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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

March 21, 2019

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

RE: DISAPPROVAL
ANNUAL GROUNDWATER MONITORING REPORT
GALLUP REFINERY – 2017
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-18-014

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has reviewed the *Annual Groundwater Monitoring Report: Gallup Refinery - 2017* (Report), dated October 30, 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

In the Executive Summary, *Group A – Wells,* page 3, and Section 6.1.1, *Boundary Wells, BW-1A/1B/1C, BW-2A/2B/2C, BW-3A/3B/3C, BW-4A/4B, and BW-5A/5B/5C,* page 26, the Permittee states, "[l]ow concentrations of toluene and [methyl tert-butyl ether (MTBE)] were detected in samples collected from BW-5B in December 2017. MTBE was detected in the sample collected from BW-5C in December 2017." According to Section 6.1.1, well BW-5B is screened in the Chinle/Alluvium interface while well BW-5C is screened in the Sonsela formation. Similarly, MTBE was detected from the groundwater samples collected from nearby groundwater

monitoring well OW-1 screened across the Sonsela in 2017. The MTBE detections in wells BW-5B, BW-5C, and OW-1 indicate that the MTBE plume is migrating further west. Comment 5 in NMED's *Disapproval Work Plan 2015 Annual Groundwater Report Comments*, dated January 28, 2019 states, "[p]ropose to install a sentinel groundwater monitoring well west of well OW-1 in the revised Work Plan." Although no revision is required to the Report, the Permittee must address the MTBE detection in wells BW-5B and 5C as well as in OW-1. The location of the sentinel wells must be proposed further west of wells BW-5B and 5C and OW-1 and screened across the Chinle/Alluvium interface and within the Sonsela formation. NMED recommends installing nested sentinel wells in three locations 1,500 feet, 2,000 feet and 2,500 feet west of pond EP-9. Submit a work plan that proposes to install additional wells to evaluate for contaminant migration.

Comment 2

In the Executive Summary, *Group A – Wells,* page 3, and Section 6.1.1, *Boundary Wells, BW-1A/1B/1C, BW-2A/2B/2C, BW-3A/3B/3C, BW-4A/4B, and BW-5A/5B/5C,* page 26, the Permittee states that uranium exceeds the standard in samples collected at BW-5B and BW-5C. It should be noted that uranium is not regulated under RCRA as a constituent of concern. No revision required.

Comment 3

In the Executive Summary, *Group A – Wells,* page 3, and Section 6.1.2, *Land Treatment Unit, MW-1, MW-2, MW-4, MW-5, SMW-2, AND SMW-4,* page 27, the Permittee states that chloride and sulfate have been detected above the WQCC standards in SMW-2 since 2011. Comment 8 in NMED's *Disapproval Investigation Work Plan [SMW-2] and [GWM-1] Areas*, dated February 20, 2019 states, "[i]f the OCD Landfarm is determined to be the source of chloride and sulfate in groundwater, propose to submit a work plan to mitigate the issue (e.g., source removal via excavation)." Although no revision is required to this Report, the Permittee must address the exceedances of chloride and sulfate in the response to the February 20, 2019 *Disapproval.*

Comment 4

In the Executive Summary, *Group A – Wells,* page 3, and Section 6.1.2, *Land Treatment Unit, MW-1, MW-2, MW-4, MW-5, SMW-2, and SMW-4,* page 27, the Permittee states, "[diesel range organics] DRO and [gasoline range organics] GRO were detected in SWM-2 above screening levels." The screening levels of DRO and GRO are 0.0452 mg/L and 0.055 mg/L, respectively, in Table 8.3.1. According to the NMED's March 2017 *Soil Screening Guidance for Human Health Risk Assessments* (Guidance), 0.0452 mg/L and 0.055 mg/L are the screening levels for #3/#6 fuel oil and kerosene/jet fuel, respectively. However, since specific sources of hydrocarbon constituents are unknown, the Permittee must compare the DRO and GRO concentrations to the screening level of unknown oil (39.8 ug/L) in the Guidance. Please note that NMED's Guidance has been updated. Reference the updated guidance in future submittals. Revise all applicable sections and tables of the Report accordingly.

Comment 5

In the Executive Summary, page 3, and Section 6.2.2, *Groundwater Monitoring Wells, NAPIS-1, NAPIS-2, NAPIS-3, and KA-3,* page 29, the Permittee states, "[s]eparate phase hydrocarbon

[SPH] was detected in NAPIS-1 in the third and fourth quarters." This is the first time SPH was detected in well NAPIS-1. NMED considers the discovery of SPH in well NAPIS-1 to be a discovery of a release and subject to RCRA Permit Section II.C.2.c. The Permittee should have notified NMED when it was discovered. In the future, if a monitoring well is discovered to contain SPH for the first time, the Permittee must notify NMED and OCD within 24 hours. The thickness of the SPH column in NAPIS-1 during the third and fourth quarters of 2017 is reported as 0.86 and 0.65 feet, respectively. SPH was not detected in either of the New API Separator Leak Detection Units (LDUs) or wells NAPIS-2, NAPIS-3, and KA-3. The source of the SPH is not clear; however, SPH in wells RW-5 and RW-6 may have migrated to well NAPIS-1. If SPH is present in 2018, purge the well completely, and check the well regularly and report to NMED and OCD by email whether SPH returns to the well and if SPH is present, then report the length of time it takes for the SPH to return. Also, check the downgradient wells for the presence of SPH. Report through email regarding the SPH in well NAPIS-1. Furthermore, collect SPH from wells RW-5, RW-6 and NAPIS-1 and compare to see if the SPH originates from the same source.

