



NEW MEXICO
ENVIRONMENT DEPARTMENT

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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

January 4, 2019

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

**RE: DISAPPROVAL
REVISED ANNUAL GROUNDWATER MONITORING REPORT
GALLUP REFINERY – 2015
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-17-007**

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has reviewed the *Revised Annual Groundwater Monitoring Report: Gallup Refinery - 2015* (Report), dated September 2018, submitted on behalf of Marathon Petroleum Company dba Western Refining Southwest Inc., Gallup Refinery (the Permittee). NMED hereby issues this Disapproval. The Permittee must address the following comments provided by both NMED and the New Mexico Energy Minerals and Natural Resources Department Oil Conservation Division (OCD):

Comment 1

An electronic version of the response to comments table was not included in the submittal. For all future submittals including the revised Report, provide an electronic version of the response to comments table along with other required documentation. In addition, the Permittee did not list sections, tables and/or figures in the Report where changes were made as required in the

response to comments table. Indicate where all changes were made to the Report in the response to comments table.

Comment 2

All revisions were not identified in the Redline Strikeout (RLSO) version. The RLSO version must identify all revisions made to the previous version of the Report, including the revisions made to the tables, charts and figures. Failure to provide an accurate RLSO version slows review, creates the potential for changes to be overlooked, and may be misleading. Provide an accurate RLSO version of the revised Report.

Comment 3

The depth-to-water (DTW) measurement data for MKTF and STP1 wells are tabulated in Appendix B, *Field Inspection Logs*; however, DTW data for other wells are not tabulated. A table showing the 2015 DTW data for all groundwater monitoring wells must be included in the revised Report.

Comment 4

The Permittee's response to NMED's *Disapproval* Comment 4 states, "[d]ue to the remote nature of the refinery, the laboratory felt that it was best to use the nitrate/nitrite analyses in case the delivery truck ran late, or if a sample had to be re-analyzed due to QC failures, or if the lab was unable to meet holding times with instruments. In the future, samples will be analyzed in accordance with the approved sampling plan." Comment 7 in NMED's September 21, 2018 *Approval with Modifications for Revised Facility-Wide Ground Water Monitoring Work Plan – Updates for 2018* (Work Plan) requires inclusion of nitrite analysis to all monitoring wells where anion analysis is included as a requirement. Resolve the issue of holding time for nitrite (e.g., overnight delivery). If the issue cannot be resolved, propose to use a field instrument (e.g., colorimeter) to report nitrate and nitrite separately, on site. Discuss the options to resolve the issues in the revised Report and note the deviation from the approved Work Plan.

Comment 5

The Permittee's response to NMED's *Disapproval* Comment 5 states, "[a]ll DRO, GRO, and MRO cleanup criteria have been adjusted to reflect those provided in the 2017 Guidance Document reference above." The Permittee elected to use the groundwater screening levels of #3 and #6 fuel oil for diesel range organics (DRO), kerosene and jet fuel for gasoline range organics (GRO), and mineral oil dielectric fluid for oil range organics (MRO). However, since all specific sources of the hydrocarbon constituents are not known, compare all concentrations to the groundwater screening level for unknown oil (39.8 ug/L) listed in Table 6-4 of the 2017 Guidance. Revise the Report accordingly.

Comment 6

The Permittee's response to NMED's *Disapproval* Comment 6, Item 4 states, "[a] discussion of the fluoride levels detected in the BW wells has been added." The discussion found in Section 6.1.1, *Boundary Wells (BW-1A/1B/1C, BW-2A/2B/2C, BW-3A/3B/3C)*, states that the ponds are likely not the source, but fluoride may be migrating from an area upgradient of the ponds since

similar concentrations are observed in the upgradient direction. In the revised Report, provide a reference to the specific monitoring wells where fluoride concentrations are observed.

