AP - 111

OW-14 INVESTIGATION REPORT (1)

2019

Marathon Petroleum Company LP

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

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

Sincerely,
Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks

Robert S. Hanks
Refinery General Manager

Enclosure

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

RESPONSE TO COMMENTS
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.



Aerial Map Source: Google Map, 01/05/2014.

N

0 160

SCALE IN FEET

LEGEND

TK 568-1 — SOIL BORING / TEMP WELL LOCATION AND IDENTIFICATION NUMBER

OW-57 — ALLUVIUM / CHINLE GP MONITORING WELL LOCATION AND IDENTIFICATION NUMBER

A —— A' LINE OF CROSS-SECTION

NEW MEXICO

GALLUP SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 10/18/19 | FILE: Mathon-dA125

FIGURE 6
CROSS SECTION LOCATION MAP (A - D)
GALLUP REFINERY
OW-14 SOURCE INVESTIGATION

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

C

C'

ELEVATION (FT MSL)

6960
6950
6940
6930
6920
6910
6900
6890
6880
6870

OW-14

SILTY,
SANDY CLAY

SILTY SAND

SILTY SAND

SANDSTONE

OW-58

SILTY CLAY

SANDY CLAY

SILTY CLAY

SANDY CLAY / CLAYEY SAND

SANDY SILTY CLAY

SILTY SAND, STAURATED

SILTY CLAY

CLAY (CH)

SILTY CLAY

SANDY GRAVEL

SHALE

TK 568-1

SANDY,
SILTY CLAY

SILTY CLAY

SANDY,
CLAYEY SILT

SILTY,
SANDY
CLAY

CLAYEY SAND

SILTY CLAY

SILTY SAND

SANDY CLAY

CLAY (CH)

SANDY SHALE

TD=49'

TK 568-2

SILTY CLAY

SANDY CLAY

CLAYEY SAND

GRAVELLY SAND /
SANDY GRAVEL

CLAYSTONE

TD=37'

RW-1

SANDY CLAY

SILTY CLAY

SANDY CLAY

CLAY

SAND

SANDY CLAY

SAND

SANDY GRAVEL

CLAY

SANDY GRAVEL

SAND

CLAY

CLAYEY SAND

CLAY

SANDY GRAVEL

SANDY SHALE

TD=48.5'

LEGEND

TK 569-1 — BORING OR WELL IDENTIFICATION

BORING OR WELL

POTENTIOMETRIC SURFACE

WELL SCREEN INTERVAL

TD=42' — TOTAL DEPTH

10
0
80

SCALE IN FEET
VERTICAL EXAGGERATION = 8X

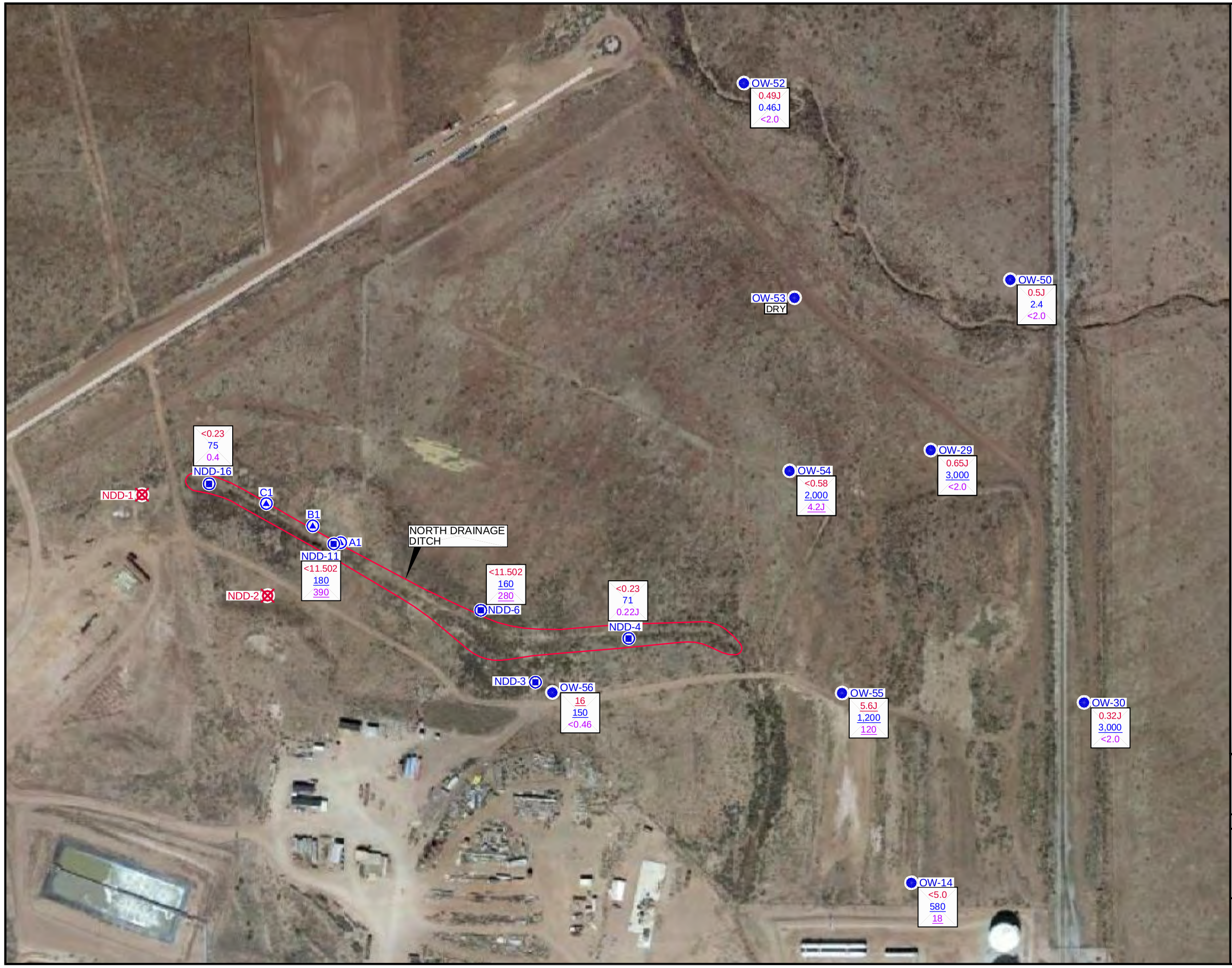
WATER BEARING SAND OR GRAVEL

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 10/18/19 | FILE: Mathon-dB230

FIGURE 9
CROSS SECTION C-C'
GALLUP REFINERY
OW-14 SOURCE INVESTIGATION

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



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

0 200
SCALE IN FEET

NEW MEXICO

GALLUP SITE LOCATION

LEGEND

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

2.7 — 1,2-DICHLOROETHANE (µg/L)
<0.231 — MTBE (µg/L)
0.87J — NAPHTHALENE (µg/L)

UNDERLINED CONCENTRATION VALUE EXCEEDS SCREENING LEVEL (µg/L)

5 — 1,2-DICHLOROETHANE (µg/L)
143 — MTBE (µg/L)
1.65 — NAPHTHALENE (µg/L)

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 4/16/19 | FILE: Mathon-dB121

FIGURE 22
VOCs
GROUNDWATER MAP

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

Appendix A
Historical Boring Logs

PRECISION ENGINEERING, INC.

PROJECT: Tank 569
LOCATION: See Boring Plan

LOG OF TEST BORINGS

FILE #: 95-018
ELEVATION: 6943.7
TOTAL DEPTH: 48.5
LOGGED BY: WHK
DATE: 3-28-95
STATIC WATER: 28.0
BORING ID: BG4
PAGE: 1

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
0.0-0.3	*********		C	**Sand**, fine, dry, brown, loose	
0.3-0.4	xxxxxxxxx	1.0	C	**Asphalt Cement Concrete**	11.0
0.4-5.0	///***///		C	**Clay**, sandy, wet, brown, firm, (fill), odor below 3.9', water saturated @ 4.8'	>1438
	///***///		C	bottom of fill is at 4.8'	
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
5.0-11.8	///--+///	5.0	C	**Clay**, silty, blocky, wet, brown, firm, scattered carbonate filaments, some	0.0
	///--+///		C	nodules, native, no odor, redder >10'	
	///--+///		C		
	///--+///		C		
	///--+///		C		
	///--+///		C		
	///--+///		C		
	///--+///		C		
	///--+///		C		
	///--+///		C		
	///--+///		C		
	///--+///		C		
	///--+///	11	C		
	///--+///		C		
11.8-13.0	///***///	12	C	**Clay**, sandy, very fine, wet, red brown to brown, soft	0.0
	///***///		C		
13.0-14.1	////+++//	13	C	**Clay**, stiff, fissured, wet, brown, some carbonate nodules	0.0
	////+++//		C		
14.1-14.6	*********	14	C	**Sand**, fine, clean, damp, white, loose	0.0
14.6-15.0	///**o*//		C	**Clay**, sandy, slightly gravelly, wet, brown, very stiff to hard	0.0
15.0-16.9	///**////	15	C	**Clay**, very fine sandy, laminar bedded, wet, brown, soft	0.0
	///**////		C		
	///**////		C		
	///**////		C		
16.9-18.1	///*/////	17	C	**Clay**, very fine sandy, slightly less than above, slightly blocky, wet, brown, firm	0.0
	///*/////		C		
	///*/////	18	C		
18.1-19.8	****//***		C	**Sand**, some clay, sandy in bands, moist to wet, brown, moderately dense to soft	0.0
	****//***		C	interbedded with finer soil	
19.8-21.3	000***000		C	**Gravel**, sandy, moist, light grey to white, dense, subrounded	0.0
	000***000	20	C		
	000***000		C		
	000***000	21	C		
21.3-21.8	///***///		C	**Clay**, sandy, wet, brown, soft	
21.8-25.5	000**/000	22	C	**Gravel**, slightly sandy, some clay as binder, moist, grey to brown, dense	
	000**/000		C	odor @ 24.4'	20 @ 22.5'
	000**/000		C		

LOGGED BY: WHK

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

PRECISION ENGINEERING, INC.

PROJECT: Tank 569
LOCATION: See Boring Plan

LOG OF TEST BORINGS

FILE #: 95-018
ELEVATION: 6943.7
TOTAL DEPTH: 48.5
LOGGED BY: WHK
DATE: 3-28-95
STATIC WATER: 28.0
BORING ID: BG4
PAGE: 2

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
	000**/000		C	continued from page 1	
	000**/000	24	C		
	000**/000		C		160 @ 24.4'
	000**/000	25	C		
25.5-29.4	*********		C	**Sand**, fine, clean of silt and clay, moist, brown, loose	45.0
	*********	26	C		
	*********		C		
	*********		C		
	*********		C		
	*********		C		
	*********		C		
	*********	29	C		
29.4-30.5	*********		C	**Sand** as above but **very weakly water bearing @ 29.4'**, grey to black, strong odor	1100
	*********	30	C		
30.5-31.2	///***///		C	**Clay**, sandy, wet, brown, soft, odor	770
	///***///	31	C		
31.2-34.0	///+++///		C	**Clay**, blocky, wet, very stiff, numerous carbonate filaments, brown, slightly	770
	///+++///		C	fissured, odor	
	///+++///		C		
	///+++///		C		
	///+++///		C		
34.0-35.0	***---***	34	C	**Sand**, silty, very fine, does not appear water bearing, but sample covered with	700
	---		C	water from above, very dark brown to black, soft, strong odor	
35.0-37.3	***///***	35	C	**Sand**, very fine, clayey, **saturated, water bearing zones--2" thick**, gradational to	1000
	///		C	clay below, brown, strong odor	
	///		C		
	///		C		
	///	37	C		
37.3-39.2	///+++///		C	**Clay**, wet, brown, stiff, carbonate filaments, soft to firm, not blocky or fissured	320
	///+++///		C		
	///+++///		C		
	///+++///	39	C		
39.2-40.9	000**/000		C	**Gravel**, sandy, slightly clayey, **water bearing**, brown, dense, rounded to subrounded	800
	000**/000		C	odor	
	000**/000		C		
40.9-45.0	----*----	41	C	**CHINLE FORMATION**	
	----*----		C	**Shale**, slightly sandy, fissle, fissured, slightly blocky, moist, red brown, hard	2.0
	----*----		C	some grey green banding, no odor	
	----*----		C		
	----*----		C		
	----*----		C		
	----*----		C		
	----*----		C		
45.0-48.5	----**---	45	C	**Shale**, sandy, fissle, moist to damp, hard, water from above runs into fissle	
	----**---		C	partings (dry on interior of sample) difficult to obtain uncontaminated sample	
	----**---		C	dark red brown, suspect samples taken may be contaminated by water from above	

LOGGED BY: WHK

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

PRECISION ENGINEERING, INC.

PROJECT: Tank 569
LOCATION: See Boring Plan

LOG OF TEST BORINGS

FILE #: 95-018
ELEVATION: 6943.7
TOTAL DEPTH: 48.5
LOGGED BY: WHK
DATE: 3-28-95
STATIC WATER: 28'-7"
BORING ID: BG4
PAGE: 3

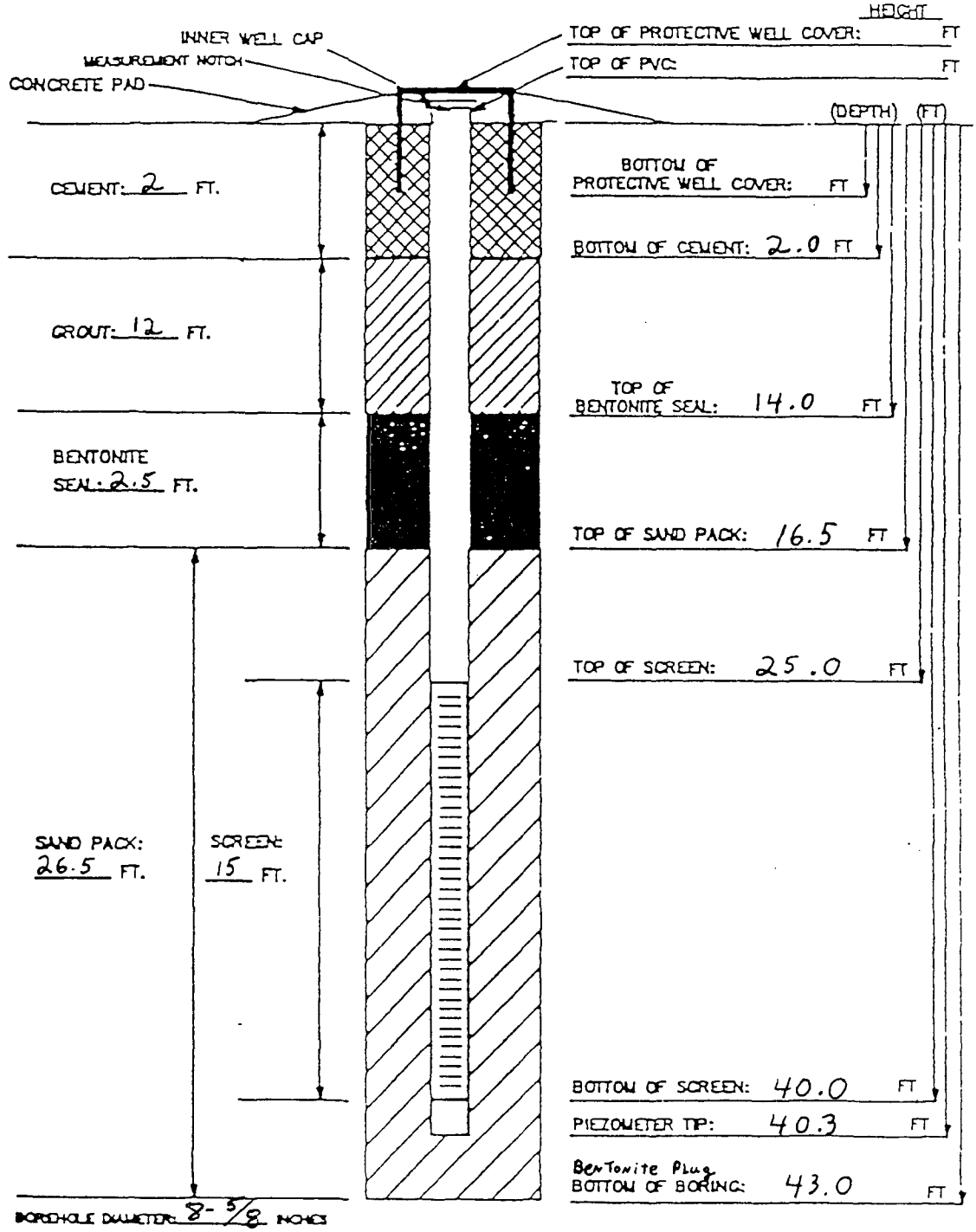
DEPTH	PLOT	SAMPLE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
	----**---		C	continued from page 2	
	----**---	47	C		23 @ 47.0'
	----**---		C		
	----**---	48	C		
	----**---		C		12 @ 48.5'
TD				stop drilling 11:05a	
				water @ 18.8' @ 11:30a -- 8" of hydrocarbon on water @ 2:00p water level @ 28'-7"	
				completed 4" well, screened from 25' to 40'	
				(see attached completion diagram)	

LOGGED BY: WHK

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

INSTALLATION DATE: 032895

INSTALLATION DIAGRAM
MONITORING WELL NO.
B6-4



MATERIALS USED:

SAND TYPE AND QUANTITY: 20-40
BENTONITE PELLETS (5-GALLON BUCKETS): 1
BAGS OF GROUT: 1
AMOUNT OF CEMENT: 8-94# Bags+75#Gel
AMOUNT OF WATER USED: 8 gal
OTHER:

Bottom Cap Used? YES
Screen Lengths: 15'
Riser Used: 30'
Top Cap Used? ____
Well Size: 4" Dia.

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

TASK: Tank 569 GEOLOGIST/ENGINEER: WHK

PRECISION ENGINEERING, INC.

PROJECT: Tank 569
LOCATION: See Boring Plan
Tank 576

LOG OF TEST BORINGS

FILE #: 95-018
ELEVATION: 6927.3
TOTAL DEPTH: 38.0
LOGGED BY: WHK
DATE: 3-29-95
STATIC WATER: 24'-3"
BORING ID: B2
PAGE: 1

DEPTH	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
0.0-5.0	///-*////		C	start at 10:00a	
	///-*////		C	**Clay**, slightly silty, little sand, wet, brown, soft to firm, no odor	0.0
	///-*////		C		
	///-*////		C		
	///-*////		C		
	///-*////		C		
	///-*////		C		
	///-*////		C		
	///-*////		C		
	///-*////	5.0	C		
	///-*////		C		
	///-*////		C		
	///-*////		C		
	///-*////		C		
	///-*////		C		
	///-*////	8.0	C		
8.4-10.6	///***///		C	**Clay**, fine sandy, gradational fine above and to below, wet, brown, firm, no odor	0.0
	///***///		C		
	///***///		C		
	///***///	10	C		
10.6-12.0	***---***		C	**Sand**, silty, fine, moist, light red brown, loose, no odor	0.0
	---		C		
	---		C		
12.0-12.5	***OOO***	12	C	**Sand**, very gravelly, to 2", moist, light red brown, dense, slightly rounded rock	0.0
12.5-13.1	***---***		C	**Sand**, silty, moist, light red brown, loose, no odor	0.0
13.1-15.0	///**--//	13	C	**Clay**, sandy, silty, moist, red brown, firm to stiff, some root filaments	0.0
	///**--//		C		
	///**--//		C		
	///**--//		C		
15.0-16.8	***///***	15	C	**Sand**, clayey, fine, moist, red brown, moderately dense, no odor	0.0
	///		C		
	///		C		
	///		C		
16.8-19.1	//*++-///	17	C	**Clay**, silty grading to very fine sandy, moist to wet, red brown, stiff, no odor	0.0
	//*++-///		C	carbonate filaments common	
	//*++-///		C		
	//*++-///		C		
	//*++-///	19	C		
19.1-20.0	//--OO++/		C	**Clay**, silty, large gravel present (2"), wet, dark brown, hard, no odor	0.0
	//--OO++/	20	C	numerous carbonate filaments	
20.0-23.6	//--++///		C	**Clay**, silty, brown, stiff, slightly blocky, no odor, carbonate filaments	0.0
	//--++///		C		
	//--++///		C		
	//--++///		C		
	//--++///		C		540 @ 22.6'
	//--++///		C		

LOGGED BY: WHK

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

PRECISION ENGINEERING, INC.

PROJECT: Tank 569
LOCATION: See Boring Plan

LOG OF TEST BORINGS

FILE #: 95-018
ELEVATION: 6927.3
TOTAL DEPTH: 38.0
LOGGED BY: WHK
DATE: 3-29-95
STATIC WATER: 24'-3"
BORING ID: B2
PAGE: 2

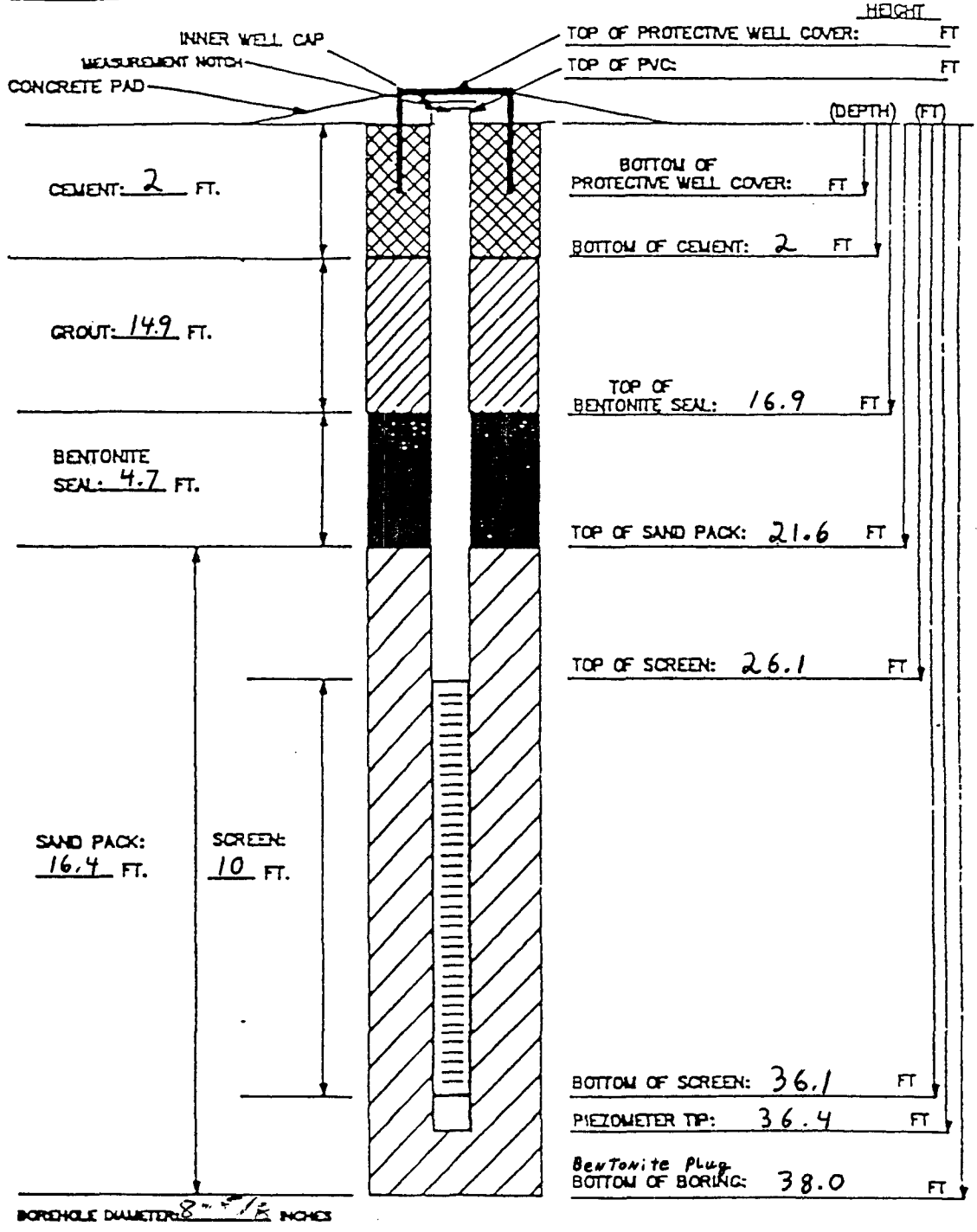
DEPTH	PLOT	SAMPLE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	PID (ppm)
23.6-24.2	***OO****		C	**Sand**, coarse, some fine gravel, saturated but does not appear water bearing, brown	1000
	OO*	24	C	dense, hydrocarbon odor	
24.2-25.5	/////////		C	**Clay**, wet, not water bearing, brown, stiff, hydrocarbon odor	1060
	/////////	25	C		
25.5-27.1	***///***		C	**Sand**, clayey, **water bearing**, brown, odor	610
	///		C		
	///		C		
27.1-28.5	/////////	27	C	**Clay**, some sand @ 28'-28.5', wet, brown, soft, slightly blocky, hydrocarbon odor	
	/////////		C	saturated but not water bearing	
	/////////	28	C		
28.5-30.9	///***///		C	**Clay**, sandy, some laminations, wet, brown, stiff	60
	///***///		C		
	///***///		C		
	///***///		C		
	///***///		C		
30.9-32.9	000**0000	31	C	**Gravel**, some sand, silica rock, **water bearing**, brown, dense, rounded to subrounded	1030
	000**0000		C		
	000**0000		C		
	000**0000		C		
32.9-35.0	----------	33	C	**CHINLE FORMATION**	
	----------		C	**Shale**, weathered, wet to moist, some green mottling, red brown overall, stiff	20
	----------		C	weak odor	
	----------		C		
35.0-38.0	----*-----	35	C	**Shale**, as above, slightly more sand, blocky, dark red brown, wet to moist	57
	----*-----		C	suspect contamination by water flowing from gravel above--gravel produces more	
	----*-----		C	water at this location than previous drilling	
	----*-----		C		
	----*-----		C		
	----*-----		C		
	----*-----	38	C		
TD				stop drilling 11:25a	
				completed 4" well - see attached well completion diagram	
				24'-3" to water	
				2" product on water	

LOGGED BY: WHK

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

INSTALLATION DATE: 032995

INSTALLATION DIAGRAM
MONITORING WELL NO.
B-2



MATERIALS USED:

SAND TYPE AND QUANTITY: 20-40
BENTONITE PELLETS (5-GALLON BUCKETS): 2
BAGS OF GROUT:
AMOUNT OF CEMENT: 8 - 94# Bags + 75# Gal
AMOUNT OF WATER USED: 8 Gal
OTHER:

Bottom Cap Used? YES
Screen Lengths: 10'
Riser Used: 30'
Top Cap Used?
Well Size: 4" Dia.

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

TASK: Tank 569 GEOLOGIST/ENGINEER: WHK

Appendix B

Fluid Level Measurements

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

Well ID Number & Date of Installation	Inspection or Sample Date	Casing Diameter (Inch)	2011 Survey [1] Ground Level Elevations (ft)	2011 Survey [1] Well Casing Rim Elevations (ft)	Stick up - length (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH [2] Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation [3] (ft)	Corrected Water Table Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit screened
OW-13 12/10/80	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	NPP	NPP	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	NPP	NPP	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	NPP	NPP	21.77	6,898.30	N/A	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	NPP	NPP	22.61	6,897.46	N/A	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
	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
	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	NPP	NPP	21.94	6,898.13	N/A	78.2 - 98.2	Sonsela
	11/15/16	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	21.68	6,898.39	N/A	78.2 - 98.2	Sonsela
	02/27/17	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	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	NPP	NPP	21.45	6,898.62	N/A	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	NPP	NPP	21.00	6,899.07	N/A	78.2 - 98.2	Sonsela
	02/28/18	4.00	6,918.95	6,920.07	1.12	99.15	NPP	NPP	20.50	6,899.57	N/A	78.2 - 98.2	Sonsela
	04/26/18	4.00	6,918.95	6,920.07	1.12	99.00	NPP	NPP	20.41	6,899.66	N/A	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	NPP	NPP	20.70	6,899.37	N/A	78.2 - 98.2	Sonsela

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

Well ID Number & Date of Installation	Inspection or Sample Date	Casing Diameter (Inch)	2011 Survey [1] Ground Level Elevations (ft)	2011 Survey [1] Well Casing Rim Elevations (ft)	Stick up length (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH [2] Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation [3] (ft)	Corrected Water Table Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit screened
OW-14 12/17/80	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
	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
	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

Well ID Number & Date of Installation	Inspection or Sample Date	Casing Diameter (Inch)	2011 Survey [1] Ground Level Elevations (ft)	2011 Survey [1] Well Casing Rim Elevations (ft)	- Stick up length (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH [2] Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation [3] (ft)	Corrected Water Table Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit screened
RW- 1 3/28/95	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\A	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	NM	NM	NM	NM	NA	N/A	25 - 40	Chinle/Alluvium Interface

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

Well ID Number & Date of Installation	Inspection or Sample Date	Casing Diameter (Inch)	2011 Survey [1] Ground Level Elevations (ft)	2011 Survey [1] Well Casing Rim Elevations (ft)	Stick up length (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH [2] Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation [3] (ft)	Corrected Water Table Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit screened
RW-2 3/29/95	03/26/13	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	24.74	6,903.79	N/A	26.1 36.1	Chinle/Alluvium Interface
	06/17/13	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	24.80	6,903.73	N/A	26.1 36.1	Chinle/Alluvium Interface
	09/16/13	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	24.64	6,903.89	N/A	26.1 36.1	Chinle/Alluvium Interface
	12/11/13	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	24.66	6,903.87	N/A	26.1 36.1	Chinle/Alluvium Interface
	03/17/14	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	24.59	6,903.94	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	06/09/14	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	23.79	6,904.74	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	09/18/14	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	23.95	6,904.58	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	11/13/14	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	23.90	6,904.63	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	03/23/15	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	23.52	6,905.01	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	06/09/15	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	23.02	6,905.51	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	08/23/15	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	23.37	6,905.16	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	10/29/15	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	22.80	6,905.73	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	03/04/16	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	22.45	6,906.08	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	06/08/16	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	22.31	6,906.22	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	09/13/16	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	22.47	6,906.06	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	11/16/16	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	22.22	6,906.31	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	03/16/17	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	21.65	6,906.88	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	06/20/17	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	21.19	6,907.34	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	09/19/17	4.00	6,926.40	6,928.53	2.13	39.80	NPP	NPP	20.71	6,907.82	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	12/05/17	4.00	6,926.40	6,928.53	2.13	40.00	NPP	NPP	20.34	6,908.19	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	02/19/18	4.00	6,926.40	6,928.53	2.13	40.00	NPP	NPP	20.00	6,908.53	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	04/25/18	4.00	6,926.40	6,928.53	2.13	39.99	NPP	NPP	20.03	6,908.50	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	08/16/18	4.00	6,926.40	6,928.53	2.13	40.00	NPP	NPP	20.10	6,908.43	N/A	26.1 - 36.1	Chinle/Alluvium Interface
	4th Qtr 2018	4.00	6,926.40	6,928.53	2.13	NM	NM	NM	NM	NA	N/A	26.1 - 36.1	Chinle/Alluvium Interface

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

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

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

Well ID Number & Date of Installation	Inspection or Sample Date	Casing Diameter (Inch)	2011 Survey [1] Ground Level Elevations (ft)	2011 Survey [1] Well Casing Rim Elevations (ft)	Stick up - length (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH [2] Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation [3] (ft)	Corrected Water Table Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit screened
RW-6 8/27/97	03/26/13	4.00	6,941.96	6,944.01	2.05	40.90	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	9.02	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	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	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	27.43	4.35	31.78	6,912.23	6,915.71	28.5 - 38.5	Chinle/Alluvium Interface
	4th Qtr 2018	4.00	6,941.96	6,944.01	2.05	NM	NM	NM	NM	NA	N/A	28.5 - 38.5	Chinle/Alluvium Interface

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

Well ID Number & Date of Installation	Inspection or Sample Date	Casing Diameter (Inch)	2011 Survey [1] Ground Level Elevations (ft)	2011 Survey [1] Well Casing Rim Elevations (ft)	Stick up length (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH [2] Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation [3] (ft)	Corrected Water Table Elevation [4] (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit screened
OW-57 10/5/16	11/07/16	2.00	6,930.64	6,933.10	2.46	28.35	NPP	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	NPP	NPP	20.75	6,912.35	N/A	15 - 25	Chinle/Alluvium Interface
	06/20/17	2.00	6,930.64	6,933.10	2.46	28.35	NPP	NPP	20.52	6,912.58	N/A	15 - 25	Chinle/Alluvium Interface
	09/19/17	2.00	6,930.64	6,933.10	2.46	28.35	NPP	NPP	20.15	6,912.95	N/A	15 - 25	Chinle/Alluvium Interface
	12/05/17	2.00	6,930.64	6,933.10	2.46	28.35	NPP	NPP	20.11	6,912.99	N/A	15 - 25	Chinle/Alluvium Interface
	02/19/18	2.00	6,930.64	6,933.10	2.46	28.35	NPP	NPP	19.88	6,913.22	N/A	15 - 25	Chinle/Alluvium Interface
	04/25/18	2.00	6,930.64	6,933.10	2.46	28.06	NPP	NPP	20.02	6,913.08	N/A	15 - 25	Chinle/Alluvium Interface
	08/16/18	2.00	6,930.64	6,933.10	2.46	28.07	NPP	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	NPP	NPP	20.30	6,912.80	N/A	15 - 25	Chinle/Alluvium Interface
OW-58 10/3/16	11/07/16	2.00	6,934.71	6,934.50	-0.21	47.55	NPP	NPP	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	NPP	NPP	26.00	6,908.50	N/A	38 - 48	Chinle/Alluvium Interface
	06/21/17	2.00	6,934.71	6,934.50	-0.21	47.55	NPP	NPP	25.14	6,909.36	N/A	38 - 48	Chinle/Alluvium Interface
	09/19/17	2.00	6,934.71	6,934.50	-0.21	47.55	NPP	NPP	25.04	6,909.46	N/A	38 - 48	Chinle/Alluvium Interface
	12/06/17	2.00	6,934.71	6,934.50	-0.21	47.50	NPP	NPP	24.67	6,909.83	N/A	38 - 48	Chinle/Alluvium Interface
	02/20/18	2.00	6,934.71	6,934.50	-0.21	47.62	NPP	NPP	24.52	6,909.98	N/A	38 - 48	Chinle/Alluvium Interface
	04/25/18	2.00	6,934.71	6,934.50	-0.21	47.50	NPP	NPP	24.25	6,910.25	N/A	38 - 48	Chinle/Alluvium Interface
	08/16/18	2.00	6,934.71	6,934.50	-0.21	47.49	NPP	NPP	24.48	6,910.02	N/A	38 - 48	Chinle/Alluvium Interface
	11/29/18	2.00	6,934.71	6,934.50	-0.21	47.30	NPP	NPP	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

ACT
Advanced Chemical Transport

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: I-40 exit 39
Jamestown , NM 87347
Technical Contact: Thurman (Beck) Larson Title: MAIN CONTACT
Name of Waste SOIL - DRILL CUTTINGS
Process Generating SOIL SAMPLING

Profile Number: ACT14825
Generator US EPA ID: NMD000333211
Phone:
Fax:
Email:

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 Gravity:** > 1 SP.GR. **Flash Point (F):** > 200 F **BTU Value:** N/A

C. Chemical Composition / UHC's

BASED UPON: ANALYTICAL (INCLUDED) **Range** **GENERATOR KNOWLEDGE** X

SOIL - DRILL CUTTINGS	100	- 100	%

D. METALS

	Total (PPM)	EP Toxicity (mg/l)
Arsenic:		
Barium:		
Cadmium:		
Chromium:		
Lead:		
Mercury:		
Chromium, Hexavalent		
Selenium:		
Silver:		
Copper:		
Nickel:		
Zinc:		
Thallium:		

E. OTHER COMPONENTS

OXIDIZER:	N	REACTIVE SULFIDES PPM	N
EXPLOSIVE:	N	REACTIVE CYANIDES PPM	N
SHOCK SENSITIVE:	N	WATER/AIR REACTIVE	N
TIRES:	N	THERMALLY UNSTABLE	N
PYROPHORIC:	N	TSCA REG PCB WASTE:	N
RADIOACTIVE:	N	COMPRESSED GASSES:	N
EXEMPT RAD:	N	CERCLA/SUPERFUND:	N
ETHIOLOGICAL:	N	PESTICIDE MAUFACTURING WASTE:	N

HALOGENATED ORGANIC COMPOUNDS PER 40 CFR 268, APPENDIX III
DEBRIS N <500 PPM VOC as generated

Subject to NESHAP Regulations N
US EPA Hazardous Waste
US EPA Hazardous Waste Codes: ; NONE

F. Shipping Information:

DOT Hazardous Material NO Exempted NO
Proper Shipping Name: Non-RCRA/Non-DOT Regulated Material Solid (SOIL - DRILL CUTTINGS)
Hazard Class:
ID #:
PG:
Anticipated Volume (Units): 4 DM
Per: YEAR

G. Special Handling 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 Adavanced 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 Cheryl Johnson *Title* Envrn Specialist *Date* 11-14-12

Print Name: Cheryl Johnson

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

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: NMD000333211
2. Page 1 of: 2
3. Emergency Response Phone: 800-424-9300
4. Manifest Tracking Number: 009005992 FLE

GENERATOR

5. Generator's Name and Mailing Address: ~~WESTERN REFINING~~ SOUTHWEST GALLUP REFINING
92 GIANT CROSSING ROAD
GALLUP, NM 87301
505 722 0258
Generator's Phone:

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

RECEIVED
APR 11 2017

6. Transporter 1 Company Name: Advanced Chemical Transport Inc. (SV)
U.S. EPA ID Number: CAR000070540

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address: ~~Advanced Chemical Treatment~~
6133 Edith Blvd NE
Albuquerque, NM 87107
505-349-5220
Facility's Phone:
U.S. EPA ID Number: NMD002208627

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. NA3077, Hazardous waste, solid, n.o.s. (chromium), 9, PGIII	02	DM	400	P	D007		
X	2. NA1993, Combustible liquid, n.o.s., Comb liq, PGIII (DIESEL IN VIALS)	01	DM	300	P	NONE		
X	3. RQ, NA3077, Hazardous waste, solid, n.o.s. (oil, sludge), 9, PGII (RQ-K050)	05	DM	1500	P	K050		
X	4. RQ UN3175, Waste Solids containing flammable liquid, n.o.s. (acetone, methanol), 4.1, PGII	03	CF	900	P	D001	F003	F005

14. Special Handling Instructions and Additional Information
Project Number 121018 Document #: D143725
1) ERG#171; ACT17854 WEA-(02) SSDM
2) ERG#128; ACT3485 WEA-(01) SSDM
3) ERG#171; RC5562 WEA (05) SSDM
4) ERG#133; ACT51807 WEA (03) CF
24 hour emergency contact; CHEMTREC 800-424-9300

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

Generator's/Offeror's Printed/Typed Name: ALVIN DORSEY
Signature:
Month 03 Day 13 Year 17

INT'L

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

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Robert Hurd
Signature:
Month 03 Day 13 Year 17

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

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☒ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

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

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

1.	2.	3.	4.
H141	H141	H141	H141

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

Printed/Typed Name: Kris Crunch
Signature:
Month 3 Day 21 Year 17

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

DESIGNATED FACILITY TO GENERATOR

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number: NMD000333211

22. Page 2 of 2

23. Manifest Tracking Number: 009005992FLE

24. Generator's Name: WESTERN REFINING SOUTHWEST GALLUP REFINING
92 GIANT CROSSING ROAD
GALLUP, NM 87301

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

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

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		
X	5) RQ UN1993, Waste Flammable liquids, n.o.s. (SOLVENT NAPTHA, XYLENE), 3, PGII (RQ D001) RCH		DM RCH		P	D001 RCH		
X	6) RQ UN1897, Waste Tetrachloroethylene, 6.1, PGIII (D039) RCH		DM RCH		P	D039 RCH	D210	
X	7) RQ UN3214, Waste Permanganates, inorganic, aqueous solution, n.o.s. (SODIUM PERMANGANATE), 5.1, PGII (D001) RCH				P	D001 RCH		
X	8) NA3082, Hazardous waste, liquid, n.o.s. (BENZENE, CHRYSENE), 9, PGIII	03	DM	900	P	F037		
	9) Non-RCRA/Non-DOT Regulated Material Solid (SOIL - DRILL CUTTINGS)	30	DM	14,250	P	NONE		
	10) UN3082, Environmentally hazardous substances, liquid, n.o.s. (SURFACTANT SOLUTION), 9, PGIII RCH		DM	RCH	P			

32. Special Handling Instructions and Additional Information
7) ERG#140; ACT82247 WEA RCH 8) ERG#160; ACT24488 WEA RCH 9) ERG#; ACT14825 WEA (03) 550 10) ERG#171; ACT142769 WEA RCH RCH

TRANSPORTER

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

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

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems) 4/11 4/11

DESIGNATED FACILITY TO GENERATC

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

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 casing^2 (ft) x 7.48 (gals/ft).
The calculated purge volumes and actual volumes removed from each well are presented below.

Well (Date)	Water Column Thickness (ft)	Calculated Purge Volume (gallons) – 3 well volumes	Actual Purge Volume (gallons)
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.

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

Appendix F

Soil Boring/Well Logs

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

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

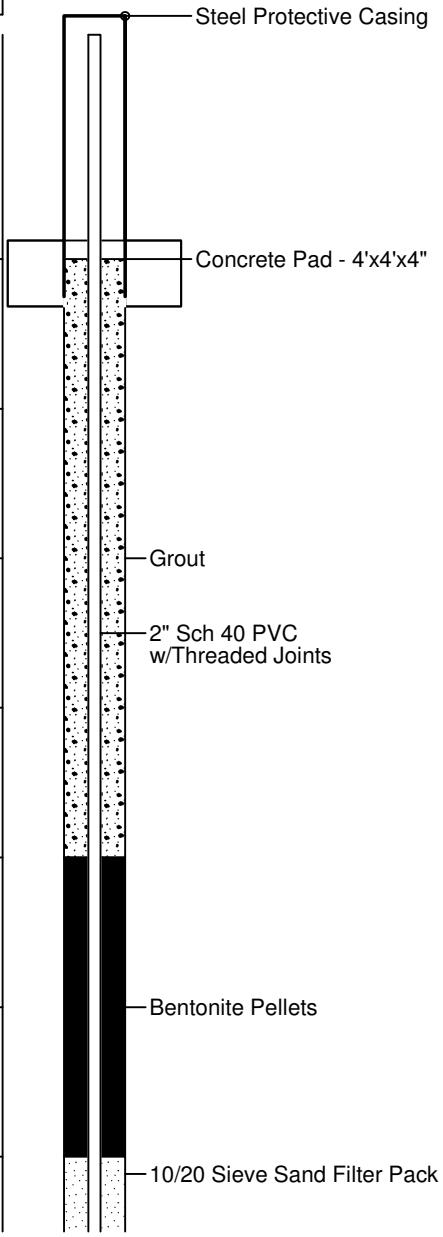
Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
1	0.6			CL	100		SILTY CLAY, moderate, firm, damp, brown, no odor,
3	0.6			CL	100		SILTY CLAY, SIMILAR TO ABOVE (STA),
5	2.6			CL	100		SILTY CLAY, STA,
7	6.2			CL	100		SILTY CLAY, STA, darker brown,
9	23.7			CL	90		SILTY CLAY, STA, no odor,
11	118			CL	90		SANDY CLAY, low, soft, damp, brown, odor,
12	85			CL			SANDY CLAY, STA, brown/tan silt at base, odor,

Saturation

▼ Saturation

Completion Results

OW-57



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

DiSorbo Consulting, LLC

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

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

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)

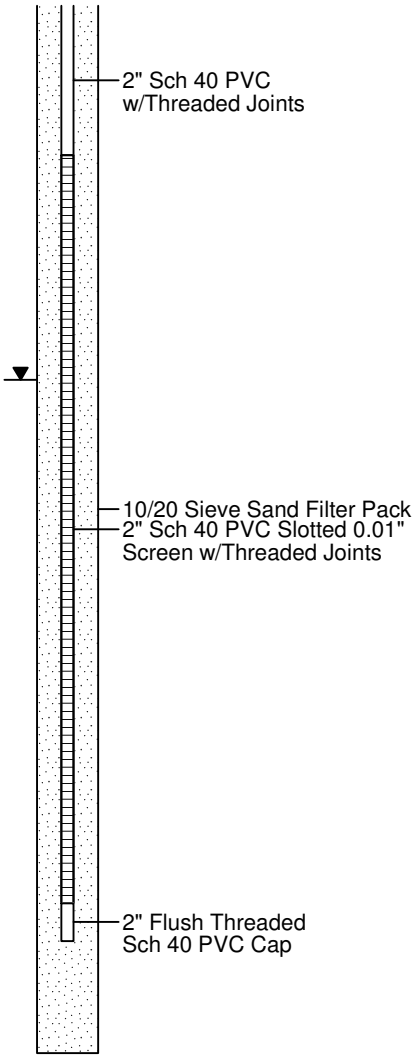
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Elev., PAD (ft. msl)	: 6930.64
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N 163475.52
E	: E 2546961.79

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
13	85			CL	80		
14							CLAYEY SILT, very fine, soft, damp, brown and tan, odor,
15	197			ML	90		
16							SILTY CLAY, low, firm, tan and brown, damp, odor,
17	205			CL	60		
18		▼					GRAVELLY CLAY, low, soft, damp to slightly moist to saturated, sandstone gravel, sandy, odor,
19	58			CL	20		
20							SANDSTONE/SAND, fine, dense, llight greenish white,very moist to saturated,
21	243			SS	10		
22							GRAVELLY SANDY CLAY, low, soft, very moist to saturated, grey, green sandstone, calcareous, odor,
23	846			CL	70		
24							GRAVELLY SANDY CLAY, STA, odor,
25	44			CL/ST	70		CLAYSTONE, very dense, dry, purple, grey at base, faint odor,
26	39			CL/ST	30		CLAYSTONE, STA, faint odor.
27							
28							
29							

Saturation
▼ Saturation

Completion Results

OW-57



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

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Austin, Texas 78759
512-693-4190

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

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)

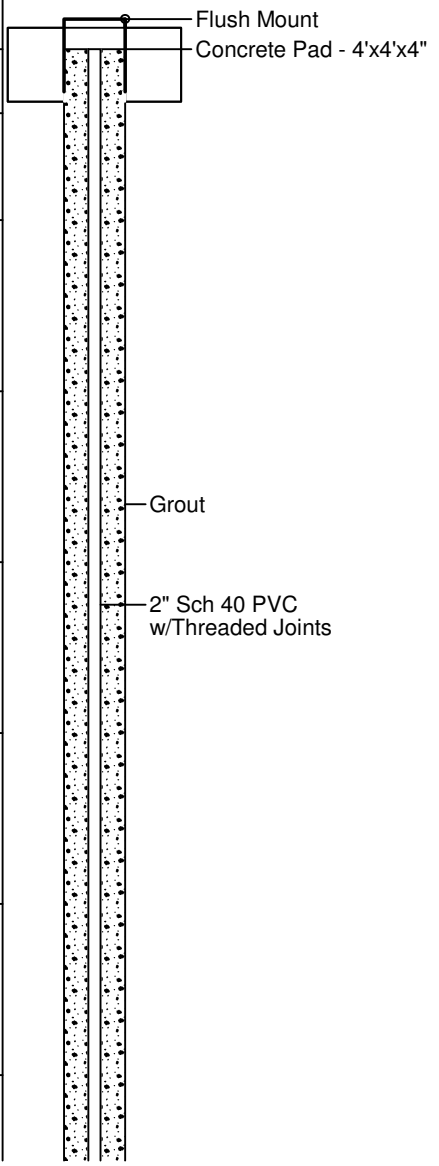
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Elev., PAD (ft. msl)	: 6934.71
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N 1634800.15
E	: E 2547414.91

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0				AR	100		ASPHALT/BASE,
1	110			CL	100		SILTY CLAY, moderate, firm to stiff, damp, brown, odor,
2							
3	40			CL	100		SILTY CLAY, SIMILAR TO ABOVE (STA),
4							
5	11.2			CL	100		SILTY CLAY, STA, moist, faint odor,
6							
7	2.2			CL	90		SILTY CLAY, low, soft, damp, brown, faint odor,
8							
9	5.3			CL	60		SILTY CLAY, STA, no odor,
10							
11	37			CL	80		SILTY CLAY, STA, sticky, black discoloration, odor,
12							
13	42			CL			SILTY CLAY, STA,

Completion Results

OW-58



DiSorbo Consulting, LLC

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

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

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DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

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

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

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
13							
	42			CL	70		
14							SILTY CLAY, low, stiff, damp, brown with black discoloration, faint odor,
15	25			CL	60		
16							SANDY CLAY, low, stiff, very fine grain sand, damp, brown, odor,
17	226			CL	60		
18							SANDY CLAY, STA, odor,
19	240			CL	50		
20							SANDY CLAY, STA, odor,
21	200			CL	60		
22							SILTY CLAY, low, very stiff, damp, brown, tan silt pockets/seams present, odor,
23	2020			CL	90		
24							SILTY CLAY, low, firm, soft/ crumbly, damp, brown, strong odor, outside of core is oily/phase separated hydrocarbon (PSH),
25	1980			CL	90		
26							SILTY CLAY, STA, firm to stiff, odor, outside of core is oily/PSH,
	973			CL			
27							

Completion Results

OW-58

Grout

2" Sch 40 PVC w/Threaded Joints

DiSorbo Consulting, LLC

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

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

07-25-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\OW-14 Source Area\OW-58.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

Geologist	: Tracy Payne
Driller	: Enviro-Drill, Inc. / Cohagan
Drilling Rig	: CME 75
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Total Depth	: 48.5'
Ground Water	: 29'
Start Date	: 09/22/2016
Finish Date	: 09/22/2016

WELL NO. OW-58

(Sheet 3 of 4)

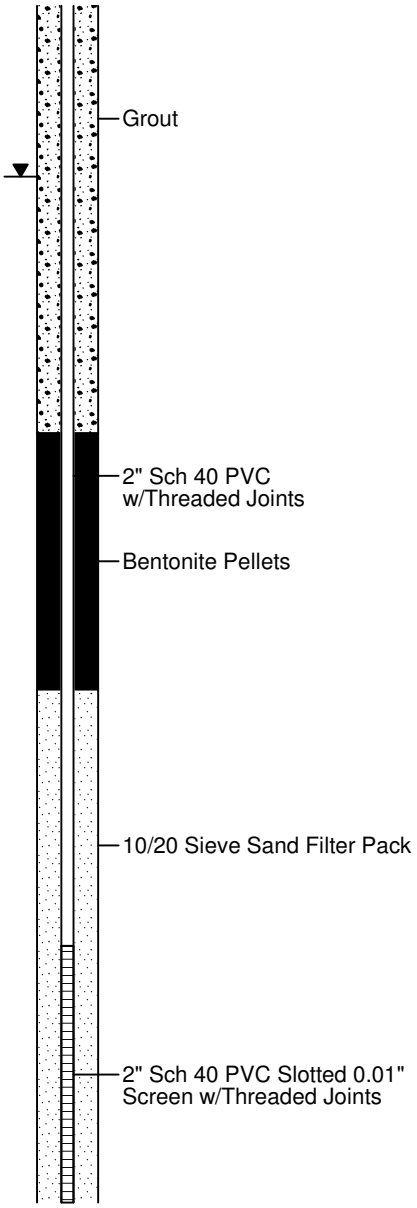
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Elev., PAD (ft. msl)	: 6934.71
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N 1634800.15
E	: E 2547414.91

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
27							
28	973			CL	90		
29	2784	▼		CL	90		SILTY CLAY, STA, damp to moist, odor,
30				CL/SC	90		SANDY CLAY/CLAYEY SAND, low, soft, very moist to saturated, dark brown, odor,
31	2350			CL	90		SANDY SILTY CLAY, low, firm, damp, saturated sand at base, grey/brown, odor,
32				SM	90		SILTY SAND, fine, loose, saturated, grey/brown, odor,
33	1775			CL	90		SILTY CLAY, low, soft, damp, greyish brown, odor,
34				CL	90		SILTY CLAY, STA, damp to very moist, odor,
35	575			CL	90		
36				CL	80		SILTY CLAY, low, firm, damp, greyish brown, odor,
37	227			CL	80		
38				CL	50		SILTY CLAY, STA, brown, odor,
39	545			CL	50		
40				CH			CLAY, high, firm, damp, brown, odor,
41	531			CH			

Completion Results

OW-58



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512-693-4190

07-25-2018 C:\Users\cholmes\Documents\M-Tech\samples\Western Refinery\OW-14 Source Area\OW-58.bor

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

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)

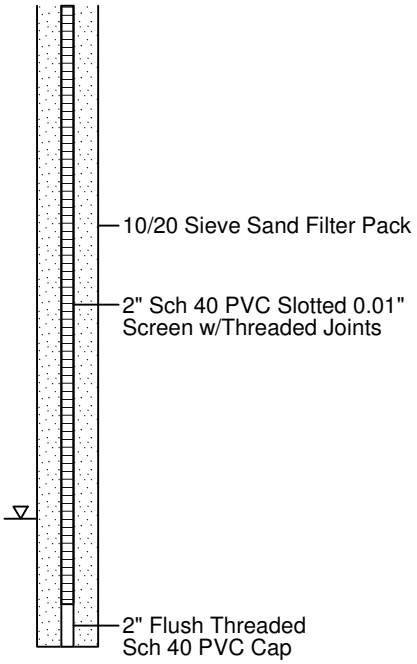
Elev., TOC (ft.msl)	: 6934.50
Elev., PAD (ft. msl)	: 6934.71
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N 1634800.15
E	: E 2547414.91

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	USCS	Recovery (%)	DESCRIPTION
41				
42	531	CH	50	
43	288	CH	50	CLAY, STA, odor,
44				
45	357	CL	50	SILTY CLAY, low to moderate, firm, occasional gravel, damp, brown, odor,
46		CL	50	SILTY CLAY, STA, odor,
47	204	SP	50	SANDY GRAVEL, medium to coarse sand with 1/4 to 1/2 inch gravel, very moist to saturated, trace silt/clay, brown, odor,
48	250	SH	10	SHALE, very dense/hard, dry, dark grey, odor.
49				
50				
51				
52				
53				
54				
55				

Completion Results

OW-58



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Western Refining SW, Inc
Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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 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

Saturation
▼ Saturation
▽ Saturation

Temporary Well

Temporary Well No. TK 568-1

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0–1	0.8			CL	100		SANDY SILTY CLAY, low, soft, damp, brown, no odor,
2–3	3.1			CL	100		SANDY SILTY CLAY, SIMILAR TO ABOVE (STA), no odor,
4–5	15.9			CL	100		SANDY SILTY CLAY, STA, no odor,
6–7	66.9			CL	60		SANDY SILTY CLAY, STA, odor,
8–9	309			CL	60		SANDY SILTY CLAY, STA, odor,
10–11	2214			CL	80		SILTY CLAY, low, firm, damp, brown, odor,
12–13	1957			CL	80		SILTY CLAY, STA, trace very fine grain sand, damp, odor, inside of spoon oily,
14–15	976			ML	90		CLAYEY SANDY SILT, very fine grain, low, soft, damp to moist, brown, odor,
16–17	1243			ML			SANDY CLAYEY SILT, STA, moist in sand seams, odor,

Top of Casing 2' Above Ground Level

Open Borehole

2" Sch 40 PVC w/Threaded Joints

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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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

Saturation
▼ Saturation
▽ Saturation

Temporary Well

Temporary Well No. TK 568-1

Depth (ft.)	PID (ppm)	USCS	Recovery (%)	DESCRIPTION
17				
	1243	ML	90	
18				SANDY CLAYEY SILT, STA, odor,
19	1731	ML	90	
20				SANDY CLAYEY SILT, STA, odor,
21	1780	ML	90	
22				CLAYEY SANDY SILT, very fine grain sand,
23	1125	ML	90	soft, damp to moist, brown, odor,
24				SILTY SANDY CLAY, low, soft to firm, damp,
25	1119	CL	90	brown, odor,
26				SILTY SANDY CLAY, STA, odor,
27	965	CL	90	
28				SILTY SANDY CLAY, STA, odor,
29	970	CL	90	
30				SILTY SANDY CLAY, STA, black discoloration
31	1308	CL	90	in sand at base, very moist, odor,
32				CLAYEY SAND, fine grain, loose, saturated,
	1680	SC	90	black, odor,
33				SILTY CLAY, low, firm, damp, brown, odor,
	733	CL	90	
34				SILTY SANDY CLAY, low, soft, black
35	1695	CL	90	discoloration, damp, brown, odor,
36				SILTY SAND, fine, loose, saturated, grey,
	1282	SM		odor, poor recovery,
37				

Open Borehole
Bentonite Pellets
2" Sch 40 PVC w/Threaded Joints
10/20 Sieve Sand Filter Pack
2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints

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Job No. WEST16006

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 3 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

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
37	1282			SM	10		
38							SANDY CLAY, low, firm, damp to moist, brown, odor, sheen on core,
39	1078			CL	80		
40							SANDY CLAY, STA, damp, odor,
41	383			CL	20		
42							SANDY CLAY, STA, white clay at base, odor,
43	476			CL	20		
44							CLAY, low, dense/crumbly, dry, dark reddish brown/grey, no odor,
45	144			CL	50		
46							CLAY, STA,
47	80			CL	20		
48	41			SH	20		SANDY SHALE, very dense, dry, grey, no odor.
49							
50							
51							
52							
53							
54							
55							
56							
57							

Temporary Well

Temporary Well No. TK 568-1



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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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'

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 568-2

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							
1	0.2			CL	100		SILTY CLAY, low, firm, damp, brown,
3	0.5			CL	100		SILTY CLAY, SIMILAR TO ABOVE (STA), no odor,
5	4.3			CL	100		SILTY CLAY, STA, faint odor,
7	4.6			CL	40		SILTY CLAY, low, soft, damp, brown, no odor,
9	5.3			CL	40		SILTY CLAY, STA, no odor,
11	30.8			CL	40		SANDY CLAY, low, soft, damp, brown, no odor,
13	34.5			CL	40		SANDY CLAY, STA, no odor,
15	16.0			CL	40		SANDY CLAY, STA, trace gravel, faint odor,
16	-						No Recovery

Top of Casing 2' Above Ground Level

Open Borehole

2" Sch 40 PVC w/Threaded Joints

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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'

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 568-2

Depth (ft.)	PID (ppm)	USCS	Recovery (%)	DESCRIPTION
17	-		-	
18				SANDY CLAY, STA, faint odor,
19	36.5	CL	40	
20				SANDY CLAY, STA, trace gravel, faint odor,
21	29.6	CL	40	
22				CLAYEY SAND, fine grain, loose, trace gravel, damp, brown, odor,
23	82	SC	60	
24				No Recovery - white sandstone lodged in shoe
25	-		-	
26				No Recovery - very dense hard sandstone in shoe
27	-		-	
28				CLAYEY SAND, very fine to fine, compact, moist to saturated at 30', brown, odor,
29	2803	SC	90	
30				CLAYEY SAND, STA, white sandstone lenses present, trace gravel, odor,
31	-	SC	90	
32				GRAVELLY SAND, fine to medium, compact, gravel 1/4 to 1/2", saturated, brown, odor, sheen on sampler,
33	-	SP	90	
34				SANDY GRAVEL, well rounded, loose, saturated, odor,
35	-	GP	90	
36	53	CLST	90	CLAYSTONE, very hard/dense, dry, dark reddish brown,
37	21	CLST	50	CLAYSTONE, STA, shaley at base.

Open Borehole
Bentonite Pellets
2" Sch 40 PVC w/Threaded Joints
10/20 Sieve Sand Filter Pack
2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints
2" Flush Threaded Sch 40 PVC Cap

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Western Refining SW, Inc
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Job No. WEST16006

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

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'

Saturation
▼ Saturation
▽ Saturation

Temporary Well

Temporary Well No. TK 569-1

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, damp, brown, no odor,
1	7.3			CL	100		
2							SILTY CLAY, SIMILAR TO ABOVE (STA),
3	6.6			CL	100		
4							SILTY CLAY, STA,
5	4.1			CL	100		
6							SILTY CLAY, STA,
7	0.5			CL	90		
8							SILTY CLAY, STA,
9	0.5			CL	90		
10							SILTY CLAY, STA,
11	2.3			CL	80		
12							SILTY CLAY, STA, trace very fine grain sand,
13	4.2			CL	70		
14							SANDY CLAY, low, firm to soft, very fine grain sand throughout, damp, brown,
15	13.6			CL			

Top of Casing 2.5' Above Ground Level

2" Sch 40 PVC w/Threaded Joints

Open Borehole

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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

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'

Saturation
▼ Saturation
▽ Saturation

Temporary Well

Temporary Well No. TK 569-1

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
15	13.6			CL	70		
16							SANDY CLAY, STA, odor,
17	32.6			CL	60		
18							SANDY CLAY, STA, odor,
19	152			CL	70		
20							CLAYEY SILTY SAND, fine to medium grain, compact, becomes more silty with depth, gravel at base, damp, odor,
21	41.6			SC/SM	90		
22							CLAYEY SILTY SAND, STA, medium to coarse sand, occasional gravel, damp,
23	92.2			SC/SM	90		
24		▼					CLAYEY SILTY SAND, very fine grain, compact, moist to saturated in silty sand seams, brown, odor,
25	2158			SC/SM	90		
26							SANDY CLAY, STA with greater clay content, brown trace gravel at base, moist to saturated in silty sand seams,
27	1147			CL	20		
28							GRAVELLY SILTY SAND, medium to coarse grain, compact, damp to moist in seams-not saturated throughtout core, brown, odor, sandstone gravel present,
29	1060			SM	50		
30		▽					CLAYEY SANDY GRAVEL, 1/8" to 1/2" gravel with medium to coarse grain sand, compact to loose, saturated, brown, odor,
31	1353			GW	60		
32				CL	60		SILTY CLAY, low, firm, damp, brown, odor,
	1622			CL			SILTY CLAY, STA, odor,
33							

Open Borehole
Bentonite Pellets
2" Sch 40 PVC w/Threaded Joints
10/20 Sieve Sand Filter Pack
2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

Geologist	: Tracy Payne
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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

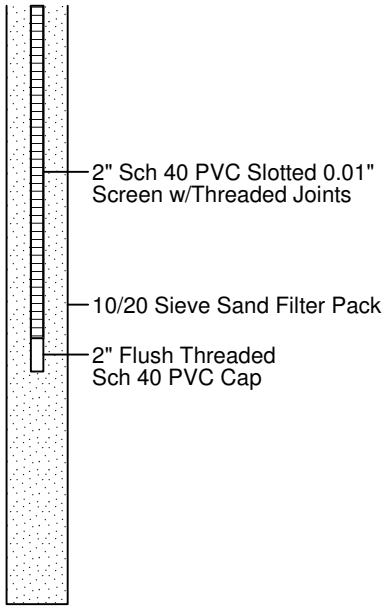
Elev., TOC (ft.msl)	:
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6952.00
Site Coordinates	:
N	: N 35° 29.403'
E	: W 108° 25.469'

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
33	1622			CL	50		
34							SILTY CLAY, STA, gravel present at base,
35	1292			CL	70		
36							CLAY, high, firm, traces gravel, damp, reddish brown/gray,
37	1621			CH	10		
38							CLAYEY GRAVEL, sandstone present, very hard, damp, odor,
39	1649			GW	50		
40							CLAYSTONE, very dense, light reddish purple/grey, odor.
41	95.6			CLST	20		
42							
43							
44							
45							
46							
47							
48							
49							
50							
51							

Temporary Well

Temporary Well No. TK 569-1



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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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

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'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, damp, brown, no odor,
1	0.3			CL	100		
2							SILTY CLAY, SIMILAR TO ABOVE (STA),
3	0.1			CL	100		
4							SILTY SAND, fine, compact, damp, brown, no odor,
5	0.0			SM	100		
6							SILTY SAND, STA,
7	0.0			SM	60		
8							SILTY CLAY, low, soft, damp, brown, no odor,
9	0.6			CL	60		
10							SILTY CLAY, STA, poor recovery,
11	7.2			CL	10		
12							SILTY CLAY, STA, very soft, poor recovery, faint odor,
13	36.5			CL			

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 569-2

Top of Casing 2' Above Ground Level

Open Borehole

2" Sch 40 PVC w/Threaded Joints

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

Geologist	: Tracy Payne
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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

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'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
13	36.5			CL	10		
14							CLAYEY SAND, very fine grain, compact, damp, brown, odor,
15	899			SC	70		
16							CLAYEY SAND, STA, odor,
17	2332			SC	70		
18							CLAYEY SAND/SANDY CLAY, STA, odor,
19	702			SC/CL	90		
20							CLAYEY SAND, STA, sand/gravel lense from 21-21.5', loose, damp, grey,
21	833			SC	60		
22							SILTY SAND, fine grain, loose, damp, brown, odor,
23	398			SM	90		
24				GW			SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor,
25	190			GW	10		SANDY GRAVEL, STA, white sandstone present,
26							SANDY GRAVEL, STA, white sandstone present,
27	1973			GW	10		
28	1684			GW			SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,
29							

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 569-2

Open Borehole
Bentonite Pellets
2" Sch 40 PVC w/Threaded Joints
10/20 Sieve Sand Filter Pack
2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints

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Western Refining SW, Inc
Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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 3 of 3)

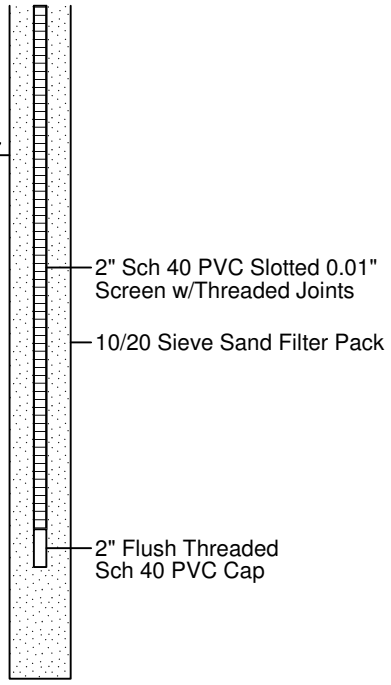
Elev., TOC (ft.msl)	:
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6952.00
Site Coordinates	:
N	: N 35° 29.403'
E	: W 108° 25.451'

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 569-2

Depth (ft.)	PID (ppm)	USCS	Recovery (%)	DESCRIPTION
29		GW	10	
30	1145			SILTY CLAY, low, firm to soft, damp, moist to saturated, silty sand seams throughout, dark brown, odor,
31		SC	90	
32	1420			CLAY, high, stiff, damp, brown, odor,
33	1390	CH	80	
34				CLAYEY GRAVEL, very hard with 4-6" sandstone (grey) at base, odor,
35	1210	GW	20	
36				CLAYSTONE, very hard, dry, reddish purple and grey.
37	405	CLST	90	
38				
39				
40				
41				
42				
43				
44				
45				



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Western Refining SW, Inc
Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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)

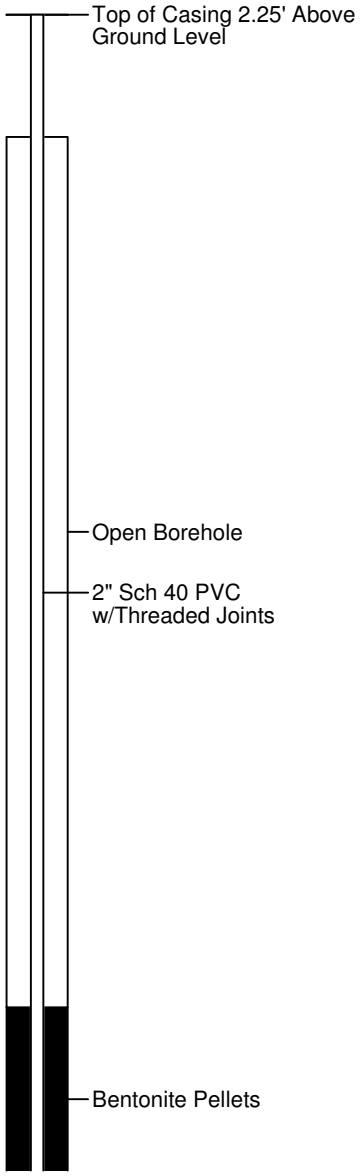
Elev., TOC (ft.msl)	:
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6952.00
Site Coordinates	:
N	: N 35° 29.390'
E	: W 108° 25.459'

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, damp, brown, no odor,
1	8.9			CL	100		
2							SILTY CLAY, SIMILAR TO ABOVE (STA),
3	10.4			CL	100		
4							SILTY CLAY, STA,
5	12.4			CL	100		
6							SILTY CLAY, STA,
7	31.8			CL	60		
8							SILTY CLAY, STA, soft,
9	27.6			CL	50		
10							SILTY CLAY, low, firm, damp, brown, odor,
11	50.9			CL	70		
12							SILTY CLAY, STA, trace very fine grain sand, odor,
13	63.9			CL	60		
14							CLAYEY SAND, very fine, compact, damp, brown, odor,
15	303			SC	70		
16							CLAYEY SAND, STA, odor,
17	377			SC	70		
18	250			SC/CL			CLAYEY SAND/SANDY CLAY, STA, odor,
19							

Temporary Well

Temporary Well No. TK 569-3



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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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'

Saturation
▼ Saturation
▽ Saturation

Temporary Well

Temporary Well No. TK 569-3

Depth (ft.)	PID (ppm)	USCS	Recovery (%)	DESCRIPTION
19	250	SC/CL	80	
20				SANDY CLAY, low, firm, damp, brown, odor,
21	387	CL	80	
22				SANDY CLAY, STA, odor,
23	405	CL	60	
24				SILTY SAND, fine grain, loose, very moist,
25	955	SM	70	brown, odor, phase separated hydrocarbon (PSH),
26		SM	90	SILTY SAND, STA, saturated, odor, PSH,
27	sat	GW	90	SANDY GRAVEL, compact, 1/2"-1" gravel, medium to coarse sand, saturated, odor, PSH,
28				SANDY CLAYEY GRAVEL, STA, clay
29	sat	GW	80	present, very moist to saturated in seams, pockets, sandstone (white) present, very dense, greenish grey sandstone at base,
30				strong odor, ,
31		GW	50	SANDY CLAYEY GRAVEL, STA, saturated, odor,
32	1620	CL	50	SILTY CLAY, low, firm, damp, brown, odor,
33	1950	CL	90	SILTY CLAY, STA, moderate, grey streaks, odor,
34				
35		GW	90	SANDY GRAVEL, compact, 1/4"-1/2" gravel, coarse sand, saturated, odor,
36				
37	239	GW	20	SANDY CLAYEY GRAVEL, very hard, 1/4" gravel with clay and sand, damp, grey and brown, odor,
38	258	CLST	30	CLAYSTONE, very hard, dry, reddish purple and grey.
39				
40				
41				

Bentonite Pellets
2" Sch 40 PVC w/Threaded Joints
2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints
10/20 Sieve Sand Filter Pack
2" Flush Threaded Sch 40 PVC Cap

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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 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'

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 570-1

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							FILL-SILT/GRAVEL, damp, brown, no odor,
1	5.3			FILL	100		
2							FILL-SILT/GRAVEL, SIMILAR TO ABOVE (STA), faint odor,
3	14.9			FILL	100		
4							FILL-SILT/GRAVEL, STA, faint odor,
5	15.8			FILL	100		
6							GRAVELLY SAND, medium to coarse, loose, damp, odor,
7	24.1			SW	90		
8							CLAYEY GRAVEL, 1/4" to 1/2" gravel in low plastic, brown, damp clay, odor,
9	1775			GM	90		
10							SANDY SILT, low, very soft, damp, dark brown, odor,
11	3445			ML	10		
12							SANDY SILT, STA, odor,
13	2408			ML			

Top of Casing 2' Above Ground Level

2" Sch 40 PVC w/Threaded Joints

Open Borehole

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

Geologist	: Tracy Payne
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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'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
13	2408			ML	10		
14							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							SILTY CLAY, STA, odor,
19	1250			CL	90		
20	1460			CL	90		SILTY CLAY, STA, odor,
21				SC	90		CLAYEY SAND, fine, compact to loose, damp, brown, odor,
22							CLAYEY SAND, STA, decrease in clay with depth, odor,
23	399			SC	90		
24							CLAYEY SAND, STA, odor,
25	695			SC	100		
26							SILTY SAND, very fine, soft/compact, damp, brown, odor,
27	952			SM	90		
28	1441			SC			CLAYEY SAND, very fine, compact, damp, brown, odor,
29							

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 570-1

Open Borehole

2" Sch 40 PVC w/Threaded Joints

Bentonite Pellets

10/20 Sieve Sand Filter Pack

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

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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'

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 570-1

Depth (ft.)	PID (ppm)	USCS	Recovery (%)	DESCRIPTION
29	1441	SC	90	
30		SM	90	SILTY SAND, very fine, soft/loose, damp, brown, odor,
31	968			
32	804	SM	60	SILTY SAND, STA, damper than above,
33		SW	60	GRAVELLY SAND, medium to coarse, loose, very moist to saturated, grey, odor,
34		GW	90	SANDY GRAVEL, 1/2" to 1" gravel with sand, fine to coarse, saturated, brown, odor,
35				
36		GW	90	SANDY GRAVEL, STA,
37	676	CH	90	CLAY, high, firm to stiff, brown, odor,
38		CH	90	CLAY, STA, sandstone present,
39	1392			
40		CH	60	CLAY, STA,
41	1117	GW	60	CLAYEY SANDY GRAVEL, compact, moist to very moist, brown, odor,
42		CL	50	GRAVELLY CLAY, low, stiff, damp to dry, reddish brown,
43	555			
44	165	CLST	70	CLAYSTONE, very stiff, dry, purple/reddish brown, odor.
45				

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

10/20 Sieve Sand Filter Pack

2" Flush Threaded Sch 40 PVC Cap

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Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

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

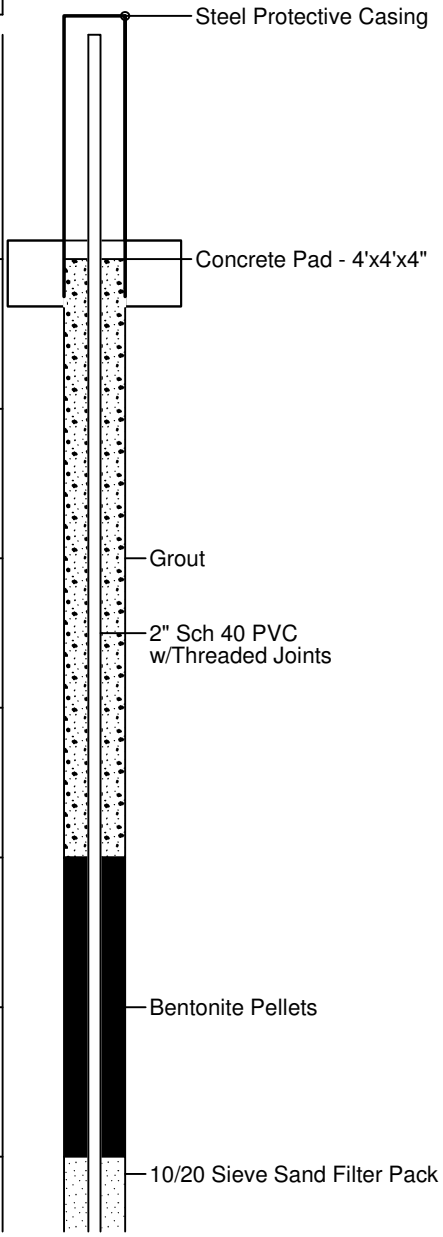
Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
1	0.6			CL	100		SILTY CLAY, moderate, firm, damp, brown, no odor,
3	0.6			CL	100		SILTY CLAY, SIMILAR TO ABOVE (STA),
5	2.6			CL	100		SILTY CLAY, STA,
7	6.2			CL	100		SILTY CLAY, STA, darker brown,
9	23.7			CL	90		SILTY CLAY, STA, no odor,
11	118			CL	90		SANDY CLAY, low, soft, damp, brown, odor,
12	85			CL			SANDY CLAY, STA, brown/tan silt at base, odor,

Saturation

▼ Saturation

Completion Results

OW-57



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Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

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)

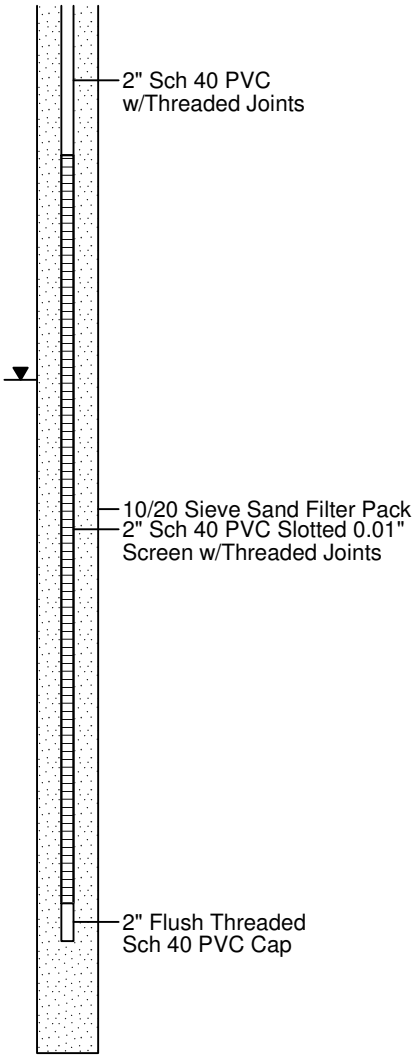
Elev., TOC (ft.msl)	: 6933.10
Elev., PAD (ft. msl)	: 6930.64
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N 163475.52
E	: E 2546961.79

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
13	85			CL	80		
14							CLAYEY SILT, very fine, soft, damp, brown and tan, odor,
15	197			ML	90		
16							SILTY CLAY, low, firm, tan and brown, damp, odor,
17	205			CL	60		
18		▼					GRAVELLY CLAY, low, soft, damp to slightly moist to saturated, sandstone gravel, sandy, odor,
19	58			CL	20		
20							SANDSTONE/SAND, fine, dense, llight greenish white,very moist to saturated,
21	243			SS	10		
22							GRAVELLY SANDY CLAY, low, soft, very moist to saturated, grey, green sandstone, calcareous, odor,
23	846			CL	70		
24							GRAVELLY SANDY CLAY, STA, odor,
25	44			CL/ST	70		CLAYSTONE, very dense, dry, purple, grey at base, faint odor,
26	39			CL/ST	30		CLAYSTONE, STA, faint odor.
27							
28							
29							

Saturation
▼ Saturation

Completion Results

OW-57



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Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

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)

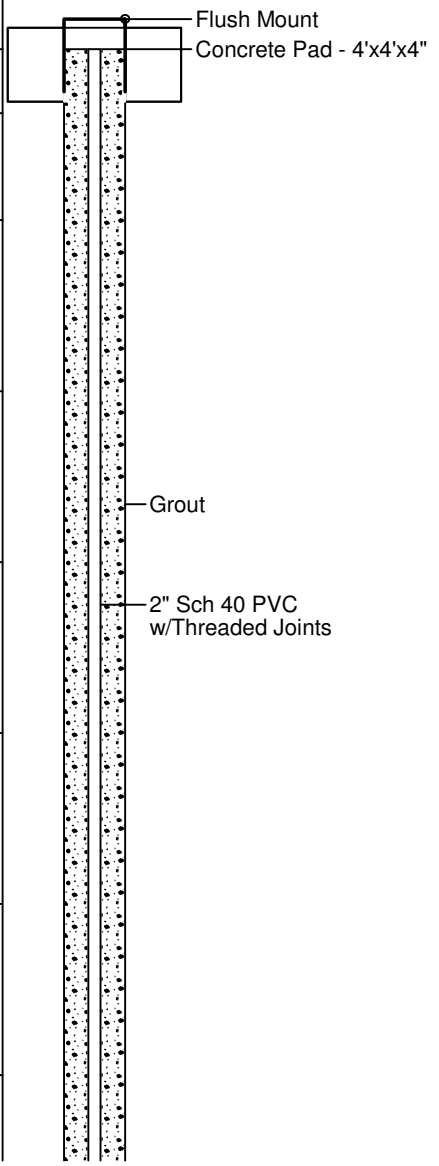
Elev., TOC (ft.msl)	: 6934.50
Elev., PAD (ft. msl)	: 6934.71
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N 1634800.15
E	: E 2547414.91

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0				AR	100		ASPHALT/BASE,
1	110			CL	100		SILTY CLAY, moderate, firm to stiff, damp, brown, odor,
2							
3	40			CL	100		SILTY CLAY, SIMILAR TO ABOVE (STA),
4							
5	11.2			CL	100		SILTY CLAY, STA, moist, faint odor,
6							
7	2.2			CL	90		SILTY CLAY, low, soft, damp, brown, faint odor,
8							
9	5.3			CL	60		SILTY CLAY, STA, no odor,
10							
11	37			CL	80		SILTY CLAY, STA, sticky, black discoloration, odor,
12							
13	42			CL			SILTY CLAY, STA,

Completion Results

OW-58



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Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

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

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

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
13							
	42			CL	70		
14							SILTY CLAY, low, stiff, damp, brown with black discoloration, faint odor,
15	25			CL	60		
16							SANDY CLAY, low, stiff, very fine grain sand, damp, brown, odor,
17	226			CL	60		
18							SANDY CLAY, STA, odor,
19	240			CL	50		
20							SANDY CLAY, STA, odor,
21	200			CL	60		
22							SILTY CLAY, low, very stiff, damp, brown, tan silt pockets/seams present, odor,
23	2020			CL	90		
24							SILTY CLAY, low, firm, soft/ crumbly, damp, brown, strong odor, outside of core is oily/phase separated hydrocarbon (PSH),
25	1980			CL	90		
26							SILTY CLAY, STA, firm to stiff, odor, outside of core is oily/PSH,
	973			CL			
27							

Completion Results

OW-58

Grout

2" Sch 40 PVC w/Threaded Joints

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Geologist	: Tracy Payne
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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 3 of 4)

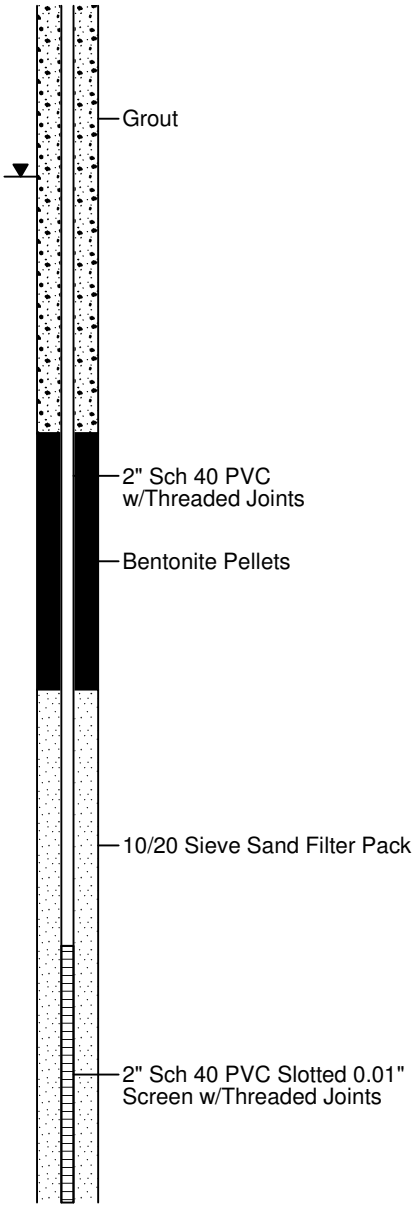
Elev., TOC (ft.msl)	: 6934.50
Elev., PAD (ft. msl)	: 6934.71
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N 1634800.15
E	: E 2547414.91

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
27							
28	973			CL	90		
29	2784	▼		CL	90		SILTY CLAY, STA, damp to moist, odor,
30				CL/SC	90		SANDY CLAY/CLAYEY SAND, low, soft, very moist to saturated, dark brown, odor,
31	2350			CL	90		SANDY SILTY CLAY, low, firm, damp, saturated sand at base, grey/brown, odor,
32				SM	90		SILTY SAND, fine, loose, saturated, grey/brown, odor,
33	1775			CL	90		SILTY CLAY, low, soft, damp, greyish brown, odor,
34				CL	90		SILTY CLAY, STA, damp to very moist, odor,
35	575			CL	90		
36				CL	80		SILTY CLAY, low, firm, damp, greyish brown, odor,
37	227			CL	80		
38				CL	50		SILTY CLAY, STA, brown, odor,
39	545			CL	50		
40				CH			CLAY, high, firm, damp, brown, odor,
41	531			CH			

Completion Results

OW-58



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Austin, Texas 78759
512-693-4190

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DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

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)

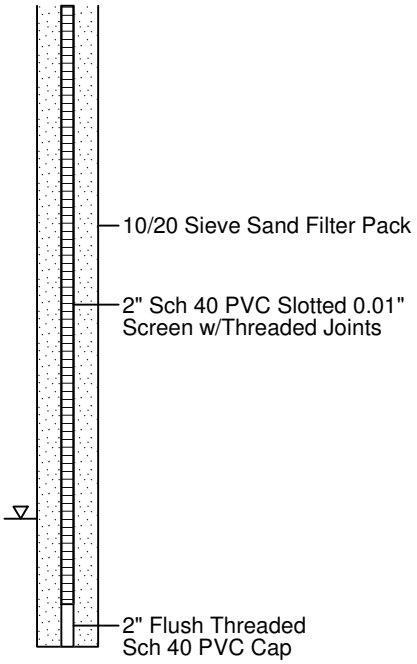
Elev., TOC (ft.msl)	: 6934.50
Elev., PAD (ft. msl)	: 6934.71
Elev., GL (ft. msl)	:
Site Coordinates	:
N	: N 1634800.15
E	: E 2547414.91

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	USCS	Recovery (%)	DESCRIPTION
41				
42	531	CH	50	
43	288	CH	50	CLAY, STA, odor,
44				
45	357	CL	50	SILTY CLAY, low to moderate, firm, occasional gravel, damp, brown, odor,
46		CL	50	SILTY CLAY, STA, odor,
47	204	SP	50	SANDY GRAVEL, medium to coarse sand with 1/4 to 1/2 inch gravel, very moist to saturated, trace silt/clay, brown, odor,
48	250	SH	10	SHALE, very dense/hard, dry, dark grey, odor.
49				
50				
51				
52				
53				
54				
55				

Completion Results

OW-58



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Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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 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

Saturation
▼ Saturation
▽ Saturation

Temporary Well

Temporary Well No. TK 568-1

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0–1	0.8			CL	100		SANDY SILTY CLAY, low, soft, damp, brown, no odor,
2–3	3.1			CL	100		SANDY SILTY CLAY, SIMILAR TO ABOVE (STA), no odor,
4–5	15.9			CL	100		SANDY SILTY CLAY, STA, no odor,
6–7	66.9			CL	60		SANDY SILTY CLAY, STA, odor,
8–9	309			CL	60		SANDY SILTY CLAY, STA, odor,
10–11	2214			CL	80		SILTY CLAY, low, firm, damp, brown, odor,
12–13	1957			CL	80		SILTY CLAY, STA, trace very fine grain sand, damp, odor, inside of spoon oily,
14–15	976			ML	90		CLAYEY SANDY SILT, very fine grain, low, soft, damp to moist, brown, odor,
16–17	1243			ML			SANDY CLAYEY SILT, STA, moist in sand seams, odor,

Top of Casing 2' Above Ground Level

Open Borehole

2" Sch 40 PVC w/Threaded Joints

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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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

Saturation
▼ Saturation
▽ Saturation

Temporary Well

Temporary Well No. TK 568-1

Depth (ft.)	PID (ppm)	USCS	Recovery (%)	DESCRIPTION
17				
	1243	ML	90	
18				SANDY CLAYEY SILT, STA, odor,
19	1731	ML	90	
20				SANDY CLAYEY SILT, STA, odor,
21	1780	ML	90	
22				CLAYEY SANDY SILT, very fine grain sand,
23	1125	ML	90	soft, damp to moist, brown, odor,
24				SILTY SANDY CLAY, low, soft to firm, damp,
25	1119	CL	90	brown, odor,
26				SILTY SANDY CLAY, STA, odor,
27	965	CL	90	
28				SILTY SANDY CLAY, STA, odor,
29	970	CL	90	
30				SILTY SANDY CLAY, STA, black discoloration
31	1308	CL	90	in sand at base, very moist, odor,
32				CLAYEY SAND, fine grain, loose, saturated,
	1680	SC	90	black, odor,
33				SILTY CLAY, low, firm, damp, brown, odor,
	733	CL	90	
34				SILTY SANDY CLAY, low, soft, black
35	1695	CL	90	discoloration, damp, brown, odor,
36				SILTY SAND, fine, loose, saturated, grey,
	1282	SM		odor, poor recovery,
37				

Open Borehole
Bentonite Pellets
2" Sch 40 PVC w/Threaded Joints
10/20 Sieve Sand Filter Pack
2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints

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Job No. WEST16006

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 3 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

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
37	1282			SM	10		
38							SANDY CLAY, low, firm, damp to moist, brown, odor, sheen on core,
39	1078			CL	80		
40							SANDY CLAY, STA, damp, odor,
41	383			CL	20		
42							SANDY CLAY, STA, white clay at base, odor,
43	476			CL	20		
44							CLAY, low, dense/crumbly, dry, dark reddish brown/grey, no odor,
45	144			CL	50		
46							CLAY, STA,
47	80			CL	20		
48	41			SH	20		SANDY SHALE, very dense, dry, grey, no odor.
49							
50							
51							
52							
53							
54							
55							
56							
57							

Temporary Well

Temporary Well No. TK 568-1



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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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'

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 568-2

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							
1	0.2			CL	100		SILTY CLAY, low, firm, damp, brown,
3	0.5			CL	100		SILTY CLAY, SIMILAR TO ABOVE (STA), no odor,
5	4.3			CL	100		SILTY CLAY, STA, faint odor,
7	4.6			CL	40		SILTY CLAY, low, soft, damp, brown, no odor,
9	5.3			CL	40		SILTY CLAY, STA, no odor,
11	30.8			CL	40		SANDY CLAY, low, soft, damp, brown, no odor,
13	34.5			CL	40		SANDY CLAY, STA, no odor,
15	16.0			CL	40		SANDY CLAY, STA, trace gravel, faint odor,
16	-						No Recovery

Top of Casing 2' Above Ground Level

Open Borehole

2" Sch 40 PVC w/Threaded Joints

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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'

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 568-2

Depth (ft.)	PID (ppm)	USCS	Recovery (%)	DESCRIPTION
17	-		-	
18				SANDY CLAY, STA, faint odor,
19	36.5	CL	40	
20				SANDY CLAY, STA, trace gravel, faint odor,
21	29.6	CL	40	
22				CLAYEY SAND, fine grain, loose, trace gravel, damp, brown, odor,
23	82	SC	60	
24				No Recovery - white sandstone lodged in shoe
25	-		-	
26				No Recovery - very dense hard sandstone in shoe
27	-		-	
28				CLAYEY SAND, very fine to fine, compact, moist to saturated at 30', brown, odor,
29	2803	SC	90	
30				CLAYEY SAND, STA, white sandstone lenses present, trace gravel, odor,
31	-	SC	90	
32				GRAVELLY SAND, fine to medium, compact, gravel 1/4 to 1/2", saturated, brown, odor, sheen on sampler,
33	-	SP	90	
34				SANDY GRAVEL, well rounded, loose, saturated, odor,
35	-	GP	90	
36	53	CLST	90	CLAYSTONE, very hard/dense, dry, dark reddish brown,
37	21	CLST	50	CLAYSTONE, STA, shaley at base.

