



SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.env.nm.gov



RYAN FLYNN
Cabinet Secretary
BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

July 15, 2016

Mark Patterson
FWDA, BRAC Coordinator
P.O. Box 93
Ravenna, OH 44266

Steve Smith
USACE FWDA Program Manager
CESWF-PEC-EF
819 Taylor Street, Room 3A12
Fort Worth, TX 76102

**RE: DISAPPROVAL
SOIL PERFORMANCE STANDARDS AND SELECTION OF SOIL SCREENING
LEVELS (SSLs) HUMAN HEALTH RISK ASSESSMENT MEMORANDUM
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO
EPA ID# NM6213820974
HWB-FWDA-16-003**

Dear Messrs. Patterson and Smith:

The New Mexico Environment Department (NMED) has reviewed the *Final Memorandum Soil Performance Standards and Selection of Soil Screening Levels (SSLs) Human Health Risk Assessment* (Memo), dated May 18, 2016 from the Fort Wingate Depot Activity (Permittee). NMED hereby issues this Disapproval. The Permittee must address the following comments.

GENERAL COMMENTS

1. Exposure Scenarios

NMED Comment: A traditional residential scenario is proposed in the Memo. However, the land at FWDA is to be handed over to Tribal Trust upon completion of corrective actions and closure. As noted in Section 1.2.1 of NMED's July 1015 *Risk Assessment Guidance for Site Investigations and Remediation* (RA Guidance), all land uses and exposure scenarios must be evaluated, and, if needed, the exposure pathways listed in the RA Guidance should be modified or augmented accordingly. There is no discussion in the Memo on whether any

communication with the Navajo Nation or Pueblo of Zuni has occurred that may result in other land use scenarios (e.g., hunting, gardening/farming, cultural uses, etc.). Provide justification that a standard residential scenario will be protective based on potential Tribal uses.

2. Ecological Risk Memo

NMED Comment: The introduction allows that an ecological risk memo will also be derived. It is unclear why another ecological memo is needed. Several site visits, meetings, and conference calls have previously been held to discuss how to conduct the ecological screening assessments. It was understood at the July 2015 meeting that questions regarding the ecological screening process had been resolved. As such, there does not appear to be any value added in reviewing another summary of this process. In addition, and as discussed more in Comment 7, there does not appear to be any value added for development of a groundwater memo, as the FWDA RCRA Permit (Permit) is very prescriptive in how groundwater is to be evaluated.

SPECIFIC COMMENTS

3. Part A.3, Soil-to-Groundwater, p 2

Permittee's Statement: "Groundwater does not discharge to surface water on the installation nor is it currently used for drinking water, therefore no current complete exposure pathways are present."

NMED Comment: These two examples have no impact on whether the soil-to-groundwater pathway is complete. This pathway assesses the likelihood of the potential for contamination in soil to migrate to groundwater; it is an assessment of the potential for future impacts to groundwater. Current uses of groundwater and surface discharge have no relevance on whether there is a source, or are sources, for contamination. Regardless of the current use of groundwater, surface discharge, or groundwater quality, the soil-to-groundwater pathway must be evaluated to either assess potential for impact (pre-remediation) or confirm source removal and protection of the resource (post remediation).

4. Part A.3, Soil-to-Groundwater, p 2

Permittee's Statement: "Future scenarios could include use of groundwater for domestic uses, therefore the pathway must be evaluated under potential future use scenarios."

NMED Comment: While the soil-to-groundwater pathway will be included for future exposure, the use of groundwater has no relevance on whether this is a complete pathway. As noted above, the soil-to-groundwater pathway must be evaluated to either assess potential for impact (pre-remediation) or to confirm source removal and protection of the resource (post remediation). Current uses of groundwater and surface discharge have no relevance on whether there is a source, or are sources, of contamination.

5. Part A.3, Soil-to-Groundwater, p 2

Permittee's Statement: "In general, the soil-to-groundwater pathway will not be evaluated using soil-to-groundwater SSLs but will be assessed directly by utilizing the groundwater well networks."