Comment 7

The Permittee's response to NMED's *Disapproval* Comment 14 states, "Table 8.7.2 has been modified to reflect a regulatory standard of 0.0014 mg/L for cyanide." According to Table 8.7.2, *Total Metals Analytical Result Summary*, EPA regional screening level (RSL) for Tap Water and NMED Tap Water screening level are listed as 0.015 mg/L and 0.00146 mg/L for cyanide, respectively. In Section 6.4.2, *Groundwater Monitoring Well: OAPIS-1*, the Permittee states that total cyanide exceeded the EPA RSL standard (0.0014 mg/L). The statement is contradictory. Resolve the discrepancy in the revised Report.

Comment 8

The Permittee's response to NMED's *Disapproval* Comment 16 states, "[t]he STP-1 unit is lined, and is not suspected of leakage. The purpose of the STP-1 monitoring wells is to monitor the chlorides and nitrates that were detected in the groundwater samples. It is noted that similar concentrations of chloride and/or nitrate have been detected in groundwater samples collected from nearby (up-gradient) wells NAPIS-1, NAPIS-2, NAPIS-3, GMW-1, GMW-2, and GMW-3, which may indicate an up-gradient source." Comment 3 in NMED's June 20, 2016 *Disapproval for 2014 Annual Groundwater Monitoring Report*, directed the Permittee to provide an explanation for why these wells were installed and how the locations were selected. The Permittee did not adequately address the comment in the response letter or in the revised 2014 Report, dated November 9, 2016. Even if the STP-1 unit is lined, leakage may still occur. The STP-1 monitoring wells are appropriately located for the detection of potential leakage from the STP-1 unit. State the original purpose of the STP-1 monitoring wells in the revised Report.

Comment 9

The Permittee's response to NMED's *Disapproval* Comment 20 states, "[a]dditionally, Gallup Refinery intends to place pneumatic pumps in all of the RW wells to recover both free product and dissolved phase hydrocarbons in the area. Following the installation of the pumps, the well screens will no longer be submerged." Prior to installation, the Permittee must submit a work plan to NMED for review. It is not appropriate to depress the water table in the wells where the screened intervals have historically been submerged, because the depth intervals where free product is present or smeared have not been delineated for these wells. A depressed water table in these wells may result in free product seeping to depths where it was initially absent. Once free product is introduced to the depths below the free product smear zone, it will be more difficult to recover. Examine historical DTW and depth-to-product (DTP) data to make an appropriate recommendation for extracting free product and groundwater from the RW wells. The extraction depths must not be set deeper than the depths where free product has previously been present. Provide a work plan to NMED to install wells with appropriate screened intervals.

Comment 10

The Permittee's response to NMED's *Disapproval* Comment 22 states, "[a]lthough low concentrations of BTEX (below regulatory standards) were reported in 2015 and 2016, the analytical results for 2017 were all below the detection limits for both OW-1 and OW-10." The referenced 2017 groundwater monitoring report has not been submitted to NMED; therefore, the statement must be removed.

Comment 11

The Permittee's response to NMED's *Disapproval* Comment 23, Item 1 states, "[l]anguage has been added to the report which addresses the presence of SPH." In Section 6.6, *Constituent Levels for MKTF Wells*, the Permittee states that the SPH thickness in the MKTF wells ranged from 0 to 1.98 feet at MKTF-7." Section 6.6 was revised to address Comment 23, Item 1; however, the statement is not accurate. The SPH thickness in well MKTF-45 was more than three feet during the second quarter in 2015. Correct the statement for accuracy in the revised Report.

Comment 12

The Permittee's response to NMED's *Disapproval* Comment 24, Item 2 states, "[i]t is not necessary to reiterate the analytical results for each well in the text of the report when it is summarized in detail in the analytical summary tables." NMED's comment did not require this. NMED's comment required the Permittee to be more specific when making statements such as "at least one". State which wells specifically contained contaminant concentrations above their respective groundwater contaminant levels. Listing the compounds detected above the screening levels without providing the designation of wells is not useful to understand site groundwater conditions. Tables should support statements made in the text. Include the information in the revised Report.

