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Base Realignment and Closure Operations Branch

Mr. Rick Shean
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New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

RE: Final Northern Area Groundwater RCRA Facility Investigation Report, Revision 2, Response to Notice of Disapproval, July 25, 2022, HWB-FWDA-21-004, Fort Wingate Depot Activity, McKinley County, New Mexico, EPA# NM6213820974

Dear Mr. Shean:

This letter is in reply to the New Mexico Environment Department (NMED) Letter of Disapproval dated July 25, 2022, reference number HWB-FWDA-21-004, Final Northern Area Groundwater RCRA Facility Investigation Report, Revision 1. The following are Army's responses to NMED comments, detailing where each comment was addressed and cross referencing the numbered NMED comments.

Comments:

1. Permittee's Response to NMED's Disapproval Comments 6, 47 and 48, dated January 25, 2022.

Permittee Statements: "The naturally occurring organic compounds are likely due to plant matter originating in the geologic formations, both alluvial and bedrock, where the wells are screened." and, "Similar to the detection in Parcels 10A/10B, this TPH-DRO detection [in Parcel 21] is not associated with a distinct source of diesel fuel, and the chromatogram for this detection lacks a distinctive diesel pattern as observed in the diesel standard (Appendix F3)." and, "Based upon the Army's review of the chromatograms, the majority of the laboratory reported DRO and GRO detections do not appear to be related to petroleum hydrocarbons. The analysis and basis for this opinion is presented in section 5.3.5.1. For future groundwater analyses of TPH, organic matter can be removed from analytical reporting via use of silica gel cleanup performed by the laboratory. This procedure is recommended in section 6.3.5 so that future misinterpretations of DRO and GRO data can be minimized."

NMED Comment: Appendix F3 (GRO and DRO Chromatograms) provides 24 chromatograms of the groundwater samples to compare peaks with those of diesel and gasoline standards, and the Permittee intends to demonstrate that the sample peak patterns are not comparable to those of diesel and gasoline standards. However, multiple analytes that may be considered as potential contaminants of concern (COCs) or fuel constituents were detected in the groundwater samples collected from the same wells (see the table below). These analytes may potentially represent peaks identified in the sample chromatograms. The cause of the total petroleum hydrocarbon (TPH) gasoline range

organics (GRO) and diesel range organics (DRO) detections remains unknown; therefore, it is premature to conclude that naturally occurring organic compounds are the sole source of the detections.

For example, the concentrations of TPH GRO and DRO in the groundwater sample collected from well BGMW13S are reported as 21 J and 43 J µg/L, respectively, the sample chromatograms were compared to the standards, and the peak patterns were observed to be different from those of diesel and gasoline standards. However, according to Table 4-3.3 (Groundwater Analytical Detections-VOCs) and Table 4-7.2 (Groundwater Analytical Detections - Other Constituents), toluene, 1,4-dioxane, and 2-methylnaphthalene were also detected in the groundwater sample collected from well BGMW13S. These constituents are site related COCs. Since TPH is analyzed by EPA Method 8015C, which utilizes a flame ionization detector, organic compounds that can be volatilized in the capillary column are not selectively detected as peaks shown on the chromatograms; the peaks may represent site related COCs rather than naturally occurring organic compounds. The following table summarizes the detection of analytes potentially considered as site related COCs that were found in the soil and groundwater samples and may potentially represent TPH GRO and/or DRO peaks on the chromatograms.

| Well ID | TPH-GRO (µg/L) | TPH-DRO (µg/L) | Detected Analytes in GW Samples | Detected Analytes in Soil Samples |
|---------|----------------|----------------|---|---|
| BGMW13S | 21 J | 43 J | toluene, 1,4-dioxane, 2-methylnaphthalene | Samples not retained for chemical analysis |
| BGMW13D | Not Detected | 39 J | 2-methylnaphthalene, naphthalene, pyrene | Samples not retained for chemical analysis |
| MW25 | Not Detected | 36 J | 1,2-dichloroethane | Samples not retained for chemical analysis |
| MW27 | Not Detected | 59 J | naphthalene | Samples not retained for chemical analysis |
| MW28 | 18 J | 51 J | 1,4-dioxane | Samples not retained for chemical analysis |
| MW29 | Not Detected | 55 J | 1,2-dichloroethane, di-n-octyl phthalate | 1,2,4-trimethylbenzene, benzene, ethylbenzene, tetrachloroethene, toluene, xylenes |
| MW30 | 12 J | 33 J | 1-methylnaphthalene, 2-methylnaphthalene, benzo[a]pyrene, benzo[g,h,i]perylene, dibenz[a,h]anthracene | benzene, toluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, ethylbenzene, xylenes |
| MW31 | Not Detected | 77 J | 1,2-dichloroethane, 1,4-dioxane | 1,2,4-trimethylbenzene, benzene, ethylbenzene, toluene, xylenes, 1,2-dichloroethane |
| MW33 | Not Detected | 90 J | 2-Butanone, 2-hexanone, chloromethane, 1,4-dioxane, 2-methylnaphthalene, naphthalene | Samples not retained for chemical analysis |
| MW34 | Not Detected | 32 J | Not Detected | Samples not retained for chemical analysis |
| MW36S | Not Detected | 86 J | phenanthrene | Samples not retained for chemical analysis |
| MW37 | Not Detected | 37 J | benzo[b]fluoranthene, 1,4-dioxane, benzo[k]fluoranthene | 1,2,3-trichlorobenzene, 1,2,4-trimethylbenzene, 1,4-dichlorobenzene, benzene, carbon disulfide, chloromethane, ethylbenzene, hexachlorobutadiene, xylenes, methylene chloride, naphthalene, toluene |
| MW39 | Not Detected | 180 J | p-isopropyltoluene, 4-methyl-2-pentanone, benzene, toluene, 2-hexanone, 1,4-dioxane, pyrene, phenanthrene, naphthalene, fluoranthene, chrysene, bis(2-ethylhexyl) phthalate, benzo[g,h,i]perylene | benzene, toluene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, methylene chloride |
| TMW50 | Not Detected | 420 | benzene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene | Samples not retained for chemical analysis |
| TMW51 | Not Detected | 44 J | benzene, styrene, toluene | Samples not retained for chemical analysis |
| TMW52 | Not Detected | 580 | benzene, toluene, carbon disulfide, 1,4-dioxane | Samples not retained for chemical analysis |
| TMW53 | Not Detected | 45 J | toluene, carbon disulfide | Samples not retained for chemical analysis |
| TMW55 | Not Detected | 46 J | 2-hexanone, di-n-octyl phthalate | Samples not retained for chemical analysis |
| TMW58 | Not Detected | 67 J | 2-butanone, toluene | Samples not retained for chemical analysis |
| TMW59 | Not Detected | 94 J | RDX, naphthalene, bis(2-ethylhexyl) phthalate, caprolactam | Samples not retained for chemical analysis |
| TMW64 | Not Detected | 71 J | chloromethane | Samples not retained for chemical analysis |