Open Borehole
Bentonite Pellets
2" Sch 40 PVC w/Threaded Joints
10/20 Sieve Sand Filter Pack
2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints
2" Flush Threaded Sch 40 PVC Cap

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Western Refining SW, Inc
Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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

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'

Saturation
▼ Saturation
▽ Saturation

Temporary Well

Temporary Well No. TK 569-1

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, damp, brown, no odor,
1	7.3			CL	100		
2							SILTY CLAY, SIMILAR TO ABOVE (STA),
3	6.6			CL	100		
4							SILTY CLAY, STA,
5	4.1			CL	100		
6							SILTY CLAY, STA,
7	0.5			CL	90		
8							SILTY CLAY, STA,
9	0.5			CL	90		
10							SILTY CLAY, STA,
11	2.3			CL	80		
12							SILTY CLAY, STA, trace very fine grain sand,
13	4.2			CL	70		
14							SANDY CLAY, low, firm to soft, very fine grain sand throughout, damp, brown,
15	13.6			CL			

Top of Casing 2.5' Above Ground Level

2" Sch 40 PVC w/Threaded Joints

Open Borehole

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Western Refining SW, Inc
Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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

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'

Saturation
▼ Saturation
▽ Saturation

Temporary Well

Temporary Well No. TK 569-1

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
15	13.6			CL	70		
16							SANDY CLAY, STA, odor,
17	32.6			CL	60		
18							SANDY CLAY, STA, odor,
19	152			CL	70		
20							CLAYEY SILTY SAND, fine to medium grain, compact, becomes more silty with depth, gravel at base, damp, odor,
21	41.6			SC/SM	90		
22							CLAYEY SILTY SAND, STA, medium to coarse sand, occasional gravel, damp,
23	92.2			SC/SM	90		
24		▼					CLAYEY SILTY SAND, very fine grain, compact, moist to saturated in silty sand seams, brown, odor,
25	2158			SC/SM	90		
26							SANDY CLAY, STA with greater clay content, brown trace gravel at base, moist to saturated in silty sand seams,
27	1147			CL	20		
28							GRAVELLY SILTY SAND, medium to coarse grain, compact, damp to moist in seams-not saturated throughtout core, brown, odor, sandstone gravel present,
29	1060			SM	50		
30		▽					CLAYEY SANDY GRAVEL, 1/8" to 1/2" gravel with medium to coarse grain sand, compact to loose, saturated, brown, odor,
31	1353			GW	60		
32				CL	60		SILTY CLAY, low, firm, damp, brown, odor,
	1622			CL			SILTY CLAY, STA, odor,
33							

Open Borehole
Bentonite Pellets
2" Sch 40 PVC w/Threaded Joints
10/20 Sieve Sand Filter Pack
2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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

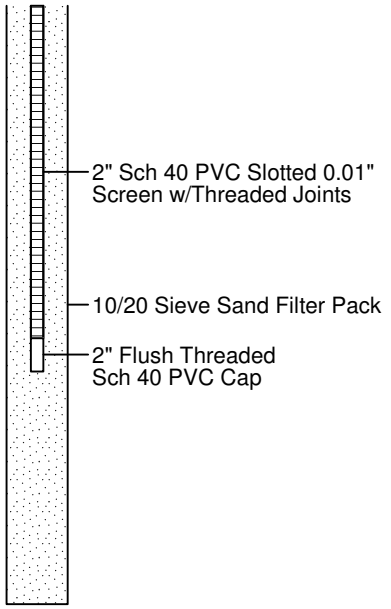
Elev., TOC (ft.msl)	:
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6952.00
Site Coordinates	:
N	: N 35° 29.403'
E	: W 108° 25.469'

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
33	1622			CL	50		
34							SILTY CLAY, STA, gravel present at base,
35	1292			CL	70		
36							CLAY, high, firm, traces gravel, damp, reddish brown/gray,
37	1621			CH	10		
38							CLAYEY GRAVEL, sandstone present, very hard, damp, odor,
39	1649			GW	50		
40							CLAYSTONE, very dense, light reddish purple/grey, odor.
41	95.6			CLST	20		
42							
43							
44							
45							
46							
47							
48							
49							
50							
51							

Temporary Well

Temporary Well No. TK 569-1



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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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

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'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, damp, brown, no odor,
1	0.3			CL	100		
2							SILTY CLAY, SIMILAR TO ABOVE (STA),
3	0.1			CL	100		
4							SILTY SAND, fine, compact, damp, brown, no odor,
5	0.0			SM	100		
6							SILTY SAND, STA,
7	0.0			SM	60		
8							SILTY CLAY, low, soft, damp, brown, no odor,
9	0.6			CL	60		
10							SILTY CLAY, STA, poor recovery,
11	7.2			CL	10		
12							SILTY CLAY, STA, very soft, poor recovery, faint odor,
13	36.5			CL			

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 569-2

Top of Casing 2' Above Ground Level

Open Borehole

2" Sch 40 PVC w/Threaded Joints

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

Geologist	: Tracy Payne
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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

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'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
13	36.5			CL	10		
14							CLAYEY SAND, very fine grain, compact, damp, brown, odor,
15	899			SC	70		
16							CLAYEY SAND, STA, odor,
17	2332			SC	70		
18							CLAYEY SAND/SANDY CLAY, STA, odor,
19	702			SC/CL	90		
20							CLAYEY SAND, STA, sand/gravel lense from 21-21.5', loose, damp, grey,
21	833			SC	60		
22							SILTY SAND, fine grain, loose, damp, brown, odor,
23	398			SM	90		
24				GW			SANDY GRAVEL, grey sandstone gravel with fine to coarse grain sand, damp, odor,
25	190			GW	10		SANDY GRAVEL, STA, white sandstone present,
26							SANDY GRAVEL, STA, white sandstone present,
27	1973			GW	10		
28	1684			GW			SANDY GRAVEL, STA, poor recovery, very hard, trace clay, damp,
29							

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 569-2

Open Borehole
Bentonite Pellets
2" Sch 40 PVC w/Threaded Joints
10/20 Sieve Sand Filter Pack
2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints

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Austin, Texas 78759
512-693-4190

DiSorbo
Environmental Consulting Firm

Western Refining SW, Inc
Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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 3 of 3)

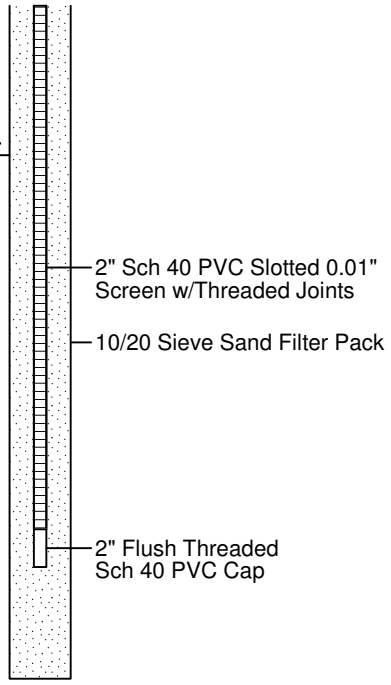
Elev., TOC (ft.msl)	:
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6952.00
Site Coordinates	:
N	: N 35° 29.403'
E	: W 108° 25.451'

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 569-2

Depth (ft.)	PID (ppm)	USCS	Recovery (%)	DESCRIPTION
29		GW	10	
30	1145			SILTY CLAY, low, firm to soft, damp, moist to saturated, silty sand seams throughout, dark brown, odor,
31		SC	90	
32	1420			CLAY, high, stiff, damp, brown, odor,
33	1390	CH	80	
34				CLAYEY GRAVEL, very hard with 4-6" sandstone (grey) at base, odor,
35	1210	GW	20	
36				CLAYSTONE, very hard, dry, reddish purple and grey.
37	405	CLST	90	
38				
39				
40				
41				
42				
43				
44				
45				



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Job No. WEST16006

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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)

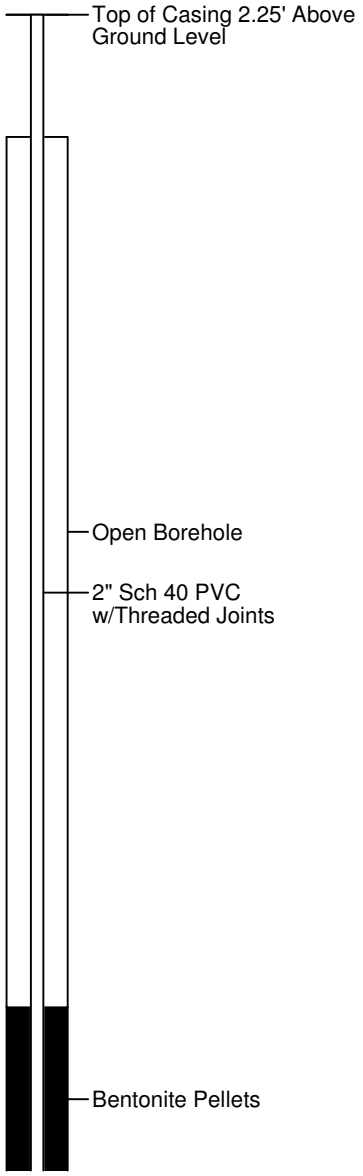
Elev., TOC (ft.msl)	:
Elev., PAD (ft. msl)	:
Elev., GL (ft. msl)	: 6952.00
Site Coordinates	:
N	: N 35° 29.390'
E	: W 108° 25.459'

Saturation
▼ Saturation
▽ Saturation

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							SILTY CLAY, low, firm, damp, brown, no odor,
1	8.9			CL	100		
2							SILTY CLAY, SIMILAR TO ABOVE (STA),
3	10.4			CL	100		
4							SILTY CLAY, STA,
5	12.4			CL	100		
6							SILTY CLAY, STA,
7	31.8			CL	60		
8							SILTY CLAY, STA, soft,
9	27.6			CL	50		
10							SILTY CLAY, low, firm, damp, brown, odor,
11	50.9			CL	70		
12							SILTY CLAY, STA, trace very fine grain sand, odor,
13	63.9			CL	60		
14							CLAYEY SAND, very fine, compact, damp, brown, odor,
15	303			SC	70		
16							CLAYEY SAND, STA, odor,
17	377			SC	70		
18	250			SC/CL			CLAYEY SAND/SANDY CLAY, STA, odor,
19							

Temporary Well

Temporary Well No. TK 569-3



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Gallup Refinery - OW-14 Source Investigation
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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'

Saturation
▼ Saturation
▽ Saturation

Temporary Well

Temporary Well No. TK 569-3

Depth (ft.)	PID (ppm)	USCS	Recovery (%)	DESCRIPTION
19	250	SC/CL	80	
20				SANDY CLAY, low, firm, damp, brown, odor,
21	387	CL	80	
22				SANDY CLAY, STA, odor,
23	405	CL	60	
24				SILTY SAND, fine grain, loose, very moist,
25	955	SM	70	brown, odor, phase separated hydrocarbon (PSH),
26		SM	90	SILTY SAND, STA, saturated, odor, PSH,
27	sat	GW	90	SANDY GRAVEL, compact, 1/2"-1" gravel, medium to coarse sand, saturated, odor, PSH,
28				SANDY CLAYEY GRAVEL, STA, clay
29	sat	GW	80	present, very moist to saturated in seams, pockets, sandstone (white) present, very dense, greenish grey sandstone at base,
30				strong odor, ,
31		GW	50	SANDY CLAYEY GRAVEL, STA, saturated, odor,
32	1620	CL	50	SILTY CLAY, low, firm, damp, brown, odor,
33	1950	CL	90	SILTY CLAY, STA, moderate, grey streaks, odor,
34				
35		GW	90	SANDY GRAVEL, compact, 1/4"-1/2" gravel, coarse sand, saturated, odor,
36				
37	239	GW	20	SANDY CLAYEY GRAVEL, very hard, 1/4" gravel with clay and sand, damp, grey and brown, odor,
38	258	CLST	30	CLAYSTONE, very hard, dry, reddish purple and grey.
39				
40				
41				

Bentonite Pellets
2" Sch 40 PVC w/Threaded Joints
2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints
10/20 Sieve Sand Filter Pack
2" Flush Threaded Sch 40 PVC Cap

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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 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'

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 570-1

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
0							FILL-SILT/GRAVEL, damp, brown, no odor,
1	5.3			FILL	100		
2							FILL-SILT/GRAVEL, SIMILAR TO ABOVE (STA), faint odor,
3	14.9			FILL	100		
4							FILL-SILT/GRAVEL, STA, faint odor,
5	15.8			FILL	100		
6							GRAVELLY SAND, medium to coarse, loose, damp, odor,
7	24.1			SW	90		
8							CLAYEY GRAVEL, 1/4" to 1/2" gravel in low plastic, brown, damp clay, odor,
9	1775			GM	90		
10							SANDY SILT, low, very soft, damp, dark brown, odor,
11	3445			ML	10		
12							SANDY SILT, STA, odor,
13	2408			ML			

Top of Casing 2' Above Ground Level

2" Sch 40 PVC w/Threaded Joints

Open Borehole

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Gallup Refinery - OW-14 Source Investigation
Job No. WEST16006

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'

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
13	2408			ML	10		
14							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							SILTY CLAY, STA, odor,
19	1250			CL	90		
20	1460			CL	90		SILTY CLAY, STA, odor,
21				SC	90		CLAYEY SAND, fine, compact to loose, damp, brown, odor,
22							CLAYEY SAND, STA, decrease in clay with depth, odor,
23	399			SC	90		
24							CLAYEY SAND, STA, odor,
25	695			SC	100		
26							SILTY SAND, very fine, soft/compact, damp, brown, odor,
27	952			SM	90		
28	1441			SC			CLAYEY SAND, very fine, compact, damp, brown, odor,
29							

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 570-1

Open Borehole

2" Sch 40 PVC w/Threaded Joints

Bentonite Pellets

10/20 Sieve Sand Filter Pack

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

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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'

Saturation
▼ Saturation

Temporary Well

Temporary Well No. TK 570-1

Depth (ft.)	PID (ppm)	USCS	Recovery (%)	DESCRIPTION
29	1441	SC	90	
30		SM	90	SILTY SAND, very fine, soft/loose, damp, brown, odor,
31	968			
32	804	SM	60	SILTY SAND, STA, damper than above,
33		SW	60	GRAVELLY SAND, medium to coarse, loose, very moist to saturated, grey, odor,
34		GW	90	SANDY GRAVEL, 1/2" to 1" gravel with sand, fine to coarse, saturated, brown, odor,
35				
36		GW	90	SANDY GRAVEL, STA,
37	676	CH	90	CLAY, high, firm to stiff, brown, odor,
38		CH	90	CLAY, STA, sandstone present,
39	1392			
40		CH	60	CLAY, STA,
41	1117	GW	60	CLAYEY SANDY GRAVEL, compact, moist to very moist, brown, odor,
42		CL	50	GRAVELLY CLAY, low, stiff, damp to dry, reddish brown,
43	555			
44	165	CLST	70	CLAYSTONE, very stiff, dry, purple/reddish brown, odor.
45				

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

10/20 Sieve Sand Filter Pack

2" Flush Threaded Sch 40 PVC Cap

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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.

TD = 58'-4" = 58.33'
DW = 31.96
26.37' of water
Pump @ 55
≈ 18 gal

PUMPING DATA

DATA SHEET FOR RECORDING PUMP TEST DATA

County: McKinley Co.
Location: Ciniza Refinery 2/22/85
Observation well no.
Pumped well no. OW-24

Average Q ____ gpm r = ____ ft. r^2 = ____

Date	Hour	t (min)	t' (min)	t/t'	Depth to water	s (unadjusted)	Adjustment Δs	s' (adjusted)	gph Q (gpm)	Remarks
2-20	1515	0			31'-11.5"	0"	Feet		10 gph	STATIC LEVEL w/ PUMP
	1516	1			33-0	12.5	1.04			LARGE INITIAL DRAW DOWN FILL HOSE FILL
	1517	2			33-1	13.5	1.13			Setting pump rate
	1518	3			33-4	16.5	1.38			
	1519	4			33-8¾	20.75	1.73			
	1520	5			33-11½	24.0	2.0'			
	1521	6			34-2	26.5	2.22			
	1522	7			34-2½	27.0	2.25			
1 min	1523	8			34-3	27.5	2.27			
	1524	9			34-4	28.5	2.37			
	1525	10			34-5	29.5	2.46			
	1527	12			34-6¾	30.75	2.56			
	1529	14			34-9	33.5	2.79			
	1531	16			35-0	36.5"	3.04			
2 min	1533	18			35-2½	38.75	3.23			
	1535	20			35-4½	41.0	3.42			
	1540	25			35-10½	47.0	3.92			
	1545	30			36-3	51.5	4.28			
	1550	35			36-2½	51.0	4.25			
	1555	40			36-8	56.5	4.71		10 gph	CLEARED PUMP Valve
5 min	1600	45			37-2¼	62.75	5.23			
	1605	50			36-10½	81.0	5.08			clear pump valve
	1610	55			NR	70.75				
	1615	60			37-10¼	88.75	5.90			Pumped 10 gal
10 min	1625	70			38-½	85.0	6.08			

PUMPING DATA

DATA SHEET FOR RECORDING PUMP TEST DATA

County: _____ Observation well no. MW-24

Location: Cimiga Refinery Pumped well no. MW-24

Average Q 10 gpm r = — ft. r^2 = —

Date	Hour	t (min)	t' (min)	t/t'	Depth to water	s (unadjusted)	Adjustment As	s' (adjusted)	Q gpm	Remarks
2-20	1635	80			39-3½	~~80.0~~ 78	6.33		10	
	1645	90			38-7	~~91.5~~ 79.5	6.79			Lift pump to 50'
	1655	100			37-6½	69.0	5.75			clear pump, ready pretime
	1705	110			36-11½	~~94.0~~ 84.0	7.00			
2 hours	1715	120			39-2½		7.27			Pumped 20 gal
	1730	135			38-11		6.97			
15 min	1745	150			39-2½		7.25			
	1800	165			39-0½		7.08			
3 h	1815	180			39-2		7.21			Pumped 30 gal
	1830	195			39-5		7.46			
	1845	210			39-5		7.46			
	1900	225			39-2		7.21			
4 h	1915	240			38-11½		7.00			Pumped 40 gal
	1930	255			39-0		7.04		10	
	1932	257			39-4		7.38		20	INCREASE PUMP RATE TO 30 GPM
	1934	259			39-10		7.87			PUMP SLIPPED APPROX 1 FOOT - REPLACED TO APPROX SAME LEVEL
2 min	1936	261			40-3½		8.33			
	1938	263			40-3½		8.33			
	1940	265			40-1½		8.17			PUMPING RATE TELL-OFF SLIGHTLY
	1945	270			40-9		8.79			
	1950	275			41-9½		9.83			
5 min	1955	280			42-0		10.04			
	~~2000~~	285			41-8		9.72			
	2005	290			42-6½		9.75			
	2010	295			43-4		11.27			Silt in Pump?
15 min 5 h	2015	300			43-2½		11.25			Adj pump valve pumped 10 gal
	2030	315			45-10½		11.92			

RECOVERY DATA

DATA SHEET FOR RECORDING PUMP TEST DATA

County: _____ Observation well no. _____

Location: Cimarron Refinery Purged well no. Rec-24

Average Q _____ gpm r = _____ ft. r^2 = _____

Date	Hour	t (min)	t' (min)	t/t'	Depth to water	s (unadjusted)	Adjustment Δs	s' (adjusted)	Q (gpm)	Remarks
1/22	20:32		0		43-1½	144"	12.0'	0	20 gph	
	2034		2		42-7-		10.63'	1.37		
	2036		4		41-8¾		9.69	2.31		
2min	2038		6		40-8¼		8.86	3.14		
	2040		8		40-2		8.21	3.79		
	2042		10		39-4¼		7.56	4.44		
	2047		15		36-0¾		6.11	5.89		
	2052		20		37-1¼		5.17	6.83		
	2057		25		36'4-		4.38	7.62		
	2102		30		35-8½		3.75	8.25		
	2107		35		35-2¼		3.27	8.73		
	2112		40		34-9¾		2.86	9.14		
5min	2117		45		34-5¾		2.52	9.48		
	2122		50		34-3¼		2.27	9.73		
	2127		55		34-0½		2.07	9.93		
	2132		60		33-10½		1.92	10.08		
	2142		70		33-7½		1.66	10.34		
10min	2152		80		33-5¾		1.51	10.49		
	2202		90		33-4½		1.42	10.58		
	2212		100		33-3¼		1.32	10.68		
	2222		110							
	2232		120							
15min	2247		135							
	2302		150							
	2317		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

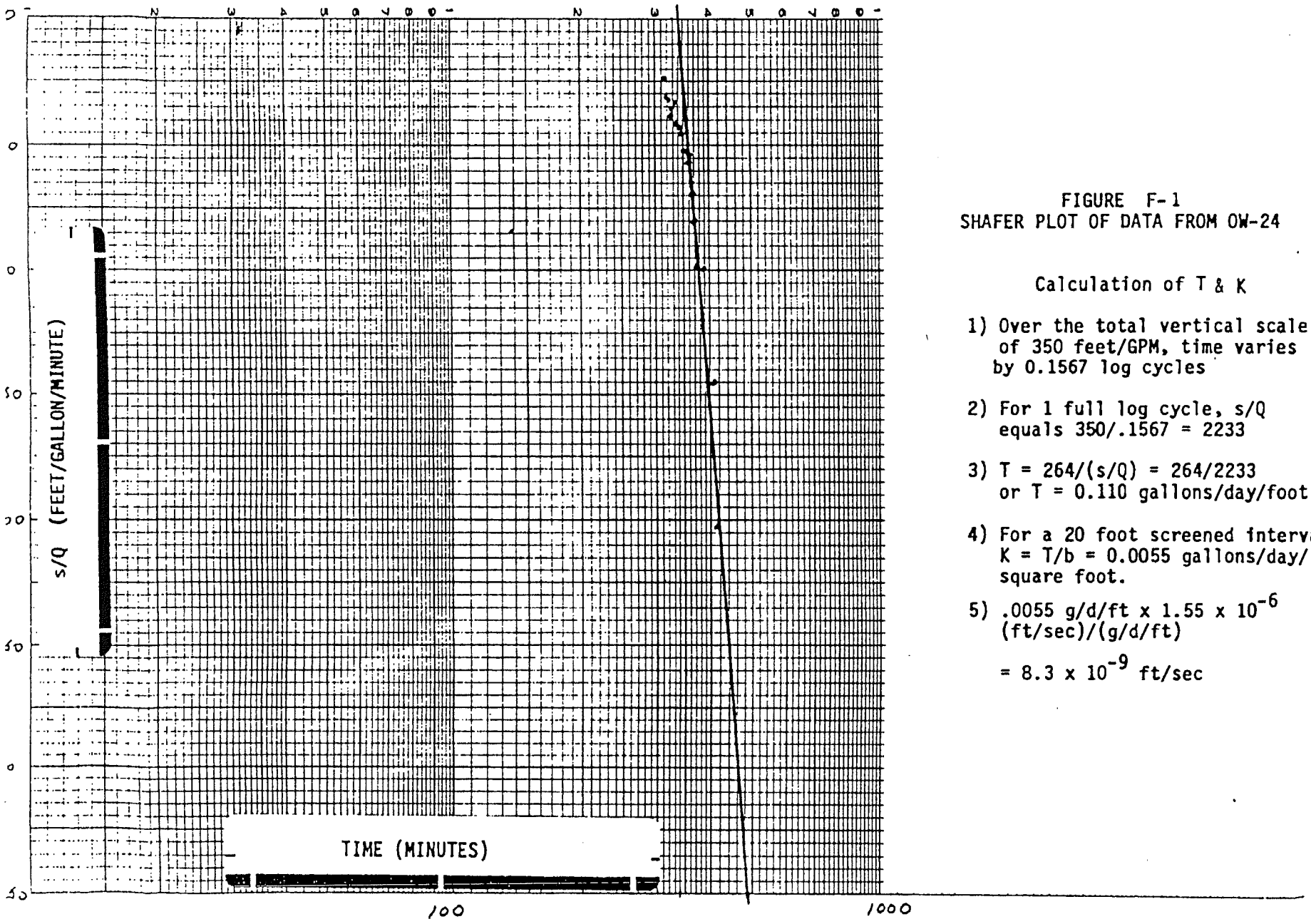


FIGURE F-1
SHAFER PLOT OF DATA FROM OW-24

Calculation of T & K

1) Over the total vertical scale of 350 feet/GPM, time varies by 0.1567 log cycles

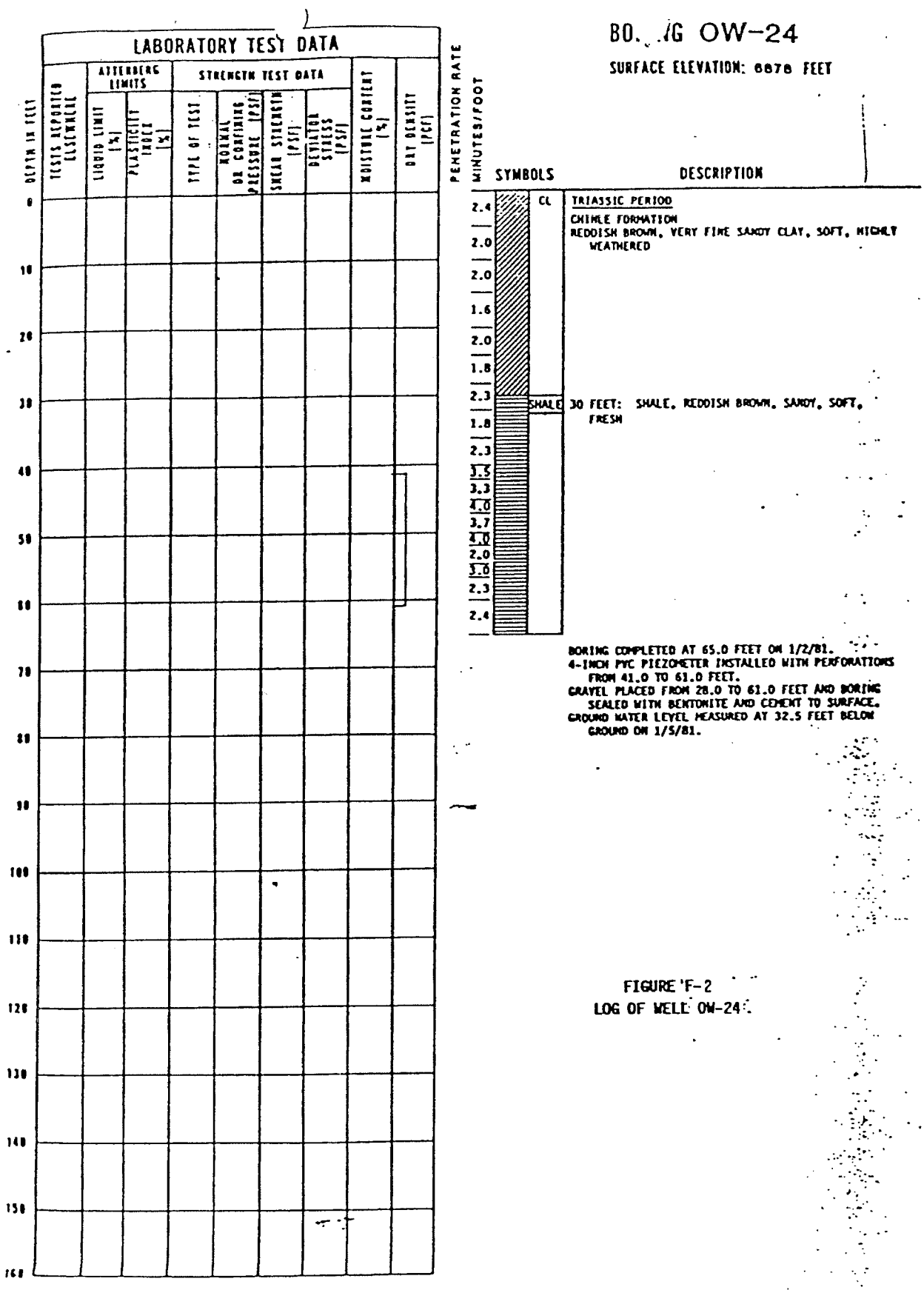
2) For 1 full log cycle, s/Q equals 350/.1567 = 2233

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 1.55×10^{-6} (ft/sec)/(g/d/ft)

$= 8.3 \times 10^{-9}$ ft/sec



BO. .G OW-24

SURFACE ELEVATION: 6678 FEET

DESCRIPTION

TRIASSIC PERIOD

CHINLE FORMATION

REDDISH BROWN, VERY FINE SANDY CLAY, SOFT, HIGHLY WEATHERED

30 FEET: SHALE, REDDISH BROWN, SANDY, SOFT, FRESH

BORING COMPLETED AT 65.0 FEET ON 1/2/81.
4-INCH PVC PIEZOMETER 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.
GROUND WATER LEVEL MEASURED AT 32.5 FEET BELOW GROUND ON 1/5/81.

FIGURE F-2
LOG OF WELL OW-24

LOG OF BORINGS

DAMES & MOORE

Pumping Test Analyses for Low Yield Formations

by David C. Shafer

Occasionally 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," 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!"

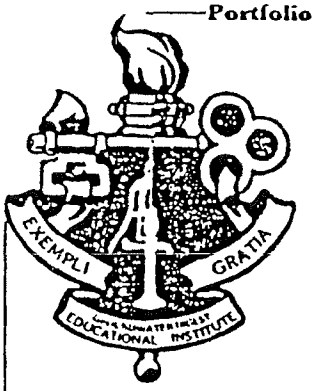
After pump shut-off, the casing slowly begins filling with water. This water comes from the aquifer and actually represents the water pumped during this so called "pumping period." The pumping rate is determined by measuring the volume of

William F. Achuff
Director

Pumping rate = 10 gpm
Pumping period = 15 minutes
Drawdown at pump shut off = 90 ft
Casing — 6" I.D.
Drop pipe — 1¼" 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 (pump shut off)	90				
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 pumping 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:

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

where $\Delta(s/Q)$ 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 shut-off 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 1¼" 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,

$$Q = 6.08 \text{ gallons}/2 \text{ minutes} = 3.04 \text{ gpm}$$

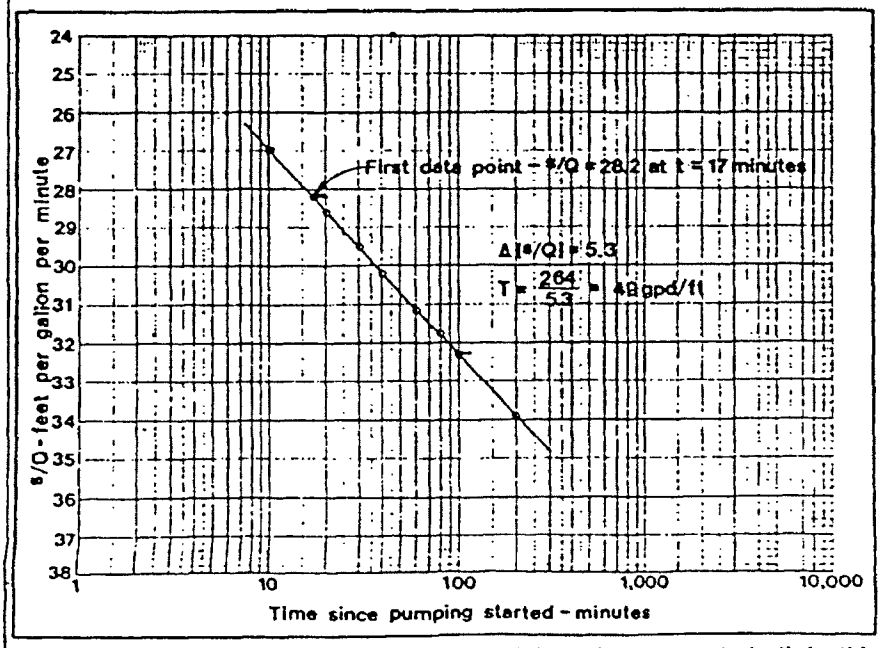
finally,

$$s/Q = 85.66 \text{ ft}/3.04 \text{ gpm} = 28.2 \text{ ft/gpm}$$

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

This analysis is repeated for each drawdown measurement. The resultant calculated s/Q values are shown in the table and plotted in the figure. The formation T value from the graph is

$$T = \frac{264}{\Delta(s/Q)} = 264/5.3 = 49 \text{ gpd/ft}$$



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.

Conventional Analysis

Examination of the hydraulic characteristics of this well (not included here) shows that if a conventional time drawdown graph had been used, casing storage effects would have lasted for approximately twelve hours. 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, in practice, it actually might have been impossible to determine the T value using conventional analysis techniques regardless of the length 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 foot and timed to the nearest second or two.

JOHN W. SHOMAKER
CONSULTING GEOLOGIST
3236 CANDELARIA, N.E.
ALBUQUERQUE, NEW MEXICO 87107

(505) 884-2897

RECEIVED SEP 24 1984

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 4×10^{-7} cm/sec.

Well MW-1 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 1.2×10^{-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, Groundwater monitoring plan, Ciniza Refinery near Gallup, New Mexico).

Please let me know if there are questions.

Sincerely,

John W. Shomaker
Consulting Geologist

cc: Tom Andrews, Delta H Engineering w/encl

well: Shell - Mira OW-4
date: 7-3-84

casing size: nominal 4½" ID 4.0 csg. matl. PVC
water levels measured from top 4½ OD PVC casing, S side,
which is 1.7 ± above ground level.
volume of slug:

OD, ft $\left(\frac{OD}{2}\right)^2 \times \pi \times$ length, ft		
0.30	0.10	0.006
0.243	0.04	0.003
0.27	4.84	0.224
0.243	0.26	0.015
0.27	4.81	0.223
0.18	0.26	0.015
0.11	0.03	0.001
	0.25	0.002
	Sum	0.489 = V, ft³ = 3.66 gal.

Note - obstruction in casing at 33. won't pass 0.27 OD.

r_c = internal radius of casing above perfs: 0.165 ft

r_s = radius of screen or open hole: _____ ft

initial water level 26.15 ft below MP, time 07:51

$$H_o = \frac{V}{\pi r_c^2} = \frac{0.489}{\pi (0.165)^2} = 5.72 \text{ ft}$$

clock time	t, sec.	water level	H	H/Ho	remarks
	0				slug released top slug: 23.2' MP
08:20:54					
21:25?	31?	20.75	5.40	0.944	
22:28	94	20.76	5.39	0.942	
23:14	140	20.80	5.35	0.935	
23:51	177	20.81	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	712	21.00	5.15	0.900	
35:16	867	21.04	5.11	0.893	
38:38	1064	21.10	5.05	0.883	
43:30	1356	21.19	4.96	0.867	
46:52	1558	21.21	4.94	0.864	raised slug 0.4ft.
49:26	1717	21.25	4.90	0.857	
52:54	1970	21.30	4.85	0.848	

t_0 = 08:20:54

0:00 = 2:46

clock time	t, sec.	level	H	H/H₀	remarks
~~08:54:13~~		~~21.34~~			
08:56:50	2096	21.35	4.80	0.839	
09:00:16	2362	21.39	4.76	0.832	
:05:00	2646	21.45	4.70	0.822	
09:55	2941	21.50	4.65	0.813	
17:46	3412	21.60	4.55	0.795	
28:25	4051	21.71	4.44	0.776	m-scope trouble
46:00	5106	21.89	4.26	0.745	
10:02:23	6089	22.05	4.10	0.717	
14:00	6786	22.15	4.00	0.699	
10:24:26	7412	22.25	3.90	0.687	stopped test; slug almost uncovered

late data matches: $\alpha = 10^{-1}$ curve, $Tt/r_c^2 = 1$ at $t = 50{,}000$ sec.

$T = \frac{1.0\, r_c^2}{t} = \frac{(1.0)(0.165)^2}{50{,}000} = 5.4 \times 10^{-7}$ ft²/sec

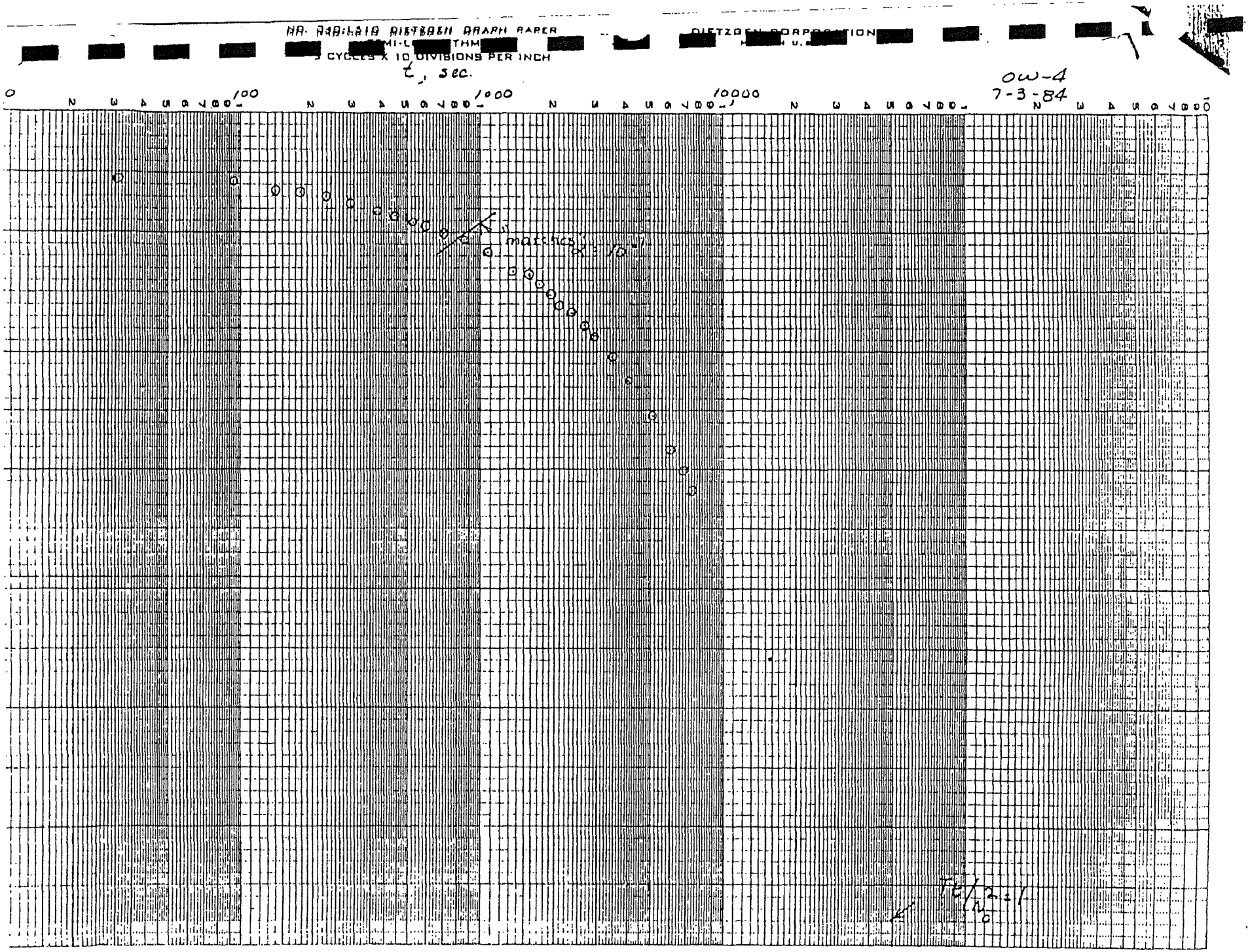
$= 0.05$ ft²/day $= 0.35$ gpd/ft

$K_h = \frac{0.05 \text{ ft}^2/\text{day}}{40 \text{ ft screen}} = 0.001$ ft/day

0.001 ft/day $\times 30.5$ cm/ft $\times \frac{1}{60 \times 1440}$ sec/day $= 4 \times 10^{-7}$ cm/sec

$S = \frac{r_c^2}{r_s^2}\alpha \approx \frac{0.027}{0.080} = 10^{-1} = 0.03$ ∴ water-table storage

67% "hole!"


t, sec.
100
1000
10000
OW-4
7-3-84
matches

date: 7-2-84

casing size: nominal 5 1/2" OD, ID 5.1" csg. matl. PVC
water levels measured from top PVC casing, SW side
which is 1.37 ft above ground level, (concrete slab)
volume of slug:

2.05
.68
1.37

cap OD, ft $\left(\frac{0.37}{0.39} \times \frac{1}{2}\right)^2 \times \pi \times$ length, ft		=	ft^3
	0.10	=	0.011
	0.05		0.006
	4.81		0.411
	0.28		0.032
	0.04		0.003
	0.04		0.006
	0.03		0.002
	0.03		0.001
	0.25		0.002
sum	0.474	= V, ft^3	= 3.55 gal

r_c = internal radius of casing above perfs: 0.211 ft

r_s = radius of screen or open hole: _____ ft

initial water level 5.72 ft below mp, time 13:32

$$H_o = \frac{V}{\pi r_c^2} = \frac{0.474}{\pi (0.211)^2} = 3.389 \text{ ft}$$

clock time	t, sec.	water level	H	H/H_o	remarks
13:48:00	0				slug released
13:48:20	20	2.30 ft	3.42	1.009	??
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	
53:33	333	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	2.91	2.75	0.811	
59:12	672	3.10	2.62	0.773	
14:01:05	785	3.20	2.52	0.744	
02:24	868	3.28	2.44	0.720	
03:52	952	3.36	2.36	0.696	

clock time	t, sec.	level	H	H/H₀	remarks
14:05:38	1058	3.45	2.27	0.670	
07:22	1167	3.54	2.18	0.643	
09:16	1276	3.62	2.10	0.620	
11:01	1381	3.69	2.03	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	
46:19	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	5.36	0.36	0.106	
53:43	7543	5.40	0.32	0.094	
16:08:22	8422	5.46	0.26	0.077	
26:59	9539	5.52	0.20	0.059	
47:10	10,750.	5.56	0.16	0.047	
17:00:20	11,540	5.58	0.14	0.041	

late data matches: $\alpha = 10^{-5}$ curve, $Tt/r_c^2 = 1$ at $t = 830$ sec.

$T = \frac{1.0\, r_c^2}{t} = \frac{(1.0)(0.21)^2}{830} = 5.36 \times 10^{-5}$ ft²/sec

$= 4.63$ ft²/day = 35 gpd/ft

$K_h = \frac{4.63 \text{ ft}^2/\text{day}}{13.3 \text{ ft screened}} = 0.35$ ft/day

$0.35 \text{ ft/day} \times 30.5 \text{ cm/ft} \times \frac{1}{60 \times 1440 \text{ sec/day}} = 1.2 \times 10^{-4} \frac{\text{cm}}{\text{sec}}$

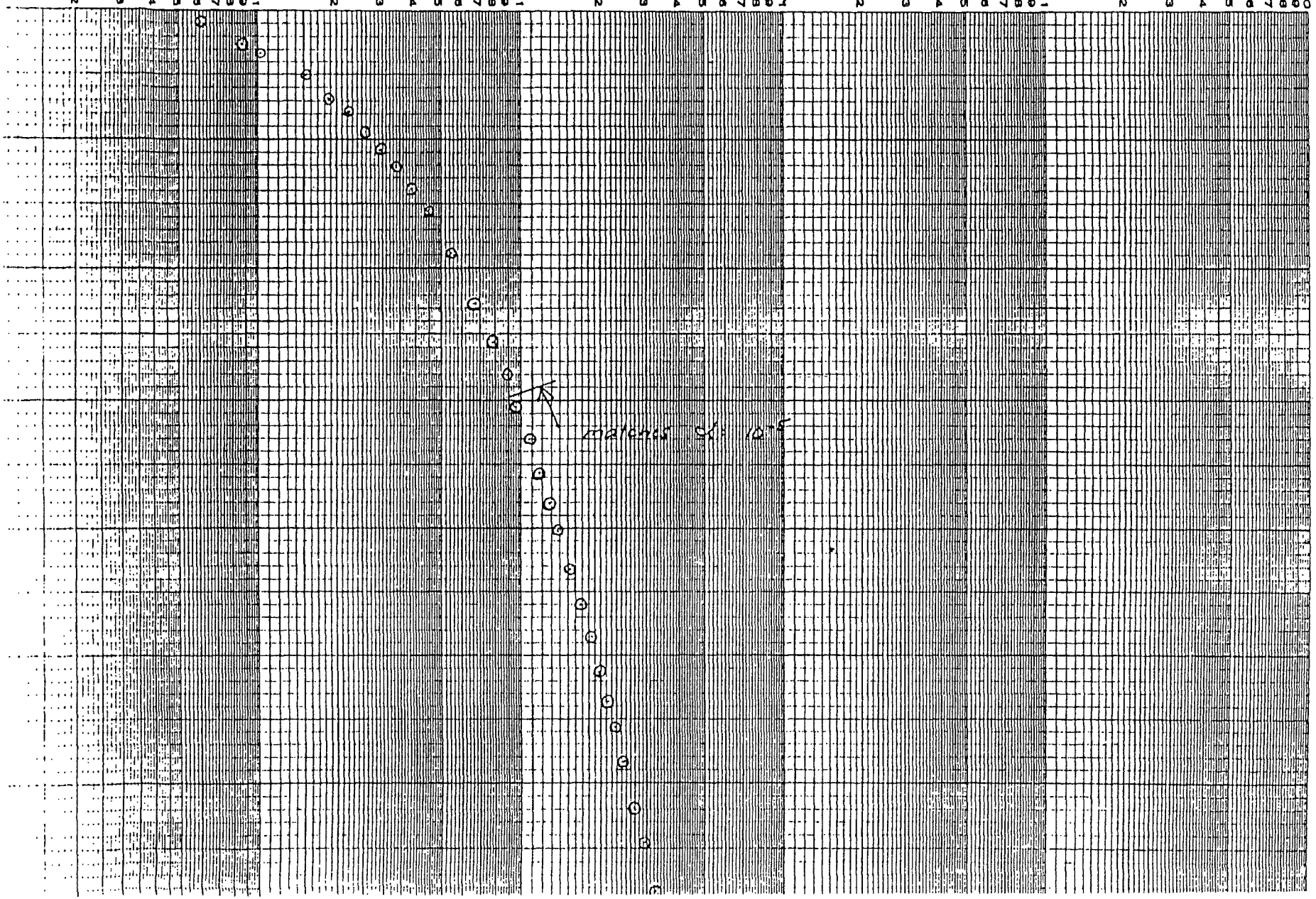
NO. 340-L510 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
5 CYCLES X 10 DIVISIONS PER INCH

DIETZGEN CORPORATION
MADE IN U.S.A.

t, sec.

MW-1
7-2-84

100 1000 10000



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 Permit 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 1.0×10^{-3} cm/sec or 3.6 cm/hr. Soil permeability as determined by laboratory measurements averages 1.9×10^{-5} cm/sec or 6.8×10^{-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.

RECENT SOIL PERMEABILITY TESTS
FIREWATER POND CONSTRUCTION PROJECT

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

Rigid Wall Hydraulic Conductivity
Falling Head

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

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

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 120.8 pcf
Dry Unit Weight: 109.0 pcf
% Moisture: 10.8
% Compaction: n/a
% Compaction Requested: n/a

PROCTOR INFORMATION:

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

Coefficient of Permeability, k_{20}: 1.1×10^{-7} cm/sec. avg

Remarks: Avg of three: 1.1×10^{-7}, 1.1×10^{-7}, 1.1×10^{-7}

C:\bill\Projects\2005\05100cinizafirewb1\[Permeability.xls]Report
Reviewed By: Reviewed By: Certified By:

05-100
SWMU NO. 1
AL2
AL1
LAB #
DEPTH

...SW Corner of Proposed ...Lagoon
...Elevation: -98.2@TD,-27@1 hr
...Add.: 05-100-1

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

File #: 05-100
Site: Giant-Cliniza

Elevation: EXISTING
Date: 9/24/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS
	0.0-5.0				Clay, Very Silty, Sandy, Very Fine, Dark Red, Wet, Firm.				
47872				2.5	[2.5-3.0 hydraulic conductivity sample]				
	5.0-10.0			5.0	Same As Above, Wet, Soft				
				7.5					
	10.0-15.0			10.0	Same As Above				
				12.5					
	15.0-16.0				Same As Above				
	16.0-17.5				Sand, Very Fine, Very Clayey, Very Silty, Weak Water Bearing, Moderately Dense, Dark Red/Brown				
	17.5-21.5				Clay, Dark Red, Wet, Soft				
				20.0					

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER LOGGED BY WHK

C:\toll\Projects\2005\05100cliniza\new\[Boring 1.xls]Sheet1

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

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-623-7574

File #:
Site: Cla
Elevation: EXIST
Date: 9/24/200

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS
	21.5-22.1				Clay, Sandy, Dark Brown, Wet, Stiff				
	22.1-23.5				Clay, Hard, Red/Brown (Brighter than Above), Wet/Moist				
	23.5-25.1				Petrified Forest Formation				
	25.0-30.0			25.0	Mudstone/Claystone, Weathered, Some Grey/Green Reduction Spots, Generally Red/ Brown, Flasile to Crumbly, Damp/Moist				
	30.0-35.0			30.0	Mudstone, As Above, Few Reduction Spots, Damp/Dry				
					Same As Above dry				
	35.0-40.0			35.0	Same As Above dry				
	40.0-45.0			40.0	Same As Above, Brighter Red @ 44.5-45.0', dry				
	41.5				siltstone/mudstone, dry, very dense,bright red brown				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER LOGGED BY: WHK

C:\bill\Projects\2005\05100cindarafirewtr\[Boring 1.xls]Sheet1A

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

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

File #: 05-100
Site: Gila Regional Medical Center Fire Water Lagoon
Elevation: EXISTING
Date: 9/24/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR,ETC.)	%M	LL	PI	CLASS
	21.5-22.1				Clay, Sandy, Dark Brown, Wet, Stiff				
	22.1-23.5				Clay, Hard, Red/Brown (Brighter than Above), Wet/Moist				
	23.5-25.1				Petrified Forest Formation Mudstone/Claystone, Weathered, Some Grey/Green Reduction Spots, Generally Red/ Brown, Friable to Crumbly, Damp/Moist				
	25.0-30.0			25.0	Mudstone, As Above, Few Reduction Spots, Damp/Dry				
	30.0-35.0			30.0	Same As Above dry				
	35.0-40.0			35.0	Same As Above dry				
	40.0-45.0			40.0	Same As Above, Brighter Red @ 44.5-45.0', dry				
	41.5				siltstone/mudstone, dry, very dense,bright red brown				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER — LOGGED BY: WHK

C:\bill\Projects\2005\05100cnrizafirewtr\[Boring 1.xls]Sheet1A

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7874

File #: 05-100
Site: Giant-Cruza
Elevation: EXISTING
Date: 9/24/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR ETC.)	%M	LL	PI	CLASS.
	45.0-50.0			45.0	Mudstone/Siltstone, Bright Red/Brown, Dry Very Dense				
	50.0-55.0			50.0	Same As Above				
	55.0-60.0			55.0	Same As Above				
	60.0-65.0			60.0	Same As Above				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER LOGGED BY: WHK

C:\bill\Projects\2005\05100cruzafirewtr\[Boring 1.xls]Sheet1

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-521-7674

Sheet: 4 OF 5
Bore Point: SW Corner of Proposed Fire Water Lagoon
Water Elevation:
Boring No.: 05-100-1

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR ETC.)	%M	LL	PI	CLASS
				65.0					
	66.0-66.2				Same As Above				
	66.2-67.4				Sandstone, Fine, Red/Brown, Hard, Fissile, Grey/Green Oolitic Reduction Spots Abundant, Dry				
	67.4-78.0				Sandstone/Siltstone Interbeds, Same Mudstone, Dark Red/Brown, Hard, Dry				
				70.0					
				75.0					
	78.0-79.1				Mudstone, Fissile, Dry, Red/Brown, Some Grey/Green Reduction Spots				
	79.1-97.7			80.0	Sandstone, Fine, Red/Brown, Fissile, Hard, Feldspathic, Bedded 6" to 1.0', White Mottled Upper Sonsela Member				
				85.0					

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER — LOGGED BY: WHK

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

File #: 05-100
Site: Giant Cinica

Elevation: EXISTING
Date: 9/24/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, ETC.)	%M	LL	PI	CLASS
					Upper Sonsela Member Continued (dry)				
				90.0					
				95.0					
	97.7-98.2				Mudstone, Hard, Dry, Green/Grey-White				
	98.2-101.6			100.0	Sandstone, Fine to Medium, Quartz Grains, Water Bearing, Hard, (Sonsela Member, Petrified Forest Formation, Chinle Group)				
	101.6				TD				
				105.0	Boring continuopusly sampled using 5' split barreled intrusion sampler. Boring closed using 10' of 3/8" TR-30 Pel Plug capped with 50' of 6% bentonite cement slurry and backfilled to the ground surface with cuttings.				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER — LOGGED BY: WHK

C:\bill\Projects\2005\05100cinzafirewtr\[Boring 1.xls]Sheet1D

Appendix H
Analytical Data Reports

Included on CD

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

October 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
4901 Hawkins NE
Albuquerque, NM 87109

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 8015M/D: DIESEL RANGE ORGANICS							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		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							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	27733
Aniline	ND	0.095	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Anthracene	ND	0.067	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Azobenzene	ND	0.12	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Benzo(a)pyrene	ND	0.076	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Benzo(b)fluoranthene	ND	0.091	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Benzoic acid	ND	0.083	0.50		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Benzyl alcohol	ND	0.079	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Bis(2-chloroethyl)ether	ND	0.074	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Bis(2-chloroisopropyl)ether	ND	0.090	0.20		mg/Kg	1	9/30/2016 12:29:55 PM	27733
Bis(2-ethylhexyl)phthalate	0.13	0.082	0.50	J	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-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 8015M/D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	5.9	1.8	9.6	J	mg/Kg	1	9/29/2016 4:26:04 AM	27746
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	9/29/2016 4:26:04 AM	27746
Surr: DNOP	99.9	0	70-130		%Rec	1	9/29/2016 4:26:04 AM	27746
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	0.0026	0.00057	0.033	J	mg/Kg	1	9/27/2016 11:29:36 AM	27712
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
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 6:26:50 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	100	10/1/2016 2:58:13 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	20	10/1/2016 6:26:50 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
Silver	ND	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
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Acenaphthene	ND	0.084	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	27733
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
Benzo(k)fluoranthene	ND	0.086	0.20		mg/Kg	1	9/30/2016 1:53:25 PM	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

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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

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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**	
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	27868
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	27868
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	27868

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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
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 RANGE							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

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Hall Environmental Analysis Laboratory, Inc.

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 RANGE							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 RANGE							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 METALS							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

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Hall Environmental Analysis Laboratory, Inc.

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 200.8: DISSOLVED METALS							Analyst: **JLF**	
Lead	ND	0.00017	0.00050		mg/L	1	10/11/2016 2:29:28 PM	A37903
Selenium	ND	0.00021	0.0010		mg/L	1	10/10/2016 9:41:13 PM	B37384
EPA 200.8: METALS							Analyst: **JLF**	
Antimony	ND	0.00047	0.0010		mg/L	1	10/13/2016 5:54:54 PM	A37945
Arsenic	ND	0.00021	0.0010		mg/L	1	10/11/2016 8:47:02 PM	D37903
Lead	ND	0.00017	0.00050		mg/L	1	10/11/2016 8:47:02 PM	D37903
Selenium	ND	0.00021	0.0010		mg/L	1	10/11/2016 8:47:02 PM	D37903
EPA METHOD 245.1: MERCURY							Analyst: **pmf**	
Mercury	ND	0.000053	0.00020		mg/L	1	10/5/2016 11:56:02 AM	27892
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
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
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(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-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
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	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

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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	R37500
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

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

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**	
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

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

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

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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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 8015M/D: DIESEL RANGE ORGANICS							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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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**	
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 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

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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 8015M/D: DIESEL RANGE ORGANICS							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							Analyst: **DAM**	
Acenaphthene	ND	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
Aniline	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:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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**	
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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: OW-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**	
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: GASOLINE 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

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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 8015M/D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	320	1.8	9.8		mg/Kg	1	9/29/2016 5:30:53 AM	27746
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	9/29/2016 5:30:53 AM	27746
Surr: DNOP	105	0	70-130		%Rec	1	9/29/2016 5:30:53 AM	27746
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	0.0047	0.00056	0.033	J	mg/Kg	1	9/27/2016 11:38:36 AM	27712
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
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
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	100	10/1/2016 3:02:52 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							Analyst: **DAM**	
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	0.12	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
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Benzoic acid	ND	0.083	0.50		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	9/30/2016 3:16:41 PM	27733
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-ethylhexyl)phthalate	0.14	0.081	0.50	J	mg/Kg	1	9/30/2016 3:16:41 PM	27733

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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**	
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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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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**	
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

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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							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

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Qualifiers:

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R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 8270C: SEMIVOLATILES							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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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**	
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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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Hall Environmental Analysis Laboratory, Inc.

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 8015M/D: DIESEL RANGE ORGANICS							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

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Qualifiers:

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R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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Hall Environmental Analysis Laboratory, Inc.

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

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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Hall Environmental Analysis Laboratory, Inc.

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 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

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

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 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 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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: TK-568-1 (30-32')
Project: OW-14 SOURCE INV
Collection Date: 9/23/2016 1:35:00 PM
Lab ID: 1609E26-009
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							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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: TK-568-1 (30-32')
Project: OW-14 SOURCE INV
Collection Date: 9/23/2016 1:35:00 PM
Lab ID: 1609E26-009
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

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: TK-568-1 (30-32')
Project: OW-14 SOURCE INV
Collection Date: 9/23/2016 1:35:00 PM
Lab ID: 1609E26-009
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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: TK-568-1 (30-32')
Project: OW-14 SOURCE INV
Collection Date: 9/23/2016 1:35:00 PM
Lab ID: 1609E26-009
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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: TK-568-1 (30-32')
Project: OW-14 SOURCE INV
Collection Date: 9/23/2016 1:35:00 PM
Lab ID: 1609E26-009
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

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
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							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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: TK-568-1 (48-49')
Project: OW-14 SOURCE INV
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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**	
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

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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 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

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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 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

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Matrix: SOIL
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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

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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 8015M/D: DIESEL RANGE ORGANICS							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	0.094	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	0.12	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	0.075	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Benzo(g,h,i)perylene	ND	0.087	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	0.082	0.50		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	9/30/2016 5:36:06 PM	27733
Bis(2-ethylhexyl)phthalate	0.15	0.081	0.50	J	mg/Kg	1	9/30/2016 5:36:06 PM	27733

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Hall Environmental Analysis Laboratory, Inc.