Comment 13

The Permittee's response to NMED's *Disapproval* Comment 24, Item 7 states, "1-methylnaphthalene will be removed from the VOC summary table as well as the discussion of VOCs in future reports." The 1-methylnaphthalene concentrations exceeded the screening level in the groundwater samples collected from the MKTF wells according to Table 8.15.5, *MKTF Wells Volatile Organic Compounds Analytical Results*. Therefore, the response is not appropriate. The Permittee must include the analytical results and discussion for the exceedance of 1-methylnaphthalene. Comment 24, Item 7 states that 1-methylnaphthalene is listed twice in page 45. Listing the same compound twice is not necessary; remove one of the listings from the revised Report, but include the constituent in both the table and the discussion.

Comment 14

The Permittee's response to NMED's *Disapproval* Comment 25 states that this issue was discussed with the NMED in our last meeting (2018), and asserts that a new monitoring well installed in that location would be cross-gradient from the source and would add little value to the monitoring system as it would provide no downgradient coverage for the pond. After the meeting referenced in the response, NMED reviewed information including laboratory data from groundwater collected in upgradient wells that demonstrate that the Permittee's explanation is

not technically defensible. The Permittee also states, “[a]s illustrated on the potentiometric maps, well MKTF-43 is upgradient from well MKTF-44 suggesting that the source of the chlorides and sulfates is located in an upgradient direction of pond EP-9. Therefore, no additional wells are proposed for the southern margin of pond EP-9.” The statement is not accurate. The closest wells positioned upgradient of pond EP-9 and well MKTF-43 are wells MKTF-32 and MKTF-41. The highest chloride and sulfate concentrations reported in 2015 for the groundwater samples collected from well MKTF-32 were 580 mg/L and 110 mg/L, respectively. Similarly, the highest chloride and sulfate concentrations reported in 2015 for the groundwater samples collected from well MKTF-41 were 900 mg/L and 79 mg/L, respectively. These concentrations are significantly lower than those recorded in the samples collected from well MKTF-43 and pond EP-9. The source of elevated chloride and sulfate concentrations likely does not originate upgradient from pond EP-9. The source may originate from the eastern perimeter of pond EP-9. As stated in Comment 25, there is no monitoring well on the southern perimeter of pond EP-9; therefore, a leak from that area cannot be detected or prevented. Installation of a groundwater monitoring well is required. Propose to submit a work plan for the installation of a groundwater monitoring well at the southern perimeter of pond EP-9; otherwise, provide a detailed description of the existing leak detection system installed at the southern perimeter of pond EP-9 in the revised Report.

Comment 15

The Permittee’s response to NMED’s *Disapproval* Comment 27 states, “[a]ll detected compounds (VOCs, SVOCs, metals, etc.) were evaluated for trends associated with increasing concentrations of monitored parameters. No clear association was observed in any of the monitored parameters.” The Permittee’s response does not address Comment 27. To clarify, Comment 27 directed the Permittee to evaluate 1) accumulation of vinyl chloride and cis-1,2-DCE, and 2) occurrence of anaerobic dechlorination in every MKTF well where chlorinated compounds were detected. The occurrence of anaerobic dechlorination and potential accumulation of related daughter products must be evaluated using the existing data (e.g., concentrations of chlorinated compounds, groundwater quality parameters, and anions concentrations). Include the discussion in the revised Report.

Comment 16

The Permittee’s response to NMED’s *Disapproval* Comment 28, Item 2 states, “[t]he anion results were removed from table 8.16.1.” The anion results are still listed in Tables 8.16 and 8.16.1. Remove the redundant data from the revised Report.

Comment 17

The Permittee’s response to NMED’s *Disapproval* Comment 28, Item 3 states, “[t]he specific conductance results were moved to table 8.16.1.” The specific conductance results are listed twice with two separate columns in Table 8.16.1. Remove the specific conductance results from Table 8.16.1. Comment 28, Item 3 states, “[t]he measurement of specific conductance must be presented in a separate table along with other water quality parameters (e.g., dissolved oxygen concentration, redox potential).” Provide the table required by Comment 28, Item 3 in the revised Report.

