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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

August 16, 2018

Mark Patterson
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Fort Wingate Depot Activity
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Steve Smith
USACE
CESWF-PER-DD
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**RE: APPROVAL WITH MODIFICATIONS
GROUNDWATER PERIODIC MONITORING REPORT
JULY THROUGH DECEMBER 2015
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO
EPA ID# NM6213820974
HWB-FWDA-16-004**

Dear Messrs. Patterson and Smith:

The New Mexico Environment Department (NMED) is in receipt of the Fort Wingate Depot Activity's (Permittee) *Final Groundwater Periodic Monitoring Report July through December 2015* (Report), dated May 2016. NMED has reviewed the Report and hereby issues this Approval with Modifications. The Permittee must address the following comments.

GENERAL COMMENTS

1. Inaccuracies/Discrepancies

NMED Comment: The Report contains multiple inaccuracies/discrepancies. Some of them are listed as follows:

- a. **Section 5.1.1, Water Quality Parameters, lines 22-23, page 5-1:** The Permittee states, "[g]roundwater pH measurements ranged from 6.09 to 9.06, with one data point above

9.0 in water from the Northern Area alluvial monitoring wells.” The pH value (9.06) was detected in the groundwater from bedrock monitoring well TMW18 rather than an alluvial monitoring well according to Table 5-1.

- b. Section 5.1.1, Water Quality Parameters, lines 25-26, page 5-1:** The Permittee states, “[d]issolved oxygen values ranged from 0.0 to 7.80 mg/L, with median values of...” The highest measured dissolved oxygen concentration was detected at 8.5 mg/L in the groundwater sample from alluvial monitoring well TMW25 according to Table 5-1. Additionally, three dissolved oxygen concentrations were detected higher than 7.80 mg/L. These concentrations were 8.33, 7.9 and 7.81 mg/L in the groundwater samples from alluvial monitoring wells TMW07, TMW27, and TMW10, respectively.
- c. Section 5.1.3, Explosive Compounds, lines 5-6, page 5-3:** The Permittee states, “[h]exahydro-1,3,5-trinitro-1,3,5-triazine (RDX) (1,000 ug/L at alluvial monitoring well TMW40S); detected in samples from five alluvial and one bedrock monitoring wells.” The compound was detected in groundwater samples collected from four alluvial wells and one bedrock monitoring well according to Table 5-3.
- d. Figure 5-3, Fall 2015 Northern Area Explosives and Perchlorate Concentrations in Alluvial Groundwater:** There is a typographical error on the description of TMW23. The compound having the concentration of 0.41 J ug/L is not 2-Amino-4,6-Dinitrotoluene. It is rather 4-Amino-2,6-Dinitrotoluene.
- e. Section 5.1.6, Other Organic Compounds, lines 7-8, page 5-5:** The Permittee states, “[b]enzoic alcohol (0.48 J ug/L at alluvial monitoring well MW23); detected in samples from three alluvial and no bedrock monitoring wells.” The compound name is misspelled (benzyl alcohol).
- f. Section 5.1.6, Other Organic Compounds, lines 15-16, page 5-5:** The Permittee states, “[f]luoranthene (0.22 J ug/L at bedrock monitoring well MW20); detected in samples from two alluvial and no bedrock monitoring wells.” MW20 is an alluvial monitoring well.
- g. Section 5.1.6, Other Organic Compounds, lines 17-18, page 5-5:** The Permittee states, “[i]sophorone (0.28 J ug/L at alluvial monitoring well MW20); detected in samples from two alluvial and no bedrock monitoring wells Phenathrene (0.26 J ug/L at alluvial monitoring well TMW23).” The description of phenanthrene should be in a separate sentence. Also, the compound name is misspelled.
- h. Section 5.1.6, Other Organic Compounds, lines 37-38, page 5-4:** The Permittee states, “[d]etected concentrations of petroleum hydrocarbons and SVOCs detected in more than one sample are as follows (the maximum detected concentrations are shown in parentheses).” Revise the statement to include all detected compounds (e.g. phenanthrene) in the discussion. The statement “more than one sample” refers to “two or more samples.”

