



State of New Mexico
ENVIRONMENT DEPARTMENT

ENTERED



Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6313
Phone (505) 476-6000 Fax (505) 476-6030
www.env.nm.gov

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lieutenant Governor

BUTCH TONGATE
Cabinet Secretary
J. C. BORREGO
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

January 31, 2018

Mr. William Bailey
Environmental Supervisor
Western Refining, Southwest Inc., Gallup Refinery
92 Giant Crossing Road
Gallup, New Mexico 87301

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

Dear Mr. Bailey:

The New Mexico Environment Department (NMED) has reviewed the *Annual Groundwater Monitoring Report: Gallup Refinery - 2015* (Report), dated August 2016, submitted on behalf of Western Refining Southwest Inc., Gallup Refinery (the Permittee). NMED hereby issues this Disapproval based upon deficiencies found upon review. The Permittee must address the following comments provided by both NMED and the New Mexico Energy Minerals and Natural Resources Department Oil Conservation Division (EMNRD) Oil Conservation Division (OCD):

Comment 1

The Report was written and submitted before receipt of NMED's comments regarding the 2014 Report. The Permittee must revise the Report to address NMED's comments regarding the 2014 Report (see NMED correspondence dated June 20, 2016 and June 1, 2017), as many of the

comments from the 2014 Report carry over to the 2015 Report. Revise the Report to address NMED's previous comments.

Comment 2

The Permittee included a red-line strikeout version with the Report. A red-line strikeout version is only required to be submitted with a *revised* document; however, the Report was a first-time submittal. Generally, when NMED disapproves a document, it must be re-submitted as a revised document with a red-line strikeout version that illustrates where all changes to text, tables and figures were made to aid in review of the revised document. When the revised Report is submitted pursuant to this correspondence, the Permittee must submit a red-line strikeout of the revisions along with the revised Report.

Comment 3

The Permittee has been including an 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. Include this change in the next updated Facility-Wide Groundwater Monitoring Work Plan. No revision to the Report is necessary.

Comment 4

In Section 6, *Groundwater Monitoring Results*, page 26, 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. In these instances, the value is conservatively listed for both nitrite and nitrate and a comparison is made between the reported concentration and the regulatory standards for both nitrite and nitrate. This may result in false indication of nitrite exceeding the regulatory standard.” The Permittee must elaborate why requirements for field preservation hinder separate analysis of nitrite and nitrate. Actual nitrate and nitrite concentrations provide valuable information regarding to evaluate groundwater conditions. Investigate the possibility of using alternative methods to obtain separate nitrate and nitrite concentrations (e.g., colorimeters), if applicable. Revise the Report to provide further discussion regarding the field methods and the reasons why nitrate and nitrite cannot be reported separately.

Comment 5

Although Diesel Range Organics (DRO), Gasoline Range Organics (GRO) and/or Motor Oil Range Organics (MRO) concentrations are compared with the screening levels to evaluate exceedances throughout the Report (Sections 6.1.2, 6.2.1, 6.2.2, 6.2.3, 6.6, and 6.7.5), all corresponding tables (Tables 8.3.1, 8.4.1, 8.5.1, 8.6, 8.15.1 and 8.18) indicate that these standards are not established (NE). Revise the Report to address the discrepancy. The groundwater standards referenced are Water Quality Control Commission (WQCC) standards, according to the Permittee's statement in Section 6.2.1, page 30; however, NMED is not aware of a Total Petroleum Hydrocarbon (TPH), DRO or GRO standard in the WQCC regulations. Provide the specific reference for the standards (e.g., NMAC title, chapter, part, section and

subsection numbers). NMED's 2015 Risk Assessment Guidance for Investigations and Remediation did not contain TPH groundwater standards; however, the updated 2017 Guidance includes TPH standards in Table 6-4 (page 95). In the response letter, acknowledge that TPH groundwater standards are available in the 2017 Guidance and evaluate the TPH data in accordance with the standards in the 2017 Report.

Comment 6

There are multiple issues in Section 6.1.1, *Boundary Wells: BW-1A/1B/1C, BW-2A/2B/2C, BW-3A/3B/3C*, page 27:

1. The Permittee states, "[l]ow concentrations of bromide were detected in BW-2A, BW-2B, BW-2C, and BW-3B." Bromide also was detected in the sample collected from well BW-3C according to the Table 8.1.1 (General Chemistry Analytical Result Summary) in 2015. Revise the Report to include this detection in the discussion.
2. The Permittee states, "[c]hromium was previously detected in BW-1C (2012) and cadmium in BW-2C (2012)." These metals were not only detected but also detected above the standards from these wells. Revise the Report for clarification.
3. The Permittee states, "[n]o dissolved metals analyzed exceeded applicable standards; however, low concentrations of barium, iron, lead, and manganese were detected in most of the wells (Table 8.1.3)." Low concentrations of arsenic, uranium, and zinc also were detected according to Table 8.1.3 (Dissolved Metals Analytical Result Summary). Revise the Report to include these detections.
4. Elevated fluoride levels relative to the standard have been observed in most of the BW wells. Provide an explanation for the detections in the revised Report.

Comment 7

There are two errors in Section 6.1.2, *Land Treatment Unit: MW-1, MW-2, MW-4, MW-5, SMW-2, SMW-4*, page 28:

1. There is a typographical error on the sampling date of SMW-2 (8/17/17). Revise the Report to correct the date.
2. The Permittee states, "[l]ow concentrations of MTBE, not exceeding applicable standards (0.0.143 mg/L), have historically been detected in SMW-2 (Table 8.3)." There is a typographical error in the reported value (0.0.143 mg/L). Revise the Report accordingly. The correct value is 0.143 mg/L according to Table 8.3.

