water. Install a primary roof drain with a sump and an out-of-service supplementary drain. Threaded pipe couplings and plugs with a 600-mm (24-in.) extension "T-bar" handle shall be provided as supplementary drains when the roof is resting on its legs and when the primary drains are inoperative. The number of drains shall be based on the specified rainfall rate and tank size. Fittings shall be at least NPS 4. Plugs shall have threads coated with a non-stick coating or anti-seize. One supplementary drain shall be located adjacent to the ladder track.

The vacuum breaker guides for the piping have coating failure with surface corrosion. It is not recommended to replace or repair the guides but to clean and coat. This issue was addressed with the recommendation to coat the tank internally.

8.2 Roof Pontoons

Internal access was not granted at the time of this inspection report. The lids were removed for inspection from the outside of the pontoons. Externally the paint coating was in overall satisfactory condition for continued service. There was no evidence of past process leaks and the internal surfaces were free of corrosion. It was recommended to test the pontoon for possible leaks during the outage. This testing was followed by others.

Ultrasonic Thickness measurements were taken on each pontoon (bottom side) from inside the tank. The thickness measurements ranged from 0.197" to 0.225". Ultrasonic Thickness measurements were taken on each pontoon (topside) at five points, one at each corner and one in the center. The thickness readings ranged from 0.187" to 0.239". Based on the UT's there were no areas of concern and no recommendations were warranted.

8.3 Roof Support Legs

The roof support legs were in overall good condition. Ultrasonic Thickness measurements were taken on the support legs and the pipe guides. The thickness measurements ranged from 0.112" to 0.285". The legs were in overall acceptable condition for continued service.





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

8.4 Roof Seals

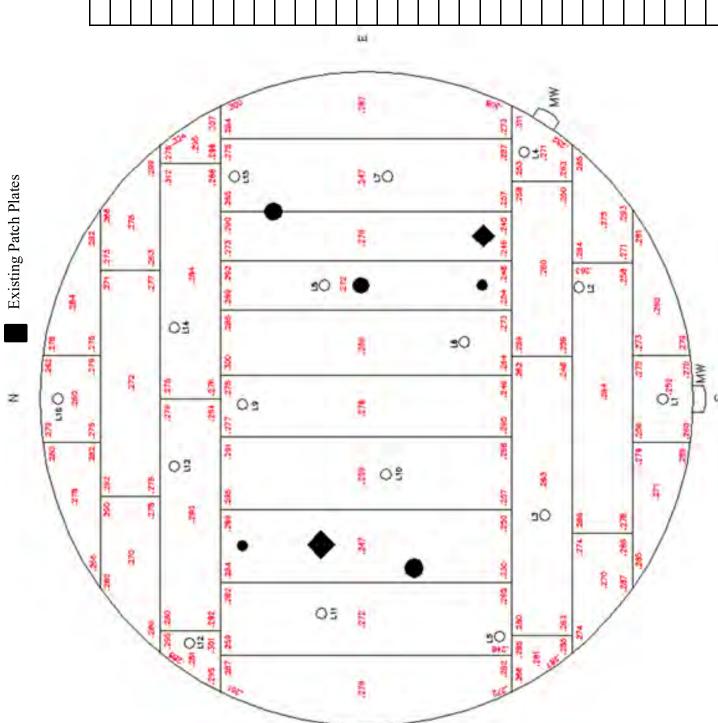
An inspection was performed from the top and bottom side of the roof seals. There was no damage found on the seals. The top side of the primary seal has standing liquid so a visual inspection was limited. It is recommended to remove the liquid prior to placing the tank back in service. After the tank is back in service a seal gap inspection will need to be performed.



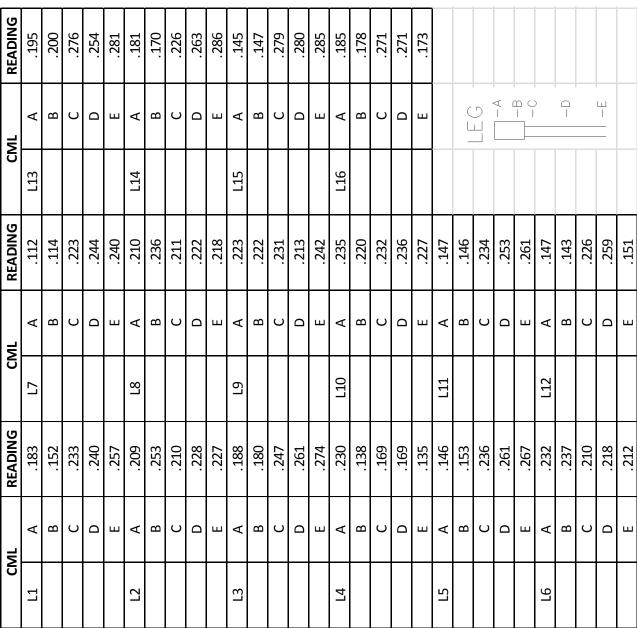
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Refining
83 Unleaded Gasoline Storage Tank TK-571
Gallup, New Mexico

