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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

November 1, 2016

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**SUBJECT: DISAPPROVAL
FINAL INTERIM MEASURES WORK PLAN PARCEL 21 – SOLID
WASTE MANAGEMENT UNIT 1 – TNT LEACHING BEDS,
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO
EPA # NM6213820974
HWB-FWDA-16-007**

Dear Messrs. Patterson and Smith:

The New Mexico Environment Department (NMED) has reviewed the *Final Interim Measures Work Plan Parcel 21 – Solid Waste Management Unit 1 – TNT Leaching Beds* (Work Plan), dated July 14, 2016 from the Fort Wingate Depot Activity (Permittee) and hereby issues this Disapproval. The Permittee must address the following comments.

GENERAL COMMENTS

1. General Lack of Information

NMED Comment: NMED is concerned that the Permittee has not adequately characterized the subsurface contamination or lithology at SWMU 1. This concern is based on the large distances between sampling locations, as well as the fact that little data was presented in the Work Plan for depths greater than 35 feet (ft) below ground surface (bgs). This lack of critical data increases the potential for over-excavation of soils and missed pockets of

contaminated soils. Lithology overall at Ft. Wingate suggests that there are likely relatively coarse-grained layers, sand stringers, and other preferential pathways for contaminant migration that could have been easily missed based on the sampling conducted to date.

The Work Plan includes an evaluation of the soil-to-groundwater migration pathway and removal of soils that could potentially pose a threat to groundwater. However, excavation is capped to a maximum of 35 feet below ground surface (ft bgs). Groundwater in the vicinity of the planned excavations is located approximately 50 to 60 ft bgs, although wells to the east and south contain water elevations in the 40 ft bgs range. Clarify why excavation of soil is restricted to 35 ft bgs. Provide a justification for not advancing the excavation to the groundwater table in order to remove all source material that exceeds the groundwater leaching criteria. Describe anticipated additional actions if excavation activities are restricted to 35 ft bgs, but confirmation samples show residual contamination above the project action levels.

2. Soil Classification

NMED Comment: The Permittee alternates between soil classification systems and utilizes differing soil designations to describe the subsurface soils at the TNT leaching beds and derive estimated soil parameters depending on the use of the data. This practice can bias calculations and/or modeling results. The Permittee must follow ASTM's *Standard Practice for Classification of Soils for Engineering Purposes*. The USDA Soil Classification System is not appropriate for use at the site and causes confusion for the reviewer. In addition, logs from borings and wells in the vicinity of the TNT leaching beds indicate a wide variety of interbedded lithologies, mostly consisting of combinations of silts and clays.

In addition, visual soil classification descriptions for borings at the site do not correlate well with the classifications derived through laboratory analyses. For instance, for borings TNT-NW, TNT-NE, and TNT-S, out of 25 samples collected and classified by both methods, only one description between visual and laboratory classification matches. Ensure that qualified personnel are performing the visual classification of soils at FWDA.

3. Modeling

NMED Comment: NMED is unable to accept the Permittee's modeling results as a derivation of a site-specific soil screening level (SSL). Issues with the modeling as presented in Appendix A include:

- a) The Permittee did not provide all input data for the model. All data must be provided and its use for this site explained. Provide a table of all input parameters and source of the parameters; further, provide a discussion of the bases of selections for the input parameters, especially when regional data were utilized instead of local or site-specific data;