Comment 8

There are multiple issues in Section 6.2.1, *Groundwater Monitoring Wells: GMW-1, GMW-2, GMW-3*, page 30:

1. The Permittee states, "[t]he highest concentration of benzene (0.012 mg/L) for 2014 was recorded in the fourth quarter." The benzene concentration of 0.012 mg/L was also

detected in the first quarter of 2010, and the second quarter of 2015. Revise the Report to address the other detections.

2. The Permittee states, “[b]romide concentrations have consistently been detected in GWM-1 since 2006.” The analytical result for bromide is not included in Table 8.4.1 (General Chemistry and DRO/GRO Analytical Result Summary). Revise the Report to include the bromide detection.
3. The Permittee states, “[l]ow concentrations of total chromium and zinc were detected during quarter three of 2015.” The total chromium concentration was detected during the second quarter of 2015 and the total zinc concentration was detected during the first, second and third quarters of 2015. Revise the Report to address the detections.
4. The Permittee states, “[c]oncentrations of VOCs and SVOCs detected above the applicable standards in the third quarter 2015 include naphthalene, 1-methyl naphthalene, benz(a)anthracene, benzo(a)pyrene, chrysene, fluorene, 1-methyl naphthalene, 2-methyl naphthalene, phenanthrene, and pyrene.” There is a spelling error (naphthalene). Revise the Report accordingly.
5. According to Table 8.4.4 (Volatile and Semi-Volatile Organic Compound Analytical Result Summary), the 2-methyl naphthalene concentration exceeded the standard but the value was not highlighted to indicate the exceedance. Revise the Report accordingly.
6. According to Table 8.4.4, the 1,2-dichloroethane (EDC) concentration in the sample collected from well GMW-1 was highlighted to indicate an exceedance during the August 2015 sampling event although it did not exceed the standard value of 0.005 mg/L. Revise the Report for accuracy.

Comment 9

In Section 6.2.2, *Groundwater Monitoring Wells: NAPIS-1, NAPIS-2, NAPIS-3, and KA-3*, page 31, the Permittee states, “[w]hen applicable, standing water is removed from the vault of the three sub-surface wells prior to opening and sampling each well. The standing water is placed into a container for proper disposal.” The Permittee must ensure that surface water is prevented from entering the wells and maintain the well vault seals so that no water enters the vault.

Comment 10

Section 6.2.2, pages 32 and 33:

1. The Permittee states, “[l]ow concentrations of fluoride, chloride, nitrite, nitrate, and sulfate were detected in NAPIS-1 in 2015 (Table 8.5.1).” The nitrite concentrations have consistently exceeded the standard throughout 2015. Revise the Report to address the exceedance.
2. The Permittee states, “[c]hloride, nitrite and nitrate concentrations in NAPIS-3 exceeded applicable standards (250 mg/L, 10 mg/L and 10 mg/L, respectively) during most of 2015 and have historically exceeded these standards since 2008.” The standard for nitrite is 1 mg/L rather than 10 mg/L according to the EPA MCLs (40 CFR 141.62). Revise the Report for accuracy.

3. The Permittee states, “[i]n NAPIS-3, total and dissolved uranium and total iron exceeded applicable standards during 2015 (Tables 8.5.2 and 8.5.3).” The dissolved iron concentration did not exceed the standard in the sample collected from well NAPIS-3 during 2015 according to Table 8.5.3 (Dissolved Metals Analytical Result Summary). On the other hand, the total manganese concentration exceeded the standard in the sample collected from well NAPIS-3 during the first quarter of 2015. The exceedance was not stated in the Report. Revise the Report accordingly.
4. The Permittee states, “[c]oncentrations of 1-methyl naphthalene (0.0061 mg/L) and naphthalene (0.0033 mg/L) exceeded applicable standards (0.0011 mg/L and 0.00165 mg/L, respectively) in NAPIS-2 during 2015.” These values were not highlighted to indicate the exceedances in Table 8.5.4 (Volatile and Semi - Volatile Organic Compound Analytical Result Summary). Revise the Report to indicate the exceedances.

Comment 11

Although identical values of nitrate and nitrite concentrations are reported separately in most analytical tables, Table 8.9.1 reports the nitrate and nitrite concentrations together as one value “nitrate + nitrite as N”. The method used by the Permittee to quantify the nitrate and nitrite concentrations is not acceptable. For all future monitoring, the method must be revised to provide actual and separate nitrate and nitrite concentrations. See Comment 4 above.

Comment 12

In Section 6.2.3, *Leak Detection Units (LDU): East LDU, Oil Sump LDU, West LDU*, page 33, the Permittee states, “[t]he LDUs were sampled for the following analytes in 2015: BTEX, MTBE, DRO, GRO, MRO, WQCC total and dissolved metals, and VOCs. Oil Sump LDU was dry all four quarters and therefore not sampled. There was not enough water in West LDU to collect a sample during the second quarter 2015.” The fluid collected in LDUs is the unprocessed water leaking from the New American Petroleum Institute Separator (NAPIS). Although the fluid has been analyzed for various contaminants and compared with the standards according to OCD’s directive, the problem has not been resolved. The sources of the leaks must be identified and repaired in the NAPIS. Submit a work plan that includes a schedule, to ensure this is completed in a timely manner. Alternatively, the Permittee may provide a discussion of recent repairs conducted to address the leaks in a separate letter report.

Comment 13

There are multiple issues in Section 6.2.3, pages 33 and 34:

1. The Permittee states, “[b]enzene, total xylenes, DRO, and GRO concentrations exceeded the applicable standards in the East LDU. Low concentrations of toluene and ethyl benzene were also detected in the East LDU for 2015.” The toluene concentration exceeded the standard during the second and third quarters of 2015. Revise the Report to address the toluene exceedances.

