



**DEPARTMENT OF THE ARMY**  
**FORT WINGATE DEPOT ACTIVITY**  
**P.O. BOX 268**  
**FORT WINGATE, NM 87316**

November 28, 2017

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

RE: *Groundwater Periodic Monitoring Report, January through June 2016, Army's Response to Comments, NMED Disapproval letter dated 7 August 2017 Fort Wingate Depot Activity, Gallup New Mexico.*

Dear Mr. Kieling:

This letter is in reply to the New Mexico Environmental Department (NMED) Disapproval letter dated August 7, 2017, reference number HWB-FWDA-16-013, regarding the Groundwater Periodic Monitoring Report, January through June 2016. The following are the Army's responses to comments received from NMED in the letter. This letter also transmits the revised work plan, and a red-line strike-out electronic copy of the edits.

**Comments:**

**1) General Comment**

**NMED Comment:**

The 2016 Report was written and submitted before receipt of NMED's comments regarding the Final Groundwater Periodic Monitoring Report January through June 2015 (2015 Report). The Permittee must revise the 2016 Report to address NMED's comments regarding the 2015 Report dated May 19, 2017 as many of the comments from the 2015 Report carry over to the 2016 Report. Revise the Report to address NMED's previous comments. Also, ensure that all future reports incorporate the changes made to address the comments concerning both the 2015 Report and the 2016 Report.

**Army Response:**

Comment acknowledged. The NMED comments on the 2015 Report were considered in the revision of the 2016 Report.

**2) Inaccuracies/Discrepancies**

**NMED Comment:**

The 2016 Report contains multiple inaccuracies/discrepancies. Examples are listed below:

- a. Figure 5-1, Spring 2016 Northern Area Nitrate and Nitrite Concentrations in Alluvial Groundwater: The nitrite concentration in well TMW29 is recorded as not detected (ND) in Figure 5-1. while the value is shown as 0.069 J mg/L in Table 5-2.

**Army Response, Figure 5-1:** The values in Table 5-2 are correct. Figure 5-1 was revised with the corrected value of 0.069 J mg/L at TMW29.

- b. Figure 5-2, Spring 2016 Northern Area Nitrate and Nitrite Concentrations in Bedrock Groundwater: The nitrite concentration in well TMW30 is recorded as ND in Figure 5-2, while the value is shown as 0.070 J mg/L in Table 5-2.

**Army Response, Figure 5-2:** The values in Table 5-2 are correct. Figure 5-2 was revised with the corrected value of 0.070 mg/L at TMW30.

- c. Figure 5-2, Spring 2016 Northern Area Nitrate and Nitrite Concentrations in Bedrock Groundwater: The nitrite concentration in well TMW48 is recorded as ND in Figure 5-2, while the value is shown as 0.053 J mg/L in Table 5-2.

**Army Response, Figure 5-2:** The values in Table 5-2 are correct. Figure 5-2 was revised with the corrected value of 0.053 J mg/L at TMW48.

- d. Figure 5-3, Spring 2016 Northern Area Explosives and Perchlorate Concentrations in Alluvial Groundwater: The RDX concentration in TMW40S is recorded as 980 J µg/L in Figure 5-3, while the value is shown as 980 µg/L in Table 5-3.

**Army Response, Figure 5-3:** On Figure 5-3, the data qualifier was removed from the RDX concentration for monitoring well TMW40S. The value in Table 5-3 is correct.

- e. Section 5.1.4, Perchlorate, lines 23-24, page 5-3: The Permittee states, "[p]erchlorate was detected in groundwater samples from 23 alluvial monitoring wells in the Northern Area, with concentrations ranging from 0.015 J to 640 µg/L." The lowest perchlorate concentration is recorded as 0.010 J µg/L in alluvial well TMW22 according to Table 5-4.

**Army Response, Section 5.1.4, Perchlorate, lines 13-14:** The perchlorate concentrations data range was corrected to read: "from 0.010 J to 640 µg/L".