BOTTOM FLOOR/LEG DRAWING AND DATA

9.0



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Sentinel Integrity Solutions TANK DIVISION

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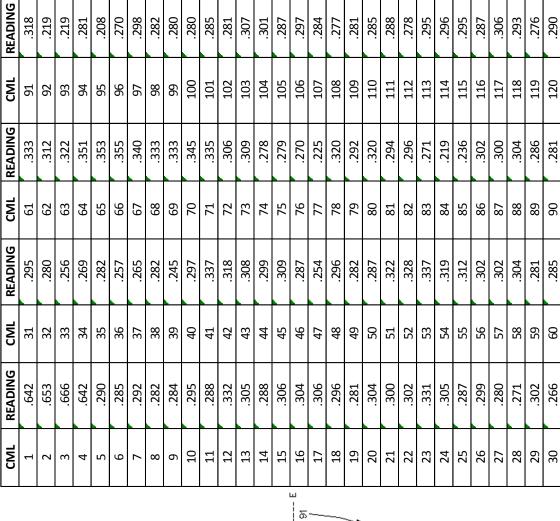
Corpus Christi (361) 887-2014 Houston (281) 457-2225



83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

BOTTOM FLOOR DRAWING (UT'S AT CORNER WELD)

9.1



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SHELL DRAWING AND DATA 10.0

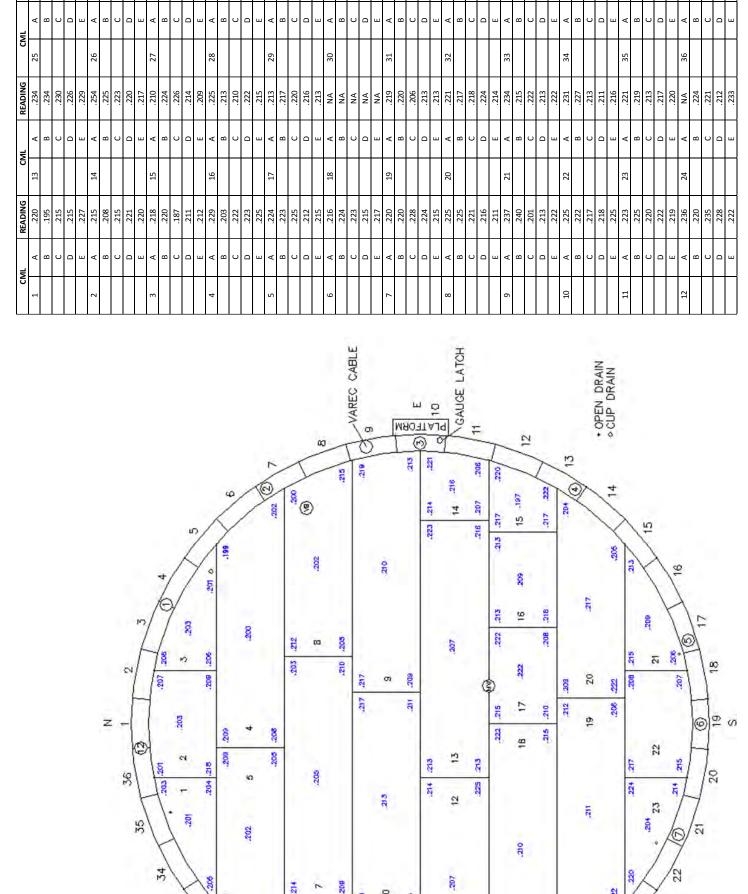
	READING	.323	.311	.275	.273		READING	.279	.296	.271	.270				
	CML	1.41	1.42	1.43	1.44		CML	13.01	13.02	13.03	13.04				
-	READING	.364	.341	.363	.303		READING	.413	.382	.382	.379	.513	.498	.542	.497
	CML	1.31	1.32	1.33	1.34		CML	11.01	11.02	11.03	11.04	12.01	12.02	12.03	12.04
	READING	.311	.287	.287	.275		READING	.393	.376	.397	.388	.447	.471	.478	.443
•	CML	1.21	1.22	1.23	1.24		CML	8.01	8.02	8.03	8.04	10.01	10.02	10.03	10.04
-	READING	.314	.303	.312	.272		READING	905.	.583	.488	.466	.483	.495	.497	.475
	CML	1.11	1.12	1.13	1.14		CML	6.01	6.02	6.03	6.04	7.01	7.02	7.03	7.04
)))	OW	\$\$\ \$\delta\$	900	S (((((((((((((((((((nt.		
W (/		-2 FROM 104 WELL	(5.12) -12" FROM (87M WELD (5.4))(3)()(3)()(3)()(3)((1) (2) (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4		(1.5)	56 8.9)				(a)