- i. **Table 5-9, Summary of Total Metals Analytical Detections (Page 1 of 7):** Although the chromium concentration in FW35 is recorded as 64 ug/L on 10/28/2014, exceeding the screening limit of 50 ug/L, the value is not highlighted with bold font.
- j. **Table 5-9, Summary of Total Metals Analytical Detections (Page 4 of 7):** Although the iron concentrations in TMW26 are recorded as 340 and 300 ug/L on 10/27/2014, exceeding the screening limit of 300 ug/L, the values are not highlighted with bold font.
- k. **Table 5-9, Summary of Total Metals Analytical Detections (Page 1 of 7):** Although the manganese concentration in BGMW03 is recorded as 140 ug/L on 10/22/2014, exceeding the screening limit of 50 ug/L, the value is not highlighted with bold font.
- l. **Table 5-9, Summary of Total Metals Analytical Detections (Page 3 of 7):** Although the manganese concentration in TMW10 is recorded as 74 ug/L on 10/28/2014, exceeding the screening limit of 50 ug/L, the value is not highlighted with bold font.
- m. **Table 5-8, Summary of Dissolved Metals Analytical Detections (Page 7 of 7):** Although the manganese concentration in TMW39D is recorded as 57 ug/L on 10/30/2014, exceeding the screening limit of 50 ug/L, the value is not highlighted with bold font.
- n. **Table 5-8, Summary of Dissolved Metals Analytical Detections (Page 2 of 7):** Although the cobalt concentrations in MW23 are recorded as 6.7 and 8.5 ug/L on 4/11/2014, below the screening limit of 50 ug/L, the values are highlighted with bold font.
- o. **Section 2.2, Groundwater Sampling, lines 40-41, page 2-2:** The Permittee states, “[a]fter well purging, groundwater samples were collected in laboratory-supplied bottles for the analyses listed in Table 2-1.” Although the groundwater sample collected from monitoring well TMW28 was analyzed for nitrate and nitrite during the fall 2015 sampling event, nitrate and nitrite were not included in Table 2-1.
- p. **Section 6.1, Summary, lines 7-8, page 5-5:** The Permittee states, “[g]roundwater samples collected from four alluvial monitoring wells had concentrations above the EPA MCL of 5 ug/L.” The concentration of 1,2-DCA in the groundwater samples collected from alluvial monitoring wells MD18D, MW20, and TMW33 (three instead of four wells) exceeded the EPA MCL of 5 ug/L according to Table 5-5.
- q. **Section 6.2, Recommendations, line 1, page 6-3:** There is a typographical error (TWM28).

Ensure that all statements provided in all future work plans and reports are accurate.

SPECIFIC COMMENTS

2. Section 2.2, Groundwater Sampling, lines 1-3, page 2-2

Permittee's Statement: "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 using a non-dedicated submersible pump or disposable bailers. Explain the variance in sampling techniques and equipment for each well in the revised 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 next groundwater periodic monitoring report.

3. Section 5.1.1, Water Quality Parameters, lines 27-28, page 5-1

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

NMED Comment: Chlorinated solvents are known to undergo dichlorination process under anaerobic conditions. However, the presence of other compounds such as nitrate interferes with the process. The incomplete biodegradation of 1,2-dichloroethane (EDC) produces highly toxic vinyl chloride. Due to the complexity of the groundwater chemistry at the site, NMED is concerned with potential vinyl chloride accumulation. As a supplement to Table 5-5, provide a table showing the most recent concentration of vinyl chloride in monitoring wells MW01, MW18D, MW20, MW22D, MW22S, TMW33, and TMW35. Include the table in the next groundwater periodic monitoring report. In addition, both 1,2-dibromoethane (EDB) and EDC are lead scavengers that were used as leaded gasoline additives until the late 1980s. EDB may be present at a site where EDC was detected. Therefore, the Permittee must add analysis for EDB to all monitoring wells where EDC has been detected. The analytical method must be capable of detecting EDB at concentrations less than 0.004 ug/L (e.g., EPA Method 8011). Propose the EDB analysis in the upcoming facility-wide groundwater monitoring plan (FWGWMP). Within ninety (90) calendar days after each anniversary of the effective date of this Permit, the updated FWGWMP must be submitted in accordance with the Permit Part V.A.4.