In order to evaluate the assertions in the Report, the Permittee must (a) define what analytes

constitute naturally occurring organic compounds and (b) collect groundwater samples from the new wells where TPH-DRO/GRO were detected and (c) conduct TPH- DRO/GRO, VOC, and SVOCs analyses with and without use of silica gel cleanup for at least two consecutive sampling events. The results of analyses must be reported and discussed in the corresponding periodic groundwater monitoring reports. Note that although the use of silica gel cleanup has not been evaluated or approved at this time, a comparison of the TPH-DRO/GRO, VOC, and SVOC analytical results with and without use of silica gel cleanup may allow NMED to evaluate whether the use of silica gel cleanup is permissible. The use of silica gel cleanup must exclusively remove naturally occurring organic compounds without affecting detections of potential COCs. Once the results are evaluated, NMED may approve or disapprove further use of silica gel cleanup for TPH-DRO/GRO analysis. Revise the Report to remove unproven assertions and propose the required analysis detailed above should the Permittee wish to pursue the use of analytical laboratory silica gel cleanup of samples prior to analysis.

Army Response: Concur with document revision and assessment of silica gel cleanup. The Army acknowledges that the presence of organic matter being reported as TPH is unproven. However, non-petroleum materials (organic contaminants, or metabolic products of petroleum biodegradation) are known to interfere with the TPH analysis. At FWDA, the Army believes interference of organic matter is a reasonable assumption given available data. This interpretation forms the basis for the recommendation for the use of the silica gel cleanup. Use of this USEPA-approved analytical method in the future could confirm the interpretation of the interference of organic matter.

The Army will propose to implement parts (a)-(c) of NMED's comment in a Phase 2 Groundwater RFI Work Plan, with a proposed submittal date of October 30, 2023 (please see response to comment #7 below).

Section 5.3.5.1 was revised to incorporate the assumption that the TPH detections are due to interference from organics, see page 5-11, lines 4 and 26.

2. Permittee's Response to NMED's Disapproval Comment 7a, dated January 25, 2022

Permittee's Statement: "Section ES-2.3 - Other Constituents, has been revised to state that metals are constituents of concern."

NMED Comment: Section ES-2.3 (Groundwater Contaminant Plumes), lines 21-22, page ES- 4 states, "[m]etals are naturally occurring constituents of concern and are expected to be reported in both total and dissolved samples." Although the text in Section ES-2.3 was revised, it does not clearly state that metals have previously been released at FWDA as a result of the facility operations. The statement is therefore still misleading and must be corrected for accuracy in the revised Report.

Army Response: Concur.

The Army acknowledges that aluminum may have been released in the Administration Area at AOC 47 as part of a spill of a photoflash compound. No other releases of metals are known to have occurred within the Study Area. The text in Section ES-2.3 has been revised as-follows.

Metals - *Metals were detected at concentrations exceeding screening levels from across the Study Area in both alluvial and bedrock wells. Metals are naturally occurring constituents of concern and are expected to be reported in both total and dissolved samples. In addition,*

highly turbid samples may have contributed to the high metals concentrations. However, aluminum may have been released in the Administration Area at AOC 47 as part of a documented spill of photoflash compound. Total metals analytical results are influenced by the presence of high turbidity. Dissolved samples are not influenced by high turbidity as these samples are filtered prior to collection in the laboratory container.

3. Permittee's Response to NMED's Disapproval Comment 7b, dated January 25, 2022

Permittee Statement: "Total metals analytical results are influenced by the presence of high turbidity. Dissolved samples are not influenced by high turbidity as these samples are filtered prior to collection in the laboratory container."

NMED Comment: Although the Permittee's response is appropriate, the relevant text in Section ES-2.3 was not revised to reflect the Permittee's response. Therefore, NMED's previous Disapproval Comment 7 has not been addressed in the Report. Correct the relevant text in Section ES-2.3 in the revised Report.

Army Response: Concur.

The text in Section ES-2.3 has been revised as follows:

"Total metals analytical results are influenced by the presence of high turbidity. Dissolved samples are not influenced by high turbidity as these samples are filtered prior to collection in the laboratory container."

4. Permittee's Response to NMED's Disapproval Comment 7c, dated January 25, 2022

Permittee Statement: "Section 5.3.5 provides an in-depth discussion of groundwater analytical results for metals. Section 6.3.5 provides recommendations for further investigation of metals."

NMED Comment: Sections 5.3.5 and 6.3.5 provide discussions regarding total petroleum hydrocarbon plumes rather than metals. The referenced sections are not accurate. Reference the appropriate sections of the Report and address NMED's previous Disapproval Comment 7 in the revised Report

Army Response: Concur.

The incorrect references have been corrected.

The text in the following sections has been revised for clarification:

Section **5.3.6.1**: *"No other releases of metals are known to have occurred to the alluvial aquifer within the Study Area."*

And

"No other releases of metals are known to have occurred to the bedrock aquifer within the Study Area."

Section **6.3.6**

However, aluminum may have been released in the Administration Area at AOC 47 as part of a documented spill of photoflash compound. Due to the number of monitoring wells in this area, no additional investigative activities are recommended for metals.

5. Permittee's Response to NMED's Disapproval Comment 9b, dated January 25, 2022

Permittee Statement: "Section 3.4.1 has been revised to reflect that Bedrock Aquifer 1 is defined by thickness and is a laterally discontinuous water bearing zone without sustainable water production."

NMED Comment: According to Table 4-2.1 (Monitoring Well Construction Details), only wells BGMW08, TMW51, TMW52, TMW53 and TMW64 were screened in the Bedrock Aquifer 1 (BR1) and all other wells screened in the sandstone formation were designated as the Bedrock Aquifer 2 (BR2) wells. However, Section 3.4.1 (Drilling) does not provide information regarding the thickness of the aquifer or water production capacity where these wells are distinguished as BR1 or BR2 wells. Section 2.3.7.2 (Bedrock Aquifer) defines that the sandstone thickness of the BR1 interval is 20 feet(\pm 10 feet). According to Appendix E1 (Boring Logs), the sandstone formation was continuously observed at the termination depths at wells TMW51 and TMW64; therefore, the thickness of the sandstone formation remains unknown at the wells. The sandstone formation appears to be thicker than 30 feet at well TMW52 and thinner than 10 feet at well TMW53. The distinction between BR1 and BR2 is still unclear. Provide clear information that defines the distinction between BR1 and BR2 in the revised Report. In addition, a lower water production rate does not necessarily indicate that the water bearing zone is laterally discontinuous unless additional supporting data is provided. Clarify the statements in all applicable sections with additional supporting data in the revised Report.