Comment 6

In the Executive Summary, *Group B – Wells,* page 4, and Section 6.2.3, *Leak Detection Units (LDU), East LDU, West LDU, and Oil Sump LDU,* page 30, the Permittee states, "[b]enzene (all four quarters) and total xylenes (third quarter) were detected in the East LDU at concentration levels above the applicable standard," and "[i]n the West LDU, benzene exceeded applicable standards in all four quarters of 2017." The construction schematic of the NAPIS/LDUs is included in the Permittee's letter titled *API Separator Leak Detection Units,* dated August 5, 2013. The construction schematic indicates that the detection pipe is connected from the secondary containment wall of each bay through the six-inch thick sump-wall to the mid-section of the LDU. The detection pipe appears to be screened or perforated within the six-inch thick sump-wall. The LDUs themselves are not screened. Therefore, when water is present in LDU, the six-inch thick sump-wall may be saturated with water that is stored in the bay that may be leaking through the secondary containment. Since water is detected in the East and West LDUs, both the east and west bays appear to be leaking through the secondary containment wall. Although some parts of the NAPIS were repaired in 2018, the NAPIS must be re-inspected for potential leaks and repaired as necessary. A report that summarizes the results of the inspection and repair of the NAPIS must be submitted to NMED no later than **June 7, 2019**.

Comment 7

In the Executive Summary, *Group B – Wells,* page 4, and Section 6.2.5, *STP1-NW, STP1-SW, OW-59, and OW-60,* page 32, the Permittee discusses the detection of constituents in wells OW-59 and OW-60. The DRO and GRO concentrations exceed the applicable standards in the groundwater samples collected from well OW-59 in 2017. There are no apparent potential sources present upgradient of the well except the contamination associated with North Drainage Ditch. Discuss potential sources of constituents detected in OW-59 in the revised Report. In addition, Comment 7 in NMED's *Disapproval Investigation Work Plan [SMW-2] and [GWM-1] Areas*, dated February 20, 2019 states, "[s]ubmit the investigation report [associated with the installation of wells OW-59 and OW-60] to NMED for review no later than April 5, 2019."

Although no revision is required to the Report, the Permittee must provide the results of the soil sampling and laboratory analyses for borings OW-59 and OW-60 in an investigation report.

Comment 8
In the Executive Summary, *Group C – Wells,* page 5, and Section 6.3.1, *Observation Wells, OW-13, OW-14, OW-29, OW-30, OW-50, OW-52, OW-53, OW-54, OW-55, OW-56,* page 34, the Permittee states, "[l]ow concentrations of MTBE [in the groundwater samples collected from OW-13] continue to be detected at values below the applicable standard." In order to address the issue of MTBE detections in well OW-13, Comment 7 in NMED's *Disapproval Work Plan 2015 Annual Groundwater Report Comments*, dated January 28, 2019 was provided with the direction to install a well screened in the Sonsela formation at a location halfway between wells OW-12 and OW-13. Although no revision is required to the Report, the Permittee must submit the required work plan to propose to investigate the extent of the MTBE plume in the Sonsela formation in response to the January 28, 2019 *Disapproval.*

Comment 9
In the Executive Summary, *Group C – Wells,* page 5, and Section 6.3.1, *Observation Wells, OW-13, OW-14, OW-29, OW-30, OW-50, OW-52, OW-53, OW-54, OW-55, OW-56,* page 34, the Permittee states that the MTBE concentrations in groundwater samples collected from well OW-30 exceeded the applicable standard in 2017. In order to delineate the eastern extent of the MTBE plume, the Permittee proposed to install a monitoring well northeast of OW-30 in the *Work Plan 2015 Annual Groundwater Report Comments,* dated October 2018. No revision to the Report is necessary.

Comment 10
In the Executive Summary, *Group C – Wells,* page 5, and Section 6.3.2, *Observation Wells, OW-57 and OW-58,* page 36, the Permittee states, "[b]enzene concentrations exceeded the applicable standard in both OW-57 and OW-58." The benzene concentrations in the groundwater samples collected from well OW-58 range from 29 mg/L to 38 mg/L in 2017 according to Table 8.13. The benzene concentrations significantly exceeded the screening level of 0.005 mg/L. Comment 31 in NMED's *Disapproval Facility-wide Ground Water Monitoring Work Plans – Updates for 2016, 2017 and 2018,* dated June 5, 2018 states that well OW-58 is appropriately positioned to monitor the SPH plume; however, its screened interval is submerged approximately 12 feet below the water table and submerged well screens are not appropriate to detect SPH. Accordingly, the Permittee submitted a work plan to reinstall well OW-58 on August 24, 2018. NMED issued the *Disapproval Investigation Work Plan OW-58 Twin Well* on October 19, 2018 and directed the Permittee to submit the revised work plan by December 31, 2018. However, the Permittee has not submitted the revised work plan or requested an extension for the submittal date which constitutes noncompliance with Permit Section I.J.12. The revised work plan must be submitted to NMED no later than **April 1, 2019**.