Comment 18

The Permittee's response to NMED's *Disapproval* Comment 29, Item 6 states, "[t]he requested language has been added to the report." Comment 29, Item 6 directs the Permittee to address the exceedance of dissolved chromium concentrations in the samples collected from ponds EP-7 and EP-9. However, Section 6.7.1, *Evaporation Ponds 1 through 12B*, does not address the dissolved chromium concentration exceeding the standard in the sample collected from pond EP-9 (0.064 mg/L). Address the exceedance in the revised Report.

Comment 19

The Permittee's response to NMED's *Disapproval* Comment 30 states, "[p]onds 12A and 12B are shallow evaporation ponds that do not receive untreated wastewater of any type... Additionally, in the summer of 2018 these ponds were observed to be completely dry as a result of high evaporation rates." The Permittee's response provides adequate explanation for the elevated e-coli concentrations in ponds 12A and 12B; however, Comment 30 requires the Permittee to provide an explanation regarding the flow path from STP-1 unit to the last evaporation pond. Include the information in the revised Report.

Comment 20

The Permittee's response to NMED's *Disapproval* Comment 32 states, "[h]owever, the boiler water is very pure to prevent the buildup of hardness within the piping so it is possible that the discharge line that carried the BW to pond EP-2 could have had leaks that allowed sulfate reducing bacteria to live in the warm water around leaks in the pipe which resulted in the sulfate detections." It should be noted that sulfate reducing bacteria (SRB) do not produce sulfate or cause sulfate detections. SRB rather drive the reduction of sulfate or sulfur to utilize small carbon substrates including petroleum hydrocarbons under anaerobic conditions. Since the boiler water is pure as a result of reverse osmosis (RO), SRB unlikely utilizes sulfate or small carbon substrates to flourish. Provide a clarification for the statement or an alternate explanation for the elevated sulfate concentrations in the boiler water.

Comment 21

The Permittee's response to NMED's *Disapproval* Comment 36 states, "[t]he NMED is aware that benzene was discharged into the aeration lagoon possible due to porous piping that served as a conduit for transport to the benzene to the aeration lagoon." This statement does not make sense. NMED is not aware of the assertion stated in the response. The Permittee must provide a better description or clarify the meaning of the statement and provide specific references to document(s) describing the benzene discharge into the aeration lagoon in the response to comments.

Comment 22

The Permittee's response to NMED's *Disapproval* Comment 39 states, "[t]here have been many wells installed in the Group C area since the submission of this report with more planned. Specifically, wells OW-53 and OW-54 were installed in the area between OW-13 and OW-29." Wells OW-53 and OW-54 were screened in the Chinle-Alluvium interface. Comment 39 directs the Permittee to propose to submit a work plan for installation of a monitoring well screened in

the Sonsela formation between wells OW-13 and OW-29. Address the comment in the response to comments submitted with the revised Report.

Comment 23

NMED's *Disapproval* Comment 41 states, "[i]n addition, revise the charts to include the ground surface and SPH elevations." Neither the ground surface or SPH elevations were included in Figures 11.1, 11.2, and 11.3. The charts with ground surface, groundwater and SPH elevations will provide information regarding the extent of the SPH smear zone. The information is an important design parameter for a SPH recovery system, if needed in the future. Include ground surface, groundwater and SPH elevations in the figures. Revise the Report accordingly.

Comment 24

The Permittee's response to NMED's *Disapproval* Comment 42, Item 1 states, "[t]he priority for any volume of water obtained is to obtain analytical data, not field parameters... Gallup Refinery will ensure that field parameters are measured and recorded when adequate amounts of water are available." A collection of field parameters is required prior to sampling in accordance with Section 2.2, *Sampling Methods and Procedures*. Field parameters must be measured to ensure that groundwater samples are representative of aquifer's natural conditions. Note that field parameters also provide valuable information regarding the site's groundwater conditions. Describe the cases when sampling for the collection of laboratory analytical data is conducted while field parameters are not collected, and provide a step-by-step explanation of field sampling methods used by technicians in the field for the MKTF wells in the revised Report.