Army Response: Concur. The Army made the following corrections and corresponding updates to the Report:

- a. TMW51. The boring log for TMW51 was reviewed and found to be in error. The field log for TMW51 reports the bottom 10 feet of the boring as claystone. The boring log for TMW51 presented in Appendix B has been revised. Therefore, the thickness of sandstone formation at TMW51 is known.
- b. TMW64. TMW64 was incorrectly designated as being completed in BR1. Review of the boring log shows that the boring passed through 25 feet of claystone (20 – 45 feet bgs) prior to encountering sandstone to the total depth of 101 feet. This claystone is the distinctive lithologic unit between BR1 and BR2. Adjacent wells (TMW30, TMW31D, TMW39D, TMW48, TMW49, TMW50) are also each designated as being completed in BR2.
- c. Tables 4-2.1 and 4-2.2, 4-2.3, 4-2.4, 4-3.4, 4-5.1, 4-7.1, 4-7.3, 4-7.4, have been revised to designate TMW64 as being completed in BR2.
- d. Figures 2-3.5a and 2-3.5b have been revised to identify BR1 and BR2. Figures 4-2.2, 4-2.3, 4-3.4, have been revised to designate TMW64 as being completed in BR2.
- e. Text revisions:

Section 2.3.7.2 presents a description of BR1 and BR2 based upon prior investigations. Reference to Figure 2.3.5a and Figure 2-3.5b have been added as these figures graphically display the BR1 and BR2 sandstone units.

Section 3.4.1. The description of BR1 and BR2 has been removed from this paragraph as this section presents investigative methods.

Section 4.2.2. This section was revised as follows:

Eight bedrock wells (*three* upper BR1 wells and *five* lower BR2 wells) were drilled and installed in the Study Area. BR1 (upper bedrock unit) *maximum* well depths ranged from 115 feet bgs at TMW52 located *west* of the TNT Leaching Beds to 125 feet bgs at TMW51 located between the TNT Leaching Beds. BR2 (lower bedrock unit) *maximum* well depths ranged from 75 feet bgs at TMW50 in the southern portion of the Study Area, south of the TNT Leaching Beds to 185 feet bgs at TMW58 located northwest of the TNT Leaching Beds. Construction details of the bedrock wells are *presented* in Table 4-2.1.

Section 4.4.2.2. This section was revised as follows:

The average *and range of bedrock* water quality parameters based upon final measurements during groundwater sampling activities in wells associated with the nitrate plume (TMW50, TMW51, TMW52 [insufficient water], TMW53, and TMW58) are summarized from Table 4-2.4 and presented in Table 4-2.5.

Section 4.2.6. This section was revised as follows:

Vertical hydraulic gradients were evaluated between two alluvial aquifer well pairs, *two* alluvial aquifer and upper bedrock unit (BR1) aquifer well pairs, and *three alluvial aquifer* and lower bedrock unit (BR2) well pairs. Groundwater elevations were used to determine the potential for vertical migration (downward or upward movement of water) between adjacent zones. Well pairs used to calculate vertical gradients are within 300 feet of each other, but are screened in different horizons and at different depths. A downward flow component is indicated if the gradient is negative, meaning the hydraulic head is less at depth. Conversely, an upward flow component is indicated if the gradient is positive, meaning the hydraulic head is greater at depth. The magnitude of the gradient indicates its significance.

The vertical gradient values between the well pairs are listed in Table 4-2.3 and illustrated on Figure 4-2.3. Both alluvial well pair units show an upward gradient. *One* well pair in the alluvial to BR1 units shows an upward gradient and one pair shows a downward gradient. *The three alluvial to BR2 unit wells show an upward gradient.*

Section 5.1.3. Bedrock Groundwater. This section has been updated with a description of BR1 and BR2 per the findings of the RFI as follows:

In fall 2019, groundwater levels were measured in wells across the Study Area to provide better delineation of potentiometric surfaces. Groundwater elevations were calculated, and these elevations and elevation contours are shown on Figure 4-2.2. The bedrock aquifer in the Study Area consists of two water-bearing sandstone layers within the Painted Desert Member of the Petrified Forest Formation - *BR1 and BR2. These two units are separated by claystone. Three* new wells were installed in the upper sandstone layer (BR1) and *five* new wells were installed in the lower sandstone layer (BR2). Groundwater elevations between three wells (TMW51, TMW52 and TMW53) in the BR1 were inconsistent and varied by as much as 31.3 feet between wells TMW52 and TMW62 (*which are approximately 1,250 feet apart*), and 9.1 feet between wells TMW52 and TMW53 (*which are located approximately 300 feet apart*). Although the findings indicate the presence of water in BR1, it is unlikely to be an extensive water bearing zone. The extent and gradient of the first water bearing zone could not be completely and reliably assessed. *A review of groundwater elevation data shows no distinct difference in bedrock groundwater elevations between groundwater wells completed in BR1 compared to BR2; therefore, these two units are considered hydraulically connected.*

6. Permittee's Response to NMED's Disapproval Comment 9c, dated January 25, 2022

Permittee Statement: "The hypothesis regarding contaminant communication between the bedrock and alluvial aquifers has been noted. The Army does not have any evidence to support the NMED hypothesis, therefore the text was not updated."

NMED Comment: NMED's previous Disapproval Comment 9 states, "hydraulic communication between the alluvial and bedrock aquifers is evident because contaminants have already migrated vertically across the aquifers in the Study Area; however, interaction between the first and second bedrock aquifers had not been determined because the presence/absence of separate aquifers among the bedrock aquifer has not been clearly demonstrated. Therefore, the former statement can be misleading." The presence of communication between the bedrock and alluvial aquifers is not a hypothesis since contaminants are present in both the alluvial and bedrock aquifers. Revise the Report to address NMED's previous Disapproval Comment 9.

Army Response: Comment Noted. As described in the response to comment 5, units BR1 and BR2 are considered hydraulically connected, and comprise the shallow bedrock aquifer in the Study Area. Persistent vertical gradients measured between the shallow bedrock aquifer and the alluvial aquifer are evidence of a confining unit that inhibits communication between these water bearing units. Furthermore, known releases have occurred at the surface in areas with exposed bedrock. The pattern of contaminants in the bedrock aquifer is consistent with surface releases that migrated directly to bedrock (in areas where the alluvial aquifer and confining units are absent). Therefore, the Army's interpretation is that contamination was released directly to both the bedrock aquifer and the alluvial aquifer, rather than contamination migrating from one aquifer to the other.

The following change was made to the Report to reflect the hydraulic connection between the two units that comprise the shallow bedrock aquifer (BR1 and BR2):

Section 5.1.3. Bedrock Groundwater.

A review of groundwater elevation data shows no distinct difference in bedrock groundwater elevations between groundwater wells completed in BR1 compared to BR2, therefore these two units are considered hydraulically connected.

