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May 24, 2021

Base Realignment and Closure Operations Branch

Mr. Kevin Pierard  
Chief, Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303

RE: Final Groundwater Periodic Monitoring Report, January through June 2019, Revision 2, Army Responses to the New Mexico Environment Department Letter of Disapproval dated January 25, 2021, Fort Wingate Depot Activity, McKinley County, New Mexico. EPA# NM6213820974, Reference # HWB-FWDA-20-003

Dear Mr. Pierard:

This letter provides responses to the comments issued in the *Disapproval Letter, Final Groundwater Periodic Monitoring Report, January through June 2019 Revision 1* from the New Mexico Environment Department (NMED), dated January 25, 2021, reference number HWB-FWDA-20-003. In addition to the comment responses provided in this letter, two (2) hard copies and one (1) electronic (CD) copy of the revised *Final Groundwater Periodic Monitoring Report, January through June 2019 Revision 2* are enclosed for your review and consideration. The electronic transmittal includes a redline-strikeout version of the above-mentioned report showing where all revisions to the report were made.

### **GENERAL COMMENT**

#### **1. Presentation of Analytical Data in the Tables**

**NMED Comment:** Although the analytical tables were revised to include data collected from the current and three previous monitoring events and the screening levels are presented on every page for comparison, as directed, the data presentation format used in previous groundwater periodic monitoring reports was not followed in the Report. Accordingly, multiple issues are identified. Some of the issues are listed below:

- a) Analytical data presented in previous periodic monitoring reports were reported with two significant figures while the data presented in this Report were reported with seemingly random significant figures. For example, the perchlorate concentrations in the samples identified as MW20042019, MW18D102017, and MW20102018 are reported with three significant figures (0.349), one significant figure (<0.1), and two significant figures (0.39), respectively. All analytical tables must be revised to report analytical data with two significant figures to be consistent with previous reports.
- b) Some data qualifiers are not defined in the Report. For example, the tetryl concentration in the sample identified as TMW18102018 is reported as

- 0.21R. However, a notation of “R” is not defined in the pertinent table. All data qualifiers must be defined.
- c) All data presented with “<” in the tables are shaded with a light gray font, which is barely legible. All data presented in the tables must be presented with clear legible font.
  - d) Some data are presented with regular black font while the others are presented with bold black font in the tables. However, no explanation was provided to distinguish them. Provide an explanation for the meaning of the bolded values.
  - e) Some detected analytes (e.g., naphthalene in MW23 during the October 2018 sampling event) are not listed on the tables. All detected analytes during the current and three previous monitoring events must be listed on the tables.

Revise the Report to correct all issues listed above. As directed in the NMED’s July 1, 2020 Disapproval Comment 1, the data presentation format must follow previous groundwater periodic monitoring reports for consistency. Revise the Report accordingly.

**Permittee’s Response:**

- a) Comment Acknowledged. Data was presented with the same significant figures and trailing zeros as received from the laboratory. Although data is not typically altered; analytical data presented in the tables and figures has been changed to two significant figures where practicable, as requested.
- b) Concur. Data qualifiers (including “R” notations) used in the laboratory summary tables has been defined in the notes section of each applicable table (Table 5-3 and Table 5-7).
- c) Concur. To remedy this issue, the light gray font has been changed to a standard black font. Tables 5-2 through 5-11 have been updated accordingly.
- d) Comment Acknowledged. In the Notes & Abbreviations section of each summary table, there is a note stating “Number - Result exceeds cited SL.” The note on each applicable table has been clarified and changed to state: “Bold Numbers = Result exceeds cited SL.” Tables 5-2 through 5-11 have been revised accordingly.
- e) Concur. Tables 5-2 through 5-11 have been revised to include all detected analytes.

**SPECIFIC COMMENTS**

**2. Permittee’s Response to NMED’s Disapproval Comment 3, dated July 1, 2020**

**Permittee Statement:** “All wells are presented on the figures and are labeled as “not sampled” or “NS” if the well was not sampled for the particular analyte as in previous groundwater monitoring reports.”

**NMED Comment:** The designation and sampling status (e.g., “NS”) of some pertinent wells are missing from the figures. For example, Figure 5-3, *Northern Area Explosives in Alluvial Groundwater - April 2019*, does not provide the designation of alluvial well TMW28 and its sampling status. The designation of alluvial well TMW28 must be shown

with its sampling status or sampling results on the figure. Provide the designation and the sampling status for all wells that are missing this information in the revised Report.