NMED Comment: The Memo states that the soil-to-groundwater pathway will not be evaluated using the soil-to-groundwater screening levels (SSLs), but rather that groundwater data will be used to determine impacts. Sufficient lines of evidence have not been provided to support this position, especially for the FWDA as a whole. It is acknowledged that the default SSLs are conservative and may not be representative of a facility's site geology/hydrogeology. However, the SSLs are a screening tool to assess if contamination in soil could pose a threat to groundwater. The SSLs may be refined to reflect site-specific conditions. In addition, the RA Guidance includes a tiered approach and allows for lines of evidence to address exceedances (e.g., source removals and vertical delineation of confirmation data). Monitoring well data, if wells are adequately placed immediately downgradient of a source, do provide useful information on historical and current status with regard to whether contamination has leached to groundwater. In addition, upon source removal and combined with other lines of evidence, groundwater monitoring may be adequate. However, during the investigation process, comparison to SSLs is required to help assess both the need for corrective action and if contamination has been adequately removed to protect groundwater.

6. Part A.3, Soil-to-Groundwater, p 2

Permittee's Statement: "Due to the geology and topography of the southern portion of the installation, there are no plans to utilize a site-specific dilution attenuation factor (DAF) in this portion of the installation."

NMED Comment: It is not clear why the geology and topography prevent calculation of a site-specific SSL. The RA Guidance specifically notes that geologic and hydrologic conditions at a site may not be readily represented by a single default parameter and that site-specific conditions may vary considerably from typical conditions represented by the values used to derive the default SSLs. The RA Guidance allows for derivation of site-specific SSLs to reflect site conditions. Further, for a large facility, a single SSL may not be appropriate for each SWMU/AOC. SSLs should be derived on a SWMU-specific basis to allow for spatial variation in geologic and hydrogeologic parameters.

7. Part A.3, Soil-to-Groundwater, p 2

Permittee's Statement: "The derivation of groundwater screening benchmarks will be compiled as per the hierarchy presented in Attachment 7 of the RCRA permit and will be presented under a separate Memo."

NMED Comment: A separate Memo is not required for groundwater because the FWDA Permit is prescriptive as to how groundwater should be addressed. Unlike soil contaminants, a risk assessment is not typically conducted for groundwater, but rather groundwater is evaluated relative to the Water Quality Control Commission (WQCC) regulations, U.S. Environmental Protection Agency's (EPA) Safe Drinking Water Act Maximum Contaminant Levels (MCLs), and NMED Tap Water Screening Levels. As outlined in Attachment 7.1 of the FWDA permit, the lessor of the contaminant limits listed in Parts 20.6.2.7.WW and 3103 of the New Mexico Administrative Code (NMAC) or the MCL under 40 Code of Federal Regulations (CFR) Parts 141 and 143 is compared to the groundwater exposure point concentration. It is only if there is no WQCC standard or EPA MCL that the tap water screening level is used for comparison. In all cases, a risk assessment is not conducted but rather a point comparison to the prescriptive level; cumulative impacts are not assessed under the WQCC regulations.

However, it should be noted that if a risk assessment for groundwater is to be conducted, a simple screening assessment to tap water screening levels may not be appropriate. Since FWDA is being transferred to Tribal Trust for unrestricted use, additional assessment may be required to evaluate all potential exposure pathways (dermal, showering, gardening use, etc.). As such, it is recommended that the approach as contained in Attachment 7 of the Permit be applied.

In addition, Figure 1 does not show all potentially complete and incomplete exposure pathways for groundwater for each receptor.

8. Part A.4, Vapor Intrusion (VI), p 2

Permittee's Statement: "If chemicals that meet NMED potential vapor intrusion criteria (Henry's law constant of approximately $1E-05$ atm-m³/mole or greater, a molecular weight of approximately 200 g/mole or less, and known to pose a potential cancer risk or non-cancer hazard through the inhalation pathway) are encountered, a lines-of-evidence analysis will be conducted to determine if further evaluation will be required."

NMED Comment: Note that the RA Guidance clearly outlines when a site-specific evaluation must be conducted, to include:

- Very shallow groundwater sources [e.g., depth to water is less than five (5) feet (ft) below foundation level];
- Shallow soil contamination resulting in vapor sources (e.g., VOCs are found at significant levels within 10 ft of the base of the foundation);
- Buildings with significant openings to the subsurface (e.g., sumps, unlined crawlspaces, earthen floors) or significant preferential pathways, either naturally-occurring or anthropogenic (not including typical utility perforations present in most buildings);
- Vapor sources originating in landfills where methane is generated in sufficient quantities to induce advective transport into the vadose zone;

- Vapor sources originating in commercial or industrial settings where vapor-forming chemicals can be released within an enclosed space and the vapor density of a chemical may result in significant advective transport of the vapors downward through cracks and openings in floors and into the vadose zone; and/or
- Leaking vapors from gas transmission lines.