- f. Figure 5-5, Spring 2016 Northern Area VOC, SVOC and TPH Concentrations in Alluvial Groundwater: The methyl tert-butyl ether concentration in well MW01 is not shown in Figure 5-5, while the value is shown as 0.29 J µg/L in Table 5-5.

**Army Response, Figure 5-5:** The values in Table 5-5 are correct. Figure 5-5 was revised with the corrected value of 0.29 J µg/L at MW01.

- g. Section 5.1.6, Other Organic Compounds, lines 21-23, page 5-5: The Permittee states, "[t]he pesticide compound, delta-hexachlorocyclohexane (delta-bhc) was detected at a concentration below the reporting limit at 0.018 J µg/L from alluvial monitoring well TMW40S." The reporting limit for the pesticide compound is not established according to Table 5-7.

**Army Response, Section 5.1.6, Other Organic Compounds, lines 8-11, page 5-5; Table 5-7:** Screening and cleanup levels had not been established for delta-hexachlorocyclohexane (delta-bhc) when the report was prepared. The laboratory limit of



detection (LOD) as reported in the laboratory data files (Appendix C - Attachment 2) is 0.021 µg/L. The detected concentration is below the LOD. EPA Regional Screening Levels were established for delta-bhc in 2017. The 2017 screening levels were added to Table 5-7. The report text was revised to state that the detected concentration was below the screening level.

- h. Section 5.1.6, Other Organic Compounds, lines 35-36, page 5-4: The Permittee states, "[d]iethyl phthalate (0.46 J µg/L at bedrock monitoring well TMW35); detected in samples from one alluvial and one bedrock monitoring wells." TMW35 is an alluvial monitoring well.

**Army Response, 5.1.6, Other Organic Compounds, line 22, page 5-4:** The text was revised to state "at alluvial monitoring well TMW35."

- i. Section 5.1.6, Other Organic Compounds, lines 39-40, page 5-4: The Permittee states, "[p]henathrene (0.57 J µg/L at alluvial monitoring well TMW35); detected in samples from two alluvial and no bedrock monitoring wells." There is a typographical error in the statement (phenanthrene; not phenathrene).

**Army Response, 5.1.6, Other Organic Compounds, line 24, page 5-4:** The compound name was corrected to "phenanthrene."

- j. Section 5.1.6, Other Organic Compounds, lines 17-18, page 5-5: The Permittee states, "[f]ourteen SVOCs were detected from TMW35, which were not detected from any other sample during this monitoring event." 21 SVOCs were detected in the samples obtained from well TMW35, and eighteen of those were not detected from any other sample during this monitoring event according to Table 5-6.

**Army Response, 5.1.6, Other Organic Compounds, line 3, page 5-5:** The statement was revised as follows: "Twenty-one SVOCs were detected in the sample from TMW35, 18 of which were not detected in any other samples from this monitoring event."

- k. Section 5.1.6, Other Organic Compounds, lines 19-20, page 5-5: The Permittee states, "[t]he TWM35 results are not fully described above, but are presented in Table 3-6." Table 3-6 is not found in the Report.

**Army Response, Section 5.1.6, Other Organic Compounds:** The text citation was corrected to Table 5-6.

- l. Figure 5-5, Spring 2016 Northern Area VOC, SVOC and TPH Concentrations in Alluvial Groundwater: There are typographical errors on the detected compound (bis(2-ethylhexyl) phthalate) for wells MW20, MW22S, and TMW41.

**Army Response, Figure 5-5:** On Figure 5-5, the spellings of ethylhexyl and phthalate were revised to use lower case letters.

- m. Figure 5-5, Spring 2016 Northern Area VOC, SVOC and TPH Concentrations in Alluvial Groundwater: The 2,4-dinitophenol concentration in well TMW40S is recorded as 19 J µg/L in Figure 5-5, while the value is reported as 16 J µg/L in Table 5-6.

**Army Response, Figure 5-5:** The values in Table 5-6 are correct. Figure 5-5 was revised with the corrected value of 16 J µg/L at TMW40S.