**Permittee's Response:** Concur. Alluvial Well TMW28 was sampled during the April 2019 sampling event. However, it was not sampled for the full suite of analyses, including explosives, per the approved sampling plan. Therefore, a result was not shown on Figure 5-3 for this well. Figure 5-3 has been revised to indicate "NS" for "Not Sampled" for explosives. This change was made to other figures as needed (Figures 5-1 thru 5-6, and Figures 5-9 thru 5-12).

### 3. **Permittee's Response to NMED's Disapproval Comment 5, dated July 1, 2020**

**Permittee Statements:** "Well BGMW07 was purged using a Reclaimer pump (gas displacement pump) and the turbidity increased as the water column approached the bottom of the well casing and disturbed much of the settled sediment."

and,

"The field team returned the following day to collect the formation water that had entered the well casing screen during recharge. This illustrate [sic] that the water sample is representative of the formation water."

**NMED Comment:** The results of total metal analysis for BGMW07 may be affected by the sampling techniques; the amount of sediments suspended in the sample matrix may cause significant variation in analytical results. For example, the total iron concentrations in the groundwater samples collected from well BGMW07 on May, 2, 2019, October, 12, 2018, and April 26, 2018 are recorded as 2,590 µg/L, 11,000 µg/L, and 780 µg/L, respectively, according to Table 5-10, Summary of Total Metals Analytical Results. On the other hand, the dissolved iron concentrations in the groundwater samples collected from well BGMW07 on May, 2, 2019, October, 12, 2018, and April 26, 2018 are recorded as <250 µg/L, 220 µg/L, and 170 µg/L, respectively, according to Table 5-11, Summary of Dissolved Metals Analytical Results. Although the dissolved iron concentrations are relatively stable over time, the total iron concentrations significantly vary. Propose a measure to minimize sampling variation in future sampling events and discuss the measure in the revised Report. Note that the water sample would not be representative of the formation water, if analytical results are affected by sampling techniques.

**Permittee's Response:** Comment Acknowledged. Total metals concentrations can vary between sampling events based on turbidity, suspended and settleable solids, and other factors. Sampling procedures defined in the Interim Groundwater Monitoring Plan have been followed as written. Dissolved metal concentration is determined by filtering a water sample through 0.45 µm filter. Water that passes through the filter is analyzed for metals and the result is reported as dissolved metal concentration. Total metal concentration is determined by analyzing the unfiltered sample. Hence, the variability in total metals is presumed to be a direct function of variability in the amounts of both suspended and settleable solids. Review of the sampling logs and field notes suggests that there has been variability to pump rates and total volume pumped on this well. This variability may be responsible for what is observed in the laboratory data for total metals. The proposed measure to minimize this variation in the future will be to employ a lower pumping rate. Data will then be reevaluated and discussed in future PMRs. The following text was added to Section 5.3, Page 5-6, Lines 9-12 (RLSO PDF: Page 5-6, Lines 29-33):

*"Total metals analytical results from well BGMW07 vary significantly when*

*compared to past sampling events. In an effort to reduce this variation in future sampling events, a lower pumping rate will be employed during purging of this well. This will be done to reduce the suspended solids as the water column reaches the bottom of the well during purging.”*

#### **4. Permittee’s Response to NMED’s Disapproval Comment 5, dated July 1, 2020**

**Permittee Statements:** “Similarly, Well BGMW08 was purged dry using a hand bailer. Hand bailer was used to collect groundwater from 180 feet below the top of casing and filling the water quality probe cup for data collection, versus using a flow-through cell (which are typically used for low flow dedicated pumps). Air bubbles were most likely trapped on the sensor when the water quality probe was submerged in the cup for data collection, resulting in an increased DO reading.”

and,

“The DO readings collected from well BGMW08 were elevated as shown in the purge log form where the lowest reading was 9.14 mg/L and the highest was 17.65 mg/L. Well BGMW08 was purged dry with a submersible pump. The field team returned the following day to collect formation water that entered through the well casing screen during recharge. Since the well was purged dry all water entering the well is considered representative of the formation water.”