If none of the above conditions apply, and if all the following criteria are met during investigation sampling, the pathway is considered potentially complete and a qualitative discussion of the vapor intrusion pathway will be required:

- Detections of volatile and toxic compounds are minimally detected (e.g., once or twice) in site media (soil, soil gas, and/or groundwater);
- Concentrations are below screening levels;
- There is no suspected source(s) for volatile and toxic compounds; and
- Concentrations are decreasing with depth (for soil).

In addition, if volatile and toxic compounds were present at a site but the source(s) and associated contaminated soil have been removed and the following criteria have been met, only a qualitative assessment of the vapor intrusion pathway will be required:

- Confirmation sampling indicates removal of the source with minimal volatile and toxic compounds detected in soil/soil gas or groundwater data,
- Concentrations are below screening levels,
- No evidence to suggest dense/sinking vapors, and
- Concentrations decrease with depth.

9. Part A.5, Exposure Pathway Analysis Conclusions, p 3

Permittee's Statement: "Beef Ingestion: complete for future residential receptor but does not present significant risk → no further evaluation is required".

NMED Comment: The beef ingestion pathway is not deemed incomplete. Based on the comments provided on Attachment 1 of this Memo (see below), it appears this pathway does require further evaluation.

10. Part B, Background Data and their Role in the Risk Screening Process, p 3

Permittee's Statement: "For arsenic, a background value of 5.6 mg/kg will be used in accordance with NMED's Evaluation of Background Levels for Arsenic in Soil, dated December 18, 2013. If the maximum or 95 Upper Confidence Limit (UCL) for arsenic is greater than 5.6 mg/kg, the detected site range will be compared to the arsenic background concentration range of 0.2-11.2 mg/kg (NMED, 2013). If it determined that the site-specific value of 5.6 mg/kg is exceeded AND the site range is greater than the background range of 0.2-11.2 mg/kg, arsenic will be considered to be above background and the NMED

residential SSL of 4.25 mg/kg (cancer endpoint) will be used for assessment of potential risk (Part D).”

NMED Comment: The comparison of arsenic to a background value of 5.6 mg/kg is not a blanket approach. As noted in the cited *Evaluation of Background Levels for Arsenic in Soil* (NMED, 2013), the approach for arsenic is only appropriate if arsenic is not suspected to be site-related for a specific SWMU/AOC and no source(s) for arsenic have been identified through review of site history. If arsenic is suspected to be site related and/or there are possible sources of arsenic, then the traditional site attribution analysis that follows the methodology outlined in the RA Guidance and site specific background data presented in USACE’s 2013 *Final Phase 2 Soil Background Report* must be applied. The Memorandum must include these caveats to indicate when the background screening to the arsenic level of 5.6 mg/kg is applicable.

11. Part C, Selection of SSLs (Table 1), p 3 and 8

Permittee’s Statement: “SSLs for direct contact for three receptors (residential, commercial/industrial, construction) using NMED SSLs (NMED, 2015) are summarized in Table 1.”

NMED Comment: The screening levels listed in Table 1 of the Memo are based on values current at the time the Memo was drafted. As noted in Attachment 7 of the FWDA Permit, the most current values must be used. As such, it is unlikely that the values listed in Table 1 will be current at the time all of the assessments for FWDA are conducted. It is recommended that screening levels be obtained only at the time reports/assessments are conducted. It is noted that the EPA Regional Screening Levels (RSLs) are updated every six months, and the NMED Soil Screening Levels are being evaluated and updated, with a new version to be released later this year. The most current values at the time of the assessment must be utilized for SSLs.

12. Part C, Selection of SSLs (Table 1), p 3 and 8

NMED Comment: It is noted that there are discrepancies in Table 1. For example, no data are listed for di-n-octyl phthalate or trichloroethene even though data are available in the RA Guidance and the RSL tables. If screening levels are to be tabulated, a thorough review of the data is required. In addition, a schedule for reviewing and updating the table (such as every six months) is also required.

13. Part C, Selection of SSLs (Table 1), p 12

Permittee’s Statement: “The following analytes were not included as they are considered commonly occurring [sic] COCs/essential nutrients: Ca, Mg, K, Na”.