7. Permittee's Response to NMED's Disapproval Comment 13b, dated January 25, 2022

Permittee Statement: "[T]he Army agrees that the bedrock aquifer in the Administration Area has not been investigated. The Army believes for the reasons stated above that groundwater contamination in this area is unlikely and is reluctant to install deep wells in this area due to the potential for cross contamination from the alluvial aquifer to the bedrock aquifer."

NMED Comment: The Permittee's June 28, 2022 supplemental correspondence does not address the Disapproval Comment 13b. Since the alluvial aquifer is already contaminated and the primary COC at the Administration Area is a chlorinated solvent (i.e., 1,2-dichloroethane) whose specific gravity is greater than one (1) and therefore will sink in water, it is possible that the underlying bedrock aquifer may also be contaminated. In addition, if deep wells are installed using appropriate methods, potential cross contamination between aquifers should not occur. NMED's previous Disapproval Comment 13 states, "submit a work plan to investigate the presence of potential groundwater contamination in the bedrock

aquifer beneath the Administration Area no later than **June 30, 2022.**" Although this comment remains valid, the Permittee's June 28, 2022 supplemental correspondence proposes to submit a work plan by July 30, 2023 due to the Permittee's contracting schedule. Since the Permittee has already had time to initiate the contracting process, an additional year to award a contract is excessive. Accordingly, the Permittee must submit a work plan to investigate the presence of potential groundwater contamination in the bedrock aquifer beneath the Administration Area no later than **February 20, 2023** rather than June 30, 2022.

Army Response: Concur on additional bedrock groundwater investigation.

The Army remains concerned regarding the potential for cross contamination between the alluvial and bedrock aquifers that may occur during drilling or after installation of a groundwater monitoring well through the alluvial aquifer to the bedrock aquifer. However, the Army will include assessment for the presence of potential groundwater contamination in the Administration Area in the Phase 2 Groundwater RFI Work Plan. The Army is pursuing a comprehensive approach to contracting for upcoming related requirements at FWDA that is requiring additional time to develop. The Army is therefore respectfully requesting to revise the proposed submittal date for the Phase 2 Groundwater RFI Work Plan to October 30, 2023.

No changes were made to the Report.

8. Permittee's Response to NMED's Disapproval Comment 14, dated January 25, 2022

Permittee Statements: "The Army removed contamination in the TNT leaching bed area, significantly reducing the amount of contaminant leaching from soil to groundwater."

NMED Comment: The RDX concentrations exceeding the soil leachate-based screening level (SL-SSL) of 0.06 mg/kg were detected in multiple confirmation samples at the TNT leaching bed area; therefore, leaching potential of the contaminants still remains. The text is misleading without stating the fact that the concentrations of multiple contaminants remain above respective SL-SSLs at the TNT leaching bed area. Revise appropriate sections of the Report accordingly.

Army Response: Comment Noted.

The text at sections **Section 2.4.2.2.7**, lines 33-35, page 2-14, and lines 6-8, page 2-15, and **Section 2.4.4.2.1**, lines 27-29, page 2-21, and lines 13-14, page 2-22 have been revised to state the "...with residual nitrate and explosives contamination below an approximate depth of 35 feet."

9. Permittee's Response to NMED's Disapproval Comment 15, dated January 25, 2022

Permittee Statements: "The Army believes that the bedrock nitrate contamination originated from releases to the exposed bedrock at the building 528 Complex."

NMED Comment: NMED does not agree with the Permittee's assertion. The Permittee's assertion may be appropriate to describe the origin of perchlorate plumes; however, since the nitrate contamination is more elevated and expanded in the alluvial aquifer than in the bedrock aquifer, the nitrate contamination in the bedrock aquifer likely originated from the overlying alluvial aquifer. Revise the appropriate sections of the Report or provide additional data to support the assertion in the revised Report.

Army Response: Comment Noted

The Army is providing the following additional data to support the assertion in the revised report that the bedrock nitrate plume originated in the bedrock aquifer, as follows:

- Figure 4-4.1 shows the Alluvial Nitrate Plume as a significantly larger downgradient plume in the alluvial aquifer.
- Figure 4-4.2 show a smaller Bedrock Nitrate Plume originating from the Building 528 complex which is hydraulically upgradient of the alluvial plume.
- Both of these figures show a northerly groundwater flow direction and the Bedrock Nitrate Plume upgradient of the Alluvial Nitrate Plume.
- Figure 4-2.3 illustrates a slightly higher potentiometric surface in the second bedrock unit (semi-confined conditions) which graphically documents a vertical hydraulic gradient from the bedrock aquifer to the alluvial aquifer. Section 5.1.3 discusses the semi-confined conditions and upward gradient from the bedrock aquifer to the alluvial aquifer.

Based upon the data as expressed in these figures, the bedrock nitrate plume is significantly smaller and hydraulically upgradient and is only incrementally intersecting the significantly larger downgradient alluvial plume. The hydraulically upgradient orientation of the bedrock plume reduces the potential for migration from the alluvial aquifer to an upgradient location. Furthermore, the vertically upward hydraulic gradient reduces the potential for downward contaminant migration from the alluvial aquifer to the bedrock aquifer. Based upon these conditions (bedrock plume hydraulically upgradient of alluvial plume, smaller bedrock plume that does not underlie the alluvial plume, and vertical upward hydraulic gradient), the Army believes that the bedrock nitrate contamination originated from releases to the exposed bedrock at the Building 528 Complex. The Army has revised section 5.3.2.1 accordingly.

Section 5.3.2.1 revised as follows:

“As shown on Figure 5-3.1, the configuration of the nitrate plumes (the significantly smaller and hydraulically upgradient bedrock plume incrementally intersecting the significantly larger downgradient alluvial plume) does not support downward contaminant migration from the alluvial aquifer to the bedrock aquifer (Figures 4-4.1 and 4-4.2 provide supporting detail for the individual configuration of the alluvial and bedrock nitrate plumes). Figure 4-2.3 graphically presents data supporting a vertical hydraulic gradient from the bedrock aquifer to the alluvial aquifer. The upward vertical gradient from the bedrock aquifer to the alluvial aquifer reduces the potential for downward migration of contaminants. Due to the geometric plume configuration and upward vertical hydraulic gradients, the Army believes that the bedrock nitrate contamination originated from releases to the exposed bedrock at the Building 528 Complex.”

10. Permittee's Response to NMED's Disapproval Comment 16, dated January 25, 2022

Permittee Statement: "No remediation activities have been performed and the perchlorate remains in soil at this location [the Building 528 Complex]."

NMED Comment: In order to prevent further contamination of groundwater by perchlorate, the Permittee must submit a separate work plan to remediate soils where perchlorate concentrations exceeded applicable SL-SSL no later than **July 30, 2023**.

Army Response: Concur.