2. The Permittee states, “[c]oncentrations of arsenic, barium and zinc were also present in these two wells and have historically been present in all three LDU wells.” LDUs are not wells. Remove the designation as wells for the LDUs from the Report.
3. The Permittee states, “[c]hromium levels have fluctuated; falling below the applicable standards for the East LDU in September of 2010 through March of 2011 and falling below applicable standards for the West LDU in quarter one and two for 2012 and 2013, respectively (Tables 8.6.1 and 8.6.2).” Because the fluid collected from LDUs is the unprocessed wastewater leaking from the NAPIS unit, the contaminant concentrations in LDUs will be directly influenced by the composition of the process flow. Collect an influent sample to the NAPIS when LDUs are sampled during future sampling events. It will be necessary to update the sampling and analysis plan in the revised Groundwater Monitoring Work Plan with this addition.
4. The Permittee states, “[c]oncentrations of 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, 2-methyl naphthalene, and 1-methylnaphthalene exceeded the EPA RSL and NMED standards in the East LDU. Concentrations of 1,2,4-trimethylbenzene, naphthalene, and 2-methylnaphthalene exceeded EPA RSL and NMED standards in the West LDU (Table 8.6.3).” Although the concentrations of naphthalene and 2-methyl naphthalene exceeded the standards, the values were not highlighted to indicate the exceedance in Table 8.6.3 (Volatile and Semi - Volatile Organic Compound Analytical Result Summary). Revise the Report to highlight the exceedances.

Comment 14

In Section 6.2.4, *Groundwater Monitoring Well: OAPIS-1*, pages 34 and 35, the Permittee states, “[t]otal cyanide exceeded the EPA RSL standard (0.0014 mg/L) during 2015 with the highest concentration recorded in quarter two (0.0887 mg/L).” Table 8.7.2 (Total Metals Analytical Result Summary) lists the MCL for cyanide as 0.2 mg/L. Revise the Report for accuracy.

Comment 15

In Section 6.2.4, page 34, the Permittee states, “[t]otal and dissolved arsenic, iron, and manganese concentrations exceeded the applicable standards in 2015 with the exception of dissolved arsenic.” The dissolved arsenic concentration exceeded the standard in the sample collected from well OAPIS-1 during the second, third and fourth quarters of 2015 according to Table 8.7.3 (Dissolved Metals Analytical Result Summary). Also, these values were not highlighted to indicate the exceedance in Table 8.7.3. Revise the Report as necessary to address the exceedance.

Comment 16

Revise the Report to explain why wells STP1-NW and STP1-SW were installed, and how the locations for the wells were selected. Because the water sample analytical results for well STP1-NW indicate elevated chloride and nitrate concentrations relative to the applicable standards according to Table 8.8 (BTEX, General Chemistry Analytical Result Summary), the Permittee must discuss all issues associated with the operation of STP-1 and discuss any other potential sources for the elevated concentrations in the revised Report.

Comment 17

In Section 6.3.1, *Observation Wells: OW-13, OW-14, OW-29, and OW-30*, page 36, the Permittee states, “[B]TEX constituents were not detected in OW-29 or OW-30 during 2015; the wells have not had detectable BTEX concentrations since 2006. (Table 8.9).” Although the Permittee’s statement is true, the statement must also address the fact that the benzene concentration has exceeded the standard (0.005 mg/L) in the samples collected from well OW-14 since 2010 according to Table 8.9 (BTEX Analytical Result Summary). In addition, the benzene concentration in well OW-14 has been increasing since 2009; the highest benzene concentration was observed at 6.2 mg/L in the last quarter of 2015. NMED received the *Revised Investigation Work Plan OW-14 Source Area* on April 18, 2016, which was before the Report was submitted; the work plan proposed an investigation to determine the cause of increasing benzene concentrations in well OW-14. Revise the Report to discuss the increasing benzene concentrations in well OW-14 and reference the work plan to indicate that the issue is being addressed.

Comment 18

In Section 6.3.1, page 36, the Permittee states, “[c]oncentrations of MTBE in OW-14, OW-29, and OW-30 during 2015 were all above the standard, with the highest being in OW-30 during the first quarter at 4.0 mg/L.” Also, in Section 7.3, *Group C – Groundwater Monitoring*, page 52, the Permittee states, “[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 groundwater at concentration levels exceeding the NMED Tap Water standard of 0.143 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.” If the MTBE plume had been moving to north or northwest from the vicinity of tank T-568 (MTBE source) with a mass transport velocity comparable to previous observations, MTBE should have been already detected in wells OW-50 and OW-52 by 2015. However, MTBE has not been detected in wells OW-50 and OW-52 as of 2015. An incomplete understanding of the groundwater flow direction may be the cause of the discrepancy. NMED has identified four approaches to address the issue. The Permittee must explore the approaches in order to understand the nature of plume expansion and coordinate with NMED to develop a course of action.

1. The MTBE plume may be migrating in a north, northwest direction with considerably slower mass transport velocity. The slower rate of mass transport may be contributed from various retardation factors (e.g., variability of hydraulic conductivity, adsorption and biodegradation). In this case, continuous monitoring of the MTBE concentration is recommended for the verification. No revision to the Report would be necessary.
2. The MTBE plume may be migrating in a northeast direction. Since there is no monitoring well to define northeastern extent of the plume beyond the property boundary, this approach would require the submittal of a work plan to install a monitoring well approximately 500 feet northeast of well OW-30 to delineate the plume. The proposed monitoring well must be screened across the Chinle-Alluvium interface.
3. Wells OW-50 and OW-52 may be located cross-gradient relative to the piezometric groundwater flow direction. A change of flow direction from north to west may be

- occurring between well OW-13 (screened in the Sonsela formation) and well OW-29. This approach would require the submittal of a work plan to install a monitoring well screened across the Chinle-Alluvium interface between well OW-13 and well OW-29.
4. The MTBE plume may be migrating in a westerly direction. Although well OW-13 is appropriately located to define western boundary of the plume, well OW-13 is screened in the Sonsela formation; thus, the screened interval of well OW-13 is not monitoring the same stratigraphic units as other monitoring wells in the area; it will not provide relevant information to characterize the groundwater flow direction. This approach would require the submittal of a work plan to install a monitoring well screened across the Chinle-Alluvium interface in the vicinity of well OW-13.

