NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

July 1, 2020

George H. Cushman
Headquarters, Department of the Army
Office of the DCS, G-9
Army Environmental Office, Room 5C140
600 Army Pentagon
Washington, DC 20310-0600

RE: DISAPPROVAL
FINAL GROUNDWATER PERIODIC MONITORING REPORT
JANUARY THROUGH JUNE 2019
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO
EPA ID# NM6213820974
HWB-FWDA-20-003

Dear Mr. Cushman:

The New Mexico Environment Department (NMED) is in receipt of the Fort Wingate Depot Activity (Permittee) *Final Groundwater Periodic Monitoring Report January through June 2019* (Report), dated March 2020. NMED has reviewed the Report, and hereby issues this Disapproval with the attached comments.

The Permittee must submit a revised Report that addresses all comments contained in the attachment. Two hard copies and an electronic version of the revised Report must be submitted to the NMED. The Permittee must also include a redline-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 all revisions have been

made, cross-referencing NMED's numbered comments. The Revised Report must be submitted to NMED no later than **December 31, 2020**.

Should you have any questions, please contact Michiya Suzuki of my staff at (505) 476-6046.

Sincerely,

for

Kevin Pierard
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
B. Wear, NMED HWB
M. Suzuki, NMED HWB
C. Hendrickson, EPA Region 6 (6LCRRC)
L. Rodgers, Navajo Nation
S. Begay-Platero, Navajo Nation
M. Harrington, Pueblo of Zuni
C. Seoutewa, Southwest Region BIA
G. Padilla, Navajo BIA
J. Wilson, BIA
B. Howerton, BIA
R. White, BIA
C. Esler, Sundance Consulting, Inc.
S. Smith, USACE

File: FWDA 2020 and Reading

Attachment

GENERAL COMMENTS

1. Presentation of Analytical Data in the Tables

NMED Comment: Section V.A.2, Monitoring Reports, of the FWDA RCRA Permit states, "[t]he format for periodic monitoring reports shall follow the format included in NMED's *General Reporting Requirements for Routine Groundwater Monitoring at RCRA Sites* [Reporting Requirements]." The Reporting Requirements clearly state, "[d]ata presented in the tables should include the current data plus data from three previous monitoring events...". The Permittee did not provide the three previous monitoring events' data in the Report. Revise all analytical tables to include the required data.

In addition, although applicable screening levels for analytes are included on the last page of each table, the screening levels must be provided on every page for comparison. The data presentation format must follow previous groundwater periodic monitoring reports for consistency.

2. Inaccurate Designation of Wells in the Figures

NMED Comment: Some figures that present analytical data (e.g., Figure 5-1, *Northern Area Nitrate and Nitrite in Alluvial Groundwater – April 2019*) designate monitoring wells as sentinel, background, primary downgradient, upgradient, dry, or other alluvial or bedrock wells. Although it is appropriate to identify dry wells, other designations may be inaccurate and unnecessary. For example, wells TMW01 and TMW31S are designated as primary downgradient wells in Figure 5-1. However, these wells are located upgradient of the TNT Leaching Beds and Workshop Area, potential source areas for nitrate in groundwater. Therefore, these wells are not considered primary downgradient wells. Remove all unnecessary designations from the monitoring wells and identify them as simply alluvial or bedrock wells in the revised figures.

3. Omission of Non-sampling Wells in the Figures

NMED Comment: The figures that present analytical data do not include wells that were not sampled for pertinent analytes. For example, Figure 5-11 only depicts wells where TPH-DRO analysis was conducted. The omission of wells from the figures may be misleading. The figures must present other wells in the vicinity even if the analysis was not conducted. Previously, all wells that were not sampled were presented in the figures and labeled as "not sampled" or "NS". Refer to the figures in previous groundwater periodic monitoring reports for the manner that data was presented and present analytical data in a consistent manner in the revised Report.

