NEW MEXICO
ENVIRONMENT DEPARTMENT

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.env.nm.gov

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lieutenant Governor

RYAN FLYNN
Cabinet Secretary
BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

May 18, 2016

Mr. Ed Riege
Environmental Manager
Western Refining Southwest Inc., Gallup Refinery
92 Giant Crossing Road
Gallup, New Mexico 87301

RE: APPROVAL WITH MODIFICATIONS
ANNUAL FACILITY-WIDE GROUND WATER MONITORING REPORT: GALLUP REFINERY – 2013
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-14-006

Dear Mr. Riege:

The New Mexico Environment Department (NMED) has reviewed the revised *Annual Ground Water Monitoring Report: Gallup Refinery – 2013* (Report), dated August 2014 submitted on behalf of Western Refining Southwest, Inc. Gallup Refinery (the Permittee). NMED hereby issues this Approval with Modifications. The Permittee must address the following comments provided by both NMED and the New Mexico Energy Minerals and Natural Resources Department Oil Conservation Division (OCD):

Comment 1
The Permittee has been including analysis of uranium in groundwater samples per an NMED comment in the December 12, 2012 *Approval with Modifications for the 2010 Facility-Wide Groundwater Monitoring Report.* While some crude oil may contain uranium, the refinery is likely not a source of uranium in groundwater. The Permittee may discontinue the analysis of uranium in groundwater samples. The Permittee must propose this change in the updated Facility-Wide Groundwater Monitoring Work Plan. No revision to the Report is necessary.

Comment 2
Groundwater analytical results for monitoring well OAPIS-1 demonstrate that "[b]enzene and [Methyl tert-butyl ether] MTBE have exceeded applicable standards in all four quarters of 2013 as well as chloride and [diesel range organics] DRO. High concentrations of arsenic, iron, manganese, uranium and cyanide were also detected in OAPIS-1. Only one organic compound, 1-Methylnaphthalene was detected in the first and fourth quarter of 2013." DRO levels appear to be increasing in OAPIS-1 from 1Q at 6.0 mg/L to 4Q at 23 mg/L. Benzene results are reported as increasing from 1Q to 4Q as well (1Q at 0.027 mg/L to 4Q at 0.089 mg/L). MTBE results remained fairly consistent throughout the year (1Q-4Q: 0.42 mg/L, 0.51 mg/L, 0.42 mg/L, and 0.43 mg/L). The above-referenced groundwater monitoring results indicate that there may be contaminant migration in the area of OAPIS-1; therefore, the Permittee must continue quarterly monitoring of OAPIS-1. A work plan for additional investigation at SWMU 1 and SWMU 14 is pending NMED review; additional groundwater investigation associated with the work plan may be required. No revision to the Report is required.

Comment 3
On page 7 the Permittee states that the, "2013 sampling results for PW-4 indicate no detectable concentration levels of [benzene, toluene, ethylbenzene, xylenes] BTEX and MTBE. Iron was detected above the applicable standard and low concentrations of three [volatile organic compound] VOCs (1,2-4-Trimethylbenzene, 1,3,5-Trimethylbenzene and n-Propylbenzene) were detected in 2013." Currently, PW-4 is scheduled for sampling every 3 years; however, because VOCs were detected for the first time in 2013 the Permittee must sample PW-4 during the next scheduled sampling event and then semi-annually thereafter in order to collect additional data. Please revise the Facility-Wide Groundwater Monitoring Work Plan as necessary. No revision to the Report is required.