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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

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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**	
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	S37546
Ethylbenzene	1.5	0.021	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
Methyl tert-butyl ether (MTBE)	1.1	0.082	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,2,4-Trimethylbenzene	5.3	0.019	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,3,5-Trimethylbenzene	1.8	0.019	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
1,2-Dichloroethane (EDC)	ND	0.068	0.26		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
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	S37546
Acetone	ND	0.34	3.9		mg/Kg	10	9/28/2016 12:46:21 PM	S37546
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	S37546
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	S37546
2-Butanone	ND	0.15	2.6		mg/Kg	10	9/28/2016 12:46:21 PM	S37546

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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

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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**	
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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 RANGE							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 RANGE							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 METALS							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	A37991
Nickel	ND	0.0031	0.010		mg/L	1	10/17/2016 2:26:27 PM	A37991
Silver	ND	0.0028	0.0050		mg/L	1	10/17/2016 2:26:27 PM	A37991
Vanadium	ND	0.0013	0.050		mg/L	1	10/17/2016 2:26:27 PM	A37991
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

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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 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	B37384
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	A37945
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

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 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

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Qualifiers:

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

Wet Chemistry by Method 9012B

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

Wet Chemistry by Method 9012B

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

Wet Chemistry by Method 4500CN E-2011

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

Wet Chemistry by Method 9012B

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

Wet Chemistry by Method 9012B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Cyanide	ND		0.250	1	10/04/2016 15:42	WG913180

Wet Chemistry by Method 9012B

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

Wet Chemistry by Method 9012B

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

Wet Chemistry by Method 9012B

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

Wet Chemistry by Method 9012B

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

Wet Chemistry by Method 9012B

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

Wet Chemistry by Method 9012B

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

Wet Chemistry by Method 4500CN E-2011

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

Method Blank (MB)

(MB) R3168792-1 10/06/16 20:40

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Cyanide	U		0.00180	0.00500

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

(OS) L862594-02 10/06/16 20:56 • (DUP) R3168792-4 10/06/16 20:57

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

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

(OS) L863487-02 10/06/16 21:11 • (DUP) R3168792-7 10/06/16 21:14

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

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

(LCS) R3168792-2 10/06/16 20:41 • (LCSD) R3168792-3 10/06/16 20:42

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Cyanide	0.100	0.0978	0.0982	98.0	98.0	85.0-115			0.000	20

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

(OS) L862596-02 10/06/16 21:04 • (MS) R3168792-5 10/06/16 21:05 • (MSD) R3168792-6 10/06/16 21:06

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Cyanide	0.200	ND	0.174	0.187	87.0	94.0	1	75.0-125			7.00	20

Method Blank (MB)

(MB) R3168076-1 10/04/16 15:30

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Cyanide	U		0.0390	0.250

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

(OS) L862217-01 10/04/16 15:36 • (DUP) R3168076-4 10/04/16 15:37

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

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

(OS) L862583-04 10/04/16 15:56 • (DUP) R3168076-7 10/04/16 15:57

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

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

(LCS) R3168076-2 10/04/16 15:31 • (LCSD) R3168076-3 10/04/16 15:32

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Cyanide	48.4	52.5	57.5	108	119	50.0-150			9.00	20

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

(OS) L862217-11 10/04/16 15:48 • (MS) R3168076-5 10/04/16 15:49 • (MSD) R3168076-6 10/04/16 15:50

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Cyanide	3.33	ND	3.23	3.10	97.0	93.0	1	75.0-125			4.00	20

Abbreviations and Definitions

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

Qualifier	Description

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Client ID: **PBW**	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								
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**	SampType: **LCS**	TestCode: **EPA Method 200.7: Metals**
Client ID: **LCSW**	Batch ID: **A37991**	RunNo: **37991**
Prep Date:	Analysis Date: **10/17/2016**	SeqNo: **1183972** 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**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Metals**
Client ID: **BatchQC**	Batch ID: **A37991**	RunNo: **37991**
Prep Date:	Analysis Date: **10/17/2016**	SeqNo: **1183973** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-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:	**A37991**	RunNo:	**37991**
Prep Date:		Analysis Date:	**10/17/2016**	SeqNo:	**1183973** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

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

Sample ID **LLLCS-B**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **B37965**	RunNo: **37965**
Prep Date:	Analysis Date: **10/15/2016**	SeqNo: **1183095** 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**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **B37965**	RunNo: **37965**
Prep Date:	Analysis Date: **10/15/2016**	SeqNo: **1183096** 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 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
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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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
Manganese	0.00058	0.0020								J
Nickel	ND	0.010								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company

Project: OW-14 SOURCE INV

Sample ID	**1609E26-003EMSDL**	SampType:	**MSDLL**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**EB092116**	Batch ID:	**D37903**		RunNo:	**37903**				
Prep Date:		Analysis Date:	**10/11/2016**		SeqNo:	**1180790**	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	**1609E26-003EMSLL**	SampType:	**MSLL**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**EB092116**	Batch ID:	**D37903**		RunNo:	**37903**				
Prep Date:		Analysis Date:	**10/11/2016**		SeqNo:	**1180791**	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			
Selenium	0.023	0.0010	0.02500	0	90.6	70	130			

Sample ID	**LCS**	SampType:	**LCS**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**LCSW**	Batch ID:	**D37903**		RunNo:	**37903**				
Prep Date:		Analysis Date:	**10/11/2016**		SeqNo:	**1180829**	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			

Sample ID	**LLLCS**	SampType:	**LCSLL**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**BatchQC**	Batch ID:	**D37903**		RunNo:	**37903**				
Prep Date:		Analysis Date:	**10/11/2016**		SeqNo:	**1180832**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00094	0.0010	0.001000	0	93.9	50	150			J
Lead	0.00047	0.00050	0.0005000	0	93.7	50	150			J
Selenium	0.00093	0.0010	0.001000	0	93.4	50	150			J

Sample ID	**MB**	SampType:	**MBLK**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**PBW**	Batch ID:	**D37903**		RunNo:	**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								
Lead	ND	0.00050								
Selenium	ND	0.0010								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company

Project: OW-14 SOURCE INV

Sample ID	**1609E26-003EMSDL**	SampType:	**MSDLL**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**EB092116**	Batch ID:	**A37945**		RunNo:	**37945**				
Prep Date:		Analysis Date:	**10/13/2016**		SeqNo:	**1182530**	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	**1609E26-003EMSLL**	SampType:	**MSLL**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**EB092116**	Batch ID:	**A37945**		RunNo:	**37945**				
Prep Date:		Analysis Date:	**10/13/2016**		SeqNo:	**1182531**	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	**1609E26-012EMSLL**	SampType:	**MSLL**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**EB092216**	Batch ID:	**A37945**		RunNo:	**37945**				
Prep Date:		Analysis Date:	**10/13/2016**		SeqNo:	**1182533**	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**		TestCode:	**EPA 200.8: 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	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			
Selenium	0.024	0.0010	0.02500	0	95.9	85	115			

Sample ID	**LLLCS**	SampType:	**LCSLL**		TestCode:	**EPA 200.8: 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	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.0010	0.0010	0.001000	0	100	50	150			
Arsenic	0.0010	0.0010	0.001000	0	103	50	150			
Lead	0.00056	0.00050	0.0005000	0	112	50	150			
Selenium	0.0010	0.0010	0.001000	0	102	50	150			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

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: **B37384**	RunNo: **37834**
Prep Date:	Analysis Date: **10/10/2016**	SeqNo: **1178573** 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**	SampType: **LCSLL**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **B37384**	RunNo: **37834**
Prep Date:	Analysis Date: **10/10/2016**	SeqNo: **1178574** 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**	SampType: **MBLK**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW**	Batch ID: **B37384**	RunNo: **37834**
Prep Date:	Analysis Date: **10/10/2016**	SeqNo: **1178575** 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: **LCS**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **A37903**	RunNo: **37903**
Prep Date:	Analysis Date: **10/11/2016**	SeqNo: **1180780** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.023	0.0010	0.02500	0	90.7	85	115			
Lead	0.012	0.00050	0.01250	0	93.4	85	115			

Sample ID **LLLCS**	SampType: **LCSLL**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **A37903**	RunNo: **37903**
Prep Date:	Analysis Date: **10/11/2016**	SeqNo: **1180783** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00076	0.0010	0.001000	0	75.9	50	150			J
Lead	0.00049	0.00050	0.0005000	0	97.6	50	150			J

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

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

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**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0052	0.00020	0.005000	0	104	80	120			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Prep Date:	Analysis Date: **10/4/2016**	SeqNo: **1174191** 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								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R37700**	RunNo: **37700**
Prep Date:	Analysis Date: **10/4/2016**	SeqNo: **1174192** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.51	0.10	0.5000	0	102	90	110			
Chloride	4.9	0.50	5.000	0	97.0	90	110			
Sulfate	9.8	0.50	10.00	0	97.7	90	110			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company

Project: OW-14 SOURCE INV

Sample ID **MB-27746**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **27746**	RunNo: **37493**
Prep Date: **9/27/2016**	Analysis Date: **9/28/2016**	SeqNo: **1166916** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.8	10								J
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.7		10.00		96.8	70	130			

Sample ID **LCS-27746**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **27746**	RunNo: **37493**
Prep Date: **9/27/2016**	Analysis Date: **9/28/2016**	SeqNo: **1166919** Units: **mg/Kg**

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**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **TK-568-1 (30-32')**	Batch ID: **27772**	RunNo: **37555**
Prep Date: **9/28/2016**	Analysis Date: **9/29/2016**	SeqNo: **1169380** Units: **mg/Kg**

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 **1609E26-009AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **TK-568-1 (30-32')**	Batch ID: **27772**	RunNo: **37555**
Prep Date: **9/28/2016**	Analysis Date: **9/29/2016**	SeqNo: **1169381** Units: **mg/Kg**

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**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **27772**	RunNo: **37555**
Prep Date: **9/28/2016**	Analysis Date: **9/29/2016**	SeqNo: **1169384** Units: **mg/Kg**

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	4.9		5.000		97.5	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Client ID: **PBS**	Batch ID: **27772**	RunNo: **37555**
Prep Date: **9/28/2016**	Analysis Date: **9/29/2016**	SeqNo: **1169386** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.8	10								J
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	12		10.00		118	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Prep Date: **9/28/2016**	Analysis 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	1.1		1.000		105	77.1	144			

Sample ID **LCS-27760**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **LCSW**	Batch ID: **27760**	RunNo: **37493**
Prep Date: **9/28/2016**	Analysis Date: **9/28/2016**	SeqNo: **1167407** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.7	1.0	5.000	0	113	63.2	155			
Surr: DNOP	0.52		0.5000		103	77.1	144			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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
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 lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS**	Batch ID: **R37518**	RunNo: **37518**
Prep Date:	Analysis Date: **9/27/2016**	SeqNo: **1166865** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.2	0.025	1.000	0	118	70	130			
Toluene	1.0	0.050	1.000	0	102	70	130			
Chlorobenzene	1.0	0.050	1.000	0	103	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Prep Date:	Analysis Date: **9/27/2016**	SeqNo: **1166865** 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)	1.1	0.050	1.000	0	113	70	130			
Surr: Dibromofluoromethane	0.54		0.5000		109	70	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**	SampType: **MS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **OW-57 (25-27')**	Batch ID: **R37518**	RunNo: **37518**
Prep Date:	Analysis Date: **9/27/2016**	SeqNo: **1166959** Units: **mg/Kg**

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**	SampType: **MSD**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **OW-57 (25-27')**	Batch ID: **R37518**	RunNo: **37518**
Prep Date:	Analysis Date: **9/27/2016**	SeqNo: **1166960** Units: **mg/Kg**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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								
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	0.074	0.75								J
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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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
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 lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS**	Batch ID: **S37546**	RunNo: **37546**
Prep Date:	Analysis Date: **9/28/2016**	SeqNo: **1168082** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	108	70	130			
Toluene	1.0	0.050	1.000	0	101	70	130			
Chlorobenzene	0.98	0.050	1.000	0	98.0	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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: **S37546**	RunNo: **37546**
Prep Date:	Analysis Date: **9/28/2016**	SeqNo: **1168082** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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 ID: **27789**	RunNo: **37599**
Prep Date: **9/29/2016**	Analysis Date: **9/30/2016**	SeqNo: **1170203** Units: **%Rec**

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**	SampType: **LCS**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **LCSS**	Batch ID: **27789**	RunNo: **37599**
Prep Date: **9/29/2016**	Analysis Date: **9/30/2016**	SeqNo: **1170204** 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**	SampType: **LCSD**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **LCSS02**	Batch ID: **27789**	RunNo: **37599**
Prep Date: **9/29/2016**	Analysis Date: **9/30/2016**	SeqNo: **1170205** Units: **%Rec**

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
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								
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								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
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
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**	SampType: **LCS**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **LCSS**	Batch ID: **27868**	RunNo: **37658**
Prep Date: **10/4/2016**	Analysis Date: **10/4/2016**	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company

Project: OW-14 SOURCE INV

Sample ID **LCSD-27868**	SampType: **LCSD**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **LCSS02**	Batch ID: **27868**	RunNo: **37658**
Prep Date: **10/4/2016**	Analysis Date: **10/4/2016**	SeqNo: **1172759** Units: **µg/Kg**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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: **LCSW**	Batch ID: **R37500**	RunNo: **37500**
Prep Date:	Analysis Date: **9/27/2016**	SeqNo: **1166023** 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			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R37500**	RunNo: **37500**
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
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:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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: **PBW**	Batch ID: **R37500**	RunNo: **37500**
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								
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	1.9	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	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								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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: **PBW**	Batch ID: **R37500**	RunNo: **37500**
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
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.7		10.00		97.3	70	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**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	103	70	130			
Toluene	21	1.0	20.00	0.1220	103	70	130			
Chlorobenzene	20	1.0	20.00	0	102	70	130			
1,1-Dichloroethene	21	1.0	20.00	0	106	70	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	9.9		10.00		99.4	70	130			
Surr: Dibromofluoromethane	9.8		10.00		97.6	70	130			
Surr: Toluene-d8	9.8		10.00		98.1	70	130			

Sample ID **1609e26-003amsd**	SampType: **MSD**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **EB092116**	Batch ID: **R37500**	RunNo: **37500**
Prep Date:	Analysis Date: **9/27/2016**	SeqNo: **1166512** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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
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	0.14	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								
2-Chlorophenol	ND	0.20								
4-Chlorophenyl phenyl ether	ND	0.20								
Chrysene	ND	0.20								
Di-n-butyl phthalate	0.10	0.40								J
Di-n-octyl phthalate	ND	0.40								
Dibenz(a,h)anthracene	ND	0.20								
Dibenzofuran	ND	0.20								
1,2-Dichlorobenzene	ND	0.20								
1,3-Dichlorobenzene	ND	0.20								
1,4-Dichlorobenzene	ND	0.20								
3,3´-Dichlorobenzidine	ND	0.25								
Diethyl phthalate	0.14	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:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **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								
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								
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	2.6		3.330		78.4	35	97.9			
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			
Surr: 4-Terphenyl-d14	1.2		1.670		72.8	15	132			

Qualifiers:

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company

Project: OW-14 SOURCE INV

Sample ID **lcs-27733**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS**	Batch ID: **27733**	RunNo: **37618**
Prep Date: **9/27/2016**	Analysis Date: **9/30/2016**	SeqNo: **1170904** Units: **mg/Kg**

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**	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
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:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	**1609e26-001amsd**	SampType:	**MSD**		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:	**1170907**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.1	0.20	1.667	0	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:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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QC SUMMARY REPORT

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	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	4.7	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	7.5	20								J

Qualifiers:

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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QC SUMMARY REPORT

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	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		60.2	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:

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

Client: Western Refining Company

Project: OW-14 SOURCE INV

Sample ID **lcs-27764**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSW**	Batch ID: **27764**	RunNo: **37618**
Prep Date: **9/28/2016**	Analysis Date: **9/30/2016**	SeqNo: **1170921** 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**	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
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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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 **1609e26-003hmsd**	SampType: **MSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **EB092116**	Batch ID: **27764**	RunNo: **37618**
Prep Date: **9/28/2016**	Analysis Date: **9/30/2016**	SeqNo: **1170929** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Prep Date: **9/26/2016**	Analysis Date: **10/1/2016**	SeqNo: **1170694** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	2.5								
Arsenic	ND	2.5								
Barium	ND	0.10								
Beryllium	ND	0.15								
Cadmium	ND	0.10								
Chromium	ND	0.30								
Cobalt	ND	0.30								
Iron	ND	2.5								
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	0.37	2.5								J

Sample ID **LCS-27710**	SampType: **LCS**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS**	Batch ID: **27710**	RunNo: **37616**
Prep Date: **9/26/2016**	Analysis Date: **10/1/2016**	SeqNo: **1170695** Units: **mg/Kg**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609E26**

28-Oct-16

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

Sample ID	**rb**	SampType:	**MBLK**		TestCode:	**EPA Method 8015D Mod: Gasoline Range**					
Client ID:	**PBS**	Batch ID:	**G37518**		RunNo:	**37518**					
Prep Date:		Analysis Date:	**9/27/2016**		SeqNo:	**1166974**	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	440		500.0		87.5	70	130				

Sample ID	**2.5ug gro lcs**	SampType:	**LCS**		TestCode:	**EPA Method 8015D Mod: Gasoline Range**					
Client ID:	**LCSS**	Batch ID:	**G37518**		RunNo:	**37518**					
Prep Date:		Analysis Date:	**9/27/2016**		SeqNo:	**1166975**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Organics (GRO)	25	5.0	25.00	0	98.2	62.9	123				
Surr: BFB	450		500.0		89.5	70	130				

Sample ID	**1609e26-001ams**	SampType:	**MS**		TestCode:	**EPA Method 8015D Mod: Gasoline Range**					
Client ID:	**OW-57 (16-18')**	Batch ID:	**G37518**		RunNo:	**37518**					
Prep Date:		Analysis Date:	**9/27/2016**		SeqNo:	**1166977**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Organics (GRO)	16	3.2	15.98	0	99.6	52.3	132				
Surr: BFB	300		319.7		93.5	70	130				

Sample ID	**rb**	SampType:	**MBLK**		TestCode:	**EPA Method 8015D Mod: Gasoline Range**					
Client ID:	**PBS**	Batch ID:	**G37546**		RunNo:	**37546**					
Prep Date:		Analysis Date:	**9/28/2016**		SeqNo:	**1168043**	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	440		500.0		87.2	70	130				

Sample ID	**2.5ug gro lcs**	SampType:	**LCS**		TestCode:	**EPA Method 8015D Mod: Gasoline Range**					
Client ID:	**LCSS**	Batch ID:	**G37546**		RunNo:	**37546**					
Prep Date:		Analysis Date:	**9/28/2016**		SeqNo:	**1168044**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Organics (GRO)	25	5.0	25.00	0	98.5	62.9	123				
Surr: BFB	470		500.0		93.7	70	130				

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 Date:	**9/28/2016**		SeqNo:	**1168046**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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 Date:	**9/28/2016**	SeqNo:	**1168046** Units: **mg/Kg**

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: Western Refining Gallup Work Order Number: 1609E26 RcptNo: 1

Received by/date: JC 09/23/16

Logged By: Anne Thorne 9/23/2016 4:40:00 PM Anne Thorne

Completed By: Anne Thorne 9/26/2016 Anne Thorne

Reviewed By: AJS 09/26/16

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: 6 2 (<2 or >12 unless noted)
Adjusted? NO
Checked by: JC

Special Handling (if applicable)

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

Person Notified: ____ Date ____
By Whom: ____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: ____
Client Instructions: ____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0217
email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0 C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1609E26	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Metals & Cyanide (See attached list)			Air Bubbles (Y or N)
9/21/16	1400	SOIL	OW-57 (16-18')	JARS-3	NEAT	-001			✓							✓	✓	✓			
				VIALS-2	MeOH	-001										✓					
				VIALS-2	SOBI	-001										✓					
	1415		OW-57 (25-27')	JARS-3	NEAT	-002			✓							✓	✓	✓			
				VIALS-2	MeOH	-002										✓					
				VIALS-2	SOBI	-002										✓					

Date:	Time:	Relinquished by:	Received by:	Date	Time
9/23/16	1400			9/23/16	1400
9/23/16	1640			9-23-16	1640

Remarks:

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

WESTERN REFINING SOUTHWEST, INC.
GALLUP REFINERY

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

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0217
email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other _____
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush _____
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample Temperature: 1.0 C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1609E26	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL & DISSOLVED)	GEN CHEM	CYANIDE		Air Bubbles (Y or N)
9/21/16	1500	WATER	EB092116	40 ML VOA-6	HCL	001			✓							✓						
				1 LITER AMBER-2	NEAT	002											✓					
				250 ML AMBER-1	NEAT	003			✓													
				500 ML PLASTIC-1	HNO_3	004												✓				
				125 ML PLASTIC-1	HNO_3	005												✓				
				125 ML PLASTIC-1	H_2SO_4	006													✓			
				500 ML PLASTIC-1	NEAT	007													✓			
				500 ML PLASTIC-1	NAOH	008														✓		

Date	Time	Relinquished by:	Received by:	Date	Time
9/22/16	1400			9/22/16	1400
9/23/16	1640			9-23-16	1640

Remarks:

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

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0217
email or Fax#: ED RIEGE @ WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample Temperature: 1.8°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1609E26	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS & CYANIDE (SEE ATTACHED LIST)			Air Bubbles (Y or N)
9/22/16	1440	SOIL	OW-58 (10-12')	JARS-3		001			✓							✓	✓	✓			
				VIALS-2		002										✓					
				VIALS-2		003										✓					
	1500		OW-58 (22-24')	JARS-3		004			✓							✓	✓	✓			
				VIALS-2		005										✓					
				VIALS-2		006										✓					
	1520		OW-58 (28-29')	JARS-3		007			✓							✓	✓	✓			
				VIALS-2		008										✓					
				VIALS-2		009										✓					
	1535		OW-58 (48-48.5')	JARS-3		010			✓							✓	✓	✓			
				VIALS-2		011										✓					
				VIALS-2		012										✓					

Date	Time	Relinquished by	Received by	Date	Time
9/23/16	1400			9/23/16	1400
9/23/16	1640			9-23-16	1640

Remarks:

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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

Chain-of-Custody Record

Client: WESTERN REFINING SN, INC
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0217
email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1609E26	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS & CYANIDE (SEE ATTACHED LIST)				Air Bubbles (Y or N)
9/23/16	1230	SOIL	TK 568-1 (12-14')	3 JARS	NEAT	-008			✓							✓	✓	✓				
				2 VIALS	SOBI	-008										✓						
				2 VIALS	MEOH	-008										✓						
	1335		TK 568-1 (30-32')	2 JARS	NEAT	-009			✓							✓	✓	✓				
				2 VIALS	SOBI	-009										✓						
				2 VIALS	MEOH	-009										✓						
	1400		TK 568-1 (48-49')	2 JARS	NEAT	-010			✓							✓	✓	✓				
				2 VIALS	MEOH	-010										✓						
				2 VIALS	SOBI	-010										✓						
	—		DUP01	2 JARS	NEAT	-011			✓							✓	✓	✓				
				2 VIALS	MEOH	-011										✓						
				2 VIALS	SOBI	-011										✓						

Analysis Request

Date:	Time:	Relinquished by:	Received by:	Date	Time
9/23/16	1400			9/23/16	1400
9/23/16	1640			9/23/16	1640

Remarks:

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Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0217
email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0 C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1609E216
9/22/16	1645	WATER	EB092216	40 ML VOA-6	HCL	-012
				1 LITER AMBER-2	NEAT	012
				250 ML AMBER-1	NEAT	012
				500 ML PLASTIC-1	HNO_3	012
				125 ML PLASTIC-1	HNO_3	012
				125 ML PLASTIC-1	H_2SO_4	012
				500 ML PLASTIC-1	NEAT	012
				500 ML PLASTIC-1	NAOH	012
			MeOH Blank			-013

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL & DISSOL)	GEN CHEM	CYANIDE		Air Bubbles (Y or N)
		✓							✓						
										✓					
		✓													
											✓				
											✓				
												✓			
												✓			
												✓	✓		

Date:	Time:	Relinquished by:	Received by:	Date	Time
9/23/16	1400			9/23/16	1400
9/23/16	1640			9/23/16	1640

Remarks:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

October 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
4901 Hawkins NE
Albuquerque, NM 87109

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 8015M/D: DIESEL RANGE							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 RANGE							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 METALS							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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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							Analyst: **pmf**	
Mercury	0.000057	0.000053	0.00020	J	mg/L	1	10/5/2016 7:47:36 AM	27871
EPA METHOD 8270C: SEMIVOLATILES							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:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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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 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

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Hall Environmental Analysis Laboratory, Inc.

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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

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Hall Environmental Analysis Laboratory, Inc.

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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

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Hall Environmental Analysis Laboratory, Inc.

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 8015M/D: DIESEL RANGE							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 RANGE							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 METALS							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	B37965
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	A37991
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

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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 200.8: DISSOLVED METALS							Analyst: **JLF**	
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
EPA 200.8: METALS							Analyst: **JLF**	
Antimony	ND	0.00047	0.0010		mg/L	1	10/13/2016 6:41:14 PM	A37945
Arsenic	ND	0.00021	0.0010		mg/L	1	10/13/2016 6:41:14 PM	A37945
Lead	ND	0.00017	0.00050		mg/L	1	10/13/2016 6:41:14 PM	A37945
Selenium	ND	0.00021	0.0010		mg/L	1	10/13/2016 6:41:14 PM	A37945
EPA METHOD 245.1: MERCURY							Analyst: **pmf**	
Mercury	0.000055	0.000053	0.00020	J	mg/L	1	10/5/2016 7:49:37 AM	27871
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
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
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(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-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
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
Dibenz(a,h)anthracene	ND	2.7	10		µg/L	1	10/11/2016 1:40:20 PM	27882

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S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: 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

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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Hall Environmental Analysis Laboratory, Inc.

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

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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Hall Environmental Analysis Laboratory, Inc.

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

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

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

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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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 #: 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 1609G57-001G / EB092716 **Sampling Time** 5:40 PM
Matrix Water
Comments

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** 9/28/2016 **Date/Time Received** 9/30/2016 11:50 AM
Client Sample ID 1609G57-002G / EB092816 **Sampling Time** 2:40 PM
Matrix 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.

Anatek Labs, Inc.

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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

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Cyanide	0.522	mg/L	0.5	104.4	90-110	10/3/2016	10/3/2016

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
160927038-004	Cyanide	ND	0.500	mg/L	0.5	100.0	90-110	10/3/2016	10/3/2016

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	0.487	mg/L	0.5	97.4	2.6	0-20	10/3/2016	10/3/2016

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/L	0.01	10/3/2016	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

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-A**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Metals**
Client ID: **PBW**	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								
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**	SampType: **LCS**	TestCode: **EPA Method 200.7: Metals**
Client ID: **LCSW**	Batch ID: **A37991**	RunNo: **37991**
Prep Date:	Analysis Date: **10/17/2016**	SeqNo: **1183972** 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**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Metals**
Client ID: **BatchQC**	Batch ID: **A37991**	RunNo: **37991**
Prep Date:	Analysis Date: **10/17/2016**	SeqNo: **1183973** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-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: **A37991**	RunNo: **37991**
Prep Date:	Analysis Date: **10/17/2016**	SeqNo: **1183973** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID **LLLCS-B**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **B37965**	RunNo: **37965**
Prep Date:	Analysis Date: **10/15/2016**	SeqNo: **1183095** 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**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **B37965**	RunNo: **37965**
Prep Date:	Analysis Date: **10/15/2016**	SeqNo: **1183096** 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 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
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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

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
Manganese	0.00058	0.0020								J
Nickel	ND	0.010								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA 200.8: 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	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			
Selenium	0.024	0.0010	0.02500	0	95.9	85	115			

Sample ID **LLLCS**	SampType: **LCSLL**	TestCode: **EPA 200.8: 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	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.0010	0.0010	0.001000	0	100	50	150			
Arsenic	0.0010	0.0010	0.001000	0	103	50	150			
Lead	0.00056	0.00050	0.0005000	0	112	50	150			
Selenium	0.0010	0.0010	0.001000	0	102	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	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID	**1609G57-001EMSDL**	SampType:	**MSD**		TestCode:	**EPA 200.8: Dissolved Metals**				
Client ID:	**EB092716**	Batch ID:	**C37903**		RunNo:	**37903**				
Prep Date:		Analysis Date:	**10/11/2016**		SeqNo:	**1180767**	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	**1609G57-001EMSLL**	SampType:	**MS**		TestCode:	**EPA 200.8: Dissolved Metals**				
Client ID:	**EB092716**	Batch ID:	**C37903**		RunNo:	**37903**				
Prep Date:		Analysis Date:	**10/11/2016**		SeqNo:	**1180768**	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:	**LCS**		TestCode:	**EPA 200.8: Dissolved Metals**				
Client ID:	**LCSW**	Batch ID:	**C37903**		RunNo:	**37903**				
Prep Date:		Analysis Date:	**10/11/2016**		SeqNo:	**1180781**	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:	**LCSLL**		TestCode:	**EPA 200.8: Dissolved Metals**				
Client ID:	**BatchQC**	Batch ID:	**C37903**		RunNo:	**37903**				
Prep Date:		Analysis Date:	**10/11/2016**		SeqNo:	**1180785**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00098	0.0010	0.001000	0	98.2	50	150			J
Lead	0.00048	0.00050	0.0005000	0	96.4	50	150			J
Selenium	0.00099	0.0010	0.001000	0	99.4	50	150			J

Sample ID	**MB**	SampType:	**MBLK**		TestCode:	**EPA 200.8: Dissolved Metals**				
Client ID:	**PBW**	Batch ID:	**C37903**		RunNo:	**37903**				
Prep Date:		Analysis Date:	**10/11/2016**		SeqNo:	**1180788**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

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: **R37589**	RunNo: **37589**
Prep Date:	Analysis Date: **9/29/2016**	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
Sulfate	ND	0.50								

Sample ID **LCSb**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R37589**	RunNo: **37589**
Prep Date:	Analysis Date: **9/29/2016**	SeqNo: **1169952** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.48	0.10	0.5000	0	95.3	90	110			
Chloride	4.6	0.50	5.000	0	91.4	90	110			
Sulfate	9.3	0.50	10.00	0	93.2	90	110			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**				
Prep Date:	**9/30/2016**	Analysis 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			

Sample ID	**MB-27808**	SampType:	**MBLK**		TestCode:	**EPA Method 8015M/D: Diesel Range**				
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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

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: **LCSW**	Batch ID: **R37576**	RunNo: **37576**
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			

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	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	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								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	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	12		10.00		115	70	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**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	106	70	130			
Toluene	16	1.0	20.00	0	79.1	70	130			
Chlorobenzene	15	1.0	20.00	0	74.6	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	97.1	70	130			
Trichloroethene (TCE)	17	1.0	20.00	0	86.1	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		110	70	130			
Surr: 4-Bromofluorobenzene	9.4		10.00		93.8	70	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**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **EB092716**	Batch ID: **R37576**	RunNo: **37576**
Prep Date:	Analysis Date: **9/29/2016**	SeqNo: **1169420** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**	RunNo: **37716**
Prep Date: **10/4/2016**	Analysis Date: **10/5/2016**	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

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**	RunNo: **37716**
Prep Date: **10/4/2016**	Analysis Date: **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	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			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G57**

28-Oct-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID	**lcs-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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **Western Refining Gallup** Work Order Number: **1609G57** RcptNo: **1**

Received by/date: AF 09/29/16

Logged By: **Lindsay Mangin** **9/29/2016 8:50:00 AM**

Completed By: **Ashley Gallegos** **9/29/2016 10:21:54 AM**

Reviewed By: AG/aJ 09/29/16

Chain of Custody

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

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: 4 2 (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted? NO
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by: aJ

Special Handling (if applicable)

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

Person Notified:		Date	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.2	Good	Yes			

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.

GALLUP REFINERY

Mailing Address: 92 GIANT CROSSING RD

GALLUP, NM 87301

Phone #: 505-722-0217

email or Fax#: ED.RIEGE@WNR.COM

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other _____

☒ EDD (Type) EXCEL

Turn-Around Time:

☒ Standard ☐ Rush _____

Project Name: GW-14 SOURCE INV.

Project #:

Project Manager: ED RIEGE

Sampler: TRACY PAYNE

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.2

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1609657	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Metals (Total & Dissolved)	Gen Chem	Cyanide		Air Bubbles (Y or N)
9/27/16	1740	WATER	EB092716	40 ML VOA-6	HCL	-001			✓							✓						
				1 LITER AMBER-2	NEAT	-001											✓					
				250 ML AMBER-1	NEAT	-001			✓													
				500 ML PLASTIC-1	HNO_3	-001												✓				
				125 ML PLASTIC-1	HNO_3	-001												✓				
				125 ML PLASTIC-1	H_2SO_4	-001													✓			
				500 ML PLASTIC-1	NEAT	-001													✓			
				500 ML PLASTIC-1	NAOH	-001														✓		

Date	Time	Relinquished by:	Received by:	Date	Time
9/28/16	6:45			9/29/16	1700
9/29/16	850			9/29/16	0850

Remarks:

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

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.

GALLUP REFINERY

Mailing Address: 92 GIANT CROSSING RD

GALLUP, NM 87301

Phone #: 505-722-0217

email or Fax#: ED.RIEGE@WNR.COM

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other _____

☒ EDD (Type) EXCEL

Turn-Around Time:

☒ Standard ☐ Rush _____

Project Name: OW-14 SOURCE INV.

Project #:

Project Manager: ED RIEGE

Sampler: TRACY PAYNE

On Ice: ☑ Yes ☐ No

Sample Temperature: 1.7

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1609657	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Metals (Total & Dissolved)	Gen Chem	Cyanide		Air Bubbles (Y or N)
9/28/16	1440	WATER	EB092816	40 ML VOA-G	HCL	-002			✓							✓						
				1 LITER AMBER-2	NEAT	-002											✓					
				250 ML AMBER-1	NEAT	-002			✓													
				500 ML PLASTIC-1	HNO_3	-002												✓				
				125 ML PLASTIC-1	HNO_3	-002												✓				
				125 ML PLASTIC-1	H_2SO_4	-002													✓			
				500 ML PLASTIC-1	NEAT	-002													✓			
				500 ML PLASTIC-1	NAOH	-002														✓		

Date	Time	Relinquished by:	Received by:	Date	Time
9/28/16	1600			9/29/16	1700
9/29/16	850			9/29/16	0850

Remarks:

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

WESTERN REFINING SOUTHWEST, INC.
GALLUP REFINERY

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

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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
4901 Hawkins NE
Albuquerque, NM 87109

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 8015M/D: DIESEL RANGE ORGANICS							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	27836
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	27836
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Benz(a)anthracene	ND	0.085	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
Benzo(a)pyrene	ND	0.075	0.20		mg/Kg	1	10/5/2016 10:47:03 AM	27836
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	27836
Benzoic acid	ND	0.082	0.50		mg/Kg	1	10/5/2016 10:47:03 AM	27836
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	27836
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	27836
Bis(2-ethylhexyl)phthalate	ND	0.081	0.50		mg/Kg	1	10/5/2016 10:47:03 AM	27836

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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

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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	27868
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

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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

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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 RANGE							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

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Qualifiers:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 ORGANICS							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							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	27836
Aniline	ND	0.094	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Anthracene	ND	0.066	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Azobenzene	ND	0.12	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Benz(a)anthracene	ND	0.086	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Benzo(a)pyrene	ND	0.076	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
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	27836
Benzoic acid	ND	0.083	0.50		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Bis(2-chloroisopropyl)ether	ND	0.089	0.20		mg/Kg	1	10/5/2016 12:10:48 PM	27836
Bis(2-ethylhexyl)phthalate	0.10	0.081	0.50	J	mg/Kg	1	10/5/2016 12:10:48 PM	27836

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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 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	27836
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

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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

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	2.4	1.8	9.8	J	mg/Kg	1	10/3/2016 3:42:59 PM	27809
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	10/3/2016 3:42:59 PM	27809
Surr: DNOP	96.0	0	70-130		%Rec	1	10/3/2016 3:42:59 PM	27809
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	ND	0.00056	0.033		mg/Kg	1	10/4/2016 8:54:48 AM	27844
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
Antimony	1.4	1.0	2.5	J	mg/Kg	1	10/5/2016 8:49:01 AM	27843
Arsenic	2.1	0.89	2.5	J	mg/Kg	1	10/5/2016 8:49:01 AM	27843
Barium	130	0.071	0.10		mg/Kg	1	10/5/2016 8:49:01 AM	27843
Beryllium	0.74	0.035	0.15		mg/Kg	1	10/5/2016 8:49:01 AM	27843
Cadmium	ND	0.063	0.10		mg/Kg	1	10/5/2016 8:49:01 AM	27843
Chromium	8.3	0.094	0.30		mg/Kg	1	10/5/2016 8:49:01 AM	27843
Cobalt	2.4	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
Silver	ND	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							Analyst: **DAM**	
Acenaphthene	ND	0.084	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Acenaphthylene	ND	0.080	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Aniline	ND	0.093	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Anthracene	ND	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
Benz(a)anthracene	ND	0.085	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Benzo(a)pyrene	ND	0.074	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Benzo(b)fluoranthene	ND	0.089	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Benzo(g,h,i)perylene	ND	0.087	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Benzo(k)fluoranthene	ND	0.087	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Benzoic acid	ND	0.081	0.49		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Benzyl alcohol	ND	0.077	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Bis(2-chloroethyl)ether	ND	0.072	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Bis(2-chloroisopropyl)ether	ND	0.088	0.20		mg/Kg	1	10/5/2016 12:38:53 PM	27836
Bis(2-ethylhexyl)phthalate	0.12	0.080	0.49	J	mg/Kg	1	10/5/2016 12:38:53 PM	27836

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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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**	
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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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	27868
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	27868
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	27868
1,1-Dichloropropene	ND	1.71	1.71		µg/Kg	1	10/4/2016 12:08:00 PM	27868
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	27868
4-Isopropyltoluene	ND	0.320	1.71		µg/Kg	1	10/4/2016 12:08:00 PM	27868
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	27868
n-Propylbenzene	ND	0.306	1.71		µg/Kg	1	10/4/2016 12:08:00 PM	27868
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	27868
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	27868

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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**	
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

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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

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Qualifiers:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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							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	0.094	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	0.12	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	0.075	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Benzo(b)fluoranthene	ND	0.089	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Benzo(g,h,i)perylene	ND	0.087	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	0.082	0.50		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Benzyl alcohol	ND	0.078	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Bis(2-chloroethoxy)methane	ND	0.11	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Bis(2-chloroethyl)ether	ND	0.073	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Bis(2-chloroisopropyl)ether	ND	0.088	0.20		mg/Kg	1	10/5/2016 1:35:18 PM	27836
Bis(2-ethylhexyl)phthalate	0.14	0.081	0.50	J	mg/Kg	1	10/5/2016 1:35:18 PM	27836

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 ORGANICS							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

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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 ORGANICS							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

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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
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 8015M/D: DIESEL RANGE ORGANICS							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	27836
Acenaphthylene	ND	0.81	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Aniline	ND	0.94	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Anthracene	ND	0.66	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Azobenzene	ND	1.2	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Benz(a)anthracene	ND	0.86	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Benzo(a)pyrene	ND	0.76	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Benzo(b)fluoranthene	ND	0.90	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Benzo(g,h,i)perylene	ND	0.88	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Benzo(k)fluoranthene	ND	0.88	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Benzoic acid	2.0	0.83	5.0	J	mg/Kg	10	10/11/2016 11:47:57 AM	27836
Benzyl alcohol	ND	0.78	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Bis(2-chloroethoxy)methane	ND	1.1	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Bis(2-chloroethyl)ether	ND	0.73	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Bis(2-chloroisopropyl)ether	ND	0.89	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Bis(2-ethylhexyl)phthalate	ND	0.81	5.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836

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R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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
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

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Qualifiers:

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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
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	27836
2-Nitroaniline	ND	1.1	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
3-Nitroaniline	ND	0.88	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
4-Nitroaniline	ND	0.71	4.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Nitrobenzene	ND	1.0	4.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
2-Nitrophenol	ND	0.99	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
4-Nitrophenol	ND	0.76	2.5		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Pentachlorophenol	ND	0.64	4.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Phenanthrene	ND	0.68	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Phenol	ND	0.75	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Pyrene	ND	0.76	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Pyridine	ND	0.79	4.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
1,2,4-Trichlorobenzene	ND	1.1	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
2,4,5-Trichlorophenol	ND	1.0	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
2,4,6-Trichlorophenol	ND	0.83	2.0		mg/Kg	10	10/11/2016 11:47:57 AM	27836
Surr: 2-Fluorophenol	25.3	0	35-97.9	S	%Rec	10	10/11/2016 11:47:57 AM	27836
Surr: Phenol-d5	29.9	0	37.3-105	S	%Rec	10	10/11/2016 11:47:57 AM	27836
Surr: 2,4,6-Tribromophenol	55.3	0	35.6-118		%Rec	10	10/11/2016 11:47:57 AM	27836
Surr: Nitrobenzene-d5	88.4		41.2-107		%Rec	10	10/11/2016 11:47:57 AM	27836
Surr: 2-Fluorobiphenyl	62.9		41.9-119		%Rec	10	10/11/2016 11:47:57 AM	27836
Surr: 4-Terphenyl-d14	48.1		15-132		%Rec	10	10/11/2016 11:47:57 AM	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

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Qualifiers:

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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**	
Carbon disulfide	ND	2.0	61		mg/Kg	200	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		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Chloroethane	ND	1.2	12		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Chloroform	ND	0.46	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
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		mg/Kg	200	9/30/2016 12:31:49 PM	27796
cis-1,2-DCE	ND	0.35	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
cis-1,3-Dichloropropene	ND	0.56	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
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		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,2-Dichlorobenzene	ND	0.53	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,3-Dichlorobenzene	ND	0.50	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,4-Dichlorobenzene	ND	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
1,1-Dichloroethane	ND	0.33	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,1-Dichloroethene	ND	2.0	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,2-Dichloropropane	ND	0.51	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,3-Dichloropropane	ND	0.69	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
2,2-Dichloropropane	ND	0.35	12		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,1-Dichloropropene	ND	0.48	12		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Hexachlorobutadiene	ND	0.75	12		mg/Kg	200	9/30/2016 12:31:49 PM	27796
2-Hexanone	ND	3.3	61		mg/Kg	200	9/30/2016 12:31:49 PM	27796
Isopropylbenzene	23	0.52	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
Methylene chloride	ND	1.8	18		mg/Kg	200	9/30/2016 12:31:49 PM	27796
n-Butylbenzene	9.9	0.54	18	J	mg/Kg	200	9/30/2016 12:31:49 PM	27796
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		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,1,1,2-Tetrachloroethane	ND	0.58	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
1,1,2,2-Tetrachloroethane	ND	0.99	6.1		mg/Kg	200	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	1.7	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796
trans-1,3-Dichloropropene	ND	0.89	6.1		mg/Kg	200	9/30/2016 12:31:49 PM	27796

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Qualifiers:

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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
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

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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 ORGANICS							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

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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

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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

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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

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Client Sample ID: TK 569-3 (38-39')
Project: OW-14 Source Inv.
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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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Anatek Labs, Inc.

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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 160930051-001 **Sampling Date** 9/27/2016 **Date/Time Received** 9/30/2016 11:50 AM
Client Sample ID 1609G64-001C / TK 568-2 (22-24) **Sampling Time** 11:15 AM
Matrix Soil
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 11:50 AM
Client Sample ID 1609G64-002C / TK 568-2 (28-30) **Sampling Time** 11:25 AM
Matrix Soil
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 **Sampling Date** 9/27/2016 **Date/Time Received** 9/30/2016 11:50 AM
Client Sample ID 1609G64-003C / TK 568-2 (36-37) **Sampling Time** 11:35 AM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.225	10/11/2016	MER	EPA 335.4	
%moisture	13.7	Percent		10/10/2016	MER	%moisture	

Sample Number 160930051-004 **Sampling Date** 9/27/2016 **Date/Time Received** 9/30/2016 11:50 AM
Client Sample ID 1609G64-005C / TK 570-1 (10-12) **Sampling Time** 4:15 PM
Matrix Soil
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

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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
Matrix Soil
Comments

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	MER	%moisture	

Sample Number 160930051-006 **Sampling Date** 9/27/2016 **Date/Time Received** 9/30/2016 11:50 AM
Client Sample ID 1609G64-007C / TK 570-1 (44-45) **Sampling Time** 4:30 PM
Matrix Soil
Comments

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 **Sampling Date** 9/28/2016 **Date/Time Received** 9/30/2016 11:50 AM
Client Sample ID 1609G64-008C / TK 569-3 (16-18) **Sampling Time** 1:35 PM
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 11:50 AM
Client Sample ID 1609G64-009C / TK 569-3 (24-26) **Sampling Time** 1:45 PM
Matrix Soil
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	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	160930051
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1609G64
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	160930051-009	**Sampling Date**	9/28/2016	**Date/Time Received**	9/30/2016 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	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Cyanide	0.504	mg/kg	0.5	100.8	90-110	10/11/2016	10/11/2016

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
160930051-001	Cyanide	ND	12.4	mg/kg	12.7	97.6	70-130	10/11/2016	10/11/2016

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	12.7	mg/kg	12.7	100.0	2.4	0-25	10/11/2016	10/11/2016

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/Kg	5	10/11/2016	10/11/2016

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(NEI:AP): E871099

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **LCS-27809**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **27809**	RunNo: **37625**
Prep Date: **9/30/2016**	Analysis Date: **10/3/2016**	SeqNo: **1171361** Units: **mg/Kg**

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**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **27809**	RunNo: **37625**
Prep Date: **9/30/2016**	Analysis Date: **10/3/2016**	SeqNo: **1171362** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		106	70	130			

Sample ID **1609G64-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **TK 568-2 (22-24')**	Batch ID: **27809**	RunNo: **37625**
Prep Date: **9/30/2016**	Analysis Date: **10/3/2016**	SeqNo: **1171397** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	9.5	47.53	0	105	33.9	141			
Surr: DNOP	4.0		4.753		84.4	70	130			

Sample ID **1609G64-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **TK 568-2 (22-24')**	Batch ID: **27809**	RunNo: **37625**
Prep Date: **9/30/2016**	Analysis Date: **10/3/2016**	SeqNo: **1172011** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**				
Prep Date:	**9/29/2016**	Analysis Date:	**9/30/2016**		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**	Batch ID:	**27796**		RunNo:	**37594**				
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			
Surr: BFB	900		1000		89.9	68.3	144			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-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: **S37582**	RunNo: **37582**
Prep Date:	Analysis Date: **9/29/2016**	SeqNo: **1169683** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Methyl tert-butyl ether (MTBE)	ND	0.050								
1,2,4-Trimethylbenzene	ND	0.050								
1,3,5-Trimethylbenzene	ND	0.050								
1,2-Dichloroethane (EDC)	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-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: **S37582**	RunNo: **37582**
Prep Date:	Analysis Date: **9/29/2016**	SeqNo: **1169683** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.53		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**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS**	Batch ID: **S37582**	RunNo: **37582**
Prep Date:	Analysis Date: **9/29/2016**	SeqNo: **1169684** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	106	70	130			
Toluene	1.0	0.050	1.000	0	101	70	130			
Chlorobenzene	0.97	0.050	1.000	0	97.3	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **100ng lcsb**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS**	Batch ID: **S37582**	RunNo: **37582**
Prep Date:	Analysis Date: **9/29/2016**	SeqNo: **1169684** 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	106	70	130			
Trichloroethene (TCE)	1.0	0.050	1.000	0	101	70	130			
Surr: Dibromofluoromethane	0.51		0.5000		103	70	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**	SampType: **MS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **TK 568-2 (28-30')**	Batch ID: **S37582**	RunNo: **37582**
Prep Date:	Analysis Date: **9/29/2016**	SeqNo: **1169687** Units: **mg/Kg**

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**	SampType: **MSD**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **TK 568-2 (28-30')**	Batch ID: **S37582**	RunNo: **37582**
Prep Date:	Analysis Date: **9/29/2016**	SeqNo: **1169688** Units: **mg/Kg**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **mb-27796**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **27796**	RunNo: **37617**
Prep Date: **9/29/2016**	Analysis Date: **9/30/2016**	SeqNo: **1170900** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Methyl tert-butyl ether (MTBE)	ND	0.050								
1,2,4-Trimethylbenzene	ND	0.050								
1,3,5-Trimethylbenzene	ND	0.050								
1,2-Dichloroethane (EDC)	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **mb-27796**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **27796**	RunNo: **37617**
Prep Date: **9/29/2016**	Analysis Date: **9/30/2016**	SeqNo: **1170900** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.47		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 **lcs-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
Benzene	0.94	0.025	1.000	0	93.9	70	130			
Toluene	1.0	0.050	1.000	0	102	70	130			
Chlorobenzene	1.0	0.050	1.000	0	101	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **lcs-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	1.0	0.050	1.000	0	103	70	130			
Trichloroethene (TCE)	0.96	0.050	1.000	0	95.9	70	130			
Surr: Dibromofluoromethane	0.46		0.5000		92.3	70	130			
Surr: 1,2-Dichloroethane-d4	0.48		0.5000		96.2	70	130			
Surr: Toluene-d8	0.48		0.5000		96.5	70	130			
Surr: 4-Bromofluorobenzene	0.49		0.5000		97.2	70	130			

Sample ID **1609g64-010ams**	SampType: **MS**	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**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.63	0.016	0.6345	0.05975	89.2	49.2	155			
Toluene	0.87	0.032	0.6345	0.2082	104	52	154			
Chlorobenzene	0.68	0.032	0.6345	0	107	53.2	150			
1,1-Dichloroethene	0.63	0.032	0.6345	0	99.5	34.2	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	0.29		0.3173		91.6	70	130			
Surr: Toluene-d8	0.31		0.3173		98.1	70	130			
Surr: 4-Bromofluorobenzene	0.32		0.3173		99.3	70	130			

Sample ID **1609g64-010amsd**	SampType: **MSD**	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: **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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-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 ID: **27789**	RunNo: **37599**
Prep Date: **9/29/2016**	Analysis Date: **9/30/2016**	SeqNo: **1170203** Units: **%Rec**

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**	SampType: **LCS**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **LCSS**	Batch ID: **27789**	RunNo: **37599**
Prep Date: **9/29/2016**	Analysis Date: **9/30/2016**	SeqNo: **1170204** 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**	SampType: **LCSD**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **LCSS02**	Batch ID: **27789**	RunNo: **37599**
Prep Date: **9/29/2016**	Analysis Date: **9/30/2016**	SeqNo: **1170205** Units: **%Rec**

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **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								
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								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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
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**	SampType: **LCS**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **LCSS**	Batch ID: **27868**	RunNo: **37658**
Prep Date: **10/4/2016**	Analysis Date: **10/4/2016**	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **LCSD-27868**	SampType: **LCSD**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **LCSS02**	Batch ID: **27868**	RunNo: **37658**
Prep Date: **10/4/2016**	Analysis Date: **10/4/2016**	SeqNo: **1172759** Units: **µg/Kg**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	1.4	0.20	1.673	0	80.7	24.7	111			
4-Chloro-3-methylphenol	2.6	0.50	3.337	0	77.3	21.7	108			
2-Chlorophenol	2.8	0.20	3.337	0	85.0	21.9	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	2.4	0.40	3.337	0	72.1	20.5	105			
Phenol	2.9	0.20	3.337	0	86.4	23.1	101			
Pyrene	1.4	0.20	1.673	0	84.3	18.3	113			
1,2,4-Trichlorobenzene	1.4	0.20	1.673	0	82.5	21.8	108			
Surr: 2-Fluorophenol	2.7		3.337		81.1	35	97.9			
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	1.3		1.673		75.9	41.2	107			
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 Date: **10/5/2016**	SeqNo: **1174804** Units: **mg/Kg**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	1.5		1.681		86.8	15	132	0	0	

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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								
Diethyl phthalate	0.21	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	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								
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								
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	2.5		3.330		74.4	35	97.9			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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
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		1.670		73.3	41.9	119			
Surr: 4-Terphenyl-d14	1.3		1.670		79.2	15	132			

Sample ID **lcs-27836**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS**	Batch ID: **27836**	RunNo: **37716**
Prep Date: **10/3/2016**	Analysis Date: **10/5/2016**	SeqNo: **1174816** Units: **mg/Kg**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID	**MB-27843**	SampType:	**MBLK**	TestCode:	**EPA Method 6010B: Soil Metals**
Client ID:	**PBS**	Batch ID:	**27843**	RunNo:	**37679**
Prep Date:	**10/3/2016**	Analysis Date:	**10/5/2016**	SeqNo:	**1173421** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	2.5								
Arsenic	ND	2.5								
Barium	ND	0.10								
Beryllium	ND	0.15								
Cadmium	ND	0.10								
Chromium	ND	0.30								
Cobalt	ND	0.30								
Iron	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								

Sample ID	**LCS-27843**	SampType:	**LCS**	TestCode:	**EPA Method 6010B: Soil Metals**
Client ID:	**LCSS**	Batch ID:	**27843**	RunNo:	**37679**
Prep Date:	**10/3/2016**	Analysis Date:	**10/5/2016**	SeqNo:	**1173422** Units: **mg/Kg**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID	**rb1**	SampType:	**MBLK**		TestCode:	**EPA Method 8015D Mod: Gasoline Range**					
Client ID:	**PBS**	Batch ID:	**G37582**		RunNo:	**37582**					
Prep Date:		Analysis Date:	**9/30/2016**		SeqNo:	**1169692**	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		450		500.0		90.1	70	130			

Sample ID	**2.5ug gro lcs**	SampType:	**LCS**		TestCode:	**EPA Method 8015D Mod: Gasoline Range**					
Client ID:	**LCSS**	Batch ID:	**G37582**		RunNo:	**37582**					
Prep Date:		Analysis Date:	**9/29/2016**		SeqNo:	**1169693**	Units:	**mg/Kg**			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range 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**	SampType:	**MS**		TestCode:	**EPA Method 8015D Mod: Gasoline Range**					
Client ID:	**TK 568-2 (22-24')**	Batch ID:	**G37582**		RunNo:	**37582**					
Prep Date:		Analysis Date:	**9/29/2016**		SeqNo:	**1169695**	Units:	**mg/Kg**			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)		16	3.2	15.94	0	103	52.3	132			
Surr: BFB		300		318.9		93.5	70	130			

Sample ID	**1609g64-001amsd**	SampType:	**MSD**		TestCode:	**EPA Method 8015D Mod: Gasoline Range**					
Client ID:	**TK 568-2 (22-24')**	Batch ID:	**G37582**		RunNo:	**37582**					
Prep Date:		Analysis Date:	**9/29/2016**		SeqNo:	**1169696**	Units:	**mg/Kg**			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range 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**	SampType:	**MBLK**		TestCode:	**EPA Method 8015D Mod: Gasoline Range**					
Client ID:	**PBS**	Batch ID:	**G37617**		RunNo:	**37617**					
Prep Date:		Analysis Date:	**9/30/2016**		SeqNo:	**1170946**	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		490		500.0		97.2	70	130			

Sample ID	**2.5ug gro lcs**	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**			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609G64**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID	**2.5ug gro lcs**	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**		
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			
Surr: BFB		500		500.0		99.8	70	130			

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **Western Refining Gallup** Work Order Number: **1609G64** RcptNo: 1

Received by/date: AF 09/29/16

Logged By: **Ashley Gallegos** **9/29/2016 8:50:00 AM**

Completed By: **Ashley Gallegos** **9/29/2016 10:26:20 AM**

Reviewed By: aJ 09/29/16

Chain of Custody

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

Log In

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

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

Adjusted?

Checked by:

Special Handling (if applicable)

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

Person Notified: Date

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

Regarding:

Client Instructions:

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.2	Good	Yes			

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0217
Email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
EDD (Type) EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample Temperature: 1.2

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1609G004	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMs)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS & CYANIDE				Air Bubbles (Y or N)
9/27/16	1115	SOIL	TK 568-2 (22-24')	JARS-3	NEAT	-001			✓							✓	✓	✓				
				VIALS-2	MEOH											✓						
	↓	↓	↓	VIALS-2	SOBI											✓						
	1125	SOIL	TK 568-2 (28-30')	JARS-3	NEAT	-002			✓							✓	✓	✓				
				VIALS-2	MEOH											✓						
	↓	↓	↓	VIALS-2	SOBI											✓						
	1135	SOIL	TK 568-2 (36-37')	JARS-3	NEAT	-003																
				VIALS-2	MEOH																	
↓	↓	↓	↓	VIALS-2	SOBI																	
9/27/16	-	MEOH	MEOH BLANK	VIALS-2	MEOH	-004										✓						

Date:	Time:	Relinquished by:	Received by:	Date	Time
9/28/16	6:45			9/28/16	1700
Date:	Time:	Relinquished by:	Received by:	Date	Time
9/29/16	8:50			9/29/16	0850

Remarks:

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

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0217
email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
EDD (Type): EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☐ Yes ☐ No
Sample Temperature: 1.7

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Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1609G104	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS & CYANIDE				Air Bubbles (Y or N)
9/27/16	1615	SOIL	TK570-1(10-12')	JARS-2	NEAT	-005			✓							✓	✓	✓				
				~~VIALS-1~~	~~MEOH~~											✓						
				~~VIALS-1~~	~~SOBI~~											✓						
9/27/16	1620	SOIL	TK570-1(32-34')	JARS-3	NEAT	-006			✓							✓	✓	✓				
				VIALS-2	MEOH											✓						
				VIALS-2	SOBI											✓						
9/27/16	1630	SOIL	TK570-1(44-45')	JARS-2	NEAT	-007			✓							✓	✓	✓				
				VIALS-2	MEOH											✓						
				VIALS-2	SOBI											✓						

Date	Time	Relinquished by:	Received by:	Date	Time
9/28/16	6:45			9/28/16	1700
9/29/16	850			9/29/16	0850

Remarks:

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Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0217
Email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package: Standard ☒ Level 4 (Full Validation)
Accreditation: ☐ NELAP ☐ Other
EDD (Type): EXCEL

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.7

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

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1609G64	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS & CYANIDE				Air Bubbles (Y or N)
9/28/16	1335	SOIL	TK569-3(16-18')	JARS-3	NEAT	-008			✓							✓	✓	✓				
				VIALS-2	MeOH											✓						
				VIALS-2	SOBI											✓						
	1345		TK569-3(24-26')	JARS-3	NEAT	-009			✓							✓	✓	✓				
				VIALS-2	MeOH											✓						
				VIALS-2	SOBI											✓						
	1400		TK569-3(38-39')	JARS-2	NEAT	-010			✓							✓	✓	✓				
				VIALS-2	MeOH											✓						
				VIALS-2	SOBI											✓						

Date:	Time:	Relinquished by:	Received by:	Date	Time
9/28/16	1600			9/28/16	1700
9/29/16	850			9/29/16	0850

Remarks:

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

WESTERN REFINING SOUTHWEST, INC.
GALLUP REFINERY

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

Hall Environmental Analysis Laboratory
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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

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 8015M/D: DIESEL RANGE							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 RANGE							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 METALS							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 PM	C38016
Cadmium	ND	0.00075	0.0020		mg/L	1	10/18/2016 12:10:37 PM	C38016
Chromium	ND	0.0018	0.0060		mg/L	1	10/18/2016 12:10:37 PM	C38016
Cobalt	0.0022	0.00074	0.0060	J	mg/L	1	10/18/2016 12:10:37 PM	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	C38016
Silver	ND	0.0028	0.0050		mg/L	1	10/18/2016 12:10:37 PM	C38016
Vanadium	0.0017	0.0013	0.050	J	mg/L	1	10/18/2016 12:10:37 PM	C38016
Zinc	0.0049	0.0028	0.010	J	mg/L	1	10/18/2016 12:10:37 PM	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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	C38136
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

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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**	
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

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Hall Environmental Analysis Laboratory, Inc.

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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

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Hall Environmental Analysis Laboratory, Inc.

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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

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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

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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 RANGE							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 RANGE							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 METALS							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	C38016
Cadmium	ND	0.00075	0.0020		mg/L	1	10/18/2016 12:17:57 PM	C38016
Chromium	ND	0.0018	0.0060		mg/L	1	10/18/2016 12:17:57 PM	C38016
Cobalt	0.0016	0.00074	0.0060	J	mg/L	1	10/18/2016 12:17:57 PM	C38016
Iron	0.92	0.020	0.020	*	mg/L	1	10/18/2016 12:17:57 PM	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	C38016
Silver	ND	0.0028	0.0050		mg/L	1	10/18/2016 12:17:57 PM	C38016
Vanadium	0.0047	0.0013	0.050	J	mg/L	1	10/18/2016 12:17:57 PM	C38016
Zinc	0.0093	0.0028	0.010	J	mg/L	1	10/18/2016 12:17:57 PM	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

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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	28061
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

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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 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

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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

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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

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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

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Hall Environmental Analysis Laboratory, Inc.

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 RANGE							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 RANGE							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 METALS							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 PM	C38016
Cadmium	ND	0.00075	0.0020		mg/L	1	10/18/2016 12:19:38 PM	C38016
Chromium	ND	0.0018	0.0060		mg/L	1	10/18/2016 12:19:38 PM	C38016
Cobalt	0.0048	0.00074	0.0060	J	mg/L	1	10/18/2016 12:19:38 PM	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	C38016
Silver	ND	0.0028	0.0050		mg/L	1	10/18/2016 12:19:38 PM	C38016
Vanadium	0.0048	0.0013	0.050	J	mg/L	1	10/18/2016 12:19:38 PM	C38016
Zinc	0.0095	0.0028	0.010	J	mg/L	1	10/18/2016 12:19:38 PM	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

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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

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Hall Environmental Analysis Laboratory, Inc.

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

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Hall Environmental Analysis Laboratory, Inc.

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

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
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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

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Hall Environmental Analysis Laboratory, Inc.

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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

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 8015M/D: DIESEL RANGE							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 RANGE							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 METALS							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	C38016
Cadmium	ND	0.00075	0.0020		mg/L	1	10/18/2016 12:21:19 PM	C38016
Chromium	ND	0.0018	0.0060		mg/L	1	10/18/2016 12:21:19 PM	C38016
Cobalt	0.0051	0.00074	0.0060	J	mg/L	1	10/18/2016 12:21:19 PM	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	C38016
Silver	ND	0.0028	0.0050		mg/L	1	10/18/2016 12:21:19 PM	C38016
Vanadium	0.0078	0.0013	0.050	J	mg/L	1	10/18/2016 12:21:19 PM	C38016
Zinc	0.010	0.0028	0.010		mg/L	1	10/18/2016 12:21:19 PM	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

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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 200.8: DISSOLVED METALS							Analyst: **JLF**	
Lead	0.0012	0.00017	0.00050		mg/L	1	10/20/2016 8:00:38 PM	A38120
Selenium	0.0042	0.0021	0.010	J	mg/L	10	10/21/2016 9:36:29 PM	C38136
EPA 200.8: METALS							Analyst: **JLF**	
Antimony	ND	0.00047	0.0010		mg/L	1	10/14/2016 1:57:24 PM	28061
Arsenic	0.016	0.0011	0.0050	*	mg/L	5	10/14/2016 6:32:51 PM	28061
Lead	0.064	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: SEMIVOLATILES							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

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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**	
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

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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

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Lab ID: 1610091-004
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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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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**	
Surr: Dibromofluoromethane	98.7	0	70-130		%Rec	50	10/6/2016 5:46:00 PM	R37724
Surr: Toluene-d8	100	0	70-130		%Rec	50	10/6/2016 5:46:00 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 8015M/D: DIESEL RANGE							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 RANGE							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 METALS							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	C38016
Cadmium	ND	0.00075	0.0020		mg/L	1	10/18/2016 12:23:04 PM	C38016
Chromium	ND	0.0018	0.0060		mg/L	1	10/18/2016 12:23:04 PM	C38016
Cobalt	0.0083	0.00074	0.0060		mg/L	1	10/18/2016 12:23:04 PM	C38016
Iron	0.74	0.020	0.020	*	mg/L	1	10/18/2016 12:23:04 PM	C38016
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	C38016
Silver	ND	0.0028	0.0050		mg/L	1	10/18/2016 12:23:04 PM	C38016
Vanadium	0.0049	0.0013	0.050	J	mg/L	1	10/18/2016 12:23:04 PM	C38016
Zinc	0.0053	0.0028	0.010	J	mg/L	1	10/18/2016 12:23:04 PM	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

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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Hall Environmental Analysis Laboratory, Inc.

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

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Hall Environmental Analysis Laboratory, Inc.

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

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

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:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 RANGE							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 RANGE							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 METALS							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

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Qualifiers:

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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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 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:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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:

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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	**Date/Time Received**	10/5/2016 12:00 PM
Client Sample ID	1610091-001G / TK 568-1-GW	**Sampling Time**	9:15 AM		
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	161006024-002	**Sampling Date**	10/2/2016	**Date/Time Received**	10/5/2016 12:00 PM
Client Sample ID	1610091-002G / TK 568-2-GW	**Sampling Time**	8:30 AM		
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		
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	161006024-004	**Sampling Date**	9/30/2016	**Date/Time Received**	10/5/2016 12:00 PM
Client Sample ID	1610091-004G / TK 570-1-GW	**Sampling Time**	2:30 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	

Anatek Labs, Inc.

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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

Sample Number	161006024-005	**Sampling Date**	10/1/2016	**Date/Time Received**	10/5/2016	12:00 PM
Client Sample ID	1610091-005G / OW-57	**Sampling Time**	10:40 AM			
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	

Sample Number	161006024-006	**Sampling Date**	9/30/2016	**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

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.

Anatek Labs, Inc.

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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

Quality Control Data

Lab Control Sample

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 Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
161006024-006	Cyanide	0.0273	0.504	mg/L	0.5	95.3	90-110	10/14/2016	10/14/2016
161006024-001	Cyanide	ND	0.524	mg/L	0.5	104.8	90-110	10/11/2016	10/11/2016

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	0.498	mg/L	0.5	94.1	1.2	0-20	10/14/2016	10/14/2016
Cyanide	0.518	mg/L	0.5	103.6	1.2	0-20	10/11/2016	10/11/2016

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/L	0.01	10/14/2016	10/14/2016
Cyanide	ND	mg/L	0.01	10/11/2016	10/11/2016

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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								
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-28061**	SampType: **LCS**	TestCode: **EPA Method 200.7: Metals**
Client ID: **LCSW**	Batch ID: **28061**	RunNo: **37991**
Prep Date: **10/13/2016**	Analysis Date: **10/17/2016**	SeqNo: **1184301** 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**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Metals**
Client ID: **BatchQC**	Batch ID: **28061**	RunNo: **37991**
Prep Date: **10/13/2016**	Analysis Date: **10/17/2016**	SeqNo: **1184302** 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:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID	**LLLCS-28061**	SampType:	**LCSLL**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**BatchQC**	Batch ID:	**28061**	RunNo:	**37991**					
Prep Date:	**10/13/2016**	Analysis Date:	**10/17/2016**	SeqNo:	**1184302**	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Client ID: **PBW**	Batch ID: **C38016**	RunNo: **38016**
Prep Date:	Analysis Date: **10/18/2016**	SeqNo: **1185332** 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								
Chromium	ND	0.0060								
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**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **C38016**	RunNo: **38016**
Prep Date:	Analysis Date: **10/18/2016**	SeqNo: **1185333** 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			
Zinc	0.47	0.010	0.5000	0	94.1	85	115			

Sample ID **LLLCS-C**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **C38016**	RunNo: **38016**
Prep Date:	Analysis Date: **10/18/2016**	SeqNo: **1185334** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Client ID: **PBW**	Batch ID: **E38016**	RunNo: **38016**
Prep Date:	Analysis Date: **10/18/2016**	SeqNo: **1186382** 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-E**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **E38016**	RunNo: **38016**
Prep Date:	Analysis Date: **10/18/2016**	SeqNo: **1186383** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

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
Antimony	ND	0.0010								
Arsenic	0.00042	0.0010								J
Lead	ND	0.00050								
Selenium	ND	0.0010								

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**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.026	0.0010	0.02500	0	104	85	115			
Arsenic	0.025	0.0010	0.02500	0	100	85	115			
Lead	0.012	0.00050	0.01250	0	100	85	115			
Selenium	0.024	0.0010	0.02500	0	95.1	85	115			

Sample ID	**MSLLLCS-28061**	SampType:	**LCSLL**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**BatchQC**	Batch ID:	**28061**	RunNo:	**37962**					
Prep Date:	**10/13/2016**	Analysis Date:	**10/14/2016**	SeqNo:	**1182966**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00097	0.0010	0.001000	0	96.7	50	150			J
Arsenic	0.0014	0.0010	0.001000	0	142	50	150			
Lead	0.00052	0.00050	0.0005000	0	104	50	150			
Selenium	0.00095	0.0010	0.001000	0	94.6	50	150			J

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-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: **A38075**	RunNo: **38075**
Prep Date:	Analysis Date: **10/19/2016**	SeqNo: **1187756** 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	85	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**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00088	0.0010	0.001000	0	87.9	50	150			J

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW**	Batch ID: **A38075**	RunNo: **38075**
Prep Date:	Analysis Date: **10/19/2016**	SeqNo: **1187760** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **A38120**	RunNo: **38120**
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
Arsenic	0.023	0.0010	0.02500	0	93.6	85	115			
Lead	0.012	0.00050	0.01250	0	94.1	85	115			

Sample ID **LLLCS**	SampType: **LCSLL**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **A38120**	RunNo: **38120**
Prep Date:	Analysis Date: **10/20/2016**	SeqNo: **1189488** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00099	0.0010	0.001000	0	99.1	50	150			J
Lead	0.00050	0.00050	0.0005000	0	99.8	50	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**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Lead	ND	0.00050								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-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: **C38136**	RunNo: **38136**
Prep Date:	Analysis Date: **10/21/2016**	SeqNo: **1190552** 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**	SampType: **LCSLL**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **C38136**	RunNo: **38136**
Prep Date:	Analysis Date: **10/21/2016**	SeqNo: **1190553** 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
Selenium	0.0010	0.0010	0.001000	0	101	50	150			

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00015	0.00020								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**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0050	0.00020	0.005000	0	101	80	120			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
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	ND	0.10								
Chloride	ND	0.50								
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **lcs**	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	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.54	0.10	0.5000	0	107	90	110			
Chloride	5.0	0.50	5.000	0	100	90	110			
Sulfate	10	0.50	10.00	0	104	90	110			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Prep Date: **10/4/2016**	Analysis 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**	Batch ID: **27867**	RunNo: **37649**
Prep Date: **10/4/2016**	Analysis Date: **10/4/2016**	SeqNo: **1173047** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.0	1.0	5.000	0	120	63.2	155			
Surr: DNOP	0.56		0.5000		112	77.1	144			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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								
Surr: BFB	17		20.00		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	18		20.00		88.9	66.4	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**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	250	10	100.0	138.8	107	70	130			
Surr: BFB	3800		4000		95.2	66.4	120			

Sample ID **1610091-001AMSD**	SampType: **MSD**	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: **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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **100ng lcs3**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R37724**	RunNo: **37724**
Prep Date:	Analysis Date: **10/6/2016**	SeqNo: **1175699** 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			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	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
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:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	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
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								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	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	1.5								J
Surr: 1,2-Dichloroethane-d4	9.9		10.00		99.4	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		103	70	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**	SampType: **MS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **TK 568-1-GW**	Batch ID: **R37724**	RunNo: **37724**
Prep Date:	Analysis Date: **10/6/2016**	SeqNo: **1176577** 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**	SampType: **MSD**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **TK 568-1-GW**	Batch ID: **R37724**	RunNo: **37724**
Prep Date:	Analysis Date: **10/6/2016**	SeqNo: **1176578** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Prep Date: **10/4/2016**	Analysis Date: **10/5/2016**	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

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Prep Date: **10/4/2016**	Analysis Date: **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	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			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610091**

01-Dec-16

Client: Western Refining Company

Project: OW-14 Source Inv.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: Western Refining Gallup Work Order Number: 1610091 RcptNo: 1

Received by/date: AS 10/03/16

Logged By: Ashley Gallegos 10/3/2016 4:55:00 PM

Completed By: Ashley Gallegos 10/4/2016 9:22:47 AM

Reviewed By: IO 10/04/16

Chain of Custody

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

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	~~Yes~~ ☑	No ☑ JC	
9. Was preservative added to bottles?	Yes ☑	~~No~~ ☑ 10/4/16	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 12, 6 (<2 or >12 unless noted)

Adjusted? yes

Checked by: JC

Special Handling (if applicable)

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

Person Notified: ____ Date: ____

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

Regarding: ____

Client Instructions: ____

17. Additional remarks:
For metals analysis: added 1mL HNO3 to -004F for acceptable pH. 10/4/16 @ 1155

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.4	Good	Yes			

JC

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0217
email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample Temperature: 4.4°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1610091	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL & DISSOLVED)	GEN CHEM	CYANIDE		Air Bubbles (Y or N)
10/2/16	0915	WATER	TK 568-1-GW	40 ML VOA-6	HCL	-001			✓							✓						
				1 LITER AMBER-2	NEAT												✓					
				250 ML AMBER-1	NEAT				✓													
				500 ML PLASTIC-1	HNO_3													✓	DW TP			
				125 ML PLASTIC-1	HNO_3													✓	DW TP			
				125 ML PLASTIC-1	H_2SO_4														✓	DW TP		
				500 ML PLASTIC-1	NEAT														✓			
↓	↓	↓	↓	500 ML PLASTIC-1	NAOH															✓		

Date:	Time:	Relinquished by:	Received by:	Date	Time
10/3/16	0730			10/3/16	1455
Date:	Time:	Relinquished by:	Received by:	Date	Time
10/3/16	1655			10/3/16	1655

Remarks:

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

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0217
email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample Temperature: 4.4°C

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1610091
10/2/16	0830	WATER	TK568-2-GW	40 ML VOA-6	HCL	-002
				1 LITER AMBER-2	NEAT	
				250ML AMBER-1	NEAT	
				500ML PLASTIC-1	HNO_3	
				125ML PLASTIC-1	HNO_3	
				125ML PLASTIC-1	H_2SO_4	
				500ML PLASTIC-1	NEAT	
				500ML PLASTIC-1	NAOH	

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Metals (Total & Dissolved)	Gen Chem	Cyanide		Air Bubbles (Y or N)
		✓							✓						
										✓					
		✓													
											✓				
											✓				
												✓			
												✓			
													✓		

Date:	Time:	Relinquished by:	Received by:	Date	Time
10/3/16	0730			10/3/16	1455
10/3/16	1655			10/3/16	1655

Remarks:

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Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.

GALLUP REFINERY

Mailing Address: 92 GIANT CROSSING RD

GALLUP NM 87301

Phone #: 505-722-0217

email or Fax#: ED.RIEGE@WNR.COM

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other _____

☒ EDD (Type) EXCEL

Turn-Around Time:

☒ Standard ☐ Rush _____

Project Name: OW-14 SOURCE INC.

Project #:

Project Manager: ED RIEGE

Sampler: TRACY PAYNE

On Ice: ☑ Yes ☐ No

Sample Temperature: 4.4°C

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

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1610091	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL & DISSOLVED)	GEN CHEM	CYANIDE		Air Bubbles (Y or N)
10/2/16	0745	WATER	TK 569-3-GW	40 ML VOA-G	HCL	-003			✓							✓						
				1 LITER AMBER-2	NEAT												✓					
				250 ML AMBER-1	NEAT				✓													
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓			
				500 ML PLASTIC-1	NEAT														✓			
				500 ML PLASTIC-1	NAOH															✓		

Date	Time	Relinquished by:	Received by:	Date	Time
10/3/16	0730			10/3/16	1457
10/3/16	1650			10/3/16	1655

Remarks:

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Chain-of-Custody Record

Client: WESTERN REFINING SW, INC
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0217
email or Fax#: ED.RIEGE@NNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample Temperature: 4.4°C

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1601091
9/30/16	1430	WATER	TK 570-1-GW	40 mL VOA-1	HCL	-004
				1 LITER AMBER-2	NEAT	
				250 mL AMBER-1	NEAT	
				500 mL PLASTIC-1	HNO_3	
				125 mL PLASTIC-1	HNO_3	
				125 mL PLASTIC-1	H_2SO_4	
				500mL PLASTIC-1	NEAT	
↓	↓	↓	↓	500 mL PLASTIC-1	NaOH	

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Metals (Total & Dissolved)	Gen Chem	Cyanide		Air Bubbles (Y or N)
		✓							✓						
										✓					
		✓													
											✓				
											✓				
												✓			
												✓			
													✓		

Date	Time	Relinquished by:	Received by:	Date	Time
10/3/16	0730			10/3/16	1445
10/3/16	1655			10/3/16	1655

Remarks:

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Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0217
email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other _____
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush _____
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample Temperature: 4.4°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
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Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1610091
10/1/16	1040	WATER	OW-57	40 ML VOA-6	HCL	-005
				1 LITER AMBER-2	NEAT	
				250 ML AMBER-1	NEAT	
				500 ML PLASTIC-1	HNO_3	
				125 ML PLASTIC-1	HNO_3	
				125 ML PLASTIC-1	H_2SO_4	
				500 ML PLASTIC-1	NEAT	
				500 ML PLASTIC-1	NAOH	

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Metals Total & Dissolved	Gen Chem	Cyanide		Air Bubbles (Y or N)
		✓							✓						
										✓					
		✓													
											✓				
											✓				
												✓			
												✓			
													✓		

Date	Time	Relinquished by:	Received by:	Date	Time
10/3/16	0730			10/3/16	14 50
10/3/16	1653			10/3/16	1655

Remarks:

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Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0217
email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample Temperature: 4.4°C

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1601091	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Metals (Total & Dissolved)	Gen Chem	Cyanide		Air Bubbles (Y or N)
9/30/16	1045	WATER	OW-58	40 ML VOA-6	HCL	-006			✓							✓						
				1 LITER AMBER-2	NEAT												✓					
				250 ML AMBER-1	NEAT				✓													
				500 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	HNO_3													✓				
				125 ML PLASTIC-1	H_2SO_4														✓			
				500 ML PLASTIC-1	NEAT														✓			
↓	↓	↓	↓	500 ML PLASTIC-1	NAOH															✓		
9/30/16	—	WATER	TRIP BLANK	40 ML VOA-4	HCL	-007										✓	✓					

Date:	Time:	Relinquished by:	Received by:	Date	Time	Remarks:
10/3/16	0730			10/3/16	14145	
10/3/16	1655			10/3/16	1655	

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 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

Hall Environmental Analysis Laboratory
4901 Hawkins NE
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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

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

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	G37741
Surr: BFB	88.3	0	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Project: OW-14 Source Inv.
Lab ID: 1610237-001C

Client Sample ID: EB100416
Collection Date: 10/4/2016 5:30:00 PM
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	10/11/2016 5:52:44 PM	27939
Acenaphthylene	ND	2.4	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Aniline	ND	2.4	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Anthracene	ND	2.5	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Azobenzene	ND	2.7	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Benz(a)anthracene	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Benzo(a)pyrene	ND	2.7	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Benzo(b)fluoranthene	ND	2.9	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Benzo(g,h,i)perylene	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Benzo(k)fluoranthene	ND	3.0	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Benzoic acid	9.5	2.6	20	J	µg/L	1	10/11/2016 5:52:44 PM	27939
Benzyl alcohol	3.1	3.0	10	J	µg/L	1	10/11/2016 5:52:44 PM	27939
Bis(2-chloroethoxy)methane	ND	2.8	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Bis(2-chloroethyl)ether	ND	2.7	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Bis(2-chloroisopropyl)ether	ND	1.9	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Bis(2-ethylhexyl)phthalate	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
4-Bromophenyl phenyl ether	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Butyl benzyl phthalate	ND	2.5	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Carbazole	ND	2.3	10		µg/L	1	10/11/2016 5:52:44 PM	27939
4-Chloro-3-methylphenol	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
4-Chloroaniline	ND	2.7	10		µg/L	1	10/11/2016 5:52:44 PM	27939
2-Chloronaphthalene	ND	2.3	10		µg/L	1	10/11/2016 5:52:44 PM	27939
2-Chlorophenol	ND	2.2	10		µg/L	1	10/11/2016 5:52:44 PM	27939
4-Chlorophenyl phenyl ether	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Chrysene	ND	2.8	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Di-n-butyl phthalate	ND	2.4	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Di-n-octyl phthalate	ND	2.0	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Dibenz(a,h)anthracene	ND	2.7	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Dibenzofuran	ND	2.5	10		µg/L	1	10/11/2016 5:52:44 PM	27939
1,2-Dichlorobenzene	ND	2.3	10		µg/L	1	10/11/2016 5:52:44 PM	27939
1,3-Dichlorobenzene	ND	2.3	10		µg/L	1	10/11/2016 5:52:44 PM	27939
1,4-Dichlorobenzene	ND	2.4	10		µg/L	1	10/11/2016 5:52:44 PM	27939
3,3´-Dichlorobenzidine	ND	2.4	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Diethyl phthalate	ND	2.7	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Dimethyl phthalate	ND	2.4	10		µg/L	1	10/11/2016 5:52:44 PM	27939
2,4-Dichlorophenol	ND	2.3	20		µg/L	1	10/11/2016 5:52:44 PM	27939
2,4-Dimethylphenol	ND	3.0	10		µg/L	1	10/11/2016 5:52:44 PM	27939
4,6-Dinitro-2-methylphenol	ND	1.8	20		µg/L	1	10/11/2016 5:52:44 PM	27939
2,4-Dinitrophenol	ND	2.8	20		µg/L	1	10/11/2016 5:52:44 PM	27939
2,4-Dinitrotoluene	ND	3.1	10		µg/L	1	10/11/2016 5:52:44 PM	27939

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Project: OW-14 Source Inv.
Lab ID: 1610237-001C

Client Sample ID: EB100416
Collection Date: 10/4/2016 5:30:00 PM
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 PM	27939
Fluoranthene	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Fluorene	ND	2.7	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Hexachlorobenzene	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Hexachlorobutadiene	ND	2.2	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Hexachlorocyclopentadiene	ND	2.3	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Hexachloroethane	ND	2.4	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Indeno(1,2,3-cd)pyrene	ND	3.0	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Isophorone	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
1-Methylnaphthalene	ND	2.9	10		µg/L	1	10/11/2016 5:52:44 PM	27939
2-Methylnaphthalene	ND	2.9	10		µg/L	1	10/11/2016 5:52:44 PM	27939
2-Methylphenol	ND	2.5	10		µg/L	1	10/11/2016 5:52:44 PM	27939
3+4-Methylphenol	ND	2.3	10		µg/L	1	10/11/2016 5:52:44 PM	27939
N-Nitrosodi-n-propylamine	ND	2.4	10		µg/L	1	10/11/2016 5:52:44 PM	27939
N-Nitrosodimethylamine	ND	2.2	10		µg/L	1	10/11/2016 5:52:44 PM	27939
N-Nitrosodiphenylamine	ND	2.3	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Naphthalene	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
2-Nitroaniline	ND	2.8	10		µg/L	1	10/11/2016 5:52:44 PM	27939
3-Nitroaniline	ND	2.9	10		µg/L	1	10/11/2016 5:52:44 PM	27939
4-Nitroaniline	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Nitrobenzene	ND	2.8	10		µg/L	1	10/11/2016 5:52:44 PM	27939
2-Nitrophenol	ND	2.4	10		µg/L	1	10/11/2016 5:52:44 PM	27939
4-Nitrophenol	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Pentachlorophenol	ND	2.3	20		µg/L	1	10/11/2016 5:52:44 PM	27939
Phenanthrene	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Phenol	ND	2.0	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Pyrene	ND	3.1	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Pyridine	ND	2.2	10		µg/L	1	10/11/2016 5:52:44 PM	27939
1,2,4-Trichlorobenzene	ND	2.6	10		µg/L	1	10/11/2016 5:52:44 PM	27939
2,4,5-Trichlorophenol	ND	2.2	10		µg/L	1	10/11/2016 5:52:44 PM	27939
2,4,6-Trichlorophenol	ND	2.4	10		µg/L	1	10/11/2016 5:52:44 PM	27939
Surr: 2-Fluorophenol	21.2	0	15-123		%Rec	1	10/11/2016 5:52:44 PM	27939
Surr: Phenol-d5	16.9	0	15-124		%Rec	1	10/11/2016 5:52:44 PM	27939
Surr: 2,4,6-Tribromophenol	36.5	0	18.4-134		%Rec	1	10/11/2016 5:52:44 PM	27939
Surr: Nitrobenzene-d5	48.6	0	28.8-134		%Rec	1	10/11/2016 5:52:44 PM	27939
Surr: 2-Fluorobiphenyl	48.7	0	35.9-125		%Rec	1	10/11/2016 5:52:44 PM	27939
Surr: 4-Terphenyl-d14	53.0	0	15-146		%Rec	1	10/11/2016 5:52:44 PM	27939

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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	Batch ID
EPA METHOD 200.7: DISSOLVED METALS							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

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
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R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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Hall Environmental Analysis Laboratory, Inc.

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	Batch 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

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

Qualifiers:

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

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	161010009
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1610237
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	161010009-001	**Sampling Date**	10/4/2016	**Date/Time Received**	10/7/2016	11:45 AM
Client Sample ID	1610237-001G / EB100416	**Sampling Time**	5:30 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	

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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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 #: 161010009
Project Name: 1610237

Analytical Results Report

Quality Control Data

Lab Control Sample

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

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
161006024-006	Cyanide	0.0273	0.504	mg/L	0.5	95.3	90-110	10/14/2016	10/14/2016

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	0.498	mg/L	0.5	94.1	1.2	0-20	10/14/2016	10/14/2016

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/L	0.01	10/14/2016	10/14/2016

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

QC SUMMARY REPORT

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**	TestCode: **EPA Method 200.7: Metals**
Client ID: **PBW**	Batch ID: **A38043**	RunNo: **38043**
Prep Date:	Analysis Date: **10/19/2016**	SeqNo: **1186310** 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								
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**	SampType: **LCS**	TestCode: **EPA Method 200.7: Metals**
Client ID: **LCSW**	Batch ID: **A38043**	RunNo: **38043**
Prep Date:	Analysis Date: **10/19/2016**	SeqNo: **1186311** 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**	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
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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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
Zinc	0.0054	0.010	0.005000	0	107	50	150			J

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: **1186465**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.020	0.20	0.02000	0	98.5	50	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**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	ND	0.0060								

Sample ID	**LCS-C**	SampType: **LCS**			TestCode: **EPA Method 200.7: Metals**					
Client ID:	**LCSW**	Batch ID: **C38098**			RunNo: **38098**					
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	0	92.5	85	115			

Sample ID	**LLLCS-C**	SampType: **LCSLL**			TestCode: **EPA Method 200.7: Metals**					
Client ID:	**BatchQC**	Batch ID: **C38098**			RunNo: **38098**					
Prep Date:		Analysis Date: **10/20/2016**			SeqNo: **1188700**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.0059	0.0060	0.006000	0	98.7	50	150			J

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **MB-A**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **PBW**	Batch ID: **A38098**	RunNo: **38098**
Prep Date:	Analysis Date: **10/20/2016**	SeqNo: **1188611** 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**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **A38098**	RunNo: **38098**
Prep Date:	Analysis Date: **10/20/2016**	SeqNo: **1188612** 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 ID: **A38098**	RunNo: **38098**
Prep Date:	Analysis Date: **10/20/2016**	SeqNo: **1188613** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **LCS-A**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **A38098**	RunNo: **38098**
Prep Date:	Analysis Date: **10/20/2016**	SeqNo: **1188613** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA 200.8: Metals**
Client ID: **LCSW**	Batch ID: **B38136**	RunNo: **38136**
Prep Date:	Analysis Date: **10/21/2016**	SeqNo: **1190524** 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	97.5	85	115			
Selenium	0.024	0.0010	0.02500	0	96.2	85	115			

Sample ID **LLLCS**	SampType: **LCSLL**	TestCode: **EPA 200.8: Metals**
Client ID: **BatchQC**	Batch ID: **B38136**	RunNo: **38136**
Prep Date:	Analysis Date: **10/21/2016**	SeqNo: **1190525** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00093	0.0010	0.001000	0	92.6	50	150			J
Selenium	0.00096	0.0010	0.001000	0	96.0	50	150			J

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA 200.8: Metals**
Client ID: **PBW**	Batch ID: **B38136**	RunNo: **38136**
Prep Date:	Analysis Date: **10/21/2016**	SeqNo: **1190526** 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: **LCS**	TestCode: **EPA 200.8: Metals**
Client ID: **LCSW**	Batch ID: **A38180**	RunNo: **38180**
Prep Date:	Analysis Date: **10/24/2016**	SeqNo: **1191818** 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	98.0	85	115			
Lead	0.012	0.00050	0.01250	0	99.9	85	115			

Sample ID **LLLCS**	SampType: **LCSLL**	TestCode: **EPA 200.8: Metals**
Client ID: **BatchQC**	Batch ID: **A38180**	RunNo: **38180**
Prep Date:	Analysis Date: **10/24/2016**	SeqNo: **1191820** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00091	0.0010	0.001000	0	90.8	50	150			J
Lead	0.00052	0.00050	0.0005000	0	104	50	150			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA 200.8: Metals**
Client ID: **PBW**	Batch ID: **A38180**	RunNo: **38180**
Prep Date:	Analysis Date: **10/24/2016**	SeqNo: **1191822** Units: **mg/L**

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

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-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: **A38180**	RunNo: **38180**
Prep Date:	Analysis Date: **10/24/2016**	SeqNo: **1191822** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID	**1610237-001EMSLL**	SampType:	**MS**		TestCode:	**EPA 200.8: Dissolved Metals**				
Client ID:	**EB100416**	Batch ID:	**C38136**		RunNo:	**38136**				
Prep Date:		Analysis Date:	**10/21/2016**		SeqNo:	**1190536**	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**	SampType:	**LCS**		TestCode:	**EPA 200.8: Dissolved Metals**				
Client ID:	**LCSW**	Batch ID:	**C38136**		RunNo:	**38136**				
Prep Date:		Analysis Date:	**10/21/2016**		SeqNo:	**1190552**	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			
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**	SampType:	**LCSLL**		TestCode:	**EPA 200.8: Dissolved Metals**				
Client ID:	**BatchQC**	Batch ID:	**C38136**		RunNo:	**38136**				
Prep Date:		Analysis Date:	**10/21/2016**		SeqNo:	**1190553**	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	**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	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	ND	0.10								
Chloride	ND	0.50								
Sulfate	ND	0.50								

Sample ID	**LCS**	SampType:	**lcs**	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	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.54	0.10	0.5000	0	107	90	110			
Chloride	5.0	0.50	5.000	0	100	90	110			
Sulfate	10	0.50	10.00	0	104	90	110			

Sample ID	**1610237-001DMS**	SampType:	**ms**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**EB100416**	Batch ID:	**R37783**	RunNo:	**37783**					
Prep Date:		Analysis Date:	**10/6/2016**	SeqNo:	**1177031**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	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	9.0	0.50	10.00	0	90.0	83	118			

Sample ID	**1610237-001DMSD**	SampType:	**msd**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**EB100416**	Batch ID:	**R37783**	RunNo:	**37783**					
Prep Date:		Analysis Date:	**10/6/2016**	SeqNo:	**1177032**	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	74.5	121	1.84	20	
Chloride	4.4	0.50	5.000	0	87.5	81.9	117	1.00	20	
Sulfate	9.1	0.50	10.00	0	91.2	83	118	1.30	20	

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Prep Date: **10/7/2016**	Analysis 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**	Batch ID: **27938**	RunNo: **37769**
Prep Date: **10/7/2016**	Analysis Date: **10/7/2016**	SeqNo: **1177608** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.3	1.0	5.000	0	107	63.2	155			
Surr: DNOP	0.51		0.5000		103	77.1	144			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	16		20.00		81.8	66.4	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	0	110	80	120			
Surr: BFB	19		20.00		92.6	66.4	120			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R37747**	RunNo: **37747**
Prep Date:	Analysis Date: **10/6/2016**	SeqNo: **1176309** 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			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R37747**	RunNo: **37747**
Prep Date:	Analysis Date: **10/6/2016**	SeqNo: **1176326** 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:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R37747**	RunNo: **37747**
Prep Date:	Analysis Date: **10/6/2016**	SeqNo: **1176326** 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								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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QC SUMMARY REPORT

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 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R37747**	RunNo: **37747**
Prep Date:	Analysis Date: **10/6/2016**	SeqNo: **1176326** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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QC SUMMARY REPORT

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**	SeqNo: **1179625** 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								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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QC SUMMARY REPORT

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**	SeqNo: **1179625** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **lcs-27939**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSW**	Batch ID: **27939**	RunNo: **37873**
Prep Date: **10/7/2016**	Analysis Date: **10/11/2016**	SeqNo: **1179626** 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**	SampType: **MS**	TestCode: **EPA Method 8270C: Semivolatiles**
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	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610237**

03-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv.