The Army will prepare a work plan to remediate soils where perchlorate concentrations exceeded applicable SL-SSLs at the Building 528 Complex. Given the location of the perchlorate spills and the exposed bedrock in the area, the Army proposes to consider addressing the perchlorate contamination through in-situ treatment of the ground and underlying groundwater. The Army proposes a Pilot Study to determine if in-situ remedies are effective for perchlorate and other explosive compounds present at depth and in groundwater that are not amenable to removal action. The Pilot Study will support the upcoming Northern Area Groundwater Corrective Measures Study. The Army is pursuing a comprehensive approach to contracting for upcoming related requirements at FWDA that is requiring additional time to develop. The Army is therefore respectfully requesting to revise the proposed submittal date for the Pilot Study Work Plan to November 30, 2023.

No changes were made to the Report.

11. Permittee's Response to NMED's Disapproval Comment 17, dated January 25, 2022

Permittee Statements: "The statement in Section 2.4.3.3 was revised as follows: "The extent of groundwater perchlorate contamination from previous investigation was determined to be limited to Parcel 21 and Parcel 22."

Well, TMW39D was installed as part of the RFI and the presence of perchlorate at this location is [reported in] Result (Section 4, see Figure 4-5.2) and Finding (Section 5)."

NMED Comment: Since the perchlorate concentrations in the groundwater samples collected from well TMW39D have exceeded the applicable screening level, it is appropriate to state that the extent of the plume is expanding from Parcels 21 and 22 to Parcel 13. In addition, such discussion is not provided in Sections 4 and 5. Reference appropriate sections of the Report if the discussion is provided; otherwise, include the discussion in the revised Report.

Army Response: Concur.

Section 5.3.3.1 has been revised to state that the alluvial and bedrock perchlorate plumes are "*in Parcels 13, 21 and 22*":

Please note that TMW39D is a new well in a location that was not previously sampled, and documents that the perchlorate plume is also in Parcel 13 at this location. The plume is not necessarily expanding but is now known to be present in Parcel 13. TMW39D documents the perchlorate plume configuration, which was previously incomplete.

12. Permittee's Response to NMED's Disapproval Comment 19, dated January 25, 2022

Permittee Statement: "The Army concurs that the depth of soil hydrocarbon contamination extends to the water table; however, not at the location of SWMU 45. The upgradient soil gas and groundwater results suggest an upgradient hydrocarbon source. Furthermore, soil analytical results from the cited report document the depth of TPH in soil at this location."

NMED Comment: According to Table 4-3.2 (Soil Analytical Detections – Chemical), multiple fuel constituents were detected from the soil samples collected from borings MW29, MW30, and MW31 at depths above the water table (10-12 feet below ground surface (bgs)). These borings were advanced in the vicinity of SWMU 45; therefore, it is possible that the soil hydrocarbon contamination extends to the water table at the location of SWMU 45.

Since Comment 7 above requires submission of a work plan to investigate the presence of potential groundwater contamination in the bedrock aquifer beneath the Administration Area, one of the bedrock wells to be advanced in the Administration Area must be proposed within the boundary of SWMU 45 so that the soil samples collected from the boring can be used to assess the vertical extent of contamination within SWMU 45. Include this provision in the work plan required by Comment 7 above.

Army Response: Concur.

The Army will include this provision in the Phase 2 Groundwater RFI Work Plan to assess the vertical extent of hydrocarbon contamination in the boundary of SWMU 45.

No changes were made to the Report.

13. Permittee's Response to NMED's Disapproval Comment 22, dated January 25, 2022

Permittee Statement: "The Army believes that collection and analysis of these soil samples would not change the findings or recommendations presented in this report regarding the extents of the groundwater contamination plumes."

NMED Comment: NMED's previous Disapproval Comment 22 lists potential data gaps associated with lack of soil sample collection and analyses and requires the Permittee to "provide justification for not collecting appropriate samples and not having the appropriate analyses conducted in the revised Report. In addition, propose to submit a work plan for collection and analyses of soil samples to fill the data gaps listed above no later than **June 30, 2022.**" Address each data gap listed in NMED's previous Disapproval Comment 22 and explain why the Permittee believes that collection and analysis of these soil samples would not change the findings or recommendations regarding the extents of the groundwater contamination plumes in the revised Report. Submit a work plan for collection and analyses of soil samples to fill the data gaps no later than **February 20, 2023** rather than June 30, 2022

Army Response: Do Not Concur

The Army respectfully disagrees with this NMED comment regarding data gaps. The purpose of the wells listed in NMED Comments 22(a)-(j) is to identify the extent of contamination in groundwater, and the collection of groundwater samples from these wells satisfies this purpose. The Army does not believe that collecting soil samples at these well locations would change the findings or recommendations regarding the extents of the groundwater contamination plumes. None of the wells in question were installed in contaminant source areas where elevated contaminant concentrations would be expected. The Army has not identified data gaps with respect to soil contamination in these areas.

The Army acknowledges the following direction from NMED in its January 22, 2020 *Approval with Modifications Final Northern Area Background Well Installation and Completion Report*, with regard to installation of future borings: "*In the future, NMED requires the collection of soil samples from every boring for laboratory analysis.*"

No changes were made to the Report.

14. Permittee's Response to NMED's Disapproval Comment 24, dated January 25, 2022

Permittee Statement: "The NMED-approved May 2019 Work Plan addresses the additional sample analyses described in this comment. Work was performed in accordance with the 2018 Work Plan and the 2019 Work Plan with no additional variations to report."

NMED Comment: NMED has no record for receiving a relevant RFI work plan in May 2019. NMED received a revised 2017 interim facility wide groundwater monitoring plan; however, the relevant wells were installed after 2017. Provide a clarification for the cited reference in the revised Report

Army Response: Comment Noted.

The subject work plan is titled: "*Letter work Plan, Downgradient Alluvial Aquifer Investigation & Installation of One Additional Well.*" It is referenced in Section ES-1, line 15 (USACE, 2019). The NMED approval is dated January 22, 2020.

No changes were made to the Report.

15. Permittee's Response to NMED's Disapproval Comment 25b, dated January 25, 2022

Permittee Statement: "Henry's Law is a screening tool and as such can be inaccurate, subject to interference and has its limitations including non-ideal conditions. However, it can quickly provide valuable information that can be used to select sample locations for laboratory analysis. The purpose of the groundwater monitoring well was to delineate the downgradient extent of the groundwater [1,2-dichloroethane (1,2-DCA)] plume. The model was not used for any other purpose. The soil vapor assessment was a screening tool to locate a groundwater monitoring well."