- n. Figure 5-5, Spring 2016 Northern Area VOC, SVOC and TPH Concentrations in Alluvial Groundwater: The bis(2-ethylhexyl) phthalate concentration in well TMW46 is not shown in Figure 5-5, while the value is reported as 0.84 J µg/L in Table 5-6.

**Army Response, Figure 5-5:** Figure 5-5 was revised to show the value of 0.84 J µg/L for bis(2-ethylhexyl) phthalate at TMW46. The reported value in Table 5-6 is correct.

- o. Figure 5-6, Spring 2016 Northern Area VOC, SVOC and TPH Concentrations in Bedrock Groundwater: Although the groundwater samples from bedrock wells TMW32, TMW39D, TMW40D, TMW48 and TMW49 were not collected for Method 8270 analysis, "not detected (ND)" was indicated instead of "not sampled (NS)".

**Army Response:** Bedrock wells TMW32, TMW39D, TMW40D, TMW48 and TMW49 were sampled for Method 8270 analysis as presented in Table 2-1. All results were non-detect for these well locations and are not presented in the summary table. As specified in the notes section of Table 5-6, if no detection occurred for TPH or SVOCs in the past four sampling events, no non-detect or historical data are presented.

- p. Figure 5-5, Spring 2016 Northern Area VOC, SVOC and TPH Concentrations in Alluvial Groundwater: The Permittee states, "[o]rganochlorine pesticides (by Method SW8081A) were not detected in any monitoring well" in the footnotes. Delta- hexachlorocyclohexane (delta-bhc) was detected at 0.018 J µg/L from the sample collected from alluvial well TMW40S during the spring 2016 sampling event according to Table 5-7.

**Army Response, Figure 5-5:** The note was removed from Figure 5-5.

- q. Table 5-8, Summary of Dissolved Metals Analytical Detections (page 4 of 7): Although the arsenic concentration in well TMW27 was detected above the regulatory limit, the value was not indicated to show the exceedance with bold font.

**Army Response, Table 5-8:** Bold font was added to the arsenic concentration at well TMW27.

- r. Table 5-9, Summary of Total Metals Analytical Detections (page 4 of 7): Although the iron concentration in well TMW26 was detected above the regulatory limit, the value was not indicated to show the exceedance with bold font.

**Army Response, Table 5-9:** The values exceeding the regulatory limit for the October 2014 samples were bolded.



- s. Table 5-9, Summary of Total Metals Analytical Detections (page 1 of 7): Although the manganese concentration in well BGMW03 was detected above the regulatory limit, the value was not indicated to show the exceedance with bold font.

**Army Response, Table 5-9:** The values exceeding the regulatory limit for the October 2014 samples were bolded.

### **SPECIFIC COMMENTS**

**3) Permittee Statement – Section 2.2, Groundwater Sampling, lines 40-42, page 2-1:**

"Monitoring well purging and sampling was performed using a variety of sampling techniques: dedicated low-flow pneumatic pumps from BESST Products, dedicated pneumatic Bennett Sample Pumps, a non-dedicated Grundfos Redi- Flo2 submersible pump, and disposable bailers."

**NMED Comment:**

It appears that some wells were equipped with dedicated pumps and others were sampled by non-dedicated submersible pump or disposable bailers. Explain the rationale for the variance in sampling technique and equipment for each well in the revised 2016 Report. Also, provide a table that describes the sampling technique and equipment (e.g., pumps, disposable or dedicated tubing) used for each well in the revised 2016 Report.

**Army Response, Table 2-1, and Section 2.2:**

Table 2-1 was modified to include the equipment type and purging method. Dedicated low-flow pumps are the dominant sampling device used for the periodic monitoring program. However, some wells have such poor hydraulic performance that they cannot support even the limited flow rates of the low flow pumps. The text in Section 2.2 provides an extensive description on how groundwater samples were collected using the different equipment types.

**4) Permittee Statement – Section 4.1.1, Northern Area Alluvial Groundwater System, lines 31-33, page 4-1:**

"However, the groundwater mound is still observed in the water level data for monitoring well MW02 and may be the result of leakage from the installation water supply well or borehole."