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Western
Refining
83 Unleaded Gasoline Storage Tank TK-571
Gallup, New Mexico

11.0 FLOATING ROOF AND PONTOON DRAWING / DATA



200

.209

33

2

205 11

29

208

0

28 3

(9)

26

27

218



Prairieville (225) 313-4617





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

12.0 CALCULATIONS

12.1.1 Shell Calculations

Visual Insp	6/9/2015		UT Insp.	6/9/2015			DATE:	<u>6/9/2015</u>	
TANK:	TK-571		INS	SPECTOR:	K. Angell		BBLS:	<u>25,000</u>	
TYPE OF	ROOF:	EX FL RO	<u>OF</u>			DA	TE BUILT:	<u>1957</u>	
SERVICE:	89 Unlead	led Gasoliı	<u>1e</u>		Р	RIOR UT IN	ISP. (Yr.):	<u>1957</u>	
BUILT BY:	Horton Ta	nk & CBI			LA	TEST UT II	NSP. (Yr.):	2015	
							` '		
		t) = 2.6(H-1)I				VISUAL II	NSP. (Yr.):	<u>2015</u>	
		us t - actual t /	•	en actual t ar	nd previous t				
Remaining	Life = actual t	- t min / corro	sion rate						
D=	Nominal diam	neter of tank, i	n feet						
G =	Highest spec	ific gravity of	the contents						
E=	Original joint	efficiency for	the tank						
H=	Height, in fee	et, from the bo	ttom in each	shell course t	o the maximu	m design liqui	d level		
S =	Maximum allo	ow able stress	in pounds pe	er square inch	٦.				
			· .						
	Diameter			Joint Eff.			Gravity		
	(D)			(E)			(G)		
	67			0.85			8.0		
		1st course	2 nd course	3 rd course	4th course	5 th course			
	Tensile	55,000	55,000	55,000	55,000	55,000			
	T Stress	23595	23595	25960	25960	25960			
	Yield	30,000	30,000	30,000		30,000			
	Y Stress	24000	24000	26400	26400	26400			
	Allowable								
	Stress (S)	23595	23595	25960		25960			
	Height (H) Course	36.00	28.65	20.90	12.60	4.30			
	Course Height	7.35	7.75	8.3	8.3	8.3			
		50	0	5.0	5.0	5.0			
Shell	UT	Previous	Corrosion	Minimum	Remaining	Visual	Shell Due		
Course	Reading (inches)*	Thickness	Rate (inches)	Thickness (inches)	Life (Yrs.)	External	for UT's (Yrs.)		
First	0.275	(inches) 0.375	0.00172	0.243	19	Due (Yrs.) 5	9		
Second	0.273	0.313	0.00172	0.192	21	5	10		
Secona Third	0.224	0.313	0.000153	0.192	86	5	15		
Fourth	0.225	0.25	0.00043	0.100	291	5	15		
Fifth	0.243	0.25	0.00012	0.100	1192	5	15	1	
1 11 (11	0.243	0.20	0.000 IZ	0.100	1132		10		
Shell is du	e for Extern	nal Visual Ir	snection:	6/9/2020					
		spection rea	•	6/9/2024					
5.1011 13 UU		Pootion ica	unigo.	<u>0, 0, 2024</u>					

COMMENTS Material unknown use: Y=30000/T=55000/E= from table 4-2 of API653/Stress API653 4.3.3.2 & .2 Course Fill Height was 30 feet (assumed)