Sample ID **1610237-001cms**	SampType: **MS**	TestCode: **EPA Method 8270C: Semivolatiles**
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	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	49		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**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	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
2-Chlorophenol	120	10	200.0	0	61.4	15	133	54.7	28.4	R
1,4-Dichlorobenzene	42	10	100.0	0	42.3	17.6	127	15.7	28.2	
2,4-Dinitrotoluene	60	10	100.0	0	59.5	38.9	98.5	11.9	22.9	
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	15	102	11.0	41.5	
Pentachlorophenol	120	20	200.0	0	58.3	15	120	20.2	45.1	
Phenol	62	10	200.0	0	30.8	15	100	19.2	33.9	
Pyrene	68	10	100.0	0	68.1	22.8	126	10.4	33.6	
1,2,4-Trichlorobenzene	48	10	100.0	0	47.8	15	143	10.4	28.2	
Surr: 2-Fluorophenol	83		200.0		41.5	15	123	0	0	
Surr: Phenol-d5	55		200.0		27.6	4.13	124	0	0	
Surr: 2,4,6-Tribromophenol	140		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	
Surr: 4-Terphenyl-d14	51		100.0		50.8	15	146	0	0	

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: Western Refining Gallup Work Order Number: 1610237 RcptNo: 1

Received by/date: AG 10/05/16

Logged By: Ashley Gallegos 10/5/2016 3:40:00 PM AG

Completed By: Ashley Gallegos 10/5/2016 5:12:39 PM AG

Reviewed By: JC 10/6/16

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: 2 1 (<2 or >12 unless noted)

Adjusted? No

Checked by: AG

Special Handling (if applicable)

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

Person Notified: ____ Date ____

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

Regarding: ____

Client Instructions: ____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.

GALLUP REFINERY

Mailing Address: 92 GIANT CROSSING RD

GALLUP NM 87301

Phone #: 505-722-0217

email or Fax#: ED.RIEGE@WNR.COM

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other _____

☒ EDD (Type) EXCEL

Turn-Around Time:

☒ Standard ☐ Rush _____

Project Name: OW-14 SOURCE INV.

Project #:

Project Manager: ED RIEGE

Sampler: TRACY PAYNE

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
9/04/16	1730	WATER	EB100416	40 ML VOA-6	HCL	1610237-001
				1 LITER AMBER-2	NEAT	
				250 ML AMBER-1	NEAT	
				500 ML PLASTIC-1	HNO_3	
				125 ML PLASTIC-1	HNO_3	
				125 ML PLASTIC-1	H_2SO_4	
				500 ML PLASTIC-1	NEAT	
				500 ML PLASTIC-1	NAOH	

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL & DISSOLVED)	GEN CHEM	CYANIDE		Air Bubbles (Y or N)
		✓							✓						
										✓					
		✓													
											✓				
											✓				
												✓			
												✓			
													✓		

Date:	Time:	Relinquished by:	Received by:	Date	Time
10/5/16	0810			10/5/16	1435
10/5/16	1540			10/05/16	1540

Remarks:

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

WESTERN REFINING SOUTHWEST, INC.
GALLUP REFINERY

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

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

4901 Hawkins NE
Albuquerque, NM 87109

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 8015M/D: DIESEL RANGE ORGANICS							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 RANGE							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							Analyst: **MED**	
Antimony	ND	1.0	2.5		mg/Kg	1	10/12/2016 2:26:14 PM	27985
Arsenic	1.6	0.88	2.5	J	mg/Kg	1	10/12/2016 2:26:14 PM	27985
Barium	200	0.070	0.099		mg/Kg	1	10/12/2016 2:26:14 PM	27985
Beryllium	0.64	0.034	0.15		mg/Kg	1	10/12/2016 2:26:14 PM	27985
Cadmium	ND	0.063	0.099		mg/Kg	1	10/12/2016 2:26:14 PM	27985
Chromium	6.4	0.093	0.30		mg/Kg	1	10/12/2016 2:26:14 PM	27985
Cobalt	3.2	0.11	0.30		mg/Kg	1	10/12/2016 2:26:14 PM	27985
Iron	12000	37	120		mg/Kg	50	10/12/2016 6:22:41 PM	27985
Lead	3.5	0.17	0.25		mg/Kg	1	10/12/2016 2:26:14 PM	27985
Manganese	210	0.053	0.099		mg/Kg	1	10/12/2016 2:26:14 PM	27985
Nickel	5.5	0.15	0.49		mg/Kg	1	10/12/2016 2:26:14 PM	27985
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							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	28021
Benzo(b)fluoranthene	ND	0.090	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Benzo(g,h,i)perylene	ND	0.088	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Benzo(k)fluoranthene	ND	0.088	0.20		mg/Kg	1	10/15/2016 5:00:07 PM	28021
Benzoic acid	0.11	0.083	0.50	J	mg/Kg	1	10/15/2016 5:00:07 PM	28021
Benzyl alcohol	ND	0.078	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:

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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 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.

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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 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	28021
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

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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

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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**	
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

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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 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	13	1.8	9.6		mg/Kg	1	10/11/2016 10:12:37 AM	27950
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	10/11/2016 10:12:37 AM	27950
Surr: DNOP	82.2	0	70-130		%Rec	1	10/11/2016 10:12:37 AM	27950
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	450	2.6	13		mg/Kg	5	10/6/2016 5:57:53 PM	27905
Surr: BFB	128	0	68.3-144		%Rec	5	10/6/2016 5:57:53 PM	27905
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	0.0020	0.00057	0.033	J	mg/Kg	1	10/12/2016 9:30:09 AM	27986
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**	
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
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 2:31:48 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							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
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
Benzyl alcohol	ND	0.076	0.19		mg/Kg	1	10/15/2016 6:25:24 PM	28021

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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 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

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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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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	S37765
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	S37765
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

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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**	
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

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	4.4	1.8	9.8	J	mg/Kg	1	10/11/2016 10:35:27 AM	27950
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	10/11/2016 10:35:27 AM	27950
Surr: DNOP	90.2	0	70-130		%Rec	1	10/11/2016 10:35:27 AM	27950
EPA METHOD 8015D: GASOLINE RANGE							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							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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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**	
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	28053
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	28053
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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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	27950
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	10/11/2016 10:58:37 AM	27950
Surr: DNOP	82.1	0	70-130		%Rec	1	10/11/2016 10:58:37 AM	27950
EPA METHOD 8015D: GASOLINE RANGE							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

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Qualifiers:

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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 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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	28053
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	28053
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

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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
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

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Qualifiers:

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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
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

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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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 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	15	1.8	9.5		mg/Kg	1	10/11/2016 11:21:33 AM	27950
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	10/11/2016 11:21:33 AM	27950
Surr: DNOP	86.2	0	70-130		%Rec	1	10/11/2016 11:21:33 AM	27950
EPA METHOD 8015D: GASOLINE RANGE							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

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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	28021
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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	61	1.8	9.6		mg/Kg	1	10/11/2016 11:44:43 AM	27950
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	10/11/2016 11:44:43 AM	27950
Surr: DNOP	86.0	0	70-130		%Rec	1	10/11/2016 11:44:43 AM	27950
EPA METHOD 8015D: GASOLINE RANGE							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							Analyst: **MED**	
Antimony	ND	1.0	2.5		mg/Kg	1	10/12/2016 2:50:49 PM	27985
Arsenic	2.4	0.89	2.5	J	mg/Kg	1	10/12/2016 2:50:49 PM	27985
Barium	1500	3.6	5.0		mg/Kg	50	10/12/2016 6:30:36 PM	27985
Beryllium	0.26	0.035	0.15		mg/Kg	1	10/12/2016 2:50:49 PM	27985
Cadmium	ND	0.064	0.10		mg/Kg	1	10/12/2016 2:50:49 PM	27985
Chromium	3.6	0.095	0.30		mg/Kg	1	10/12/2016 2:50:49 PM	27985
Cobalt	2.2	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: SEMIVOLATILES							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

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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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	27923
Toluene	2.5	0.0056	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Ethylbenzene	1.2	0.0077	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Methyl tert-butyl ether (MTBE)	ND	0.030	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,2,4-Trimethylbenzene	3.8	0.0069	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,3,5-Trimethylbenzene	1.3	0.0068	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,2-Dichloroethane (EDC)	ND	0.025	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,2-Dibromoethane (EDB)	ND	0.0067	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Naphthalene	0.32	0.015	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1-Methylnaphthalene	0.17	0.021	0.38	J	mg/Kg	2	10/10/2016 12:09:27 PM	27923
2-Methylnaphthalene	0.30	0.020	0.38	J	mg/Kg	2	10/10/2016 12:09:27 PM	27923
Acetone	ND	0.12	1.4		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Bromobenzene	ND	0.0076	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923

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Qualifiers:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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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	27923
Bromoform	ND	0.011	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Bromomethane	ND	0.035	0.28		mg/Kg	2	10/10/2016 12:09:27 PM	27923
2-Butanone	ND	0.054	0.94		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Carbon disulfide	ND	0.031	0.94		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Carbon tetrachloride	ND	0.0062	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Chlorobenzene	ND	0.0077	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Chloroethane	ND	0.019	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Chloroform	ND	0.0071	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Chloromethane	ND	0.0084	0.28		mg/Kg	2	10/10/2016 12:09:27 PM	27923
2-Chlorotoluene	ND	0.0069	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
4-Chlorotoluene	ND	0.0083	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
cis-1,2-DCE	ND	0.0055	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
cis-1,3-Dichloropropene	ND	0.0087	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,2-Dibromo-3-chloropropane	ND	0.029	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Dibromochloromethane	ND	0.0085	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Dibromomethane	ND	0.0082	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,2-Dichlorobenzene	ND	0.0082	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,3-Dichlorobenzene	ND	0.0077	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,4-Dichlorobenzene	ND	0.012	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Dichlorodifluoromethane	ND	0.029	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,1-Dichloroethane	ND	0.0051	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,1-Dichloroethene	ND	0.031	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,2-Dichloropropane	ND	0.0079	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,3-Dichloropropane	ND	0.011	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
2,2-Dichloropropane	ND	0.0054	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,1-Dichloropropene	ND	0.0075	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Hexachlorobutadiene	ND	0.012	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	27923
2-Hexanone	ND	0.051	0.94		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Isopropylbenzene	0.089	0.0081	0.094	J	mg/Kg	2	10/10/2016 12:09:27 PM	27923
4-Isopropyltoluene	0.035	0.0085	0.094	J	mg/Kg	2	10/10/2016 12:09:27 PM	27923
4-Methyl-2-pentanone	ND	0.027	0.94		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Methylene chloride	ND	0.027	0.28		mg/Kg	2	10/10/2016 12:09:27 PM	27923
n-Butylbenzene	0.21	0.0083	0.28	J	mg/Kg	2	10/10/2016 12:09:27 PM	27923
n-Propylbenzene	0.60	0.0073	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
sec-Butylbenzene	0.076	0.013	0.094	J	mg/Kg	2	10/10/2016 12:09:27 PM	27923
Styrene	ND	0.0084	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
tert-Butylbenzene	ND	0.0078	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,1,1,2-Tetrachloroethane	ND	0.0090	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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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**	
1,1,2,2-Tetrachloroethane	ND	0.015	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Tetrachloroethene (PCE)	ND	0.0078	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
trans-1,2-DCE	ND	0.026	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
trans-1,3-Dichloropropene	ND	0.014	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,2,3-Trichlorobenzene	ND	0.014	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,2,4-Trichlorobenzene	ND	0.010	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,1,1-Trichloroethane	ND	0.0057	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,1,2-Trichloroethane	ND	0.011	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Trichloroethene (TCE)	ND	0.010	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Trichlorofluoromethane	ND	0.0070	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
1,2,3-Trichloropropane	ND	0.016	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Vinyl chloride	ND	0.0077	0.094		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Xylenes, Total	7.7	0.018	0.19		mg/Kg	2	10/10/2016 12:09:27 PM	27923
Surr: Dibromofluoromethane	86.4		70-130		%Rec	2	10/10/2016 12:09:27 PM	27923
Surr: 1,2-Dichloroethane-d4	88.1		70-130		%Rec	2	10/10/2016 12:09:27 PM	27923
Surr: Toluene-d8	98.4		70-130		%Rec	2	10/10/2016 12:09:27 PM	27923
Surr: 4-Bromofluorobenzene	103		70-130		%Rec	2	10/10/2016 12:09:27 PM	27923

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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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 ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	19	1.8	9.7		mg/Kg	1	10/11/2016 12:07:45 PM	27950
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	10/11/2016 12:07:45 PM	27950
Surr: DNOP	87.7	0	70-130		%Rec	1	10/11/2016 12:07:45 PM	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							Analyst: **MED**	
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	27985
Barium	380	0.14	0.20		mg/Kg	2	10/12/2016 2:57:08 PM	27985
Beryllium	0.26	0.069	0.30	J	mg/Kg	2	10/12/2016 2:57:08 PM	27985
Cadmium	ND	0.13	0.20		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	0.22	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							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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	11	1.8	9.6		mg/Kg	1	10/11/2016 12:30:50 PM	27950
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	10/11/2016 12:30:50 PM	27950
Surr: DNOP	84.8	0	70-130		%Rec	1	10/11/2016 12:30:50 PM	27950
EPA METHOD 8015D: GASOLINE RANGE							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	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	3.7	1.9	10	J	mg/Kg	1	10/11/2016 12:53:48 PM	27950
Motor Oil Range Organics (MRO)	ND	51	51		mg/Kg	1	10/11/2016 12:53:48 PM	27950
Surr: DNOP	86.8	0	70-130		%Rec	1	10/11/2016 12:53:48 PM	27950
EPA METHOD 8015D: GASOLINE RANGE							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

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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
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

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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
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	28053
Methyl tert-butyl ether (MTBE)	0.688	0.296	1.76	J	µg/Kg	1	10/16/2016 6:25:00 PM	28053
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	28053
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

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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

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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**	
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

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining 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

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S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Company
Client Sample ID: 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

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S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 161010015
Project Name: 1610238

Analytical Results Report

Sample Number 161010015-001 **Sampling Date** 10/4/2016 **Date/Time Received** 10/7/2016 11:45 AM
Client Sample ID 1610238-001C / TK569-2(16-18) **Sampling Time** 11:20 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 161010015-002 **Sampling Date** 10/4/2016 **Date/Time Received** 10/7/2016 11:45 AM
Client Sample ID 1610238-002C / TK569-2(29-31) **Sampling Time** 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	

Sample Number 161010015-003 **Sampling Date** 10/4/2016 **Date/Time Received** 10/7/2016 11:45 AM
Client Sample ID 1610238-003C / TK569-2(36-38) **Sampling Time** 12:15 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.269	10/18/2016	MER	EPA 335.4	
%moisture	13.3	Percent		10/18/2016	MER	%moisture	

Sample Number 161010015-004 **Sampling Date** 10/4/2016 **Date/Time Received** 10/7/2016 11:45 AM
Client Sample ID 1610238-004C / TK569-1(18-20) **Sampling Time** 3:50 PM
Matrix Soil
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	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 161010015
Project Name: 1610238

Analytical Results Report

Sample Number 161010015-005 **Sampling Date** 10/4/2016 **Date/Time Received** 10/7/2016 11:45 AM
Client Sample ID 1610238-005C / TK569-1(24-26) **Sampling Time** 4:00 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.281	10/18/2016	MER	EPA 335.4	
%moisture	15.6	Percent		10/18/2016	MER	%moisture	

Sample Number 161010015-006 **Sampling Date** 10/4/2016 **Date/Time Received** 10/7/2016 11:45 AM
Client Sample ID 1610238-006B / TK569-1(36-38) **Sampling Time** 4:05 PM
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 1610238-007B / TK569-1(40-42) **Sampling Time** 4:15 PM
Matrix Soil
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.156	10/18/2016	MER	EPA 335.4	
%moisture	10.9	Percent		10/18/2016	MER	%moisture	

Sample Number 161010015-008 **Sampling Date** 10/4/2016 **Date/Time Received** 10/7/2016 11:45 AM
Client Sample ID 1610238-008C / DUP02 **Sampling Time**
Matrix Soil
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	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 161010015
Project Name: 1610238

Analytical Results Report

Sample Number	161010015-009	**Sampling Date**	10/4/2016	**Date/Time Received**	10/7/2016 11:45 AM
Client Sample ID	1610238-009C / DUP03	**Sampling Time**			
Matrix	Soil				
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 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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Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 161010015
Project Name: 1610238

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Cyanide	0.496	mg/kg	0.5	99.2	90-110	10/19/2016	10/19/2016

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
161010015-001	Cyanide	ND	12.5	mg/kg	13.6	91.9	70-130	10/19/2016	10/19/2016

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	12.9	mg/kg	13.6	94.9	3.1	0-25	10/19/2016	10/19/2016

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/Kg	5	10/19/2016	10/19/2016

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

QC SUMMARY REPORT

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**				
Prep Date:	**10/7/2016**	Analysis Date:	**10/11/2016**		SeqNo:	**1178986**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	10	50.00	0	99.0	62.6	124			
Surr: DNOP	4.8		5.000		96.1	70	130			

Sample ID	**MB-27950**	SampType:	**MBLK**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**PBS**	Batch ID:	**27950**		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								J
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.9		10.00		98.7	70	130			

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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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-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)	31	5.0	25.00	0	123	74.6	123			
Surr: BFB	950		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**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	880		1000		88.1	68.3	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	0	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**
Client ID: **TK569-1(36-38')**	Batch ID: **27923**	RunNo: **37778**
Prep Date: **10/6/2016**	Analysis Date: **10/7/2016**	SeqNo: **1177527** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	180	9.6	47.94	141.4	85.4	59.3	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**

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

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID **lcs-27905**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS**	Batch ID: **27905**	RunNo: **37747**
Prep Date: **10/5/2016**	Analysis Date: **10/6/2016**	SeqNo: **1176297** Units: **%Rec**

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**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **27905**	RunNo: **37747**
Prep Date: **10/5/2016**	Analysis Date: **10/6/2016**	SeqNo: **1176299** Units: **%Rec**

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**	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
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								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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								
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								
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	0.0068	0.050								J
1,1,1-Trichloroethane	ND	0.050								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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
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**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS**	Batch ID: **S37765**	RunNo: **37765**
Prep Date:	Analysis Date: **10/6/2016**	SeqNo: **1176719** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	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**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **S37805**	RunNo: **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
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								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-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: **S37805**	RunNo: **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								
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								
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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-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: **S37805**	RunNo: **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
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 lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS**	Batch ID: **S37805**	RunNo: **37805**
Prep Date:	Analysis Date: **10/7/2016**	SeqNo: **1177633** Units: **mg/Kg**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID **mb-27923**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **27923**	RunNo: **37833**
Prep Date: **10/6/2016**	Analysis Date: **10/10/2016**	SeqNo: **1178560** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Methyl tert-butyl ether (MTBE)	ND	0.050								
1,2,4-Trimethylbenzene	ND	0.050								
1,3,5-Trimethylbenzene	ND	0.050								
1,2-Dichloroethane (EDC)	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								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID **mb-27923**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **27923**	RunNo: **37833**
Prep Date: **10/6/2016**	Analysis Date: **10/10/2016**	SeqNo: **1178560** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.49		0.5000		97.1	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 **lcs-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
Benzene	1.0	0.025	1.000	0	104	70	130			
Toluene	1.1	0.050	1.000	0	108	70	130			
Chlorobenzene	1.1	0.050	1.000	0	106	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID **lcs-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	1.4	0.050	1.000	0	136	70	130			S
Trichloroethene (TCE)	1.1	0.050	1.000	0	107	70	130			
Surr: Dibromofluoromethane	0.49		0.5000		97.4	70	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**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.048	0.9588	0.1217	81.9	49.2	155			
Toluene	1.9	0.096	0.9588	2.467	-57.2	52	154			S
Chlorobenzene	0.93	0.096	0.9588	0	97.4	53.2	150			
1,1-Dichloroethene	0.97	0.096	0.9588	0	101	34.2	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			
Surr: 1,2-Dichloroethane-d4	0.86		0.9588		90.1	70	130			
Surr: Toluene-d8	0.91		0.9588		95.0	70	130			
Surr: 4-Bromofluorobenzene	0.97		0.9588		101	70	130			

Sample ID **1610238-006amsd**	SampType: **MSD**	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: **1178616** Units: **mg/Kg**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID **lcs-28053**	SampType: **LCS**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **LCSS**	Batch ID: **28053**	RunNo: **37972**
Prep Date: **10/13/2016**	Analysis Date: **10/16/2016**	SeqNo: **1183301** Units: **µg/Kg**

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 **lcsd-28053**	SampType: **LCSD**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **LCSS02**	Batch ID: **28053**	RunNo: **37972**
Prep Date: **10/13/2016**	Analysis Date: **10/16/2016**	SeqNo: **1183302** Units: **µg/Kg**

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**	RunNo: **37972**
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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID **mb-28053**	SampType: **MBLK**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **PBS**	Batch ID: **28053**	RunNo: **37972**
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
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								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID **mb-28053**	SampType: **MBLK**	TestCode: **Method 8260B/5035LOW: VOLATILES**
Client ID: **PBS**	Batch ID: **28053**	RunNo: **37972**
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
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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID **lcs-28021**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS**	Batch ID: **28021**	RunNo: **37969**
Prep Date: **10/12/2016**	Analysis Date: **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			

Sample ID **mb-28021**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
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
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:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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 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								
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								J
Di-n-octyl phthalate	ND	0.40								
Dibenz(a,h)anthracene	ND	0.20								
Dibenzofuran	ND	0.20								
1,2-Dichlorobenzene	ND	0.20								
1,3-Dichlorobenzene	ND	0.20								
1,4-Dichlorobenzene	ND	0.20								
3,3´-Dichlorobenzidine	ND	0.25								
Diethyl phthalate	ND	0.20								
Dimethyl phthalate	ND	0.20								
2,4-Dichlorophenol	ND	0.40								
2,4-Dimethylphenol	ND	0.30								
4,6-Dinitro-2-methylphenol	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Phenol-d5	2.0		3.321		59.4	37.3	105			
Surr: 2,4,6-Tribromophenol	2.0		3.321		61.6	35.6	118			
Surr: Nitrobenzene-d5	0.93		1.666		55.6	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**
Prep Date: **10/12/2016**	Analysis Date: **10/15/2016**	SeqNo: **1183239** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.2	0.20	1.659	0	69.6	24.7	111	2.57	30.2	
4-Chloro-3-methylphenol	2.3	0.50	3.309	0	68.7	21.7	108	2.94	37.2	
2-Chlorophenol	1.9	0.20	3.309	0	58.6	21.9	103	3.56	48	
1,4-Dichlorobenzene	0.94	0.20	1.659	0	56.4	15.8	93.9	0.152	40.6	
2,4-Dinitrotoluene	1.0	0.50	1.659	0	60.4	19.9	101	9.74	47.7	
N-Nitrosodi-n-propylamine	1.0	0.20	1.659	0	63.3	17.7	100	3.07	52.5	
4-Nitrophenol	2.0	0.25	3.309	0	61.1	19.3	112	0.512	36.6	
Pentachlorophenol	2.0	0.40	3.309	0	59.6	20.5	105	4.75	65.5	
Phenol	2.1	0.20	3.309	0	64.5	23.1	101	0.659	44	
Pyrene	1.2	0.20	1.659	0	71.9	18.3	113	0.780	42.1	
1,2,4-Trichlorobenzene	0.99	0.20	1.659	0	59.4	21.8	108	0.868	31.5	
Surr: 2-Fluorophenol	1.9		3.309		58.2	35	97.9	0	0	
Surr: Phenol-d5	2.0		3.309		59.3	37.3	105	0	0	
Surr: 2,4,6-Tribromophenol	2.2		3.309		65.1	35.6	118	0	0	
Surr: Nitrobenzene-d5	0.93		1.659		56.0	41.2	107	0	0	
Surr: 2-Fluorobiphenyl	1.0		1.659		60.3	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	125			

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610238**

01-Nov-16

Client: Western Refining Company

Project: OW-14 Source Inv

Sample ID	**MB-27985**	SampType:	**MBLK**	TestCode:	**EPA Method 6010B: Soil Metals**					
Client ID:	**PBS**	Batch ID:	**27985**	RunNo:	**37883**					
Prep Date:	**10/10/2016**	Analysis Date:	**10/12/2016**	SeqNo:	**1180046**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	2.5								
Arsenic	ND	2.5								
Barium	ND	0.10								
Beryllium	ND	0.15								
Cadmium	ND	0.10								
Chromium	ND	0.30								
Cobalt	ND	0.30								
Iron	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

Sample ID	**LCS-27985**	SampType:	**LCS**	TestCode:	**EPA Method 6010B: Soil Metals**					
Client ID:	**LCSS**	Batch ID:	**27985**	RunNo:	**37883**					
Prep Date:	**10/10/2016**	Analysis Date:	**10/12/2016**	SeqNo:	**1180047**	Units:	**mg/Kg**			

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: Western Refining Gallup Work Order Number: 1610238 RcptNo: 1

Received by/date: AG

Logged By: Ashley Gallegos 10/5/2016 3:40:00 PM AG

Completed By: Ashley Gallegos 10/5/2016 5:30:02 PM AG

Reviewed By: AJ 10/6/16

Chain of Custody

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

Log In

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

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

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

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

Person Notified: _____ Date _____

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

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0217
Email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package: Standard [X] Level 4 (Full Validation)
Accreditation: [X] NELAP [ ] Other
EDD (Type): EXCEL

Turn-Around Time: [X] Standard [ ] Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: [X] Yes [ ] No
Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1601238	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS & CYANIDE				Air Bubbles (Y or N)
4/16	1120	SOIL	TK 569-2 (16-18')	JARS-3	NEAT	-001			✓							✓	✓	✓				
				VIALS-2	MeOH											✓						
				VIALS-2	SOBI											✓						
	1145		TK 569-2 (29-31')	JARS-3	NEAT	-002			✓							✓	✓	✓				
				VIALS-2	MeOH											✓						
				VIALS-2	SOBI											✓						
	1215		TK569-2 (36-38')	JARS-3	NEAT	-003			✓							✓	✓	✓				
				VIALS-2	MeOH											✓						
				VIALS-2	SOBI											✓						
	1550		TK 569-1 (18-20')	JARS-3	NEAT	-004			✓							✓	✓	✓				
				VIALS-2	MeOH											✓						
				VIALS-2	SOBI											✓						

Date	Time	Relinquished by:	Received by:	Date	Time
5/16	0810			10/5/16	14:35
/16	1542			10/05/16	1540

Remarks:

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

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0217
Email or Fax#: ED.RIEGE@NNR.COM
QA/QC Package: Standard [X] Level 4 (Full Validation)
Accreditation: [X] NELAP [ ] Other
EDD (Type) EXCEL

Turn-Around Time: [X] Standard [ ] Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: [X] Yes [ ] No
Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1610238	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS & CYANIDE				Air Bubbles (Y or N)
10/5/16	1600	SOIL	TK 569-1(24-26')	JARS-3	NEAT	-005			✓							✓	✓	✓				
				VIALS-2	MEOH											✓						
				VIALS-2	SOBI											✓						
	1605		TK 569-1(36-38')	JAR-1	NEAT	-006			✓							✓	✓	✓				
	1615		TK 569-1(40-42')	JARS-2	NEAT	-007			✓							✓	✓	✓				
				VIALS-2	MEOH											✓						
				VIALS-2	SOBI											✓						
	—		DUP02	JARS-2	NEAT	-008			✓						*	✓	✓	✓				
				VIALS-2	MEOH											✓						
				VIALS-2	SOBI											✓						

Date:	Time:	Relinquished by:	Received by:	Date	Time
10/5/16	0810			10/5/16	14:36
Date:	Time:	Relinquished by:	Received by:	Date	Time
10/5/16	1542			10/05/16	1540

Remarks:

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Chain-of-Custody Record

Client: WESTERN REFINING SW, INC
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0217
Email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package: Standard [X] Level 4 (Full Validation)
Accreditation: [X] NELAP [ ] Other
EDD (Type): EXCEL

Turn-Around Time: [X] Standard [ ] Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: [X] Yes [ ] No
Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
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Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1610338	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS & CYANIDE				Air Bubbles (Y or N)
4/16	—	SOIL	DUP03	JARS-3	NEAT	-009			✓							✓	✓	✓				
↓	↓	↓	↓	VIALS-2	MEOH											✓						
↓	↓	↓	↓	VIALS-2	8081											✓						
4/16	—	MEOH	MEOH BLANK	VIALS-2	MEOH	-010										✓						

Date: 9/16 Time: 0810 Relinquished by: — Received by: — Date Time: 10/5/16
Date: 9/16 Time: 1542 Relinquished by: — Received by: — Date Time: 10/05/16 1540

Remarks:

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

WESTERN REFINING SOUTHWEST, INC.
GALLUP REFINERY

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

November 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
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

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**	
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	R37866
1,2-Dichloropropane	ND	5.5	50		µg/L	50	10/11/2016 5:42:00 PM	R37866
1,3-Dichloropropane	ND	7.8	50		µg/L	50	10/11/2016 5:42:00 PM	R37866
2,2-Dichloropropane	ND	8.3	100		µg/L	50	10/11/2016 5:42:00 PM	R37866
1,1-Dichloropropene	ND	6.7	50		µg/L	50	10/11/2016 5:42:00 PM	R37866

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Qualifiers:

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: 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

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Hall Environmental Analysis Laboratory, Inc.

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	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

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

Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

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 ID
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
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	10/11/2016 11:56:47 AM	27993
Surr: DNOP	129	0	77.1-144		%Rec	1	10/11/2016 11:56:47 AM	27993

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Hall Environmental Analysis Laboratory, Inc.

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: 1610355-001D
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	27995
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	27995
2,4-Dimethylphenol	33	3.0	10		µg/L	1	10/20/2016 1:03:05 PM	27995
4,6-Dinitro-2-methylphenol	ND	1.8	20		µg/L	1	10/20/2016 1:03:05 PM	27995
2,4-Dinitrophenol	ND	2.8	20		µg/L	1	10/20/2016 1:03:05 PM	27995
2,4-Dinitrotoluene	ND	3.1	10		µg/L	1	10/20/2016 1:03:05 PM	27995

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

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: 1610355-001D
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 1:03:05 PM	27995
Fluoranthene	ND	2.6	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Fluorene	ND	2.7	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Hexachlorobenzene	ND	2.6	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Hexachlorobutadiene	ND	2.2	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Hexachlorocyclopentadiene	ND	2.3	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Hexachloroethane	ND	2.4	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Indeno(1,2,3-cd)pyrene	ND	3.0	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Isophorone	ND	2.6	10		µg/L	1	10/20/2016 1:03:05 PM	27995
1-Methylnaphthalene	71	2.9	10		µg/L	1	10/20/2016 1:03:05 PM	27995
2-Methylnaphthalene	76	2.9	10		µg/L	1	10/20/2016 1:03:05 PM	27995
2-Methylphenol	68	2.5	10		µg/L	1	10/20/2016 1:03:05 PM	27995
3+4-Methylphenol	110	2.3	10		µg/L	1	10/20/2016 1:03:05 PM	27995
N-Nitrosodi-n-propylamine	ND	2.4	10		µg/L	1	10/20/2016 1:03:05 PM	27995
N-Nitrosodimethylamine	ND	2.2	10		µg/L	1	10/20/2016 1:03:05 PM	27995
N-Nitrosodiphenylamine	ND	2.3	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Naphthalene	210	2.6	10		µg/L	1	10/20/2016 1:03:05 PM	27995
2-Nitroaniline	ND	2.8	10		µg/L	1	10/20/2016 1:03:05 PM	27995
3-Nitroaniline	ND	2.9	10		µg/L	1	10/20/2016 1:03:05 PM	27995
4-Nitroaniline	ND	2.6	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Nitrobenzene	ND	2.8	10		µg/L	1	10/20/2016 1:03:05 PM	27995
2-Nitrophenol	ND	2.4	10		µg/L	1	10/20/2016 1:03:05 PM	27995
4-Nitrophenol	ND	2.6	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Pentachlorophenol	ND	2.3	20		µg/L	1	10/20/2016 1:03:05 PM	27995
Phenanthrene	ND	2.6	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Phenol	69	2.0	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Pyrene	ND	3.1	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Pyridine	ND	2.2	10		µg/L	1	10/20/2016 1:03:05 PM	27995
1,2,4-Trichlorobenzene	ND	2.6	10		µg/L	1	10/20/2016 1:03:05 PM	27995
2,4,5-Trichlorophenol	ND	2.2	10		µg/L	1	10/20/2016 1:03:05 PM	27995
2,4,6-Trichlorophenol	ND	2.4	10		µg/L	1	10/20/2016 1:03:05 PM	27995
Surr: 2-Fluorophenol	6.31	0	15-123	S	%Rec	1	10/20/2016 1:03:05 PM	27995
Surr: Phenol-d5	38.5	0	15-124		%Rec	1	10/20/2016 1:03:05 PM	27995
Surr: 2,4,6-Tribromophenol	36.0	0	18.4-134		%Rec	1	10/20/2016 1:03:05 PM	27995
Surr: Nitrobenzene-d5	45.8	0	28.8-134		%Rec	1	10/20/2016 1:03:05 PM	27995
Surr: 2-Fluorobiphenyl	49.4	0	35.9-125		%Rec	1	10/20/2016 1:03:05 PM	27995
Surr: 4-Terphenyl-d14	34.3	0	15-146		%Rec	1	10/20/2016 1:03:05 PM	27995

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Hall Environmental Analysis Laboratory, Inc.

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: 1610355-001E
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

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Hall Environmental Analysis Laboratory, Inc.

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	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	28031

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

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	Batch ID
EPA METHOD 200.7: DISSOLVED METALS							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

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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: 1610355-002A
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

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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: 1610355-002A
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

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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: 1610355-002B
Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANGE							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	66.4-120		%Rec	500	10/11/2016 12:30:13 PM	G37864

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Project: OW-14 Source Inv.
Collection Date: 10/5/2016 3:00:00 PM
Lab ID: 1610355-002C
Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							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

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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	27995

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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	27995
Fluoranthene	ND	2.6	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Fluorene	ND	2.7	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Hexachlorobenzene	ND	2.6	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Hexachlorobutadiene	ND	2.2	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Hexachlorocyclopentadiene	ND	2.3	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Hexachloroethane	ND	2.4	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Indeno(1,2,3-cd)pyrene	ND	3.0	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Isophorone	ND	2.6	10		µg/L	1	10/20/2016 2:26:59 PM	27995
1-Methylnaphthalene	59	2.9	10		µg/L	1	10/20/2016 2:26:59 PM	27995
2-Methylnaphthalene	ND	2.9	10		µg/L	1	10/20/2016 2:26:59 PM	27995
2-Methylphenol	80	2.5	10		µg/L	1	10/20/2016 2:26:59 PM	27995
3+4-Methylphenol	130	2.3	10		µg/L	1	10/20/2016 2:26:59 PM	27995
N-Nitrosodi-n-propylamine	ND	2.4	10		µg/L	1	10/20/2016 2:26:59 PM	27995
N-Nitrosodimethylamine	ND	2.2	10		µg/L	1	10/20/2016 2:26:59 PM	27995
N-Nitrosodiphenylamine	ND	2.3	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Naphthalene	47	2.6	10		µg/L	1	10/20/2016 2:26:59 PM	27995
2-Nitroaniline	ND	2.8	10		µg/L	1	10/20/2016 2:26:59 PM	27995
3-Nitroaniline	ND	2.9	10		µg/L	1	10/20/2016 2:26:59 PM	27995
4-Nitroaniline	ND	2.6	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Nitrobenzene	ND	2.8	10		µg/L	1	10/20/2016 2:26:59 PM	27995
2-Nitrophenol	ND	2.4	10		µg/L	1	10/20/2016 2:26:59 PM	27995
4-Nitrophenol	ND	2.6	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Pentachlorophenol	ND	2.3	20		µg/L	1	10/20/2016 2:26:59 PM	27995
Phenanthrene	ND	2.6	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Phenol	96	2.0	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Pyrene	ND	3.1	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Pyridine	ND	2.2	10		µg/L	1	10/20/2016 2:26:59 PM	27995
1,2,4-Trichlorobenzene	ND	2.6	10		µg/L	1	10/20/2016 2:26:59 PM	27995
2,4,5-Trichlorophenol	ND	2.2	10		µg/L	1	10/20/2016 2:26:59 PM	27995
2,4,6-Trichlorophenol	ND	2.4	10		µg/L	1	10/20/2016 2:26:59 PM	27995
Surr: 2-Fluorophenol	15.2	0	15-123		%Rec	1	10/20/2016 2:26:59 PM	27995
Surr: Phenol-d5	40.2	0	15-124		%Rec	1	10/20/2016 2:26:59 PM	27995
Surr: 2,4,6-Tribromophenol	63.7	0	18.4-134		%Rec	1	10/20/2016 2:26:59 PM	27995
Surr: Nitrobenzene-d5	49.5	0	28.8-134		%Rec	1	10/20/2016 2:26:59 PM	27995
Surr: 2-Fluorobiphenyl	56.3	0	35.9-125		%Rec	1	10/20/2016 2:26:59 PM	27995
Surr: 4-Terphenyl-d14	51.5	0	15-146		%Rec	1	10/20/2016 2:26:59 PM	27995

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: TK-569-2-GW
Project: OW-14 Source Inv.
Collection Date: 10/5/2016 3:00:00 PM
Lab ID: 1610355-002E
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

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: 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	28031

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: 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	Batch ID
EPA METHOD 200.7: DISSOLVED METALS							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

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: DUP-GW
Project: OW-14 Source Inv.
Collection Date: 10/5/2016
Lab ID: 1610355-003A
Matrix: 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	R37866
Toluene	43000	59	500		µg/L	500	10/11/2016 7:42:00 PM	R37866
Ethylbenzene	2800	5.6	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
Methyl tert-butyl ether (MTBE)	1100	11	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,2,4-Trimethylbenzene	1600	5.5	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,3,5-Trimethylbenzene	440	5.8	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,2-Dichloroethane (EDC)	ND	5.8	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,2-Dibromoethane (EDB)	ND	5.6	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
Naphthalene	330	4.6	100		µg/L	50	10/11/2016 8:05:00 PM	R37866
1-Methylnaphthalene	58	10	200	J	µg/L	50	10/11/2016 8:05:00 PM	R37866
2-Methylnaphthalene	83	7.9	200	J	µg/L	50	10/11/2016 8:05:00 PM	R37866
Acetone	1400	250	500		µg/L	50	10/11/2016 8:05:00 PM	R37866
Bromobenzene	ND	4.9	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
Bromodichloromethane	ND	7.0	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
Bromoform	ND	5.1	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
Bromomethane	ND	39	150		µg/L	50	10/11/2016 8:05:00 PM	R37866
2-Butanone	840	37	500		µg/L	50	10/11/2016 8:05:00 PM	R37866
Carbon disulfide	ND	30	500		µg/L	50	10/11/2016 8:05:00 PM	R37866
Carbon Tetrachloride	ND	5.4	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
Chlorobenzene	ND	5.7	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
Chloroethane	ND	9.6	100		µg/L	50	10/11/2016 8:05:00 PM	R37866
Chloroform	ND	4.4	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
Chloromethane	ND	11	150		µg/L	50	10/11/2016 8:05:00 PM	R37866
2-Chlorotoluene	ND	20	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
4-Chlorotoluene	ND	6.4	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
cis-1,2-DCE	ND	6.2	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
cis-1,3-Dichloropropene	ND	5.3	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,2-Dibromo-3-chloropropane	ND	12	100		µg/L	50	10/11/2016 8:05:00 PM	R37866
Dibromochloromethane	ND	4.3	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
Dibromomethane	ND	6.0	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,2-Dichlorobenzene	ND	20	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,3-Dichlorobenzene	ND	7.2	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,4-Dichlorobenzene	ND	7.1	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
Dichlorodifluoromethane	ND	18	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,1-Dichloroethane	ND	5.4	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,1-Dichloroethene	ND	5.4	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,2-Dichloropropane	ND	5.5	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,3-Dichloropropane	ND	7.8	50		µg/L	50	10/11/2016 8:05:00 PM	R37866
2,2-Dichloropropane	ND	8.3	100		µg/L	50	10/11/2016 8:05:00 PM	R37866
1,1-Dichloropropene	ND	6.7	50		µg/L	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:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Project: OW-14 Source Inv.
Lab ID: 1610355-003A

Client Sample ID: DUP-GW
Collection Date: 10/5/2016
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 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:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: DUP-GW
Project: OW-14 Source Inv.
Collection Date: 10/5/2016
Lab ID: 1610355-003B
Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	270	13	25		mg/L	500	10/11/2016 12:54:23 PM	G37864
Surr: BFB	83.3	0	66.4-120		%Rec	500	10/11/2016 12:54:23 PM	G37864

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: DUP-GW
Project: OW-14 Source Inv.
Collection Date: 10/5/2016
Lab ID: 1610355-003C
Matrix: 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

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: 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**	
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	27995
4,6-Dinitro-2-methylphenol	ND	1.8	20		µg/L	1	10/20/2016 2:55:10 PM	27995
2,4-Dinitrophenol	ND	2.8	20		µg/L	1	10/20/2016 2:55:10 PM	27995
2,4-Dinitrotoluene	ND	3.1	10		µg/L	1	10/20/2016 2:55:10 PM	27995

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Qualifiers:

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S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: 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 PM	27995
Fluoranthene	ND	2.6	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Fluorene	ND	2.7	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Hexachlorobenzene	ND	2.6	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Hexachlorobutadiene	ND	2.2	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Hexachlorocyclopentadiene	ND	2.3	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Hexachloroethane	ND	2.4	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Indeno(1,2,3-cd)pyrene	ND	3.0	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Isophorone	ND	2.6	10		µg/L	1	10/20/2016 2:55:10 PM	27995
1-Methylnaphthalene	66	2.9	10		µg/L	1	10/20/2016 2:55:10 PM	27995
2-Methylnaphthalene	45	2.9	10		µg/L	1	10/20/2016 2:55:10 PM	27995
2-Methylphenol	83	2.5	10		µg/L	1	10/20/2016 2:55:10 PM	27995
3+4-Methylphenol	120	2.3	10		µg/L	1	10/20/2016 2:55:10 PM	27995
N-Nitrosodi-n-propylamine	ND	2.4	10		µg/L	1	10/20/2016 2:55:10 PM	27995
N-Nitrosodimethylamine	ND	2.2	10		µg/L	1	10/20/2016 2:55:10 PM	27995
N-Nitrosodiphenylamine	ND	2.3	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Naphthalene	150	2.6	10		µg/L	1	10/20/2016 2:55:10 PM	27995
2-Nitroaniline	ND	2.8	10		µg/L	1	10/20/2016 2:55:10 PM	27995
3-Nitroaniline	ND	2.9	10		µg/L	1	10/20/2016 2:55:10 PM	27995
4-Nitroaniline	ND	2.6	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Nitrobenzene	ND	2.8	10		µg/L	1	10/20/2016 2:55:10 PM	27995
2-Nitrophenol	ND	2.4	10		µg/L	1	10/20/2016 2:55:10 PM	27995
4-Nitrophenol	ND	2.6	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Pentachlorophenol	ND	2.3	20		µg/L	1	10/20/2016 2:55:10 PM	27995
Phenanthrene	ND	2.6	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Phenol	61	2.0	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Pyrene	ND	3.1	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Pyridine	ND	2.2	10		µg/L	1	10/20/2016 2:55:10 PM	27995
1,2,4-Trichlorobenzene	ND	2.6	10		µg/L	1	10/20/2016 2:55:10 PM	27995
2,4,5-Trichlorophenol	ND	2.2	10		µg/L	1	10/20/2016 2:55:10 PM	27995
2,4,6-Trichlorophenol	ND	2.4	10		µg/L	1	10/20/2016 2:55:10 PM	27995
Surr: 2-Fluorophenol	11.6	0	15-123	S	%Rec	1	10/20/2016 2:55:10 PM	27995
Surr: Phenol-d5	32.0	0	15-124		%Rec	1	10/20/2016 2:55:10 PM	27995
Surr: 2,4,6-Tribromophenol	51.3	0	18.4-134		%Rec	1	10/20/2016 2:55:10 PM	27995
Surr: Nitrobenzene-d5	35.6	0	28.8-134		%Rec	1	10/20/2016 2:55:10 PM	27995
Surr: 2-Fluorobiphenyl	0	0	35.9-125	S	%Rec	1	10/20/2016 2:55:10 PM	27995
Surr: 4-Terphenyl-d14	38.0	0	15-146		%Rec	1	10/20/2016 2:55:10 PM	27995

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: DUP-GW
Project: OW-14 Source Inv.
Collection Date: 10/5/2016
Lab ID: 1610355-003E
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 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

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: DUP-GW
Project: OW-14 Source Inv.
Collection Date: 10/5/2016
Lab ID: 1610355-003F
Matrix: 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	28031

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Gallup
Client Sample ID: DUP-GW
Project: OW-14 Source Inv.
Collection Date: 10/5/2016
Lab ID: 1610355-003G
Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: DISSOLVED METALS							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

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Hall Environmental Analysis Laboratory, Inc.

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 RANGE							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	R37866
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

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Qualifiers:

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Hall Environmental Analysis Laboratory, Inc.

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

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Qualifiers:

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	161012021
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1610355
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	161012021-001	**Sampling Date**	10/5/2016	**Date/Time Received**	10/11/2016 11:00 AM
Client Sample ID	1610355-001H / TK-569-1-GW	**Sampling Time**	1:55 PM		
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	

Sample Number	161012021-002	**Sampling Date**	10/5/2016	**Date/Time Received**	10/11/2016 11:00 AM
Client Sample ID	1610355-002H / TK-569-2-GW	**Sampling Time**	3:00 PM		
Matrix	Water				
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	**Sampling Date**	10/5/2016	**Date/Time Received**	10/11/2016 11:00 AM
Client Sample ID	1610355-003H / DUP-GW	**Sampling Time**			
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.

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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

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Cyanide	0.530	mg/L	0.5	106.0	90-110	10/19/2016	10/19/2016

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
161011059-001	Cyanide	ND	0.517	mg/L	0.5	103.4	90-110	10/19/2016	10/19/2016

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	0.513	mg/L	0.5	102.6	0.8	0-20	10/19/2016	10/19/2016

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/L	0.01	10/19/2016	10/19/2016

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

QC SUMMARY REPORT

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 Date: **10/27/2016**	SeqNo: **1195095** 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**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Metals**
Client ID: **BatchQC**	Batch ID: **28269**	RunNo: **38294**
Prep Date: **10/25/2016**	Analysis Date: **10/27/2016**	SeqNo: **1195096** 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: **LCS**	TestCode: **EPA Method 200.7: Metals**
Client ID: **LCSW**	Batch ID: **28269**	RunNo: **38294**
Prep Date: **10/25/2016**	Analysis Date: **10/27/2016**	SeqNo: **1195097** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Client ID:	**LCSW**	Batch ID:	**28269**	RunNo:	**38294**
Prep Date:	**10/25/2016**	Analysis Date:	**10/27/2016**	SeqNo:	**1195097** 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			
Silver	0.093	0.0050	0.1000	0	93.5	85	115			
Vanadium	0.47	0.050	0.5000	0	94.8	85	115			
Zinc	0.43	0.010	0.5000	0	86.5	85	115			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Client ID: **PBW**	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								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Nickel	ND	0.010								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Sample ID **LLLCS-B**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **B38141**	RunNo: **38141**
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
Zinc	0.0052	0.010	0.005000	0	105	50	150			J

Sample ID **LCS-B**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **B38141**	RunNo: **38141**
Prep Date:	Analysis Date: **10/21/2016**	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			
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:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID **1610355-003GMS**	SampType: **MS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **DUP-GW**	Batch ID: **B38141**	RunNo: **38141**
Prep Date:	Analysis Date: **10/21/2016**	SeqNo: **1190226** 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**	SampType: **MSD**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **DUP-GW**	Batch ID: **B38141**	RunNo: **38141**
Prep Date:	Analysis Date: **10/21/2016**	SeqNo: **1190227** 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**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **PBW**	Batch ID: **A38164**	RunNo: **38164**
Prep Date:	Analysis Date: **10/24/2016**	SeqNo: **1191047** 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								
Manganese	ND	0.0020								

Sample ID **LCS-A**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **A38164**	RunNo: **38164**
Prep Date:	Analysis Date: **10/24/2016**	SeqNo: **1191048** 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:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**				
Prep Date:		Analysis Date:	**10/24/2016**		SeqNo:	**1191049**	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
Manganese	0.0020	0.0020	0.002000	0	99.5	50	150			J

Sample ID	**LLLCS-A**	SampType:	**LCSLL**		TestCode:	**EPA Method 200.7: Dissolved Metals**				
Client ID:	**BatchQC**	Batch ID:	**A38164**		RunNo:	**38164**				
Prep Date:		Analysis Date:	**10/24/2016**		SeqNo:	**1191614**	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:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**					
Prep Date:	**10/25/2016**	Analysis Date:	**10/26/2016**	SeqNo:	**1193707**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	ND	0.00050								
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	0	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**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.00037	0.00050	0.0005000	0	74.5	50	150			J
Selenium	0.00088	0.0010	0.001000	0	88.2	50	150			J

Sample ID	**MB-28269**	SampType:	**MBLK**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**PBW**	Batch ID:	**28269**	RunNo:	**38356**					
Prep Date:	**10/25/2016**	Analysis Date:	**10/31/2016**	SeqNo:	**1197518**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00029	0.0010								J

Sample ID	**MSLCS-28269**	SampType:	**LCS**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**LCSW**	Batch ID:	**28269**	RunNo:	**38356**					
Prep Date:	**10/25/2016**	Analysis Date:	**10/31/2016**	SeqNo:	**1197520**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.026	0.0010	0.02500	0	102	85	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	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.0013	0.0010	0.001000	0	125	50	150			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.024	0.0010	0.02500	0	98.0	70	130	4.68	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**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.023	0.0010	0.02500	0	93.5	70	130			

Sample ID	**MB-28468**	SampType:	**MBLK**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**PBW**	Batch ID:	**28468**		RunNo:	**38518**				
Prep Date:	**11/3/2016**	Analysis Date:	**11/7/2016**		SeqNo:	**1203031**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								

Sample ID	**MSLCS-28468**	SampType:	**LCS**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**LCSW**	Batch ID:	**28468**		RunNo:	**38518**				
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	0	106	85	115			

Sample ID	**MSLLLCS-28468**	SampType:	**LCSLL**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**BatchQC**	Batch ID:	**28468**		RunNo:	**38518**				
Prep Date:	**11/3/2016**	Analysis Date:	**11/7/2016**		SeqNo:	**1203036**	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	105	50	150			

Sample ID	**1610355-001FMSLL**	SampType:	**MSLL**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**TK-569-1-GW**	Batch ID:	**28468**		RunNo:	**38518**				
Prep Date:	**11/3/2016**	Analysis Date:	**11/7/2016**		SeqNo:	**1203045**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.0055	0.0050	0.02500	0	22.0	70	130			S

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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
Arsenic	0.025	0.0010	0.02500	0	102	85	115			
Selenium	0.027	0.0010	0.02500	0	110	85	115			

Sample ID **LLLCS**	SampType: **LCSLL**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **C38300**	RunNo: **38300**
Prep Date:	Analysis Date: **10/28/2016**	SeqNo: **1196238** 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			J
Selenium	0.0010	0.0010	0.001000	0	103	50	150			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW**	Batch ID: **C38300**	RunNo: **38300**
Prep Date:	Analysis Date: **10/28/2016**	SeqNo: **1196239** 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								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

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	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **lcs**	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	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.52	0.10	0.5000	0	104	90	110			
Chloride	4.9	0.50	5.000	0	97.1	90	110			
Sulfate	10	0.50	10.00	0	100	90	110			

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R37871**	RunNo: **37871**
Prep Date:	Analysis Date: **10/12/2016**	SeqNo: **1179540** 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								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R37871**	RunNo: **37871**
Prep Date:	Analysis Date: **10/12/2016**	SeqNo: **1179541** 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:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Prep Date: **10/11/2016**	Analysis Date: **10/11/2016**	SeqNo: **1179035** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.9	1.0	5.000	0	117	63.2	155			
Surr: DNOP	0.58		0.5000		115	77.1	144			

Sample ID **MB-27993**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **PBW**	Batch ID: **27993**	RunNo: **37844**
Prep Date: **10/11/2016**	Analysis Date: **10/11/2016**	SeqNo: **1179036** 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		126	77.1	144			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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								
Surr: BFB	17		20.00		87.2	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**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	490	25	250.0	259.5	93.6	70	130			
Surr: BFB	8900		10000		88.9	66.4	120			

Sample ID **1610355-001BMSD**	SampType: **MSD**	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: **1179289** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	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:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R37866**	RunNo: **37866**
Prep Date:	Analysis Date: **10/11/2016**	SeqNo: **1179427** 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**	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	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:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
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QC SUMMARY REPORT

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	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:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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	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	8.9		10.00		89.3	70	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**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	34000	50	1000	33230	81.8	70	130			E
Toluene	39000	50	1000	38590	45.3	70	130			ES
Chlorobenzene	980	50	1000	0	98.4	70	130			
1,1-Dichloroethene	860	50	1000	0	85.8	70	130			
Trichloroethene (TCE)	790	50	1000	0	79.4	70	130			
Surr: 1,2-Dichloroethane-d4	430		500.0		86.7	70	130			
Surr: 4-Bromofluorobenzene	480		500.0		95.5	70	130			
Surr: Dibromofluoromethane	470		500.0		93.5	70	130			
Surr: Toluene-d8	490		500.0		98.8	70	130			

Sample ID **1610355-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **TK-569-1-GW**	Batch ID: **R37866**	RunNo: **37866**
Prep Date:	Analysis Date: **10/11/2016**	SeqNo: **1179613** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610355**

21-Nov-16

Client: Western Refining Southwest, Gallup

Project: OW-14 Source Inv.

Sample ID **1610355-001dms**	SampType: **MS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **TK-569-1-GW**	Batch ID: **27995**	RunNo: **38101**
Prep Date: **10/11/2016**	Analysis Date: **10/20/2016**	SeqNo: **1188816** 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**	SampType: **MSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **TK-569-1-GW**	Batch ID: **27995**	RunNo: **38101**
Prep Date: **10/11/2016**	Analysis Date: **10/20/2016**	SeqNo: **1188817** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Prep Date: **10/11/2016**	Analysis Date: **10/20/2016**	SeqNo: **1188817** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	39		100.0		39.4	15	146	0	0	

Sample ID **lcs-27995**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSW**	Batch ID: **27995**	RunNo: **38101**
Prep Date: **10/11/2016**	Analysis Date: **10/20/2016**	SeqNo: **1188820** 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			

Sample ID **mb-27995**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBW**	Batch ID: **27995**	RunNo: **38101**
Prep Date: **10/11/2016**	Analysis Date: **10/20/2016**	SeqNo: **1188821** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **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**
Prep Date: **10/11/2016**	Analysis Date: **10/20/2016**	SeqNo: **1188821** Units: **µg/L**

Analyte	Result	PQL	SPK value	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								

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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QC SUMMARY REPORT

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**
Prep Date: **10/11/2016**	Analysis Date: **10/20/2016**	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								
Naphthalene	ND	10								
2-Nitroaniline	ND	10								
3-Nitroaniline	ND	10								
4-Nitroaniline	ND	10								
Nitrobenzene	ND	10								
2-Nitrophenol	ND	10								
4-Nitrophenol	ND	10								
Pentachlorophenol	ND	20								
Phenanthrene	ND	10								
Phenol	ND	10								
Pyrene	ND	10								
Pyridine	ND	10								
1,2,4-Trichlorobenzene	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
Surr: 2-Fluorophenol	110		200.0		52.8	15	123			
Surr: Phenol-d5	98		200.0		49.0	4.13	124			
Surr: 2,4,6-Tribromophenol	120		200.0		57.7	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: Western Refining Gallup Work Order Number: 1610355 RcptNo: 1

Received by/date: AT 10/07/16

Logged By: Anne Thorne 10/7/2016 9:25:00 AM Anne Thorne

Completed By: Anne Thorne 10/7/2016 Anne Thorne

Reviewed By: aJ 10/10/16

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: 9, 3 (<2 or >12 unless noted)

Adjusted? NO

Checked by:

Special Handling (if applicable)

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

Person Notified: ____ Date ____

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

Regarding: ____

Client Instructions: ____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP, NM 87301
Phone #: 505-722-0217
email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1610355	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Metals (Total & Dissolved)	Gen Chem	Cyanide		Air Bubbles (Y or N)
10/5/16	1355	WATER	TK569-1-GW	40 mL VOA-6	HCL	001			✓							✓						
				1 LITER AMBER-2	NEAT	001											✓					
				250 mL AMBER-1	NEAT	001			✓													
				500 mL PLASTIC-1	HNO_3	001												✓				
				125 mL PLASTIC-1	HNO_3	001												✓				
				125 mL PLASTIC-1	H_2SO_4	001													✓			
				500 mL PLASTIC-1	NEAT	001													✓			
↓	↓	↓	↓	500 mL PLASTIC-1	NAOH	001														✓		

Date: 10/7/16 Time: 925 Relinquished by:
Received by: Date 10/07/16 Time 0925
Date: Time: Relinquished by:
Received by: Date Time

Remarks:

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

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.

GALLUP REFINERY

Mailing Address: 92 GIANT CROSSING RD

GALLUP NM 87301

Phone #: 505-722-0217

email or Fax#: ED.RIEGE@WNR.COM

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:

☒ Standard ☐ Rush _____

Project Name: OW-14 SOURCE INV.

Project #:

Project Manager: ED RIEGE

Sampler: TRACY PAYNE

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.0°

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1610355	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL & DISSOLVED)	GEN CHEM	CYANIDE		Air Bubbles (Y or N)
10/5/16	1500	WATER	TK 569-2-GW	40 ML VOA-6	HCL	002			✓							✓						
				1 LITER AMBER-2	NEAT	002											✓					
				250ML AMBER-1	NEAT	002			✓													
				500 ML PLASTIC-1	HNO_3	002												✓				
				125 ML PLASTIC-1	HNO_3	002												✓				
				125ML PLASTIC-1	H_2SO_4	002													✓			
				500 ML PLASTIC-1	NEAT	002													✓			
↓	↓	↓	↓	500ML PLASTIC-1	NAOH	002														✓		

Date	Time	Relinquished by:	Received by:	Date	Time
10/7/16	925			10/07/16	0925
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

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

Chain-of-Custody Record

Client: WESTERN REFINING SW, INC.
GALLUP REFINERY
Mailing Address: 92 GIANT CROSSING RD
GALLUP NM 87301
Phone #: 505-722-0217
email or Fax#: ED.RIEGE@WNR.COM
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: OW-14 SOURCE INV.
Project #:
Project Manager: ED RIEGE
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
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Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
10/5/16	—	WATER	DUP-GW	40 ML VOA-6	HCL	001
				1 LITER AMBER-2	NEAT	002
				250 ML AMBER-1	NEAT	002
				500 ML PLASTIC-1	HNO_3	002
				125 ML PLASTIC-1	HNO_3	002
				125 ML PLASTIC-1	H_2SO_4	003
				500 ML PLASTIC-1	NEAT	003
↓	↓	↓	↓	500 ML PLASTIC-1	NAOH	003
10/5/16	—	WATER	TRIP BLANK	40 ML VOA-3	HCL	004

Analysis Request	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	METALS (TOTAL & DISSOLVED)	GEN CHEM	CYANIDE		Air Bubbles (Y or N)
10/5/16 — WATER DUP-GW			✓							✓						
											✓					
			✓													
												✓				
												✓				
													✓			
													✓			
														✓		
10/5/16 — WATER TRIP BLANK										✓						

Date: 10/7/16 Time: 925 Relinquished by: Received by: Date 10/07/16 Time 0925
Date: Time: Relinquished by: Received by: Date Time

Remarks:

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

WESTERN REFINING SOUTHWEST, INC.
GALLUP REFINERY

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 HN03 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:
    - Toluene – 0.22 ug/L;
    - 1,2,4-Trimethylbenzene – 0.14 ug/L;
    - Naphthalene – 0.33 ug/L;
    - 1-Methylnaphthalene – 0.43 ug/L;
    - 2-Methylnaphthalene – 0.51 ug/L;
    - 2-Methyl-2-pentanone – 1.4 ug/L;
    - 1,2,3-Trichlorobenzene – 0.13 ug/L;
    - 1,2,4-Trichlorobenzene – 0.18 ug/L; and
    - 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:
    - 1,2,4-Trimethylbenzene – 0.13 ug/L;
    - Naphthalene – 0.30 ug/L;
    - 1-Methylnaphthalene – 0.43 ug/L;
    - 2-Methylnaphthalene – 0.50 ug/L;
    - Chlorobenzene – 0.14 ug/L;
    - 4-Methyl-2-pentanone – 1.4 ug/L;
    - Methylene chloride – 0.21 ug/L; and
    - 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:

HEAL Report 1610091 – 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.

HEAL Report 1610355 – 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.

<u>HEAL Report 1610091</u>

- 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;

    - Acenaphthene;
    - 4-Chloloro-3-methylphenol;
    - 2-Chlorophenol;
    - 1,4-Dichlorobenzene;
    - 2,4-Dinitrotoluene;
    - N-Nitrosodi-n-propylamine;
    - Phenol; and
    - 1,2,4-Trichlorobenzene.

    None of the SVOCs were detected in the associated analytical batch. The results were not qualified.

<u>HEAL Report 1610091</u>

- 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 2-chlorophenol were detected in the associated analytical batch. The results were not qualified.

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- 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.

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- 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 (DUP01) 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:

$$\% \text{ Technical Completeness} = \left(\frac{\text{Number of usable results}}{\text{Number of reported results}}\right) \times 100$$

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.

Table A-1 - Sample Identification
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

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
OW-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

Table A-1 - Sample Identification
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Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

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
FD = Field duplicate
FB = Field blank
NA = Not applicable
TB = Trip blank
EB = Equipment blank
GW = Groundwater sample
MB = Methanol blank

Table A-2 Qualified Data
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Sample ID	Lab Sample ID	Date Collected	Parameter Name	Result	Units	Matrix	Qualifier	Comments
OW-57 (16-18')	1609E26-001A	09/21/16	Bis(2-ethylhexyl)phthalate	0.13	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.14 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 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
OW-57 (25-27')	1609e26-002a	09/21/16	1-Methylnaphthalene	0.281	µg/Kg	Soil	J+	Analyte detected below quantitation limits and is biased high as 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 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
OW-57 (25-27')	1609e26-002a	09/21/16	Diethyl phthalate	0.17	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as 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 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
OW-58 (10-12)	1609e26-004a	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 (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
OW-58 (22-24')	1609e26-005a	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 (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
OW-58 (28-29')	1609e26-006a	09/22/16	Bis(2-ethylhexyl)phthalate	0.14	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 0.14 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
OW-58 (48-48.5')	1609e26-007a	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
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 recovery for DNOP

Table A-2 Qualified Data
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Sample ID	Lab Sample ID	Date Collected	Parameter Name	Result	Units	Matrix	Qualifier	Comments
TK-568-1 (30-32')	1609e26-009a	09/23/16	DRO	11	mg/kg	soil	J+	Analyte detected in method blank at 5.8 mg/kg. The MSD recovery was above the accptance limit. The RPD was outside the accpted 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

Table A-2 Qualified Data
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

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.

Table A-2 Qualified Data
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

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.
OW-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.
OW-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.
OW-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

Table A-2 Qualified Data
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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.

Table A-2 Qualified Data
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

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.

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK-568-1 (30-32')		DUP01		RPD
	1609E26-009		1609E26-011		
	9/23/2016		9/23/2016		%
Metals (mg/kg)					
Antimony	< 0.9808	u	< 1.0074	u	NC
Arsenic	1.6	J	1.6	J	0.0
Barium	180	v	210	v	3.8
Beryllium	0.74	v	0.62	v	4.4
Cadmium	< 0.0618	u	< 0.0635	u	NC
Chromium	7.6	v	6.4	v	4.3
Cobalt	3.3	v	3	v	2.4
Cyanide	< 0.25	u	< 0.25	u	NC
Iron	12000	v	10000	v	4.5
Lead	3.9	v	6	v	10.6
Manganese	290	v	300	v	0.8
Mercury	0.0028	J	0.0045	J	11.6
Nickel	5.9	v	5.2	v	3.2
Selenium	< 1.7733	u	< 1.8214	u	NC
Silver	< 0.061	u	< 0.0627	u	NC
Vanadium	14	v	12	v	3.8
Zinc	11	v	9.4	v	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	v	5.3	v	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	v	1.8	v	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

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK-568-1 (30-32')		DUP01		RPD
	1609E26-009		1609E26-011		
	9/23/2016		9/23/2016		%
2-Chlorotoluene	< 0.0222	u	< 0.0193	u	NC
2-Hexanone	< 0.1637	u	< 0.1426	u	NC
2-Methylnaphthalene	0.55	J	0.47	J	3.9
4-Chlorotoluene	< 0.0266	u	< 0.0232	u	NC
4-Isopropyltoluene	< 0.027	u	< 0.0235	u	NC
4-Methyl-2-pentanone	< 0.0877	u	< 0.0764	u	NC
Acetone	< 0.3892	u	< 0.3392	u	NC
Benzene	0.26	v	0.39	v	10.0
Bromobenzene	< 0.0242	u	< 0.0211	u	NC
Bromodichloromethane	< 0.0175	u	< 0.0153	u	NC
Bromoform	< 0.0366	u	< 0.0319	u	NC
Bromomethane	< 0.1108	u	< 0.0966	u	NC
Carbon disulfide	< 0.0993	u	< 0.0865	u	NC
Carbon tetrachloride	< 0.0197	u	< 0.0172	u	NC
Chlorobenzene	< 0.0245	u	< 0.0213	u	NC
Chloroethane	< 0.06	u	< 0.0523	u	NC
Chloroform	< 0.0227	u	< 0.0198	u	NC
Chloromethane	< 0.0268	u	< 0.0233	u	NC
cis-1,2-DCE	< 0.0175	u	< 0.0152	u	NC
cis-1,3-Dichloropropene	< 0.0277	u	< 0.0242	u	NC
Dibromochloromethane	< 0.0272	u	< 0.0237	u	NC
Dibromomethane	< 0.0261	u	< 0.0227	u	NC
Dichlorodifluoromethane	< 0.0931	u	< 0.0811	u	NC
Ethylbenzene	1.5	v	1.5	v	0.0
Hexachlorobutadiene	< 0.0368	u	< 0.0321	u	NC
Isopropylbenzene	0.11	J	0.11	J	0.0
Methyl tert-butyl ether (MTBE)	1	v	1.1	v	2.4
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	u	< 0.0234	u	NC
tert-Butylbenzene	< 0.0249	u	< 0.0217	u	NC
Tetrachloroethene (PCE)	< 0.0249	u	< 0.0217	u	NC
Toluene	0.4	v	0.46	v	3.5
trans-1,2-DCE	< 0.0842	u	< 0.0734	u	NC
trans-1,3-Dichloropropene	< 0.044	u	< 0.0384	u	NC
Trichloroethene (TCE)	< 0.0322	u	< 0.0281	u	NC
Trichlorofluoromethane	< 0.0225	u	< 0.0196	u	NC
Vinyl chloride	< 0.0246	u	< 0.0214	u	NC
Xylenes, Total	9.1	v	9.2	v	0.3

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK-568-1 (30-32')		DUP01		RPD
	1609E26-009		1609E26-011		
	9/23/2016		9/23/2016		%
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	v	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	v	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

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK-568-1 (30-32')		DUP01		RPD
	1609E26-009		1609E26-011		
	9/23/2016		9/23/2016		%
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	v	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 (mg/kg)					
Gasoline Range Organics (GRO)	330	v	340	v	0.7
Diesel Range Organics (DRO)	11	v	430	v	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)) x 100

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK569-2 (16-18')		DUP02		RPD
	1610238-001		1610238-008		
	10/4/2016		10/4/2016		%
Metals (mg/kg)					
Antimony	< 0.9951	u	< 1.0148	u	NC
Arsenic	1.6	J	1.3	J	5.2
Barium	200	v	160	v	5.6
Beryllium	0.64	v	0.78	v	4.9
Cadmium	< 0.0627	u	< 0.064	u	NC
Chromium	6.4	v	7.9	v	5.2
Cobalt	3.2	v	3.6	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	v	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	v	14	v	3.8
Zinc	9.6	v	12	v	5.6
Volatiles (mg/kg)					
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	v	1.4	v	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	v	0.44	v	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	v	0.23	v	8.2
2,2-Dichloropropane	< 0.0033	u	< 0.002	u	NC
2-Butanone	< 0.0332	u	< 0.0201	u	NC

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK569-2 (16-18')		DUP02		RPD
	1610238-001		1610238-008		
	10/4/2016		10/4/2016		%
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	v	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	v	0.23	v	14.1
Hexachlorobutadiene	< 0.0071	u	< 0.0043	u	NC
Isopropylbenzene	0.071	v	0.044	v	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	v	0.39	v	9.8
n-Butylbenzene	0.23	v	0.17	v	7.5
n-Propylbenzene	0.34	v	0.21	v	11.8
sec-Butylbenzene	0.072	v	0.043	v	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	v	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

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK569-2 (16-18')		DUP02		RPD
	1610238-001		1610238-008		
	10/4/2016		10/4/2016		%
Semi-volatiles (mg/kg)					
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	v	< 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	< 0.0826	u	NC
Benzyl alcohol	< 0.0779	u	< 0.078	u	NC
Bis(2-chloroethoxy)methane	< 0.108	u	< 0.1082	u	NC

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK569-2 (16-18')		DUP02		RPD
	1610238-001		1610238-008		
	10/4/2016		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 (mg/kg)					
Gasoline Range Organics (GRO)	31	v	24	v	6.4
Diesel Range Organics (DRO)	17	v	11	v	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)) x 100

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK569-2 (36-38')		DUP03		RPD
Lab ID	1610238-003		1610238-009		%
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	v	160	v	15.2
Beryllium	0.58	v	0.63	v	2.1
Cadmium	< 0.0621	u	< 0.0635	u	NC
Chromium	6.6	v	7.2	v	2.2
Cobalt	2.1	v	2.3	v	2.3
Cyanide	< 0.269	u	< 0.246	u	NC
Iron	11000	v	11000	v	0.0
Lead	1.1	v	1	v	2.4
Manganese	450	v	490	v	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)					
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	v	0.0025	v	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

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK569-2 (36-38')		DUP03		RPD
Lab ID	1610238-003		1610238-009		
Sample Date	10/4/2016		10/4/2016		%
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	<0.0002	u	<0.0002	u	NC
Chloroethane	<0.0003	u	<0.0003	u	NC
Chloroform	<0.0019	u	<0.0018	u	NC
Chloromethane	<0.0005	u	<0.0004	u	NC
cis-1,2-DCE	<0.0019	u	<0.0018	u	NC
cis-1,3-Dichloropropene	<0.0019	u	<0.0018	u	NC
Dibromochloromethane	<0.0019	u	<0.0018	u	NC
Dibromomethane	<0.0019	u	<0.0018	u	NC
Dichlorodifluoromethane	<0.0011	u	<0.001	u	NC
Ethylbenzene	0.0041	v	0.0019	v	18.3
Hexachlorobutadiene	<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	v	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	v	21.2

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK569-2 (36-38')		DUP03		RPD
Lab ID	1610238-003		1610238-009		%
Sample Date	10/4/2016		10/4/2016		
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

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK569-2 (36-38')		DUP03		RPD
Lab ID	1610238-003		1610238-009		
Sample Date	10/4/2016		10/4/2016		%
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)) x 100

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK-569-1-GW		DUP-GW		RPD
Lab ID	1610355-001		1610355-003		
Sample Date	10/5/2016		10/5/2016		%
Metals (ug/l) TOTAL					
Antimony	<2.36	u	<0.47	u	NC
Arsenic	16	Z	15	Z	1.6
Barium	8700	Z	9500	Z	2.2
Beryllium	1.7	J	2.2	v	6.4
Cadmium	<1.48	u	<1.48	u	NC
Chromium	14	v	16	v	3.3
Cobalt	9.4	v	10	v	1.5
Cyanide	<10	u	<10	u	NC
Iron	28000	Z	30000	Z	1.7
Lead	21	Z	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	J	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	J	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)					
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

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK-569-1-GW		DUP-GW		RPD
Lab ID	1610355-001		1610355-003		
Sample Date	10/5/2016		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	J	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

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK-569-1-GW		DUP-GW		RPD
Lab ID	1610355-001		1610355-003		
Sample Date	10/5/2016		10/5/2016		%
tert-Butylbenzene	<5.75	u	<5.75	u	NC
Tetrachloroethene (PCE)	<7.6	u	<7.6	u	NC
Toluene	41000	v	43000	v	1.2
trans-1,2-DCE	<20	u	<20	u	NC
trans-1,3-Dichloropropene	<5.16	u	<5.16	u	NC
Trichloroethene (TCE)	<8.75	u	<8.75	u	NC
Trichlorofluoromethane	<10.22	u	<10.22	u	NC
Vinyl chloride	<9.77	u	<9.77	u	NC
Xylenes, Total	15000	v	15000	v	0.0
Semi-volatiles (ug/l)					
1,2,4-Trichlorobenzene	<2.62	u	<2.62	u	NC
1,2-Dichlorobenzene	<2.29	u	<2.29	u	NC
1,3-Dichlorobenzene	<2.26	u	<2.26	u	NC
1,4-Dichlorobenzene	<2.39	u	<2.39	u	NC
1-Methylnaphthalene	71	v	66	v	1.8
2,4,5-Trichlorophenol	<2.18	u	<2.18	u	NC
2,4,6-Trichlorophenol	<2.45	u	<2.45	u	NC
2,4-Dichlorophenol	<2.33	u	<2.33	u	NC
2,4-Dimethylphenol	33	v	39	v	4.2
2,4-Dinitrophenol	<2.75	u	<2.75	u	NC
2,4-Dinitrotoluene	<3.13	u	<3.13	u	NC
2,6-Dinitrotoluene	<2.73	u	<2.73	u	NC
2-Chloronaphthalene	<2.25	u	<2.25	u	NC
2-Chlorophenol	<2.18	u	<2.18	u	NC
2-Methylnaphthalene	76	v	45	v	12.8
2-Methylphenol	68	v	83	v	5.0
2-Nitroaniline	<2.76	u	<2.76	u	NC
2-Nitrophenol	<2.38	u	<2.38	u	NC
3,3´-Dichlorobenzidine	<2.4	u	<2.4	u	NC
3+4-Methylphenol	110	v	120	v	2.2
3-Nitroaniline	<2.95	u	<2.95	u	NC
4,6-Dinitro-2-methylphenol	<1.8	u	<1.8	u	NC
4-Bromophenyl phenyl ether	<2.64	u	<2.64	u	NC
4-Chloro-3-methylphenol	<2.56	u	<2.56	u	NC
4-Chloroaniline	<2.71	u	<2.71	u	NC
4-Chlorophenyl phenyl ether	<2.56	u	<2.56	u	NC
4-Nitroaniline	<2.56	u	<2.56	u	NC
4-Nitrophenol	<2.55	u	<2.55	u	NC
Acenaphthene	<2.55	u	<2.55	u	NC
Acenaphthylene	<2.36	u	<2.36	u	NC
Aniline	<2.44	u	<2.44	u	NC
Anthracene	<2.49	u	<2.49	u	NC
Azobenzene	<2.67	u	<2.67	u	NC
Benz(a)anthracene	<2.64	u	<2.64	u	NC
Benzo(a)pyrene	<2.72	u	<2.72	u	NC
Benzo(b)fluoranthene	<2.88	u	<2.88	u	NC
Benzo(g,h,i)perylene	<2.64	u	<2.64	u	NC

Table A-3 - Field Duplicate Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	TK-569-1-GW		DUP-GW		RPD
Lab ID	1610355-001		1610355-003		
Sample Date	10/5/2016		10/5/2016		%
Benzo(k)fluoranthene	<3	u	<3	u	NC
Benzoic acid	43	v	85	v	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	v	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	v	27	v	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	v	150	v	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	v	61	v	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	v	270	v	0.9
Diesel Range Organics (DRO)	22	v	23	v	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)) x 100

Table A-4 - Completeness Summary
OW-14 Source Area Investigation Report
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	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

Western Refining Company

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 onTK-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: **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: 2/1/2011

IN-SERVICE TANK INSPECTION REPORT

CLIENT: Western Refining **FACILITY LOCATION:** Gallup NM **TANK #:** TK-568

GENERAL INFORMATION

TANK LOCATION: Tank farm **TYPE:** Storage
LIQUID CONTENTS: MTBE **HEIGHT** 24' **CAPACITY:** 5000 Barrels
DIAMETER: 25' **ROOF TYPE:** FLAT **BOTTOM TYPE:** FLAT
TANK SUPPORT TYPE FLAT **MATERIAL:** STEEL
TANK MATERIAL AND TYPE OF CONSTRUCTION: A36
NAME PLATE INFORMATION YES

INSPECTION CHECKLIST

ITEM	Inspection Task	ACC	NA	Comments & Observations
1.1 Foundation	Inspect anchor bolts & nuts for corrosion, 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

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
5.1 Roof	Inspect for paint failure, corrosion or pitting (gauge)	X		
5.2	Check for indications of standing water	X		
5.3	Inspect insulation for cracks, leaks or wet	X		
6.1 Roof Attachments	Inspect nozzles for flange leaks, cracked 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

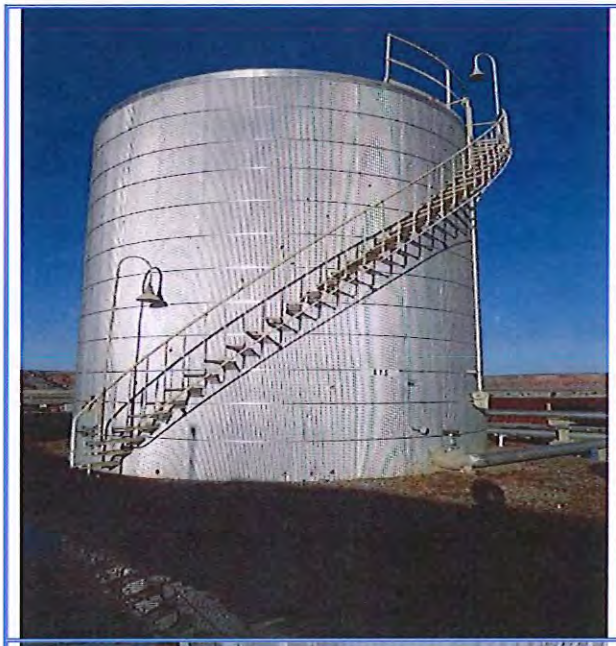
Recommendations: (W/O# 624998/ IR# 2015-125)

- 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 — **January 2015**
Performed by Terminal Personnel

Shell External Visual Inspection — **December 2019**
*Performed by an authorized inspector
Minimum of RCA/4N or 5 yrs

Shell Ultrasonic Thickness Inspection — **December 2029**
*Performed by an authorized inspector
Minimum of RCA/2N or 15 yrs

Corrosion Rate **0.0001** **in/yr**

Client: Western Refining
Date: December 19, 2014
Tank Number: 568

Liquid Load Condition

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	H	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:

$$t_d = \frac{2.6D(H-1)G}{E.\varphi.S_d}$$

$$t_t = \frac{2.6D(H-1)}{E.S_t}$$

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	[-]	1.324
Filling height	*h*	feet	22.00
Maximum safe filling height	*h*	feet	22.00

Course No.	Course height [feet]	Product height [feet]	Material Yield Y [PSI]	Material Tensile T [PSI]	Allowable Stress S [PSI]	Joint Efficiency Factor E	Minimum calculated t [inch]	Minimum allowable t [inch]	Measured t min [inch]	Integrity check
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	OK
2	6.00	16.00	30000	55000	23595	0.85	0.064	0.100	0.183	OK
1	6.00	22.00	30000	55000	23595	0.85	0.090	0.100	0.181	OK

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 [inch]	min t allowable liq.load [inch]	min allowable [inch]	min thickness measured [inch]	Integrity check
4	0.041	0.100	**0.100**	0.185	OK
3	0.041	0.100	**0.100**	0.182	OK
2	0.041	0.100	**0.100**	0.183	OK
1	0.041	0.100	**0.100**	0.181	OK

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]
4	0.188	0.185	0.000	0.100	0.085	745	484.5	969.0
3	0.188	0.182	0.000	0.100	0.082	719	212.5	424.9
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
		Maximum CR:	0.000114			Minimum Allowable:	5.0	15.0

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.