**NMED Comment:**

Even if there is no apparent hydraulic connection between the shallow and deep aquifers, pollutants could migrate into the deep aquifer through faulty construction of the water supply well (Water Supply Well 69) because the well is located near the former fueling facility. Provide all available construction details for the water supply well (e.g., total depth, screen interval).

**Army Response:**

Water Supply Well 69 is completed in the San Andres/Glorieta aquifer. The groundwater potentiometric surface elevation for this aquifer in the Fort Wingate Administration Area is above the ground surface. Groundwater flows from areas of high potential to areas of lower

potential; therefore, leakage from Water Supply Well 69 would discharge from the San Andres/Glorieta aquifer to the shallow alluvial aquifer. Stable isotope analyses by the USGS published in Geochemical Evidence of Groundwater Flow Paths and the Fate and Transport of Constituents of Concern in the Alluvial Aquifer at Fort Wingate Depot Activity, New Mexico (USGS, 2013) confirm discharge of San Andres/Glorieta groundwater to the alluvial aquifer. The well construction diagram for Water Supply Well 69 is attached to this response to comments.

**5) Permittee Statement - Section 4.1.2, Northern Area Bedrock Groundwater System, lines 3-8, page 4-2:**

"Steep horizontal gradients from east to west (in particular, between monitoring wells TMW38 and TMW40D and between monitoring wells TMW17 and TWM37) indicate that a geologic structural feature impedes groundwater flow. Vertical offset of the sandstone layers in the bedrock aquifer by a fault or fracture zones may be present in this area and impede groundwater flow. Contaminant transport of perchlorate to the north (instead of to the west) also provides evidence supporting the conceptual model of a structural impediment to westerly groundwater flow in bedrock beneath the Workshop Area."

**NMED Comment:**

Although it is true that steep horizontal groundwater gradient from east to west is detected between wells TMW38 and TMW40D and wells TMW17 and TMW37, the bedrock surface elevations (elevations where bedrock is encountered) do not change significantly between these wells to indicate the presence of vertical offset. The top of bedrock elevation changes between wells TMW38 to TMW40D and wells TMW17 and TMW37 are recorded as -0.3 and +4.6 feet, respectively, according to the boring logs in the Monitoring Well/ Installation and Abandonment Work Plan, dated April 12, 2011. However, notable elevation differences in the top of the bedrock elevations are detected between wells TMW16 to TMW17(-41 feet) and wells TMW18 to TMW19 (+35 feet). The changes may indicate that a subsurface feature dips to the east between these wells. The higher bedrock elevation west of the Workshop Area may be the cause of slower contaminant transport to the west creating a preferential pathway to the north. Since the theory of a geologic structural feature is unconfirmed, the Permittee must revise the statement to include the fact that the groundwater flow direction has not been fully characterized in the bedrock aquifer beneath the Workshop Area. The groundwater elevation contours in Figure 4-3 and Figure 4-4 must be removed from the revised 2016 Report.

According to TNT Leaching Bed Soil Boring Test Results and Development of Site-Specific Dilution Attenuation Factors, a Geoprobe™ investigation was conducted from March 24 through April 5, 2014 and thirty-four borings were advanced to approximately 35 feet below ground surface (bgs). During the investigation, drilling refusal was encountered within 20 feet bgs while advancing borings SB04, SB09, SB14 and SB18. The location of these soil borings appears to be aligned with the apparent geologic structural feature in Figure 4-3 and Figure 4-4. During excavation of the TNT Leaching Beds, the Permittee must visually inspect the cause of the refusal in the vicinity of borings SB04, SB09, SB14, and SB18 and report all findings in the Interim Measures Report.



**Army Response: Figure 4-3 and 4-4**

Due to the geologic structure at Fort Wingate, the top of the bedrock units is not indicative of the depth to the sandstone water-bearing unit in the Petrified Forest Formation, Painted Desert Member. In this portion of the installation, the Petrified Forest Formation, Painted Desert Member strikes to the northeast, and the sandstone water-bearing unit dips approximately 6 degrees to the northwest as measured on the outcrop near SWMU 27, Building 528 Complex. Due to dipping sandstone unit, the elevation of the top of the bedrock erosional surface is not indicative of the depth to the bedrock aquifer or the potentiometric surface elevation of the bedrock aquifer. As requested, the groundwater elevation contours were removed from Figure 4-3 and Figure 4-4. Excavation activities at the TNT Leaching Beds are not a part of the periodic groundwater monitoring program, However, Army will visually inspect the cause of refusal during the field activities at the TNT beds.