SPECIFIC COMMENTS

4. **Section 1.1, Site Description and Activities, lines 34-37, page 1-1**

   Permittee Statement: "The Workshop Area is located south of the Administration Area. This area provided a facility for munitions maintenance and renovation, and included the former trinitrotoluene (TNT) washout facility and the TNT Leaching Beds (solid waste management unit [SWMU] 1)."

   NMED Comment: The Permittee conducted soil excavation to depths close to the water table as an interim corrective measure at SWMU 1 in 2018 and 2019. This corrective measure may affect the concentrations of explosive compounds in groundwater samples collected from the wells in the vicinity of the TNT Leaching Beds. Describe implementation of the interim corrective measure at SWMU 1 and discuss how the concentrations of explosive compounds may be affected by the excavation in the revised Report.

   In addition, Comment 14 in NMED's *Disapproval Final Groundwater Periodic Monitoring Report July through December 2018*, dated January 30, 2020, states, "[t]he operation associated with the TNT Leaching Beds soil excavation was complete in October 2019 and the concentrations of explosive compounds are expected to decrease gradually. The changes in RDX concentrations must be discussed in future groundwater monitoring reports. Provide plots that depict the concentrations of RDX over time for wells TMW03, TMW04, TMW23 and TMW40S in future groundwater monitoring reports." The Permittee failed to provide the required plots. Provide figures (concentrations versus time) that present trends for RDX concentrations at wells TMW03, TMW04, TMW23, and TMW40S in the revised Report and all future groundwater periodic monitoring reports.

5. **Section 2.2, Groundwater Sampling, lines 25-32. Page 2-2**

   Permittee Statement: "Well purging was performed until water-quality parameters stabilized within the following ranges.
   - pH (±0.5 standard units)
   - temperature (±10%)
   - specific conductance (±10%)
   - DO (±10%)
   - turbidity (±10%)
   - ORP (±10%)"

   NMED Comment: Some water-quality parameters were not stabilized during well purging as specified. For example, according to Appendix A, *Field Notes*, the last three turbidity readings collected from well BGMW07 are recorded as 0.0, 630, and 749 NTU. Similarly, the last three dissolved oxygen (DO) readings collected from well BGMW08 are recorded as

11.89, 6.96, and 12.20 mg/L. Since the parameters were not stabilized, it is not clear whether the groundwater samples collected from the wells were representative of the formation water. Provide a justification for why the groundwater samples were representative of formation water even though some water quality parameters were not stabilized in the revised Report.

Additionally, the DO readings of 11.89 and 12.20 mg/L exceeded the theoretical maximum value (see Comment 9). The instrument used to measure DO was unlikely calibrated properly. The Permittee must ensure that the instrument is properly calibrated.

6. **Section 4.1.1, Northern Area Alluvial Groundwater System, lines 30-31, page 4-1**

Permittee Statement: "This mound may be the result of leakage from the inactive artesian Well 68."

NMED Comment: The designation of the pertinent artesian well may be Well 69. Correct the typographical error, if appropriate. Otherwise, provide more information regarding Well 68 (e.g., location, depth of the screened interval) in the revised Report.

7. **Section 4.1.2, Northern Area Bedrock Groundwater System, lines 41-43, page 4-1, and lines 9-11, page 4-2**

Permittee Statements: "The upper sandstone layer is denoted by monitoring well TMW02, and the remaining bedrock monitoring wells are completed in the lower sandstone layer separated by a thick shale sequence."
and,
"Groundwater-level elevation data from monitoring well TMW02 were not used to calculate hydraulic gradients because the monitoring well is completed in a different water-bearing zone than the other bedrock monitoring wells."

NMED Comment: The Permittee's Response to Comment 10 in NMED's *Disapproval Final Groundwater Periodic Monitoring Report July through December 2018*, dated April 6, 2020, states, "[t]he Army believes that BGMW08 may be in a separate sandstone lens; however, the groundwater at this well originates from the same target formation, similar to existing bedrock well TMW02." Clarify whether well BGMW08 is screened into the same unit where the remaining bedrock wells (except TMW02) are screened. There may be a third separate sandstone layer. Provide a clarification regarding the screened interval of bedrock monitoring well BGMW08 in the revised Report. Additionally, discuss the appropriateness of the use of well BGMW08 as a background well in the revised Report.