NB: Local regulations/conditions may have affect on the above recommendations.

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 ☐ POOR	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

EXTERNAL TANK INSPECTION REPORT

ADDITIONAL COMMENTS

No Recommendations.

Reference Photographs



Full View



Name Plate



Ground Wire



Ground Wire

EXTERNAL TANK INSPECTION REPORT

	
Attached Piping	Ladder and Roof Appurtenances

Signature: Gary J Shelton **Date: 2/5/2019**

Inspector & API #
Gary J. Shelton
API-653 Cert. #6399

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



Full View



Name Plate



Interior of Tank



Interior of Tank

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.	



Interior of Tank



Interior of Tank



Interior of Tank



Underside of Roof

Signature: Gary J Shelton **Date: 2/5/2019**

Inspector & API #
Gary J. Shelton
API-653 Cert. #6399

Western Refining Company

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

Western Refining Company

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: _____

Jay White
Senior Plant Inspector
Western Refining Southwest, Inc.
Date: 10-07-2010

Western Refining

Title:	Procedure No:	PSM 510
	Page:	1 of 1
Attachment 510P – MECHANICAL INTEGRITY FORM - PIPING	Revision:	00
	Effective Date:	04/01/2008

Required section completed by MOC Owner

MOC Owner Kelly Sanchez

MOC Title TANK Farm 2010-052 Radar gauge & Target

Required section completed by Gallup Pipe Dept.

The inspection aspects of the above MOC were verified by Jay White (print name)

Inspection Report(s)/N.D.E. Request for the above MOC is filed in: Equipment File

INCLUDED IN INSPECTION FILE

N.D.E. File	IWR[1] No.	_____	YES	_____	NO	_____
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

Jay White WNR — Print Inspector's Name & Company

Inspector's Signature — 10-8-10 Date

Chief Inspector's Signature — 10-8-10 Date

DISTRIBUTION: **MOC RELATED (ORIGINAL):** PSM Administrative Assistant
NON MOC (ORIGINAL): Inspection

Western Refining

Title:

Attachment 510P – Mechanical Integrity Form – Piping & Equipment Inspection Test Plan.

Procedure No:	508.03
Page:	1
Revision:	0
Effective Date:	09/02/09

Date:	06-25-2010		
Unit:	Tank Farm	Line or Equipment #:	Tank 569
AFE #:			
WO# or PO#:			
MOC Owner:			
MOC Number:			

Design Code: ☐ASME B31.3 ☐ASME B31.1 ☐ASME Sec. VIII D1 ☐API 620 ☒API 650 ☐Other: _____
Repair Code: ☐NBIC ☐API 510 ☐API 570 ☒API 653 ☐Other: _____

Testing or Inspection Required					
Technique	**Complete?**	**Extent**	**Technique**	**Complete?**	**Extent**
☒ RT	☐Y ☒N	100% of Repairs to shell	☐ PMI	☐Y ☐N	
☒ UT	☒Y ☐N	UT floor, 1st Shell course, & Roof	☐ BHN	☐Y ☐N	
☐ PT	☐Y ☐N		☐ FLIR	☐Y ☐N	
☐ MT ☒ WFMT	☒Y ☐N	WFMT 1st Shell course, "T" Joints, Internal Nozzle Att. Welds, & Shell To Bottom "T" Joint	☐ Preheat	☐Y ☐N	
			☐ PWHT	☐Y ☐N	
☒ VT	☒Y ☐N	☒Internal	☒External		
		API 653	API 653		
☐ Boroscope	☐Y ☐N				
☐ Jeep testing	☐Y ☐N				
☐ Hydrostatic	☐Y ☐N	**Extent**			**Test Pressure**
		☐Full ☐ Partial			
☐ Pneumatic	☐Y ☐N	**Extent**			**Test Pressure**
		☐Full ☐ Partial			

Additional Testing / Inspection and comments:

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, and all floor seams.
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 Jay White **Date:** 06-25-2010

(Post-Work) Inspection Report(s)/NDE request for the above MOC is filed in: Equipment File

(Post Work:) The Inspection aspects of the above work or MOC were verified by: **Chief Inspector:** [signature] **Date:** 10-8-10

Western Refining

Title:	Procedure No:	508.03
	Page:	1
Attachment 510P – Mechanical Integrity Form – Piping & Equipment Inspection Test Plan.	Revision:	0
	Effective Date:	09/02/09

Date:	09-02-2010		
Unit:	Tank Farm	Line or Equipment #:	Tank 569 Floor Repair
AFE #:			
WO# or PO#:			
MOC Owner:			
MOC Number:			

Design Code: ☐ASME B31.3 ☐ASME B31.1 ☐ASME Sec. VIII D1 ☐API 620 ☒API 650 ☐Other: _____
Repair Code: ☐NBIC ☐API 510 ☐API 570 ☒API 653 ☐Other: _____

Testing or Inspection Required

Technique	Complete?	Extent	Technique	Complete?	Extent
☐ RT	☐Y ☐N		☐ PMI	☐Y ☐N	
☒ UT	☐Y ☐N	UT base metal area for patch	☐ BHN	☐Y ☐N	
☐ PT	☐Y ☐N		☐ FLIR	☐Y ☐N	
☐ MT ☐ WFMT	☐Y ☐N		☐ Preheat	☐Y ☐N	
			☐ PWHT	☐Y ☐N	
☒ VT	☐Y ☐N	☐Internal	☒External		
☐ Boroscope	☐Y ☐N				
☐ Jeep testing	☐Y ☐N				
☐ Hydrostatic	☐Y ☐N	Extent: ☐Full ☐ Partial	Test Pressure		
☐ Pneumatic	☐Y ☐N	Extent: ☐Full ☐ Partial	Test Pressure		

Additional Testing / Inspection and comments:

Vacuum box fillet welds on patches. A circular plate should be A516-70, .25 inches thick with a minimum six inch radius placed no closer than two inches of an existing weld and no closer than six inches from the shell to floor attaching weld. Weld should be a two pass .25 inch fillet weld.

(Pre-Work) Inspector: Jay White _____ **Date:** 09-02-2010

(Post-Work) Inspection Report(s)/NDE request for the above MOC is filed in: Equipment File

(Post Work:) The Inspection aspects of the above work or MOC were verified by: **Chief Inspector:** _____ **Date:** 10-8-10

Western Refining

Title:	Procedure No:	508.03
Attachment 510P – Mechanical Integrity Form – Piping & Equipment Inspection Test Plan.	Page:	1
	Revision:	0
	Effective Date:	09/02/09

Date:	09-01-2010		
Unit:	Tank Farm	Line or Equipment #:	Tank 569 Roof Repair
AFE #:			
WO# or PO#:			
MOC Owner:			
MOC Number:			

Design Code: ☐ASME B31.3 ☐ASME B31.1 ☒ASME Sec. VIII D1 ☐API 620 ☐API 650 ☐Other: _____
Repair Code: ☐NBIC ☒API 510 ☐API 570 ☐API 653 ☐Other: _____

Testing or Inspection Required

Technique	Complete?	Extent	Technique	Complete?	Extent
☐ RT	☐Y ☐N		☐ PMI	☐Y ☐N	
☒ UT	☒Y ☐N	UT base metal area for patch	☐ BHN	☐Y ☐N	
☐ PT	☐Y ☐N		☐ FLIR	☐Y ☐N	
☐ MT ☐ WFMT	☐Y ☐N		☐ Preheat	☐Y ☐N	
			☐ PWHT	☐Y ☐N	
☒ VT	☒Y ☐N	☐Internal	☒External		
☐ Boroscope	☐Y ☐N				
☐ Jeep testing	☐Y ☐N				
☐ Hydrostatic	☐Y ☐N	**Extent** ☐Full ☐ Partial			**Test Pressure**
☐ Pneumatic	☐Y ☐N	**Extent** ☐Full ☐ Partial			**Test Pressure**

Additional Testing / Inspection and comments:

Vacuum box fillet welds on patches. Plate should be GR A516-70, .25 inches thick with 2 inch radius on corners and extend minimum 2 inches past existing welds. Minimum dimensions six inches by six inches by .250 inch thick. Weld should be a two pass .25 inch fillet weld.l

(Pre-Work) Inspector: Jay White J White **Date:** 09-01-2010

(Post-Work) Inspection Report(s)/NDE request for the above MOC is filed in: Equipment File

(Post Work:) The Inspection aspects of the above work or MOC were verified by: **Chief Inspector:** BJ Hill **Date:** 10-8-10

Western

Title:	Procedure No:	PSM 510
	Page:	1 of 1
Attachment 510N – MOC Rotating Equip., Fixed Equip. Piping Closure Form	Revision:	02
	Effective Date:	03/24/2008

EQUIPMENT #: TANK 569 UNIT: TANK FARM

SERVICE DESCRIPTION: 83 octane AG Storage TANK DATE: 10-7-10

Has Punch List / Recommendations Completed:	YES ☐	NO ☐	NA ☒	Waived ☐
Has leveling and alignment been completed and tested:	YES ☐	NO ☐	NA ☒	Waived ☐
Has vibration analysis been completed:	YES ☐	NO ☐	NA ☒	Waived ☐
Has overspeed trip test been completed:	YES ☐	NO ☐	NA ☑	Waived ☐

Partial Hydrostatic Complete Unit/System Vessel	☐	Partial Pneumatic Complete Unit/System Vessel	☐	Partial Waived Complete Unit/System Vessel	☐
Shell Side	☐	Shell Side	☐	Shell Side	☐
Tube Side	☐	Tube Side	☐	Tube Side	☐
Spool	☐	Spool	☐	Spool	☐

Test Pressure: NA Psig. Medium: NA Hold Time: NA Ambient Temp: NA °F

RESPONSIBILITIES Closure Form only

1)	Maintenance/ Contactor:	Will ensure that the equipment was put back together as per the current approved drawing/revision.
2)	Engineering:	Will be involved only during Catalyst and Packing loading/unloading. Catalyst and Packing loading will be performed with an approved loading Diagram.
3)	Inspection:	Will ensure all Testings are completed and certify the equipment for continuous service.
4)	Operations/ Terminal:	Will ensure prior to closing the equipment that it is clean and free of any debris internally. It should also be free externally from scaffolding or any other source of energy that was temporarily installed.
5)	Refinery Manager:	If applicable will sign off the waiver.

1. Stephen Sandoval Date: 10-7-10
Maintenance/~~Contractor~~

2. _____ Date: _____
Engineering

3. [signature] Date: 10-7-10
Inspection

4. [signature] Date: 10-1-10
~~Operations-Process~~/Offsites

_____ Date: _____
Refinery Manager *(for waiver granted)*

DISTRIBUTION: MOC RELATED: PSM Administrative Assistant

3861 Vincent Station
Drive Owensboro, KY
42303 Tele: (270) 689-
9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

ULTRASONIC EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	I.T.I.	8/26/2010

Project: UT READINGS TAKEN ON TANK 569 SHELL & NOZZELS

Contract No. or Purchase Order No.	Integrity Testing Job No.
	2010-00106

Item

Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other:
☐	☐	☐	☐	☐	☐	☐	

Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other:
☐	☑	☑	☐	☐	☐	☐	

Material

Size	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld ☑ N/A ☐ Smooth ☐ As Welded
67' D X 40' H	19	CS		

Location

Location	System
WESTERN REFINING, GALLUP N.M.	TANK 569

Acceptance Standard

	Procedure
API 653	UT QCP 601

Type of Inspection

Soundness	A-P1	Bond
☐	☐	☐

Pulse Echo	Angle-Beam	Other
☑	☐	☐

Transducer: ☐ Single Crystal ☑ Dual Crystal

Frequency	Size	Angle
5 MHz	0.3125"	0"

Flat	Concave	Convex
☑	☐	☐

Couplant: SonoTest Ultragel-II

UT Equipment/Model: 37 DL PLUS
S/N 061409209

Standard	Material	Notch depth	Serial No.
N/A	CS	N/A	N/A
Step Wedge ☑ / Tube Wedge ☐	Material	Thickness Range	Serial No.
	CS	.500-.100	06-3474

Reference: Summary ☐ See Attachment

Results of Inspection:

PERFORMED UT THICKNESS MEASUREMENTS ON TANK 569 SHELL & NOZZELS

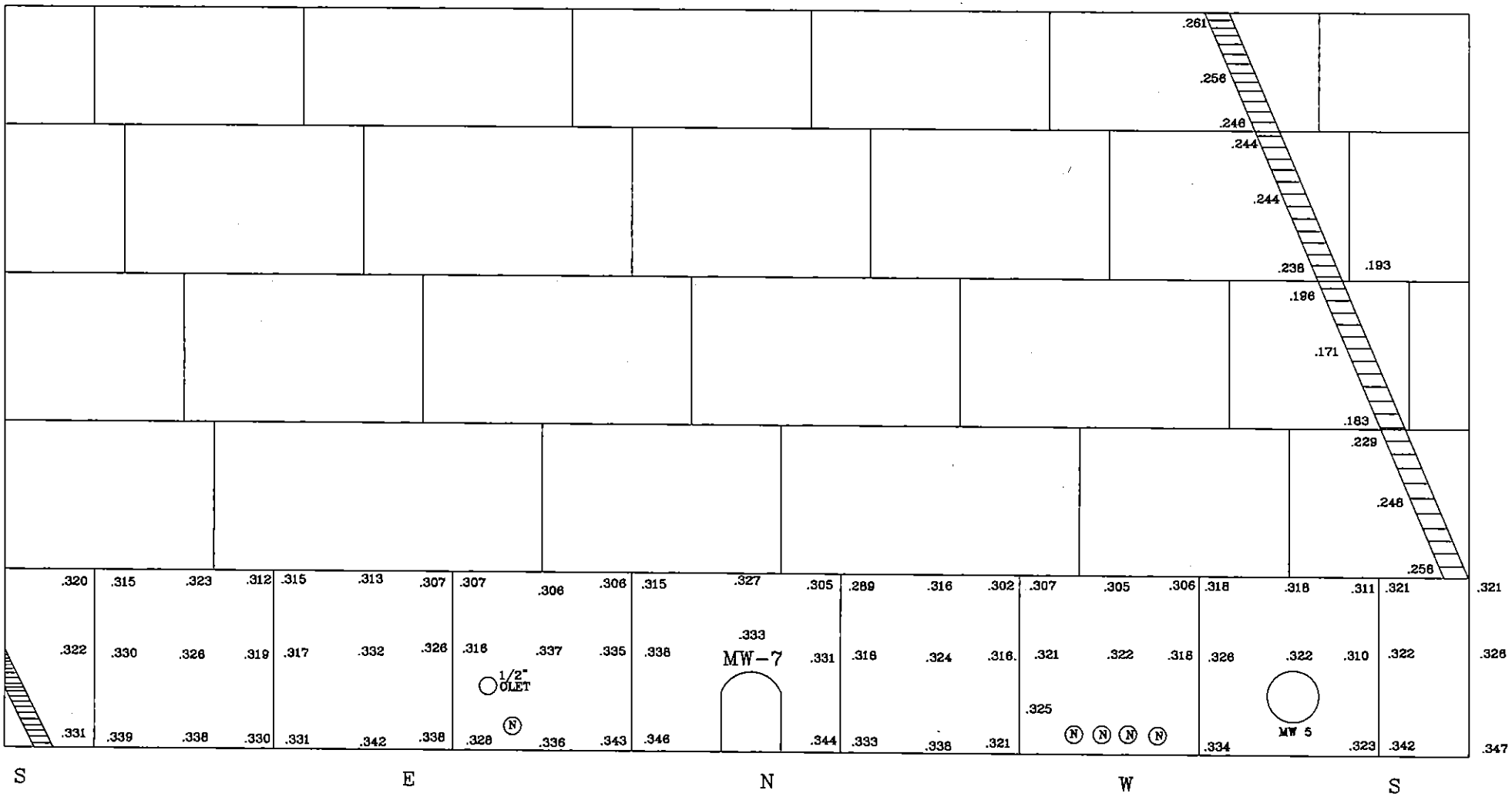
SEE ATTACHMENT FOR LOCATIONS AND THICKNESS READINGS

Copy To:

Requested By:	Reported By (Technician):
BRIAN HINES	David Mitchell / Rayn Woodring
☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: ROLAN COLEMAN

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.

N1–6"	N2–8"	N3–6"	N4–8"	MW–5–26"	N6–3"	MW–7
T .389	T .510	T .401	T .438	T .476	T .281	T .474
B .371	B .472	B .403	B .447	B .474	B .277	E .477
N .412	N .484	N .380	N .469	N .479	N .284	W .480
S .390	S. .518	S .394	S .454	S .480	S .287	



FACILITY:	P&ID #:	DESIGN TEMP: °F	INSULATED:	SCALE:
LINE:#	FLANGE RATING:	OPER TEMP: °F	DRAWN BY: JD	DESCRIPTION:
SERVICE:	DESIGN CODE:	DESIGN PSIG:	DATE: 9-3-10	TECHNICIANS: RB - RW
SPEC:	TEST PSIG:	OPER PSIG:	PAGE: OF	DATE: 8-27-10
SIZE:				
NOMINAL:				
MATERIAL				
DESC: UT READINGS ON TK569 SHELL & NOZZ.		CLIENT:		

INTEGRITY TESTING & INSPECTION

3861 Vincent Station Drive
Owensboro, KY 42303 Tele: (270)
689-9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

MAGNETIC PARTICLE EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	I.T.I	8/27/2010

Project: WET MAG ON TANK 569 CHIME WELD, 1' UP ALL VERT WELDS AND ALL NOZZLE ATTACHMENTS PLUS DRAIN ON FLOOR

Contract No. or Purchase Order No.	Integnty Testing Job No.
	2010-0020

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	Type of Filler Material	Weld ☐ N/A ☐ Smooth ☑ As Welded
67'D X 40' H	19	CS	CS	

Location

Location	System
WESTERN REFINING, GALLUP, NM.	TANK 569

Acceptance Standards	Procedure
ASME SCE. VIII DIV. 1	MT QCP 500 REV. 4

Type of Check

Initial	Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final
☐	☐	☐	☐	☐	☐	☐	☐	☑

Type of Inspection

				Other:
☐ Longitudinal	☐ Coil	☐ DC Probe	☑ Continuous	
☑ Wet	☐ Dry	☐ Direct Contact	☐ Residual	
☐ Circular	☐ AC Prod	☑ Yoke		

MT Equipment/Model	Surface Preparation Method
PARKER DA CONTOUR PROBE DA400 S#15859	SAND BLASTED/ WIRE BRUSH
Inspection Medium/Color	**Demagnetization Method / Equipment**
14AM GREEN	NA

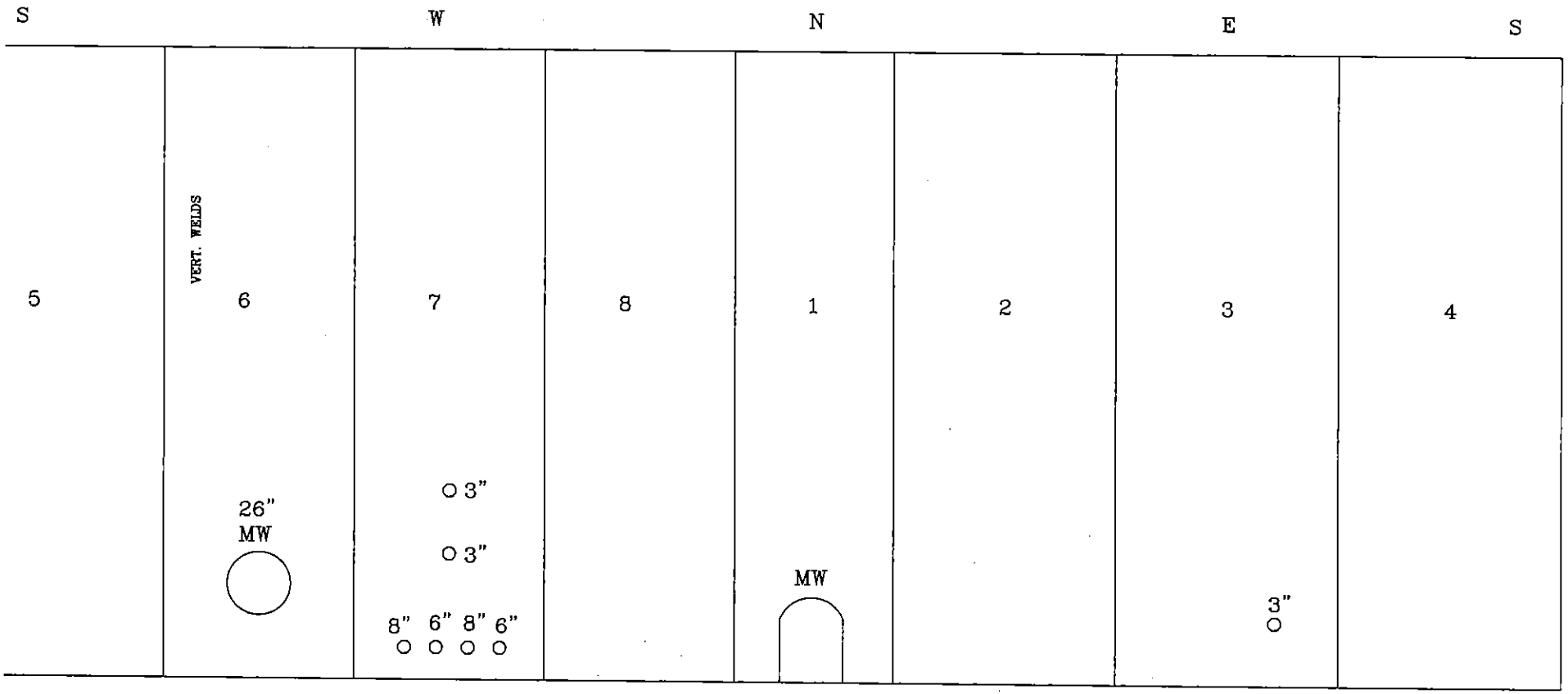
Reference: Summary ☑ See Attachment

Results of Inspection

FOUND NO REJECTABLE OR RELEVANT
INDICATIONS AT TIME OF INSPECTION.
WET M.T. WAS PERFORMED ON TANK 569
CHIME AND ALL NOZZLE ATTACHMENT WELDS
PLUS DRAIN

Copy To:	Requested By:	Reported By (Technician):
	BRIAN J. HINES	David Mitchell / Rene Becerra
	☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: ROLAND COLEMAN

NOTICE:
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FLOOR CHIME WELDS

WET MAG ON TANK 569 CHIME WELDS 1" UP ALL VERT. WELDS
AND NOZZLE ATTACHMENTS PLUS DRAIN ON FLOOR

FACILITY:	P&ID #:	DESIGN TEMP:	°F INSULATED:	SCALE:	
LINE:#	FLANGE RATING:	OPER TEMP:	°F DRAWN BY: JD	DESCRIPTION:	
SERVICE:	DESIGN CODE:	DESIGN PSIG:	DATE: 8-3-10	TECHNICIANS: RB - RW	
SPEC:	TEST PSIG:	OPER PSIG:	PAGE: OF	DATE: 8-27-10	
SIZE:					
NOMINAL:					
MATERIAL:					
DESC:		CLIENT:			

INTEGRITY TESTING & INSPECTION

3861 Vincent Station
Drive Owensboro, KY
42303 Tele: (270) 689-
9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

ULTRASONIC EXAMINATION REPORT ☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	I.T.I.	8/30/2010

Project: UT READINGS TAKEN ON TANK 569 FLOOR PLATES

Contract No. or Purchase Order No.	Integrity Testing Job No.
	2010-00105

Item

Weld	Structural	Casting	Machinery	Macb. Parts	Pipe	N/A	Other:
☐	☐	☐	☐	☐	☐	☐	

Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other:
☐	☑	☐	☐	☐	☐	☐	

Material

Size	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld ☑ N/A ☐ Smooth ☐ As Welded
67' D X 40' H	30	CS		

Location

Location	System
WESTERN REFINING, GALLUP N.M.	TANK 569

Applicable Standard

	Procedure
API 653	UT QCP 601

Type of Inspection

Soundness	A-P1	Bond
☐	☐	☐

Pulse Echo	Angle-Beam	Other
☑	☐	☐

Transducer: ☐ Single Crystal ☑ Dual Crystal

Frequency	Size	Angle
5 MHz	0.3125"	0"

Flat	Concave	Convex
☑	☐	☐

Couplant: SonoTest Ultragel-II

UT Equipment/Model: 37 DL PLUS
S/N 061409209

Standard	Material	Notch depth	Serial No.
N/A	CS	N/A	N/A
Step Wedge ☑ / Tube Wedge ☐	Material	Thickness Range	Serial No.
	CS	.500-.100	06-3474

Reference: Summary ☐ See Attachment

Results of Inspection

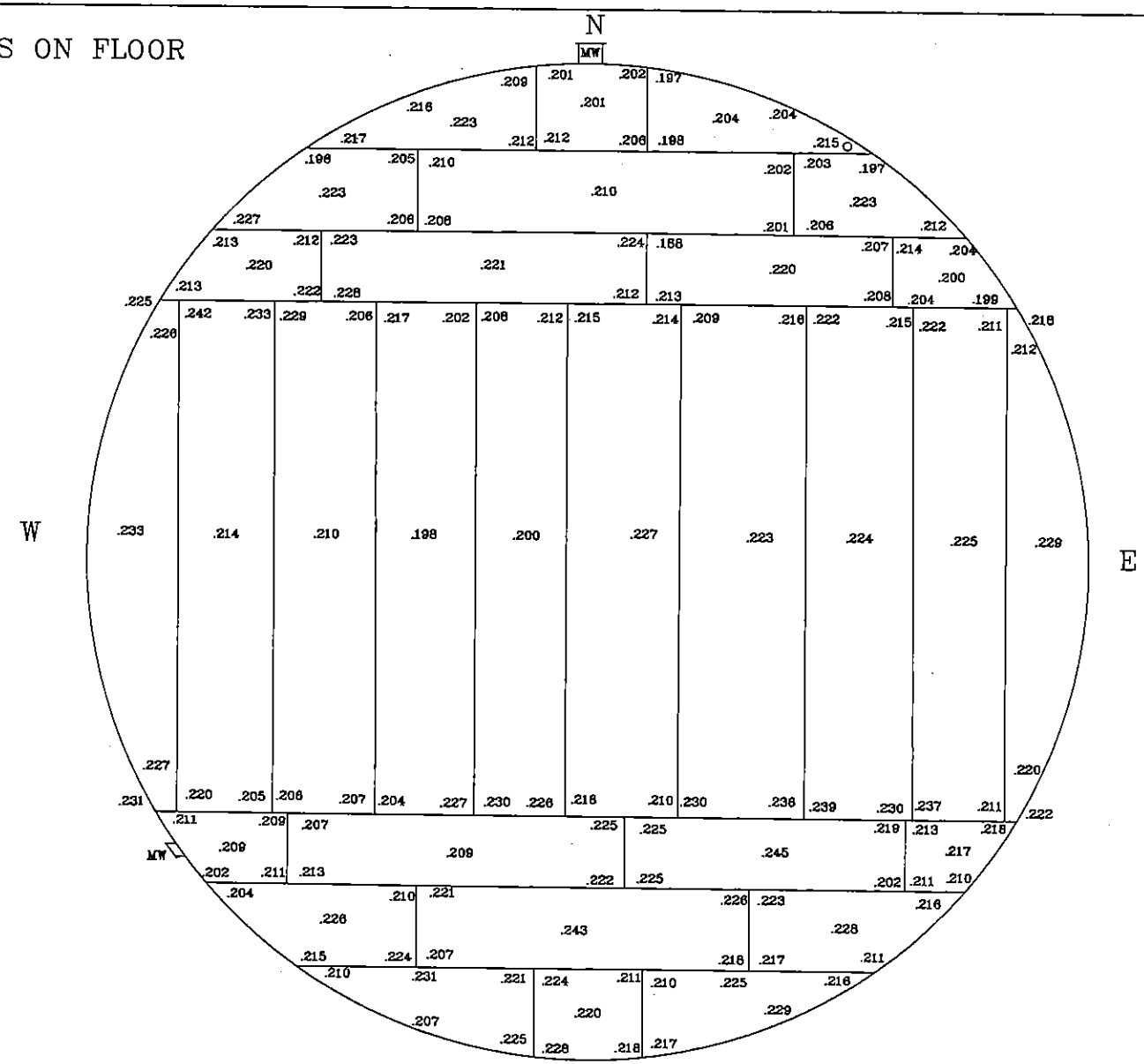
PERFORMED UT THICKNESS
MEASUREMENTS ON TANK 569

SEE ATTACHMENT FOR LOCATIONS AND
THICKNESS READINGS

Copy To:	Requested By:	Reported By (Technician):
	BRIAN HINES	David Mitchell / Ken Armstrong
	☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: ROLAN COLEMAN

NOTICE:
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UT'S ON FLOOR



FACILITY: TANK FARM	P&ID #:	DESIGN TEMP:	°F	INSULATED:	SCALE:
LINE #:	FLANGE RATING:	OPER TEMP:	°F	DRAWN BY: JD	DESCRIPTION:
SERVICE:	DESIGN CODE:	DESIGN PSIG:		DATE:	TECHNICIANS: DM – KA
SPEC:	TEST PSIG:	OPER PSIG:		PAGE:	DATE: 8-3-10
SIZE:					
NOMINAL:					
MATERIAL					
DESC: UT'S TAKEN ON TK#589 FLOOR PLS.		CLIENT:			

INTEGRITY TESTING & INSPECTION

3861 Vincent Station
Drive Owensboro, KY
42303 Tele: (270) 689-
9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

VISUAL EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	I.T.I.	8/2/2010

Project: VACUUM BOX TESTED FLOOR SEAMS. TANK 569

Contract No. or Purchase Order No.:

Integrity Testing Report #: 2010-0002

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	Type of Filler Material	Weld ☐ N/A ☐ Smooth ☑ As Welded
	67' D X 40' H	30	CS	CS	

Location	WESTERN REFINING, GALLUP, NM.	System: TANK FARM
Acceptance Stanmdards	API 653	Procedure: LT QCP 900 REV. 0

Results of Inspection:

VACUUM BOX TESTED ALL TANK FLOOR SEAMS. FOUND NO REJECTABLE OR RELEVANT INDICATIONS.
AREAS NOT ACCESSIBLE WITH VACUUM BOX WERE EXAMIED BY WET MAGNETIC PARTICLE
INSPECTION.

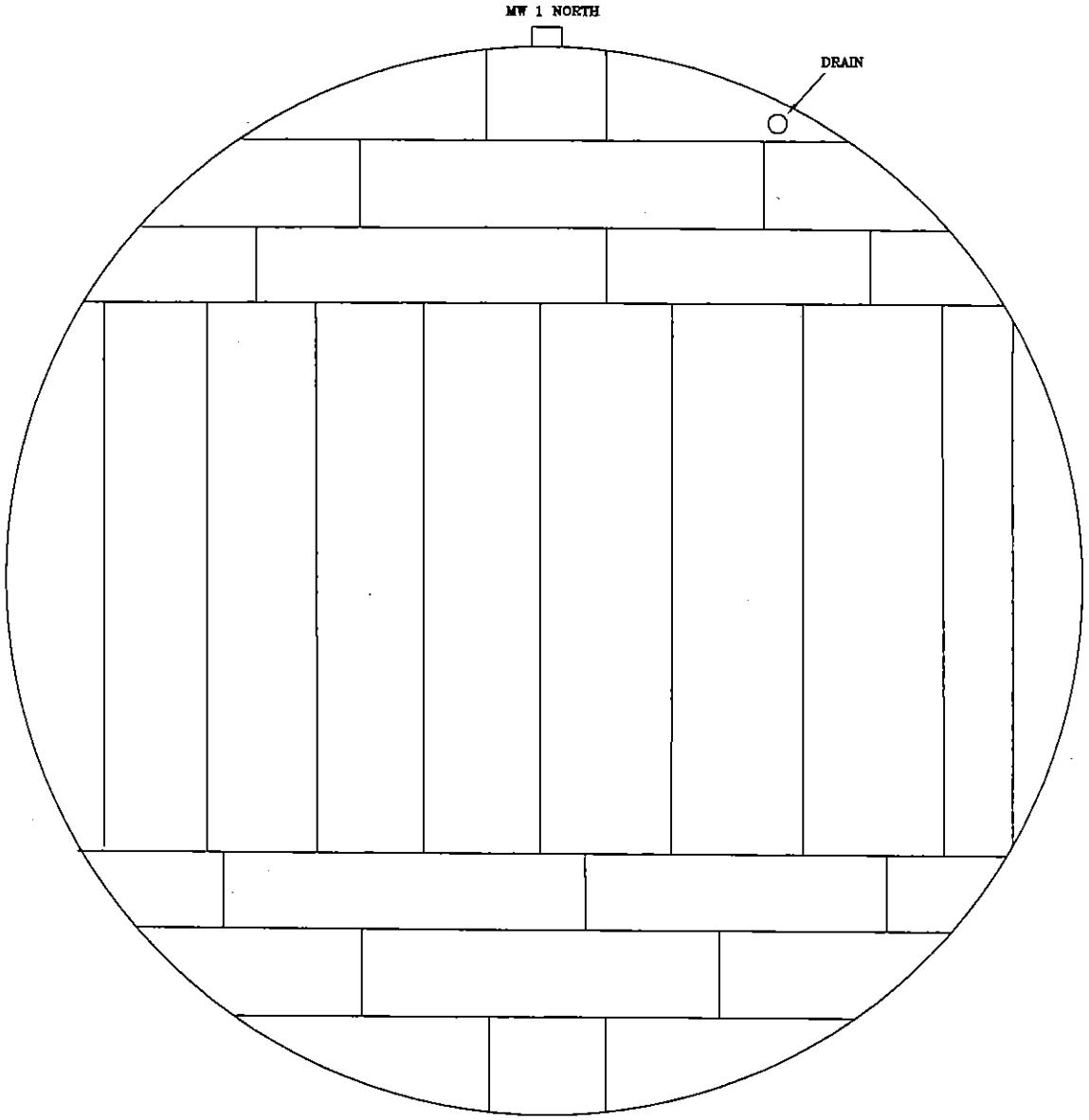
☑ See Attachment

Reference:

1. FLOOR SEAMS

Copy To:	Requested By:	Reported By (Technician):
	BRIAN HINES	David Mitchell/ Ken Armstrong
	☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: ROLAND COLEMAN

NOTICE:
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VACUUM BOX ALL OF TANK 569 FLOOR SEAMS

FACILITY: TANK FARM	P&ID #:	DESIGN TEMP:	°F INSULATED:	SCALE:	
LINE #:	FLANGE RATING:	OPER TEMP:	°F DRAWN BY: JD	DESCRIPTION:	
SERVICE:	DESIGN CODE:	DESIGN PSIG:	DATE:	TECHNICIANS: DM – KA	
SPEC:	TEST PSIG:	OPER PSIG:	PAGE:	DATE: 9-3-10	
SIZE:					
NOMINAL:					
MATERIAL					
DESC: VACUMM BOX ALL OF TANK #569	FLOOR SEAMS	CLIENT:			

INTEGRITY TESTING & INSPECTION

3861 Vincent Station
Drive Owensboro, KY
42303 Tele: (270) 689-
9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

ULTRASONIC EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	I.T.I.	8/30/2010

Project: UT READINGS TAKEN ON TANK 569 FLOATING ROOF

Contract No. or Purchase Order No.	Integrity Testing Job No.
	2010-00107

Item

Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other:
☐	☐	☐	☐	☐	☐	☐	

Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other:
☐	☑	☐	☐	☐	☐	☐	

Material

Size	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld ☑ N/A ☐ Smooth ☐ As Welded
67' D X 40' H	22	CS		

Location

Location	System
WESTERN REFINING, GALLUP N.M.	TANK 569

Acceptance Standards

	Procedure
API 653	UT QCP 601

Type of Inspection

Soundness ☐ A-P1 ☐ Bond ☐

Pulse Echo ☑ Angle-Beam ☐ Other ☐

Transducer: ☐ Single Crystal ☑ Dual Crystal

Frequency	Size	Angle
5 MHz	0.3125"	0"

Flat	Concave	Convex
☑	☐	☐

Couplant: SonoTest Ultragel-II

UT Equipment/Model: 37 DL PLUS
S/N 061409209

Standard	Material	Notch depth	Serial No.
N/A	CS	N/A	N/A

Step Wedge ☑ / Tube Wedge ☐	Material	Thickness Range	Serial No.
	CS	.500-.100	06-3474

Reference: Summary ☐ See Attachment

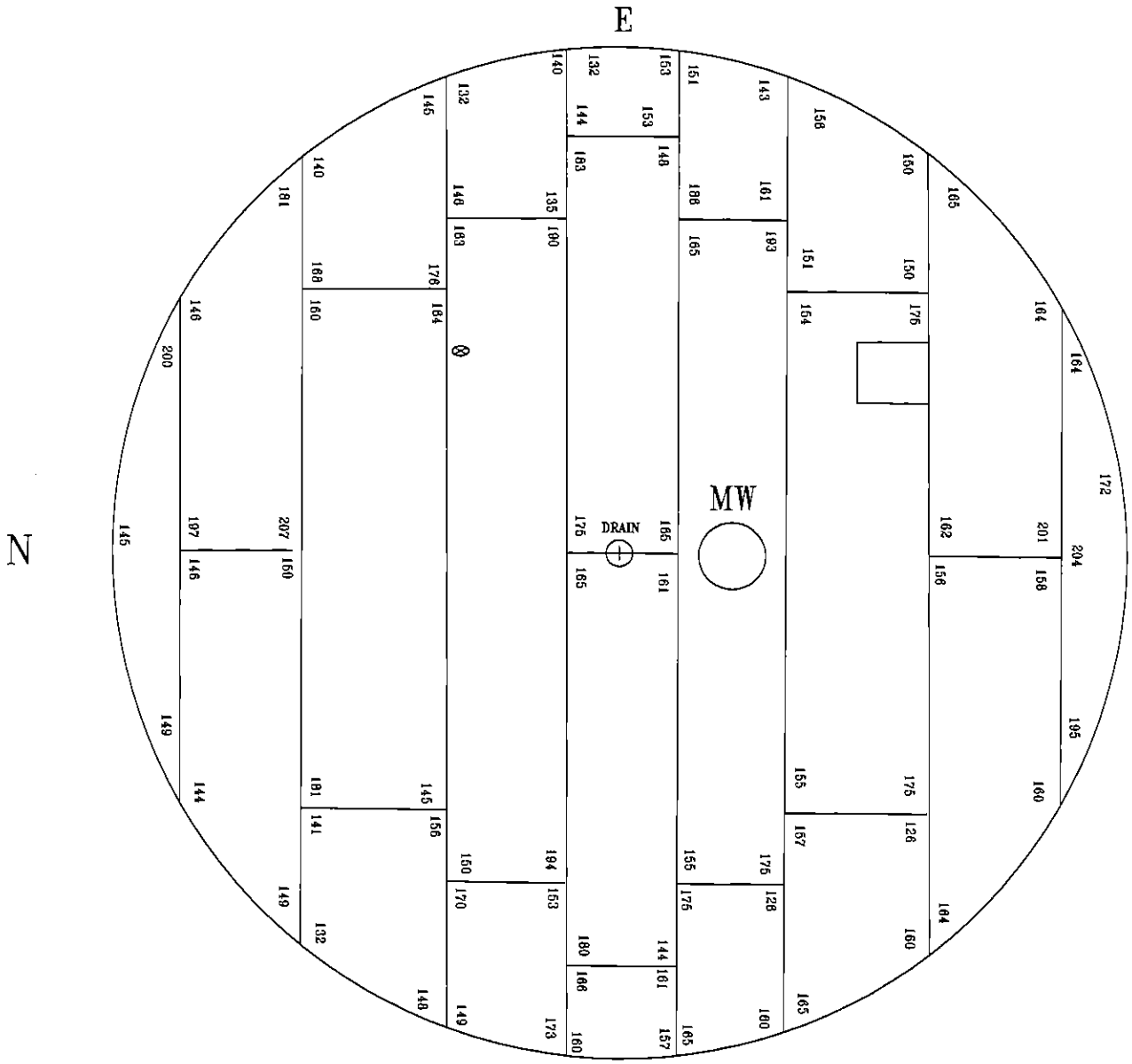
Results of Inspection

PERFORMED UT THICKNESS MEASUREMENTS ON TANK 569 FLOATING ROOF
SEE ATTACHMENT FOR LOCATIONS AND THICKNESS READINGS

Copy To:

Requested By:	Reported By (Technician):
BRIAN HINES	David Mitchell / Rene Becerra
☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: ROLAND COLEMAN

NOTICE:
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FACILITY: TANK FARM	P&ID #:	DESIGN TEMP:	°F INSULATED:	SCALE:	
LINE #:	FLANGE RATING:	OPER TEMP:	°F DRAWN BY: JD	DESCRIPTION:	
SERVICE:	DESIGN CODE:	DESIGN PSIG:	DATE:	TECHNICIANS:	
SPEC:	TEST PSIG:	OPER PSIG:	PAGE:	DATE: 9-3-10	
SIZE:					
NOMINAL:					
MATERIAL:					
DESC: FLOATING ROOF TK# 569		CLIENT:			

INTEGRITY TESTING & INSPECTION

3861 Vincent Station
Drive Owensboro, KY
42303 Tele: (270) 689-
9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

VISUAL EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	I.T.I.	8/2/2010

Project: VACUUM BOX TESTED REPAIR PATCHES ON TANK FLOOR & ROOF. TANK 569

Contract No. or Purchase Order No.:

Integrity Testing Report #: 2010-0002

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	Type of Filler Material	Weld ☐ N/A ☐ Smooth ☑ As Welded
	67' D X 40' H	n/a	CS	CS	

Location	WESTERN REFINING, GALLUP, NM.	System: TANK FARM
Acceptance Standards	API 653	Procedure: LT QCP 900 REV. 0

Results of Inspection:

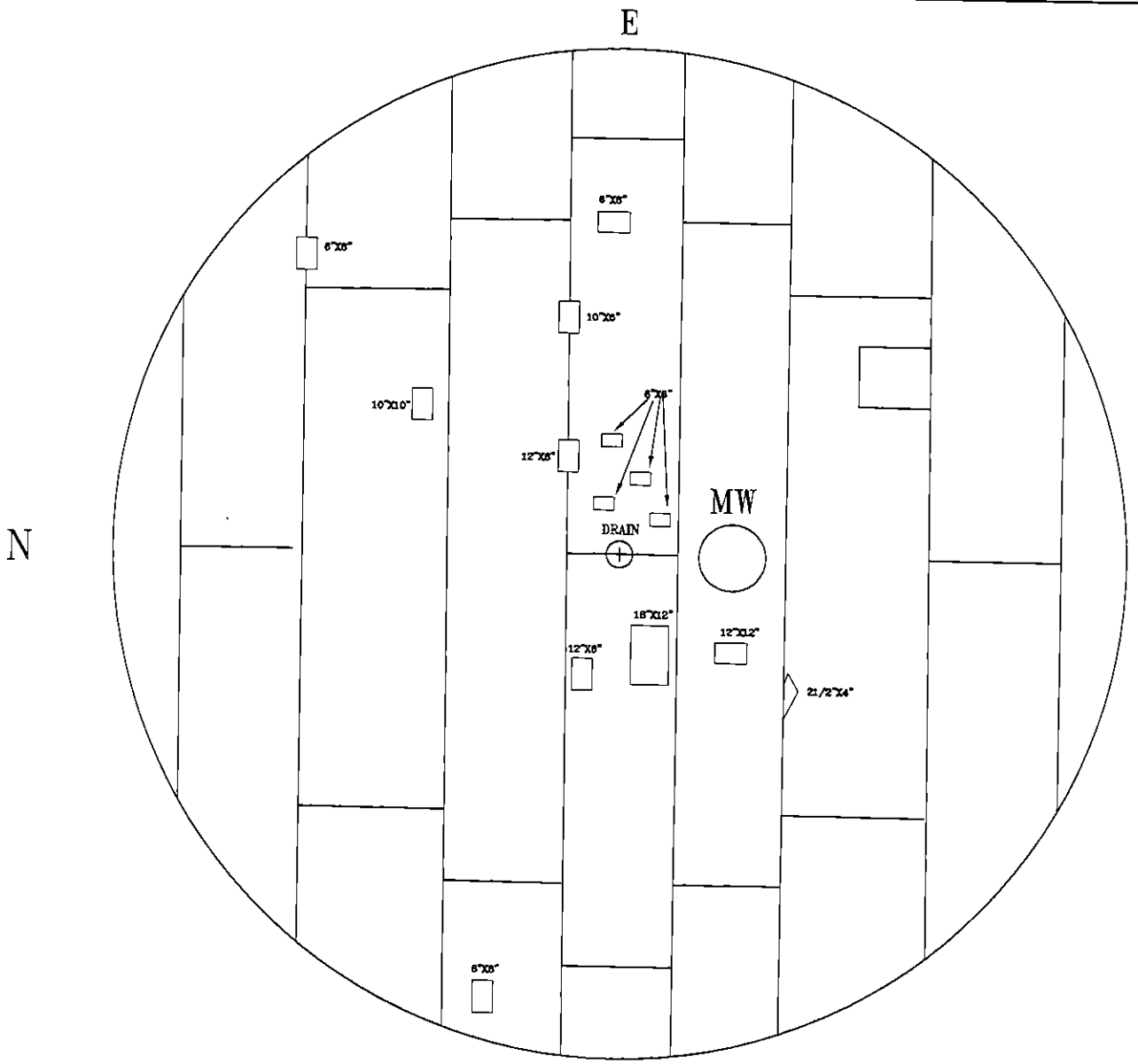
VACUUM BOX TESTED ALL REPAIR PATCHES ON TANK FLOOR AND ROOF.
FOUND NO REJECTABLE OR RELEVANT INDICATIONS.

Reference: ☑ See Attachment

1. Repair Patches on Tank Floor & Roof

Copy To:	Requested By: BRIAN HINES	Reported By (Technician): Ryan Woodring/ Ken Armstrong
	☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: ROLAND COLEMAN

NOTICE:
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FACILITY: TANK FARM	P&ID #:	DESIGN TEMP:	°F INSULATED:	SCALE:	
LINE:#	FLANGE RATING:	OPER TEMP:	°F DRAWN BY: JD	DESCRIPTION:	
SERVICE:	DESIGN CODE:	DESIGN PSIG:	DATE:	TECHNICIANS: KA – RW	
SPEC:	TEST PSIG:	OPER PSIG:	PAGE:	DATE: 9-3-10	
SIZE:					
NOMINAL:					
MATERIAL:					
DESC: VACCUM BOX ROOF REPAIRS ON	TK# 589	CLIENT:			

INTEGRITY TESTING & INSPECTION

3861 Vincent Station
Drive Owensboro, KY
42303 Tele: (270) 689-
9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

ULTRASONIC EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	I.T.I.	8/30/2010

Project: UT READINGS TAKEN ON TANK 569 FLOATING ROOF AROUND THE THREE PIN HOLES

Contract No. or Purchase Order No.	Integrity Testing Job No.
	2010-00108

Item

Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other:
☐	☐	☐	☐	☐	☐	☐	

Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other:
☐	☑	☐	☐	☐	☐	☐	

Material

Size	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld ☑ N/A ☐ Smooth ☐ As Welded
67' D X 40' H	3	CS		

Location

Location	System
WESTERN REFINING, GALLUP N.M.	TANK 569

Acceptance Standards

	Procedure
API 653	UT QCP 601

Type of Inspection

Soundness ☐ A-P1 ☐ Bond ☐

Pulse Echo ☑ Angle-Beam ☐ Other ☐

Transducer: ☐ Single Crystal ☑ Dual Crystal

Frequency	Size	Angle
5 MHz	0.3125"	0"

Flat	Concave	Convex
☑	☐	☐

Couplant: SonoTest Ultragel-II

UT Equipment/Model: 37 DL PLUS S/N 061409209

Standard	Material	Notch depth	Serial No.
N/A	CS	N/A	N/A
Step Wedge ☑ / Tube Wedge ☐	Material	Thickness Range	Serial No.
	CS	.500-.100	06-3474

Reference: Summary ☐ See Attachment

1. PIN HOLES UT READINGS

Results of Inspection

PERFORMED UT THICKNESS MEASUREMENTS ON TANK 569 FLOATING ROOF AROUND THE THREE PIN HOLES SEE ATTACHMENT FOR LOCATIONS AND THICKNESS READINGS

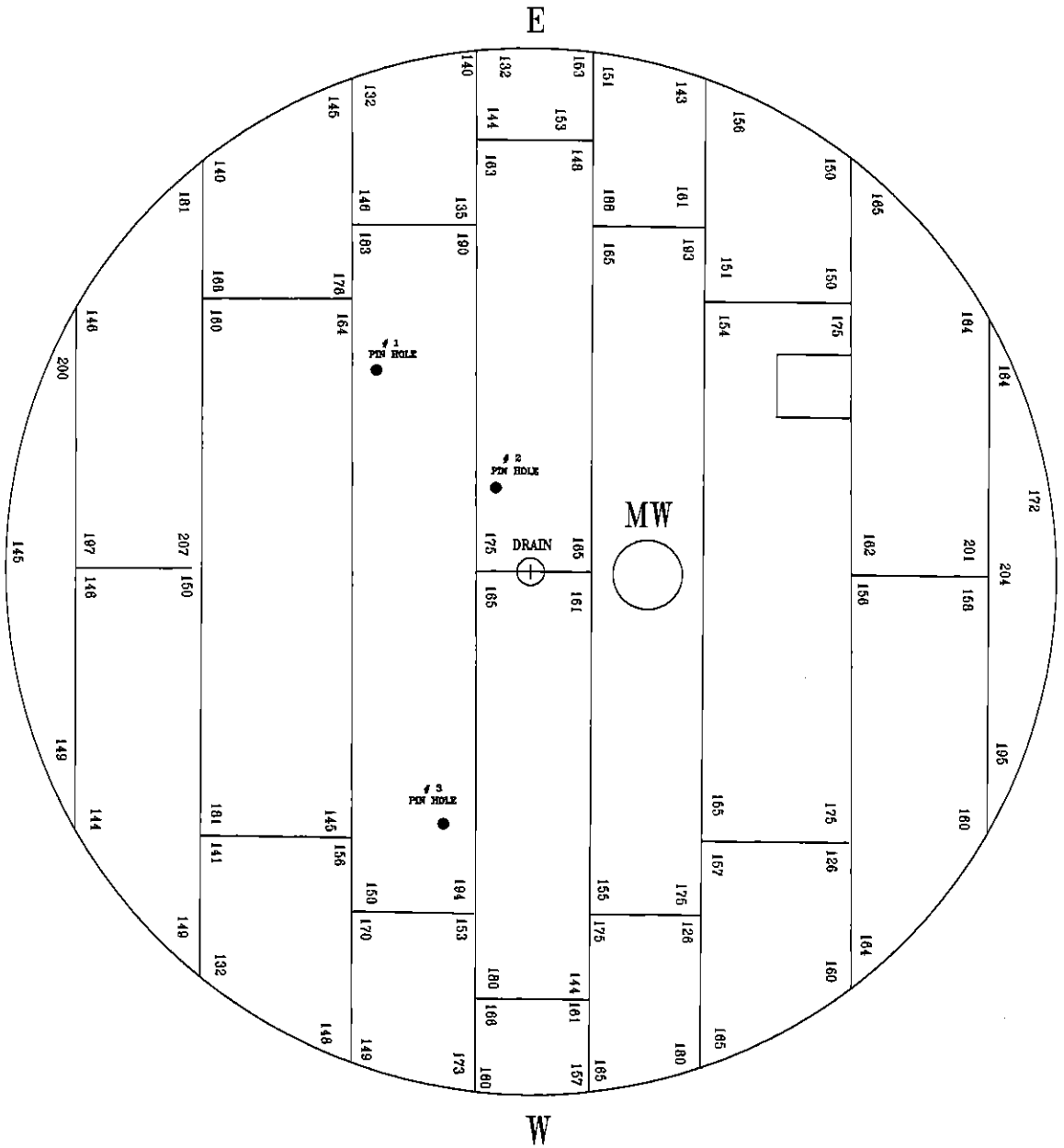
Copy To:	Requested By:	Reported By (Technician):
	BRIAN HINES	Ryan Woodring
	☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: ROLAND COLEMAN

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# 1	
PIN	HOLE
.124	.125
.123	.126
.124	.120
.123	.121
.127	.131
.124	.130
.125	130

# 2	
PIN	HOLE
.117	.129
.122	.088
.139	.045
.108	.124
.114	.125
.130	.129
.107	.106

# 3	
PIN	HOLE
.127	.105
.125	.112
.114	.114
.127	.130
.126	.127
.119	.129
.129	



FACILITY: TANK FARM	P&ID #:	DESIGN TEMP:	°F INSULATED:	SCALE:	
LINE:#	FLANGE RATING:	OPER TEMP:	°F DRAWN BY: JD	DESCRIPTION:	
SERVICE:	DESIGN CODE:	DESIGN PSIG:	DATE:	TECHNICIANS:	
SPEC:	TEST PSIG:	OPER PSIG:	PAGE:	DATE: 9-3-10	
SIZE:					
NOMINAL:					
MATERIAL:					
DESC: FLOATING ROOF TK# 569		CLIENT:			

INTEGRITY TESTING & INSPECTION

3861 Vincent Station
Drive Owensboro, KY
42303 Tele: (270) 689-
9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

VISUAL EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	I.T.I.	8/2/2010

Project: VACUUM BOX TESTED REPAIR PATCHES ON TANK FLOOR & ROOF. TANK 569

Contract No. or Purchase Order No.:

Integrity Testing Report #: 2010-0002

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	Type of Filler Material	Weld ☐ N/A ☐ Smooth ☑ As Welded
	67' D X 40' H	n/a	CS	CS	

Location	System
WESTERN REFINING, GALLUP, NM.	TANK FARM

Acceptance Stanmdards	Procedure
API 653	LT QCP 900 REV. 0

Results of Inspection:

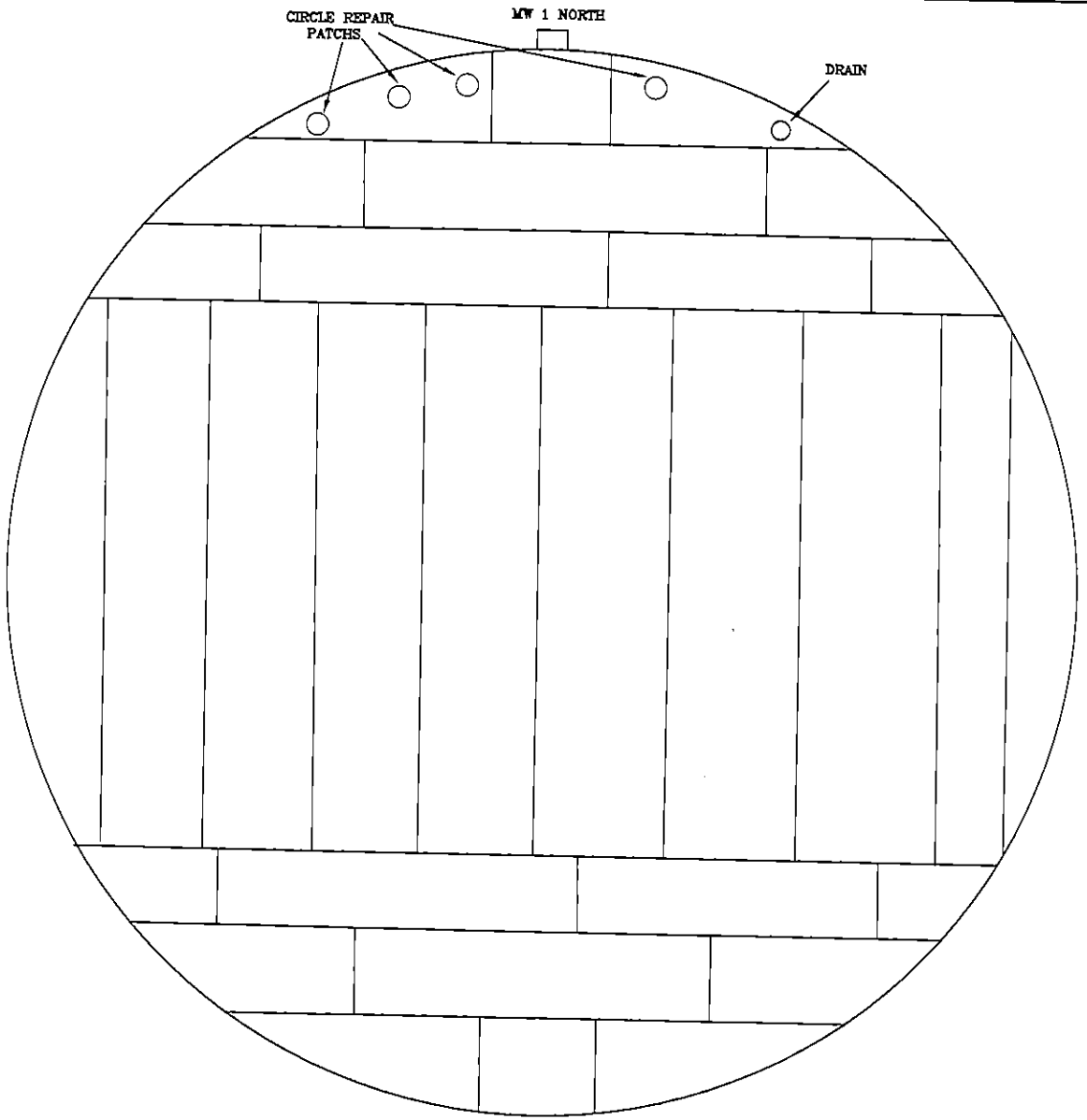
VACUUM BOX TESTED ALL REPAIR PATCHES ON TANK FLOOR AND ROOF.
FOUND NO REJECTABLE OR RELEVANT INDICATIONS.

Reference: ☑ See Attachment

1. Repair Patches on Tank Floor & Roof

Copy To:	Requested By: BRIAN HINES	Reported By (Technician): Ryan Woodring/ Ken Armstrong
	☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: ROLAND COLEMAN

NOTICE:
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VACUUM BOX REPAIRS ON TANK 569 FLOOR

FACILITY: TANK FARM	P&ID #:	DESIGN TEMP:	T INSULATED:	SCALE:	
LINE: #	FLANGE RATING:	OPER TEMP:	T DRAWN BY: JD	DESCRIPTION:	
SERVICE:	DESIGN CODE:	DESIGN PSIG:	DATE:	TECHNICIANS: DM – KA	
SPEC:	TEST PSIG:	OPER PSIG:	PAGE:	DATE: 9-3-10	
SIZE:					
NOMINAL:					
MATERIAL					
DESC: VACUMM REPAIRS ON TANK #569	FLOOR SEAMS	CLIENT:			

INTEGRITY TESTING & INSPECTION

3861 Vincent Station Drive
Owensboro, KY 42303
Tele: (270) 689-9980 Fax:
(270) 689-9660

— INTEGRITY TESTING & INSPECTION —

M.F.E. EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	I.T.I.	8/27/2010

Project: TANK 569

Contract No. or Purchase Order No.:

Integrity Testing Job No.: 2010-0002

Item

Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other:
☐	☐	☐	☐	☐	☐	☐	

Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other
☐	☑	☐	☐	☐	☐	☐	

Material

Size	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld ☑ N/A ☐ Smooth ☐ As Welded
67' D X 40' H	30	CS	CS	

Location

Location	System
WESTERN REFINING, GALLUP N.M.	TANK 569

Acceptance Standards	Procedure
API 653	

Type of Check

Initial	Plate	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final
☐	☑	☐	☐	☐	☐	☐	☐	☐

Type of Inspection

				Other:
☐ Longitudinal	☐ Coil	☐ DC Probe	☐ Continuous	
☐ Wet	☑ Dry	☐ Direct Contact	☐ Residual	
☐ Circular	☐ AC Prod	☐ Yoke		

M.F.E. Equipment/Model	Surface Preparation Method
MFE2414 MARK II	SWEPT WITH BROOM
SERIAL NUMBER	**CALIBRATION**
207099	8/27/2010

Reference: Summary ☑ See Attachment

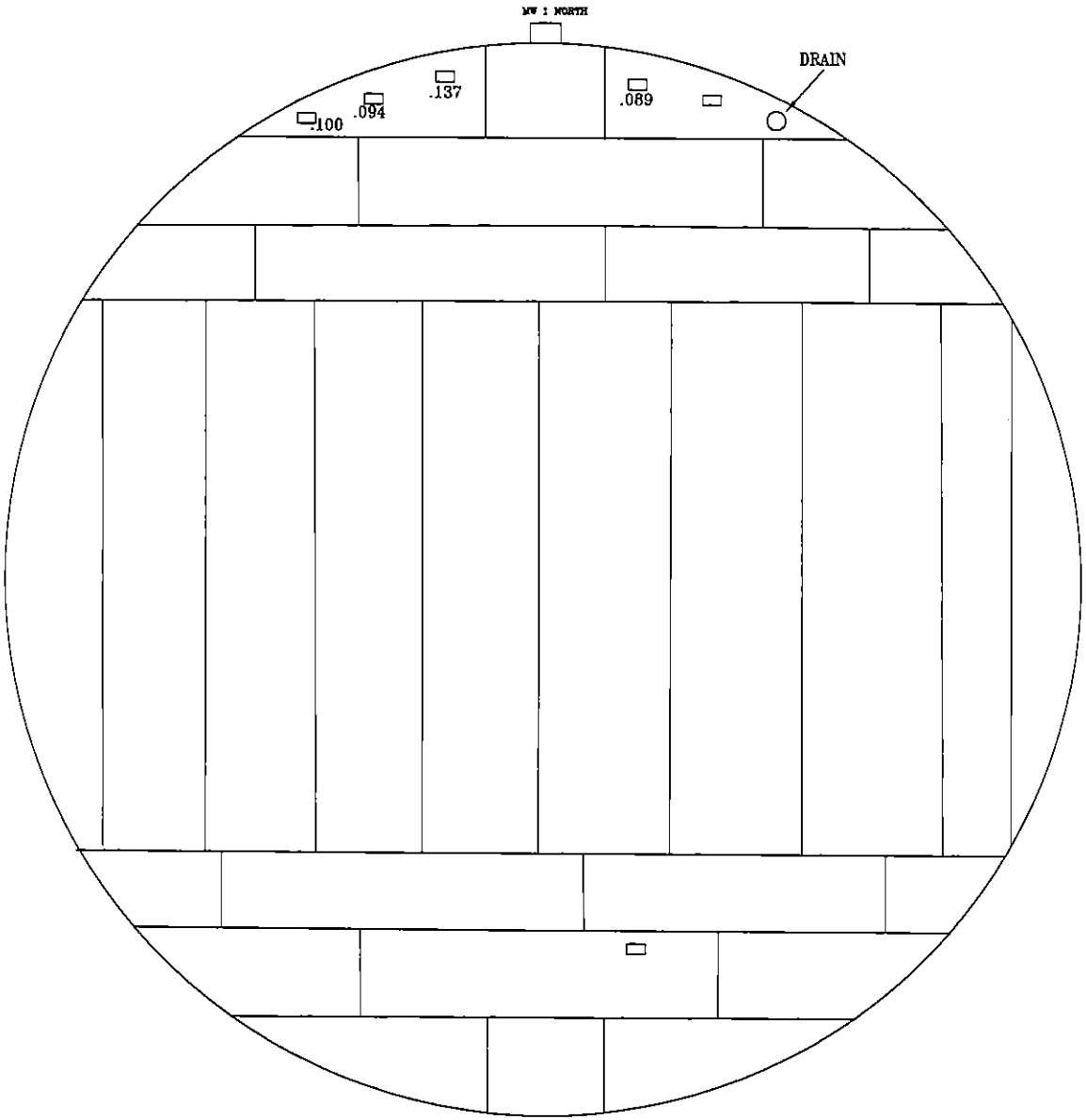
1. FLOOR PLATES

Results of Inspection:
DISCOVERED SIX LOW POINTS ON MFE SCAN. FOLLOWED UP WITH A UT EXAM. FOUND FOUR RELEVANT INDICATIONS.

Copy To:

Requested By:	Reported By (Technician):
BRIAN HINES	David Mitchell/ Ryan Woodring
☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: ROLAND COLEMAN

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FACILITY: TANK FARM	P&ID #:	DESIGN TEMP:	°F INSULATED:	SCALE:	
LINE #:	FLANGE RATING:	OPER TEMP:	°F DRAWN BY: JD	DESCRIPTION:	
SERVICE:	DESIGN CODE:	DESIGN PSIG:	DATE:	TECHNICIANS: DM – KA	
SPEC:	TEST PSIG:	OPER PSIG:	PAGE:	DATE: 9-3-10	
SIZE:					
NOMINAL:					
MATERIAL:					
DESC: MFE ON TK#569		CLIENT:			

INTEGRITY TESTING & INSPECTION

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Drive Owensboro, KY
42303 Tele: (270) 689-
9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

VISUAL EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	I.T.I.	8/2/2010

Project: VACUUM BOX TESTED ROOF SEAMS. TANK 569

Contract No. or Purchase Order No.	Integrity Testing Report #
	2010-0002

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	Type of Filler Material	Weld ☐ N/A ☐ Smooth ☑ As Welded
	67' D X 40' H	21	CS	CS	

Location	WESTERN REFINING, GALLUP, NM.	System: TANK FARM
Acceptance Stanmdards	API 653	Procedure: LT QCP 900 REV. 0

Results of Inspection

VACUUM BOX TESTED ALL TANK ROOF SEAMS. FOUND NO REJECTABLE OR RELEVANT INDICATIONS.

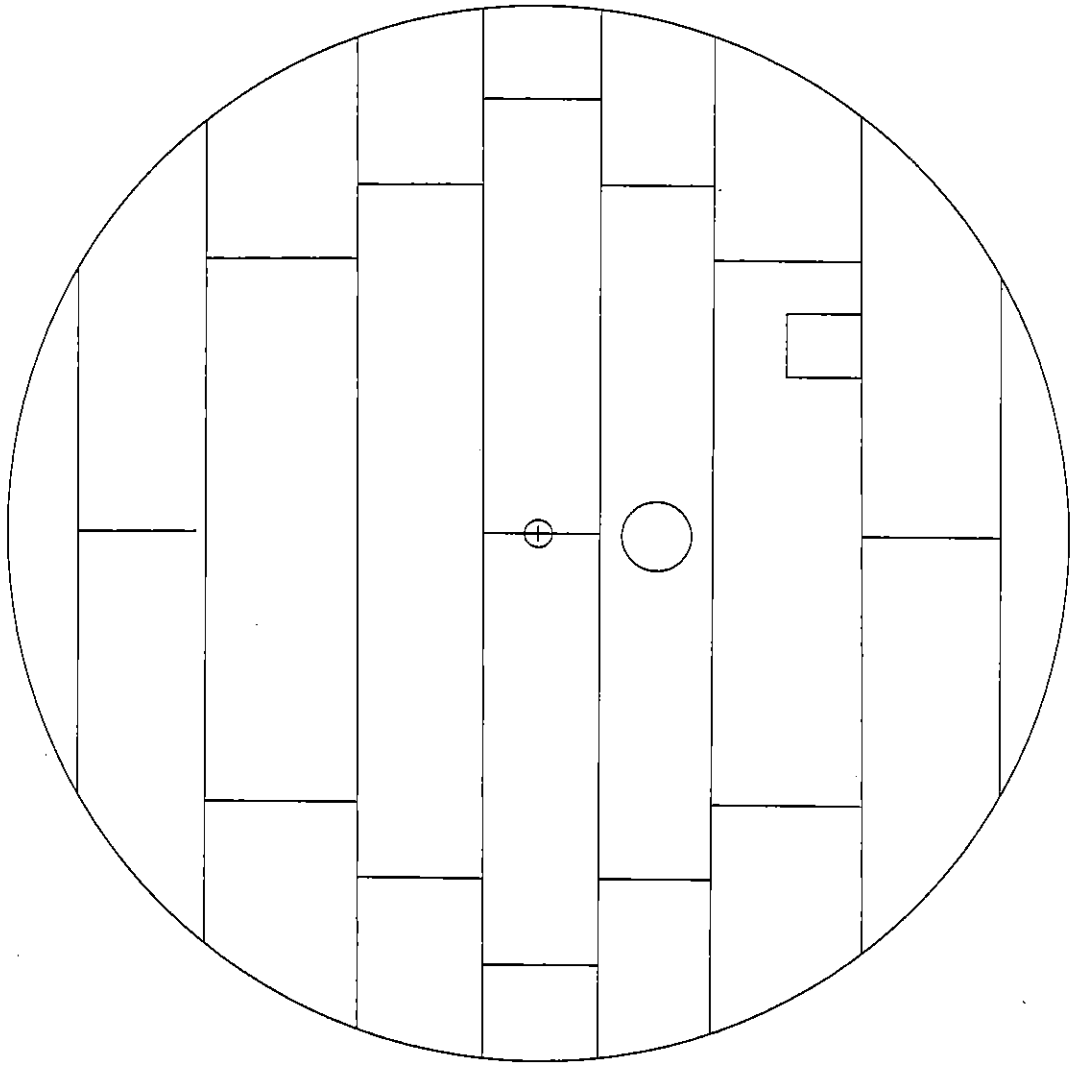
☑ See Attachment

Reference:

1. ROOF SEAMS

Copy To:	Requested By: BRIAN HINES	Reported By (Technician): David Mitchell/ Ken Armstrong
	☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: ROLAND COLEMAN

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FACILITY:	P&ID #:	DESIGN TEMP: °F	INSULATED:	SCALE:
LINE:#	FLANGE RATING:	OPER TEMP: °F	DRAWN BY:	DESCRIPTION:
SERVICE:	DESIGN CODE:	DESIGN PSIG:	DATE:	TECHNICIANS:
SPEC:	TEST PSIG:	OPER PSIG:	PAGE: OF	DATE:
SIZE:				
NOMINAL:				
MATERIAL				
DESC:		CLIENT:		

INTEGRITY TESTING & INSPECTION











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	

INSPECTOR:	**B. Eddie Luna**	**API#:**	**33623**	**DATE:**	**07/22/2014**

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 API 653 Cert #33623	July 22, 2014	Sentinel Integrity 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

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- **INSPECTION INTERVALS**
- **BOTTOM INSPECTION RESULTS**
  - **PROJECTION PLATE**
- **DIFFERENTIAL SETTLEMENT (API 653)**
- **SHELL INSPECTION RESULTS**
  - **LIQUID LOAD CONDITION**
  - **SHELL ASSESSMENT (MINIMUM ALLOWABLE SHELL THICKNESS)**
  - **SHELL THICKNESS MEASUREMENTS**
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  - **SHELL APPURTENANCES AND VERTICAL WELDS**
- **ROOF INSPECTION RESULTS**
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- **ITI REPORTS**
- **API CHECKLIST**

1.0 TANK DETAILS

TANK SPECIFIC

Tank Number	**569**
Type	**EFRT**
Product Storage	**83 Unleaded Gasoline**
Product Specific Gravity	**0.80**
Nameplate Present	**Yes**
Operating Temperature (F)	**Ambient**

DIMENSIONS

Diameter	**67 ft.**
Height	**40 ft.**
Safe Filling Height	**36 ft. (assumed)**
Capacity (nominal)	**25,000 bbls**

CONSTRUCTION DATA

Year Built	**1957**
Design Standard	**API**
Manufacturer	**Horton Tank & CBI**
Design Specific Gravity	**1.0 (assumed)**
Foundation	**Earthen**
Secondary Containment	**No**
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
  - UT's on shell, 4 drops with 4 readings taken per course
  - UT's on the projection plate, minimum of 8
  - UT's on the shell nozzle neck, reinforcing pad, flange, and cover
  - 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.
3. (W/O# 611587) 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.
4. (W/O# 611587) 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.
6. (W/O# 611587) 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



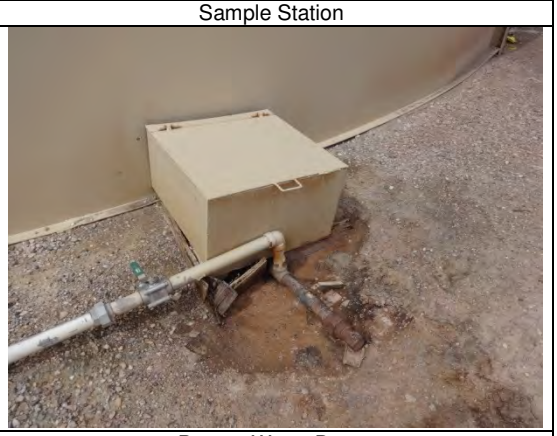
Shell Nameplate


Cleanout


TI


Sample Station


Roof Drain


Bottom Water Draw

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 l 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 — **August 2014**
Performed by Terminal Personnel

Shell External Visual Inspection — **July 2019**
*Performed by an authorized inspector
Minimum of RCA/4N or 5 yrs

Shell Ultrasonic Thickness Inspection — **September 2026**
*Performed by an authorized inspector
Minimum of RCA/2N or 15 yrs

Corrosion Rate **0.001526** **in/yr**

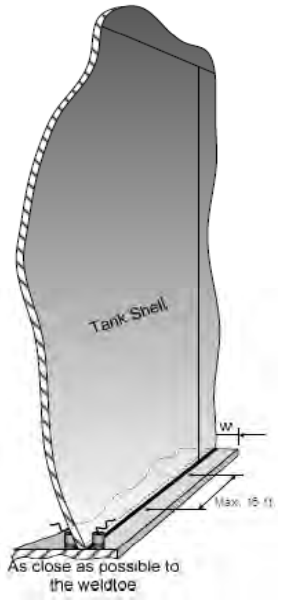
Out-of-Service Inspection Interval per last internal inspection by ITI and Western Chief Inspector

Bottom Inspection Interval June 2020 **With Coating**

Client: Western Refining
Date: July 22, 2014
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.



Loc.	WT 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
Minimum thickness measured inch 0.240 > 0.10 inch thus OK.

Client: Western Refining
Date: July 22, 2014
Revision Number: 1
Project Number: 569
Site: Jamestown, NM

Differential Settlement (API653)

Mechanical Data

Tank diameter	D	feet	67.00	
Tank height	H	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	*Maximum 32 feet*
Material Yield	Y	PSI	31183	
Youngh Modulus	E	PSI	30022813	

Differential settlement API653, Appendix B

Location [Deg]	Settlement Readings [inch]	Relative Elevation [inch]	Planar Tilt [inch]	Settlement [inch]	Deflection [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:

$$|S| = \frac{L^2 * Y * 11}{2 * E * H} * 12$$

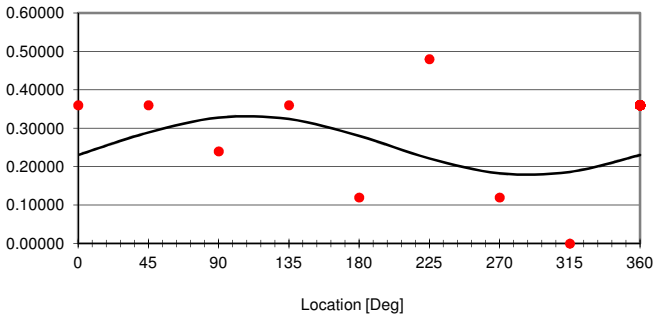
where

S = Critical deflection [inch]
L = Arc Length [feet]
E = Young's modulus [PSI]
Y = Yield strength [PSI]
H = Tank height [feet]

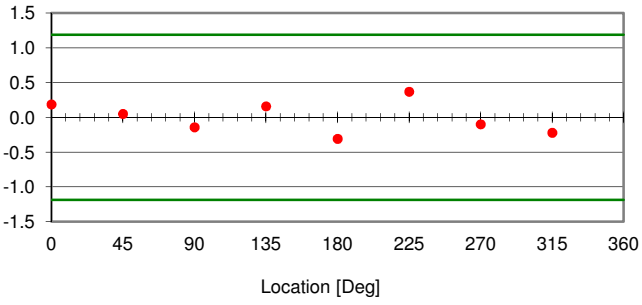
Critical deflection [inch]: 1.2

OK

Shell Settlement Elevation Graph [inch]



Shell Settlement Deflection Graph [inch]



Client:	Western Refining
Date:	July 22, 2014
Revision Number:	1
Project no:	569
Site:	Jamestown, NM

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	H	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	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:

$$t_d = \frac{2.6D(H-1)G}{E.\varphi.S_d}$$

$$t_t = \frac{2.6D(H-1)}{E.S_t}$$

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 No.	Course height [feet]	Product height [feet]	Material Yield Y [PSI]	Material Tensile T [PSI]	Allowable Stress S [PSI]	Joint Efficiency Factor E	Minimum calculated t [inch]	Minimum allowable t [inch]	Measured t min [inch]	Integrity check
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

Client: Western Refining
Date: July 22, 2014
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

Course No.	Course height [feet]	Product height [feet]	Material Yield Y [PSI]	Material Tensile T [PSI]	Allowable Stress S [PSI]	Joint Efficiency Factor E	Calculated t min [inch]	Min. allowable t [inch]	Measured t min. [inch]	Integrity check
5	8.30	3.25	30000	55000	27000	0.85	0.017	0.100	0.246	OK
4	8.30	11.55	30000	55000	27000	0.85	0.080	0.100	0.167	OK
3	8.30	19.85	30000	55000	27000	0.85	0.143	0.143	0.148	OK
2	7.75	27.60	30000	55000	25960	0.85	0.210	0.210	0.210	OK
1	7.32	34.92	30000	55000	25960	0.85	0.268	0.268	0.317	OK

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 Strength [PSI]		
Temp. [°F]	< 45000 PSI	≥ 45000 to < 55000 PSI	≥ 55000 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

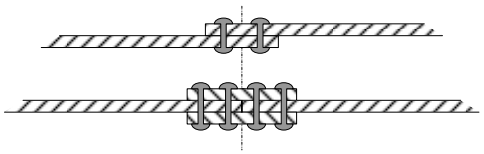
Linear interpolation shall be applied for intermediate values

Joint efficiency factors

Type of joint	No. rivets	E
Lap	1	0.45 [0.60]
Lap	2	0.60 [0.73]
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

But welded tanks — Use table 4-2 of API653
Lap-welded tanks — Use table 4-2 of API653 or use E=0.75

Riveted tanks — Use following table (Conform of API653 Table 4-3)



Butt: i.e. number of rows on each side of joint center line

Client: Western Refining
Date: July 22, 2014
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 year 2014

Minimum allowable shell thickness for loadcase liquid load and roof load.