**6) Permittee Statement – Section 5.1.1, Water Quality Parameters, line 27, page 5-1 and Section 5.1.5, Volatile Organic Compound, lines 10-11, page 5-4:**

"Low median values indicate that anaerobic conditions (<1 mg/L) are likely present in some areas of FWDA."

and "The only VOC detected in groundwater samples at concentrations above regulatory levels was the gasoline additive and chlorinated solvent 1,2-dichloroethane."

**NMED Comment:**

Chlorinated solvents are known to undergo dechlorination under anaerobic conditions. However, the presence of other compounds such as nitrate interferes with the process. The incomplete biodegradation of 1,2-dichloroethane produces vinyl chloride. The accumulation of vinyl chloride may be occurring at the site. Include all previously acquired data for vinyl chloride in the revised 2016 Report, and evaluate whether vinyl chloride is accumulating at the site.

**Army Response:**

The reductive dechlorination pathway for 1,2-dichloroethane is to chloroethane and subsequently ethane. Vinyl chloride is the reductive dechlorination daughter product of cis-1,2-dichloroethene. Vinyl chloride has been detected sporadically in a total of 10 groundwater samples collected at the site since 1998. The last vinyl chloride detection was in a sample from TMW39S collected October 18, 2011. There is no indication that vinyl chloride is accumulating at the site. The historical groundwater vinyl chloride data is outside of the date range presented in this report and was not added to the 2016 Report revision.

**7) Permittee Statement – Section 5.1.1, Water Quality Parameters, lines 37-40, page 5-1:**

"Values of Eh below approximately 400 mV in neutral pH waters indicate that perchlorate is susceptible to chemical degradation (Takeno, 2005). Values of Eh below approximately 300 mV in neutral pH waters indicate that nitrate and some nitrogen-based explosive compounds are susceptible to chemical degradation (Takeno, 2005)."

**NMED Comment:**

The reference (Takeno, 2005) does not fully support the Permittee's statement defining degradability of nitrate and perchlorate. Eh-pH diagrams in the reference merely show

dominant species by boundary. Either provide additional reference(s) to support the statement or remove the statement from the revised 2016 Report.

**Army Response: Section 5.1.1, Water Quality Parameters, lines 35-36, page 5-1**  
Comment noted. The EH-ph diagrams illustrate which species are thermodynamically favored under specific groundwater Eh and pH conditions. The statement was deleted.

**8) Permittee Statement – Section 5.1.6, Other Volatile Organic Compounds, lines 4-5, page 5-5:**

"No screening levels were identified for petroleum hydrocarbons."

**NMED Comment:**

NMED's 2015 Risk Assessment Guidance for Investigations and Remediation removed the TPH groundwater standards; however, the updated 2017 Guidance includes TPH standards in Table 6-4. Revise the 2016 Report to include a discussion of the 2017 standards.

**Army Response, Section 5.1.6, Other Volatile Organic Compounds:**

The individual petroleum-related constituents associated with the release of a TPH mixture, such as VOCs and SVOCs, are already evaluated against the appropriate screening level criteria. The groundwater cleanup levels specified in the Fort Wingate RCRA permit include the New Mexico Water Quality Control Commission (WQCC) standards, the federal drinking water maximum contaminant levels (MCLs), and the EPA Regional Screening Levels for tapwater. The TPH screening levels identified in the NMED 2017 Risk Assessment Guidance are not considered in the permit hierarchy for the development of cleanup levels. The statement was deleted.

**9) Permittee Statement – Section 5.1.6, Other Volatile Organic Compounds, lines 10-12, page 5-5:**

"The common plastic additive bis(2-ethylhexyl) phthalate may be present in a variety of laboratory and sampling equipment (including sample tubing, pump, bailer, and laboratory equipment) and was detected in samples from four monitoring wells."