**NMED Comment:** Theoretical maximum dissolved oxygen (DO) concentration in water at 15 degrees Celsius is approximately 10 mg/L which does not account for elevation above sea level. 17.65 mg/L would be impossible for a DO concentration and the field crew should have discarded the readings. The water entering the well is representative of the formation water; however, the water sample would not be representative of the formation water unless the sampling techniques are appropriate (see Comment 3 above). Since the Permittee is able to identify the cause of inaccurate DO readings in well BGMW08, discuss appropriate measures to resolve the issue in the revised Report and resolve the issue for future sampling events.

**Permittee’s Response:** Comment Acknowledged. The sampling techniques applied follow the approved workplan, and as such are appropriate for each well. Issues being discussed relating to DO readings are not a result of inappropriate technique, but rather innate weaknesses of instruments used in variable field conditions. The following text was added to the report to address inaccurate DO readings (Section 5.1, Page 5-1, Lines 29-35 [RLSO PDF: Page 5-1, Lines 32-38]):

*“The following measures will be taken to address inaccurate DO readings:*

- 1. water quality instruments will be calibrated and tested prior to field deployment and as necessary during field work;*
- 2. if the instrument cannot be properly calibrated, or is producing anomalous readings, a backup instrument will be calibrated and used; and*
- 3. field personnel will be made aware and trained to recognize inaccurate DO readings and will use one of the abovementioned procedures to ensure the accuracy of DO readings.”*

These measures will be followed and are expected to resolve the issue for future

sampling events.

**5. Permittee's Response to NMED's Disapproval Comment 9, dated July 1, 2020**

**Permittee Statement:** "The elevated DO in well TMW31S is likely due to the purging method. A submersible pump was used to purge the water into a cup to collect water quality parameters, which likely resulted in air bubbles on the sensor. The bedrock aquifer range for DO was 0.0 in four total wells to 12.20 mg/L in well BGMW08, which also resulted in elevated DO caused by bailing the well dry, collecting the water quality parameters in a cup, creating air bubbles on the sensor."

**NMED Comment:** Since the Permittee is able to identify the cause of inaccurate DO readings, discuss appropriate measures to resolve the issue in the revised Report and resolve the issue for future sampling events (see Comment 4 above).

**Permittee's Response:** Comment Acknowledged. The following text was added to the report to address inaccurate DO readings (Section 5.1, Page 5-1, Lines 29-35 [RLSO PDF: Page 5-1, Lines 32-38]):

*"The following measures will be taken to address inaccurate DO readings:*

- 1. water quality instruments will be calibrated and tested prior to field deployment and as necessary during field work;*
- 2. if the instrument cannot be properly calibrated, or is producing anomalous readings, a backup instrument will be calibrated and used; and*
- 3. field personnel will be made aware and trained to recognize inaccurate DO readings and will use one of the above-mentioned procedures to ensure the accuracy of DO readings."*

These measures will be followed and are expected to resolve the issue for future sampling events.

**6. Permittee's Response to NMED's Disapproval Comment 12, dated July 1, 2020**

**Permittee Statement:** "The new 32 wells will be sampled for 1,4-dioxane for two consecutive events in 2020 and will be sampled and analyzed for the full suite of analytical for four consecutive events starting in year 2021."

**NMED Comment:** The new wells should have been sampled for the full analytical suite in 2020. The Permittee was previously directed to analyze 1,4-dioxane using EPA Method 8270 Selective Ion Monitoring (SIM) in groundwater samples collected from wells where chlorinated solvents were previously detected. The direction was not followed. Whether or not chlorinated solvents are detected in 2021, 1,4-dioxane analysis must continue for wells where 1,4-dioxane was detected in 2020. Include the provision in the next groundwater monitoring plan update and provide an explanation regarding the failure to follow previous NMED direction.

**Permittee's Response:**

- a) Comment Acknowledged. The comment provided is pertaining to future sampling events. This PMR describes the January to June 2019 sampling effort. No

change to the document is necessary. The Army will follow NMED directions for the 2020 sampling events.

- b) Comment Acknowledged. In addition, select wells with detections of 1,4-dioxane during year 2020 will continue to be monitored for 1,4-dioxane in year 2021.