Course No.	min t allowable roofload [inch]	min t allowable liq.load [inch]	min allowable [inch]	min thickness measured [inch]	Integrity check
5	0.000	0.100	**0.100**	0.246	OK
4	0.000	0.100	**0.100**	0.167	OK
3	0.000	0.126	**0.126**	0.148	OK
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 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]
5	0.281	0.252	0.001	0.100	0.152	100	74.1	148.1
4	0.250	0.208	0.001	0.100	0.108	71	36.6	73.3
3	0.250	0.163	0.002	0.126	0.037	24	6.1	12.2
2	0.313	0.237	0.001	0.192	0.045	29	8.4	16.9
1	0.375	0.323	0.001	0.243	0.080	52	21.9	43.7
		Maximum CR:	0.001526		Minimum Allowable:		5.0	12.2

Recommendations:

Since the intended next service period is years, the following interval is to be considered.

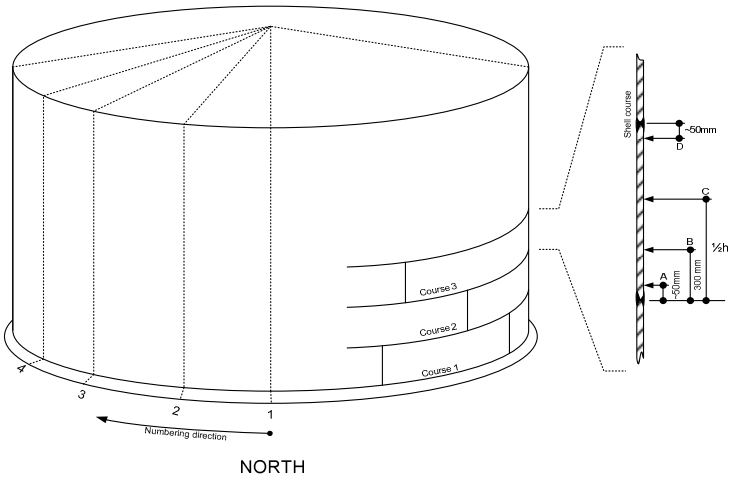
Next External inspection by an authorized inspector should be carried out not later than: 2019.

Next External UT inspection of the shell (and roof) should be carried out not later than: 2026.

NB: Local regulations/conditions may have affect on the above recommendations.

Client: Western Refining
Date: July 22, 2014
Tank Number: 569

Shell Thickness Measurements

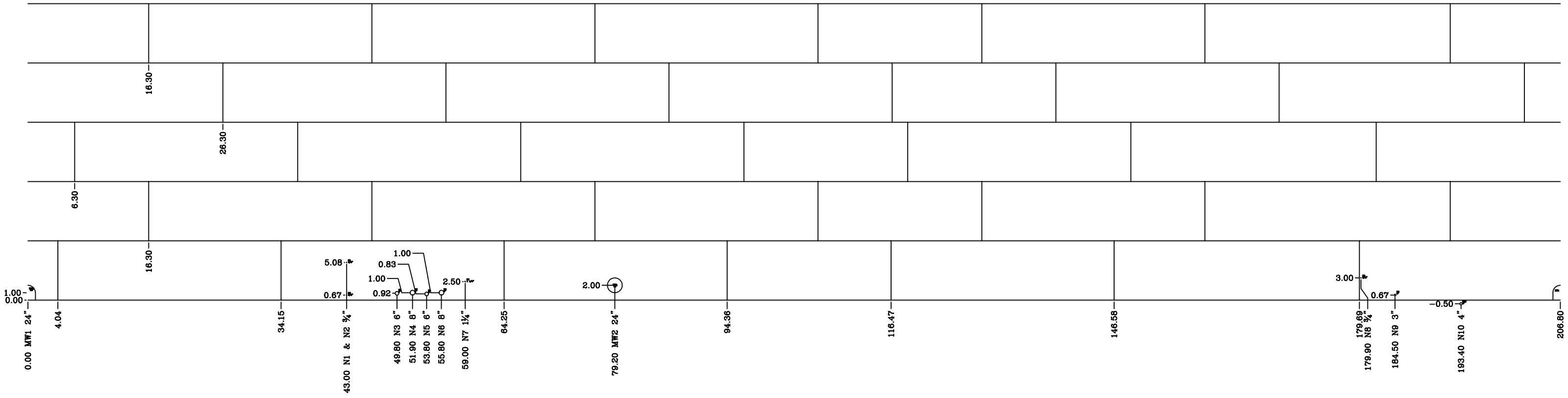


NORTH

Number of courses:	5
Course	Height [ft]
5	8.30
4	8.30
3	8.30
2	7.75
1	7.35
Height	**40.00** ft.

Shell thickness Stairway

Location		N	W	S	E		
Course	WT	[in]	[in]	[in]	[in]		
5	A	0.246	0.240	0.251	0.249	Min	**0.235**
	B	0.249	0.238	0.250	0.245	Max	**0.257**
	C	0.255	0.236	0.243	0.240	Average	**0.244**
	D	0.257	0.235	0.240	0.237	STDEV	**0.007**
4	A	0.167	0.233	0.243	0.234	Min	**0.167**
	B	0.198	0.225	0.243	0.227	Max	**0.247**
	C	0.220	0.219	0.228	0.219	Average	**0.221**
	D	0.247	0.205	0.220	0.206	STDEV	**0.020**
3	A	0.155	0.192	0.208	0.203	Min	**0.142**
	B	0.148	0.193	0.195	0.186	Max	**0.208**
	C	0.154	0.173	0.188	0.175	Average	**0.179**
	D	0.196	0.142	0.181	0.171	STDEV	**0.020**
2	A	0.248	0.261	0.247	0.246	Min	**0.210**
	B	0.249	0.261	0.262	0.254	Max	**0.262**
	C	0.240	0.250	0.254	0.248	Average	**0.248**
	D	0.210	0.231	0.248	0.257	STDEV	**0.013**
1	A	0.330	0.297	0.309	0.305	Min	**0.297**
	B	0.323	0.337	0.319	0.299	Max	**0.337**
	C	0.321	0.334	0.328	0.314	Average	**0.320**
	D	0.317	0.337	0.335	0.322	STDEV	**0.013**



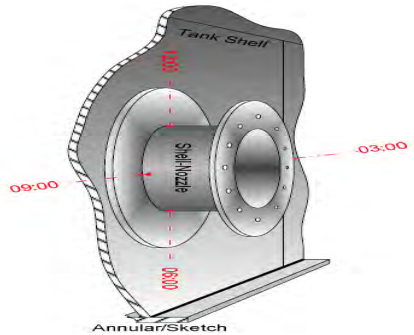
Western Refining
GALLUP REFINERY

TANK FARM
TANK 569

DRN. BY: CG	DATE: 07/31/14	RFE No:
CHK'D. BY:	DATE:	CAD REF:
APP'D. BY:	DATE:	
DRAWING NO. TANK 569		REV 1

Client: Western Refining
Date: July 22, 2014
Tank Number: 569

Shell Nozzles



ID	Function	Size [in]	Station [ft]	CL Elev. [in]	Weld Spacing [in]	Reinforcing Pad					Nozzle WT				Flange WT [in]	Cover WT [in]	Comments
						Width [in]	Height [in]	Shape	Tell-tale [y/n]	WT [in]	12:00 [in]	03:00 [in]	06:00 [in]	09:00 [in]			
MW1	Cleanout	24x24	0.0	12	-	72	36	D	y	0.518	0.502	0.471	0.448	0.465	0.494	0.464	
N1	Gauge Coupling	3/4	43.0	61	-	-	-	-	-	-	-	-	-	-	-	-	6
N2	Gauge Coupling	3/4	43.0	8	-	-	-	-	-	-	-	-	-	-	-	-	6
N3	Transfer	6	49.8	11	2 1/4	94	19	A	y	0.385	0.368	0.384	0.390	0.378	0.809	-	9
N4	Sales	8	51.9	12	2 1/4						0.578	0.580	0.580	0.579	0.810	-	9
N5	Circ. Discharge	6	53.8	10	2 1/4						0.490	0.492	0.488	0.492	1.006	-	9
N6	Circ. Suction	8	55.8	12	2 1/4						0.438	0.501	0.460	0.475	1.082	-	9
N7	TI	1 1/4	59.0	30	-	-	-	-	-	-	-	-	-	-	-	-	6
MW2	Manway	24	79.2	24	0	60	48	A	y	0.448	0.475	0.474	0.477	0.477	1.937	2.035	1
N8	Sample	3/4	179.9	36	-	-	-	-	-	-	-	-	-	-	-	-	6
N9	Roof Drain	3	184.5	8	2	14	11	C	y	0.247	0.268	0.259	0.273	0.264	0.810	-	
N10	Water Draw	4	193.4	-6	-	-	-	-	-	-	-	-	-	-	-	-	8

Stations are measured in feet counter-clockwise from MW1 (station 0.0)

Repad Shape



Comments

1-Inadequate weld spacing per current API	4- No tell tale present	7- Corrosion/coating failure on nuts/bolts	10-
2- No reinforcing pad	5- Coating failure (neck, repad, and/or flange	8- Tank bottom penetration	11-
3- Plugged tell tale	6-Threaded connection	9-Shared reinforcing pad	12-

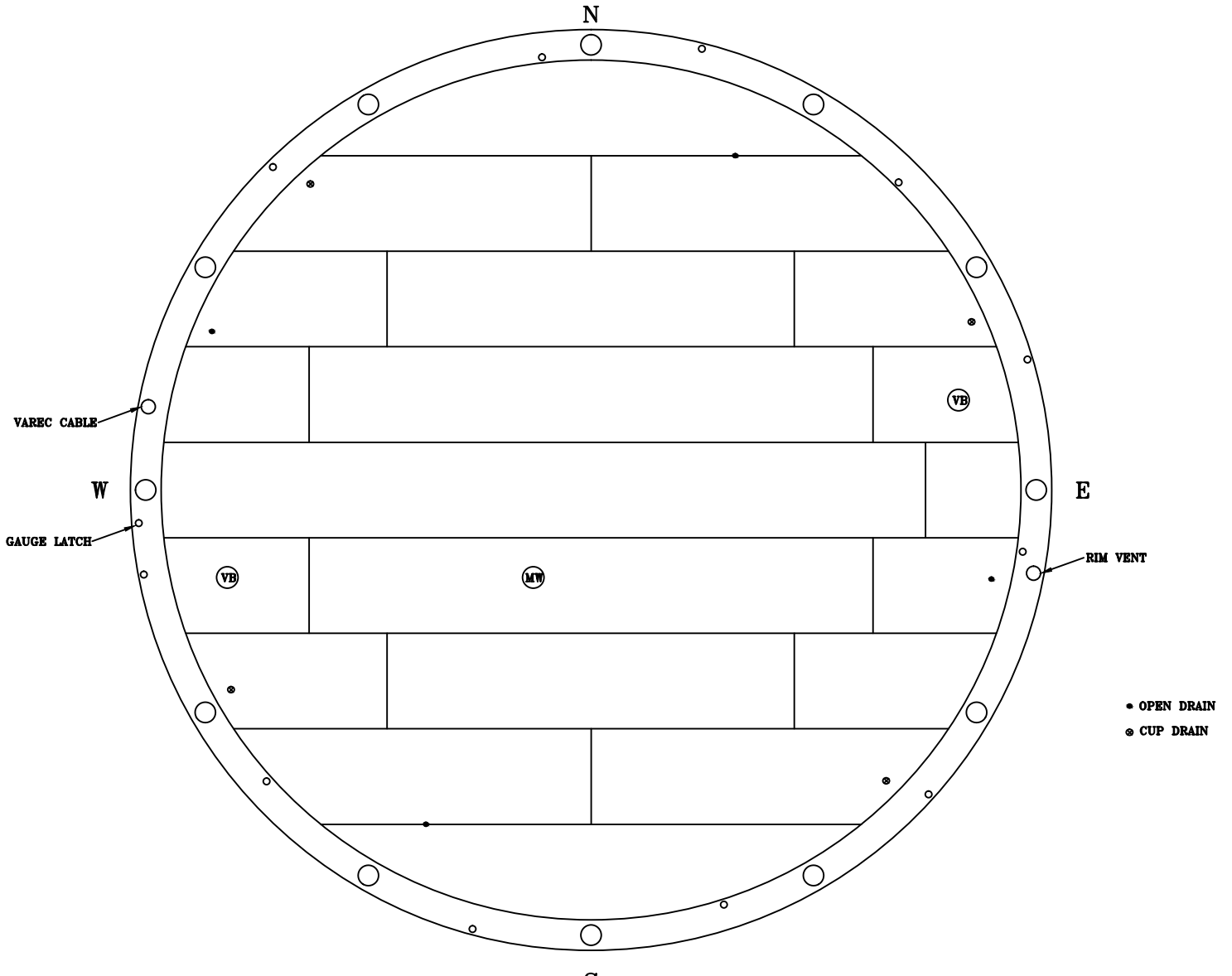
Client: Western Refining
Date: July 22, 2014
Tank Number: 569

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 Weld Seam Location of 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	



FACILITY: MARKETING TANK FARM			P&ID #:			DESIGN TEMP:		°F	INSULATED:	SCALE: NTS	
LINE:#			FLANGE RATING:		lb/in²	OPER TEMP:		°F	DRAWN BY:C.G.	DESCRIPTION:	
SERVICE:			DESIGN CODE:			DESIGN PSIG:		lb/in²	DATE: 09/03/14	TECHNICIANS:	
SPEC:			TEST PSIG:			OPER PSIG:			PAGE: OF	DATE:	
SIZE:										TANK 569 – ROOF	
NOMINAL:											
MATERIAL: –											
DESC: TANK 569 – ROOF						CLIENT: WESTERN REFINING					

INTEGRITY TESTING & INSPECTION

3861 Vincent Station Dr.
Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

ULTRASONIC EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	**J.Gonzalez/ J. Morgan**	**7/22/2014**

Project: **UT Thickness readings taken on tank 569.**

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	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld
	0	**0**	**CS**		☐ Smooth ☑ N/A ☐ As Welded

Location	System
JAMESTOWN, NM	**Tank Farm**

Acceptance Standards	Procedure
Info Only	**UT QCP 620 REV. 0**

Type of Inspection

Soundness ☐ Thickness ☑ Bond ☐

Pulse Echo ☐ Angle-Beam ☐ Other ☐

UT Equipment/Model: **Panametric DL 37 Plus**

SN:071455702

1/3/2015

Transducer: Single Crystal ☐ Dual Crystal ☑

Frequency	Size	Angle
5 MHZ	**0.500"**	**0º**

Flat ☑ Concave ☐ Convex ☐

Couplant: **Sono Test Ultra Gel**

Standard	Material	Notch Depth	Serial No.

Step Wedge ☑ / Tube Wedge ☐	Material	Thickness Range	Serial No.
	C/S	**.100"-.500"**	**12-4061**

Reference: Summary ☑ See Attachment

UT's taken on shell, shell nozzles, and projection plate.

Results of Inspection

UT Thickness reading taken on tank 569.

Copy To:

Requested By: **Tom Lewis**

☑ Customer Specifications ☐ Accept ☐ Reject

Reported By (Technician): **J.Gonzalez/ J. Morgan**

NDT Supervisor: **MARVIN FIGUEROA**

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 IN-SERVICE INSPECTION CHECKLIST

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: 67 ft.
Tank Height: 40 ft.
Tank Type: External Floating Roof
Date of Tank Construction: 1957

1.1 FOUNDATION

a. Yes Was foundation levelness and bottom elevations measured? (See API-653 - Appendix B for extent of measurements).

1.1.1 Concrete Ring

a. NA 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. NA 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. NA Were 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. NA 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. NA 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. No 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

a. No 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

a. Y Was the site drainage away from the tank and associated piping and manifolds? If no, explain.
b. NA 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?

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TANK IN-SERVICE INSPECTION CHECKLIST

1.2 SHELL

1.2.1 External Visual Inspection

a. N Were there any signs of paint failure, pitting, and/or corrosion? If yes, explain.

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.

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. N 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. NA Did the supports have reinforcing pads 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?

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 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. N 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. 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. NA Was there proper movement of the tape when the checker on the autogauge was bumped?

d. NA Was the size and construction materials of the autogauge tape (floating roof tanks) documented?
Size: _____ Construction material: _____

e. No 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.

i. NA Was there freedom of movement of the marker and float? If no, explain.

TANK IN-SERVICE INSPECTION CHECKLIST

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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. NA 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. NA Did the mixer have the proper mounting flange and support?

b. NA 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. N 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. Y 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. drain was closed

1.4.4 Level of Floating Roof

a. NA 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. NA Were 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. 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. NA Was the seal fabric on the primary shoe seals pulling shoes away from the shell (fabric not wide enough)?

b. NA Were there signs of deterioration, holes, tears, or cracks in the fabric? If yes, describe.

c. NA Were there any visible signs of corrosion and wear on the metallic parts? If yes, describe.

d. NA Were there any openings in the seals that would permit vapor emissions? If yes, describe.

e. NA 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. NA 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. NA Did the wedge-type wiper seals show signs of flexibility and resilience? If no, explain.

i. NA Were there any signs of cracks and/or tears on the wedge-type wiper seal? If yes, explain.

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TANK IN-SERVICE INSPECTION CHECKLIST

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 Were spot UT measurements taken on top of the pontoons?

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 Sample Hatch

a. NA Did the sample hatch cover function properly and in good condition? If no, explain.

b. NA On tanks governed by Air Quality Monitoring District rules, was the seal inside the hatch cover in satisfactory condition? If no, explain..

c. 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, 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 Was operation of the system tested?

h. NA On ultra clean stocks such as JP4 (to prevent rust from getting into the sample), was the protective liner or coating 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. 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.

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TANK IN-SERVICE INSPECTION CHECKLIST

1.5.13 Pontoon Inspection 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.

1.6 ACCESS STRUCTURES

1.6.1 Handrails

a. Y Was the type (steel pipe, galvanized pipe, square tube, angle etc.) and size of handrails identified?
Type: Steel
Size: —
b. N Was there any pitting, holes, or paint failures? If yes, explain.
c. Y Were the attachment welds in good condition? If no, explain.
d. N Were there any cold joints and sharp edges on the handrails or midrails? If yes, describe.
e. 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. N 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. N 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.

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. N 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. N Was corrosion found on rolling ladder stringer? If yes, describe.
b. Y Were the ladder fixed rungs identified? (square bar, round bar, angles etc.) round bar
c. N Was there corrosion on the ladder fixed rungs, particularly where the angle rungs are welded to the stringers? If yes, describe.

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TANK IN-SERVICE INSPECTION CHECKLIST

d. N 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.

i. Y Did the rolling ladder wheels have freedom of movement? If no, explain.

j. — Did the rolling ladder wheels have flat spots? If yes, describe.

k. — Did the rolling ladder axles show signs of wear? If yes, explain.

l. — Was the rolling ladder aligned with the roof rack? If no, explain.

m. — 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.

o. — Did the track supports on the roof have reinforcing pads seal welded to the deck plate?

p. N Was the maximum angle of the rolling ladder checked by dimensioning when the roof was on low legs? Max Angle: _____

q. NA 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 = YES N = NO N/A = NOT APPLICABLE

PARTS OF THE CHECKLIST THAT WERE NOT APPLICABLE (N/A) ARE NOT INCLUDED ON THE FORMAL REPORT

Inspector /Certification #: B. Eddie Luna #33623 Date: 7-22-14

Inspector /Certification #: _____ Date: _____

Western Refining

INTERNAL/EXTERNAL TANK INSPECTION REPORT

UNIT	Tank Farm	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 ☐ GOOD ☐ FAIR ☐ 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.

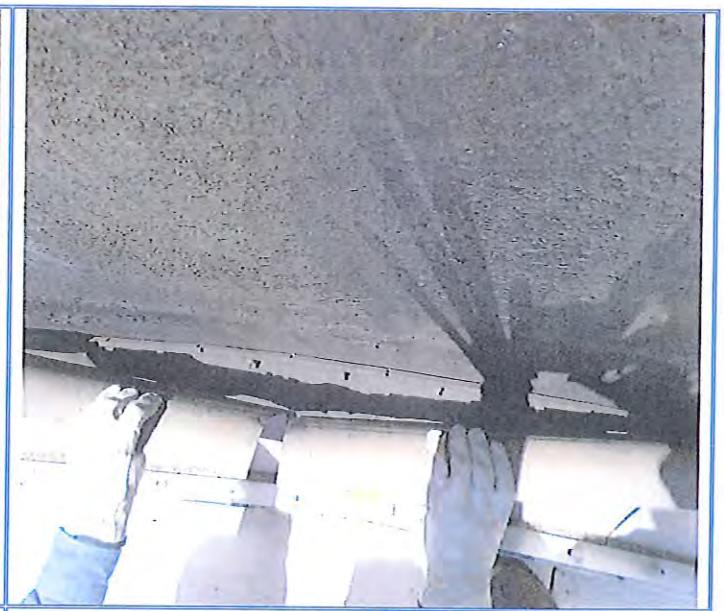
Guide Pole, Instruments: The guide bar associated with the roof was distorted inward approximately ¼" from the shell. Guide plate was corroded and thinning.

Seals: The roof seal was cracked and falling apart around the roof perimeter. See photos. Seal replaced.

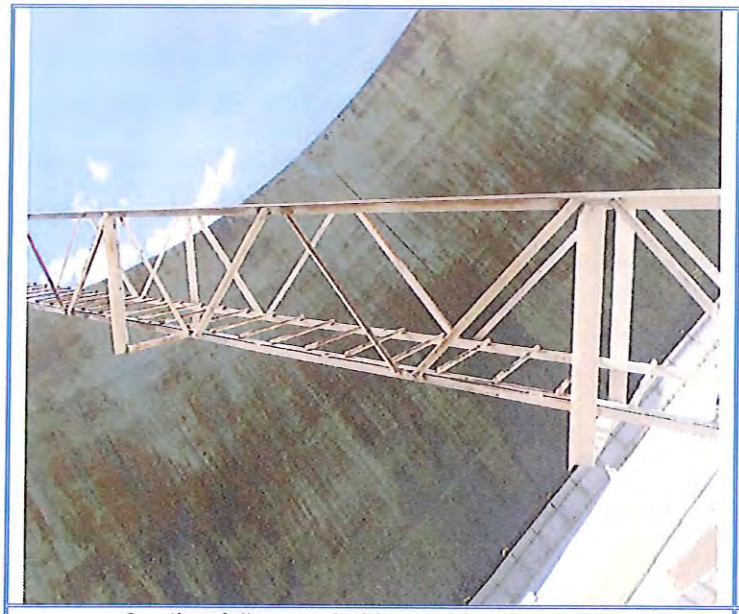
Reference Photographs



Seal Failure



Seal Missing



Coating failure on ladder and inside of shell



Coating failure on ladder and inside of shell



Corrosion and coating failure on roof platform support



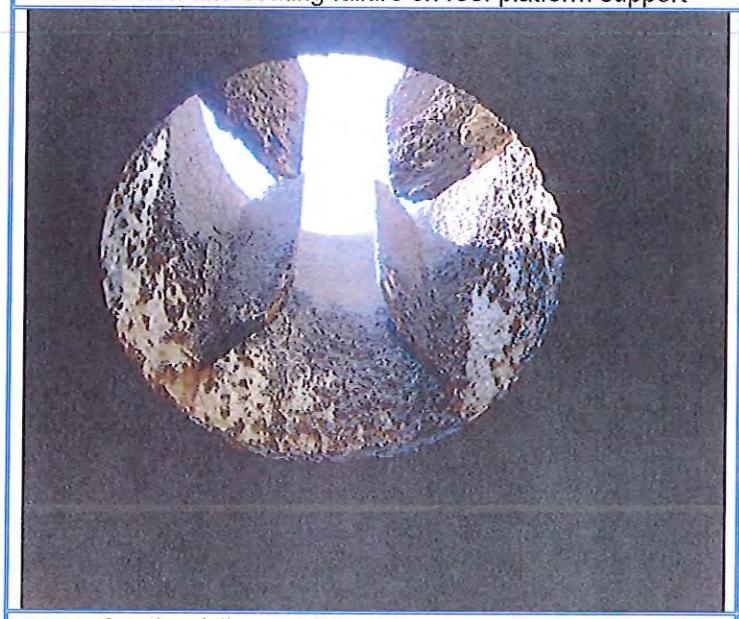
Corrosion and coating failure on roof platform support



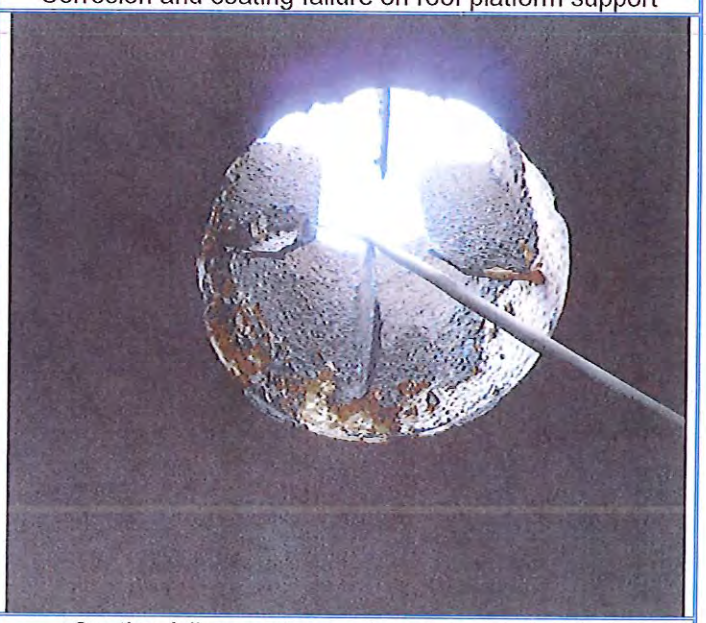
Corrosion and coating failure on roof platform support



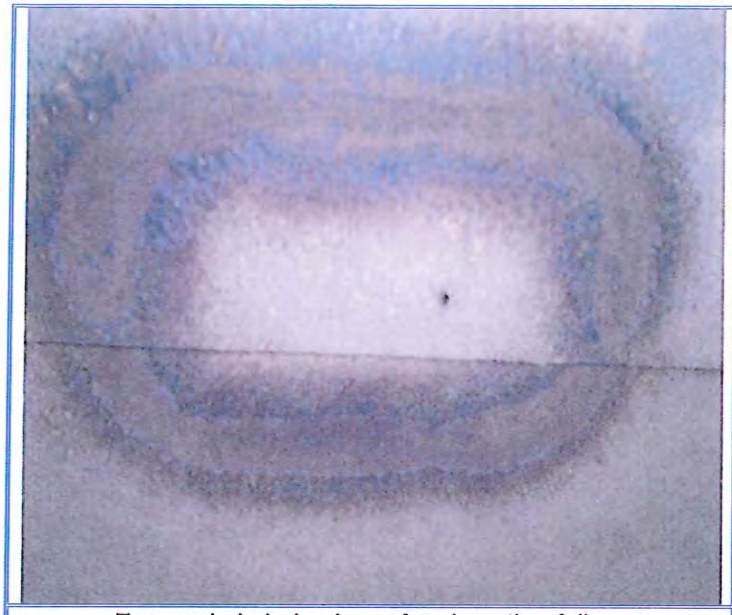
Corrosion and coating failure on roof platform support



Coating failure and corrosion on vortex breaker



Coating failure and corrosion on vortex breaker



Exposed pin holes in roof and coating failure



Exposed pin holes in roof and coating failure



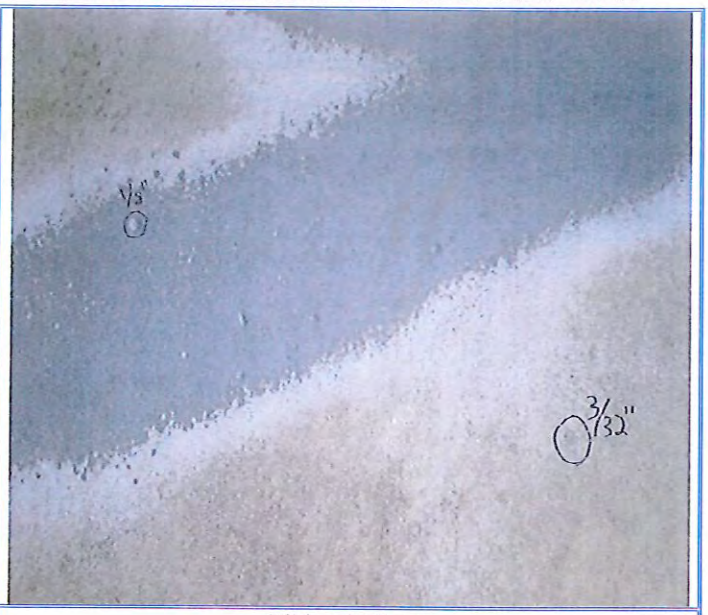
Corrosion and pitting on striker plate



Corrosion and pitting on striker plate



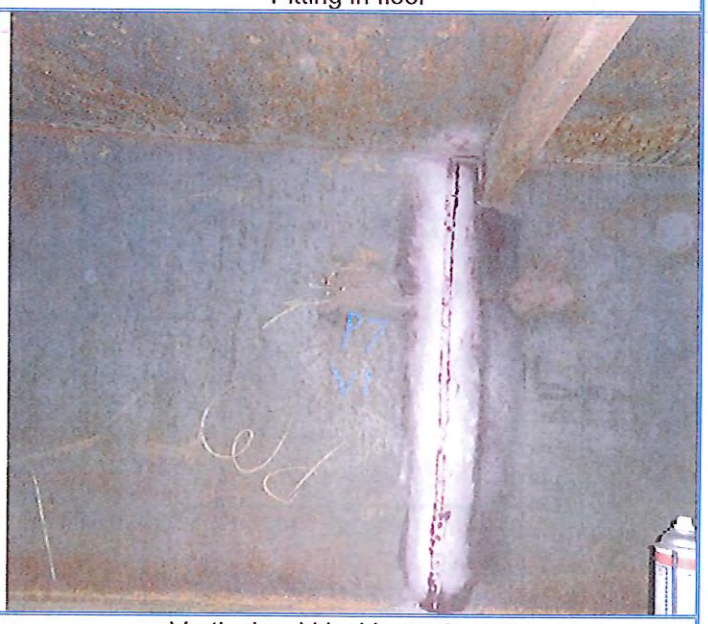
Hex head bolts in shell



Pitting in floor



Leak in pontoon 3



Vertical weld inside pontoon 7



Anti-Rotation setup



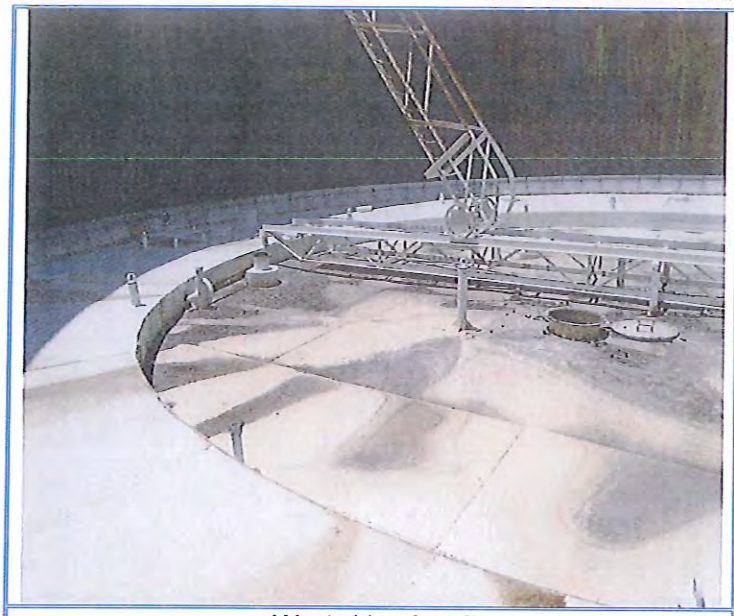
Corrosion and coating failure on anti-rotation device



Anti-rotation bar pulling away from shell



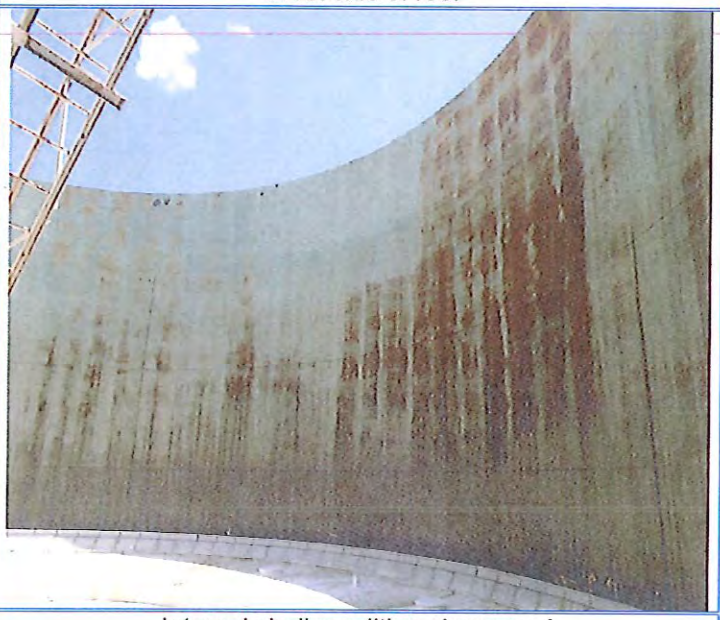
Anti-rotation bar pulling away from shell



West side of roof



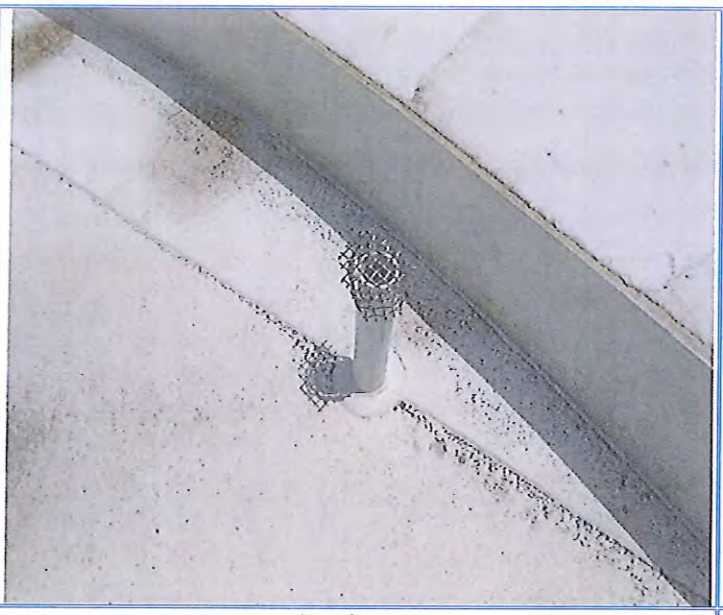
East side of roof



Internal shell condition above roof



Internal shell condition above roof and underside of ladder

	
Roof vent	Roof leg support

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**

Western Refining Company

API 653 Tank Inspection

Internal Inspection

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 Closure	

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.

Western Refining Company

API 653 Tank Inspection

Internal Inspection

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 Closure	

Reference Photographs



New Roof Seals



New Roof Seals



Roof Foam Line



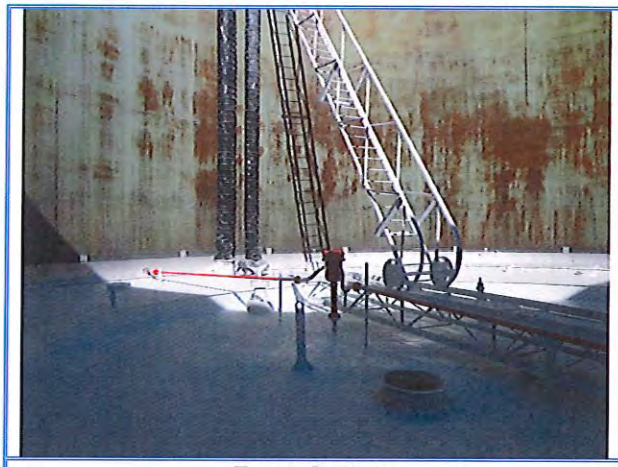
Rolling Ladder Supports

Western Refining Company

API 653 Tank Inspection

Internal Inspection

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 Closure	



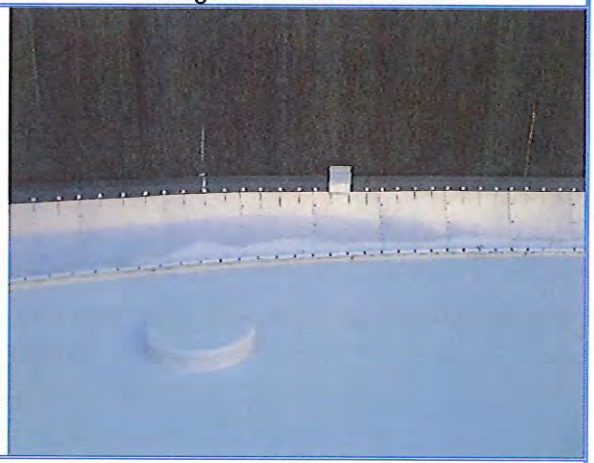
Foam System



Rolling Ladder and Platform



Bolt that was ground flush and seal welded.



New Seal

Western Refining Company

API 653 Tank Inspection

Internal Inspection

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 Closure	



Bolt that was seal welded on the exterior.

Signature: _____ **Date: 8/17/2017**

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

	1st course	2nd course	3rd course	4th course	5th 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

DATE: **08/24/17**

TANK: **TK-569**

INSPECTOR: **Gary Shelton**

TYPE OF ROOF: **External Floating Roof**

DATE BUILT: **1957**

SERVICE: **83 Octane Unleaded Gasoline**

NEW BOTTOM INSTALLED: **No**

PRIOR INSP (Yr): **07/17/1997**

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

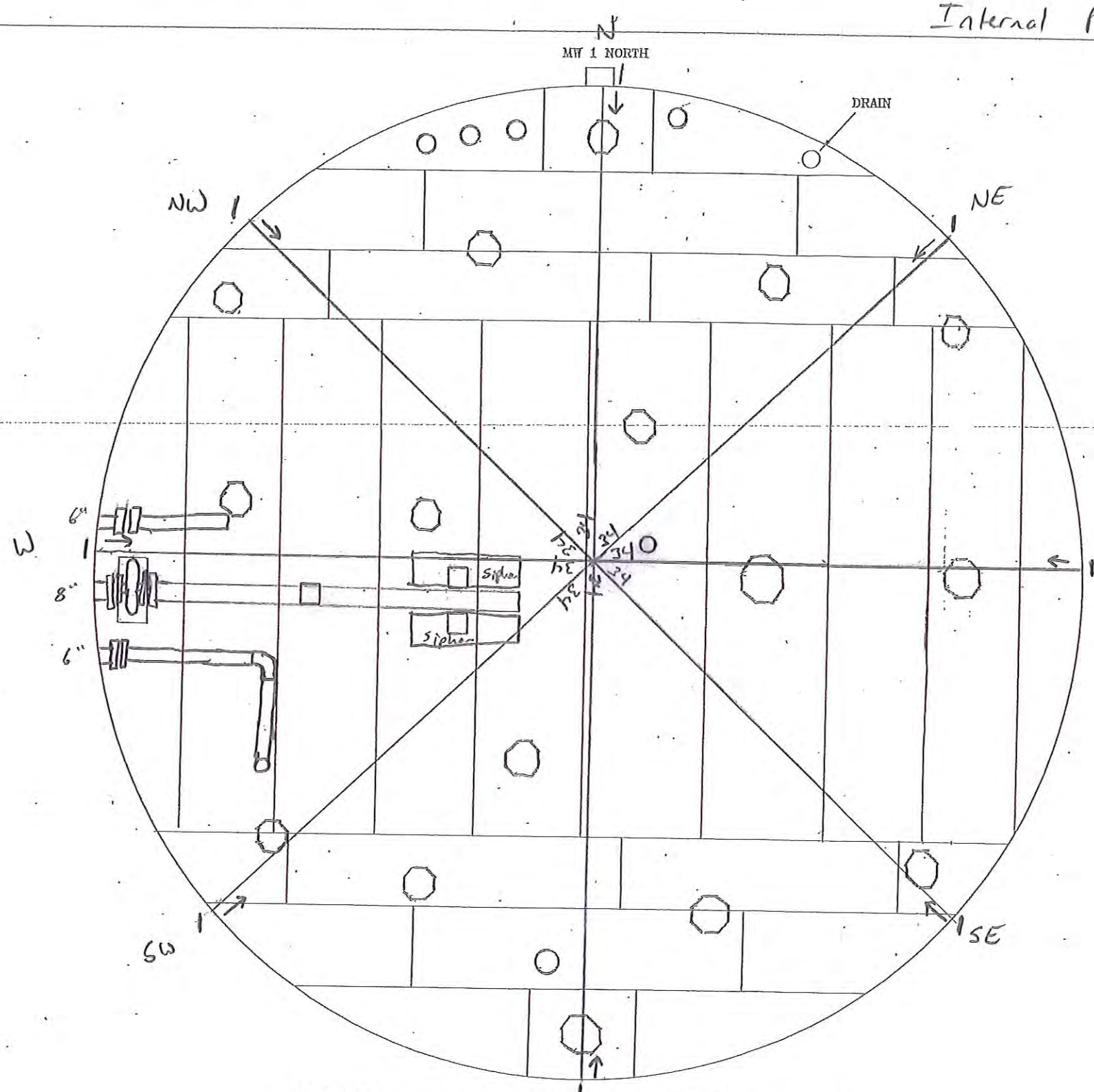
COMMENTS:

— 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		

8 Spoke Floor UT locations
&
Internal Piping



= Striker Plates

= Patches From past inspection

= piping supports

VACUUM BOX ALL OF TANK 569 FLOOR SEAMS

CILITY: TANK FARM	P&ID #:	DESIGN TEMP:	F INSULATED:	SCALE:	
E:#	FLANGE RATING:	OPER TEMP:	F DRAWN BY: JD	DESCRIPTION:	
RVICE:	DESIGN CODE:	DESIGN PSIG:	DATE:	TECHNICIANS: DM – KA	
C:	TEST PSIG:	OPER PSIG:	PAGE:	DATE: 9-3-10	
BOX ALL OF TANK #569	FLOOR SEAMS	CLIENT:			

INTEGRITY TESTING & INSPECTION

34

3861 Vincent Station Dr.
Owensboro, KY 42303
Tele: (270) 689-9980
Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

LEAK TESTING / VACCUM BOX REPORT

To	From	Date
Western Refining	Richard Ramsey	06/29/2017

Project: Tank 569 Floor Plate Seam Welds and Chime Weld

Purchase Order No.	Integrity Testing Job No.
	2017-0002

Item	Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other:
	☑	☐	☐	☐	☐	☐	☐	N/A

Material	Size:	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld
	Various	1 Floor	CS	CS	☐ N/A ☐ Smooth ☑ As Welded

Type of Leak Test	BLT (Vacuum) Test	Pneumatic Test	Hydro Test	Other Testing Type
	☑	☐	☐	

Pressure	Holding Time	Inspection Medium(If any used)
18" Hg	10 seconds	Snoop

Location	System
Western Refining/Jamestown, NM	Tank Farm

Acceptance Standards	Procedure
Customer Specifications	QCP 900 Rev. 1

Results of Inspection

ITI was asked to perform internal Vacuum box leak test on tank 569 floor plate seam welds and chime weld.

No indications found at time of inspection.

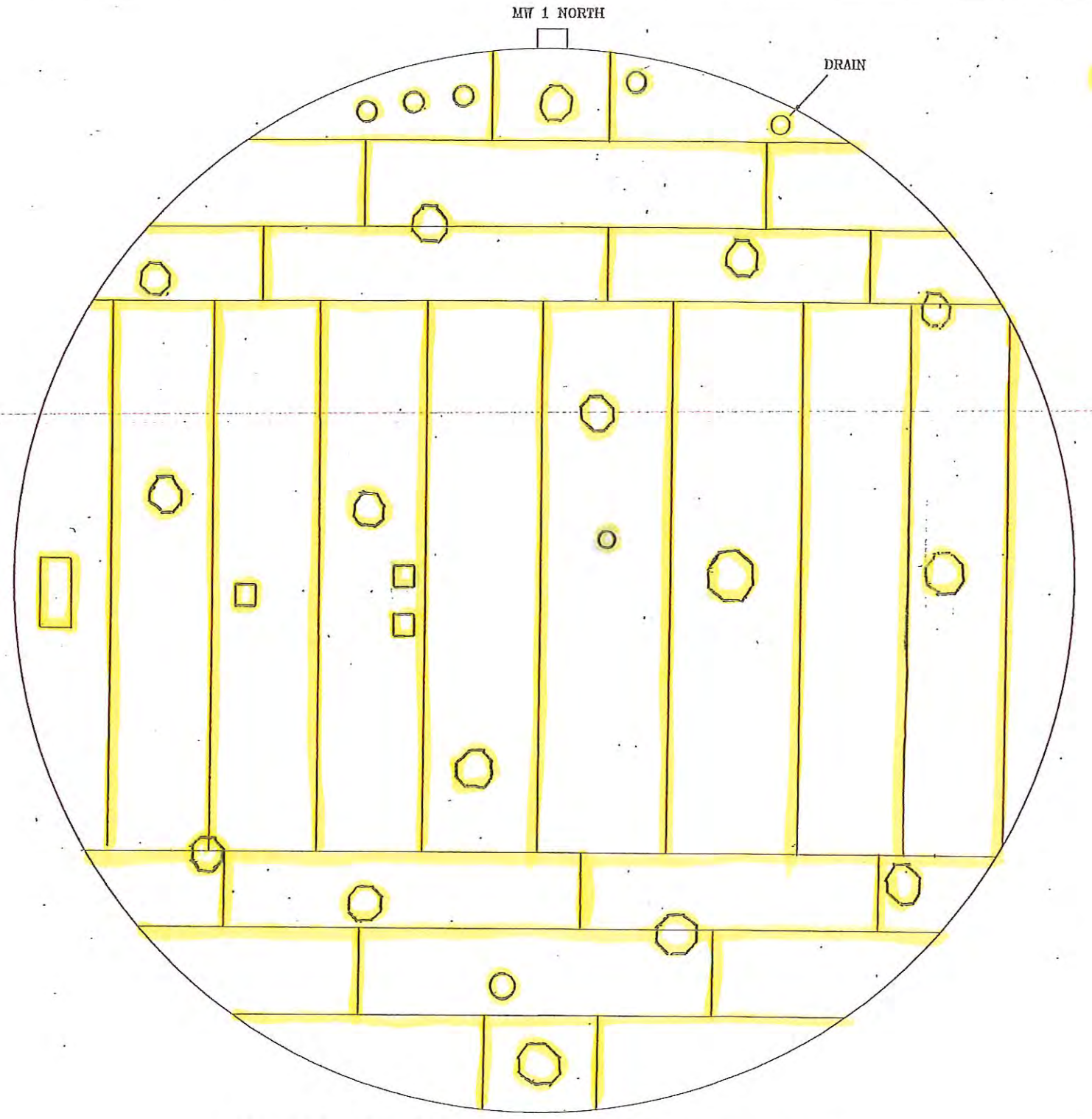
Reference: Summary ☑ See Attachment

Copy To:

Requested By:	Reported By (Technician):
Tom Lewis	R. Ramsey / F. Ramirez
☑ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: Caleb Morgan

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.



= Welds Leak Tested Internally

= Striker Plates

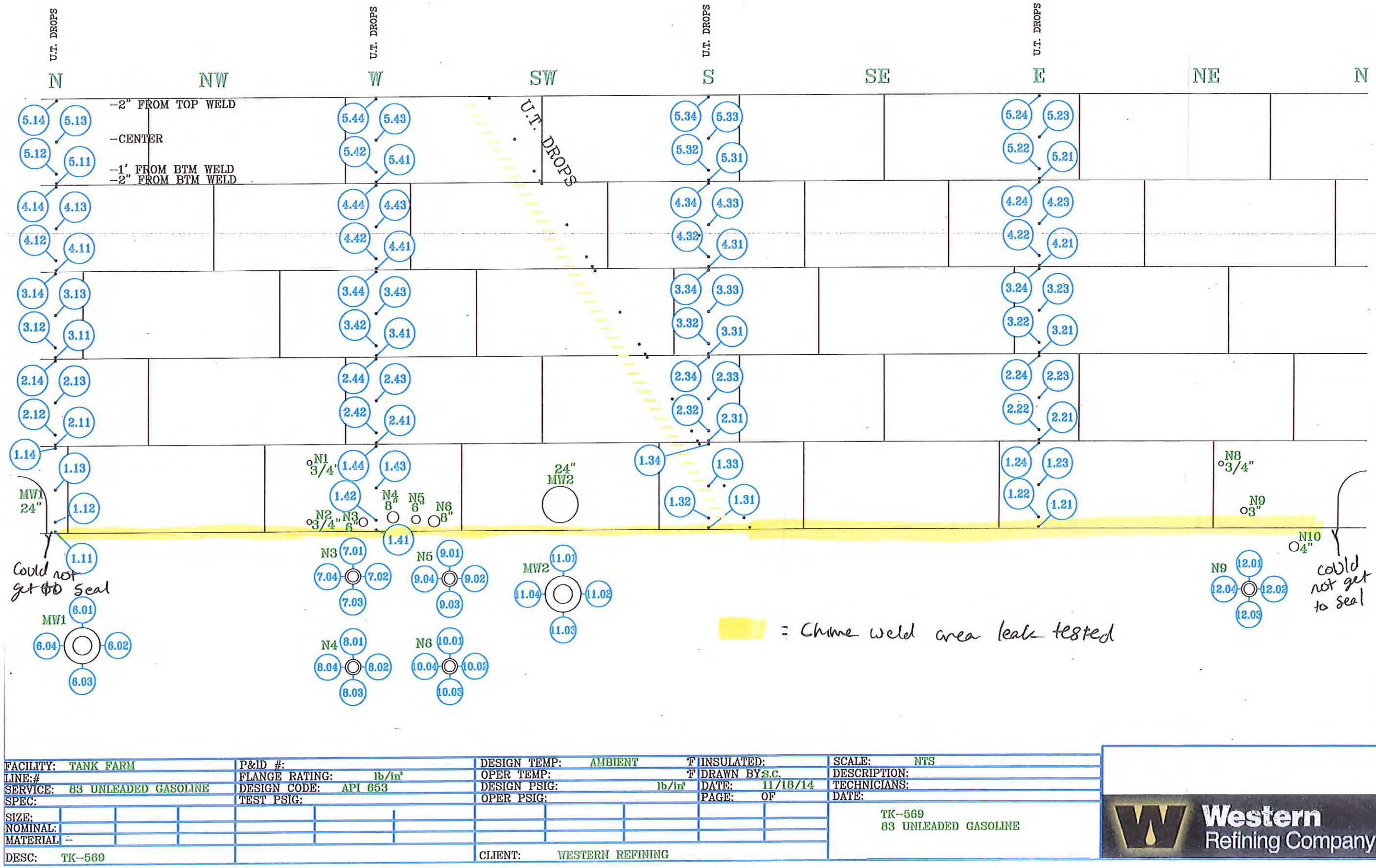
= Patches From past Inspection

= piping supports

VACUUM BOX ALL OF TANK 569 FLOOR SEAMS

CILITY: TANK FARM	P&ID #:	DESIGN TEMP:	°F INSULATED:	SCALE:	INTEGRITY TESTING & INSPECTION
NE:#	FLANGE RATING:	OPER TEMP:	°F DRAWN BY: JD	DESCRIPTION:	
RVICE:	DESIGN CODE:	DESIGN PSIG:	DATE:	TECHNICIANS: DM – KA	
EC:	TEST PSIG:	OPER PSIG:	PAGE:	DATE: 9-3-10	
BOX ALL OF TANK #569	FLOOR SEAMS	CLIENT:			

Corner Vac Box
(Leak Test)



FACILITY: TANK FARM	P&ID #:	DESIGN TEMP: AMBIENT °F	INSULATED:	SCALE: NTS	
LINE:#	FLANGE RATING: lb/in²	OPER TEMP: °F	DRAWN BY: S.C.	DESCRIPTION:	
SERVICE: 83 UNLEADED GASOLINE	DESIGN CODE: API 653	DESIGN PSIG: lb/in²	DATE: 11/18/14	TECHNICIANS:	
SPEC:	TEST PSIG:	OPER PSIG:	PAGE: OF	DATE:	
SIZE:				TK–569 83 UNLEADED GASOLINE	Western Refining Company
NOMINAL:					
MATERIAL: –					
DESC: TK–569		CLIENT: WESTERN REFINING			

3861 Vincent Station Dr.
Owensboro, KY 42303
Tele: (270) 689-9980 Fax:
(270) 689-9660

INTEGRITY TESTING & INSPECTION

LIQUID PENETRANT EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	R.R. / F.R.	06/29/2017

Project: **PT Internal Verts welds in Pontoons**

Contract No. or Purchase Order No.	Integrity Testing Job No.
W.O. #	2017-0120

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	Type of Filler Material	Weld
24in	11	C/S	SMAW	☐ N/A ☐ Smooth ☑ As Welded

Location

Location	System
Western Refining Jamestown NM	Tank -569

Acceptance Standards	Procedure
Customer Spec.	PT-QCO-400 Rev 8

Type of Check

Initial	Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final
☐	☐	☐	☐	☐	☐	☐	☐	☑

Type of Inspection

☑ Color Contrast ☐ Fluorescent Penetrant

Pre-Test Cleansing Method / Solution	Penetrant Application Method / Penetrant
Spray & wipe / SKC - S	Spray / SKL-SP1

Penetrant Removal Method / Remover	Penetrant Time	Penetrant Specimen / Surface Temperature
Wipe/ SKC-S	20 Min	Ambient

Penetrant Emulsifier Method / Emulsifier	Developer Application Method / Developer
NA	Spray / SKC-D

Developing Time	Final Cleaning Method / Solution
10 Min	Spray & Wipe

Reference: ☑ See Attachment	Results of Inspection
ITI was asked to perform PT"s on internal Vert welds inside pontoons for Tank 569. Pontoon 1 pinholes and HOLE upper left coner, Pontoon 2 pinholes and HOLE upper rigth coner, Pontoon 3 LEAK HOLE top of weld (left side) pinholes on (rigth side), Pontoon 7 pinholes	4 relavent indications found at time of inspection

Requested By:	Reported By (Technician):
Tom Lewis	R. Ramsey / F, Ramirez
☑ Customer Specifications ☐ Accept ☑ Reject	NDT Supervisor: Caleb Morgan

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730 East 18th Street
Owensboro, KY 42303
Tele: (270) 689-9980 Fax:
(270) 689-9660

— INTEGRITY TESTING & INSPECTION —

MAGNETIC PARTICLE EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
/Western Refining	R. R. / F. R.	06/29/2017

Project: Tank Farm Tk-569 Internal Inspection

Contract No. or Purchase Order No.	Integrity Testing Job No.
W.O.#	2017-0026

Item

Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A
☑	☐	☐	☐	☐	☑	☐

Other: MT Final

Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A
☐	☐	☐	☐	☐	☐	☑

Other: N/A

Material

Size	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld
Various	12	C/S	SMAW	☐ N/A ☐ Smooth ☑ As Welded

Location

Location: Western Refining Gallup NM

System: Tank -569

Acceptance Standards: Customer Spec.

Procedure: MT QCP 500 Rev.5

Type of Check

Initial	Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final
☐	☐	☐	☐	☐	☐	☐	☐	☑

Type of Inspection

☑ Longitudinal	☐ Coil	☐ DC Probe	☑ Continuous	Other:
☑ Wet	☐ Dry	☐ Direct Contact	☐ Residual	
☐ Circular	☐ AC Prod	☑ Yoke		

MT Equipment/Model: Parker DA400 Contour Probe S/N 17431

Surface Preparation Method: Sand Blasted

Inspection Medium/Color: Flourescent

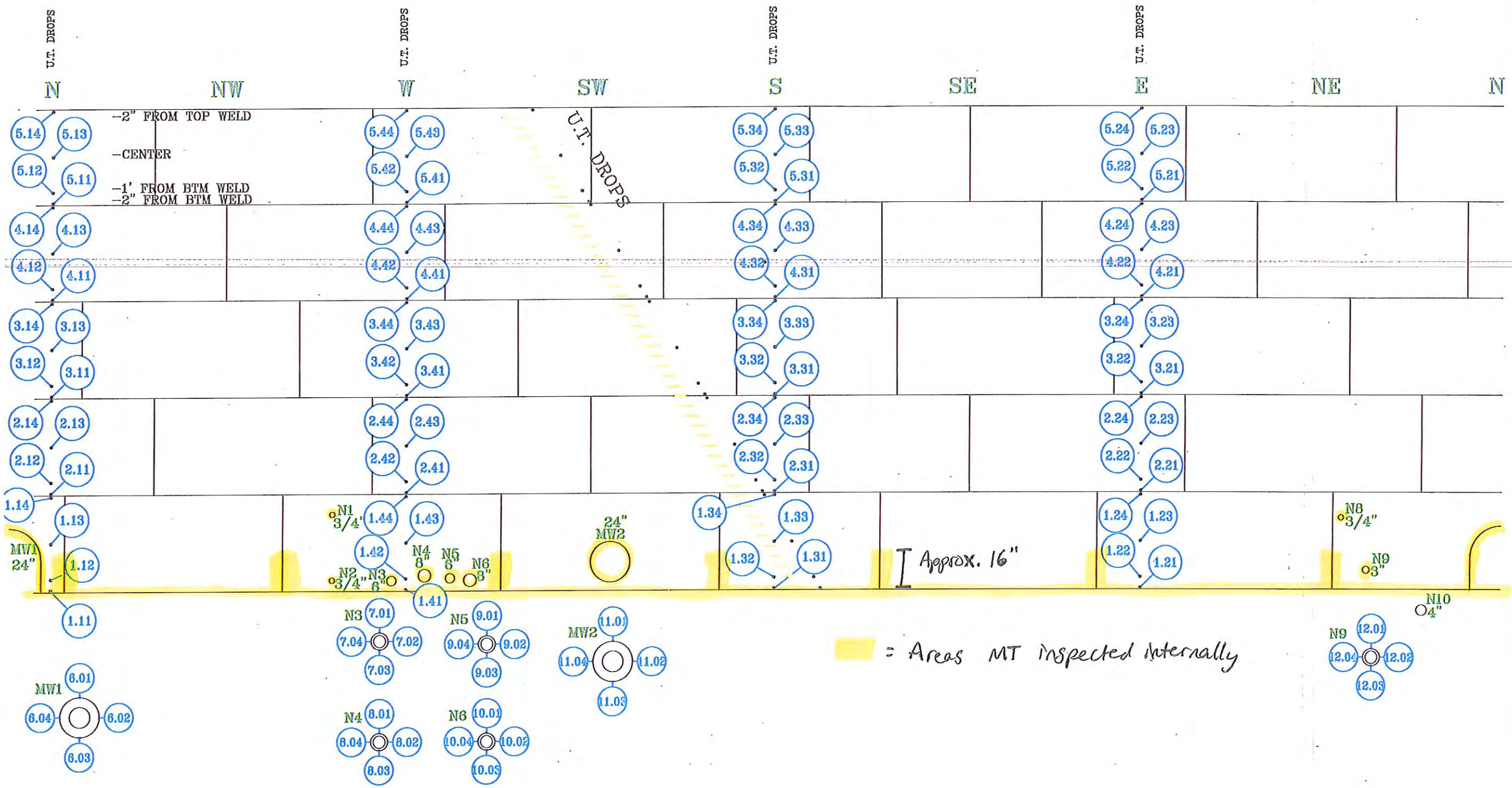
Demagnetization Method / Equipment: N/A

Reference: Summary ☑ See Attachment	Results of Inspection
ITI was asked to perform an Internal MT inspection on Tank -569, Chime, Nozzles back welds and Floor Junctions. 1st Shell course junctions where not acccessible for inspection.	No Relevan Indications found at time of inspection.

Copy To:

Requested By:	Reported By (Technician):
Tom Lewis	R. Ramsey / F. Ramirez
☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: Caleb Morgan

NOTICE:
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ACILITY: TANK FARM	P&ID #:	DESIGN TEMP: AMBIENT °F	INSULATED:	SCALE: NTS	
NE:#	FLANGE RATING: lb/in²	OPER TEMP: °F	DRAWN BY: S.C.	DESCRIPTION:	
ERVICE: 83 UNLEADED GASOLINE	DESIGN CODE: API 653	DESIGN PSIG: lb/in²	DATE: 11/18/14	TECHNICIANS:	
PEC:	TEST PSIG:	OPER PSIG:	PAGE: OF	DATE:	
IZE:				TK-569 83 UNLEADED GASOLINE	
OMINAL:					
ATERIAL:					
ESC: TK-569		CLIENT: WESTERN REFINING			

Western Refining Company

3861 Vincent Station Dr.
Owensboro, KY 42303
Tele: (270) 689-9980 Fax:
(270) 689-9660

INTEGRITY TESTING & INSPECTION

M.F.E. EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	Richard Ramsey	06/29/2017

Project: MFE Scan Performed on Tank 569 Floor

Integrity Testing Job No.: 2017-0027

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	Type of Filler Material	Weld ☑ N/A ☐ Smooth ☐ As Welded
67' Diam	1 Floor	C/S	C/S	

Location

Location	System
Jamestown, NM	Tank Farm

Acceptance Standards	Procedure
Customer Specifications	MT QCP 503 Rev 2

Type of Check

Initial	Plate	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final
☐	☑	☐	☐	☐	☐	☐	☐	☑

Type of Inspection

				Other:
☐ Longitudinal	☐ Coil	☐ DC Probe	☑ Continuous	N/A
☐ Wet	☐ Dry	☑ Direct Contact	☐ Residual	
☐ Circular	☐ AC Prod	☐ Yoke		

M.F.E. Equipment/Model	Surface Preparation Method
Mark 4 Tank Floor Scanner	Water Blast
SERIAL NUMBER	CALIBRATION
MK4-0007-A-TFS	Before Use

Reference: Summary ☑ See Attachment

ITI was asked to perform MFE examination on Tank 569 floor plates.

Results of Inspection

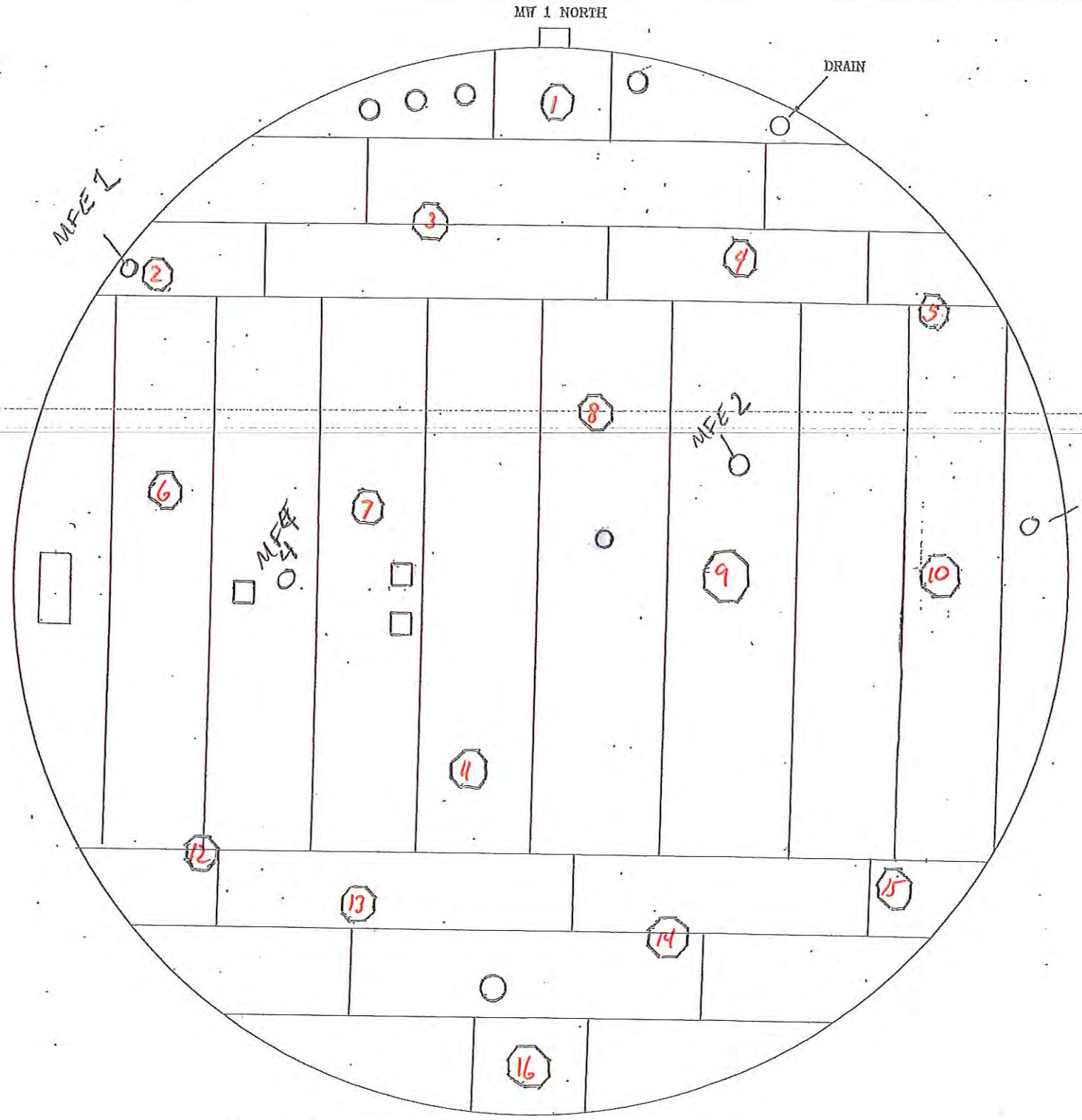
Pitting found on floor plates. Suspect areas were proofed up with UTT during inspection.

See attached drawings for additional locations and information.

Copy To:

Requested By:	Reported By (Technician):
Tom Lewis	Richard Ramsey / Francisco Ramirez
☑ Customer Specifications ☐ Accept ☐ Reject	NDT Supervisor: Caleb Morgan

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Low From MFE .188"

= Striker Plates

= Patches From past Inspection

= piping supports

VACUUM BOX ALL OF TANK 569 FLOOR SEAMS

ITY: TANK FARM	P&ID #:	DESIGN TEMP:	F INSULATED:	SCALE:	INTEGRITY TESTING & INSPECTION
#	FLANGE RATING:	OPER TEMP:	F DRAWN BY: JD	DESCRIPTION:	
ICE:	DESIGN CODE:	DESIGN PSIG:	DATE:	TECHNICIANS: DM -- KA	
:	TEST PSIG:	OPER PSIG:	PAGE:	DATE: 9-3-10	
BOX ALL OF TANK #569	FLOOR SEAMS	CLIENT:			

3861 Vincent Station Dr.
Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

INTEGRITY TESTING & INSPECTION

ULTRASONIC EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To: Western Refining	From: Richard Ramsey	Date: 06/29/2017
Project: Tank 569 floor, critical zone, and internal piping.		
Work Order Number: N/A	Integrity Testing Job No.: 2017-0037	

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: Various	No. of Pieces: 1 Floor	Type of Base Metal: C/S	Type of Filler Material: N/A	Weld: ☑ N/A ☐ Smooth ☐ As Welded
Location	JAMESTOWN, NM		System: Tank Farm		
Acceptance Standards	Customer Specs.		Procedure: UTT QCP-620 Rev. 0		

Type of Inspection

Soundness ☐ Thickness ☑ Bond ☐

Pulse Echo ☑ Angle-Beam ☐ Other ☐

UT Equipment/Model
37 DL Plus
SN: 119271-01
Cal Due: 2-2-18
D790 5MHL: 561343

Transducer: Single Crystal ☐ Dual Crystal ☑

Frequency	Size	Angle
5 MHZ	.5"	0°

Flat ☑ Concave ☐ Convex ☐

Couplant: Sono Test Ultra Gel

Standard	Material	Notch Depth	Serial No.
N/A	N/A	N/A	N/A

	Material	Thickness Range	Serial No.
Step Wedge ☑ Tube Wedge ☐	C/S	.100-.500	12-4059

Reference: Summary ☑ See Attachment

ITI was asked to perforne UT Thickness internal inspection on Tank 569 floor plates, piping, along with the critical zone.

Results of Inspection:
See attached reports and drawings for results and locations of inspection.

Requested By: Tom Lewis	Reported By (Technician): Richard Ramsey / Francisco Ramirez
☑ Customer Specifications ☐ Accept ☐ Reject	NDT Supervisor: Caleb Morgan

NOTICE:

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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		
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		
34	0.227	0.249	0.242	0.259	0.246	0.257	0.234	0.234		

— INTEGRITY TESTING & INSPECTION —

Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 Chime Readings
Technician: R. Ramsey / F. Ramirez
Date:

Chime 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	0.235
	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

— INTEGRITY TESTING & INSPECTION —

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					

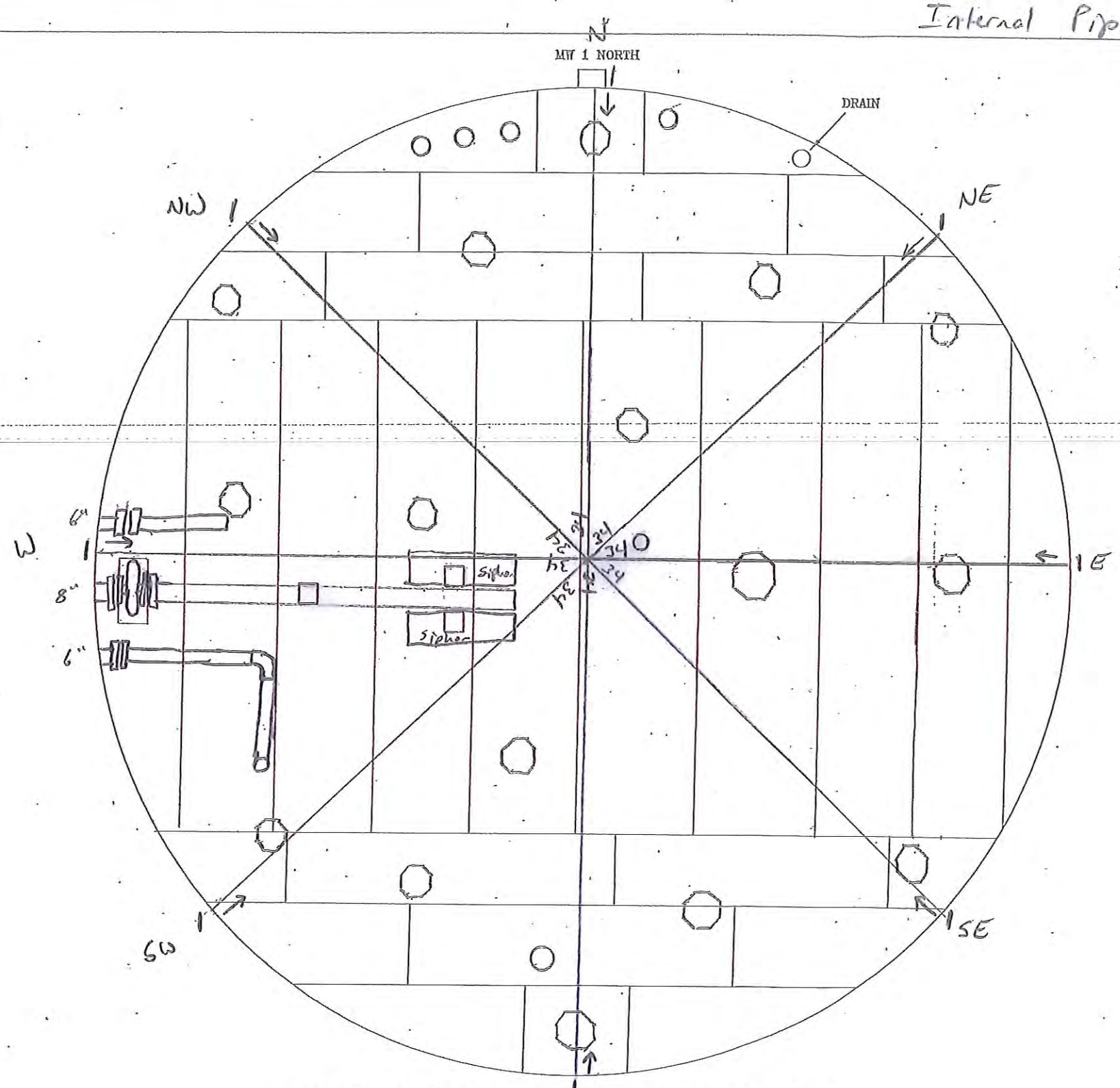
— INTEGRITY TESTING & INSPECTION —

Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 internal Piping
Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

Locations	0/Top	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						

Comments:

8 Spoke Floor OTT locations
↓
Internal Piping



= Striker Plates

O = Patches From past Inspection

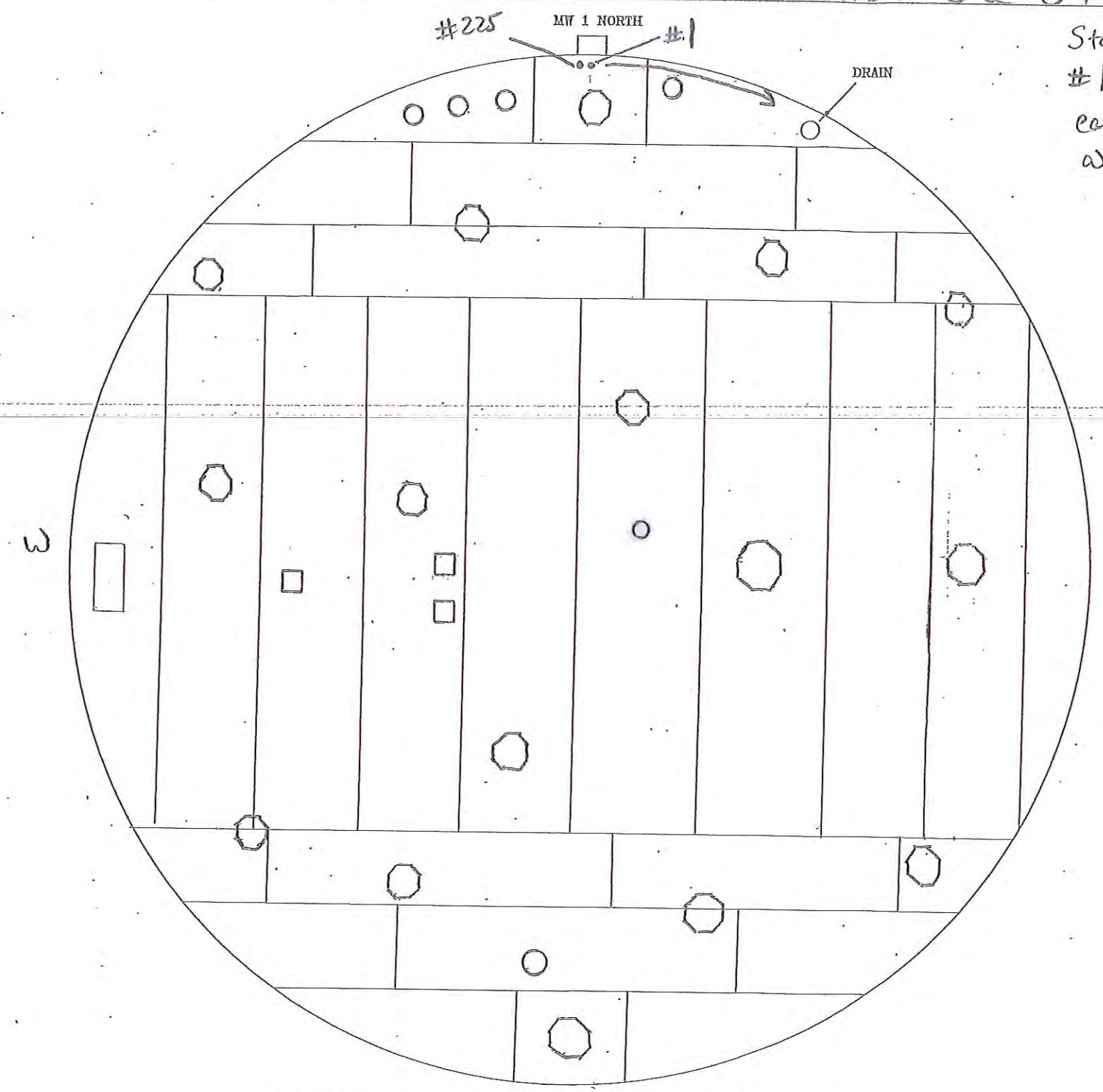
= piping supports

VACUUM BOX ALL OF TANK 569 FLOOR SEAMS

LITY: TANK FARM	P&ID #:	DESIGN TEMP:	°F	INSULATED:	SCALE:
#:	FLANGE RATING:	OPER TEMP:	°F	DRAWN BY: JD	DESCRIPTION:
ICE:	DESIGN CODE:	DESIGN PSIG:		DATE:	TECHNICIANS: DM – KA
:	TEST PSIG:	OPER PSIG:		PAGE:	DATE: 9-3-10
BOX ALL OF TANK #569	FLOOR SEAMS	CLIENT:			

INTEGRITY TESTING & INSPECTION

Critical Zone UTT location



Started at Manway with #1 going clockwise (going east) and ended at Manway with #225.