Comment 11
In the Executive Summary, *Group C – Wells,* page 6, and Section 6.3.3, *Recovery Wells, RW-1, RW-2, RW-5, and RW-6,* page 38, the Permittee states, "[n]o samples were collected from RW-5 and RW-6 during the second, third and fourth quarters of 2017 due to the detection of SPH in the

wells." The discovery of SPH in wells RW-5 and RW-6 is subject to RCRA Permit Section II.C.2.c. The Permittee should have notified NMED when SPH was discovered. In the future, if a monitoring well is discovered to contain SPH after being absent for more than one year or for the first time, the Permittee must notify NMED and OCD within 24 hours. The column thickness of SPH in well RW-5 ranged from 6.19 to 9.25 feet and RW-6 from 5.08 to 9.02 feet in 2017. According to Appendix A, *Separate Phase Hydrocarbon Recovery Logs,* the recorded SPH column thickness in 2017 is significantly more compared to the previously recorded thicknesses in the wells. The previous maximum SPH thicknesses were recorded as 1.78 feet in RW-5 in 2006 and 1.38 feet in RW-6 in 2005. In addition, SPH has not been measured in well RW-5 since February 2009 and in RW-6 since November 2011. A sudden decrease in groundwater levels between the first and second quarter of 2017 may have contributed to the resurgence of SPH. However, the significant increase in the current SPH thicknesses in comparison to the previous measurements is not explained by the decrease in groundwater levels alone since historic groundwater levels were recorded at elevations lower than the current levels prior to 2010. The detection of SPH in wells RW-5 and RW-6 suggests a new release. Collect SPH samples from wells RW-5 and RW-6 for hydrocarbon fingerprint analysis to compare to SPH in NAPIS-1, purge the wells completely, and after purging the wells, check the wells regularly and report the rate at which SPH returns to the wells. The Permittee must report the length of time it took for the SPH to return. In addition, in Section 2.7, *Remediation Activities,* page 20, the Permittee states that the change in conditions was evaluated in 2018 and the [recovery] effort will be discussed in the *2018 Annual Ground Water Monitoring Report* as the activities did not occur during the 2017 reporting period. However, since SPH appeared in 2017, the discussion regarding the evaluation of the site conditions and recovery effort is relevant and must be included in the Report. Revise the Report accordingly.

Comment 12

In the Executive Summary, *Group D – Wells,* page 6, the Permittee states, "[t]wo organic constituents were detected at levels below applicable standards in 2017 (bis (2-ethylhexyl) phthalate and di-n-octylphthalate)." However, the bis (2-ethylhexyl) phthalate concentration in well PW-4 exceeded the applicable screening level in 2017. Section 6.4.1, *Process Wells, PW-2, PW-3, and PW-4,* page 39, addresses the exceedance correctly. However, the statement in Executive Summary must be corrected for accuracy. In addition, the laboratory report identified as 1703F34 in Appendix G, *Hall Laboratory Analytical Data*, indicates that benzoic acid and acetone were also detected in the groundwater sample collected from well PW-4 in 2017. Include the discussions for all detected constituents in the revised Report.

Comment 13

In the Executive Summary, *Group D – Wells,* page 6, and Section 6.4.2, *Observation Wells, OW-1 and OW-10,* page 41, the Permittee states, "[l]ow concentrations of cations were detected in OW-1 throughout 2017 at concentration levels below the applicable standard. OW-10 had exceedances of chloride in all of 2017." The discussion here is related to anions, rather than cations. Correct the typographical error in the revised Report.

Comment 14
In the Executive Summary, *Additional Sites Monitored,* page 7, and Section 6.6.1, *Evaporation Ponds EP-1 through EP-12B,* page 45, the Permittee states, "[b]enzene was detected above the applicable standard in evaporation ponds EP- 2 and EP-12B in 2017. Toluene, ethylbenzene, and total xylenes were detected at concentration levels below applicable standards in evaporation ponds EP-2, EP- 3, EP-4 and EP-12B." The benzene, DRO and GRO concentrations in the wastewater samples collected from the outlet of pond STP-1 (inlet of pond EP-2) also exceeded the applicable standards in 2017. The wastewater treatment system is underperforming. Benzene concentrations detected in wastewater treatment samples collected from downstream of the carbon canister system were less than the hazardous characteristic level of 0.5 mg/L; however, it appears that the aerators in STP-1 are not effectively treating the benzene that reaches STP-1. The wastewater from the outlet of pond STP-1 must not contain organic contaminant concentrations exceeding the applicable standards. STP-1 should have sufficient aerators running to remove VOCs. Benzene should not be present in the evaporation ponds. Submit a separate letter to explain why benzene is not being effectively treated in STP-1. In addition, explain why the benzene concentrations in the wastewater sample collected from pond EP-12B also exceeded the applicable standard. Furthermore, provide information regarding the flow path of wastewater from pond EP-2 through the last evaporation ponds in the revised Report as required by Comment 19 in NMED's *Disapproval 2015 Revised Annual Groundwater Monitoring Report*, dated January 4, 2019.