#### 7. **Permittee's Response to NMED's Disapproval Comment 16, dated July 1, 2020**

**Permittee Statement:** "All detections have been included in the tables."

**NMED Comment:** The SVOC concentrations (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)) were detected in groundwater samples collected from well MW23 during the October 2018 sampling event. However, these compounds are not listed in Table 5-6, Summary of TPH and SVOC Analytical Results. All detected analytes during the current and three previous monitoring events must be presented in the revised table (see Comment 1, item e).

**Permittee's Response:** Concur. All detected analytes during the current and three previous monitoring events are now presented in the revised Table 5-6.

#### 8. **Permittee's Response to NMED's Disapproval Comment 18, dated July 1, 2020**

**Permittee Statements:** "The discrepancy in the 100-foot difference in groundwater elevations of bedrock well BGMW08 measured in January and April 2019 was likely attributed to the presence of a perched water zone that once drained may not recharge each season."

and,

"The groundwater elevations were all verified through multiple measurements during the field monitoring events and confirmed to accurately record the depth to water."

**NMED Comment:** According to Table 4-1, Northern Area Groundwater Elevations, depth to water measurements in well BGMW08 in October 2018, January 2019, and April 2019 are recorded as 168.64, 23.46, and 145.77 feet below top of casing (btoc) and well BGMW08 is screened from 165 to 185 feet below ground surface (bgs). Since well BGMW08 is screened at the depths from 165 to 185 feet bgs, the referenced perched zone that raised water level to 23.46 feet bgs does not intercept the screened interval of well BGMW08. Unless well BGMW08 is poorly constructed, an isolated perched zone will not affect the potentiometric surface of the deeper bedrock aquifer. In addition, the water level increased by more than 140 feet from October 2018 to January 2019; then, decreased by more than 120 feet from January 2019 to April 2019. It is possible that hydraulic communication between upper and lower aquifers exists; however, such sudden changes of water level cannot be explained. The Permittee asserts that the measurements are correct. If so, well BGMW08 may be damaged or poorly constructed and a conduit for contaminant migration. Discuss how well BGMW08 was constructed and propose to submit a work plan to investigate the integrity of well BGMW08, if necessary, in the revised Report.

Furthermore, report depth to water readings in feet bgs rather than feet btoc or provide casing stickup length with the ground surface elevation in Table 4-1 so that water and screen depths can directly be compared for each well. Revise the Report accordingly.

**Permittee's Response:**

- a) Comment Acknowledged. Well BGMW08 is being proposed for abandonment due to improper construction causing anomalous data. The well will continue to be monitored and sampled until abandonment is approved. A discussion of BGMW08 well construction would be included in a future work plan.
- b) Comment Acknowledged. In an effort to be consistent with previous reports, the depth to water measurements will continue to be reported as feet below top of casing (btoc). To address the comment, a column has been added to Table 4-1 indicating the casing stickup length, and screened interval of each well in NAVD 88 datum allowing the reader to compare groundwater elevations with well screen interval elevations.

**9. Permittee's Response to NMED's Disapproval Comment 20, dated July 1, 2020**

**Permittee Statements:** "The Army has contacted many other laboratories and is working towards finding a DOD-certified laboratory that can either meet or achieve levels closer to the NMED suggested screening levels."

and,

"The Army will provide NMED its findings in the near future. Please note that constituents where the method of detection limit, reporting detection limit, or practical quantitation limit exceed the screening level are considered data quality exceptions and are identified as such in the text, tables, and figures where they are presented."

**NMED Comment:** NMED's May 21, 2019 Approval with Modifications Letter for the Final 2017 Interim Facility-Wide Groundwater Monitoring Plan, Version 10, Revision 1, Response to NMED Approval with Modifications Letter Dated October 22, 2018 states:

The Permittee secured a laboratory that is able to achieve adequately low limits of quantification (LOQs) for most contaminants. NMED approves implementation of the enhanced analytical procedures. Propose all changes associated with the enhanced analytical procedures in the next Interim Facility- Wide Groundwater Monitoring Plan (IFGMP) update. However, the Permittee also states, "[i]f the presence of compounds requiring these special analytical methods is not confirmed [in four consecutive sampling rounds], the analytical program will revert to the normal methods that were previously used." The Permittee is required to utilize appropriate analytical labs and methods that are capable of achieving LOQs below the respective SSLs. The Permittee must continue to utilize methods capable of achieving LOQs less than the cleanup levels for all future sampling events.