NOTE: Thickness Readings taken independent of Western's corrosion monitoring program. Calculations based from build date with current thickness readings and long term corrosion rate. Thickness readings from 2nd course to top shell course were taken from the ladder off the tank. * Recommended to take full thickness survey and enter into





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

12.2 Bottom Calculations

DATE: 06/09/15

TANK: TK-571 INSPECTOR: K. Angell

TYPE OF ROOF: **EX. FL. Roof** DATE BUILT: <u>1957</u>

SERVICE: 89 Unleaded Gasoline NEW BOTTOM INSTALLED: 1957

PRIOR INSP (Yr): 2003 LATEST INSP (Yr): 2015

DOES TANK HAVE SECONDARY CONTAINMENT? NO

BOTTOM FORMULA CALCULATIONS

MRT = (Minimum of RTbc or Rtip) - Or (StPr +UPr)

MRT = Minimum remaining thickness at the end of interval Or. This value must meet the requirements of API 653 Table 4-4 and Paragraph 6.4.2.

	0.25	Original plate thickness, in inches
RTbc	0.2	Minimum remaining thickness from bottom side corrosion after repairs
Rtip	0.17	Minimum remaining thickness from internal corrosion after repairs
	0.025	Maximum depth of underside pitting after repairs.
	0.08	Max depth of int. pitting after repairs are completed, in inches, measured from the orig. thickness
StPr =	0.00138	Max internal pitting rate, in inches per year; StPr = 0 if the tank bottom is internally lined.
UPr =	0.00043	Max underside pitting rate, in inches per year; UPr = 0 if tank bottom is cathodically protected.
Or =	20	Anticipated in-service period of operation (normally 10 years).

MRT = 0.13379 Minimum remaining thickness at the end of the in-service period of operation, in inches.

Tank is due for Internal Inspection in

6/1/35

COMMENTS: The calculations were conservative. Credit for internal coating was not taken. Gave min remaining thickness on bottom side 0.200"; there was no corrosion on bottom side on the samples.

Table 4.4—Bottom Plate Minimum Thickness							
Minimum Bottom							
Plate Thickness at	Tank Bottom/						
Next Inspection	Foundation Design						
(in.)							
0.1	Tank bottom/foundation design with no means						
0.1	for detection and containment of a bottom leak.						
	Tank bottom/foundation design with means to						
0.05	provide detection and containment of a bottom						
	leak.						
	Applied tank bottom reinforced lining,						
0.05	> 0.05 in. thick, in accordance with						
	API 652.						



for

83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

13.0 TANK OUT-OF-SERVICE INSPECTION CHECKLIST

TANK OUT-OF-SERVICE INSPECTION CHECKLIST

TANK: TK-571

2.0 TANK DATA

> Tank Capacity 80,000 bbls 67'-0" Ft/In Tank Diameter 40'-0" Ft/In Tank Height

Tank Type (Cone, Int Floater, Ext Floater External Floating Roof

Tank Construction (Welded or Riveted) WELDED Date of Tank Construction 1957 Floating Roof (Steel or Aluminum) C/Steel

Product Storage 89 Unleaded Gasoline

2.1 **OVERVIEW**

- a. Y Was the tank cleaned, gas freed, and safe for entry?
- b. Y Was the tank completely isolated from product lines, all electrical power, and steam lines?
- d. N Was there the presence of falling object hazards, such as corroded-through roof rafters, asphalt stalactites, and trapped hydrocarbons in unopened or plugged equipment or appurtenances, ledges, etc.?
- e. N Were there any slipping hazards on the bottom and roof decks?

2.2 TANK EXTERIOR

- a. <u>N</u> Were appurtenances opened during cleaning such as lower floating swing sheave assemblies, nozzle interiors (after removal of the valves) inspected? ALL VALVES NOT REMOVED
- Were UT measurements taken on the floating roof (5 readings on each plate) and nozzles and were these measurements b. <u>Y</u> accurately sketched?
- d. <u>Y</u> Were UT measurements taken on the shell and nozzles (each plate on the bottom course and one plate on each course up the radial ladder)? Were these readings accurately sketched? AS PER CLIENTS REQUEST.