**NMED Comment:**

Concentrations of bis(2-ethylhexyl) phthalate in the sample collected from well TMW18 have been consistently present since 2014. The Permittee's statement is insufficient to justify the presence of the contaminant. Examine each step of the sampling procedure to verify if any variance exists. See Comment 3. In addition, bis(2-ethylhexyl) phthalate was detected from eleven monitoring wells (not four monitoring wells). Revise the 2016 Report to address these issues.

**Army Response, Section 5.1.6, Other Organic Compounds, lines 36-41, page 5-4:**

Concur: The Bennett Pump installed in monitoring well TMW18 failed in early 2014. The pump was removed and sent to the manufacturer for maintenance. As part of the maintenance activities, the water discharge tubing on the pump was replaced. The refurbished pump was reinstalled in the well for the April 2014 monitoring event. The elevated concentrations of Bis(2-ethylhexyl)phthalate in the April 2014 and later



groundwater samples are believed to result from the new discharge tubing installed during the maintenance event.

Statements about the number of detections in samples from alluvial and bedrock monitoring wells were deleted.

**10) Permittee Statement – Section 6.1, Summary, lines 12-15, page 6-1:**

“Groundwater in the bedrock appears to flow radially to a potentiometric low south of monitoring well TMW32 in the eastern portion of the Workshop Area and to the west in the western portion of the Workshop Area, with an interpreted geologic feature impeding flow between the two areas.”

**NMED Comment:**

The groundwater flow direction may be interpreted differently based on the current groundwater water elevations in bedrock monitoring wells, and the contour maps may be drawn without an interpreted geologic feature. The absence of the contaminants in the western portion of the Workshop Area may also be explained by different assumptions and interpretations. See Comment 5. There are not enough bedrock monitoring wells to adequately define the groundwater flow direction in the bedrock aquifer beneath the Workshop Area. Propose installation of additional bedrock monitoring wells to define the groundwater flow direction in the revised Supplemental RFI Work Plan for the northern area groundwater.

**Army Response:**

Comment noted. Also see response to Comment 5. The Army has proposed seven additional bedrock groundwater monitoring wells to be installed within the Workshop Area to refine the conceptual model and bedrock groundwater flow. Also, once the new bedrock wells are installed, a survey of the well network will be conducted to eliminate any discrepancies between historic survey data.

**11) Permittee Statements – Section 6.1 Summary, lines 30-31, page 6-1 and Section 6.2, Recommendations, lines 7-8, page 6-3:**

“The extent of the alluvial nitrate plume is not defined west of the Administration Area”  
And perform additional investigation of the alluvial aquifer nitrate plume to define the western boundary of the plume. The nitrate plume boundaries will be investigated as part of the revised Supplemental RFI.”

**NMED Comment:**

The nitrate concentration in the groundwater sample collected from alluvial monitoring well TMW46 was 82 mg/L during the spring 2016 sampling event. No alluvial monitoring well is present within approximately 1,500 feet to the north of TMW46; therefore, the norther extent of alluvial nitrate plume is also not defined. Propose to investigate all undefined nitrate plume boundaries in the revised Supplemental RFI Work Plan for the northern area groundwater.

**Army Response, Section 6.1 Summary, lines 30-31, page 6-1 and Section 6.2, Recommendations, lines 7-8, page 6-3:**

Concur. The Army added language to indicate the western and northern boundary of the nitrate plume will be investigated. New monitoring wells are proposed to be installed west and north of TMW46 in the Revised Supplemental RFI Work Plan.

**12) Permittee Statements – Section 6.1, Summary, lines 12-15 & 31-32, page 6-1:**

“Groundwater in the bedrock appears to flow radially to a potentiometric low south of monitoring well TMW32 in the eastern portion of the Workshop Area and to the west in the western portion of the Workshop Area, with an interpreted geologic feature impeding flow between the two areas.”

and

“The bedrock nitrate plume is also present at the TNT Leaching Beds (SWMU1) but extends upgradient to the south.”