Comment 4
Regarding the analytical results for OW-10, the Permittee states that a, "[l]ow concentration of MTBE has been detected in OW-10 since 2010 and gradually increasing over time. In the first and second quarter of 2013, MTBE exceeded the NMED Tap Water screening level of 0.125 mg/L. Uranium has also been detected in OW-10 at levels exceeding the WQCC standard of 0.03 mg/L since 2010. Low concentrations of three organic compounds (1,1-Dichloroethane, 1,2-Dichloroethane (EDC), and 1,1-Dichloroethane) have been detected in fourth quarter of 2012 , and in the first quarter of 2013 in OW-10." Since EDC is a lead scavenger, the Permittee must add analysis for 1,2-Dibromoethane (EDB) in all monitoring wells where EDC has been detected; this change must be incorporated into the updated Facility-Wide Groundwater Monitoring Work Plan. The Permittee must use an analytical method capable of detecting EDB at concentrations less than 0.004 micrograms per liter (e.g., EPA Method 8011). Additionally, EDC was detected in OW-29 in 2008 and in OW-30 in 2007. Since MTBE is increasing over time, OW-10 is likely detecting the leading edge of a contaminant plume. The data reported in Section 8.12 demonstrates that there was a spike in MTBE from 3/22/2012 through 9/4/2013.

The nearest downgradient well is OW-1. Currently, OW-1 is checked for water and if water is present it is sampled and analyzed for major cations and anions, VOC, DRO extended/gasoline range organics (GRO), and Water Quality Control Commission (WQCC) metals. The Permittee must include MTBE, EDC and EDB starting with the next round of quarterly sampling. Update the Facility-wide Groundwater Monitoring Plan as necessary. See also Comment 8. No revision to the Report is required.

Comment 5

In Section 6.2.2, NAPIS-1, NAPIS-2, NAPIS-3, KA-3, page 39 the Permittee states, "[d]uring quarterly inspections upon removing the cover, standing water was observed inside the vault of each well. The standing water was removed from each well and placed inside a container for proper disposal before well cap was removed to continue with quarterly sampling." This is the second time standing water was reported for the NAPIS wells. No later than September 30, 2016, the Permittee must repair the vault seals to ensure that surface water is prevented from entering the wells. No revision to the Report is required.

Comment 6

On page 60 the Permittee reports that the analytical results for EP-2 inlet state that benzene was detected at 0.033 mg/l and DRO detected at 2.3 mg/L. The level of benzene reported for the EP-2 inlet should be non-detect since this water has been through both the wastewater treatment plant and aerated in STP-1. There appears to be either a source for the benzene that bypasses the treatment system or the treatment system is not effectively treating the wastewater. The Permittee must sample the EP-2 inlet on a quarterly basis to monitor the level of benzene being discharged from STP-1 to EP-2. In addition, the Permittee must provide NMED with information regarding any issues with the wastewater treatment plant and STP-1 in the response letter. The Permittee revised Table 1 to require annual sampling of the inlet to EP-2 (previously, the pond inlets were sampled quarterly). The EP-2 inlet was sampled twice in 2013 and only one laboratory report is presented in the Report. In the response letter explain why the inlet sampling was modified to annual sampling and explain why EP-2 inlet was sampled twice but only one of the samples was sent to the analytical laboratory. No revision to the Report is required.

Comment 7

In Section 6.6, ADDITIONAL SAMPLING AND/OR CHANGES, page 63 the Permittee states, "[a] request was also made in the 2011 Work Plan Updates to change analytical sampling method 8021B to 8260B for a more detailed list of VOCs in GWM-2 and GWM-3 which may help in determining the source of the water found in these wells, (Pending approval from NMED)." NMED approved this request in the July 24, 2015 Approval with Modifications letter. No revision necessary.

Comment 8
In Section 7.4, GROUP D GROUND WATER MONITORING, page 70, the Permittee states, "OW-1 is an artesian well located on the west section of the refinery property. OW-1 is a relatively clean well. The only contaminant that has exceeded the WQCC standard since 2010 is uranium which is a naturally occurring element found in rock, soil and water. This particular well may require repair and/or re-location as the concrete base on this well has deep cracks. RECOMMENDATIONS: Continue with inspections/sampling plan. Replace and/or repair well." The Permittee must prepare a work plan for installation of a replacement well and propose to properly abandon OW-1. Additionally, because OW-1 is the only well downgradient from OW-10 (see also Comment 4) the Permittee must propose to install additional groundwater monitoring wells to track and delineate contaminant migration. No revision to the Report is necessary.