NMED Comment: Although NMED agrees that Henry's Law is a screening tool and as such can be inaccurate, the Permittee established the soil vapor screening criterion based on the selected Henry's Law Constant, which guided the extent of the investigation; therefore, it is important to use an accurate Henry's Law Constant. The Permittee calculated the soil vapor screening level (60 parts per billion by volume (ppbv)) using the New Mexico Water Quality Control Commission (NM WQCC) standard for groundwater protectiveness (5 µg/L) and Henry's Law Constant for 1,2-DCA (0.048). According to the formula provided in Section 3.7.1(Soil Vapor Screening Criteria), the Henry's Law Constant (0.048) is based on a temperature of 298.15 Kelvin (25 degrees Celsius (°C)). If the soil vapor temperature was lower, the Henry's Law Constant would be lower and, proportionally, the soil vapor screening level would be lower, which would result in a larger plume boundary. According to Figure 4-1.1 (1,2-DCA Soil Vapor Plume), elevated 1,2-DCA concentrations were detected in the soil gas samples collected from multiple boring locations outside of the 60 ppbv plume boundary (e.g., SG36, SG47, SG70, SG75, SG83). These locations may potentially be included in the plume boundary if a lower Henry's Law Constant is used. Subsequently, the conclusions and recommendations regarding delineation of the downgradient extent of the groundwater 1,2-DCA plume may change. The soil vapor plume may be larger if the calculated soil vapor screening level is lower. Provide justification for the soil vapor screening level of 60 ppbv or revise the Report to include an empirical value for the Henry's Law Constant.

Army Response: Concur.

The Army concurs that soil conditions at depth may not represent ideal conditions of standard temperature (25°C) and pressure (1 atm) and that the soil temperature may be lower than 25°C, which may result in a larger soil vapor plume at depth.

Based upon the possibility of non-standard conditions at depth, the Report has been revised as follows:

Figure 4-1.1 and Figure 5-2.1 presenting the soil vapor plume contour have been revised as “*estimated*.”

Sections 5.2.1 and 5.2.2 have been revised to incorporate “*estimated*” when describing the soil vapor plume.

Section 5.2.3 has been revised as follows:

Soil vapor temperatures at depth may not represent ideal conditions of standard temperature and pressure and the soil temperature may be lower than 25°C, which may result in a larger soil vapor plume at depth. Based upon the possibility of non-standard conditions at depth, the soil vapor plume contours are estimated.

Section 6.2 has been revised to add soil vapor plume delineation to the west of Building B005. As part of future soil vapor plume delineation (see comment #25), additional data will be collected to assess subsurface conditions or sample analytical methods will be modified to better assess the lateral extent of the soil vapor plume. The Report has been revised as follows: To design a remedy for the soil vapor plume, it is recommended that the horizontal limits of the plume be defined by collection and analysis of additional soil vapor samples to the north, south, west and east of Building B005.

16. Permittee's Response to NMED's Disapproval Comment 25c, dated January 25, 2022

Permittee Statement: "The soil vapor data was not used for a vapor intrusion assessment as suggested by this comment. The intent of the data collection was consistent with the 2018 Work Plan and consistent with NMED Directive in its letter dated July 3, 2019, comment #3: "The Permittee may utilize the HAPSITE GC/MS for soil gas screening purposes. The Permittee is reminded that data collected by field instruments may only be used for screening purposes unless a high correlation with duplicate analytical laboratory data is demonstrated. Field instrument screening data may not be used for confirmation or compliance purposes."

Also note that the soil vapor samples were collected at a depth of approximately 30 feet below ground surface to assess potential presence of groundwater contamination and are not representative of near surface soil vapor conditions which would be used for vapor intrusion purposes.

As intended and directed, none of the data was used for vapor intrusion assessment purposes. Instead, the groundwater sample results from wells MW25 and MW31 provide the empirical data for this investigation, as opposed to the soil vapor data. For these reasons, the units for soil vapor data have not been converted to $\mu\text{g}/\text{m}^3$."

NMED Comment: The Permittee's explanation for not converting the unit for soil vapor data is not relevant. NMED's previous Disapproval Comment 25 states, "[s]tandard units for soil vapor concentrations and NMED's vapor intrusion screening levels are $\mu\text{g}/\text{m}^3$. For all discussion or presentation of soil vapor or air quality data, the Permittee must use $\mu\text{g}/\text{m}^3$ for concentration units." Failure to follow NMED direction constitutes noncompliance and may result in an enforcement action. Resolve the issue in the revised Report.

Army Response: Concur.

The soil vapor units were converted from ppbv to $\mu\text{g}/\text{m}^3$.

The following Report sections were changed accordingly:

- Acronyms and Abbreviations
- Table 3.8.1
- Table 4-1.1
- Figure 4-1.1
- Figure 5-2.1
- Section 3.3.2
- Section 3.7.1
- Section 4.1.2
- Section 5.2.2

17. Permittee's Response to NMED's Disapproval Comment 27, dated January 25, 2022

Permittee Statement: "The Army proposes to address potential soil contamination associated with Building B005 as part of a separate work plan to further investigate data gaps in the Administration Area. Furthermore, B005 is not occupied and is not suitable for occupancy due to the dilapidated interior. Signage will be posted at each entrance indicating that the building is not suitable for occupancy. Therefore, due to the lack of potential for indoor air exposure, the Army does not consider there to be a vapor intrusion hazard at B005."

NMED Comment: It is possible that Building B005 may be used for occupancy in the future. Posting signage alone does not ensure safety for future occupants. Submit a separate work plan to investigate risks associated with vapor intrusion within Building B005, as required by NMED's previous Disapproval Comment 27 no later than **July 30, 2023**.

Army Response: Concur.

The Army will include investigation of vapor intrusion within Building B005 in the work plan to further investigate data gaps in the Administration Area. The Army is pursuing a comprehensive approach to contracting for upcoming related requirements at FWDA that is requiring additional time to develop. The Army is therefore respectfully requesting to revise the proposed submittal date for the work plan to November 30, 2023. Building B005 is vacant and is not suitable for occupancy. In the future the Army intends to demolish this building.

No changes were made to the Report.

18. Permittee's Response to NMED's Disapproval Comment 29, dated January 25, 2022

NMED Comment: Based on the Permittee's response, it is not clear which future periodic monitoring report(s) will address NMED's previous Disapproval Comment 29 to evaluate the presence/absence of separate units within the alluvial/bedrock aquifers (e.g., by comparing the groundwater quality and chemical composition of groundwater in the two zones). Provide a clarification in the revised Report.

Army Response: Concur.

The 2023 Groundwater Periodic Monitoring Work Plan includes information to assess the presence/absence of separate units within the alluvial/bedrock aquifers where suitable well pairs exist.

No changes were made to the Report because NMED's previous Comment 29 said no revision is required.

19. Permittee's Response to NMED's Disapproval Comment 31, dated January 25, 2022

NMED Comment: Although total porosity analysis was conducted for geotechnical samples, effective porosity analysis was not conducted for any geotechnical samples. Effective porosity can often be an important parameter for various remediation technologies. When geotechnical analyses are conducted at the areas where groundwater remediation may potentially be required in the future, include a provision to conduct both total and effective porosity analyses. No revision is required to the Report.