**NMED Comment:**

The groundwater flow direction contradicts in the Permittee's statements. Revise the 2016 Report to correct the discrepancy.

**Army Response: Section 6.1, Summary, lines 31-32, page 6.1:**

Concur. The text was changed to state: “The bedrock nitrate plume is also present at the TNT Leaching Beds (SWMU 1) but extends downgradient to the south.”

**13) Permittee Statement – Section 6.1, Summary, line 38-39, page 6-1 and Section 6.2, Recommendations, lines 9-10, page 6-3**

“The highest perchlorate concentrations were detected in groundwater samples from the bedrock groundwater unit in the Workshop Area. The northern boundary of the bedrock perchlorate plume has not been defined.” and “Perform additional investigation of the bedrock aquifer perchlorate plume to define the northern boundary of the plume.”

**NMED Comment:**

The plume boundaries must be investigated by installing additional bedrock monitoring wells. The proposed monitoring wells must be located to define the groundwater flow direction north of well TMW02. See Comment 10. Propose installation of additional bedrock monitoring wells to define the perchlorate plume boundary and groundwater flow direction in the revised Supplemental RFI Work Plan for the northern area groundwater.

**Army Response, Section 6.2, Recommendations, lines 11-13, page 6-3:**

Comment Noted. Bullet was edited to read: “Perform additional investigation of the bedrock aquifer perchlorate plume to define the northern boundary of the plume and refine the bedrock groundwater flow direction. The perchlorate plume boundaries will be investigated as part of the revised Supplemental RFI, which includes additional bedrock monitoring well installation.” In the Revised Supplemental RFI Work Plan, additional wells are proposed to determine the extent of the first bedrock water-bearing unit where TMW02 is screened, and will also define the groundwater flow direction related to TMW02.



**14) Permittee Statement – Section 6.2, Recommendations, line 28, page 6-2:**

“Re-survey the elevations of all bedrock monitoring wells. Wells were surveyed during multiple events, which is believed to have introduced errors into the measured groundwater elevation data and associated groundwater potentiometric surface maps. The mapped groundwater flow directions in the bedrock aquifer conflict with the observed contaminant distributions.”

**NMED Comment:**

NMED provided the comment to re-survey all alluvial and bedrock monitoring wells. In the Permittee’s correspondence titled as Approval with Modifications: Final Groundwater Periodic Monitoring Report, July through December 2015, dated in November 9, 2016, the Permittee states, “[t]he Army has plans on resurveying all wells during the Northern Area RCRA Facility Investigation field efforts, anticipated to begin in June 2017.” Revise the 2016 Report to include the new survey data for all monitoring wells. In addition, provide an example where the mapped groundwater flow directions in the bedrock aquifer conflict with the observed contaminant distributions in the revised 2016 Report.

**Army Response:**

Comment Noted. The Army does have plans to resurvey all northern area alluvial and bedrock monitoring wells upon completing the installation of monitoring wells proposed in the Northern Area Supplemental RFI fieldwork. The time period that this Periodic Monitoring Report covers, January through June 2016, is prior to the anticipated date stated by the Army to conduct the resurvey (June 2017). By this, it would be inappropriate to include new data that was not available at this reporting time period, and alter interpretations based on newer data than this Monitoring Report covers. The Supplemental RFI Work Plan is currently in review with NMED at the date of this letter. Once the Supplemental RFI Work Plan is approved and the additional monitoring wells are installed, a survey of existing northern area alluvial and bedrock monitoring wells will be conducted. Any data conflicts will be reported between the new survey data and the existing surveys in the groundwater RFI report.

If you have questions or require further information, please call me at (505) 721-9770.

Sincerely,

PATTERSON.MAR  
K.C.1229214493

Digitally signed by  
PATTERSON.MAR.K.C.1229214493  
DN: c=US, o=U.S. Government, ou=DoD,  
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Mark Patterson  
BRAC Environmental Coordinator

Enclosures

CF:

Media

D Cobrain, NMED HWB

B Wear, NMED HWB  
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S Smith, USACE  
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