8. Section 5.1, Water-Quality Parameters, lines 21-23, page 5-1

Permittee Statement: "pH values below 7 represent acidic conditions and contribute to anaerobic conditions while those above 7 represent basic conditions and aerobic conditions."

NMED Comment: The statement is not representative of the data presented in Table 5-1, *April 2019 Stable Groundwater Parameters*. According to Table 5-1, page 3 of 3, the pH reading for groundwater in well TMW32 is recorded as 8.49 while the DO reading is recorded as 0.0 mg/L. Similarly, the pH reading for groundwater in TMW48 is recorded as 4.04 while the DO reading is recorded as 7.14 mg/L. Remove or revise the statement for accuracy.

9. Section 5.1, Water-Quality Parameters, lines 24-26, page 5-1

Permittee Statement: "DO values in the alluvium aquifer ranged from 0.0 in nine total wells to 14.54 milligrams per liter (mg/L) in well TMW31S..."

NMED Comment: Theoretical maximum DO concentration in water at 15 degrees Celsius is approximately 10 mg/L which does not account for elevation above sea level. The groundwater temperature reading from well TMW31S is recorded as 15.17 degrees Celsius according to Table 5-1. It is not clear how the DO reading (14.54 mg/L) exceeded the theoretical maximum DO value (10 mg/L) in the groundwater sample collected from well TMW31S. Explain (1) whether the instrument was properly calibrated prior to the measurement, (2) the potential causes of the DO reading exceeding the theoretical maximum concentration, and (3) why the instrument operator did not identify a problem with the instrument based on the inaccurate result in the revised Report.

10. Section 5.1, Water-Quality Parameters, lines 33-34, page 5-1

Permittee Statement: "Low ORP values (<300 mV) indicate that anaerobic conditions are present in areas of FWDA."

NMED Comment: According to Table 5-1, none of the ORP values exceeds 300 mV although aerobic conditions are present in many wells. For example, the ORP reading is recorded as -110 mV in well FW31 while the DO reading is recorded as 5.90 mg/L. The statement is not representative of the data presented in Table 5-1. Remove or revise the statement for accuracy in the revised Report.

11. Section 5.2.1, Nitrate and Nitrite, lines 2-4, page 5-2

Permittee Statement: "Nitrate concentrations have decreased over time from well BGMW02, previous data shows a concentration of 15 mg/L from January to June 2017, 14 mg/L from January to June 2018, and 13 mg/L from July to December 2018."

NMED Comment: The nitrate concentration in the groundwater sample collected from well BGMW02 in April 2019 is recorded as 10.8 mg/L in Figure 5-1. According to Appendix E, *Historical Data Analysis,* the nitrate concentration in the groundwater sample collected from the same well in October 2012 is recorded as 12 mg/L. The nitrate level in April 2019 was slightly lower than previously measured levels; however, it does not demonstrate a clear decreasing trend over time. The nitrate concentrations in groundwater samples collected from BGMW02 rather appear to be stable over time. Remove the statement from the revised Report.

12. Section 5.2.3, Perchlorate, lines 13-14, page 5-3

Permittee Statement: "The extent of perchlorate groundwater contamination has not been completely delineated."

NMED Comment: The *Final Groundwater Supplemental RCRA Facility Investigation Work Plan Revision 4*, dated March 23, 2018, proposed installation of multiple wells to address the data gap. In the revised Report, describe what measures are proposed to resolve the data gap in the referenced work plan.

13. Section 5.2.4, Volatile Organic Compounds, lines 29-30, page 5-3

Permittee Statement: "The detected VOCs are primarily associated with chlorinated solvents, petroleum fuels, and their degradation products."