Comment 15
In the Executive Summary, *Additional Sites Monitored,* page 7, and Section 6.6.1, *Evaporation Ponds EP-1 through EP-12B,* page 45, the Permittee states that bromomethane was detected in ponds EP-2 and EP-12B above the NMED Tap Water standard in 2017. Comment 26 in NMED's *Disapproval 2016 Annual Groundwater Monitoring Report,* dated June 4, 2018 states, "[w]hen bromomethane is detected in surface water bodies, pesticides may have been used extensively nearby. Collect water samples from ponds EP-3, EP-12A and EP-12B for pesticides analysis using EPA Method 8081A during the 2018 sampling events." The Permittee's response to the comments dated September 30, 2018 states, "[s]amples from ponds EP-3, EP-12A and EP-12B will be analyzed for pesticides using EPA Method 8081A during the next sampling event and each sampling event at the Evaporation Ponds thereafter for the remainder of 2018." Since bromomethane was also detected in the wastewater sample collected from pond EP-2, the Permittee must also collect wastewater sample from pond EP-2 for pesticide analysis using EPA Method 8081A.

Comment 16
In the Executive Summary, *Additional Sites Monitored,* page 7, and Section 6.6.5, *Outfall STP-1 to EP-2 Inlet,* page 47, the Permittee states, "[biological oxygen demand (BOD)] and [chemical oxygen demand (COD)] concentrations exceeded the applicable standards in 2017." The BOD concentrations ranged from 470 to 1,400 mg/L and the COD concentrations ranged from 1,100 to 2,100 mg/L in the wastewater samples collected from outlet of STP-1 in 2017. These concentrations are similar to those in the samples collected from pond EP-2. The e-coli concentrations in wastewater samples collected from pond EP-2 exceeded 24,196 CFU/100 ml in 2017. The Permittee previously explained that the elevated e-coli concentrations in the

evaporation ponds were possibly caused by feces from birds. Evaluate whether the e-coli concentrations in wastewater from STP-1 outlet are similar to those in wastewater from pond EP-2. The aerator in STP-1 may not be providing sufficient aeration to treat sewage water. Propose to collect a wastewater sample from STP-1 outlet for e-coli analysis during the 2019 sampling events in the revised Report.

Comment 17

In Section 1.2, *Background Information,* page 11, the Permittee states, "[t]he waste water effluent flows into T-27, T-28 and into T-35 (which works in parallel to T-27 and T-28) and into the NAPIS which provides the first stage oil-water separation where the removal of free oil is separated from waste water by gravity." From the Permittee's description, it is not clear how wastewater is conveyed into tanks T-27, T-28 and T-35 from the refinery. Provide a figure showing the location of pipes connecting from the refinery to the wastewater storage tanks (T-27, T-28 and T-35) in the revised Report. Also, explain whether the pipe is below ground and if so, how deep the pipe is buried in the revised Report. In addition, the Permittee states, "[t]he clarified water [from the NAPIS] is routed to the waste water treatment plant (WWTP) Dissolved Gas Flotation (DGF) system which provides the second stage oil-water separation process." Provide a figure showing the location of the DGF system. In addition, provide a process schematic of the wastewater treatment system including NAPIS, DGF, carbon canister system and STP-1 in the revised Report. Furthermore, the Permittee states, "[t]he DGF process involves the pressurization of waste water in the presence of air or nitrogen, creating a super-saturated solution called coagulates that are carried to the surface. The float is removed to disposal by mechanical float scrapers and the effluent is recycled back to the flotation chamber." According to Table 8.16, the total dissolved solids (TDS) concentrations in outlet of STP-1 consistently exceed the applicable standard. TDS level is often proportional to the level of total suspended solids (TSS). In order to evaluate effectiveness of the DGF system, propose to collect wastewater samples from the STP-1 outlet for TSS analysis during the 2019 sampling events in the revised Report.

Comment 18

In Section 1.2, *Background Information,* page 11, the Permittee states, "[f]low rates up to 500 [gallons per minute (GPM)] can now be achieved through the carbon system. The waste water that passes through the carbon canisters discharges into the sanitary treatment pond (STP-1). STP-1 has two bays, north and south and each bay is equipped with five aerators." Since the concentrations of organic constituents exceeded in wastewater samples collected from the outlet of STP-1, the wastewater treatment system may be underperforming. The benzene concentrations in the effluent samples collected from the carbon canister system have been recorded below the characteristic hazardous waste limit of 0.5 mg/L and the carbon canister system appears to be capable of treating the wastewater stream; however, STP-1 may be underperforming because of the excessive influent flowrate or insufficient aeration. Wastewater that was characteristically hazardous for benzene has been discharged to STP-1 in the past. Explain whether all 10 aerators are operating at all times and demonstrate that STP-1 is theoretically capable of reducing benzene from 0.5 mg/L to 0.005 mg/L at a flowrate of 500 GPM in a response letter.