2.3 **BOTTOM INTERIOR SURFACES**

- a. Y Were UT measurements taken on the tank bottom (5 reading on each plate) and were these measurements accurately sketched? Explain results: SEE ATTACHED DRAWING OF BOTTOM.
- b. <u>Y</u> Was a MFL floor scan performed on the tank bottom and the measurements recorded and sketched? Explain findings. SEE ATTACHED REPORT.
- c. Y With a flashlight held close to and parallel to the bottom plates, and using the bottom plate layout as a guide, was the entire bottom visually inspected and hammer tested?
- Was the depth of pitting measured and documented?
- Were the areas marked requiring patching or further inspection?
- Were there any leaks or corrosion noted in the welds especially the shell-to-bottom welds? If yes, explain.
- d. <u>Y</u>
 e. <u>Y</u>
 g. <u>N</u>
 h. <u>Y</u> Were there any signs of corrosion on the sketch plates? If yes, explain. SEE ATACHED FINDINGS
- Were the bottom lap welds vacuum box tested?
- m. <u>Y</u> Were there reinforcing pads under all bottom attached clips, brackets, and supports?
- u. <u>Y</u> Were the sumps hammer tested and UT measurements taken on the bottom plate? Explain results.

2.4 SHELL SEAMS AND PLATE

- Was the depth of pitting measured on each course? Explain findings. SEE ATTACHED FINDINDS b. Y
- f. <u>Y</u> Were there any signs of damage, deterioration, and/or disbanding to the existing protective coating? If yes, explain. COATING AT FAILURE, SEE ATTACHED FINDINGS
- Were there indications of leakage in the shell plates or seams? If yes, explain. h. <u>N</u>
- k. N Was the shell surveyed to check for roundness and plumb? NOT REQUIRED BY CLIENT

2.6 ROOF INTERIOR SURFACE



for

83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

2.6.1 General

- Were there any holes, scale build up, and/or pitting on the underside surface of the plates? If yes, explain.
- $\begin{array}{c} a.\ \underline{N} \\ b.\ \underline{Y} \end{array}$ Was the vapor space of the floating roof and or at the edge of roof on a cone roof tank ultrasonically examined or hammer tested for thin spots?

2.11.3 **Shell Nozzles**

a. <u>Y</u> Were there any signs of pitting and/or thinning on the shell nozzles? SEE ATTACHED

2.12 **EMERGENCY ROOF DRAINS**

Were seal fabric discs slightly smaller than the pipe ID and the fabric seal? NO FABRIC; SEE ATTACHED FINDINGS a. <u>Y</u>

2.13 **Pontoon Inspection Hatches**

a. NO Did any pontoons show visual signs of leakage, after removal of inspection hatch cover? ACCESS WAS NOT GRANTED

NOTE: $Y = YES \quad N = NO$

PARTS OF THE CHECKLIST THAT WERE NOT APPLICABLE WERE NOT INCLUDED ON THIS LIST

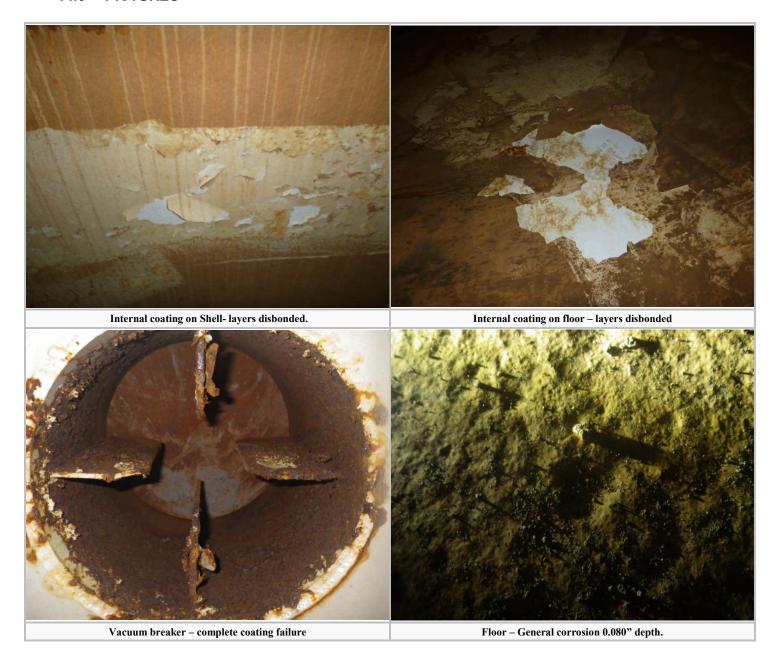
Inspector: Keith Angell Date: 06/09/2015





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

14.0 PICTURES





for Western



Striker Pates (3) – corrosion up to 0.140" in depth



Piping Knuckle/Inlet "Y" - Pads under support are stitch welded.