NMED Comment: Carbon disulfide has been detected from both alluvial and bedrock groundwater samples at the site. Carbon disulfide is unlikely associated with chlorinated solvents, petroleum fuels, or their degradation products. Discuss the potential sources of carbon disulfide detections in the revised Report.

14. Section 5.2.5, Other Organic Compounds, lines 28-33, page 5-4

Permittee Statement: "Pesticide compounds were not detected from any monitoring wells sampled in April 2019, as shown in Figures 5-13 and 5-14. Results from pesticides analysis are summarized in Table 5-7. Pesticide compounds were analyzed using EPA Method 8081A. Herbicides and polychlorinated biphenyls (PCB) compounds were not detected from any

monitoring wells sampled in April 2019, as shown in Figure 5-15. Results from the herbicides and PCB analysis are summarized in Table 5-8 and Table 5-9 respectively."

NMED Comment: Since pesticides, herbicides, and polychlorinated biphenyls (PCB) were not detected in any groundwater samples, it is not necessary to include the figures that present these data. Remove the figures from the revised Report.

15. Section 5.2.6, Metals, lines 3-5, page 5-5

Permittee Statement: "Metals results are not discussed in this PMR. Contaminant plume maps will be generated as part of a future work effort when an agreement between NMED and ARMY has been reached regarding background metal concentrations for total or dissolved metals."

NMED Comment: NMED is in receipt of the *Final Groundwater Background Evaluation*, dated December 26, 2019, and currently, the document is under review. Once background threshold values for metals presented in the evaluation report are evaluated and approved by NMED, the Permittee must provide a more thorough discussion regarding the detection of metals. No response required.

16. Section 5.6, New Findings, lines 6-9, page 5-6

Permittee Statement: "Concentrations for April 2019 in sentinel well MW23 were non detect for six previously trace SVOCs in October 2018; naphthalene (0.51 J µg/L), 1,2-dichlorobenzene (0.48 J µg/L), 1,3-dichlorobenzene (0.49 J µg/L), 1,4-dichlorobenzene (0.51 J µg/L), 1,2,4-trichlorobenzene (0.60 J µg/L), and 2-methylnaphthalene (0.46 J µg/L)."

NMED Comment: The SVOCs detected during the October 2018 sampling event are not listed in Table 5-6, *Summary of TPH and SVOC Analytical Results*. Comment 1 above requires revision of all analytical tables to include the required data. Accordingly, all compounds detected during the pertinent sampling periods must be listed in the tables. Revise the Report accordingly.

17. Section 6.0, Summary, lines 41-42, page 6-1

Permittee Statement: "The boundaries of the alluvial TPH-DRO plume have not been defined."

NMED Comment: The extent of the TPH-DRO plume is presented in Figure 5-11, *Northern Area TPH-DRO in Alluvial Groundwater – April 2019*; however, the western and southern boundaries of the plume are not delineated. Well TMW46 is the closest well located west of well TMW34 where a TPH-DRO exceedance was observed. Groundwater samples were not

collected from well TMW46 for TPH-DRO analysis. Similarly, wells TMW06, TMW07, and TMW21 are the closest wells located south of MW20 where a TPH-DRO exceedance was observed. Groundwater samples collected from these wells were not analyzed for TPH-DRO. In addition, according to Figure 3-10 included in the *Final 2019 Interim Northern Area Groundwater Monitoring Plan Version 11*, dated April 2020, the TPH-DRO concentration exceeded the applicable screening level in the groundwater sample collected from well MW22D. The extent of TPH-DRO plume is not delineated north of well MW22D. Well TMW10 is the closest well located north of well MW22D where a TPH-DRO exceedance was observed. Groundwater samples were not collected from well TMW10 for TPH-DRO analysis. In order to better delineate the plume, propose to collect groundwater samples from wells TMW06, TMW07, TMW10, TMW21 and TMW46 for TPH-DRO analysis in the next update of the groundwater monitoring plan. Alternately, the Permittee may propose to submit a separate work plan to install new wells to delineate the plume north of well MW22D, west of well TMW34 and south of well MW20.