Comment 19
In Section 2.2, *Sampling Method and Procedures,* page 17, the Permittee states, "[f]ield water quality measurements must stabilize for a minimum of three consecutive readings taken at 2 to 5-minute intervals, within the following limits before purging will be discontinued and sampling may begin: dissolved oxygen (DO) (10%), specific conductance (10%), temperature (10%), and pH (10%)." The sampling protocol was not always followed according to Appendix B, *Field Inspection Logs.* For example, during the first quarter of the 2017 sampling event, groundwater samples were collected from well MKTF-39 before the water quality parameters were stabilized within the criteria. Only two consecutive readings were collected. The DO readings were recorded as 108.4% [sic] and 14.5% [sic], equivalent to a 645% difference. The specific conductance readings were recorded as 205 uS, mS [sic] and 3,916 uS, mS [sic], equivalent to a 1,810% difference. The temperature readings were recorded as 20.68 °C and 14.15 °C, equivalent to a 46% difference. Finally, the pH readings were recorded as 7.89 and 7.08, equivalent to a 11.4% difference. None of the readings were within the stabilization criteria. The Permittee must instruct field personnel to follow the sampling protocol in future sampling events and provide an explanation for why the sampling protocol was not followed during the 2017 sampling events in the revised Report. In addition, provide a table summarizing final (stabilized readings of all groundwater parameters (e.g., DO, pH) as required by Comment 25 in NMED's *Disapproval 2015 Revised Annual Groundwater Monitoring Report,* dated January 4, 2019.

Comment 20
In Section 2.4, *Collection of Surface Water Samples,* page 19, the Permittee states, "[a]t the evaporation ponds, grab samples were collected near the inlets (pond edge). This location was noted in the field notebooks." The description of the locations where grab samples were collected is not included in the field notes in Appendix B. Include the referenced field notebooks in the revised Report or otherwise identify the sample locations.

Comment 21
In Section 5, *Groundwater Elevations,* page 24, the Permittee did not include a discussion regarding the groundwater elevation and flow direction shown in Figure 10, *Alluvium/Chinle Gp Interface Water Elevation Map.* Include the discussion in the revised Report. In addition, although it is appropriate to include a map that depicts groundwater flow direction over the entire facility (Figure 10), parts of contour lines are subjectively interpreted or extrapolated because monitoring wells are either far apart or not present at all in some areas. In order to indicate that some parts of contour lines are subjectively interpreted, distinguish them with dotted lines. Revise Figure 10 and all applicable figures accordingly. Furthermore, the groundwater flow direction at the northeastern facility is generally depicted from south to north while the groundwater flow direction at the northwestern facility is generally depicted from east to west. Although the revision in flow directions shown in Figure 10 is not required, note that the flow directions as shown may not be accurate because groundwater monitoring wells are too widely spaced in the area.

Comment 22
In Section 6, *Groundwater Monitoring Results,* page 25, the Permittee states, "[d]ue to requirements for field preservation of samples, some samples have the results for nitrite and nitrate reported as a single value of nitrogen," and "[m]odifications to the field sampling program have been made to allow reporting of both nitrate and nitrite in future reports." Comment 11 in NMED's *Disapproval 2015 Annual Groundwater Monitoring Report,* dated January 31, 2018 directs the Permittee to conduct separate nitrate and nitrite analyses in groundwater samples and report the concentrations separately. The Permittee did not include the modifications that allowed separate reporting of nitrate and nitrite in the Report. Include the discussion regarding the modifications in the revised Report, rather than in the future reports.

Comment 23
In Section 6.1.1, *Boundary Wells, BW-1A/1B/1C, BW-2A/2B/2C, BW-3A/3B/3C, BW-4A/4B, and BW-5A/5B/5C* , page 25, the Permittee states, "BW-1A, BW-2A, BW-3A, BW-4A, and BW-5A are screened within the Upper Sand stratigraphic unit (Figure 12); BW-1B, BW-2B, BW-3B, BW-4B and BW-5B are screened in the Chinle/Alluvium Interface stratigraphic unit (Figure 10); and BW-1C, BW-2C, BW-3C, and BW-5C are screened within the Sonsela stratigraphic unit (Figure 9)." Figure 9, *Sonsela Water Elevation Map – 2017*, does not present the groundwater elevations measured in each well. Revise the figure to present the groundwater elevations in the revised Report.

Comment 24
In Section 6.1.1, *Boundary Wells, BW-1A/1B/1C, BW-2A/2B/2C, BW-3A/3B/3C, BW-4A/4B, and BW-5A/5B/5C,* page 25, the Permittee states, "[t]he boundary wells are sampled on an annual basis and evaluated for the following analytes: 8260B plus MTBE, gasoline range organics, (GRO), diesel range organics (DRO) and motor oil range organics (MRO), major cations/anions, and WQCC metals (total and dissolved)." EPA Method 8260B includes the analysis of MTBE. Revise the statement for accuracy. Similarly, in Section 6.1.2, *Land Treatment Unit, MW-1, MW-2, MW-4, MW-5, SMW-2, and SMW-4,* page 26, the Permittee states, "[a]nnual samples were analyzed for the following analytes: 8260B plus MTBE, DRO, GRO, MRO, major cations/anions, WQCC metals (total and dissolved), cyanide, VOCs, and SVOCs." Revise the statement for accuracy throughout the revised Report.