= Striker Plates

= Patches From past Inspection

= piping supports

VACUUM BOX ALL OF TANK 569 FLOOR SEAMS

S

LITY: TANK FARM	P&ID #:	DESIGN TEMP: F	INSULATED:	SCALE:	
:#	FLANGE RATING:	OPER TEMP: F	DRAWN BY: JD	DESCRIPTION:	
VICE:	DESIGN CODE:	DESIGN PSIG:	DATE:	TECHNICIANS: DM – KA	
C:	TEST PSIG:	OPER PSIG:	PAGE:	DATE: 9-3-10	
BOX ALL OF TANK #569	FLOOR SEAMS	CLIENT:			

INTEGRITY TESTING & INSPECTION

3861 Vincent Station Dr.
Owensboro, KY 42303 Tele:
(270) 689-9980 Fax: (270)
689-9660

— INTEGRITY TESTING & INSPECTION —

ULTRASONIC EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To: **Western Refining**	From: **Richard Ramsey**	Date: **06/29/2017**
Project: **Tank 569 External Shell and Nozzles**		
Work Order Number: **N/A**	Integrity Testing Job No.: **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: **Various**	No. of Pieces: **Various**	Type of Base Metal: **C/S**	Type of Filler Material: **N/A**	Weld: ☑ N/A ☐ Smooth ☐ As Welded
Location	**JAMESTOWN, NM**			System: **Tank Farm**	
Acceptance Standards	**Customer Specs.**			Procedure: **UTT QCP-620 Rev. 0**	

Type of Inspection

Soundness ☐ Thickness ☑ Bond ☐

Pulse Echo ☑ Angle-Beam ☐ Other ☐

UT Equipment/Model
37 DL Plus
SN: 119271-01
Cal Due: 2-2-18
D790 5MHL: 561343

Transducer: Single Crystal ☐ Dual Crystal ☑

Frequency	Size	Angle	Couplant
5 MHZ	**.5"**	**0⁰**	**Sono Test Ultra Gel**

Flat	Concave	Convex
☑	☐	☐

Standard	Material	Notch Depth	Serial No.
N/A	**N/A**	**N/A**	**N/A**

	Material	Thickness Range	Serial No.
Step Wedge ☑ Tube Wedge ☐	**C/S**	**.100-.500**	**12-4059**

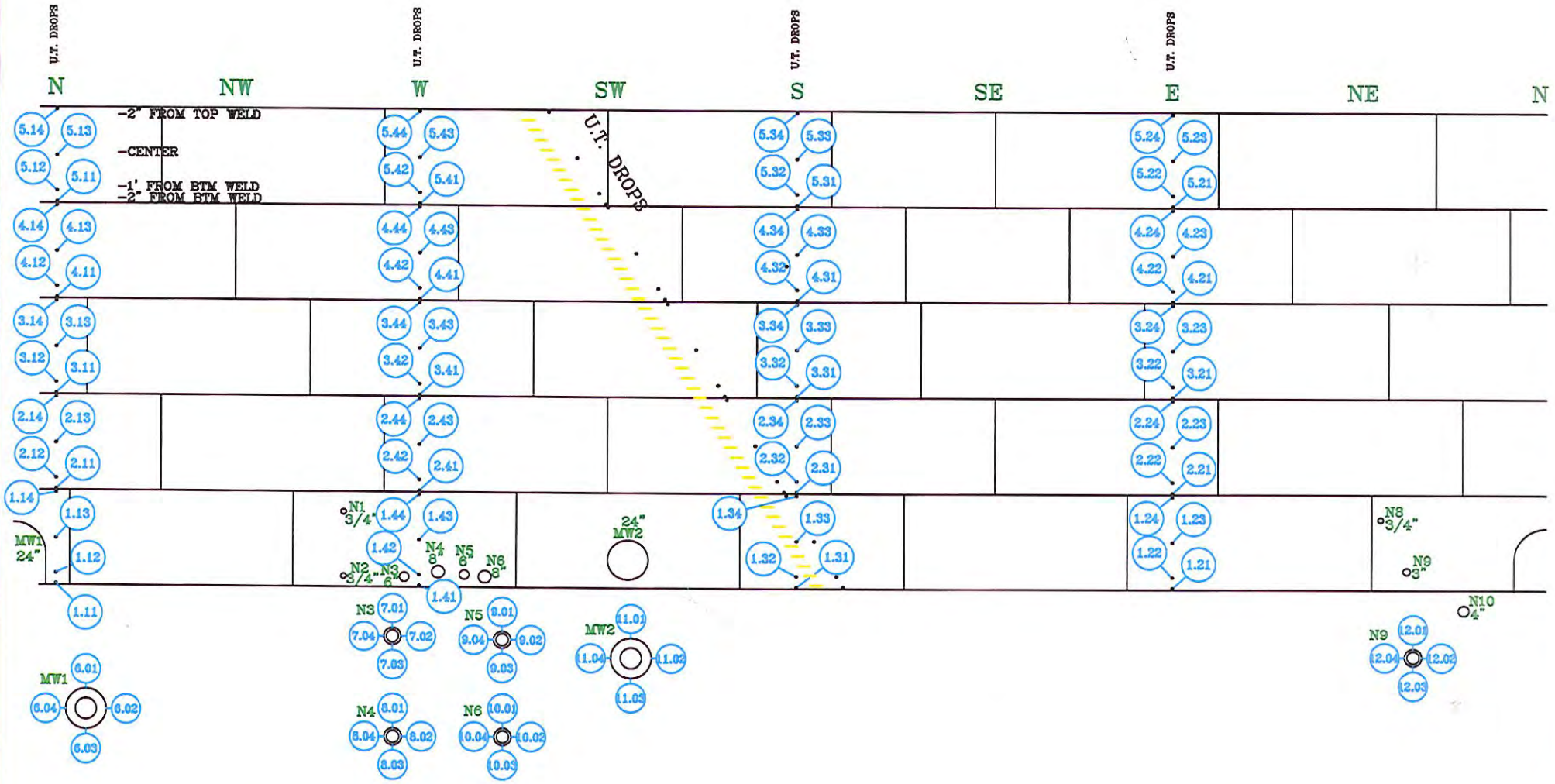
Reference: Summary ☑ See Attachment

ITI was asked to performed UT Thickness inspection on Tank 569 external shell and nozzles.

Results of Inspection:
See attached reports and drawings for results and locations of inspection.

Requested By: **Tom Lewis**	Reported By (Technician): **Richard Ramsey / Francisco Ramirez**
☑ Customer Specifications ☐ Accept ☐ Reject	NDT Supervisor: **Caleb Morgan**

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FACILITY: TANK FARM	P&ID #:	DESIGN TEMP: AMBIENT °F	INSULATED:	SCALE: NTS	
LINE:#	FLANGE RATING: lb/in²	OPER TEMP: °F	DRAWN BY: S.C.	DESCRIPTION:	
SERVICE: 83 UNLEADED GASOLINE	DESIGN CODE: API 653	DESIGN PSIG: lb/in²	DATE: 11/18/14	TECHNICIANS:	
SPEC:	TEST PSIG:	OPER PSIG:	PAGE: OF	DATE:	
SIZE:				TK-569	
NOMINAL:				83 UNLEADED GASOLINE	
MATERIAL: -					
DESC: TK-569		CLIENT: WESTERN REFINING			

Western Refining Company

Western Refining Southwest, Inc.
Gallup Refinery
UltraPIPE Inspection Data Management

Corrosion Monitoring Survey - Columns Report

(Thickness in inches)

Report Date: 07/17/2017 15:07:21

Unit: TK FARM
Eq/Circ ID: TK-569
Eq Type: TANK
Class:
RBI:

TML No	Location	07/22/2014	05/05/2017	6-21-17	6-22-17						
1.11	SHLCRS 1 N-BTM	0.330	Empty	.332"							
1.12	SHLCRS 1 N-CTR	0.321	Empty	.321"							
1.13	SHLCRS 1 N-TOP	0.317	Empty	.314"							
1.21	SHLCRS 1 E-BTM	0.299	Empty	.315	CM						
1.22	SHLCRS 1 E-CTR	0.314	Empty	.314"							
1.23	SHLCRS 1 E-TOP	0.322	Empty	~~.306~~	.312" CM						
1.31	SHLCRS 1 S-BTM	0.319	Empty	.319"							
1.32	SHLCRS 1 S-CTR	0.328	Empty	.733"							
1.33	SHLCRS 1 S-TOP	0.335	Empty	~~.345~~	.325" CM						
1.41	SHLCRS 1 W-BTM	0.337	Empty	.337"							
1.42	SHLCRS 1 W-CTR	0.334	Empty	~~.348~~	.330" CM						
1.43	SHLCRS 1 W-TOP	0.337	Empty	~~.308~~	.337" CM						
1.51	SHLCRS 1 NW-BTM	Empty	0.356	~~.321~~	.356" CM						
1.52	SHLCRS 1 NW-CTR	Empty	0.357	~~.348~~	.357" CM						
1.53	SHLCRS 1 NW-TOP	Empty	0.367	~~.355~~	.367" CM						
1.61	SHLCRS 1 S-BTM	Empty	0.378	~~.354~~	.378" CM						
1.62	SHLCRS 1 S-CTR	Empty	0.355	~~.335~~	.355" CM						
1.63	SHLCRS 1 S-TOP	Empty	0.347	~~.347~~	.347 CM						
1.71	SHLCRS 1 SE-BTM	Empty	0.371	~~.344~~	.371" CM						
1.72	SHLCRS 1 SE-CTR	Empty	0.375	~~.344~~	.375" CM						
1.73	SHLCRS 1 SE-TOP	Empty	0.381	~~.333~~	.370" CM						
1.81	SHLCRS 1 NE-BTM	Empty	0.358	~~.320~~	.358" CM						
1.82	SHLCRS 1 NE-CTR	Empty	0.343	.347"							
1.83	SHLCRS 1 NE-TOP	Empty	0.352	~~.323~~	.352" CM						
2.11	SHLCRS 2 N-BTM	0.248	Empty	.256"							
2.12	SHLCRS 2 N-BTM	0.249	Empty	.266"	CM						
2.13	SHLCRS 2 N-CTR	0.240	Empty	.259"	CM						
2.14	SHLCRS 2 N-TOP	0.210	Empty	.262"	CM						
2.21	SHLCRS 2 E-BTM	0.246	Empty	.246"							
2.22	SHLCRS 2 E-BTM	0.254	Empty	.249"							
2.23	SHLCRS 2 E-CTR	0.248	Empty	.248							
2.24	SHLCRS 2 E-TOP	0.257	Empty	.250"							
2.31	SHLCRS 2 S-BTM	0.247	Empty	.247"							
2.32	SHLCRS 2 S-BTM	0.262	Empty	.240"	CM						
2.33	SHLCRS 2 S-CTR	0.254	Empty	.248"							
2.34	SHLCRS 2 S-TOP	0.248	Empty	~~.220~~	.248" CM						
2.41	SHLCRS 2 W-BTM	0.261	Empty	~~.237~~	.261" CM						
2.42	SHLCRS 2 W-BTM	0.261	Empty	~~.243~~	.261" CM						
2.43	SHLCRS 2 W-CTR	0.250	Empty	.250							
2.44	SHLCRS 2 W-TOP	0.231	Empty	.245"							
3.11	SHLCRS 3 N-BTM	0.155	Empty	.175"							
3.12	SHLCRS 3 N-BTM	0.148	Empty	.185"	CM wrong probes						
3.13	SHLCRS 3 N-CTR	0.154	Empty	.187"							
3.14	SHLCRS 3 N-TOP	0.196	Empty	.194"							
3.21	SHLCRS 3 E-BTM	0.203	Empty	.185"	CM						
3.22	SHLCRS 3 E-BTM	0.186	Empty	.199"							

Western Refining Southwest, Inc.
Gallup Refinery
UltraPIPE Inspection Data Management

TML No	Location	07/22/2014	05/05/2017	6-21-2017	6-22-17
3.23	SHLCRS 3 E-CTR	0.175	Empty	.208	CM
3.24	SHLCRS 3 E-TOP	0.171	Empty	.201	CM
3.31	SHLCRS 3 S-BTM	0.208	Empty	.165	
3.32	SHLCRS 3 S-BTM	0.195	Empty	.180	CM
3.33	SHLCRS 3 S-CTR	0.188	Empty	.164	.188" CM
3.34	SHLCRS 3 S-TOP	0.181	Empty	.180	
3.41	SHLCRS 3 W-BTM	0.192	Empty	.191	
3.42	SHLCRS 3 W-BTM	0.193	Empty	.183	
3.43	SHLCRS 3 W-CTR	0.173	Empty	.194	CM
3.44	SHLCRS 3 W-TOP	0.142	Empty	.205	
4.11	SHLCRS 4 N-BTM	0.167	Empty	.211	
4.12	SHLCRS 4 N-BTM	0.198	Empty	.228	
4.13	SHLCRS 4 N-CTR	0.220	Empty	.237	
4.14	SHLCRS 4 N-TOP	0.247	Empty	.237	
4.21	SHLCRS 4 E-BTM	0.234	Empty	.218	CM
4.22	SHLCRS 4 E-BTM	0.227	Empty	.239	
4.23	SHLCRS 4 E-CTR	0.219	Empty	.243	CM Wrong pass
4.24	SHLCRS 4 E-TOP	0.206	Empty	.242	
4.31	SHLCRS 4 S-BTM	0.243	Empty	.195	.243" CM
4.32	SHLCRS 4 S-BTM	0.243	Empty	.210	.240" CM
4.33	SHLCRS 4 S-CTR	0.228	Empty	.224	
4.34	SHLCRS 4 S-TOP	0.220	Empty	.231	
4.41	SHLCRS 4 W-BTM	0.233	Empty	.204	.229" CM
4.42	SHLCRS 4 W-BTM	0.225	Empty	.221	
4.43	SHLCRS 4 W-CTR	0.219	Empty	.230	CM
4.44	SHLCRS 4 W-TOP	0.205	Empty	.231	CM
5.11	SHLCRS 5 N-BTM	0.246	Empty	.231	
5.12	SHLCRS 5 N-BTM	0.249	Empty	.241	
5.13	SHLCRS 5 N-CTR	0.255	Empty	.243	
5.14	SHLCRS 5 N-TOP	0.257	Empty	.240	CM
5.21	SHLCRS 5 E-BTM	0.249	Empty	.244	
5.22	SHLCRS 5 E-BTM	0.245	Empty	.249	
5.23	SHLCRS 5 E-CTR	0.240	Empty	.254	.240 CM
5.24	SHLCRS 5 E-TOP	0.237	Empty	.254	.235" CM
5.31	SHLCRS 5 S-BTM	0.251	Empty	.236	CM
5.32	SHLCRS 5 S-BTM	0.250	Empty	.245	
5.33	SHLCRS 5 S-CTR	0.243	Empty	.250	
5.34	SHLCRS 5 S-TOP	0.240	Empty	.252	
5.41	SHLCRS 5 W-BTM	0.240	Empty	.234	
5.42	SHLCRS 5 W-BTM	0.238	Empty	.246	
5.43	SHLCRS 5 W-CTR	0.236	Empty	.249	
5.44	SHLCRS 5 W-TOP	0.235	Empty	.246	
6.01	24X24 MW1 12:00	0.502	Empty	.470	CM
6.02	24X24 MW1 3:00	0.471	Empty	.477	
6.04	24X24 MW1 9:00	0.465	Empty	.470	
7.01	N3 6" NOZ 12:00	0.368	Empty	.394	got chipped
7.02	N3 6" NOZ 3:00	0.384	Empty	.385	
7.03	N3 6" NOZ 6:00	0.390	Empty	.364	
7.04	N3 6" NOZ 9:00	0.378	Empty	.409	.380" CM
8.01	N4 8" NOZ 12:00	0.578	Empty	.506	CM
8.02	N4 8" NOZ 3:00	0.580	Empty	.504	CM
8.03	N4 8" NOZ 6:00	0.580	Empty	~~.510~~	.499 CM
8.04	N4 8" NOZ 9:00	0.579	Empty	~~.482~~	.487 CM
9.01	N5 6" NOZ 12:00	0.490	Empty	~~.449~~	.494 CM
9.02	N5 6" NOZ 3:00	0.492	Empty	~~.404~~	.435" CM
9.03	N5 6" NOZ 6:00	0.488	Empty	~~.386~~	.429 CM

Western Refining Southwest, Inc.
Gallup Refinery
UltraPIPE Inspection Data Management

9.04	N5 6" NOZ 9:00	0.492	Empty	~~.495~~	* .427 RM						
TML No	**Location**	**07/22/2014**	**05/05/2017**	6-21-2017							
10.01	N6 8" NOZ 12:00	0.438	Empty	.438							
10.02	N6 8" NOZ 3:00	0.501	Empty	~~.456~~	* .472" RM						
10.03	N6 8" NOZ 6:00	0.460	Empty	.461							
10.04	N6 8" NOZ 9:00	0.475	Empty	.477							
11.01	24" MW2 12:00	0.475	Empty	.471							
11.02	24" MW2 3:00	0.474	Empty	.480							
11.03	24" MW2 6:00	0.477	Empty	.481							
11.04	24" MW2 9:00	0.477	Empty	.485							
12.01	N9 3" NOZ 12:00	0.268	Empty	.262							
12.02	N9 3" NOZ 3:00	0.259	Empty	.277							
12.03	N9 3" NOZ 6:00	0.273	Empty	.262							
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 —

ULTRASONIC EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To: Western Refining	From: Richard Ramsey	Date: 06/29/2017
Project: Tank 569 Roof and Pontoon Readings		
Work Order Number: N/A	Integrity Testing Job No.: 2017-0036	

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: Various	No. of Pieces: 1 Roof	Type of Base Metal: C/S	Type of Filler Material: N/A	Weld ☑ N/A ☐ Smooth ☐ As Welded
Location	JAMESTOWN, NM			System: Tank Farm	
Acceptance Standards	Customer Specs.			Procedure: UTT QCP-620 Rev. 0	

Type of Inspection

Soundness ☐ Thickness ☑ Bond ☐

Pulse Echo ☑ Angle-Beam ☐ Other ☐

UT Equipment/Model
37 DL Plus
SN: 119271-01
Cal Due: 2-2-18
D790 5MHL: 561343

Transducer: Single Crystal ☐ Dual Crystal ☑

Frequency	Size	Angle
5 MHZ	.5"	0^0

Flat ☑ Concave ☐ Convex ☐

Couplant: Sono Test Ultra Gel

Standard	Material	Notch Depth	Serial No.
N/A	N/A	N/A	N/A

Step Wedge ☑ Tube Wedge ☐

Material	Thickness Range	Serial No.
C/S	.100-.500	12-4059

Reference: Summary ☑ See Attachment

ITI was asked to performed UT Thickness inspection on Tank 569 Roof plates, along with the outside and inside of pontoons.

Results of Inspection:
See attached reports and drawings for results and locations of inspection.

Requested By: Tom Lewis	Reported By (Technician): Richard Ramsey / Francisco Ramirez
☑ Customer Specifications ☐ Accept ☐ Reject	NDT Supervisor: Caleb Morgan

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.

INTEGRITY TESTING & INSPECTION

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						

— INTEGRITY TESTING & INSPECTION —

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		

Comments:

FACILITY: MARKETING TANK FARM	P&ID #:		DESIGN TEMP:	°F	INSULATED:	SCALE: NTS
LINE:#	FLANGE RATING:	lb/in²	OPER TEMP:	°F	DRAWN BY:C.G.	DESCRIPTION:
SERVICE:	DESIGN CODE:		DESIGN PSIG:	lb/in²	DATE: 09/03/14	TECHNICIANS:
SPEC:	TEST PSIG:		OPER PSIG:		PAGE: OF	DATE:
SIZE:						
NOMINAL:						
MATERIAL: –						
DESC: TANK 669 – ROOF			CLIENT: WESTERN REFINING			TANK 669 – ROOF

INTEGRITY TESTING & INSPECTION

INTEGRITY TESTING AGENCY

S

SE

SW

E

W

NE

NW

N

1 2 3 4 5 6 7 8 9 10 11 12

VB VB MW

RIM VENT

GAUGE LATCH

VAREC CABLE

○ OPEN DRAIN

⊗ CUP DRAIN

1-2-2

— 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		
Top	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		

Comments:

— INTEGRITY TESTING & INSPECTION —

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					
Top	0.147	0.151	0.157	0.158	0.151	Rim Plate				
C	0.182	0.198	0.194	0.194	0.191					
BTM	0.133	0.144	0.136	0.135	0.142					
OR	0.172	0.163	0.155	0.158	0.155					
C	0.152	0.153	0.135	0.142	0.147					
IR	0.170	0.149	0.136	0.137	0.149					
Pontoon 2										
Top	0.151	0.151	0.155	0.163	0.157	Rim Plate				
C	0.177	0.190	0.191	0.191	0.190					
BTM	0.156	0.135	0.132	0.138	0.147					
OR	0.143	0.141	0.144	0.146	0.143					
C	0.156	0.144	0.154	0.143	0.146					
IR	0.149	0.148	0.158	0.143	0.146					
Pontoon 3										
Top	0.160	0.142	0.159	0.154	0.162	Rim Plate				
C	0.183	0.184	0.187	0.187	0.187					
BTM	0.133	0.134	0.131	0.132	0.115					
OR	0.167	0.151	0.140	0.142	0.147					
C	0.145	0.146	0.147	0.139	0.144					
IR	0.166	0.158	0.146	0.151	0.154					
Pontoon 4										
Top	0.156	0.155	0.162	0.146	0.157	Rim Plate				
C	0.186	0.184	0.189	0.189	0.191					
BTM	0.134	0.113	0.135	0.136	0.137					
OR	0.154	0.143	0.147	0.138	0.137					
C	0.144	0.151	0.139	0.153	0.155					
IR	0.155	0.139	0.147	0.146	0.164					
Pontoon 5										
Top	0.159	0.174	0.143	0.165	0.160	Rim Plate				
C	0.191	0.194	0.191	0.196	0.187					
BTM	0.138	0.112	0.129	0.135	0.134					
OR	0.138	0.140	0.139	0.142	0.145					
C	0.136	0.148	0.136	0.143	0.151					

— INTEGRITY TESTING & INSPECTION —

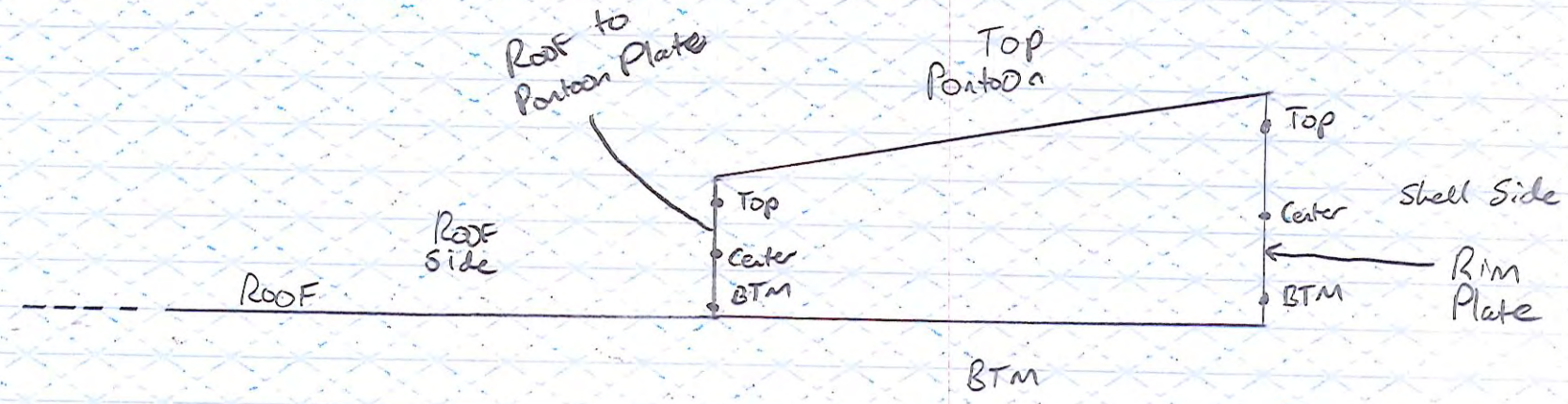
Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 Pontoon/Rim Plate Readings
Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

Pontoon 6	1	2	3	4	5					
Top	0.168	0.176	0.178	0.176	0.172	Rim Plate				
C	0.194	0.194	0.196	0.197	0.192					
BTM	0.126	0.137	0.139	0.128	0.112					
OR	0.137	0.155	0.144	0.138	0.136					
C	0.128	0.136	0.149	0.138	0.139					
IR	0.122	0.139	0.140	0.139	0.135					
Pontoon 7										
Top	0.173	0.177	0.176	0.182	0.184	Rim Plate				
C	0.190	0.194	0.194	0.197	0.195					
BTM	0.122	0.132	0.136	0.133	0.138					
OR	0.124	0.139	0.140	0.142	0.146					
C	0.145	0.152	0.161	0.134	0.128					
IR	0.145	0.143	0.130	0.133	0.116					
Pontoon 8										
Top	0.178	0.123	0.173	0.172	0.178	Rim Plate				
C	0.193	0.193	0.194	0.194	0.193					
BTM	0.131	0.180	0.126	0.129	0.124					
OR	0.152	0.144	0.136	0.138	0.141					
C	0.147	0.147	0.152	0.148	0.136					
IR	0.140	0.144	0.144	0.127	0.149					
Pontoon 9										
Top	0.185	0.189	0.184	0.176	0.182	Rim Plate				
C	0.196	0.198	0.196	0.196	0.195					
BTM	0.127	0.128	0.133	0.128	0.118					
OR	0.142	0.138	0.135	0.141	0.146					
C	0.152	0.143	0.135	0.132	0.133					
IR	0.152	0.146	0.140	0.144	0.140					
Pontoon 10										
Top	0.180	0.181	0.180	0.175	0.186	Rim Plate				
C	0.191	0.194	0.197	0.194	0.196					
BTM	0.138	0.139	0.138	0.128	0.126					
OR	0.137	0.148	0.145	0.141	0.148					
C	0.143	0.130	0.135	0.147	0.139					

— INTEGRITY TESTING & INSPECTION —

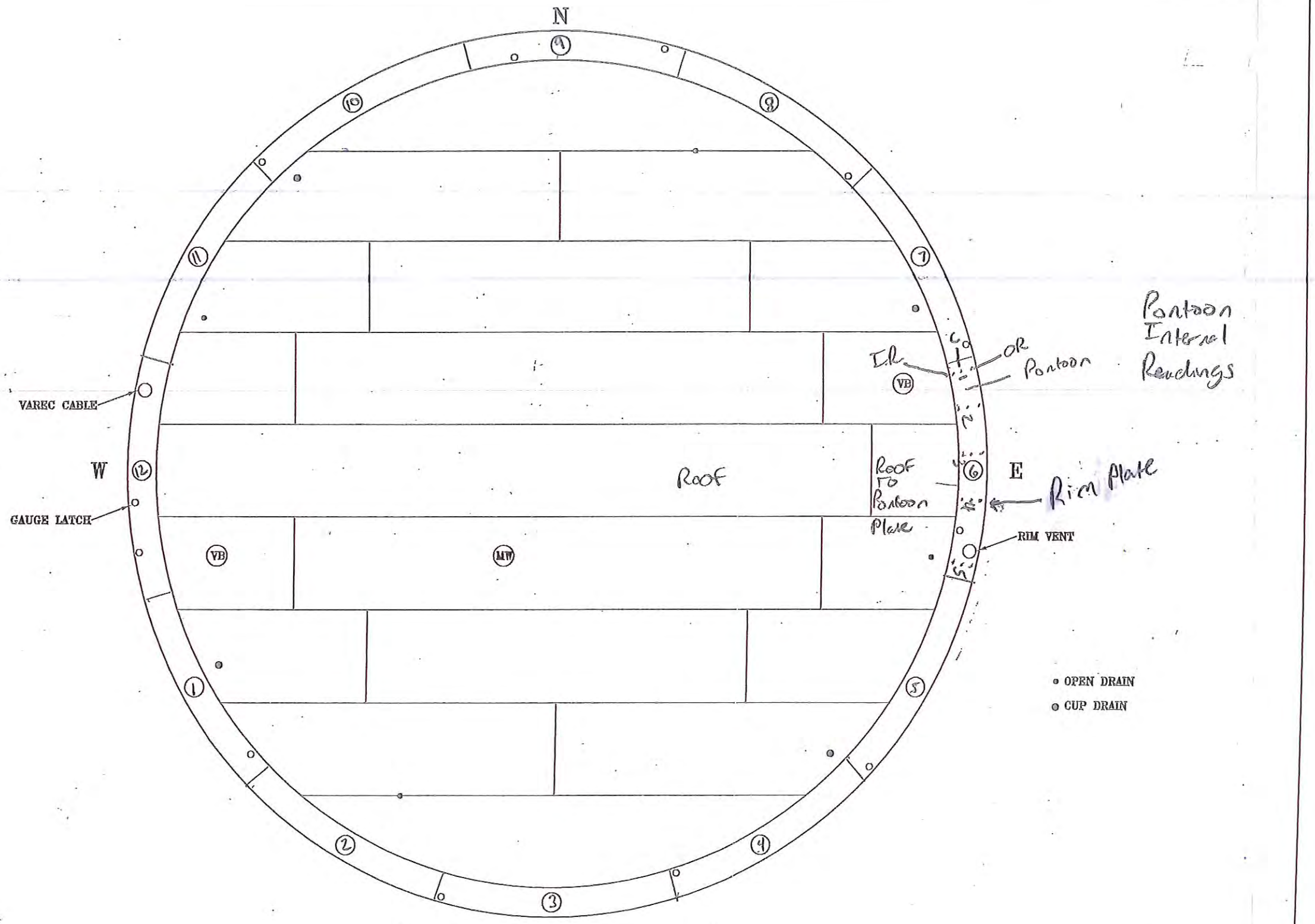
Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 Pontoon/Rim Plate Readings
Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

Ponton 11	1	2	3	4	5					
Top	0.174	0.165	0.166	0.172	0.176	Rim Plate				
C	0.194	0.196	0.195	0.196	0.197					
BTM	0.140	0.143	0.140	0.137	0.130					
OR	0.146	0.148	0.145	0.142	0.145					
C	0.138	0.148	0.144	0.143	0.148					
IR	0.143	0.138	0.135	0.125	0.141					
Pontoon 12										
Top	0.153	0.167	0.157	0.148	0.156	Rim Plate				
C	0.190	0.194	0.192	0.195	0.198					
BTM	0.126	0.154	0.141	0.134	0.140					
OR	0.143	0.129	0.137	0.148	0.155					
C	0.145	0.142	0.148	0.151	0.145					
IR	0.136	0.145	0.153	0.140	0.129					



DRAWN BY: RR/FR	LINE#:
DATE: 6-29-17	EQUIPMENT: T-569 Roof/Pontoon
UNIT: Tank Farm	DESCRIPTION: UT Point description

INTEGRITY TESTING & INSPECTION



LITY: MARKETING TANK FARM	P&ID #:	DESIGN TEMP: °F	INSULATED:	SCALE: NTS	
:#	FLANGE RATING: lb/in²	OPER TEMP: °F	DRAWN BY: C.G.	DESCRIPTION:	
VICE:	DESIGN CODE:	DESIGN PSIG: lb/in²	DATE: 09/03/14	TECHNICIANS:	
:	TEST PSIG:	OPER PSIG:	PAGE: OF	DATE:	
INAL:				TANK 569 – ROOF	
ERIAL –					
: TANK 569 – ROOF		CLIENT: WESTERN REFINING			

INTEGRITY TESTING & INSPECTION

— INTEGRITY TESTING & INSPECTION —

Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 Top Pontoon plate readings
Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

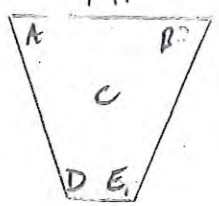
	A	B	C	D	E					
1 (N)	0.186	0.186	0.181	0.186	0.188					
2	0.186	0.183	0.186	0.182	0.186					
3	0.186	0.186	0.185	0.184	0.186					
4	0.189	0.189	0.189	0.187	0.189					
5	0.194	0.191	0.190	0.187	0.190					
6	0.192	0.193	0.194	0.188	0.187					
7	0.199	0.197	0.197	0.192	0.194					
8	0.193	0.193	0.195	0.191	0.189					
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	0.187	0.188	0.186					
34	0.189	0.188	0.191	0.185	0.188					

— INTEGRITY TESTING & INSPECTION —

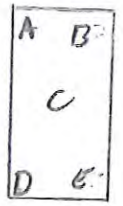
Company: Western Refining
Address: Jamestown, NM
Description: Tank 569 Top Pontoon plate readings
Technician: R. Ramsey / F. Ramirez
Date: 06/29/2017

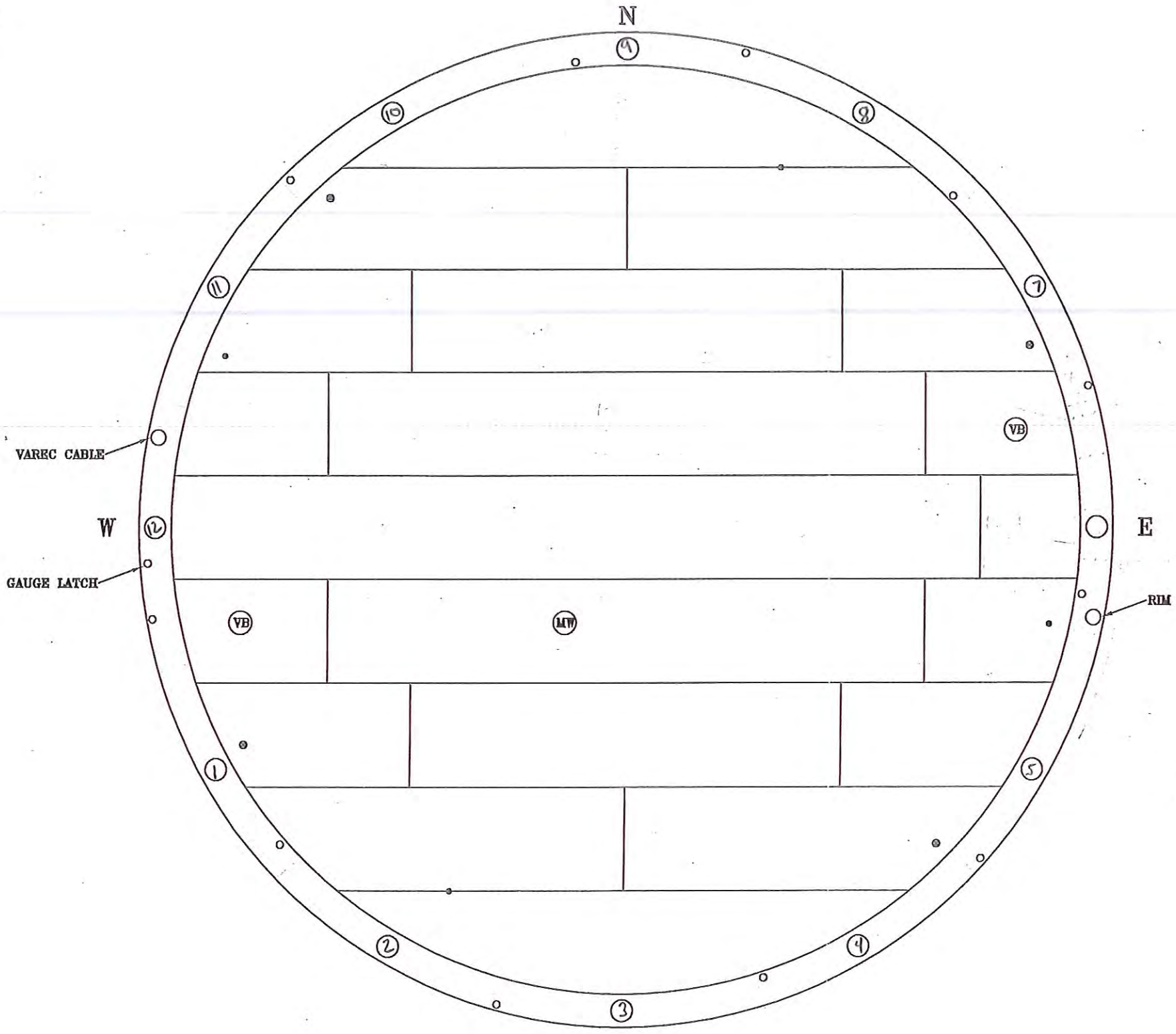
	A	B	C	D	E					
35	0.191	0.189	0.187	0.186	0.188					
36	0.185	0.185	0.186	0.183	0.188					

POPTOON ODD PLATE NUMBERS TYP



POPTOON EVEN PLATE NUMBERS TYP





- OPEN DRAIN
- CUP DRAIN

ACILITY: MARKETING TANK FARM	P&ID #:	DESIGN TEMP: °F	INSULATED:
NE:#	FLANGE RATING: lb/in²	OPER TEMP: °F	DRAWN BY:C.G.
ERVICE:	DESIGN CODE:	DESIGN PSIG: lb/in²	DATE: 09/03/14
EC:	TEST PSIG:	OPER PSIG:	PAGE: OF
ZE:			
OMINAL:			
ATERIAL: –			
ESC: TANK 569 – ROOF		CLIENT: WESTERN REFINING	

SCALE: NTS	TANK 569 – ROOF
DESCRIPTION:	
TECHNICIANS:	
DATE:	

INTEGRITY TESTING & INSPECTION

3861 Vincent Station Dr.
Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

ULTRASONIC EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
Western Refining/RMF	J.Morgan/J.Torrez	07/10/2017

Project: Performed UTT Cutline on Tank 569

Work Order#	Integrity Testing Job No.
26229685	2017-0041

Item	Weld ☐	Structural ☑	Casting ☐	Machinery ☐	Mach. Parts ☐	Pipe ☐	N/A ☐	Other
	Non-Weld ☐	Plate ☑	Pipe ☐	Bar ☐	Casting ☐	Mach. Parts ☐	N/A ☐	Other

Material	Size	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld
	3"	2	C/S	N/A	☐ Smooth ☑ N/A ☐ As Welded

Location	Western Refining	System	Tank Farm
Acceptance Standards	Info Only	Procedure	UT QCP 620 Rev.0

Type of Inspection

Soundness ☐ Thickness ☑ Bond ☐

Pulse Echo ☑ Angle-Beam ☐ Other ☐

UT Equipment/Model
38DL PLUS
SN: 151175909
Cal Due: 10/07/2017

Transducer: Single Crystal ☐ Dual Crystal ☑

Frequency	Size	Angle	Couplant
5MHz	0.5"	0°	Sono Test Ultra gel II

Flat ☑ Concave ☐ Convex ☐

Standard	Material	Notch Depth	Serial No.
N/A	N/A	N/A	N/A

Step Wedge ☑ Tube Wedge ☐

Material	Thickness Range	Serial No.
C/S	.100"-.500"	12-4061

Reference: Summary ☑ See Attachment

Performed UTT Cutline on Tank 569 for new foam and drain line installation at penetration points.

Results of Inspection

North Cutline
Hi: .360"
Lo: .345"

South Cutline
Hi: .357"
Lo: .333"

Copy To:

Requested By:	Reported By (Technician):
Joel Carlson	J.Morgan/J.Torrez
☑ Customer Specifications ☐ Accept ☐ Reject	NDT Supervisor: Caleb Morgan

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RMF

N.D.E. REQUEST FORM

Job/Project Name: TK-569
Work Order Number: 26229685
JOB #:
Equipment#:
Unit:
Line Number:
Material: CS.
Request By: JOEL CARLSON
Date of Request: 7-10-2016

Welder I.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 spool
	PRE-CUT SHELL	UT	3"	NO				FOAM LINE PRE-CUT
	PRE-CUT SHELL	UT	3"	No				DRAIN LINE PRE CUT
	PT ROOT PASS	PT	3"	NO				ROOT OF FOAM LINE
	PT ROOT PASS	PT	3"	NO				ROOT OF DRAIN LINE

Comments: UT SHELL OF TK-569 AT PENETRATION POINTS.
PT ROOT PASS OF BOTH DRAIN + FOAM LINE SHELL PENETRATIONS.

Notes: Please attach weld map work, and any associated drawing with request

Please attach to report

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— INTEGRITY TESTING & INSPECTION —

LIQUID PENETRANT EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
Western Refinery/ RMF	Storm.S/Frank.G	07/12/2017

Project: **PT final on Tk-569 penetration welds for the Drain and Foam line.**

Contract No. or Purchase Order No.	Integrity Testing Job No.
TK-569	2017-0127

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	Type of Filler Material	Weld
	3"	6	C/S	C/S	☐ N/A ☐ Smooth ☑ As Welded

Location	Location	System
	Western Refining Jamestown NM	Tank Farm

Acceptance Standards	Procedure
API 653	PT-QCO-400 Rev 8

Type of Check	Initial	Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final
	☐	☐	☐	☐	☐	☐	☐	☐	☑

Type of Inspection			
	☑ Color Contrast	☐ Fluorescent Penetrant	
	Pre-Test Cleansing Method / Solution: Spray & wipe / SKC - S	Penetrant Application Method / Penetrant: Spray / SKL-SP1	
	Penetrant Removal Method / Remover: Wipe/ SKC-S	Penetrant Time: 20 Min	Penetrant Specimen / Surface Temperature: Ambient
	Penetrant Emulsifier Method / Emulsifier: NA	Developer Application Method / Developer: Spray / SKC-D	
	Developing Time: 10 Min	Final Cleaning Method / Solution: Spray & Wipe	

Reference: ☑ See Attachment	Results of Inspection
ITI performed the PT finals on Tank 569's penetration welds for the Drain line and Foam line.	No Relevant Indications found at time of inspection.

Requested By:	Reported By (Technician):
Joel Carlson	Storm.S/ Frank.G
☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: Caleb Morgan

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RMF

N.D.E. REQUEST FORM

Job/Project Name: TK-569
Work Order Number: 2629658
JOB #:
Equipment#:
Unit:
Line Number:
Material: C.S.
Request By: JOEL CARLSON
Date of Request: 7-11-2017

Welder I.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 spool
ED		PT	3"	NO				FOAM LINE
KD		PT	3"	NO				DRAIN LINE
	Comments: FINAL PT ON FINISHED PENETRATION WELDS							

Notes: Please attach weld map work, and any associated drawing with request

Please attach to report

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LIQUID PENETRANT EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
Western Refinery/ RMF	Storm.S/ Frank.G	07/12/2017

Project: **PT Root Pass on both Drain and Foam line penetration welds.**

Contract No. or Purchase Order No.	Integrity Testing Job No.
TK-569	2017-0126

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	Type of Filler Material	Weld
3"	8	C/S	C/S	☐ N/A ☐ Smooth ☑ As Welded

Location

Location	System
Western Refining Jamestown NM	Tank Farm

Acceptance Standards	Procedure
API 653	PT-QCO-400 Rev 8

Type of Check

Initial	Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final
☐	☐	☐	☐	☑	☐	☐	☐	☐

Type of Inspection

☑ Color Contrast ☐ Fluorescent Penetrant

Pre-Test Cleansing Method / Solution	Penetrant Application Method / Penetrant
Spray & wipe / SKC - S	Spray / SKL-SP1

Penetrant Removal Method / Remover	Penetrant Time	Penetrant Specimen / Surface Temperature
Wipe/ SKC-S	20 Min	Ambient

Penetrant Emulsifier Method / Emulsifier	Developer Application Method / Developer
NA	Spray / SKC-D

Developing Time	Final Cleaning Method / Solution
10 Min	Spray & Wipe

Reference: ☑ See Attachment	Results of Inspection
ITI performed PT's on the root passes for the Drain and Foam line shell penetrations.	No Relevant Indications found at time of inspection.

Requested By:	Reported By (Technician):
Joel Carlson	Storm.S/ Frank.G
☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: Caleb Morgan

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RMF

N.D.E. REQUEST FORM

Job/Project Name: TK-569
Work Order Number: 26229685
JOB #:
Equipment#:
Unit:
Line Number:
Material: C.S.
Request By: JOEL CARLSON
Date of Request: 7-10-2016

Welder I.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 spool
	PRE-CUT SHELL	UT	3"	NO				
	PRE-CUT SHELL	UT	3"	No				FOAM LINE PRE-CUT
EB	PT ROOT PASS	PT	3"	NO				DRAIN LINE PRE CUT
KD	PT ROOT PASS	PT	3"	NO				ROOT OF FOAM LINE
								ROOT OF DRAIN LINE

Comments: UT SHELL ON TK-569 @ PENETRATION POINTS.
PT ROOT PASS OF BOTH DRAIN + FOAM LINE SHELL PENETRATIONS.

Notes: Please attach weld map work, and any associated drawing with request

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INTEGRITY TESTING & INSPECTION

ULTRASONIC EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
Western Refining / RMF	Storm.S/Frank.G	7/17/17

Project: A UT scan was performed on Tank 569 for two 1½" nozzles to be added.

Work Order#:

Integrity Testing Job No.: 2017-0042

Item	Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other
	☐	☐	☐	☐	☐	☐	☑	N/A
	Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other
	☐	☑	☐	☐	☐	☐	☐	Tank 569

Material	Size	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld
	1½"	2	C/S	N/A	☐ Smooth ☐ As Welded ☑ N/A

Location	System
Western Refining	Tank Farm

Acceptance Standards	Procedure
API 653	UT QCP 620 Rev.0

Type of Inspection

Soundness ☐ Thickness ☑ Bond ☐

Pulse Echo ☑ Angle-Beam ☐ Other ☐

UT Equipment/Model
38DL PLUS
SN: 151175809
Cal Due: 10/07/2017

Transducer: ☐ Single Crystal ☑ Dual Crystal

Frequency	Size	Angle
5MHz	0.5"	0°

Flat ☑ Concave ☐ Convex ☐

Couplant: Sono Test Ultra gel II

Standard	Material	Notch Depth	Serial No.
N/A	N/A	N/A	N/A

Step Wedge ☑ / Tube Wedge ☐	Material	Thickness Range	Serial No.
	C/S	.100"-.500"	12-4061

Reference: Summary ☑ See Attachment

A UT Scan was performed on Tank 569 for two 1½" nozzles to be added for Thermo-couples.

Results of Inspection

1st area on existing nozzle
L: .311"
H: .330"

2nd area for new nozzle
L: .312"
H: .330"

Copy To:

Requested By: Joel Carlson

Reported By (Technician): Storm.S / Frank.G

☐ Customer Specifications ☑ Accept ☐ Reject

NDT Supervisor: Caleb Morgan

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RMF

N.D.E. REQUEST FORM

Job/Project Name: TK-569
Work Order Number: 26229685
JOB #:
Equipment#:
Unit:
Line Number:
Material: C-S
Request By: JOEL CARLSON
Date of Request: 7-17-2017

Welder I.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 spool
	PRE-CUT	VT	1-½"	NO				TWO-1-1/2" THERMO-COUPLES
	ROOT PASS	PT	1-½"	NO				"
	FINAL	PT	1-½"	NO				"
	Comments:							

Notes: Please attach weld map work, and any associated drawing with request

Please attach to report

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LIQUID PENETRANT EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
RMF / Western Refinery	ITI	7-18-17

Project: Perform PT on New Nozzles on T-569 (thermo-couples)

Contract No. or Purchase Order No.	Integrity Testing Job No.
2622296085	2017-0130

Item

Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other:
☒	☐	☐	☐	☐	☒	☐	Nozzle

Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other:
☐	☐	☐	☐	☐	☐	☒	

Material

Size	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld
1½"	8	C/S	C/S	☐ N/A ☐ Smooth ☒ As Welded

Location

Location	System
Western Refining Jamestown NM	Tank farm

Acceptance Standards	Procedure
API 653	PT-QCP-400 Rev 8

Type of Check

Initial	Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final
☐	☐	☐	☐	☒	☐	☐	☐	☐

Type of Inspection

☑ Color Contrast ☐ Fluorescent Penetrant

Pre-Test Cleansing Method / Solution	Penetrant Application Method / Penetrant	
Spray & wipe / SKC - S	Spray / SKL-SP1	
Penetrant Removal Method / Remover	**Penetrant Time**	**Penetrant Specimen / Surface Temperature**
Wipe/ SKC-S	20 Min	Ambient
Penetrant Emulsifier Method / Emulsifier	**Developer Application Method / Developer**	
NA	Spray / SKC-D	
Developing Time	**Final Cleaning Method / Solution**	
10 Min	Spray & Wipe	

Reference: ☑ See Attachment

Reference:	Results of Inspection
PT was performed on T-569's two new Thermo-couples. (1½") Root passes.	No Relevant indications were found at the time of this inspection.

Requested By:	Reported By (Technician):
Joel Carlson	F. Gonzales / S. Smith
☐ Customer Specifications ☒ Accept ☐ Reject	NDT Supervisor: Caleb Morgan

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RMF

N.D.E. REQUEST FORM

Job/Project Name: IK-569
Work Order Number: 26229685
JOB #:
Equipment#:
Unit:
Line Number:
Material: C-S
Request By: JOEL CARLSON
Date of Request: 7-17-2017

Welder I.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 spool
	PRE-CUT	UT	1-½"	NO				TWO-1-1/2" THERMO-COUPLES
	ROOT PASS	PT	1-½"	NO				〃
	FINAL	PT	1-½"	NO				〃
	Comments:							

Notes: Please attach weld map work, and any associated drawing with request

Please attach to report

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LIQUID PENETRANT EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN/RMF	V.Willie/J.Morgan	07/20/2017

Project: Performed PT Finals on Weld Build Up Tank 569 Internal Floor Plates

Work Order#	Integrity Testing Job No.
	2017-0133

Item

Weld	Structural	Casting	Machinery	Mach. Parts	Pipe	N/A	Other:
☑	☐	☐	☐	☐	☐	☐	

Non-Weld	Plate	Pipe	Bar	Casting	Mach. Parts	N/A	Other:
☐	☑	☐	☐	☐	☐	☐	

Material

Size	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld
Various	39	C/S	C/S	☐ Smooth ☑ As Welded ☐ N/A

Location

Location	System
JAMESTOWN, NM	Tank Farm

Acceptance Standards	Procedure
API 653	QCP-400 Rev 7

Type of Check

Initial	Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final
☐	☐	☐	☐	☐	☐	☐	☐	☑

Type of Inspection

☑ Color Contrast ☐ Fluorescent Penetrant

Pre-Test Cleansing Method / Solution	Penetrant Application Method / Penetrant	
Spray & Wipe / SKC - 5	Spray / SKL-SP1	
Penetrant Removal Method / Remover	**Penetrant Time**	**Penetrant Specimen / Surface Temperature**
Wipe/ SKC-5	20 Min	Ambient
Penetrant Emulsifier Method / Emulsifier	**Developer Application Method / Developer**	
N/A	Spray / SKC-D	
Developing Time	**Final Cleaning Method / Solution**	
10 Min	Spray & Wipe	

Reference: Summary ☑ See Attachment

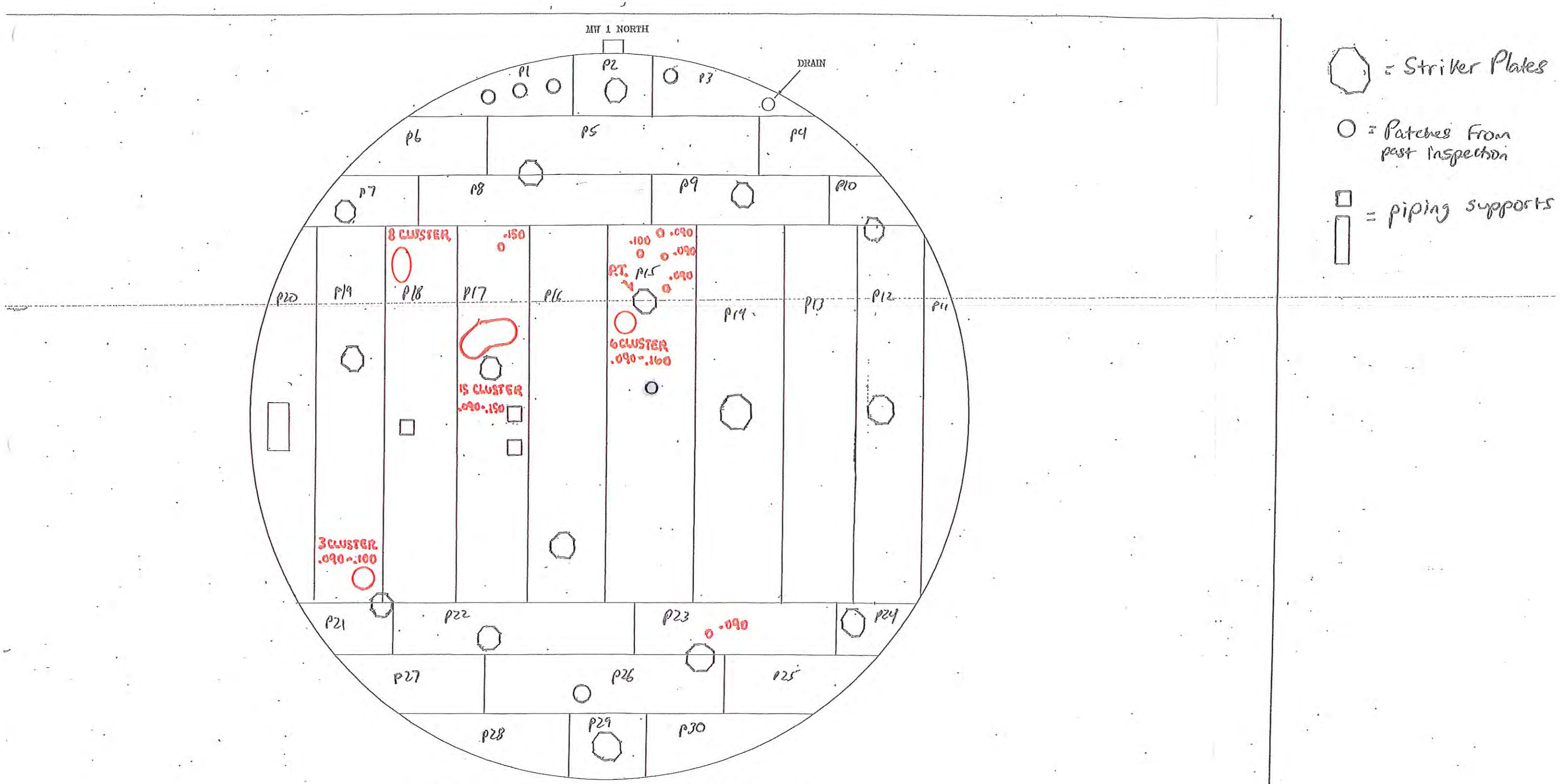
Performed PT Final on Weld Build Up on Floor Plates inside Tank 569. See Attached Drawing for PT testing locations.

Results of Inspection

NO RELEVENT INDICATIONS FOUND AT THE TIME OF INSPECTION.

Requested By:	Reported By (Technician):
Grant Christensen	V.Willie/J.Morgan
☐ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: Caleb Morgan

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VACUUM BOX ALL OF TANK 569 FLOOR SEAMS

ACILITY: TANK FARM	P&ID #:	DESIGN TEMP:	F	INSULATED:	SCALE:
E:	FLANGE RATING:	OPER TEMP:	F	DRAWN BY: JD	DESCRIPTION:
EC:	DESIGN CODE:	DESIGN PSIG:		DATE:	TECHNICIANS: DM – KA
	TEST PSIG:	OPER PSIG:		PAGE:	DATE: 9-3-10
BOX ALL OF TANK #569	FLOOR SEAMS	CLIENT:			

INTEGRITY TESTING & INSPECTION

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— INTEGRITY TESTING & INSPECTION —

LIQUID PENETRANT EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING/RMF	J.Morgan/V.Willie	07/27/2017

Project: **PT Internal Vertical Weld Repairs in Tank 569 Pontoons**

Contract No. or Purchase Order No.	Integrity Testing Job No.
	2017-0136

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	Type of Filler Material	Weld
Various	5	C/S	C/S	☐ N/A ☐ Smooth ☑ As Welded

Location

Location	System
Western Refining Jamestown NM	Tank Farm

Acceptance Standards	Procedure
Customer Spec.	PT-QCO-400 Rev 8

Type of Check

Initial	Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final
☐	☐	☐	☐	☐	☐	☐	☐	☑

Type of Inspection

☑ Color Contrast ☐ Fluorescent Penetrant

Pre-Test Cleansing Method / Solution	Penetrant Application Method / Penetrant
Spray & wipe / SKC - S	Spray / SKL-SP1

Penetrant Removal Method / Remover	Penetrant Time	Penetrant Specimen / Surface Temperature
Wipe/ SKC-S	20 Min	Ambient

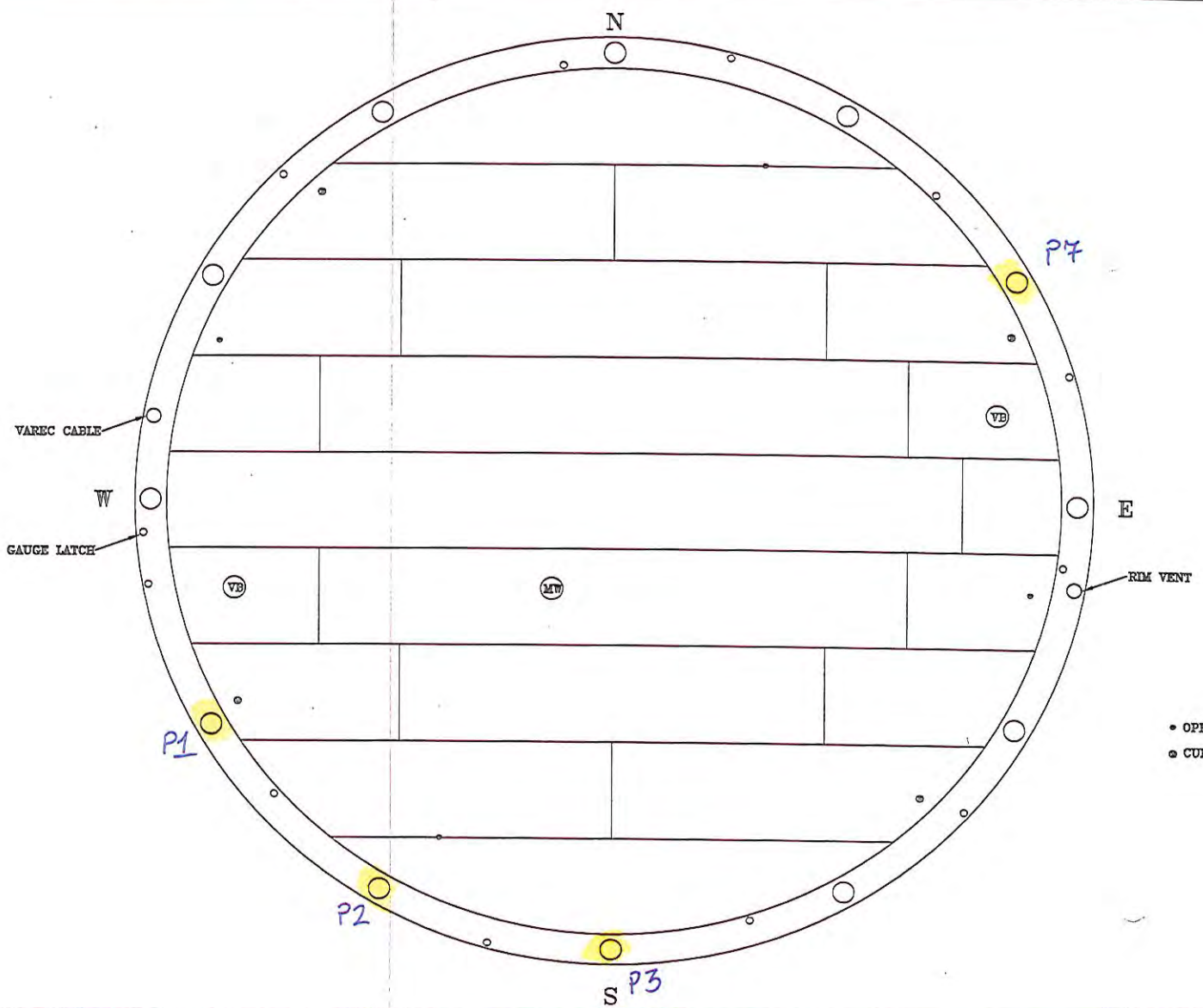
Penetrant Emulsifier Method / Emulsifier	Developer Application Method / Developer
NA	Spray / SKC-D

Developing Time	Final Cleaning Method / Solution
10 Min	Spray & Wipe

Reference: ☑ See Attachment	Results of Inspection
Performed Liquid Penetrant Testing on the repair welds for Internal Vertical Weld Seams in Pontoons for Tank 569. PT'ed the Vertical Welds seams inside Pontoons 1, 2, 3, and 7.	No Relevant Indications Found at Time of Inspection.

Requested By:	Reported By (Technician):
Grant Christensen	J.Morgan/V.Willie
☑ Customer Specifications ☑ Accept ☐ Reject	NDT Supervisor: Caleb Morgan

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.



FACILITY: MARKETING TANK FARM	P&ID #:	DESIGN TEMP: °F	INSULATED:	SCALE: NTS	
LINE #:	FLANGE RATING: lb/in²	OPER TEMP: °F	DRAWN BY: C.G.	DESCRIPTION:	
SERVICE:	DESIGN CODE:	DESIGN PSIG: lb/in²	DATE: 09/03/14	TECHNICIANS:	
SPEC:	TEST PSIG:	OPER PSIG:	PAGE: OF	DATE:	
SIZE:				TANK 569 – ROOF	
NOMINAL:					
MATERIAL: –					
DESC: TANK 569 – ROOF		CLIENT: WESTERN REFINING			

INTEGRITY TESTING & INSPECTION

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

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API 653 INTERNAL INSPECTION SUMMARY

TANK SPECIFIC

Tank Number	**TK-570**
Owner	**Western Refining**
Product Storage	**83 Unleaded Gasoline**
Specific Gravity	**0.80**
Nameplate Present	**Yes**
Operating Temperature (F)	**Ambient**

DIMENSIONS

Diameter	**67 ft.**
Height	**40 ft.**
Capacity (nominal)	**25,000 bbls**
Safe Fill Height	**36 ft. (assumed)**

CONSTRUCTION DATA

Year Built /	**1957**
Design Standard	**API**
Secondary Containment	**NO**
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**

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.**

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.

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.

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 2nd and 3rd 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

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.

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".

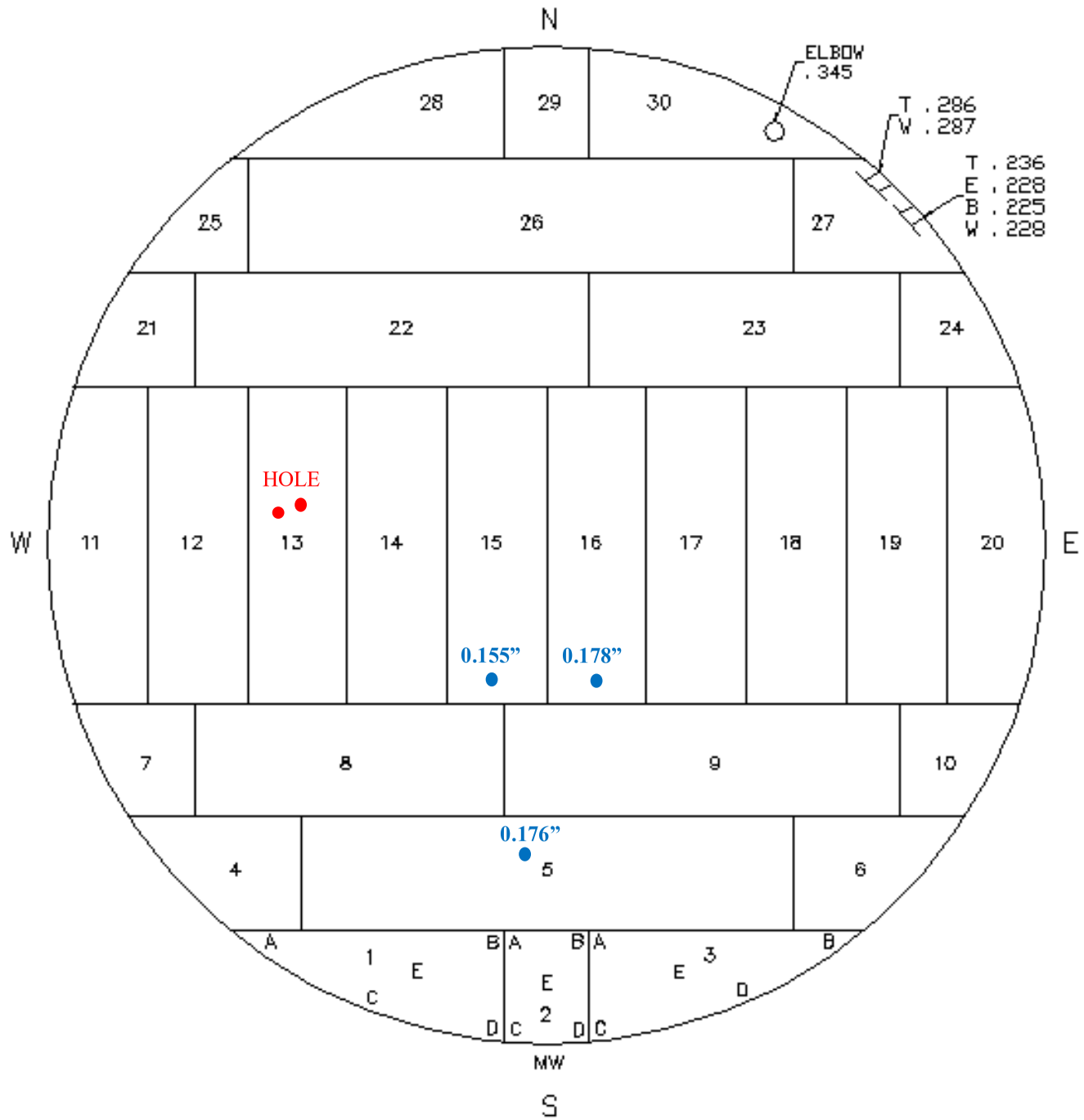
8.3 Roof Support Legs

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".

8.4 Roof Seals

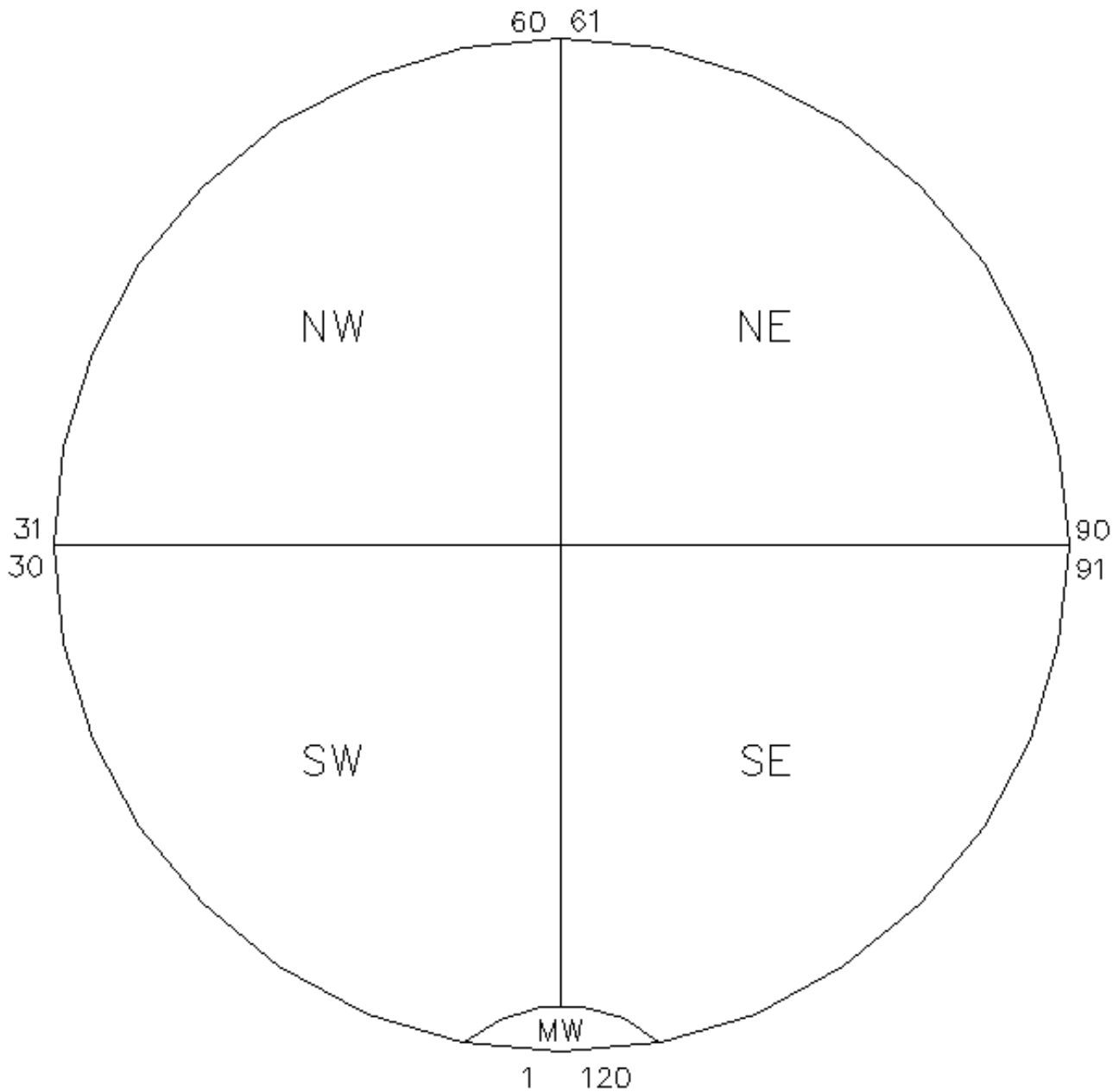
The secondary roof seal had missing and loose hardware throughout. It was recommended during the outage to replace all loose and missing hardware on the seal. It was also recommended to perform new seal inspections after the tank is placed back into service. Excluding the missing and loose hardware the seals were found “as in new condition”.

9.0 BOTTOM FLOOR DRAWING AND DATA



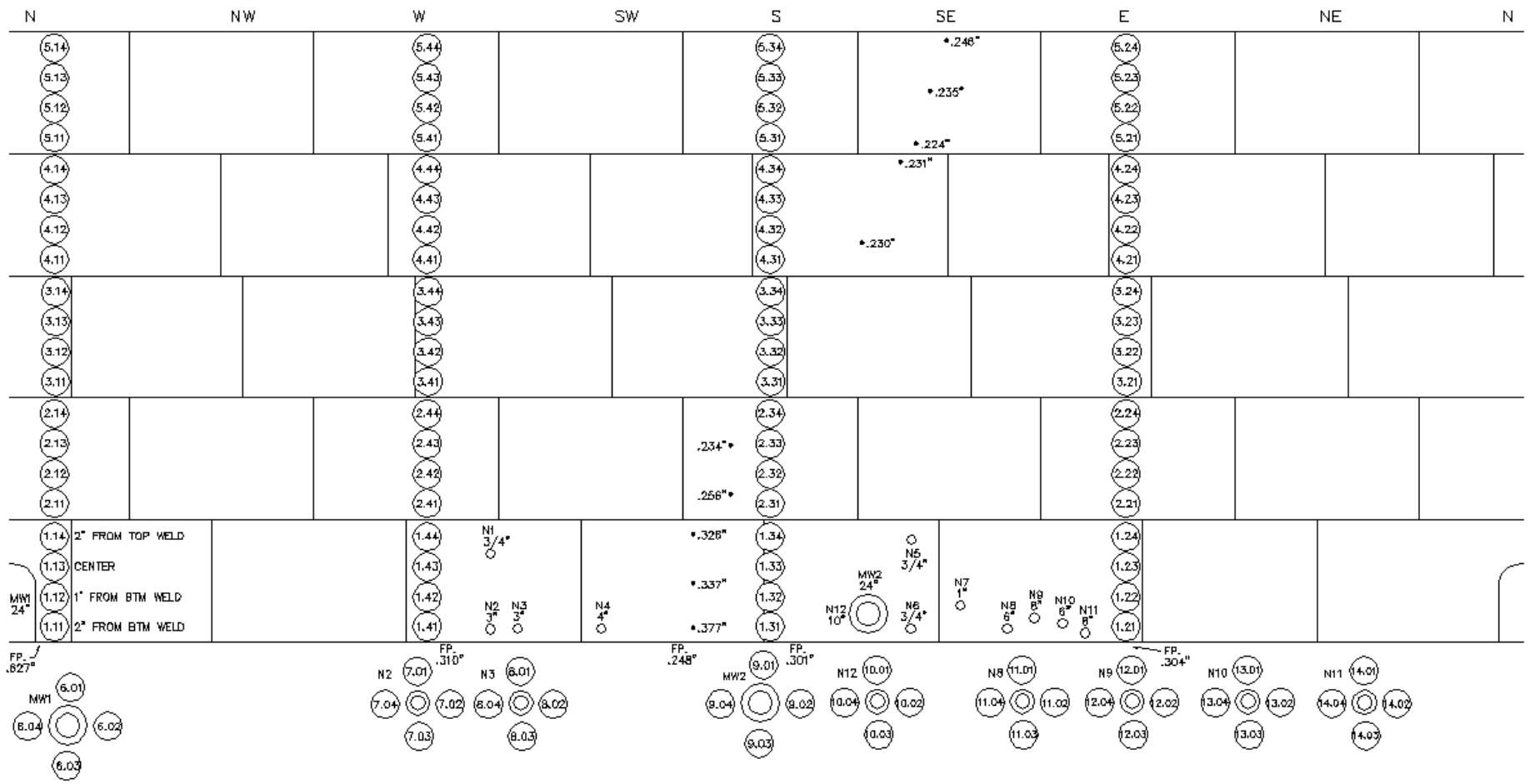
CML	A	B	C	D	E
1	0.244"	0.234"	0.233"	0.219"	0.246"
2	0.231"	0.215"	0.212"	0.222"	0.224"
3	0.237"	0.214"	0.239"	0.233"	0.239"
4	0.238"	0.244"	0.237"	0.235"	0.242"
5	0.250"	0.240"	0.241"	0.235"	0.248"
6	0.238"	0.227"	0.218"	0.214"	0.228"
7	0.245"	0.238"	0.249"	0.238"	0.247"
8	0.234"	0.241"	0.237"	0.231"	0.248"
9	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"
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"
26	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"
29	0.226"	0.237"	0.231"	0.247"	0.237"
30	0.230"	0.240"	0.239"	0.230"	0.240"

9.1 BOTTOM FLOOR DRAWING AND DATA (UT'S AT CORNER WELD)



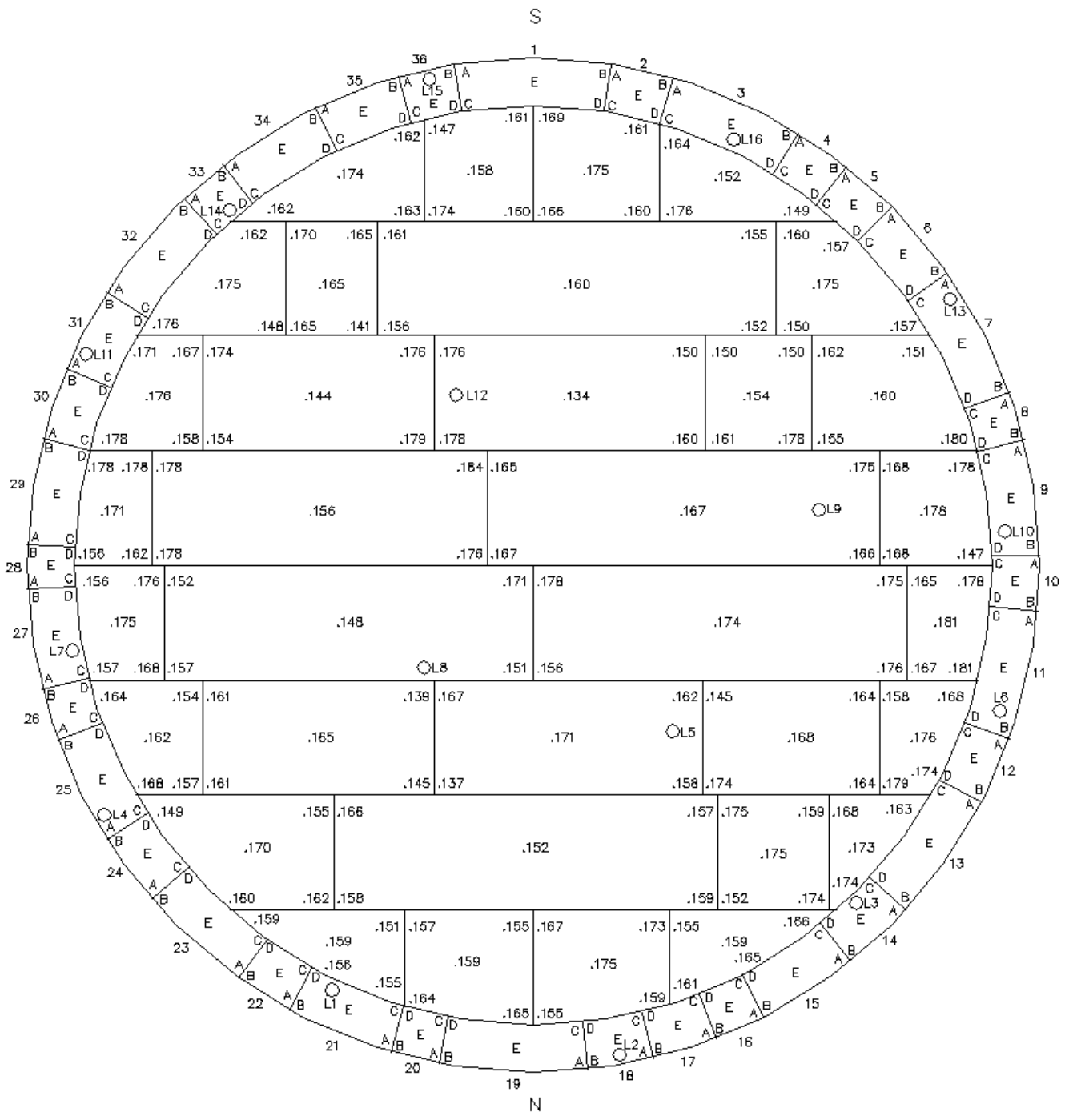
CML	READING		CML	READING		CML	READING		CML	READING
1	0.677"		31	0.279"		61	0.294"		91	0.268"
2	0.663"		32	0.286"		62	0.281"		92	0.292"
3	0.298"		33	0.286"		63	0.288"		93	0.294"
4	0.296"		34	0.294"		64	0.296"		94	0.256"
5	0.328"		35	0.263"		65	0.299"		95	0.272"
6	0.298"		36	0.263"		66	0.287"		96	0.273"
7	0.281"		37	0.290"		67	0.294"		97	0.289"
8	0.282"		38	0.276"		68	0.299"		98	0.270"
9	0.288"		39	0.280"		69	0.295"		99	0.255"
10	0.299"		40	0.295"		70	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"		76	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"		86	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"		89	0.269"		119	0.670"
30	0.290"		60	0.294"		90	0.282"		120	0.671"

10.0 SHELL DRAWING AND DATA



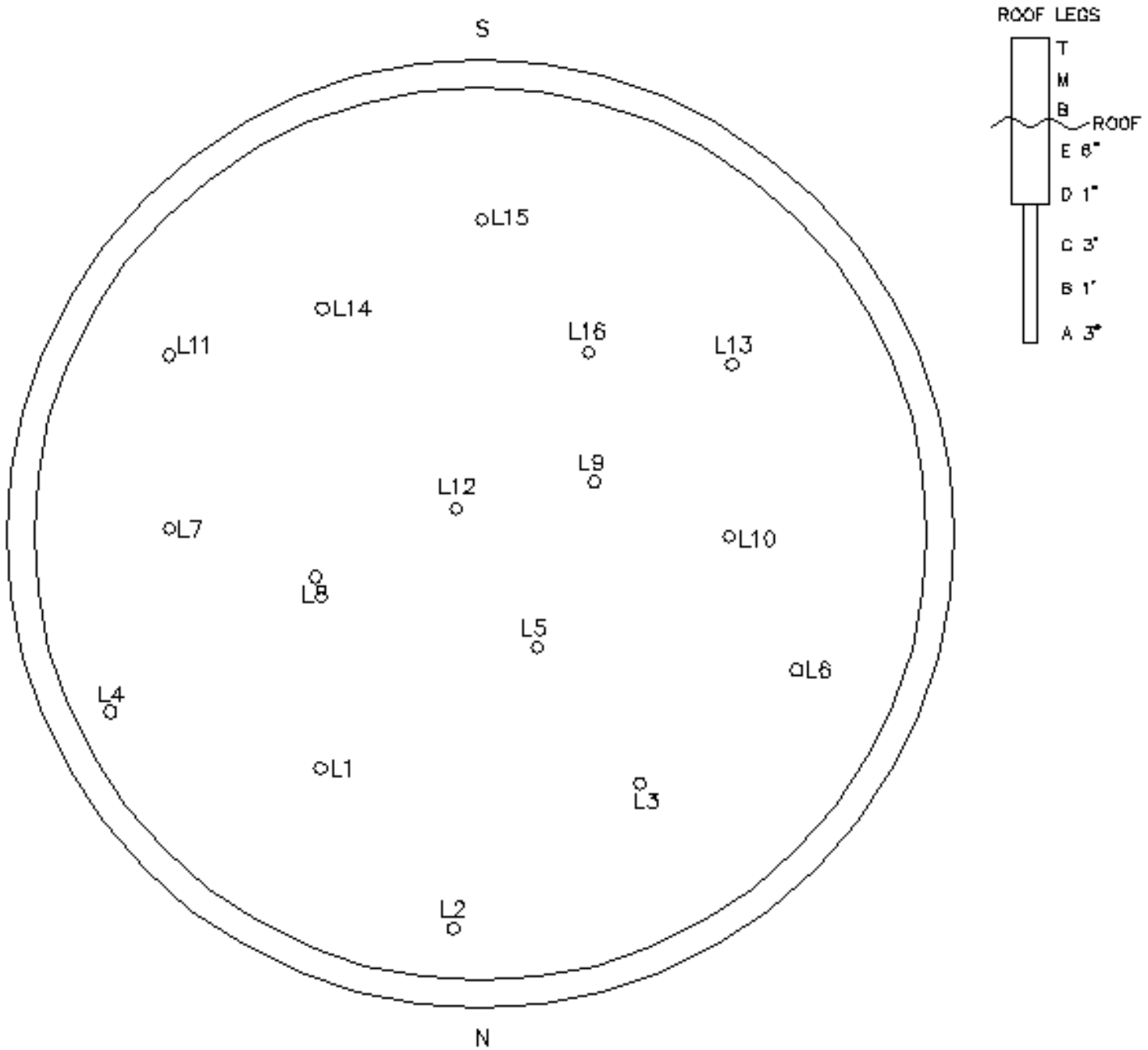
CML	READING		CML	READING
1.11	.365"		8.01	.283"
1.12	.348"		8.02	.288"
1.13	.347"		8.03	.270"
1.14	.331"		8.04	.277"
1.21	.290"		9.01	.498"
1.22	.319"		9.02	.485"
1.23	.335"		9.03	.488"
1.24	.336"		9.04	.477"
1.31	.333"		11.01	.393"
1.32	.342"		11.02	.389"
1.33	.340"		11.03	.390"
1.34	.355"		11.04	.370"
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	.500"
7.01	.212"		14.02	.483"
7.02	.220"		14.03	.495"
7.03	.228"		14.04	.479"
7.04	.214"			

11.0 FLOATING ROOF AND PONTOON DRAWING



CML	A	B	C	D	E
1	0.116"	0.190"	0.175"	0.165"	0.176"
2	0.179"	0.173"	0.166"	0.173"	0.179"
3	0.185"	0.177'	0.164"	0.173"	0.162"
4	0.174"	0.174"	0.165"	0.169"	0.164"
5	0.193"	0.187"	0.171"	0.172"	0.171"
6	0.185"	0.186"	0.164"	0.166"	0.169"
7	0.179"	0.180"	0.168"	0.173"	0.169"
8	0.186"	0.181"	0.169"	0.173"	0.168"
9	0.186"	0.172"	0.175"	0.167"	0.171"
10	0.178"	0.179"	0.164"	0.185"	0.171"
11	0.178"	0.177"	0.181"	0.176"	0.163"
12	0.176"	0.190"	0.167"	0.163"	0.159"
13	0.183"	0.177"	0.161"	0.162"	0.158"
14	0.178"	0.200"	0.160"	0.154"	0.157"
15	0.205"	0.201"	0.164"	0.164"	0.161"
16	0.198"	0.194"	0.169"	0.167"	0.162"
17	0.187"	0.195"	0.158"	0.162"	0.171"
18	0.199"	0.189"	0.157"	0.170"	0.155"
19	0.192"	0.182"	0.165"	0.163"	0.168"
20	0.184"	0.196"	0.163"	0.167"	0.167"
21	0.195"	0.198"	0.180"	0.172"	0.176"
22	0.178"	0.172"	0.176"	0.179"	0.168"
23	0.169"	0.179"	0.154"	0.171"	0.168"
24	0.160"	0.170"	0.185"	0.163"	0.161"
25	0.169"	0.172"	0.169"	0.180"	0.170"
26	0.178"	0.187"	0.171"	0.156"	0.158"
27	0.196"	0.197"	0.160"	0.175"	0.172"
28	0.205"	0.201'	0.181"	0.195"	0.174"
29	0.180"	0.205"	0.179"	0.179"	0.169"
30	0.202"	0.191	0.172"	0.179"	0.171"
31	0.194"	0.189"	0.171"	0.164"	0.174"
32	0.193"	0.200"	0.175"	0.172"	0.177"
33	0.203"	0.179"	0.162"	0.171"	0.165"
34	0.204"	0.177"	0.160"	0.174"	0.162"
35	0.201"	0.183"	0.182"	0.177"	0.159"
36	0.183"	0.133"	0.182"	0.162"	0.154"

12.0 ROOF SUPPORT LEG DRAWING



CML	A	B	C	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"
L5	0.243"	0.248"	0.238"	0.165"	0.139"
L6	0.283"	0.253"	0.251"	0.159"	0.139"
L7	0.244"	0.267"	0.262"	0.142"	0.155"
L8	0.281"	0.270"	0.227"	0.155"	0.151"
L9	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"

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**

SERVICE: **83 Unleaded Gasloline** PRIOR UT INSP. (Yr.): **2014**

BUILT BY: **Horton Tank & CBI** LATEST UT INSP. (Yr.): **2015**

VISUAL INSP. (Yr.): **2015**

· 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)	Joint Eff. (E)	Gravity (G)
67	0.85	0.8

	1st course	2nd course	3rd course	4th course	5th 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.