Comment 19

Section 6.3.3, *Recovery Wells: RW-1, RW-2, RW-5, RW-6*, pages 38 and 39:

1. The Permittee states, “[p]urge water is collected and disposed upstream of the NAPIS.” Provide a justification for placing the purge water into the leaking sewer line in the revised Report.
2. The Permittee states, “[h]ydrocarbon recovery from RW-1 has shown a steady decrease from 2005 through 2015. In 2015, total hydrocarbon recovery is estimated at 2.0 gallons in 55 gallons of water purged compared to the 2005 estimate of 431 gallons of hydrocarbons in 1,210 gallons of water.” While this statement is true, it omits the fact that a persistent product thickness (from 1.94 to 4.6 feet) has been recorded during 2015 monitoring events. Revise the Report to address the persistent product thickness.

Comment 20

The screened intervals of all RW wells were submerged below the water table during 2015 gauging events. When the screened interval is submerged below the water table, Separate Phase Hydrocarbon (SPH) will likely not be detected if present. Also, a well with a submerged screen will not provide accurate information regarding the vertical extent of the hydrocarbon smear zone. The average depth to groundwater in well RW-2 is approximately five feet higher than the top of the screen; the inappropriate depth of the screened interval may be contributing to the lack of observed SPH. Include a proposal to submit a work plan to abandon well RW-2 and replace it with a well screened across the water table.

Comment 21

In Section 6.4.1, *Process Wells: PW-2, PW-3, PW-4*, page 39, the Permittee states, “[t]he production wells are on a staggered 3-year sampling schedule, with the exception of PW-3 which is sampled annually since the detection of 2-methylnaphthalene exceeding the applicable standard in 2008.” Even if there is no apparent hydraulic connection between the shallow and deep aquifers, pollutants may leach to the deep aquifer through well construction and because well PW-3 is surrounded by the facility infrastructure. Provide all available construction details for PW-3.

Comment 22

In Section 6.4.2, *Observation Wells: OW-1 and OW-10*, page 40, the Permittee states, “[i]n the last quarter of 2015, low concentrations of benzene, toluene, total xylenes, and MTBE were detected in OW-1, and low concentrations of toluene, ethylbenzene, total xylenes and MTBE were detected in OW-10.” The detected contaminants in well OW-1 may indicate the leading edge of plume migration. The plume may be further expanding to the west of well OW-1. Although the installation of two shallow wells near well OW-1 and three clustered wells approximately 750 feet south of well OW-1 is proposed in the Permittee’s *Work Plan SMW-2 Area Investigation and Boundary Well Installations*, dated October 2016, these proposed wells do not address the extent of the plume west of well OW-1. Propose a work plan to install a monitoring well screened within the Sonsela formation west of well OW-1. It should be noted that MTBE was not detected in the neighboring wells (wells MKTF-43 and MKTF-44), screened in the Chinle-Alluvium interface.

Comment 23

There are multiple issues in Section 6.6, *Constituent Levels for MKTF Wells*, pages 42 and 43:

1. The observation of SPH in MKTF wells must be included in the list of bullet points. Revise the Report accordingly.
2. The Permittee states, “[b]enzene concentrations exceeded the standard of 0.005 mg/L in the following wells: MKTF-1, MKTF-2, MKTF-4, MKTF-9, MKTF-10, MKTF-11, MKTF-16, and MKTF-17 through MKTF-26.” The benzene concentrations also exceeded the standard in the samples collected from wells MKTF-35 through MKTF-39 during the 2015 sampling events according to Table 8.15 (BTEX Analytical Results). Revise the Report for accuracy.
3. The Permittee states, “[t]oluene concentrations exceeded the standard of 0.75 mg/L in the following wells: MKTF-1, MKTF-10, MKTF-11, MKTF-20, and MKTF-23.” The toluene concentration also exceeded the standard of 0.75 mg/L in the sample collected from well MKTF-16 during the sampling event in the second quarter of 2015 according to Table 8.15. Revise the Report accordingly.
4. The Permittee states, “[e]thylbenzene concentrations exceeded the standard of 0.7 mg/L in the following wells: MKTF-1, MKTF-10, MKTF-11, MKTF-16, and MKTF-19.” The ethylbenzene concentration also exceeded the standard of 0.7 mg/L in the sample collected from well MKTF-36 during the sampling events in the first, second and third quarters of 2015 according to Table 8.15. Revise the Report accordingly.
5. The 2015 analytical data for well MKTF-15 is missing from Table 8.15.1 (General Chemistry Analytical Results). Include the data for well MKTF-15 in the revised Report; alternatively, provide the reason why it is not provided.
6. Although the fluoride concentration in well MKTF-2 (2.5 mg/L) exceeded the applicable standard (1.6 mg/L) in 2015, the value is not highlighted to indicate the exceedance in Table 8.15.1. Similarly, although the chloride concentration in well MKTF-39 (6,400 mg/L) exceeded the applicable standard (250 mg/L) in 2015, the value is not highlighted to indicate the exceedance in Table 8.15.1. Revise the Report to highlight the exceedances.