Comment 25
In Section 6.2.1, *Groundwater Monitoring Boundary Wells, GWM-1. GWM-2, and GWM-3,* page 28, the Permittee states, "SPH was found to be present in GMW-1 during all four quarterly gauging events in 2017 and thus no groundwater samples were collected for chemical analysis." If SPH is still present, purge the well completely. After purging the well, check the well regularly and report whether SPH returns to the well and if SPH is present, then report the length of time it took for the SPH to return. Section 7.2, *Group B – Groundwater Monitoring, Recommendations,* page 49, also discusses inspection of GWM-1. Provide the information by email with the data from NAPIS-1 and the RW-wells as well as include the information in the next annual report.

Comment 26
In Section 6.3.1, *Observation Wells, OW-13, OW-14, OW-29, OW-30, OW-50, OW-52, OW-53, OW-54, OW-55, and OW-56,* page 35, the Permittee states, "[n]o organic compounds detected were exceeding applicable standards in OW-29 and OW-30 in all of 2017." The concentrations of various organic compounds (e.g., MTBE) exceeded applicable screening levels. Remove the statement from the revised Report.

Comment 27
In Section 6.3.1, *Observation Wells, OW-13, OW-14, OW-29, OW-30, OW-50, OW-52, OW-53, OW-54, OW-55, and OW-56,* page 35, the Permittee states, "a low concentration of MTBE was detected in both wells [OW-50 and OW-52] in [the] 2016 and 2017 annual groundwater sampling events (Tables 8.5 and 8.5.1)." According to Table 8.5, the MTBE concentrations in the samples collected from wells OW-50 and OW-52 are consistently increasing. MTBE plume appears to be migrating in all directions including north of well OW-52. However, there is no sentinel monitoring well north of OW-52 to define the northern extent of the MTBE plume. Submit a work plan to install a sentinel well for MTBE plume north of well OW-52.

Comment 28
In Section 6.3.1, *Observation Wells, OW-13, OW-14, OW-29, OW-30, OW-50, OW-52, OW-53, OW-54, OW-55, and OW-56,* page 35, the Permittee states, "[i]n OW-56 there were no detectable concentrations of benzene and MTBE that exceeded the applicable standards." However, according to the *Investigation Report North Drainage Ditch and OW-29 and OW-30 Areas,* dated August 2018, temporary well NDD-11 was installed approximately 600 feet northwest of well OW-56 along the Roger's Ditch; the benzene concentration in a groundwater sample collected from the temporary well was recorded as 8.2 mg/L, exceeding the benzene screening level of 0.005 mg/L. Since well OW-56 has not contained benzene and is located upgradient from temporary well NDD-11, the source of contaminants detected in temporary well NDD-11 may not be from a directly upgradient source. The detected benzene in temporary well NDD-11 may have originated from the vicinity of wells RW-5 and RW-6, where SPH was detected in 2017. SPH may be migrating from the vicinity of wells RW-5 and RW-6. Investigate the extent of the SPH plume north of wells RW-5 and RW-6. Submit a work plan to install a well north of wells RW-5 and RW-6 in the vicinity of well OW-12, screened in the Chinle/Alluvium interface, to delineate the extent of SPH plume.

Comment 29
In Section 6.3.3, *Recovery Wells, RW-1, RW-2, RW-5, and RW-6,* page 37, the Permittee states, "[q]uarterly inspections for the RW wells include product recovery of SPH using disposable bailers in RW-5 and RW-6, and a portable 2-inch bladder pump for RW-1." Appendix A, *Separate Phase Hydrocarbon Recovery Logs,* indicates that SPH was recovered with a bailer from well RW-1 during the fourth quarter of 2017. Provide an explanation for the variance in the revised Report.

Comment 30
In Section 6.3.3, *Recovery Wells, RW-1, RW-2, RW-5, and RW-6,* page 39, the Permittee states, "[t]he recovery well was never completely purged dry due to suction of the submersible pump

being at the top, which left approximately 24" of product/water level remaining in RW-1." The pump is presumably a 24-inch top-loading submersible pump and placed at the bottom of the well. Well RW-1 is screened from 25 to 40 feet bgs; therefore, the SPH/groundwater interface has brought to the depth of 38 feet bgs by continuous pumping, where SPH has not been introduced by a natural fluctuation of groundwater elevations. This is an issue because SPH may potentially have contaminated the soils where SPH was initially absent. In order to prevent SPH from potentially contaminating clean deep soils and groundwater via pumping, the position of pump inlet must not be set lower than the lowest groundwater elevation among historical groundwater elevation data. Propose to change the depth of the pump inlet in the revised Report.