NMED Comment: Table 5-1 of the RA Guidance includes SSLs for essential nutrients, including those listed above. These elements may not be excluded from assessment and must

be evaluated in accordance with Section 5.2 of the RA Guidance. Include these analytes in the risk assessments, as appropriate.

14. Part C, Selection of SSLs (Table 1), p 3 and 8

Permittee's Statement: "The selected screening criteria (Part C, Table 1) from the summary of direct contact pathway receptors (residential, commercial/industrial, construction) and background (Part B) SSLs will be used".

NMED Comment: Using the most conservative screening level regardless of receptor is commonly applied as an action level to ensure laboratory detection limits are sufficient to meet defined data quality objectives. Using the mix and match approach is also a useful tool in assessing data to see if removals may be needed. However, it is not clear how the lowest screening level is to be applied at FWDA. It is not appropriate to mix and match screening levels for demonstration of a specific scenario (residential or industrial). As noted above, this may be a good internal tool but not for use in risk assessments. Using a construction worker screening level for a residential scenario creates a false and overly conservative and skewed estimate of risk. The exposure assumptions are not consistent. Based on the information provided, it is unclear if the goal is to conduct just one assessment and state that the assessment is protective of all three receptors. It is not clear that an assessment will be performed for each receptor population. On a side note, once you show excess risk, it is difficult to justify why the risk can be modified using a different screening level; this is especially difficult to explain to the public. Screening levels must not be mixed between receptors.

15. Part D, Selection of SSLs for Risk/Hazard Screening for Removal Actions, p 4

Permittee's Statement: "TPH, as a mixture, will not be included in the cancer risk/non-cancer hazard totals since it represents a mixture of aliphatic and aromatic hydrocarbons; individual TPH constituents such as VOCs, SVOCs and PAHs are already included in the risk/hazard totals from their evaluation in their analyses categories as individual constituents".

NMED Comment: Please note that the total petroleum hydrocarbon (TPH) section and the methodology for how TPH, mixtures, and aliphatic/aromatic hydrocarbons are to be evaluated in the RA Guidance are being revised. Following Attachment 7 of the FWDA Permit will ensure the most current RA Guidance is applied, which may influence future evaluations.

16. Part D, Selection of SSLs for Risk/Hazard Screening for Removal Actions, p 4

Permittee's Statement: "If an analyte is detected and does not have an NMED SSL or EPA RSL, an SSL will be developed or appropriate surrogate will be used, with NMED approval".

NMED Comment: If a SSL cannot be developed, the constituent must be addressed in the uncertainties section of the risk assessment.

17. Attachment 1, Beef Ingestion Pathway, Section 3.2.2, Site-Specific Refinements to the COC List, p 17

Permittee's Statement: "Three groups of compounds were removed from the evaluation:

- 1) Volatile Organic Compounds (VOCs): these COCs were removed from the installation wide evaluation because they are not widely distributed and are virtually non-detected where tested and do not contribute significantly to risk
- 2) Semi-Volatile Organic Compounds (SVOCs): all COCs in this analysis category were removed with the exception of PAHs, which were all retained. With the exception of PAHs, virtually all COCs in the SVOC category were non-detected where tested and do not contribute significantly to risk
- 3) Polychlorinated Biphenyls (PCBs): these COCs were removed because they are associated specifically (and infrequently) with transformers, whose locations are known and whose contamination is localized and will be mitigated by removal."

NMED Comment: VOCs, SVOCs, and PCBs have been omitted as potential constituents of concern (COCs). However, the data used for the evaluation of the beef pathway as presented in this Memo are based on a limited number of SWMUs/AOCs within a select few Parcels. The Memo does not provide any discussion or justification that the data applied is appropriate for other areas yet to be investigated or for other Parcels. It is unclear how any determination of whether the beef pathway presents an undue risk can be made using such a limited dataset that does not account for all SWMUs/AOCs (refer to Attachment 8 of the Permit) and Parcels. The representativeness of these data and applicability to all sites, including those yet to be investigated, must be evaluated.

18. Attachment 1, Beef Ingestion Pathway, Section 3.2.3, Determining the Concentration Term, p 18

Permittee's Statement: "The following data extraction/reduction was performed:

- 1) Soil data from the 0-5' horizon were selected (shallow rooted plants)
- 2) All data from parcels 7, 13, 21, 22, 23 were combined
- 3) All U qualified data were set equal to zero but were included in the sample count
- 4) All J qualified data were retained
- 5) All R qualified data were removed
- 6) 95 UCLs were calculated for each constituent".