Comment 25

The Permittee's response to NMED's *Disapproval* Comment 42, Item 3, states, "[f]inal stabilized readings are on the sampling forms." NMED's *Disapproval* Comment 42, Item 3 states, "[a]ll water quality parameters must be tabulated and presented in an organized manner. The final (stabilized) readings must be recorded in the table." As stated in Comment 24 above, field parameters provide valuable information regarding the site's groundwater conditions. Providing field parameter data on sampling forms, but not in a summary table is equivalent to providing analytical results on laboratory reports but not in a summary table. The Permittee must tabulate all field parameter data collected in 2015 and provide a table summarizing the data in the revised Report.

Comment 26

The Permittee's response to NMED's *Disapproval* Comment 42, Item 4 states, "[a]lthough the sampling form indicates that the units of dissolved oxygen are \"%", it is actually recorded in mg/L." The unit of dissolved oxygen (DO) in the sampling forms is still indicated as "%". If making the correction on each field form is retrospectively impracticable, insert a note clarifying the correction in Appendix B of the revised Report. However, all future sampling forms must be corrected to report DO in mg/L. In addition, the reported DO concentrations often significantly exceed the solubility limit of oxygen at the given temperature. For example, the DO

concentrations in well NAPIS-3 were reported from 71.8 mg/L to 59.6 mg/L at a temperature of approximately 20 °C. The solubility limit of oxygen in fresh water at a temperature of 20 °C under the atmospheric pressure is slightly less than 10 mg/L. The solubility limit of oxygen in more saline water, which may be more representative of site's groundwater conditions, is even lower than the solubility limit in fresh water. The field instrument must be calibrated daily (according to manufacturer specifications) prior to conducting the measurements in all future sampling events. The required calibration for the instrument must be described in Section 2.2 of the revised Report. If the issue of DO readings cannot be resolved, investigate alternate instruments for measuring DO concentrations and justify a recommendation in future reports.

Comment 27

The Permittee's response to NMED's *Disapproval* Comment 42, Item 5 states, "[i]f there is sufficient water present to obtain the readings and fill sample containers for analysis, the field readings are recorded on the forms. However, if a bailer is used to remove modest amounts of water from a well then no readings are taken due to insufficient water. Water quality readings are provided for wells where the data was recorded." In case groundwater recharge is slow in a well after purging, a sampler may allow no more than 24 hours to recharge groundwater in the well; then, measure field parameters and collect samples. In any case, all activities and observations must be recorded accurately in the field forms. Presenting blank forms without explanation or providing inaccurate information is misleading.

Comment 28

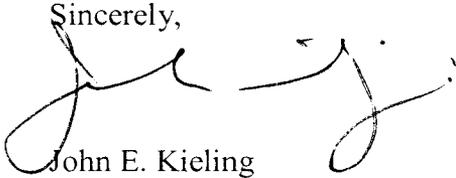
The Permittee's response to NMED's *Disapproval* Comment 43 states, "[t]he analytical report and Form C-141 for the November 2015 wastewater spill has been added to the revised report." The laboratory analytical report for the wastewater was not attached to the Form C-141. Provide a reference (e.g., laboratory report number if it is already included in the appendices) or include the laboratory analytical report for the wastewater as an attachment to the Form C-141 in the revised Report.

The Permittee must address all comments in this *Disapproval* and submit a revised Report. Two bound hard copies and an electronic version must be submitted to NMED. In addition, include a red-line strikeout version in electronic format showing where all revisions to the Report have been made. The revised Report must be accompanied with a response letter that details where revisions have been made, cross-referencing NMED's numbered comments. The revised Report must be submitted to NMED no later than **April 5, 2019**.

Mr. Moore
January 4, 2019
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If you have questions regarding this Disapproval, please contact Michiya Suzuki of my staff at 505-476-6059.

Sincerely,

A handwritten signature in black ink, appearing to read "John E. Kieling". The signature is fluid and cursive, with a large initial "J" and a long horizontal stroke.

John E. Kieling
Chief
Hazardous Waste Bureau

cc: K. Van Horn, NMED HWB
D. Cobrain, NMED HWB
M. Suzuki, NMED HWB
C. Chavez, OCD
L. King, EPA Region 6
B. Moore, WRG

File: Reading File and WRG 2018 File
HWB-WRG-17-007