Comment 31

In Section 6.4.1, *Process Wells, PW-2, PW-3, and PW-4,* page 40, the Permittee states, "[t]wo semi-volatile organic compounds [(SVOCs)] were reported in concentrations above the detection limits (Table 8.6.3) [in the PW wells]." The PW wells were advanced to the depth of approximately 1,000 feet bgs and within the San Andres/Yeso aquifer. Explain potential causes of the SVOC detections from the groundwater samples collected from the PW wells (e.g., materials used during sampling, well construction). Provide the discussion in the revised Report.

Comment 32

Section 6.4.2, *Observation Wells, OW-1 and OW-10*, page 41, discusses detection of 1,2-dichloroethane (EDC) in the groundwater samples collected from wells OW-1 and OW-10. The Permittee appropriately conducted 1,2-dibromoethane (EDB) analysis using EPA Method 8011 for the groundwater samples collected from the wells. EDB was not detected in either well in 2017. Since the detection of EDC raises a question for the presence of EDB, include the discussion of EDB analytical results in the revised Report. In addition, if EDC was newly detected in groundwater samples collected from wells during 2017 and EDB analysis was not yet proposed for the wells in the *2018 Facility-wide Groundwater Work Plan*, propose to conduct EDB analysis using EPA Method 8011 in the *2019 Facility-wide Groundwater Work Plan.*

Comment 33

In Section 6.5, *Constituent Levels in Group E Monitoring Wells,* page 42, the Permittee states, "[w]ells that had a hydrocarbon layer were not sampled." Identify the MKTF wells that contained SPH during the 2017 monitoring events. In addition, provide the criterion (e.g., SPH column thickness) for whether or not groundwater samples are collected from the wells. Revise the Report accordingly.

Comment 34

In Section 6.5, *Constituent Levels in Group E Monitoring Wells,* page 42, the Permittee states, "[t]he highest benzene concentration (24 mg/L) during 2017 occurred in well MKTF-15 during the fourth quarter (Table 8.17)." According to Table 8.17, the highest benzene concentration in the groundwater sample collected from well MKTF-15 was detected during the first quarter of 2017. Revise the Report accordingly.

Comment 35
In Section 6.5, *Constituent Levels in Group E Monitoring Wells,* page 43, the Permittee states, "[t]otal xylenes concentrations exceeded the standard of 0.62 mg/L in the following wells: MKTF-4, MKTF-10, MKTF-11, MKTF-13, MKTF-15, MKTF-16, MKTF-19, MKTF-20, MKTF-21, MKTF-23, and MKTF-37." According to Table 8.17, groundwater samples were not collected from well MKTF-23 in 2017. Revise the Report accordingly.

Comment 36
In Section 6.5, *Constituent Levels in Group E Monitoring Wells,* page 44, the Permittee states, "[s]even semi-volatile organic compounds were detected that exceeded applicable standards in 2017," and "[e]leven volatile organic compounds were detected in the MKTF wells in 2017 at concentration levels above the applicable standards." The compounds detected above the standards are listed in the Report; however, the designation of wells where the exceedances were detected is not identified. Identify the wells where these exceedances were detected in the revised Report.

Comment 37
Section 6.6.1, *Evaporation Ponds EP-1 through EP-12B*, page 45 does not include discussion regarding the exceedance of e-coli concentrations in wastewater samples collected from ponds EP-2, EP-3, EP-4, and EP-12B. Include the discussion in the revised Report.

Comment 38
In Section 6.7.5, *Outfall STP1 to EP-2 Inlet,* page 46, the Permittee states, "STP-1 effluent now flows into the northeast corner of EP-2." The e-coli concentrations in wastewater samples collected from pond EP-2 exceeded the applicable standard. Propose to collect wastewater samples from the STP-1 effluent and influent(s) for e-coli analysis in the revised Report.

Comment 39
In Section 7.2, *Group B – Groundwater Monitoring, Recommendation,* page 49, the Permittee states, "[a]n investigation of the source of SPH that was identified in NAPIS-1 is on-going." Submit a work plan before conducting any investigations regarding the detection of SPH in well NAPIS-1. Any investigation work without an approval from NMED is considered conducted at risk which could result in additional cost to the Permittee if the work is determined to be incomplete or otherwise unacceptable to NMED.

Comment 40
In Section 7.3, *Group C – Groundwater Monitoring, Recommendation,* page 51, the Permittee states, "SPH appeared in RW-5 and RW-6, after not being present for a number of years, suggesting a potential new source of SPH in the tank farm." Discuss whether tanks and lines have been recently tested and inspected, the dates of the tests and inspections, and associated results in the revised Report. In the email response to NMED Comment 11, discuss whether the fingerprint analysis identified potential sources within the tank farm.

Comment 41
In Section 7.4, *Group D – Groundwater Monitoring,* page 51, the Permittee states, "[f]our organic compounds were detected in 2017: 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane (EDC) and cis-1,2-DCE, all at concentration levels below the applicable standards [in groundwater samples collected from well OW-10 which is screened within the Sonsela]." Chlorinated solvents were used at the facility and are also present in wells screened in the Chinle/Alluvium. 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 anion concentrations). Include the discussion in the revised Report.