7. The sulfate concentrations in the samples collected from wells MKTF-29 (650 mg/L), MKTF-40 (890 mg/L) and MKTF-43 (1,700 mg/L) exceeded the standard (600 mg/L) in 2015 according to Table 8.15.1. These exceedances are not included in the list of bullet points. Include the exceedances in the revised Report.
8. Although the chromium concentration in the sample collected from well MKTF-33 (6.2E-03 mg/L) did not exceed the standard (0.05 mg/L) in 2015, the value was highlighted to indicate the exceedance in Table 8.15.2 (Total Metal Analytical Result Summary). Revise the Report as necessary.
9. The Permittee states, “[d]issolved metals concentrations above applicable standards were noted in the following wells (Table 8.15.3): Manganese: all wells except MKTF-30, MKTF-31, MKTF-32, MKTF-34, MKTF-41, and MKTF-44.” The manganese concentration did not exceed the standard in well MKTF-28 during 2015 sampling event according to Table 8.15.3 (Dissolved Metals Analytical Result Summary). Revise the Report accordingly.
10. Page 43, the discussion of dissolved uranium and VOCs and SVOCs detections are stated in the same paragraph. Use new bullet points to address the findings regarding VOCs and SVOCs. Also, the discussion of VOCs must be separate from the discussion of SVOCs. Revise the Report accordingly.

Comment 24

In Section 6.6. page 44, a list of SVOCs and VOCs where concentrations exceeded the standards in MKTF wells during the 2015 sampling events is presented. However, there are multiple issues regarding the list:

1. Define the concentration value in parenthesis after each compound name in the revised Report. It is not clear whether the value represents maximum detected concentration or applicable standard value.
2. Provide specific designation(s) for MKTF well(s), where the concentration(s) exceeded the standard(s) in the revised Report. For example, the Permittee’s statement “at least one of the MKTF wells...” is not sufficient.
3. Although 3,4-methylphenol is listed as a compound for which the concentration exceeded the standard, the exceedance was not detected in any MKTF well during 2015 according to Table 8.15.4 (Semi-Volatile Organic Compound Analytical Result Summary). Remove the compound from the list in the revised Report.
4. Although phenanthrene is listed as a compound for which the concentration exceeded the standard, the exceedance was not detected in any MKTF well during 2015 according to Table 8.15.4. Remove the compound from the list in the revised Report.
5. Although cis-1,2-DCE was detected above the standard in the samples collected from eleven MKTF wells in 2015 according to Table 8.15.5 (Volatile Organic Compounds Analytical Results), the compound is not listed. Revise the Report to add the compound in the list.
6. Although 1,1,1-trichloroethane was detected above the standard in the samples collected from two MKTF wells in 2015 according to Table 8.15.5, the compound is not listed. Revise the Report to add the compound in the list.

7. 1-methyl naphthalene is listed twice presumably because the compound appears as a target analyte in both VOCs and SVOCs. The discussion of VOCs and SVOCs must be separated in the revised Report. See Comment 23 (10).
8. Vinyl chloride is listed; however, the unit is missing in the parenthesis. Revise the Report to add the appropriate unit within the parenthesis.
9. Trichloroethane is listed with a standard of 0.005 mg/L. Specify whether the compound is 1,1,1-trichloroethane or 1,1,2-trichloroethane in the revised Report. If the compound is 1,1,2-trichloroethane, the value in the parenthesis will match with the standard of 0.005 mg/L. However, 1,1,2-trichloroethane was not detected above the standard in samples collected from any MKTF well in 2015. If the compound is 1,1,1-trichloroethane, the value in the parenthesis will not match, as its standard is 0.06 mg/L. 1,1,1-trichloroethane was detected above the standard in wells MKTF-9 and MKTF-25 during 2015, according to Table 8.15.5.

Comment 25

The chloride and sulfate concentrations in the sample collected from well MKTF-43 were recorded as 17,000 and 1,700 mg/L, respectively, in the August 2015 sampling event according to Table 8.15.1 (General Chemistry Analytical Results). The concentrations are the highest among the samples collected from all MKTF wells. Well MKTF-43 is located on the eastern perimeter of pond EP-9. The chloride and sulfate concentrations in the samples collected from pond EP-9 have been consistently high (exceeding 30,000 and 4,500 mg/L, respectively, in 2015) according to Table 8.16 (BTEX and General Chemistry Analytical Result Summary). The detected chloride and sulfate concentrations in the sample collected from well MKTF-44 were only 110 and 120 mg/L, respectively in the August 2015 sampling event. Well MKTF-44 is located on the western perimeter of pond EP-9. Based upon the data, it appears that the wastewater stored in pond EP-9 is leaking from the eastern perimeter and leaching into groundwater causing the elevated chloride and sulfate concentrations in well MKTF-43. According to the *revised Summary Report - Evaporation Pond Repairs*, dated February 15, 2017, the entire northern and parts of the eastern and western perimeters of pond EP-9 were strengthened and repaired in 2016. The repair may have already addressed the issue; however, during future sampling events, samples must be collected from the influent to pond EP-9 and wells MKTF-43 and MKTF-44 for further analysis of chloride and sulfate to verify whether the leak has been repaired. In addition, there is no monitoring well on the southern perimeter of pond EP-9. Submit a work plan to propose to install a monitoring well at the southern perimeter of pond EP-9 to evaluate for the presence of chloride and sulfate.

Comment 26

Concentrations of trichloroethylene (TCE), vinyl chloride, and EDC were detected in groundwater samples collected from MKTF wells. Since EDC is a lead scavenger, the Permittee must add analysis for EDB in all monitoring wells where EDC has been detected; this change must be incorporated into the next 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 (i.e., EPA Method 8011). No revision is required.

Comment 27

Vinyl chloride and cis-1,2-DCE were detected in samples collected from many MKTF wells according to Table 8.15.5 (Volatile Organic Compounds Analytical Results). The accumulation of these compounds may be occurring at the site. Evaluate the groundwater quality parameters pertinent to accumulation or degradation of vinyl chloride (e.g., concentrations of chlorinated compounds, groundwater quality parameters, and anions). Include all previously acquired data and interpretation of the existing data in the revised Report.