18. Table 4-1, Northern Area Groundwater Elevations, page 29 of 38

NMED Comment: The groundwater elevations of bedrock well BGMW08 measured in January and April 2019 are recorded as 6,661.56 and 6,539.25 feet, respectively, according to Table 4-1. The elevation measured in January was more than 100 feet higher than in April. Verify the accuracy of the measurement and explain the cause of the discrepancy in the revised Report.

19. Table 5-3, Summary of Explosives Analytical Results, page 1 of 2

NMED Comment: The 2,4-dinitrotoluene, 2,6-dinitrotoluene, and nitrobenzene concentrations in the groundwater samples collected from well TMW33 were analyzed and recorded in Table 5-3. However, other explosive compounds (e.g., RDX) were not analyzed for during the April 2019 sampling event. Provide an explanation for why only a limited number of explosive compounds were analyzed for the groundwater samples collected from well TMW33.

In addition, according to Table 2-2, *Groundwater Sample Matrix*, page 1 of 2, explosive compounds analysis is not required for groundwater samples collected from well TMW33. Explain why a groundwater sample was collected from well TMW33 during the April 2019 sampling event and analyzed for only a limited suite of explosive compounds in the revised Report.

20. Table 5-6, Summary of TPH and SVOC Analytical Results

NMED Comment: Section 6.2.2, Sample Analysis Requirements, of the FWDA RCRA Permit, Attachment states, "[t]o the extent possible all method detection limits and reporting limits shall be less than the applicable cleanup levels included in Permit Attachment 7."

According to Table 5-6, the TPH-DRO concentrations in the groundwater samples collected from wells MW03, MW22D, TMW08 and TMW35 are recorded as <55 µg/L, <52 µg/L, <53 µg/L and <58 µg/L, respectively. The screening level for TPH-DRO is 16.7 µg/L. Similarly, the screening levels for nitrobenzene, bis(2-ethylhexyl)phthalate, and 1,2-diphenylhydrazine concentrations are lower than their respective detection limits. For example, the 1,2-diphenylhydrazine concentration in the groundwater sample collected from well BGMW01 is recorded as <2.9 µg/L. The screening level for 1,2-diphenylhydrazine is 0.78 µg/L.

The Permittee has previously been directed to provide analyses whose method detection limits, reporting detection limits, and practical quantitation limits are below the applicable screening level for each contaminant of concern. All data provided by analyses where the method detection limit, reporting detection limit, or practical quantitation limit exceed the screening level are considered data quality exceptions and cannot be used to demonstrate compliance. In addition, all data quality exceptions must be identified in the text, tables, and figures where there are presented. Revise the Report accordingly.

21. Figure 4-1, Northern Area Alluvial Groundwater Contour Map – January 2019, and Figure 4-2, Northern Area Alluvial Groundwater Contour Map – April 2019

NMED Comment: The figures indicate that groundwater monitoring well TMW26 and piezometer well PZ04 are positioned in the same location. However, the groundwater elevations of TMW26 appear to be approximately five feet higher than those of PZ04. Discuss the cause of higher measured groundwater elevations in well TMW26 in the revised Report.

22. Figure 5-2, Northern Area Nitrate and Nitrite in Bedrock Groundwater – April 2019

NMED Comment: According to Table 5-2, *Summary of Nitrate-N and Nitrite-N Analytical Results*, page 2 of 2, the nitrate and nitrite concentrations were measured in Well 69 during the April 2019 sampling event. Well 69 is depicted in Figure 5-2; however, the nitrate and nitrite concentrations in groundwater samples collected from Well 69 are not presented in the figure. Include the nitrate and nitrite concentrations for Well 69 in a revised Figure 5-2.