Comment 42
In Section 7.5, *Group E – Groundwater Monitoring, Recommendations,* page 52, the Permittee states, "[i]t is recommended to reduce the monitoring frequency in 2019, as many of the analytical results indicate little change, such that continued quarterly monitoring is not warranted at all MKTF wells." There are on-going investigations in the vicinity of MKTF wells and the Hydrocarbon Seep Investigation is on-going, and activities associated with the investigations will likely affect groundwater conditions in the vicinity of MKTF wells. Therefore, NMED does not concur with the recommendation for reducing the monitoring frequency. The Permittee must continue to conduct quarterly monitoring and sampling of all MKTF wells in 2019. Revise the Report accordingly.

Comment 43
In Section 9, *Well Data DTW/DTB Measurements,* page 54, the Permittee states, "[t]he Well Data Table is attached as Section 9.1." Although Tables 9.1 and 9.2 present the 2017 DTB/DTW measurement data are included in Section 9, the referenced Section 9.1 is not included in the Report. Revise the Report as necessary.

Comment 44
Table 9.1, *2017 DTB/DTW Measurements,* indicates that a decrease of groundwater levels was observed in wells RW-5 and RW-6 while an increase was observed in wells RW-1, RW-2, OW-58. DTW in wells RW-5 and RW-6 was not measured below 30 feet bgs between 2013 and the second quarter of 2017. Provide an explanation for the sudden decrease of groundwater level in wells RW-5 and RW-6 (e.g., if there are any site activities that may have affected the groundwater levels in the vicinity), if known.

Comment 45
Table 9.1, *2017 DTB/DTW Measurements,* and Table 9.2, *2017 DTB/DTW Measurements for Wells MKTF-01 through MKTF-45,* present the 2017 DTW data. However, in order to evaluate present data relative to historic trends, it is essential to examine previous data. Revise the table to include the data from the three previous monitoring events, where applicable, in accordance with RCRA Permit Section IV.L.4.K. Revise the Report accordingly.

Comment 46
Figure 11, *Groundwater Elevation vs. Time – 2017* does not include the ground surface or SPH elevations. The charts with ground surface, groundwater and SPH elevations 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 as also required by Comment 23 in NMED's *Disapproval 2015 Revised Annual Groundwater Monitoring Report*, dated January 4, 2019. Revise the Report accordingly.

Comment 47
In Appendix A, *Separate Phase Hydrocarbon Recovery Logs,* the estimated recovery volume of SPH from well RW-6 is recorded as 34 gallons in 2013; however, SPH was not detected in well RW-6 during the 2013 gauging events. Resolve the discrepancy in the revised Report.

Comment 48
In Appendix B, *Field Inspection Logs,* the unit of dissolved oxygen (DO) in the sampling forms is still indicated as "%". Although the Permittee previously provided a statement explaining that the DO reporting unit (%) was intended to be milligrams per liter (mg/L), the sampling forms were not corrected in the Report. Previously, similar comments were provided to correct the DO units in the sampling forms. If making the correction on each field form is impracticable, insert a note for the corrected DO unit in Appendix B of the revised Report. All future sampling forms must be corrected to report DO in mg/L.

Comment 49
In Appendix B, *Field Inspection Logs,* the reported DO concentrations often significantly exceed the solubility limit of oxygen at the given temperature. For example, the DO concentrations in well STP1-NW were reported from 101.4 [mg/L] to 113.8 [mg/L] at an average temperature of approximately 25 °C. The solubility limit of oxygen in fresh water at a temperature of 25 °C under the atmospheric pressure is approximately 8 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 procedure for the instrument must be described in the appropriate section of the revised Report. If the issue cannot be resolved, investigate alternate instruments for measuring DO concentrations. Note any changes to the instrument used in future reports.

Comment 50
In Appendix B, *Field Inspection Logs,* the conductivity readings have two different units, uS and mS. Correct the unit of conductivity readings in the revised Report. It should be noted that the SI unit of conductivity is siemens per meter (S/m) or micro or milli siemens per meter (uS/m or mS/m).

The Permittee must address all comments in this Disapproval and submit a revised Report. Two bound hard copies and electronic versions 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 **May 7, 2019**.

An inspection and repair report regarding the NAPIS required by Comment 6 must be submitted to NMED no later than **June 7, 2019**.

A revised *Work Plan OW-58 Twin Well* required by Comment 10 must be submitted to NMED no later than **April 1, 2019**.

A letter providing an explanation for why benzene is not effectively treated in STP-1 required by Comment 14 must be submitted to NMED no later than **May 7, 2019**.

A work plan required by Comments 27 and 28 must be submitted to NMED no later than **August 30, 2019**.

A work plan to address Comment 39 must be submitted to NMED no later than **May 31, 2019**.

An email response regarding SPH in NAPIS-1 (Comment 5), RW-wells (Comments 11 and 40), and GWM-1 (Comment 25) must be submitted to NMED no later than **May 7, 2019**.

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

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: K. Van Horn, NMED HWB
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