Comment 28

There are multiple issues on the tables presenting the analytical results for evaporation ponds EP-1 through 12B:

1. Table 8.16 (BTEX and General Chemistry Analytical Result Summary) presents analytical results of BTEX, MTBE, and anions. The analytical method for anions is not specified in the table. Revise the Report to specify the analytical method used for anions.
2. Both Table 8.16 and 8.16.1 (General Chemistry Analytical Result Summary) present identical analytical results for anions. It is redundant to present same data in two tables. Remove the data from one of the tables in the revised Report.
3. Both Table 8.16 and 8.16.1 include the specific conductance data. The measurement of specific conductance must be presented in a separate table along with other water quality parameters (e.g., dissolved oxygen concentration, redox potential). Include a water quality parameter summary table in the revised Report.
4. Although the arsenic concentration exceeded the standard in pond EP-8 during the September 2015 sampling event, according to Table 8.16.3 (Dissolved Metals Analytical Result Summary), it was not highlighted to indicate the exceedance. Revise the Report to indicate the exceedance.
5. The March 2015 SVOC analytical result for pond EP-12B is missing from Table 8.16.5 (Semi Volatile Organic Compound Analytical Result Summary). Provide the result in the revised Report; alternatively, explain why it is not provided.
6. There is a typographical error on the description of analytical method for pond EP-7 in Table 8.16.5. Revise the Report accordingly.

Comment 29

In Section 6.7.1, *Evaporation Ponds 1 through 12B*, pages 45 and 46, provides a discussion of the analytical results for pond EP-1 through 12B; however, there are multiple inaccuracies and discrepancies:

1. The Permittee states, “[t]he e-coli standard of 500 organisms/100 mL was exceeded in EP-2 (5,475 CFU/100 mL), EP-3 (24,196 CFU/100 mL), EP-4 (5,475 CFU/100mL), EP-5 (1,515 CFU/100mL), EP-12A (12,033 CFU/100mL), and EP-12B (>2,419.6 CFU/100mL) (Table 8.16.1).” The e-coli concentration in the sample collected from pond EP-12B is recorded as 17,329 CFU/100mL during the March 2015 sampling event according to Table 8.16.1 (General Chemistry Analytical Result Summary). Revise the Report accordingly.

2. The Permittee states, “[f]luoride, chloride and sulfate concentrations exceeded the applicable standards in each evaporation pond during 2015 (Table 8.16.2).” The concentrations of anions are presented in Table 8.16 and Table 8.16.1 (rather than Table 8.16.2). Revise the Report to correct the reference.
3. The Permittee states, “[t]otal metals concentrations in pond samples were detected as follows (Table 8.16.3):” Table 8.16.3 presents the summary for dissolved metals analytical results (not total metals analytical results). Revise the Report to correct the reference.
4. The Permittee states, “[d]etectable concentrations of barium and chromium were found in one or more samples, but were below applicable standards with the exception of exceedance of chromium in EP-6 (1.6 mg/L).” The total chromium concentration was detected in all evaporation pond samples and one concentration exceeded the standard (from pond EP-7) according to Table 8.16.2 (Total Metals Analytical Result Summary). The total and dissolved chromium concentrations in the sample collected from pond EP-6 during the 2015 sampling events were below the standard of 0.05 mg/L. Revise the Report accordingly.
5. The Permittee states, “[a] low concentration of mercury (0.0.00032 mg/L) was detected in one EP-1 sample, but the concentration was below the applicable standard.” There is a typographical error in the value (0.0.00032 mg/L). Also, the last sampling event for pond EP-1 was conducted in 2014; thus, the finding is not applicable to the discussion of analytical result. Remove the statement from the revised Report.
6. The dissolved chromium concentrations exceeded the standard in the samples collected from ponds EP-7 (0.064 mg/L) and EP-9 (0.064 mg/L) according to Table 8.16.3; however, the exceedances were not noted. Address the exceedances in the revised Report.
7. The Permittee states, “[n]o VOCs were detected in any of the ponds during 2015 with the exception of low concentrations of acetone in EP-3 and EP -12B (Table 8.16.5).” The concentrations of VOCs are presented in Table 8.16.4 not Table 8.16.5. Revise the Report to correct the reference.
8. The Permittee states, “[p]henol concentrations exceeded the standard of 0.005 mg/L in September 2015 for EP-2 (0.22 mg/L).” The phenol concentration also exceeded the standard in the sample collected from pond EP-12B during the September 2015 sampling event. Address the EP-12B exceedance in the revised Report.
9. The Permittee states, “[l]ow concentrations of 3,4-methylphenol were detected in EP-1, EP-2, EP-3, and EP-12B but did not exceed the applicable standard of 0.093 mg/L (Table 8.16.6).” 3,4-methylphenol was also detected in pond EP-4 during the September 2015 sampling event. Address the detection in the revised Report. The last sampling event for pond EP-1 was conducted in 2014; thus, the discussion is not applicable for the 2015 analytical result. Remove the reference to EP-1 from the revised Report. Additionally, the concentrations of SVOCs are presented in Table 8.16.5 rather than Table 8.16.6. Revise the Report accordingly.

Comment 30

The chloride and sulfate concentrations and specific conductance in samples collected from pond EP-11 were one order of magnitude higher than the values from ponds EP-12A and EP-12B in 2015. Conversely, the e-coli concentration in the sample collected from pond EP-11 was two to

three orders of magnitude lower compared to the concentrations in samples collected from ponds EP-12A and EP-12B according to Table 8.16.1. From the data, it appears that the water in evaporation ponds does not flow from pond EP-11 to EP-12A and EP-12B. Provide an explanation for the increased e-coli concentrations in ponds EP-12A and EP-12B. Ensure that raw sewage is not being discharged directly into the evaporation ponds. If there is any new sanitary effluent discharge at the facility beyond the Pilot Travel Center, the Permittee must direct all sanitary effluent to the new WWTP (STP-1). Provide an explanation regarding all flow path(s) in the evaporation ponds and the e-coli concentration in ponds EP-12A and EP-12B in the revised Report.