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 Next Inspection (in.)	Tank Bottom/ Foundation Design
0.1	Tank bottom/foundation design with no means for detection and containment of a bottom leak.
0.05	Tank bottom/foundation design with means to provide detection and containment of a bottom leak.
0.05	Applied tank bottom reinforced lining, > 0.05 in. thick, in accordance with API 652.

14.0 TANK OUT-OF-SERVICE INSPECTION CHECKLIST

TANK OUT-OF-SERVICE INSPECTION CHECKLIST

TANK: TK-570

2.0 TANK DATA

Tank Capacity	25,000 bbls
Tank Diameter	67'-0" Ft/In
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

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. N Were appurtenances opened during cleaning such as lower floating swing sheave assemblies, nozzle interiors (after removal of the valves) inspected? **ALL VALVES NOT REMOVED**
b. Y Were UT measurements taken on the floating roof (5 readings on each plate) and nozzles and were these measurements accurately sketched?
d. Y 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. Y 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. Y Was the depth of pitting measured and documented?
e. Y Were the areas marked requiring patching or further inspection?
g. N Were there any leaks or corrosion noted in the welds especially the shell-to-bottom welds? If yes, explain.
h. Y 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. Y Were there reinforcing pads under all bottom attached clips, brackets, and supports?
u. N 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

b. Y Was the depth of pitting measured on each course? Explain findings. **SEE ATTACHED FINDINDS**
f. Y Were there any signs of damage, deterioration, and/or disbanding to the existing protective coating? If yes, explain. **COATING AT FAILURE, SEE ATTACHED FINDINGS**
h. N Were there indications of leakage in the shell plates or seams? If yes, explain.
k. N Was the shell surveyed to check for roundness and plumb? **NOT REQUIRED BY CLIENT**

2.6 ROOF INTERIOR SURFACE

2.6.1 General

a. N Were there any holes, scale build up, and/or pitting on the underside surface of the plates? If yes, explain.

b. Y 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. N Were there any signs of pitting and/or thinning on the shell nozzles? If yes, explain.

2.12 EMERGENCY ROOF DRAINS

a. Y Were seal fabric discs slightly smaller than the pipe ID and the fabric seal? **NO FABRIC; SEE ATTACHED FINDINGS**

2.13 Pontoon Inspection Hatches

a. N/A Did any pontoons show visual signs of leakage, after removal of inspection hatch cover? **ACCESS WAS NOT GRANTED**

NOTE: Y = YES N = NO
PARTS OF THE CHECKLIST THAT WERE NOT APPLICABLE WERE NOT INCLUDED ON THIS LIST

Inspector: Keith Angell Date: 3/30/2015

15.0 PICTURES



Internal coating on floor- blistering



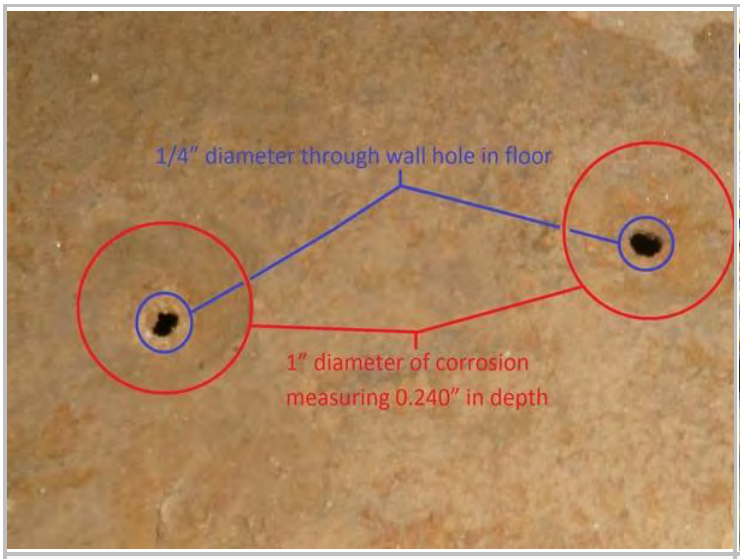
Internal coating on floor – complete failure



Vacuum breaker – corrosion at liquid level



Vacuum breaker – thinning/knif-edge



Floor – topside corrosion 0.240" & through wall hole



Floor – close up of hole



Floor – general corrosion on floor 0.080" depth



Pontoon – not attached to suction line



Striker Pates – corrosion up to 0.375” in depth



Nozzle N1/N5/N6 (shell opening) – ¼” and plugged at two locations



Nozzle N1,5,6,7 (couplings) – nipples not seal welded between valve and fittings.



3/8” threaded plugs (10) – plugs not seal welded



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



"Y" mixer/injection – Supports not seal welded



"Y" mixer/injection – Supports not seal welded



Old Style roof drains & catch pans (3) – no longer in use



Support clip- attachment weld broken



Tank Ground Wire – Attached; no adverse conditions



Shell Attachment Welds – Full profile, no corrosion/pitting noted



Foam Line & Varec – Paint failure with surface oxidation



Floating Roof – Paint failure with surface oxidation

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 l 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 Repairs	

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.
2. 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.
10. 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 Photographs

Signature: **Date: 5/13/2015**

Inspector & API # Ronnie Crutcher #42499

Western Refining

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 ☐ POOR	
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	

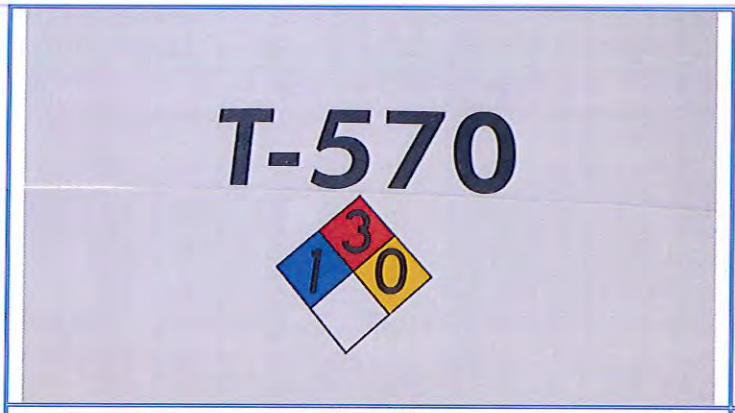
INSPECTOR:	Travis York	API#:	58126	DATE:	3-21-2016

ADDITIONAL COMMENTS

Recommendations:
-Remove debris from under stairs on wind girder (No W/O)

Western Refining Company
API-653 EXTERNAL TANK INSPECTION

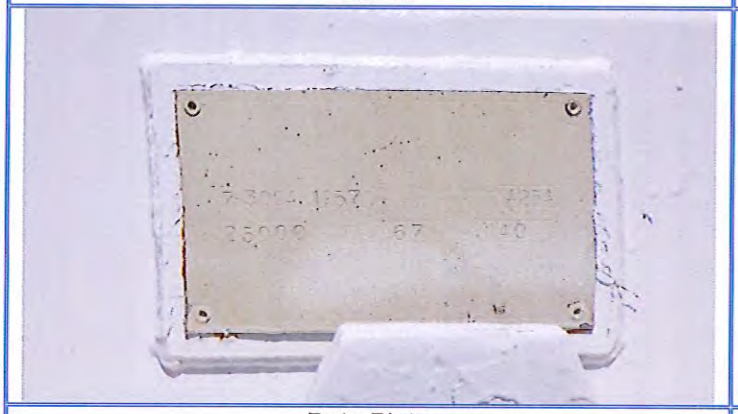
Reference Photographs



Tank ID



Overall of tank



Data Plate



Sump box



Debris on wind girder



Ground wire

Western Refining Company

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: Darwin Helms **Date:** 11-16-2010

Darwin Helms
CISI Inc.
Senior Refinery Inspector

Western Refining Company

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 onTK-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 INSPECTION REPORT

CLIENT: Western Refining **FACILITY LOCATION:** Gallup NM **TANK #:** TK-571

GENERAL INFORMATION

TANK LOCATION: Tank farm **TYPE:** Storage
LIQUID CONTENTS: Gasoline **HEIGHT** 40' **CAPACITY:** 25000 Barrels
DIAMETER: 67' **ROOF TYPE:** FLOATING **BOTTOM TYPE:** FLAT
TANK SUPPORT TYPE FLAT **MATERIAL:** STEEL
TANK MATERIAL AND TYPE OF CONSTRUCTION: A36
NAME PLATE INFORMATION YES

INSPECTION CHECKLIST

ITEM	Inspection Task	ACC	NA	Comments & Observations
1.1 Foundation	Inspect anchor bolts & nuts for corrosion, 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		
2.2	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 Attachments	Inspect manways, nozzles & reinforcing plates for 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 TANK INSPECTION REPORT

CLIENT: **Western Refining** FACILITY LOCATION: **Gallup NM** TANK #: **TK-571**

INSPECTION CHECKLIST

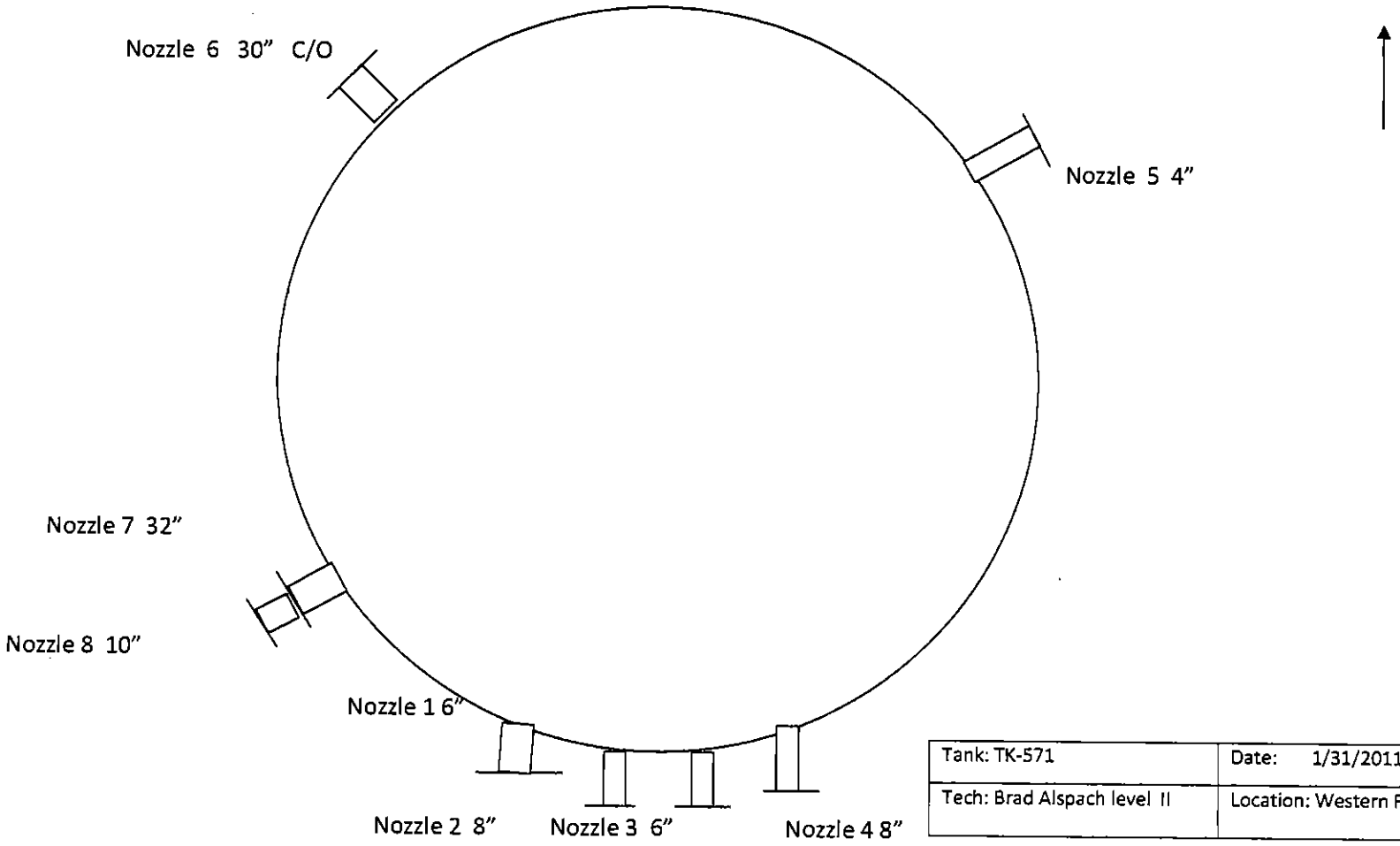
ITEM	Inspection Task	Acc	N/A	Comments & Observations
4.7	Inspect for mixer flange or shell distortion	X		
4.8	If running, check for excessive vibration	X		
4.9	Inspect heater drain or other lines to the first	X		
4.10.	Inspect overflow for corrosion & adequate	X		
4.11	Inspect operation of any level gauging	X		
4.12	Inspect stairway, ladder, cage & handrail-to-	X		
4.13	Inspect for paint failure & corrosion	X		
5.1 Roof	Inspect for paint failure, corrosion or pitting (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 Attachments	Inspect nozzles for flange leaks, cracked 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

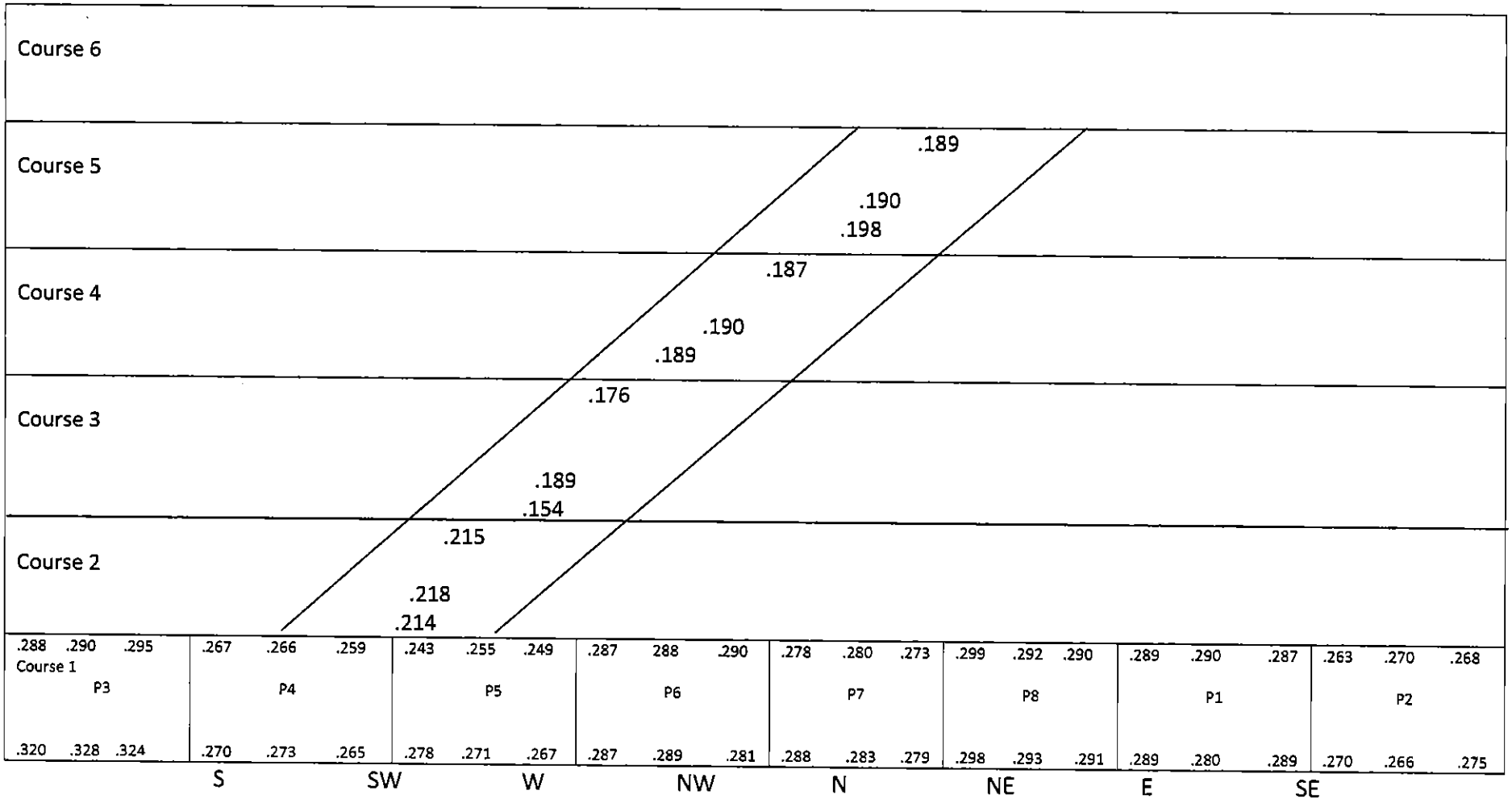
Date:
1/31/2011

Nozzle 1 6"	Nozzle 2 2"	Nozzle 3 6"	Nozzle 4 8"	Nozzle 5 4"	Nozzle 6 30"	Nozzle 7 32"	Nozzle 8 10"	
T.451	T.345	T.279	T.540	T.278	T.433	T.490	T.516	
B.459	B.340	B.270	B.548	B.271	N/A	B.495	B.520	
E.453	E.343	E.276	E.544	E.276	E.441	E.491	E.512	
W.449	W.340	W.280	W.541	W.280	W.439	W.494	W.515	

West



Tank: TK-571	Date: 1/31/2011
Tech: Brad Alspach level II	Location: Western Refining Gallup NM



Tank: TK-571	Date: 1/31/2011
Tech: Brad Alspach level II	Location: Western Refining Gallup NM

Western Refining

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 ☐ 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	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 ☐ 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	

INSPECTOR:	B. Eddie Luna	API#:	33623	DATE:	07/25/2014

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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- **INSPECTION INTERVALS**
- **BOTTOM INSPECTION RESULTS**
  - **PROJECTION PLATE**
- **DIFFERENTIAL SETTLEMENT (API 653)**
- **SHELL INSPECTION RESULTS**
  - **LIQUID LOAD CONDITION**
  - **SHELL ASSESSMENT (MINIMUM ALLOWABLE SHELL THICKNESS)**
  - **SHELL THICKNESS MEASUREMENTS**
  - **SHELL LAYOUT**
  - **SHELL NOZZLES**
  - **SHELL APPURTENANCES AND VERTICAL WELDS**
- **ROOF INSPECTION RESULTS**
  - **ROOF LAYOUT**
- **ITI REPORTS**
- **API CHECKLIST**

1.0 TANK DETAILS

TANK SPECIFIC

Tank Number	**571**
Type	**EFRT**
Product Storage	**89 Unleaded Gasoline**
Product Specific Gravity	**0.80 (SDS)**
Nameplate Present	**Yes**
Operating Temperature (F)	**Ambient**

DIMENSIONS

Diameter	**67 ft.**
Height	**40 ft.**
Safe Filling Height	**36 ft. (assumed)**
Capacity (nominal)	**25,000 bbls**

CONSTRUCTION DATA

Year Built	**1957**
Design Standard	**API**
Manufacturer	**Horton Tank & CBI**
Design Specific Gravity	**1.0 (assumed)**
Foundation	**Earthen**
Secondary Containment	**No**
Bottom & Material	**Lap welded-Carbon Steel**
Shell & Material	**Butt welded-Carbon Steel**
Roof & Material	**Lap welded-Carbon Steel**
Bottom Coated	**Yes-2004**

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
  - UT's on shell, 4 drops with 4 readings taken per course
  - UT's on the projection plate, minimum of 8
  - UT's on the shell nozzle neck, reinforcing pad, flange, and cover
  - 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.
7. 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.





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

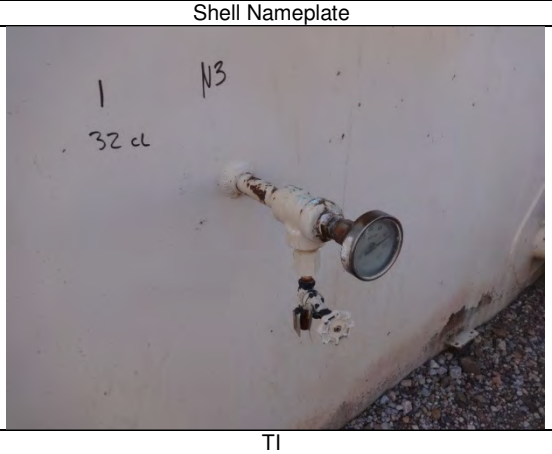
No issues were observed.

8.0 ADDITIONAL PICTURES



Shell Nameplate


Cleanout



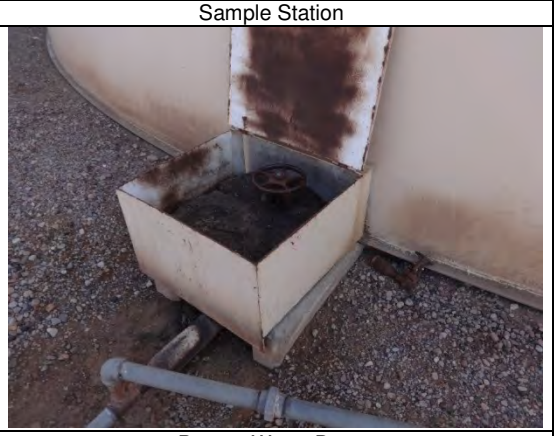
TI



Sample Station



Roof Drain


Bottom Water Draw

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 l 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 July 25, 2014
Tank Number: 571

Inspection Intervals

Routine in-service Inspection — **August 2014**
Performed by Terminal Personnel

Shell External Visual Inspection — **May 2015**
*Performed by an authorized inspector
Minimum of RCA/4N or 5 yrs

Shell Ultrasonic Thickness Inspection — **February 2016**
*Performed by an authorized inspector
Minimum of RCA/2N or 15 yrs

Corrosion Rate **0.002193** **in/yr**

Out-of-Service Inspection Interval **per records, last internal inspection was July 2003**

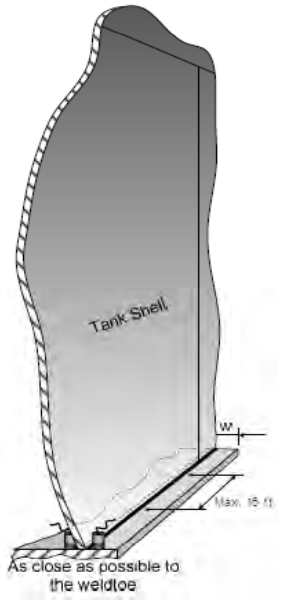
Bottom Inspection Interval July 2013 **With Coating**

Client: Western Refining
Date: July 25, 2014
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.



Loc.	WT 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

Minimum thickness measured inch 0.242 > 0.10 inch thus OK.

Client: Western Refining
Date: July 25, 2014
Tank Number: 571

Differential Settlement (API653)

Mechanical Data

Tank diameter	D	feet	67.00	
Tank height	H	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	*Maximum 32 feet*
Material Yield	Y	PSI	31183	
Youngh Modulus	E	PSI	30022813	

Differential settlement API653, Appendix B

Location [Deg]	Settlement Readings [inch]	Relative Elevation [inch]	Planar Tilt [inch]	Settlement [inch]	Deflection [inch]
0	65.88	2.40	1.9	0.5	0.8
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:

$$|S| = \frac{L^2 * Y * 11}{2 * E * H} * 12$$

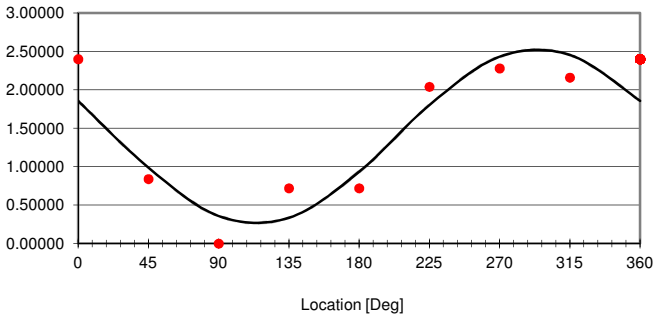
where

S = Critical deflection [inch]
L = Arc Length [feet]
E = Young's modulus [PSI]
Y = Yield strength [PSI]
H = Tank height [feet]

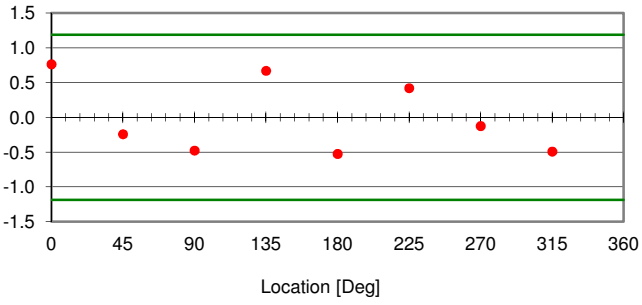
Critical deflection [inch]: 1.2

OK

Shell Settlement Elevation Graph [inch]



Shell Settlement Deflection Graph [inch]



Client: Western Refining
Date: July 25, 2014
Tank Number: 571

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	H	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	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:

$$t_d = \frac{2.6D(H-1)G}{E.\varphi.S_d}$$

$$t_t = \frac{2.6D(H-1)}{E.S_t}$$

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 No.	Course height [feet]	Product height [feet]	Material Yield Y [PSI]	Material Tensile T [PSI]	Allowable Stress S [PSI]	Joint Efficiency Factor E	Minimum calculated t [inch]	Minimum allowable t [inch]	Measured t min [inch]	Integrity check
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

Client: Western Refining
Date: July 25, 2014
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 No.	Course height [feet]	Product height [feet]	Material Yield Y [PSI]	Material Tensile T [PSI]	Allowable Stress S [PSI]	Joint Efficiency Factor E	Calculated t min [inch]	Min. allowable t [inch]	Measured t min. [inch]	Integrity check
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 °F, the allowable stress shall be multiplied by the applicable reduction factor as given in the following table :

	Minimum specified Yield Strength [PSI]		
Temp. [°F]	< 45000 PSI	≥ 45000 to < 55000 PSI	≥ 55000 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

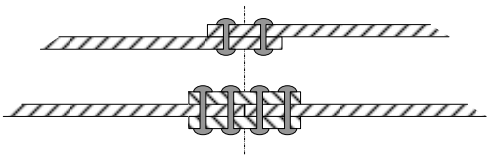
Joint efficiency factors

Type of joint	No. rivets	E
Lap	1	0.45 [0.60]
Lap	2	0.60 [0.73]
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

But welded tanks — Use table 4-2 of API653
Lap-welded tanks — Use table 4-2 of API653 or use E=0.75

Riveted tanks — Use following table (Conform of API653 Table 4-3)



Client: Western Refining
Date: July 25, 2014
Tank Number: 571

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 [inch]	min t allowable liq.load [inch]	min allowable [inch]	min thickness measured [inch]	Integrity check
5	0.000	0.100	**0.100**	0.227	OK
4	0.000	0.100	**0.100**	0.215	OK
3	0.000	0.126	**0.126**	0.172	OK
2	0.000	0.192	**0.192**	0.211	OK
1	0.000	0.243	**0.243**	0.250	OK

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]
5	0.250	0.227	0.000404	0.100	0.127	58	78.7	157.4
4	0.250	0.215	0.000614	0.100	0.115	52	46.8	93.6
3	0.250	0.172	0.001368	0.126	0.046	21	8.5	16.9
2	0.313	0.211	0.001781	0.192	0.019	9	2.6	5.3
1	0.375	0.250	0.002193	0.243	0.007	3	0.8	1.5
		Maximum CR:	0.002193		Minimum Allowable:		0.8	1.5

Recommendations:

Since the intended next service period is years, the following interval is to be considered.

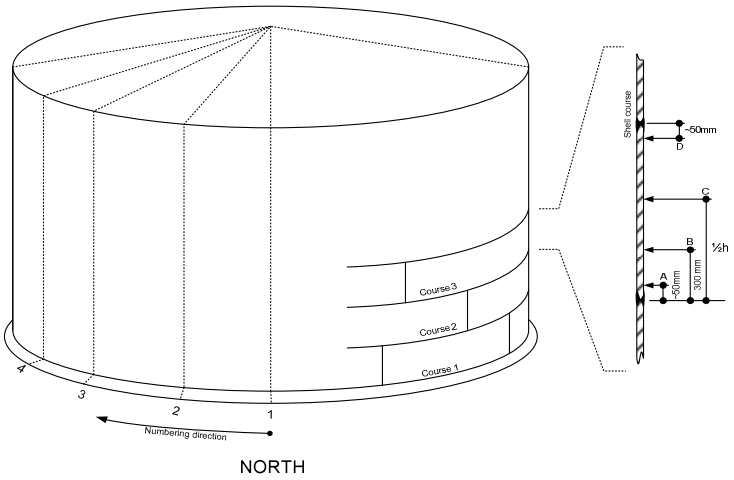
Next External inspection by an authorized inspector should be carried out not later than: 2015.

Next External UT inspection of the shell (and roof) should be carried out not later than: 2016.

NB: Local regulations/conditions may have affect on the above recommendations.

Client: Western Refining
Date: July 25, 2014
Tank Number: 571

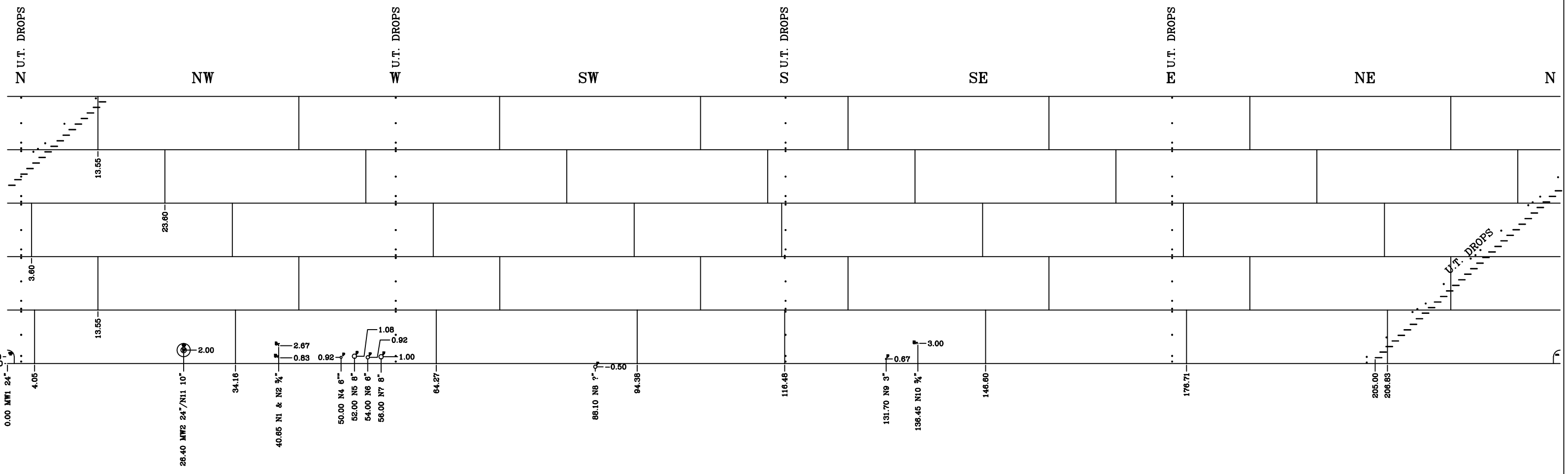
Shell Thickness Measurements



Number of courses:	5
Course	Height [ft]
5	8.30
4	8.30
3	8.30
2	7.75
1	7.35
Height	**40.00** ft.

Shell thickness **Stairway**

Location		W	N	S	E		
Course	WT	[in]	[in]	[in]	[in]		
5	A	0.255	0.243	0.227	0.250	Min	**0.227**
	B	0.256	0.241	0.241	0.252	Max	**0.256**
	C	0.248	0.239	0.251	0.245	Average	**0.245**
	D	0.242	0.235	0.246	0.245	STDEV	**0.008**
4	A	0.248	0.235	0.215	0.235	Min	**0.215**
	B	0.244	0.237	0.217	0.238	Max	**0.248**
	C	0.231	0.226	0.236	0.217	Average	**0.230**
	D	0.227	0.220	0.240	0.215	STDEV	**0.011**
3	A	0.240	0.225	0.172	0.220	Min	**0.172**
	B	0.221	0.224	0.199	0.216	Max	**0.240**
	C	0.204	0.197	0.208	0.192	Average	**0.207**
	D	0.196	0.192	0.214	0.193	STDEV	**0.017**
2	A	0.245	0.250	0.247	0.248	Min	**0.211**
	B	0.235	0.265	0.246	0.245	Max	**0.265**
	C	0.211	0.222	0.254	0.220	Average	**0.236**
	D	0.211	0.242	0.216	0.217	STDEV	**0.017**
1	A	0.250	0.310	0.320	0.270	Min	**0.250**
	B	0.287	0.343	0.320	0.296	Max	**0.360**
	C	0.290	0.360	0.306	0.316	Average	**0.310**
	D	0.309	0.360	0.296	0.331	STDEV	**0.030**



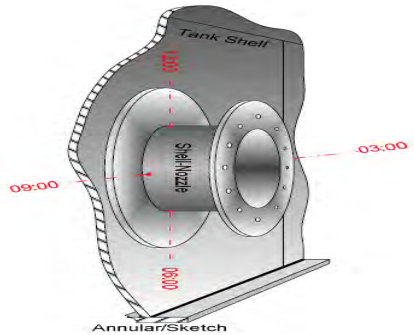
Western Refining
GALLUP REFINERY

TANK FARM
TANK 571

DRN. BY: CG	DATE: 09/09/14	RFE No:
CHK'D. BY:	DATE:	CAD REF:
APP'D. BY:	DATE:	
DRAWING NO. TANK 571		REV 1

Client: Western Refining
Date: July 25, 2014
Tank Number: 571

Shell Nozzles



ID	Function	Size [in]	Station [ft]	CL Elev. [in]	Weld Spacing [in]	Reinforcing Pad					Nozzle WT				Flange WT [in]	Cover WT [in]	Comments
						Width [in]	Height [in]	Shape	Tell-tale [y/n]	WT [in]	12:00 [in]	03:00 [in]	06:00 [in]	09:00 [in]			
MW1	Cleanout	24x24	0.0	12	-	72	36	D	y	0.524	0.479	0.496	0.500	0.507	0.606	0.453	-
MW2	Manway	24	26.4	24	0	60	48	A	y	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	94	19	A	y	0.381	0.397	0.398	0.382	0.395	1.017	-	-
N5	Circ. Suction	8	52.0	13	2 3/8						0.478	0.463	0.465	0.428	1.109	-	-
N6	Transfer	6	54.0	11	2 3/8						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	C	y	0.394	0.307	0.264	0.291	0.270	1.104	-	-
N10	Sample	3/4	136.45	36	-	-	-	-	-	-	-	-	-	-	-	-	6

Stations are measured in feet counter-clockwise from MW1 (station 0.0)

Repad Shape



Comments

1-Inadequate weld spacing per current API	4- No tell tale present	7- Corrosion/coating failure on nuts/bolts	10-
2- No reinforcing pad	5- Coating failure (neck, repad, and/or flange	8- Nozzle on cover of MW2	11-
3- Plugged tell tale	6-Threaded connection	9-Tank Bottom Penetration	12-

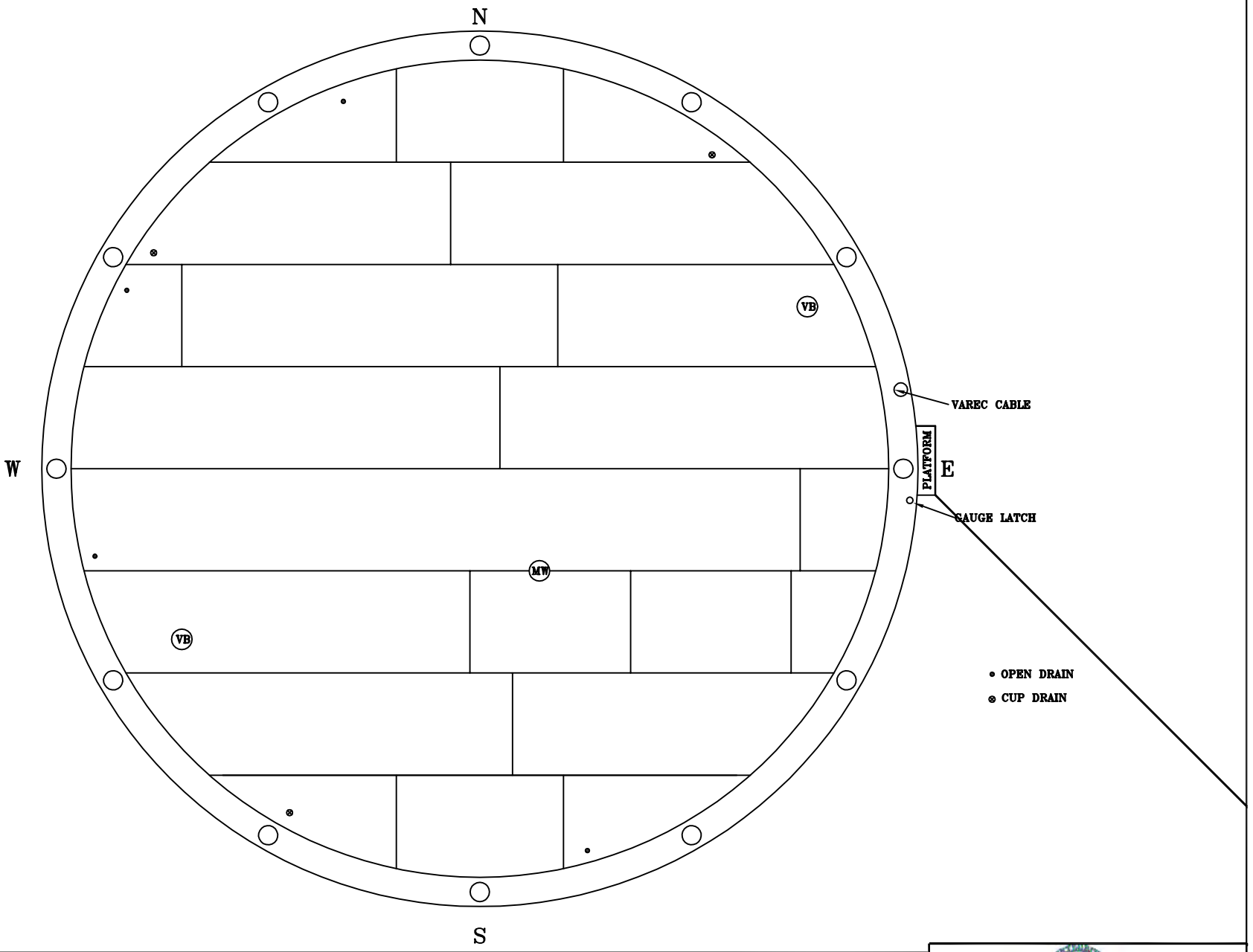
Client: Western Refining
Date: July 25, 2014
Tank Number: 571

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 Weld Seam Location of Course 1							
1	2	3	4	5	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	



FACILITY: TANK FARM	P&ID #:	DESIGN TEMP: °F	INSULATED:	SCALE: NTS
LINE:#	FLANGE RATING: lb/in²	OPER TEMP: °F	DRAWN BY:C.G.	DESCRIPTION:
SERVICE:	DESIGN CODE:	DESIGN PSIG: lb/in²	DATE: 09/09/14	TECHNICIANS:
SPEC:	TEST PSIG:	OPER PSIG:	PAGE: OF	DATE:
SIZE:				TANK 571 – ROOF
NOMINAL:				
MATERIAL: –				
DESC: TANK 571 – ROOF		CLIENT: WESTERN REFINING		

INTEGRITY TESTING & INSPECTION

3861 Vincent Station Dr.
Owensboro, KY 42303 Tele: (270) 689-9980 Fax: (270) 689-9660

— INTEGRITY TESTING & INSPECTION —

ULTRASONIC EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To	From	Date
WESTERN REFINING	**J.Gonzalez/ J. Morgan**	**7/25/2014**

Project: **UT Thickness readings taken 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	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld
	0	**0**	**CS**		☐ Smooth ☑ N/A ☐ As Welded

Location	System
JAMESTOWN, NM	**Tank Farm**

Acceptance Standards	Procedure
Info Only	**UT QCP 620 REV. 0**

Type of Inspection

Soundness ☐ Thickness ☑ Bond ☐

Pulse Echo ☐ Angle-Beam ☐ Other ☐

UT Equipment/Model: **Panametric DL 37 Plus**

SN:071455702

1/3/2015

Transducer: Single Crystal ☐ Dual Crystal ☑

Frequency	Size	Angle
5 MHZ	**0.500"**	**0º**

Flat ☑ Concave ☐ Convex ☐

Couplant: **Sono Test Ultra Gel**

Standard	Material	Notch Depth	Serial No.

Step Wedge ☑ / Tube Wedge ☐	Material	Thickness Range	Serial No.
	C/S	**.100"-.500"**	**12-4061**

Reference: Summary ☑ See Attachment

UT's taken on shell, shell nozzles, and projection plate.

Results of Inspection

UT Thickness reading taken on tank 571.

Copy To:

Requested By: **Tom Lewis**

☑ Customer Specifications ☐ Accept ☐ Reject

Reported By (Technician): **J.Gonzalez/ J. Morgan**

NDT Supervisor: **MARVIN FIGUEROA**

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 IN-SERVICE INSPECTION CHECKLIST

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:	67 ft.
Tank Height:	40 ft.
Tank Type:	EFRT
Date of Tank Construction:	1957

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. NA 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. NA 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. NA Were 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. NA 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. NA 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. N 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

a. N 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

a. Y 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?

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TANK IN-SERVICE INSPECTION CHECKLIST

1.2 SHELL

1.2.1 External Visual Inspection

a. Y Were there any signs of paint failure, pitting, and/or corrosion? If yes, explain. Paint failure & thinning of shell

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?

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?

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 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. not inspected

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. not inspected

e. — 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. N 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. 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.

i NA Was there freedom of movement of the marker and float? If no, explain.

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TANK IN-SERVICE INSPECTION CHECKLIST

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. 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. NA Did the mixer have the proper mounting flange and support?

b. NA 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. 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. Y 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. Drain needs to be opened

1.4.4 Level of Floating Roof

a. N 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. NA Were 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. 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. NA Was the seal fabric on the primary shoe seals pulling shoes away from the shell (fabric not wide enough)?

b. NA Were there signs of deterioration, holes, tears, or cracks in the fabric? If yes, describe.

c. NA Were there any visible signs of corrosion and wear on the metallic parts? If yes, describe.

d. NA Were there any openings in the seals that would permit vapor emissions? If yes, describe.

e. NA 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. NA 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. NA Did the wedge-type wiper seals show signs of flexibility and resilience? If no, explain.

i. NA Were there any signs of cracks and/or tears on the wedge-type wiper seal? If yes, explain.

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TANK IN-SERVICE INSPECTION CHECKLIST

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 Were spot UT measurements taken on top of the pontoons?

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 Sample Hatch

a. NA Did the sample hatch cover function properly and in good condition? If no, explain.

b. NA On tanks governed by Air Quality Monitoring District rules, was the seal inside the hatch cover in satisfactory condition? If no, explain..

c. 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, 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 Was operation of the system tested?

h. NA On ultra clean stocks such as JP4 (to prevent rust from getting into the sample), was the protective liner or coating 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. 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.

TANK IN-SERVICE INSPECTION CHECKLIST

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1.5.13 Pontoon Inspection 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.

1.6 ACCESS STRUCTURES

1.6.1 Handrails

a. Y Was the type (steel pipe, galvanized pipe, square tube, angle etc.) and size of handrails identified?
Type: steel
Size: —
b. Y Was there any pitting, holes, or paint failures? If yes, explain.
c. Y Were the attachment welds in good condition? If no, explain.
d. N Were there any cold joints and sharp edges on the handrails or midrails? If yes, describe.
e. 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. — 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. Y 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. N 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.

1.6.3 Deck Plate and Grating

a. NA Did the deck plate have holes (not drain holes) or thinning caused by corrosion? If yes, explain.
b. Y 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. N Was corrosion found on rolling ladder stringer? If yes, describe.
b. Y Were the ladder fixed rungs identified? (square bar, round bar, angles etc.) round bar
c. N Was there corrosion on the ladder fixed rungs, particularly where the angle rungs are welded to the stringers? If yes, describe.

571

TANK IN-SERVICE INSPECTION CHECKLIST

d. N 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. NA Was there corrosion and/or wear found on moving parts? If yes, describe.

i. Y Did the rolling ladder wheels have freedom of movement? If no, explain. appear to

j. — Did the rolling ladder wheels have flat spots? If yes, describe.

k. — Did the rolling ladder axles show signs of wear? If yes, explain.

l. — Was the rolling ladder aligned with the roof rack? If no, explain.

m. — 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. N Was there corrosion on the rolling ladder track welds? If yes, describe.

o. — Did the track supports on the roof have reinforcing pads seal welded to the deck plate?

p. — Was the maximum angle of the rolling ladder checked by dimensioning when the roof was on low legs? Max Angle: _____

q. — 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 = YES N = NO N/A = NOT APPLICABLE

PARTS OF THE CHECKLIST THAT WERE NOT APPLICABLE (N/A) ARE NOT INCLUDED ON THE FORMAL 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	IWR # 001
Equipment Name:	83 Unleaded Gasoline	

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.

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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 Authorized: ☐ Repair Deferred: ☐ Change Order Required: Yes ☐ No ☐

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SENTINEL INTEGRITY SOLUTIONS

INSPECTION WORK REQUEST

UNIT: TANK FARM	Western Refining – Gallup	DATE:	06-08-2015

INSPECTION PHOTOS



Internal coating on Shell- layers disbonded.



Internal coating on floor – layers disbonded



Vacuum breaker – complete coating failure



Floor – General corrosion 0.080” depth.

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

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89 Unleaded Gasoline Tank TK-571
Internal / External Inspection



Western Refining

Gallup, New Mexico

Keith Angell API 653 Cert #30340	06/09/15	Sentinel Integrity Solutions
Inspector	Date	Company

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

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API 653 INTERNAL INSPECTION SUMMARY

TANK SPECIFIC

Tank Number	**TK-571**
Owner	**Western Refining**
Product Storage	**89 Unleaded Gasoline**
Specific Gravity	**0.80 (SDS)**
Nameplate Present	**Yes**
Operating Temperature (F)	**Ambient**

DIMENSIONS

Diameter	**67 ft.**
Height	**40 ft.**
Capacity (nominal)	**25,000 bbls**
Safe Fill Height	**36 ft. (assumed)**

CONSTRUCTION DATA

Year Built /	**1957**
Design Standard	**API 650**
Secondary Containment	**NO**
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**
Bottom Coated	**Yes- 2003**

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.**

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 anti-seize. 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.

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

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.

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 3rd, /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

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.

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.

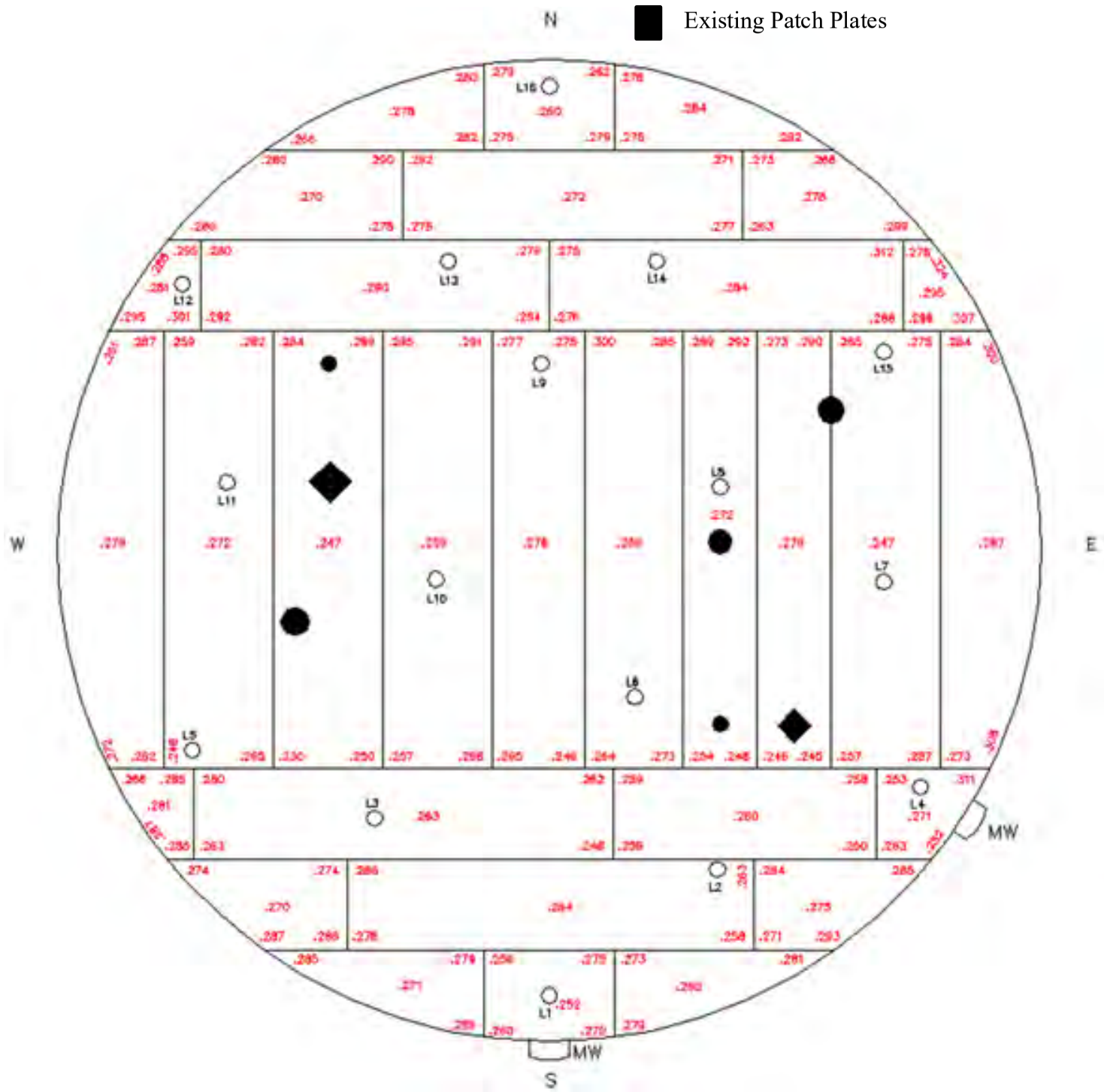
8.3 Roof Support Legs

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.

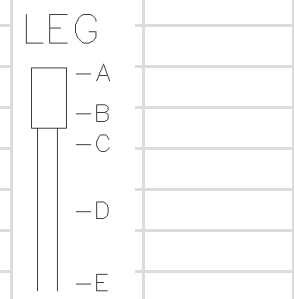
8.4 Roof Seals

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.

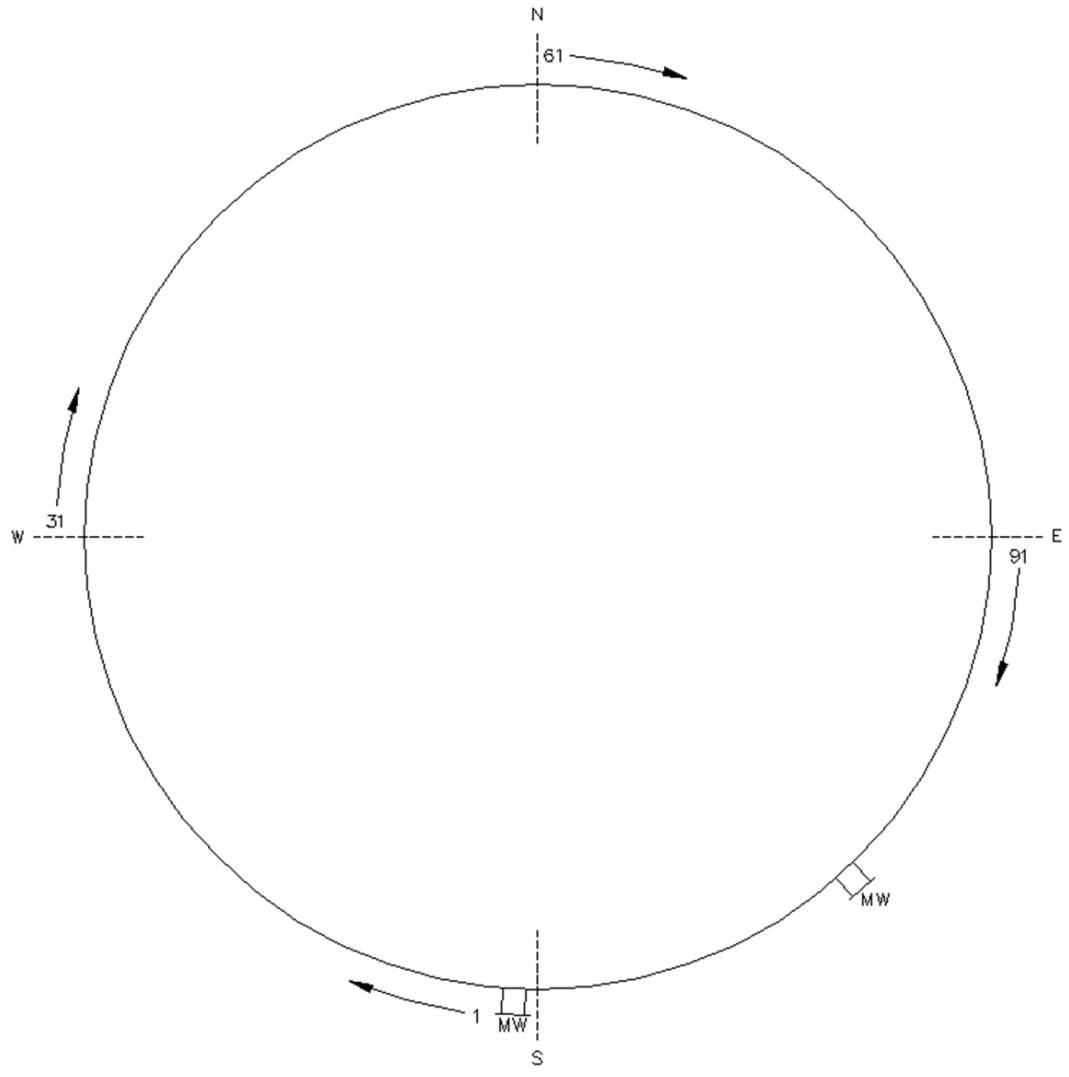
9.0 BOTTOM FLOOR/LEG DRAWING AND DATA



CML		READING	CML		READING	CML		READING
L1	A	.183	L7	A	.112	L13	A	.195
	B	.152		B	.114		B	.200
	C	.233		C	.223		C	.276
	D	.240		D	.244		D	.254
	E	.257		E	.240		E	.281
L2	A	.209	L8	A	.210	L14	A	.181
	B	.253		B	.236		B	.170
	C	.210		C	.211		C	.226
	D	.228		D	.222		D	.263
	E	.227		E	.218		E	.286
L3	A	.188	L9	A	.223	L15	A	.145
	B	.180		B	.222		B	.147
	C	.247		C	.231		C	.279
	D	.261		D	.213		D	.280
	E	.274		E	.242		E	.285
L4	A	.230	L10	A	.235	L16	A	.185
	B	.138		B	.220		B	.178
	C	.169		C	.232		C	.271
	D	.169		D	.236		D	.271
	E	.135		E	.227		E	.173
L5	A	.146	L11	A	.147			
	B	.153		B	.146			
	C	.236		C	.234			
	D	.261		D	.253			
	E	.267		E	.261			
L6	A	.232	L12	A	.147			
	B	.237		B	.143			
	C	.210		C	.226			
	D	.218		D	.259			
	E	.212		E	.151			

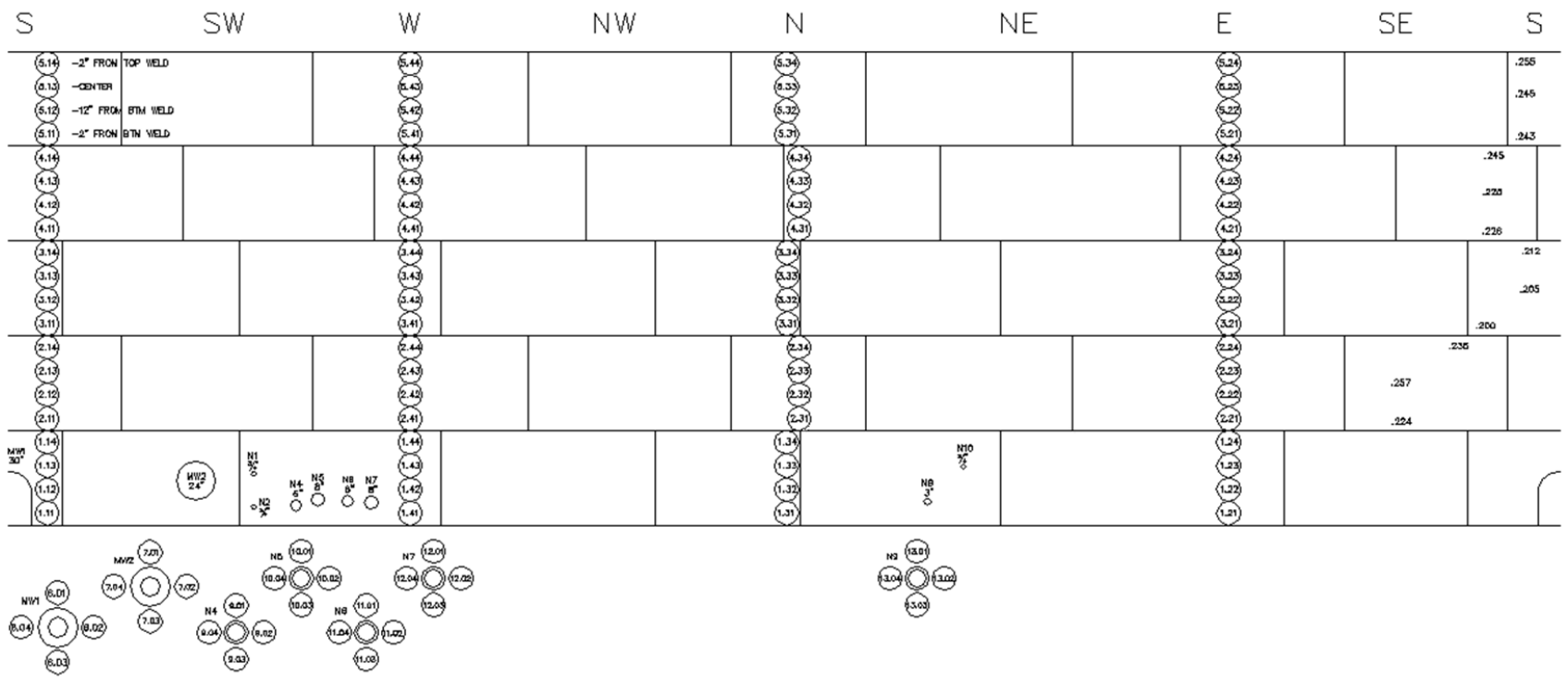


9.1 BOTTOM FLOOR DRAWING (UT'S AT CORNER WELD)



CML	READING	CML	READING	CML	READING	CML	READING
1	.642	31	.295	61	.333	91	.318
2	.653	32	.280	62	.312	92	.219
3	.666	33	.256	63	.322	93	.219
4	.642	34	.269	64	.351	94	.281
5	.290	35	.282	65	.353	95	.208
6	.285	36	.257	66	.355	96	.270
7	.292	37	.265	67	.340	97	.298
8	.282	38	.282	68	.333	98	.282
9	.284	39	.245	69	.333	99	.280
10	.295	40	.297	70	.345	100	.280
11	.288	41	.337	71	.335	101	.285
12	.332	42	.318	72	.306	102	.281
13	.305	43	.308	73	.309	103	.307
14	.288	44	.299	74	.278	104	.301
15	.306	45	.309	75	.279	105	.287
16	.304	46	.287	76	.270	106	.297
17	.306	47	.254	77	.225	107	.284
18	.296	48	.296	78	.320	108	.277
19	.281	49	.282	79	.292	109	.281
20	.304	50	.287	80	.320	110	.285
21	.300	51	.322	81	.294	111	.288
22	.302	52	.328	82	.296	112	.278
23	.331	53	.337	83	.271	113	.295
24	.305	54	.319	84	.219	114	.296
25	.287	55	.312	85	.236	115	.295
26	.299	56	.302	86	.302	116	.287
27	.280	57	.302	87	.300	117	.306
28	.271	58	.304	88	.304	118	.293
29	.302	59	.281	89	.286	119	.276
30	.266	60	.285	90	.281	120	.290

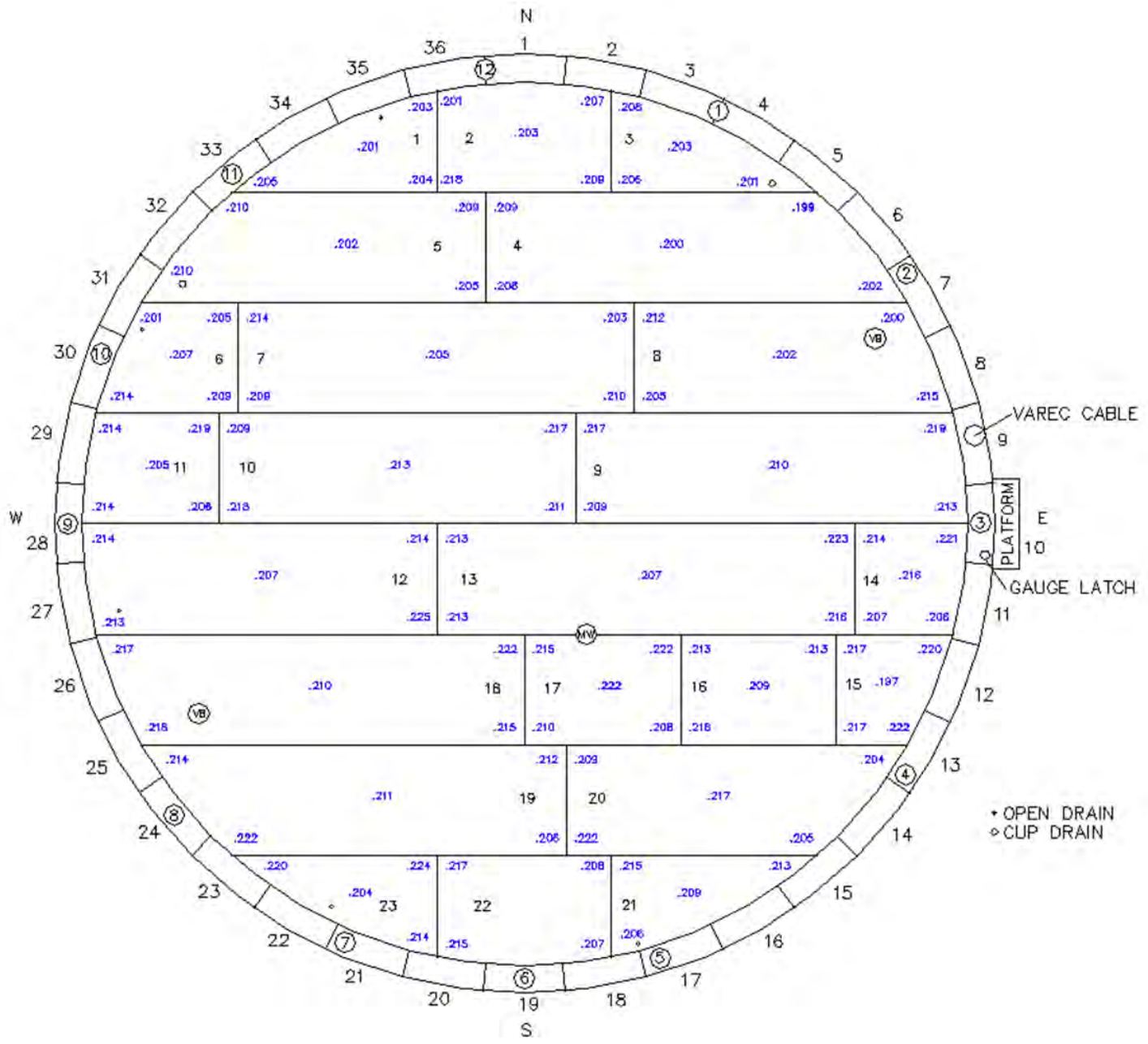
10.0 SHELL DRAWING AND DATA



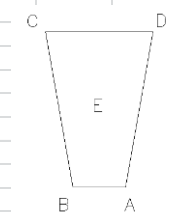
CML	READING	CML	READING	CML	READING	CML	READING
1.11	.314	1.21	.311	1.31	.364	1.41	.323
1.12	.303	1.22	.287	1.32	.341	1.42	.311
1.13	.312	1.23	.287	1.33	.363	1.43	.275
1.14	.272	1.24	.275	1.34	.303	1.44	.273

CML	READING	CML	READING	CML	READING	CML	READING
6.01	.506	8.01	.393	11.01	.413	13.01	.279
6.02	.583	8.02	.376	11.02	.382	13.02	.296
6.03	.488	8.03	.397	11.03	.382	13.03	.271
6.04	.466	8.04	.388	11.04	.379	13.04	.270
7.01	.483	10.01	.447	12.01	.513		
7.02	.495	10.02	.471	12.02	.498		
7.03	.497	10.03	.478	12.03	.542		
7.04	.475	10.04	.443	12.04	.497		

11.0 FLOATING ROOF AND PONTOON DRAWING / DATA



CML		READING	CML		READING	CML		READING
1	A	.220	13	A	.234	25	A	.219
	B	.195		B	.234		B	.214
	C	.215		C	.230		C	.216
	D	.215		D	.226		D	.225
	E	.227		E	.229		E	.214
2	A	.215	14	A	.254	26	A	.227
	B	.208		B	.225		B	.214
	C	.215		C	.223		C	.222
	D	.221		D	.220		D	.223
	E	.220		E	.217		E	.221
3	A	.218	15	A	.210	27	A	.223
	B	.220		B	.224		B	.217
	C	.187		C	.226		C	.215
	D	.211		D	.214		D	.217
	E	.212		E	.209		E	.214
4	A	.229	16	A	.225	28	A	.217
	B	.203		B	.213		B	.221
	C	.222		C	.210		C	.229
	D	.223		D	.222		D	.234
	E	.225		E	.215		E	.233
5	A	.224	17	A	.213	29	A	.218
	B	.223		B	.217		B	.224
	C	.225		C	.220		C	.239
	D	.212		D	.216		D	.232
	E	.215		E	.213		E	.227
6	A	.216	18	A	NA	30	A	.223
	B	.224		B	NA		B	.219
	C	.223		C	NA		C	.223
	D	.215		D	NA		D	.218
	E	.217		E	NA		E	NA
7	A	.220	19	A	.219	31	A	.223
	B	.220		B	.220		B	.234
	C	.228		C	.206		C	.225
	D	.224		D	.213		D	.231
	E	.215		E	.213		E	.220
8	A	.225	20	A	.221	32	A	.218
	B	.225		B	.217		B	.224
	C	.221		C	.218		C	.217
	D	.216		D	.224		D	.211
	E	.211		E	.214		E	NA
9	A	.237	21	A	.234	33	A	.225
	B	.240		B	.215		B	.223
	C	.201		C	.222		C	.219
	D	.213		D	.213		D	.214
	E	.222		E	.222		E	.217
10	A	.225	22	A	.231	34	A	.225
	B	.222		B	.227		B	.233
	C	.217		C	.213		C	.217
	D	.218		D	.211		D	.230
	E	.225		E	.216		E	.221
11	A	.223	23	A	.221	35	A	.229
	B	.225		B	.219		B	.234
	C	.220		C	.213		C	.229
	D	.222		D	.217		D	.212
	E	.219		E	.220		E	.216
12	A	.236	24	A	NA	36	A	.213
	B	.220		B	.224		B	.229
	C	.235		C	.221		C	.218
	D	.228		D	.212		D	.221
	E	.222		E	.233		E	.210



12.0 CALCULATIONS

12.1.1 Shell Calculations

Visual Insp	6/9/2015	UT Insp.	6/9/2015	DATE:	6/9/2015
TANK:	TK-571	INSPECTOR:	K. Angell	BBLS:	25,000
TYPE OF ROOF:	EX FL ROOF			DATE BUILT:	1957
SERVICE:	89 Unleaded Gasoline			PRIOR UT INSP. (Yr.):	1957
BUILT BY:	Horton Tank & CBI			LATEST UT INSP. (Yr.):	2015
· Minimum thickness - (min t) = 2.6(H-1)DG / SE				VISUAL INSP. (Yr.):	2015
· 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)	Joint Eff. (E)	Gravity (G)
67	0.85	0.8

	1st course	2nd course	3rd course	4th course	5th 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.)	Visual External Due (Yrs.)	Shell Due for UT's (Yrs.)
First	0.275	0.375	0.00172	0.243	19	5	9
Second	0.224	0.313	0.00153	0.192	21	5	10
Third	0.2	0.25	0.00086	0.126	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

Shell is due for External Visual Inspection: 6/9/2020
Shell is due for UT Inspection readings: 6/9/2024

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 Readngs 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

12.2 Bottom Calculations

DATE: **06/09/15**

TANK: **TK-571** INSPECTOR: **K. Angell**

TYPE OF ROOF: **EX. FL. Roof** DATE BUILT: **1957**

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 Next Inspection (in.)	Tank Bottom/ Foundation Design
0.1	Tank bottom/foundation design with no means for detection and containment of a bottom leak.
0.05	Tank bottom/foundation design with means to provide detection and containment of a bottom leak.
0.05	Applied tank bottom reinforced lining, > 0.05 in. thick, in accordance with API 652.

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
Tank Diameter	67'-0" Ft/In
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	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. N Were appurtenances opened during cleaning such as lower floating swing sheave assemblies, nozzle interiors (after removal of the valves) inspected? **ALL VALVES NOT REMOVED**
b. Y Were UT measurements taken on the floating roof (5 readings on each plate) and nozzles and were these measurements accurately sketched?
d. Y 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. Y 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. Y Was the depth of pitting measured and documented?
e. Y Were the areas marked requiring patching or further inspection?
g. N Were there any leaks or corrosion noted in the welds especially the shell-to-bottom welds? If yes, explain.
h. Y 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. Y Were there reinforcing pads under all bottom attached clips, brackets, and supports?
u. Y Were the sumps hammer tested and UT measurements taken on the bottom plate? Explain results.

2.4 SHELL SEAMS AND PLATE

b. Y Was the depth of pitting measured on each course? Explain findings. **SEE ATTACHED FINDINDS**
f. Y Were there any signs of damage, deterioration, and/or disbanding to the existing protective coating? If yes, explain. **COATING AT FAILURE, SEE ATTACHED FINDINGS**
h. N Were there indications of leakage in the shell plates or seams? If yes, explain.
k. N Was the shell surveyed to check for roundness and plumb? **NOT REQUIRED BY CLIENT**

2.6 ROOF INTERIOR SURFACE

2.6.1 General

a. N Were there any holes, scale build up, and/or pitting on the underside surface of the plates? If yes, explain.

b. Y 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. Y Were there any signs of pitting and/or thinning on the shell nozzles? **SEE ATTACHED**

2.12 EMERGENCY ROOF DRAINS

a. Y Were seal fabric discs slightly smaller than the pipe ID and the fabric seal? **NO FABRIC; SEE ATTACHED FINDINGS**

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 N = NO
PARTS OF THE CHECKLIST THAT WERE NOT APPLICABLE WERE NOT INCLUDED ON THIS LIST

Inspector: Keith Angell Date: 06/09/2015

14.0 PICTURES



Internal coating on Shell- layers disbonded.



Internal coating on floor – layers disbonded



Vacuum breaker – complete coating failure



Floor – General corrosion 0.080" depth.



Striker Pates (3) – corrosion up to 0.140" in depth



Piping Knuckle/Inlet "Y" - Pads under support are stitch welded.



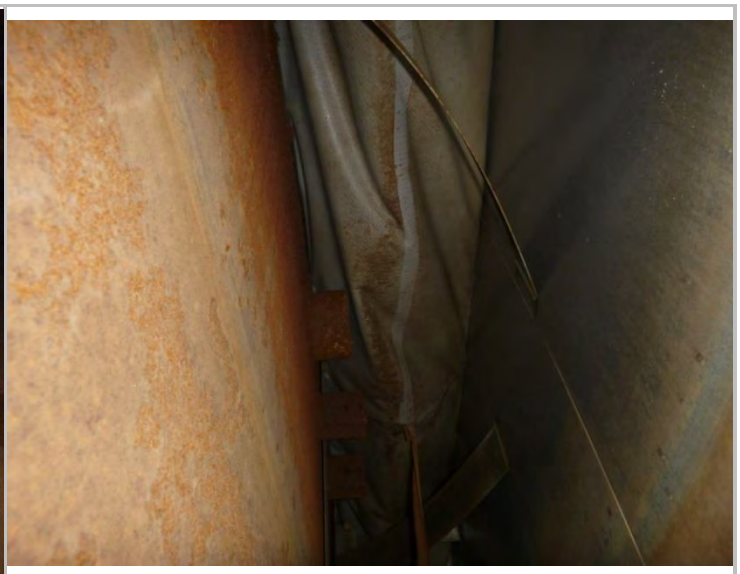
3/8" threaded plugs in shell – plugs not seal welded



Old Style roof drains & catch pans (5) – no longer in use



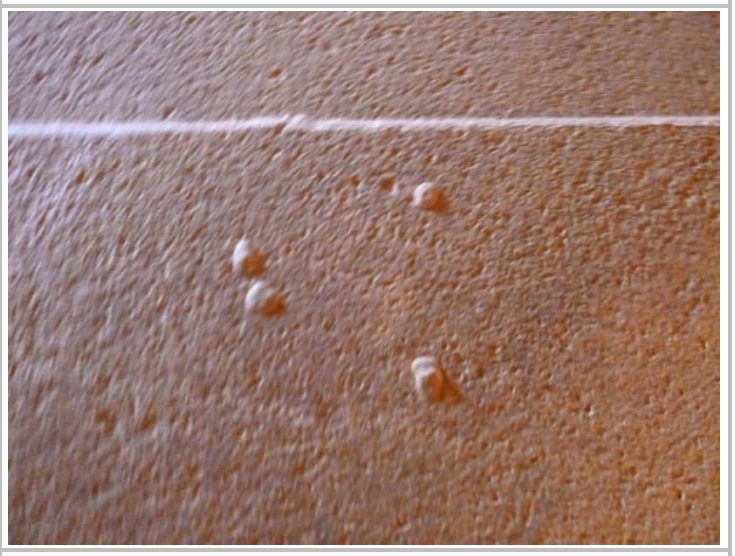
Internal pontoons – no adverse conditions noted



Primary Seal (TYP) – No tears/adverse conditions



Bottom Floor Drain – no adverse conditions noted.



Floor – spot welding fond throughout.



Bottom Floor Coupon Sample (TYP) – No measurable corrosion/pitting found



Rolling ladder – overall good condition; has no ground wire



Shell 2nd 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

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 l 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.