4. Section 5.1.1, Water Quality Parameters, lines 37-40, page 5-1

Permittee's Statement: "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 next groundwater periodic monitoring report.

5. Section 5.1.6, Other Volatile Organic Compounds, lines 28-30, page 5-5

Permittee’s Statement: 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 TMW18 have been significantly higher than in any other monitoring well since 2014. The justification described in the Report is insufficient. Examine each step of the sampling procedure to verify if any discrepancies exist. See Comment 2. Provide further justification in the next groundwater periodic monitoring report.

6. Section 6.1, Summary, lines 12-15, page 6-1

Permittee’s Statement: “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 difference in perchlorate and nitrate concentrations from east to west of the interpreted geologic feature also supports the Permittee’s hypothesis. It appears that the bedrock perchlorate and nitrate contamination are limited to the eastern side of the geologic feature. The hydraulic communication must be verified across the geologic feature. The location of several proposed bedrock wells is depicted in Figure 2-2 of the *Final Groundwater Supplemental RCRA Facility Investigation Work Plan Revision 4* (RFI Work Plan), dated March 23, 2018. Explain how these proposed bedrock wells will help identifying the presence or absence of the hydraulic communication across the geologic feature in the next groundwater periodic monitoring report.

7. Section 6.2, Recommendations, line 27, page 6-2

Permittee’s Statement: “Re-survey the elevations of all bedrock monitoring wells.”

NMED Comment: NMED provided the comment to re-survey all alluvial and bedrock monitoring wells. On the correspondence dated in November 9, 2016 (page 1), 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.” Explain whether the survey has already been conducted. If the survey has been conducted, incorporate the data in all future reports. If the survey has not been conducted, ensure that all alluvial and bedrock monitoring wells are re-surveyed. Provide an explanation in the next groundwater periodic monitoring report. If a re-survey was conducted, provide a table listing the original and re-surveyed elevations in future periodic monitoring reports.

8. Section 6.2, Recommendations, lines 36-37, page 6-2

Permittee’s Statement: “Well TMW40S and FW35 will be replaced by one or more alluvial aquifer monitoring wells proposed in the Supplemental RFI Work Plan.”

NMED Comment: NMED does not agree with replacing TMW40S at this time. TMW40S must be monitored periodically based on the presence of nitrate, explosives, perchlorate, and heavy metals. TMW40S contains more than one foot of saturated well screen; thus, TMW40S should yield sufficient formation water if samplers return to the well to collect water samples several times after purging during the sampling event. Continue monitoring TMW40S in future sampling events. In addition, the replacement of well FW35 was not proposed in the supplemental RFI Work Plan. Provide an explanation for why the replacement of well FW35 was not proposed in the RFI Work Plan. Propose to submit a work plan to replace well FW35, if necessary.

9. Section 6.2, Recommendations, lines 1-2, page 6-3

Permittee’s Statement: “No additional sampling for nitrate/nitrite is recommended at TMW28 because the constituents were not detected in the sample from the Fall 2015 monitoring event.”


NMED Comment: On the correspondence dated in November 9, 2016 (page 2), the Permittee states, “[t]he Army will continue periodic sampling for nitrate/nitrite at monitoring well BGMW02 and will sample for nitrate/nitrite at monitoring well TMW28 during the 2018 groundwater monitoring activities, as requested.” Address this statement in the next groundwater periodic monitoring report.

Messrs. Patterson and Smith
August 16, 2018
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The Permittee must submit a response to comments letter that addresses all comments contained in this Approval with Modifications as well as include any discussion, information, or changes required in the next groundwater periodic monitoring report no later than **November 28, 2018**.

Should you have any questions, please contact Ben Wear of my staff at (505) 476-6041.

Sincerely,



John Kieling
Chief
Hazardous Waste Bureau
New Mexico Environment Department

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File: FWDA 2018 and Reading, Groundwater, FWDA-16-004