Comment 31

In Section 6.7.4, *Outfall BW to EP-2*, page 47, the Permittee states, “[t]he BW to EP-2 sample was taken March 23, 2015.” The sample was collected once in 2015; however, in *Executive Summary*, page 8, the Permittee states, “[i]t is sampled at its discharge point to the pond on a semi-annual basis for major cations/anions.” Revise the Report to address the discrepancy. Also, on page 47, the boxes exhibiting the sampling location and date are blank. Revise the Report to fill in the boxes.

Comment 32

In Section 6.7.4, page 47, the Permittee states, “[B]W is defined as reverse osmosis water coming from the boiler unit.” The sulfate concentration in sample collected at the discharge point has consistently exceeded the standard (600 mg/L) since 2010 according to Table 8.17 (General Chemistry and Total Recoverable Metals Analytical Result Summary). Provide an explanation for the elevated sulfate concentration in the revised Report.

Comment 33

There are three issues in Section 6.7.5, *Outfall STP1 to EP-2 Inlet*, page 47:

1. The Permittee states, “[t]he STP1 to EP-2 inlet is sampled on an annual basis”. NMED’s June 2016 Disapproval Comment 8 for the 2014 Report requires quarterly sampling. The Permittee must collect the sample on a quarterly basis rather than annual basis.
2. The boxes exhibiting the sampling location and date are blank. Revise the Report to add the information.
3. The Permittee states, “[B]OD and COD concentrations exceeded the applicable standards.” The COD concentration (80.6 mg/L) was detected below the standard (<125 mg/L) in 2015 according to Table 8.18.1 (BOD/COD Analytical Result Summary). Revise the Report to accordingly.

Comment 34

In Section 6.8, *Additional Sampling and/or Changes*, page 47, the Permittee states, “[r]equired by NMED: sample wells upgradient from the NAPIS wells, OW-1, OW-10, and OW-11 and review analytical results to determine if uranium detections are similar in concentrations in unaffected wells.” The Permittee may discontinue the analysis for uranium in groundwater samples. See Comment 3.

Comment 35

In Section 7.1, *Group A*, page 50, the Permittee states, “[n]o detectable concentration levels of BTEX constituents were found in these wells from 2006 through 2014.” There is a typographical error (it should be through 2015). Revise the Report for accuracy.

Comment 36

In Section 7.2, *Group B – Groundwater Monitoring*, page 50, the Permittee states, “[b]enzene concentrations from all 2015 sampling events at GWM-1 have exceed[ed] applicable standards. This would indicate the potential for historical releases from the aeration lagoons.” The Permittee must further discuss the causes of persistent BTEX and MTBE concentrations in well GMW-1 despite the fact that all discharges to the aeration lagoons ceased in 2013. The contaminant concentrations should exhibit decreasing trends if historical releases are the only cause of the contamination. Provide an explanation of persistent contaminant concentrations in well GMW-1 in the revised Report.

Comment 37

In Section 7.2, page 50, the Permittee states, “[t]here were no significant changes in contaminant detections noticed in the GMW wells.” SPH appeared in well GMW-1 for the first time during the last quarter of 2015. The SPH appearance is a significant change from previous observations; revise the statement for accuracy in the revised Report.

Comment 38

In Section 7.2, page 50, the Permittee states, “[d]own gradient of the NAPIS on the west side, NAPIS-2 and KA-3 have had concentrations of benzene and MTBE above the applicable standards.” The benzene concentration was below the detection limit in the samples collected from well KA-3 during 2015 according to Table 8.5 (BTEX Analytical Result Summary). Similarly, the MTBE concentration was detected but did not exceed the applicable standard in the samples collected from well KA-3 during 2015 according to Table 8.5. Revise the Report as necessary.

Comment 39

In Section 7.3, *Group C – Groundwater Monitoring*, page 51, the Permittee states, “[a]lthough concentration levels of MTBE in OW-13 does not exceed the applicable standard of 0.143 mg/L, sample data indicates a steady increase of MTBE from year to year.” Well OW-13 is screened in the Sonsela formation. All other Group C wells (OW-14, OW-29, OW-30, OW-50, OW-52, RW-1, RW-2, RW-5, and RW-6) are screened in the Chinle-Alluvium interface. The increasing trend of MTBE concentration in well OW-13 indicates that the plume may be expanding laterally as well as vertically. The Permittee must investigate the expansion of MTBE plume. Propose to submit a work plan to install a monitoring well screened in the Sonsela formation between wells OW-13 and OW-29.

Comment 40

In Section 7.5, *Group E – Groundwater Monitoring*, pages 53 and 54, the Permittee states, “[t]o date, a total of 44 permanent monitoring wells (MKTF-1 through MKTF-44) have been installed to aid in delineating the extent of a hydrocarbon seep discovered in 2013, directly west of crude tanks T-101 and T-102.” The well screen intervals of many MKTF wells are submerged below the water table and are not suitable for SPH measurement. The following table (modified from *Section 6 Data Table*) shows the comparison in depths to the top of screened interval and fluid level in MKTF wells during the 2015 gauging events:

Date	Well ID	Depth to the top of well screen (ft - b.g.s.)	Depth to the top of fluid level (ft - b.g.s.)
3/11/2015	MKTF-01	5	3.46
6/9/2015			4.76
8/21/2015			3.84
11/4/2015			3.48
3/11/2015	MKTF-02	7	4.43
6/9/2015			5.1
8/21/2015			4.85
11/4/2015			4.8
3/16/2015	MKTF-04	10	10.58
6/4/2015			11.33
8/18/2015			10.97
11/3/2015			4.56
3/12/2015	MKTF-17	14	12.84
6/8/2015			13.43
8/18/2015			12.01
11/3/2015			12.37
3/17/2015	MKTF-18	17	9.24
6/8/2015			9.18
8/18/2015			9.15
11/3/2015			8.84
3/11/2015	MKTF-28	3	3.79
6/9/2015			2.55
8/20/2015			3.57
11/4/2015			2.89
3/11/2015	MKTF-29	10	
6/10/2015			
8/20/2015			
11/4/2015			
3/11/2015	MKTF-31	6	5.37

6/10/2015			5.14
8/21/2015			5.48
11/4/2015			5.53
3/12/2015	MKTF-41	22	17.54
6/9/2015			17.24
8/21/2015			17.37
11/5/2015			17.24
3/11/2015	MKTF-43	2	2.42
6/10/2015			0.85
8/21/2015			1.02
11/5/2015			2.34
3/12/2015	MKTF-44	38	35.9
6/10/2015			27.01
8/17/2015			28.69
11/9/2015			30.78

The highlighted values (both yellow and red) indicate that the fluid levels are higher than the level of screened intervals; thus, the well screens in these wells are submerged. Among the wells having submerged screens, wells MKTF-01, 02, 04, 17, 18 and 28 are located near the SPH plume and critical for more accurate SPH plume delineation. These wells must be replaced with wells with appropriate screened intervals. Propose to submit a work plan to abandon these wells and replace them with wells with appropriate screened intervals. In addition, well MKTF-29 has a fluid level above the ground surface elevation (see red highlighted values). Well MKTF-29 is located adjacent to the wastewater pipeline to the tanks T-27, 28 and 35. The elevated water level may be associated with a leak from the pipeline. Other possibilities include survey error and overflow from the sanitary lagoon located 100 feet southeast of well MKTF-29. Provide a discussion of the elevated water level in well MKTF-29 in the revised Report.

Comment 41

Figures 11.1, 11.2 and 11.3, *Groundwater Elevation vs. Time – 2015*, include the charts for the groundwater elevations in MKTF wells. It appears identical figures titled as Figures 11A, 11B and 11C are included subsequent to Figures 11.1, 11.2 and 11.3. Delete the redundant figures (Figures 11A, 11B and 11C) from the revised Report. In addition, revise the charts to include the ground surface and SPH elevations.

Comment 42

There are multiple issues in Appendix B, Field Inspection Logs:

1. The field log for MKTF wells is presented as a table form in Appendix B, but does not include any water quality parameters (e.g., pH, temperature, conductivity). The table must be revised to include all water quality parameters. If water quality parameters have

- not been collected previously from MKTF wells, collect measurements of pH, conductivity, temperature, dissolved oxygen and ORP during all future sampling events.
2. Water quality parameters must be recorded for every well where a groundwater sample is collected. Provide an explanation for the circumstances where data collection is not feasible.
 3. All water quality parameters must be tabulated and presented in an organized manner. The final (stabilized) readings must be recorded in the table. Include the table in the revised Report.
 4. The unit of dissolved oxygen concentration presented in the Field Inspection Logs is shown as a percent (%). Clarify whether the reported concentration represents the percent of the solubility limit at a given temperature. It is conventional to report the concentration with a unit in milligrams per liter (mg/L). Convert the unit of dissolved oxygen concentration from percent (%) to mg/L in the revised Report.
 5. Some field inspection logs presented water quality readings although these wells were listed as dry (e.g., BW-3A 3rd Quarter). The others were left blank for water quality readings although the presence of water was indicated in the well (e.g., water appearance - clear, no odor detected in well BW-3C during the 3rd Quarter 2015). Ensure that the descriptions on the logs are accurate; revise the Report to correct all errors and omissions.
 6. The dissolved oxygen readings fluctuate significantly. For example, initial readings decreased from 15.3 to 8.4%; then, the final reading suddenly increased to 40.3% in well OW-30 during the first quarter of 2015. The field techniques utilized during the measurement must be consistent. In addition, ensure the instrument is properly calibrated prior to use.

Comment 43

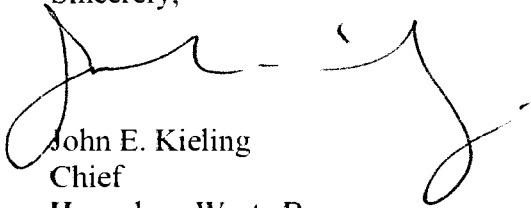
In Appendix E, Summary of *All Leaks, Spills and Releases*, the Permittee states, “[t]he wastewater believed to contain < .5 ppm benzene was vacuumed up with vacuum truck and placed back into the WW treatment system.” Include a laboratory analytical report for the wastewater as an attachment to the Form C-141 in the revised Report.

The Permittee must address all comments in this Disapproval and submit a revised Report. Two hard copies and an electronic version must be submitted to NMED. 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 **September 30, 2018**. In addition, submit a work plan to address Comments 18.2, 18.3, 18.4, 20, 22, 25, 39 and 40 and a letter report to address Comment 12 for NMED review no later than **October 30, 2018**.

Mr. Bailey
January 31, 2018
Page 19

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

Sincerely,

A handwritten signature in black ink, appearing to read "John E. Kieling". The signature is fluid and cursive, with a large loop at the end.

John E. Kieling
Chief
Hazardous Waste Bureau
New Mexico Environment Department

cc: K. Van Horn NMED HWB
M. Suzuki NMED HWB
C. Chavez OCD
A. Hains WRG
C. Johnson WRG
L. King EPA Region 6

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