- b) The Permittee states, “[t]he surface infiltration was estimated previously as described in Henry et al. (2014).” The document cited was disapproved by NMED. NMED is unable to accept modeling results based on values derived from a previously disapproved document;
- c) The hydraulic conductivity values used in the modeling are not acceptable. Table 5 of the Permittee’s 2006 *Supplemental Ground Water Investigation – Administration and TNT Leaching Bed Areas* (2006 Report) presents a range of values for hydraulic conductivity based on slug tests performed at 13 wells. In the Permittee’s 2014 *Fort Wingate Depot Activity TNT Leaching Bed Soil Boring Test Results and Development of Site-specific Dilution Attenuation Factors* (2014 Report), site-specific data from boring logs were used to estimate the hydraulic conductivity. But, the hydraulic conductivity values used in the current modeling were obtained from the Rosetta database and are overestimated. For instance, the average hydraulic conductivity calculated for the 13 wells in the 2006 Report, which included values for both rising and falling head, was 0.017 ft/hr and the average for the closest well to the TNT leaching beds, TMW29, was 0.0025 ft/hr. The 2014 Report estimated the hydraulic conductivity based on site-specific boring logs to be 0.0034 ft/hr. In contrast, the Permittee states, “Horizontal K values ranged from 0.4 ft/hr to 4.0 ft/hr.” Based on the site-specific estimates from previous reports, the Permittee overestimated the hydraulic conductivity at the site by one to three orders of magnitude. These values are not appropriate for use. Use site-specific data, when available, and justify that each estimated input value is appropriate for use at the site.
- d) Figure 5, 3-D conceptual model of averaged subsurface geology, indicates that the majority of soils at the site are coarse grained materials. This is not representative of the site based on boring logs, where the majority of soils at the site appear to be fine grained silts and clays interbedded with silty sands and clayey sands. Using a generalized coarse-grained materials designation for these soils, as well as allowing the modeling program to designate soil properties based on this type, does not represent site conditions.
- e) The groundwater elevation data used in the modeling skews the results. The Permittee utilized 3 downgradient wells and one upgradient well where the groundwater elevation is approximately 20 feet higher than those in the downgradient wells. This creates a very steep groundwater gradient that is likely not representative of conditions at the site.

Based on the interbedded and inconsistent lithology apparent in the boring logs for the site, it appears that an overly generalized model to calculate a groundwater leaching value is not appropriate unless the selected input values are site-specific or very conservative. Unless the Permittee can present a logical and appropriate justification for their estimation of a dilution attenuation factor (DAF) or a model that is consistent with site-specific conditions, the cleanup levels at the site will be set at a DAF of 20.

4. Section 3.2.3, Remediation Goals, Surface to a maximum depth of ten ft. bgs, p 3-4

NMED Comment: The second bullet indicates that if arsenic is greater than the site-specific background level and above the range for background, then the arsenic will be assessed using the NMED residential human health soil screening level (SSL). As noted in the technical review comments on the 2015 version of the IMWP, this does not make sense. If site levels of arsenic are above the site-specific level (5.6 milligrams per kilogram, mg/kg) and above the top of the range for background (11.2 mg/kg is the maximum of the range for background), then clearly, the site will not pass risk (SSL is 4.2 mg/kg). Assuming a site concentration at the upper range of background (11.2 mg/kg) results in a cancer risk level of 2.64E-05, which is above the NMED target risk level of 1E-05 without considering risk from any other constituents. An additional data quality objective must be added to include removal of soils to background levels to ensure the site can meet closure requirements. Otherwise, arsenic will drive risk, and it will be difficult to demonstrate that the site meets risk and that there is not residual arsenic present due to past site activities.

5. Section 3.2.2, Conceptual Site Exposure Model, p 3-2

Permittee's Statement: "Additionally, ecological risks are being addressed under a separate facility-wide ecological risk evaluation."

NMED Comment: NMED does not agree with the facility-wide approach proposed by FWDA, especially for the small receptors and has requested that NMED discontinue review of the Site-specific Approach for Screening Level Ecological Risk Assessment (SLERA)]. Ecological risks must be evaluated on a site-specific basis. For the TNT beds and associated areas, several lines of evidence can be presented with regard to ecological risk to demonstrate that, while potentially complete exposure pathways may be present, only a qualitative assessment is likely required.

- a) The area of impact includes the leaching beds and several miscellaneous areas. Given the small acreage of the SWMU (under 10 acres combined), the only receptors required for assessment are the deer mouse, the horned lark, and plants.
- b) The estimated depth for the leaching beds is up to 35 ft bgs. Thus, there would be no complete exposure pathways for the deer mouse, the horned lark, or plants. No ecological assessment will be required for the leaching beds.
- c) The deer mouse, while considered a burrowing animal, typically does not have deep burrows. The range of burrow depths (based on kangaroo rats and pocket mice) is 0.15 to just over five ft bgs ("Habitat Requirements and Burrowing Depths of Rodents in Relation to Shallow Waste in Burial Sites", <http://pbadupws.nrc.gov/docs/ML1036/ML103620641.pdf>); the horned lark does not burrow. Thus for the deer mouse and horned lark, a case can be made that the applicable exposure interval is the top five feet of soil. The exposure interval for plants is 0-10 ft bgs.