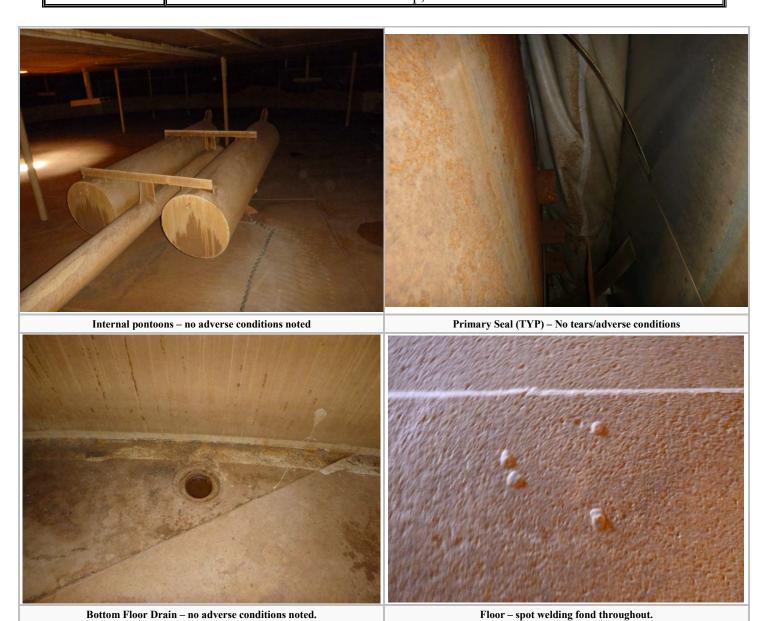
3/8" threaded plugs in shell – plugs not seal welded



Old Style roof drains & catch pans (5) - no longer in use









Western











Shell 2^{nd} course and above – complete coating failure; 0.20" to 0.040" general corrosion/pitting



Roof vent/emergency drain - see recommendations



Roof vent/emergency drain - has screen but open to rain- see recommendations





83 Unleaded Gasoline Storage Tank TK-571 Gallup, New Mexico

15.0 INSPECTION EQUIPMENT

15.1 MFL

The MFL equipment utilized for the inspection was a MFE Enterprise Mark III MFL Machine. The calibration block utilized was the MFE Enterprise Calibration Plate.

15.2 Ultrasonic

The UT equipment utilized for the inspection was a Panametrics EPOCH XT Flaw Detector. The transducer utilized was a KBA Model FH2E-WR, 7.5 MHz, 0.375 inch dual element. The calibration block utilized was a 4 step, Carbon Steel test block.

Ultragel was used as a couplant.

15.3 Vacuum Box

The LT/BT equipment utilized for the inspection was a Uniweld Hummvac Tester, Series TSP 30FBFlex (Flat) and Corner Box.

15.4 PIT GAUGE

The pit gauge utilized was a W.R. Thorpe Co. standard pipe pit gauge.

16.0 WARRANTY

Sentinel Integrity Solutions, has appraised the condition of this tank based on the inspections and measurements made by the Sentinel Integrity Solutions' Tank Inspector. Whereas our evaluation correctly describes the condition of the tank and tank appurtenances at the time of inspection, the tank owner/operator has ultimate responsibility assessing the inspection information / report provided by Sentinel Integrity Solutions and any conclusions reached by the tank owner/operator and any action taken or excluded are the sole responsibility of the owner / operator. With respect to inspection and testing, Sentinel Integrity Solutions warrants only that the services have been performed in accordance with accepted industry practice. If any such services fail to meet the foregoing warranty, Sentinel Integrity Solutions shall re-perform the service to the same extent and on the same conditions as the original service.

The preceding paragraph sets forth the restricted remedy for claims based on failure or of defect in materials or services, whether such claim is made in contract or tort (including negligence) and however instituted, and, upon expiration of the warranty period, all such liability shall terminate. The foregoing warranty is exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. No implied warranty of merchantability or Fitness for Purpose shall apply, nor shall Sentinel Integrity Solutions be liable for any loss or damage whatsoever by reason of its failure to discover, report, repair or modify latent defects or defects inherent in the design of any tank inspected. In no event, whether a result of breach of contract, warranty or tort (including negligence) shall Sentinel Integrity Solutions be liable for any substantial or supplementary I damages including, but not limited to, loss of profit or revenues, loss of use of equipment tested or services by Sentinel Integrity Solutions or any associated damage to facilities, down-time costs or claims of other damages.