Army Response: Concur.

Total and effective porosity analyses will be considered for geotechnical samples in the future.

No changes were made to the Report.

20. Permittee's Response to NMED's Disapproval Comment 33, dated January 25, 2022

NMED Comment: The chromium concentration in the soil sample collected from boring TMW57 at 55- 57 feet bgs is reported as 5.3 mg/kg in Table 4-3.2 (Soil Analytical Detections- Chemical). Although the reported concentration does not exceed the SL-SSL for total chromium (205,000 mg/kg), it exceeds the SL-SSL for hexavalent chromium (0.192 mg/kg). Submit a work plan to advance a soil boring to collect a soil sample at the nearest accessible location from well TMW57 for hexavalent chromium analysis no later than **July 30, 2023** or provide an explanation why hexavalent chromium analysis is not required in the revised Report.

Army Response: Concur.

The Army provided an explanation why hexavalent chromium analysis is not required in the revised Report.

Section 4.8.1.2 has been revised as follows:

Collection and analysis of soil samples for hexavalent chromium was not identified at the locations of the wells installed as part of the Northern Area Groundwater RFI, as there are no contaminating activities identified that would result in the presence of hexavalent chromium. The relatively low concentration of trivalent chromium as compared to the screening levels is suggestive of the low potential presence of hexavalent chromium. Analysis of hexavalent chromium would not change the findings or recommendations regarding the extents of the groundwater contamination for the Northern Area Groundwater RFI.

21. Permittee's Response to NMED's Disapproval Comment 34, dated January 25, 2022

Permittee Statement: "The following discussions were added to: Section 4.7.2.1: "Nitrite- There were three nitrite exceedances." Section 4.7.2.2: "Nitrite - no screening level exceedances."

NMED Comment: The referenced Sections 4.7.2.1 and 4.7.2.2 are not relevant to the discussion regarding the exceedance of nitrite. Reference the relevant sections of the Report where the discussion is provided or include the required discussion in the revised Report.

Army Response: Concur.

The Army's response mis-stated the sections presenting the revised text. The revised text regarding nitrite data is presented in the following sections:

Section 4.8.2.1:

Nitrite – There were three nitrite exceedances.

Section 4.8.2.2:

Nitrite - no screening level exceedances.

No changes were made to the Report.

22. Permittee's Response to NMED's Disapproval Comment 34, dated January 25, 2022

Permittee Statement: "Based upon the isolated nitrite exceedances and the lack of nitrite exceedances during the 2018 groundwater monitoring year, there does not appear to be a nitrite plume. While similar groundwater purging and sampling methods were used during the RFI and the semi-annual monitoring events, different laboratories were used which may explain the differing groundwater analytical results."

NMED Comment: The nitrite concentrations in groundwater samples collected from wells MW27, MW35, and MW59 [sic TMW59] must be evaluated to determine whether the exceedances were false detections, and the discussion must be provided in the future periodic groundwater monitoring reports. Propose to split the nitrite samples collected from the wells and direct the two laboratories to conduct nitrite analysis to evaluate for potential analytical errors in the revised Report.

Army Response: Concur.

The requested analyses will be performed as part of the periodic groundwater monitoring program and reported therein.

No changes were made to the Report.

23. Permittee's Response to NMED's Disapproval Comment 36, dated January 25, 2022

Permittee Statements: "The shape of the dissolved RDX plume is influenced by the groundwater mound that may be impacted by wells 68 and/or 69. These wells are planned for decommissioning in 2022. Once these wells are decommissioned, the Army will assess the configuration of the RDX plume and the need for further delineation of the RDX plume

using the existing monitoring well network."

NMED Comment: NMED does not believe that the existing monitoring well network is sufficient to assess the configuration of the RDX plume. The distance from well TMW62 to wells TMW21 and MW27 exceeds 500 feet; therefore, the RDX plume boundary west of well TMW62 is not well defined. Submit a work plan to install an additional well to delineate the western boundary of the RDX plume no later than **February 20, 2023**.

Army Response: Do Not Concur.

The Army believes it has sufficiently determined the extent of RDX in the alluvial aquifer to proceed with remedy evaluation and selection. Similar to other groundwater contaminant plumes at FWDA, the Northern Area Groundwater RFI presents groundwater contaminant plume maps using interpolation of groundwater concentrations between the various groundwater monitoring wells. The Army believes that the existing groundwater monitoring well network is sufficient to define the extents of groundwater contamination, including the extent of RDX in the alluvial aquifer, and that additional alluvial groundwater monitoring wells will not provide incremental benefit to groundwater plume delineation.

Installation of additional wells may be necessary as part of groundwater corrective measures. The Army requests that consideration of additional wells be deferred until that time to better address the long-term goals of site remediation.

No changes were made to the Report.

24. Permittee's Response to NMED's Disapproval Comment 36, dated January 25, 2022

Permittee Statement: "At the location of TMW54, the alluvial sediments are shallower than at other nearby locations and are unsaturated. This does not mean that the screen interval for TMW54 was not appropriate, only that the alluvial sediments in this location are sometimes dry. The subsurface conditions at FWDA are variable. The Army does not believe additional investigation is needed at TMW54. TMW54 is being monitored as part of the 2022 semi-annual groundwater monitoring events and if groundwater is present, a sample will be collected."

NMED Comment: Although NMED agrees that the subsurface conditions at FWDA are variable, it does not agree that additional investigation is unnecessary at well TMW54. Although the Permittee proposes to monitor TMW54 as part of future periodic groundwater monitoring events, groundwater is unlikely to be present in well TMW54 due to the shallow depth of the screened interval. Submit a work plan to augment well TMW54 with an adjacent well that is constructed with a more appropriate screened interval or at an alternative nearby location no later than **February 20, 2023**.

Army Response: Comment Noted.

The Army respectfully disagrees with NMED comment. Our rationale is provided below: TMW54 is appropriately constructed in the alluvial sediments and is monitoring groundwater conditions representative of this location. TMW54 was installed correctly to assess groundwater in the alluvial aquifer and is screened from the top of bedrock and through the alluvium. The shallow screen interval is due to the shallow thickness of the alluvial sediments at this location. A deeper screened well will be representative of bedrock conditions. There are several adjacent wells from which groundwater samples are collected and additional alluvial groundwater monitoring wells will not provide incremental benefit to delineation of

any of the groundwater contaminant plumes at this location. The Army believes that the current alluvial groundwater monitoring network in this area is sufficient for groundwater contaminant plume monitoring purposes.

No changes were made to the Report.

25. Permittee's Response to NMED's Disapproval Comment 42, dated January 25, 2022

Permittee Statement: "The Army plans to submit a separate work plan to assess the extent of the soil vapor plume as part of a separate effort to further investigate data gaps in the Administration Area. The Army respectfully requests that this effort be treated independently from the Northern Area Groundwater RFI that is the subject of this report."