The Permittee states, "[i]n addition, the previous research showed that n-nitrodimethylamine [sic] [NDMA] was not utilized at Fort Wingate Depot Activity (FWDA)." A large portion of the facility is currently leased to and is being utilized by the Missile Defense Agency (MDA). Activities undertaken by MDA are likely to include utilization of rocket fuels. The LOQ provided by the Permittee in replacement Table 5-1 appears to be four orders of magnitude higher than the SSL. Other facilities under NMED RCRA oversight have been able to contract with analytical laboratories that are able to achieve LOQs much closer to the SSL. One facility has utilized ALS labs in Ontario, Canada to achieve 0.5 to 1.0 ng/L. Another facility has utilized TestAmerica Labs to achieve 4 to 5 ng/L. Therefore, an LOQ of

10 µg/L, which is four orders of magnitude greater than the what the two labs listed above are able to achieve, is not acceptable. NMED cannot defend the assertion that NDMA contamination does not exist at FWDA based on laboratory analysis that can only achieve LOQs that are four orders of magnitude higher than the SSL. If the Permittee cannot provide data that meets the standards, then it will not be possible to demonstrate that releases related to MDA operations have not occurred.

In addition, NMED's December 17, 2019 letter regarding Additional Information Related to the August 16, 2019 Proposal to Reset Enforceable Schedule and Resolve Programmatic Issues at Fort Wingate Depot Activity states:

The Permittee is required to use analytical laboratories and methods that can achieve LOQs at or below the screening levels for all constituents of concern. The Permittee has proposed using labs where the LOQ for an analyte is multiple orders of magnitude above the screening level. This is not acceptable. The Permittee will likely need to use more than one lab to achieve the requirement. Other NMED-regulated facilities have been using multiple labs to achieve appropriate LOQs for many years. NMED cannot defend an assertion that a site is clean without data that support such a conclusion. Therefore, any future CAC requests may be disapproved based on NMED's inability to defend that a site is clean based on the Permittee's inability to demonstrate that contaminants are not present above applicable cleanup levels.

The direction provided in NMED's previous letters was not followed. Failure to follow NMED direction constitutes noncompliance and may result in an enforcement action.

**Permittee's Response:**

- a) Comment Acknowledged. There are a total of 42 Data Quality Exceptions where detection levels are above the screening level. Of these, TPH gas and diesel are known to be constituents of concern. Of the remaining 40 compounds, only three have been detected at FWDA. The three compounds include: bis-(2-Ethylhexyl)phthalate (SVOC), Phenol (SVOC), and 2,6-Dinitrotoluene (Explosive).
- b) Comment Acknowledged. With the exception of TPH gas and diesel, the overall list of DQEs does not have direct implications to the interim groundwater monitoring program at FWDA. The Army and its subcontractor have been evaluating the LOD and LOQ screening level detection limit issue and is waiting on BRAC headquarters to provide guidance and funding to proceed.

**10. Permittee's Response to NMED's Disapproval Comment 27, dated July 1, 2020**

**Permittee Statement:** "The new wells (BGMW11, BGMW12, MW13S, MW13D, MW-25 through MW-35, MW36S, MW36D, and TMW50 through TMW64) will be incorporated into the full suite of analytical (including TPH-DRO) starting in year 2021."

**NMED Comment:** The Permittee's response to NMED's July 1, 2020 Disapproval Comment 17 states, "The new wells (BGMW11, BGMW12, MW13S, MW13D, MW-25 through MW-35, MW36S, MW36D, and TMW50 through TMW64) will be incorporated into the full suite of analytical (including TPH-DRO) starting in year 2022." Resolve the discrepancy in the revised Report. The new wells must be sampled for the full analytical suite starting in calendar year 2021.

**Permittee's Response:** Concur. The year 2022 in the statement has been changed to



2021 in the response letter:

*“The new wells (BGMW11, BGMW12, MW13S, MW13D, MW-25 through MW-35, MW36S, MW36D, and TMW50 through TMW64) will be incorporated into the full suite of analytical (including TPH-DRO) starting in year 2021.”*

If you have questions or require further information, please contact me at [George.h.cushman.civ@mail.mil](mailto:George.h.cushman.civ@mail.mil), 703-455-3234 (Temporary Home Office, preferred) or 703-608-2245 (Mobile).

Sincerely,



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Enclosures

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