Comment 9
Appendix A, Separate Phase Hydrocarbons, "Year to Date Hydrocarbon Recovery Logs" RW-5 and RW-6 demonstrate decreasing amounts of product thickness while RW-1 demonstrated decreasing thickness in 2010 and 2011. However RW-1 now displays increasing levels of SPH (the SPH level went from 0.53ft, 0.39 ft, to 1.54 ft for the last several sampling events listed in the Appendix A table). The Permittee must address the apparent continued movement of the SPH plume and provide NMED and OCD with data regarding the tank farm and any inspections to address potential leaking tanks that may be contributing to increasing SPH levels in RW-1. The Permittee has an approved Work Plan for investigation at OW-14 that may address some issues in the tank farm area. Additionally, it appears that the reported product thicknesses for RW-1 in 2005 and 2008 are errors reported at 25.9 ft and 18 ft of measured product thickness, respectively. Revise the table to address these errors.

Comment 10
In Section 6.3.1, OW-13, OW-14, OW-29, OW-30, page 45, the Permittee discusses OW-29 and OW-30. MTBE concentrations are increasing in these wells. OW-29 and OW-30 are located on the northwest section of the facility. There are two downgradient wells (OW-50 and OW-52) however, it is not clear that those wells are effectively monitoring groundwater movement in relation to the locations of OW-29 and OW-30. On page 18 the Permittee states, "[s]hallow ground water located under refinery property generally flows along the upper contact of the Chinle Formation. Although the prevailing flow direction is from the southeast and toward the northwest; a subsurface ridge has been identified and is thought to deflect some flow in a northeasterly direction in the vicinity of the refinery tank farm." Figure 10 (Chinle GP/Alluvium Interface) also depicts groundwater movement. In Section 7.3, GROUP C GROUND WATER MONITORING, on page 58, the Permittee confirms this stating,

> "[d]own gradient from OW-14 is OW-29, and OW-30 and the analytical data from both of these wells indicates that MTBE is present in the ground water at concentration levels

exceeding the NMED Tap Water standard of 0.125 mg/L since March of 2010 in OW-29 and December 2007 in OW-30. Analytical data for these four wells indicate a steady increase of MTBE concentration levels indicating that the MTBE plume is slowly migrating in a north, north-west direction down-gradient from RW-1 and RW-2. The stratigraphic units in which these wells exist are in what is known as the Chinle/Alluvium Interface. RECOMMENDATIONS: Continue with current sample schedule. MTBE plume is present between OW-13, OW-14, OW-29 and OW-30 and analytical data indicates a very slight increase in concentration levels over time. It was suspected that the migration of the MTBE plume may be in a northeast direction. As a result OW-50 and OW-52 were installed down gradient from these wells. After three years of sampling no contaminants have been detected in the ground water collected quarterly from these wells. It is possible that the MTBE plume may be migrating in a north northwest direction from OW-29 following the natural formation of the Chinle-Alluvium interface. Analytical data indicates that MTBE concentrations have been slowly increasing from year to year in OW-29 as well as OW-30."

Since OW-50 and OW-52 do not intersect contaminant migration in this area, the Permittee must submit a work plan to propose to install additional groundwater monitoring wells to the north-northwest of OW-30 to capture the plume path and demonstrate that the plume is not migrating off-site. No revision to the Report is required.

Comment 11
Appendix F (MKTF 1-18 – Survey, Boring Logs, Analytical Data) will be reviewed as part of the Permittee's *Hydrocarbon Seep Interim Measures Report*, dated July 2015. Continue to monitor and report on the MKTF wells in the Facility-wide Groundwater Monitoring Report. No revision necessary.