NMED Comment: NMED concurs to treat the work plan to investigate the extent of the soil vapor plume, including the potential for vapor intrusion, in the vicinity of Building B006 independently from the Northern Area Groundwater RFI. The work plan must be submitted to NMED no later than **July 30, 2023**. No revision is required to the Report.

Army Response: Concur.

The Army will propose to investigate the extent of the soil vapor plume, including the potential for vapor intrusion, in the vicinity of Building B006, as work plan to further investigate data gaps in the Administration Area. The Army is pursuing a comprehensive approach to contracting for upcoming related requirements at FWDA that is requiring additional time to develop. The Army is therefore respectfully requesting to revise the proposed submittal date for the work plan to November 30, 2023.

No changes were made to the Report.

26. Permittee's Response to NMED's Disapproval Comment 44, dated January 25, 2022

Permittee Statement: "There are no inconsistencies regarding groundwater flow directions and groundwater contaminant plume configurations. As reported, the groundwater at FWDA is variable, hence groundwater contaminant plume configurations are variable as well."

NMED Comment: According to Figure 4-2.1 (Groundwater Elevation Contours -Alluvial), groundwater flows toward the west in the vicinity of the former TNT Leaching Beds. However, according to Figure 4-4.1(Alluvial Groundwater Plume - Nitrate), the nitrate plume expands north rather than west. There is an inconsistency regarding groundwater flow directions and groundwater contaminant plume configurations. Provide more detailed explanation regarding variability of the groundwater flow direction to support the assertion in the revised Report.

Army Response: Comment Noted.

Section 5.3.2.2 was modified as follows:

"Also note that the hydraulic conditions at FWDA have changed over time due do the former use and then cessation of the use of the TNT leaching beds. The TNT leaching beds likely induced alluvial aquifer groundwater mounding which would have influenced groundwater flow directions. Evidence of the mounding is no longer observed from the potentiometric maps (Figure 4-2.1). The influence of the mounding could explain the nitrate plume

configuration which is not currently perpendicular to the alluvial groundwater contours."

27. Permittee's Response to NMED's Disapproval Comment 51, dated January 25, 2022

Permittee Statement: "The Army plans to submit a separate work plan to assess the locations and integrity of the sewer lines, and the potential of the sewer lines as a source nitrate contamination to groundwater. The work plan will be submitted as part of an additional work plan to further investigate data gaps in the Administration Area."

NMED Comment: The work plan must be submitted to NMED no later than **July 30, 2023**. No revision is required to the Report.

Army Response: Concur.

The Army is pursuing a comprehensive approach to contracting for upcoming related requirements at FWDA that is requiring additional time to develop. The Army is therefore respectfully requesting to revise the proposed submittal date for the work plan to November 30, 2023.

No changes were made to the Report.

28. Permittee's Response to NMED's Disapproval Comment 53, dated January 25, 2022

Permittee Statements: "Additional sample and analyses for herbicides is considered investigative. Sampling and analysis for pesticides which were detected at less than screening levels is not required for investigative purposes and can be addressed as needed in the groundwater monitoring program, Groundwater monitoring program recommendations are not provided in the RFI report, and no changes were made."

NMED Comment:

28a. The Permittee must propose to (a) analyze potential COCs and (b) modify the groundwater monitoring program, as necessary, in the RFI reports, based on findings from the investigations. The Permittee recommended to conduct additional groundwater sampling and analysis of herbicides for wells MW36S, BGMW13D and BGMW07. Accordingly, it is appropriate to propose the modifications to the groundwater monitoring program in the upcoming Interim Northern Area Groundwater Monitoring Plan. Revise the Report accordingly.

28b. In addition, pesticides were detected below their respective screening levels in the groundwater samples collected from well TMW52. While the presence of these lower-level detections may be addressed in the uncertainty section, the Permittee has not provided such discussion in the Report.

28c. For the initial screening assessment, all potential site related analytes with at least one detection must be evaluated. Propose to conduct pesticide analysis for the groundwater samples collected from wells TMW40S and TMW52 for a minimum of two consecutive groundwater sampling events in the revised Report and update the sampling requirement in the upcoming Interim Northern Area Groundwater Monitoring Plan, as required by NMED's previous Disapproval Comment 53. This comment also applies to the Permittee's response to NMED's previous Disapproval Comment 54.

Army Response: Concur.

28a. Section 6 Recommendations, has been revised as follows:

“This section presents investigative and additional monitoring recommendations for potential COCs to address data gaps identified during this RFI. The additional monitoring will be performed as part of the semi-annual periodic groundwater monitoring events to assess if detections are repeated.”

28b Section 6.3.6 Herbicides, Pesticides and PCBs has been revised to incorporate analysis of pesticides from wells TMW40S and TMW52 where pesticides were reported at concentrations below screening levels in the groundwater. These analyses will be performed for a minimum of two consecutive groundwater sampling events. This section is revised as follows:

“Additional groundwater sampling and analysis of herbicides is recommended from monitoring wells MW36S, BGMW13D, BGMW07, TMW40S and TMW52 to determine if the reported estimated herbicide and/or concentrations below screening levels detections are repeatable and present. These analyses will be performed for a minimum of two consecutive groundwater sampling events.”

28c The Army will modify the *Interim Northern Area Groundwater Monitoring Plan* to incorporate analysis of pesticides for monitoring wells MW36S, BGMW13D, BGMW07, TMW40S and TMW52 for a minimum of two consecutive groundwater sampling events.

Section 4.9.2.1 Uncertainty Discussion has been revised to incorporate discussion of two pesticides (endosulfan I and 1,4-dioxane) detected in groundwater below their respective USEPA Tapwater RSL values at well TMW52.

This section is revised as follows:

“Groundwater samples from TMW52 had detections of two pesticides (endosulfan I and 1,4-dioxane) in groundwater below their respective USEPA Tapwater RSL values. Endosulfan I was qualified as estimated. No qualification for 1,4-dioxane was required, No bias is present for these two analytes at TMW52. To confirm these single detections below screening levels, recommendations for supplemental analysis are presented in Section 6.3.6.”

Final Comment: The Permittee must submit a revised Report that addresses all comments contained in this letter. 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, 2022**. In addition, the work plan required by Comments 7, 13, 23 and 24 must be submitted no later than **February 20, 2023**. The work plan required by 17, 25 and 27 must be submitted no later than **July 30, 2023**, as requested by the Permittee's June 28, 2022 supplemental correspondence. Furthermore, the work plan required by Comments 10 and 20 must also be submitted no later than **July 30, 2023**. Each investigation required by the comments may independently be submitted as a letter work plan, if the Permittee chooses to do so.

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

Sincerely,

George H. Cushman IV

George H. Cushman IV
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