- d) For the Building 503 footprint, the settling tank area, and the small area soil excavation, depth of excavation is estimated to be less than 10 feet. If excavations are at least five ft bgs, the exposure pathway for the deer mouse and horned lark will be incomplete. For plants, given the very small size of these areas, a case can also be made that the area of impact is relatively small, rendering the exposure pathway incomplete.
- e) In the event that shallow excavations occur and an assessment is needed, excavations are planned to ensure protection of groundwater. Thus, soil will be excavated to meet the soil screening levels (SSLs) for protection of groundwater. The three constituents of concern (COC) that are driving removals are RDX, HMX, and TNT. In the event that excavations are less than five ft bgs, comparing the Tier 1 SSLs for protection of groundwater to the ecological screening levels (ESL) for the deer mouse, horned lark, and plants, the removal criteria are generally protective of the receptors. If the Tier 1 assessment showed excess risk, it is likely that any risk would be reduced to acceptable levels through refinement of an initial screening assessment using the Tier 2 screening criteria and area use factor; a simple refinement using the Tier 2 ESLs along with just the area use factor would likely be sufficient to show acceptable risk.

6. Sections 4.6, Confirmation Sampling of Excavations Sidewalls and Floors

NMED's Comment: As noted in the review comments on the 2015 IMWP, a description of the strategy employed in developing the sampling approach proposed for confirmatory sampling was needed. A discussion of the methodology used in developing the confirmatory sampling approach described in Sections 4.6 and 5.1 is needed to include identification of the techniques (e.g., Visual Sampling Plan, VSP) used and how it was determined that the number of samples and sampling locations proposed in the IMWP are sufficient for the intended use of the confirmatory sampling results (e.g., will sufficient numbers of samples be available to support a risk assessment and determination of an exposure point concentration).

7. Section 4.6.1, Excavation Sidewall Sampling, p 4-18

Permittee's Statement: "Once determined, the segments along each excavation's sidewalls will then be marked with stakes, survey paint, or some other method to clearly delineate the segments."

NMED's Comment: Paint must not be used to delineate sidewall sampling in order to prevent any cross-contamination with the soil samples. Remove any references to using paint near sampling locations from the Work Plan.

8. Section 4.6.2, Excavation Floor Sampling, Bullets 2 and 3, p 4-19

Permittee's Statement: "If any excavation floors are 50 ft. by 50 ft. or larger (i.e., the Post-1962 leaching bed after the top one ft. has been removed), discrete soil samples will be collected from a grid pattern approximately every 50 ft. on the excavation floor. One discrete confirmation soil sample will be collected at each sample location on the 50 ft. grid pattern."

NMED's Comment: The proposed soil sampling is not appropriate for characterizing the area described above. The Permittee must collect discrete samples at an interval of one sample per every 400 square feet in the base of the excavation. Alternately, NMED may consider composite samples collected for confirmation sampling of the excavation floor. Composite samples must be comprised of nine subsamples randomly collected from within each sampling area and homogenized prior to placement in sample containers.

9. Section 4.8.1, Waste Soil Classification, p 4-20

Permittee's Statement: "The Red Rock Regional Landfill, through NMED, has stipulated that soil waste characterization sampling must be completed at a rate of every 250 CY [cubic yards] of soil. An acceptable method of soil stockpile sampling is to create 1,000 CY soil stockpiles and sample each stockpile in four equally spaced locations (quadrants) in order to achieve the 250 CY sample requirement."

and

"Four samples of soil will be collected from every 1,000 CY soil stockpile by collecting a discrete soil sample from each quarter of the stockpile."

NMED's Statement: NMED does not agree that this is an acceptable method of soil stockpile sampling. A single discrete sample is not representative of 250 CY of soil, and four discrete samples are not representative of 1000 CY of soil. The Permittee must follow the protocol for stockpile sampling as described in their February 19, 2013 *Approved Final Removal Work Plan HWMU, Parcel 3*, Section 3.9.1, Stockpile Sampling Method. This protocol requires 250 CY stockpiles, one composite sample per stockpile consisting of ten subsamples, 5 of them collected from the first 125 CY and 5 collected from the second 125 CY. The subsamples are required to be collected one to two feet below the surface of the stockpile. An alternative to the composite sampling would be to collect a single discrete sample for every 100 CY of soil.