Comment 12
In Section 9 (Well Data DTW/DTB Measurements) there appear to be errors in the table presented in this section. See below:

- **a.** OW-1 is reported with DTW of 0.0ft on 11/11/2013.
- **b.** OW-10 is reported with DTW of 0.0ft on 11/11/2013. OW-10 also appears to have greatly fluctuating groundwater measurements per quarter: 3.8 ft, 8.0 ft, 0.92 ft, 0 ft, respectively.
- **c.** The table reports GWM-3 as "DRY" for all quarters of 2013, but the log in Appendix C indicated the 1Q depth to groundwater measurement was 4.85 ft.
- **d.** The MKTF wells have fairly large fluctuations in reported DTW and groundwater elevations. For example MKTF-01 from 2nd to 3rd quarter groundwater elevation reported as 6913.23 ft and 6909.09 ft, respectively.

Revise the Section 9 table to accurately report field measurements. Also, explain any discrepancies in the response letter.

Comment 13
There appears to be an error in Section 10, Table 1, where the last row reads "[a]ll wells including Recovery Wells." As per a discussion related to financial assurance, it is not clear where this requirement came from; therefore, remove the statement from Table 1 in future work plans and reports.

Comment 14
Figure 8 (S-N Section Westerly Plant Area) does not correlate to the information provided in Figure 6. For example, wells OW-05 and OW-03 and OW-24 are not shown on Figure 6. Provide updated figures that show the locations of all groundwater monitoring wells. If the wells have been abandoned, note this on the figures. Where appropriate, provide replacement figures with the response letter.

Comment 15
The Permittee must provide NMED and OCD with documentation of repairs to the NAPIS to demonstrate that the leaks evident from the sampling of the east and west LDUs have been addressed. Provide this information with the response letter. No revision to the Report is required.

Comment 16
Appendix H (Summary of Leaks, Spills, and Releases) contains C141 forms submitted to NMED and OCD regarding releases. The Permittee must include more specific information with these forms for future releases. For instance, the latitude and longitude provided are for the location of the Refinery; however, this information is not specific enough to determine where, within the refinery property, the release occurred. Since it is difficult to provide this information with the latitude and longitude, in all future spill reports, the Permittee must submit a figure with the C141 form that demonstrates where the release occurred.

The Permittee must address all of these comments in a response letter (specifically Comments 5, 7 and 13) and provide revised tables for Section 9 and Appendix A. The response letter and revised tables must be submitted to NMED by **August 8, 2016**.

To summarize the required changes to the Facility-wide Groundwater Monitoring Work Plan:

- The Permittee must sample PW-4 during the next scheduled sampling event and then semi-annually thereafter.
- Since EDC is a lead scavenger, the Permittee must add analysis for 1,2-Dibromoethane (EDB) in all monitoring wells where EDC has been detected.

- The Permittee must include analysis for MTBE, EDC and EDB at OW-1 starting with the next round of quarterly sampling.
- The Permittee must sample the EP-2 inlet on a quarterly basis.
- The Permittee may discontinue analysis for uranium in all wells.
- The Permittee must edit Table 1 to remove the statement "[a]ll wells including Recovery Wells."

The Permittee must submit work plans and/or additional information for the following:

- The Permittee must prepare a work plan for installation of a replacement well and propose to properly abandon OW-1. Additionally, the Permittee must submit a work plan to propose additional wells downgradient of the Evaporation Ponds per OCD's requirement, see Comment 8. The work plan must be submitted by **November 1, 2016**.
- The Permittee must submit a work plan to propose to install additional groundwater monitoring wells to the north-northwest of OW-30. The work plan must be submitted by **September 1, 2016.**

If you have questions regarding this Approval with Modifications, please contact Kristen Van Horn of my staff at 505-476-6046.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain NMED HWB
N. Dhawan NMED HWB
K. Van Horn NMED HWB
C. Chavez OCD
A. Hains WRG
C. Johnson WRG
L. King EPA Region 6

File: Reading File and WRG 2016 File
HWB-WRG-14-006