23. Figure 5-3, Northern Area Explosives in Alluvial Groundwater – April 2019

NMED Comment: According to Table 5-3, *Summary of Explosives Analytical Results*, pages 1 and 2, explosive compounds in the groundwater samples collected from well TMW33 and Well 69 were analyzed during the April 2019 sampling event. However, well TMW33 and Well 69 are not depicted in Figure 5-3. Include well TMW33 and Well 69 with corresponding analytical data in a revised figure or provide an explanation for why these wells are not included in the figure.

24. Figure 5-6, Northern Area Perchlorate in Bedrock Groundwater – April 2019

NMED Comment: According to Table 5-4, *Summary of Perchlorate Analytical Results,* page 2 of 2, the perchlorate concentration was measured in Well 69 during the April 2019 sampling event. Well 69 is depicted in Figure 5-6; however, the perchlorate concentration in groundwater samples collected from Well 69 is not included in the figure. Include the perchlorate concentration for Well 69 in a revised Figure 5-6.

25. Figure 5-8, Northern Area VOCs in Bedrock Groundwater – April 2019

NMED Comment: According to Table 5-5, *Summary of VOC Analytical Results,* page 3 of 3, the VOC concentrations were measured in Well 69 during the April 2019 sampling event. Well 69 is depicted in Figure 5-8; however, the VOC concentrations in groundwater samples collected from Well 69 are not included in the figure. Include the VOC concentrations for Well 69 in a revised Figure 5-8.

26. Figure 5-10, Northern Area SVOCs in Bedrock Groundwater – April 2019

NMED Comment: According to Table 5-6, *Summary of TPH and SVOC Analytical Results,* page 3 of 3, SVOC concentrations were measured in Well 69 during the April 2019 sampling event. Well 69 is depicted in Figure 5-10; however, the SVOC concentrations in groundwater samples collected from Well 69 are not included in the figure. Include the SVOC concentrations for Well 69 in a revised Figure 5-10.

27. Figure 5-12, Northern Area TPH-GRO in Alluvial Groundwater – April 2019

NMED Comment: The extent of the TPH-GRO plume is presented in Figure 5-12; however, the southern boundary of the plume is not delineated. Wells TMW06, TMW07, and TMW21 are the closest wells located south of MW20 where a TPH-GRO exceedance was observed. Groundwater samples were not collected from these wells for TPH-GRO analysis. Propose to collect groundwater samples from wells TMW06, TMW07, and TMW21 for TPH-GRO analysis in the next update of the groundwater monitoring plan. Alternately, the Permittee may propose to submit a separate work plan to install a well to delineate the plume south of well MW20 (see Comment 17).

Kimberly Rudawsky

From: Christy Esler
Sent: Wednesday, July 1, 2020 10:55 AM
To: Kimberly Rudawsky; Chasitty Badonie
Subject: FW: Letter to Mr. Cushman
Attachments: FWDA 2020- Disapproval Final Groundwater PMR Jan.-June 2019 HWB-FWDA-20-003.pdf

From: Martinez, Cynthia, NMENV <cynthia.martinez1@state.nm.us>
Sent: Wednesday, July 1, 2020 10:13 AM
To: george.h.cushman.civ@mail.mil
Cc: Pierard, Kevin, NMENV <Kevin.Pierard@state.nm.us>; Cobrain, Dave, NMENV <dave.cobrain@state.nm.us>; Wear, Benjamin, NMENV <Benjamin.Wear@state.nm.us>; Suzuki, Michiya, NMENV <Michiya.Suzuki@state.nm.us>; 'hendrickson.charles@epa.gov' <hendrickson.charles@epa.gov>; lasar98@yahoo.com; srbp@navajoadvantage.com; Mark.Harrington@ashiwi.org; clayton.seoutewa@bia.gov; george.padilla@bia.gov; judith.wilson@bia.gov; bj.howerton@bia.gov; 'robin.white@bia.gov' <robin.white@bia.gov>; Christy Esler <cesler@sundance-inc.net>
Subject: Letter to Mr. Cushman

Good Morning,
Please see attachment.

Cynthia Martinez
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Bldg.1
Santa Fe, New Mexico 87505-6313