10. Figure 4-4, Soil Sampling Screening Summary Parcel 21 – SWMU 1

NMED's Comment: Figure 4-4 must be edited for legibility and organized so that the data is readable. The issues with this figure include:

- a) Many labels on the figure are covered by other labels, thereby making them illegible;

- b) The label font sizes do not match throughout the figure, e.g., some wells are labeled with a very small font, while others are labeled with a large font, with no indication of reason or purpose;
- c) Some wells have up to 9 labels with no indication for the differentiation for the multiple labels;
- d) There are duplicate labels on the figure;
- e) While the black or red font indicates which criterion is exceeded, the figure would be more useful if the text boxes also included the contaminant concentrations. Include contaminant concentrations in the revised figure;
- f) It appears that data are missing from the figure, e.g., Table 2-2 indicates that a sample collected at 20 ft bgs from well TWP06 exceeded the leaching criteria, but the figure does not contain data for TWP06;
- g) The lines used to indicate excavation depths are indecipherable from one another in the key;
- h) The figure includes many well/boring locations with no data. If the samples from these wells were analyzed and found to be non-detect, provide a text box with sample depths and "ND" to indicate non-detect;
- i) According to the figure, it appears that no excavation will occur north and south of the triangular leaching bed where exceedances of criteria were observed between 6 and 35 ft bgs (SB22, SB24, SB25, and SB32). This also conflicts with various other figures in the Work Plan.

Revise the figure accordingly. In order to make the figure more useful, separate the data into four figures; one for 0-10 ft bgs, one for 10-20 ft bgs, one for 20-30 ft bgs, and one for sampling greater than 30 ft bgs. The separate maps will also provide a better indication of the data gaps at various depths. Also, provide an explanation as to why the areas north and south of the triangular bed are not being excavated or revise the figure as necessary.

11. Appendix A, Leaching Model, p A-1

NMED's Comment: The labeling of appendices within the appendices is confusing for a reviewer. For example, Appendix A contains an Appendix A. Provide a logical nomenclature for appendices within another appendix. For example, Appendix A-1, A-2, etc.

In addition, the page numbering of Appendix A is repetitive and confusing. For example, there are five pages numbered 1 (one) in the Appendix and several pages with no numbers at all. All Appendices must be presented with properly numbered pages.

Revise the Work Plan to correct these issues.

12. Other Appendices

NMED's Comment: NMED did not review and does not provide approval for:

- Appendix C, Landfill Disposal Management Plan/Documentation
- Final Installation Spill Contingency Plan included in Appendix D
- Appendix E, NRCS Soil Survey of McKinley County, New Mexico
- Appendix G, Programmatic Agreement
- Appendix H, Asphalt Road Construction Specifications
- Appendix I, Laboratory Quality Control Limits

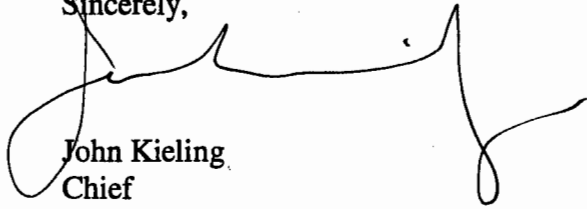
Previous NMED comments on other documents have requested that the Permittee not include full documents or reports as appendices. These documents or reports must be referenced in the Work Plan, but should be submitted to NMED separately as reference documents. In addition, adding full documents, such as the Spill Contingency Plan into an appendix titled, "Field Analysis Work Plan" is confusing. All appendices must have all pages properly numbered for review. Revise the Work Plan to correct these issues.

The Permittee must submit a revised Work Plan to address all comments contained in this Disapproval. In addition, the Permittee must include a response letter that details where all comments were addressed. The Permittee must also submit an electronic redline-strikeout version of the revised Work Plan showing where all changes were made to the Work Plan. The revised Work Plan must be submitted on or before **April 28, 2017**.

Messrs. Patterson and Smith
November 1, 2016
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Should you have any questions, please contact Ben Wear of my staff at (505) 476-6041.

Sincerely,



John Kieling
Chief
Hazardous Waste Bureau

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File: FWDA 2016 and Reading, TNT Leaching Beds, FWDA-16-007