NMED Comments: Comments on the data extraction/reduction are as follows:

- a) The Memo allows that data from Parcels 7, 13, 21, 22, and 23 were combined. Clarify specifically which SWMUs/AOCs were included in the culling of data. In addition, the SWMUs/AOCs for which data were not used (or not available) were not specified.

- b) The Parcels and, specifically, which SWMUs/AOCs were not included in the dataset (e.g., Parcels 2, 3, 4, 6, 9, 11, 16, 15, 19, 20, 24 and SWMUs such as the open burn/open detonation area, the rifle range, demolition areas, landfills/CAMU, etc.) were not discussed. Also, data gaps associated with omission of these areas and the potential for under/overestimation of the risks associated with the beef pathway as currently assessed were not discussed.
- c) Inclusion of "U" qualified data as a zero value is not appropriate and results in a dilution of estimated soil concentrations. As noted in Section 2.7.7 of the RA Guidance, non-detects ("U") should be evaluated following the appropriate methodology outlined in the most recent version of the US EPA's ProUCL Technical Guidance. Further, use of one-half the method detection limit (MDL) or sample quantitation limit or simple substitution (such as setting data equal to zero) are not considered appropriate methods for handling non-detects. Currently, the ProUCL Technical Guide indicated that the Kaplan-Meier (KM) method yields more precise and accurate estimates of decision characteristics than those based on substitution and regression on order statistics. The data must be evaluated accordingly.
- d) The method for deriving the 95% upper confidence limits (UCL) was not discussed and the input (including all data) / output files for the statistical determination of the UCL were not included.

19. Attachment 1, Beef Ingestion Pathway, Section 3.2.4, Area Weighted Exposure Point Concentration for Beef Ingestion (EPC_{AWA-Install}), p 18

NMED Comment: The area weighted EPC is based on an assumption that SWMUs/AOC comprise 8.5% of the land at FWDA and thus the EPC is weighted against a site percentage versus percent of the SWMU/AOC. This most likely overestimates risk. The risks associated with the beef pathway (Table 3) for carcinogens exceeds the NMED target level and the hazard index is slightly below the target level. However, the pathway may not be evaluated independently of other risk. As specified in Sections 2.6 and 5.0 of the RA Guidance, once the beef ingestion risk and hazards are determined, these values should be added to the cumulative risk/hazards (see Equations 57 and 58 in the RA Guidance). When looking at cumulative risk across all pathways, the beef ingestion route will drive cancer risks and there is a potential that the beef hazard could add to exceedances of noncancer hazard. If the approach is still to assess this pathway across the entire FWDA, it is strongly suggested that weighted EPCs be determined on a site-specific basis and a weighted estimation be based on the area within the SWMU/AOC that is impacted. Using the SWMU/AOC specific EPCs, a weighted EPC could then be estimate for the FDWA as a whole. Not only will this result in a more realistic estimation of the EPC, but will provide a better estimation of exposure across the site.

However, there is concern that too much weight is being placed on this pathway. It is unclear why the pathway is not being evaluated on a SWMU/AOC-specific basis. Refining of EPCs for SWMUs/AOCs based on area of impact within the particular site will likely result in this pathway dropping from assessment (as area of impact may be below 2 acres) or contributing a lesser amount to overall risk.

20. Attachment 1, Beef Ingestion Pathway, Section 4.2, Site Cancer Risk, p 19

Permittee's Statement: "After accounting for arsenic, the FWDA Risk_{Beef} is 8.37E-05, which exceeds the target cancer risk threshold of 1E-05. However, two factors mitigate this risk, which only slightly exceeds the target risk threshold; mass removal due to future remediation, and uptake of COCs by plants (PUFs)."

NMED Comment: Uncertainties associated with the excess cancer risk included lack of consideration of source removals and uptake by plants. It is not clear how any determinations on the beef pathway can be made when site investigations are still underway and remediations are not complete. This evaluation is based on an incomplete dataset, likely results in an overestimation of risk that will drive cumulative estimates, and does not account for all sites (which could result in significant changes to the EPCs). It is not clear how any determinations on the significance of the beef pathway can be made at this time.

21. Attachment 1, Beef Ingestion Pathway, Section 4.2, Site Cancer Risk, p 19

Permittee's Statement: "These compilations, histogram and graphical plots of chemical analyses show how a few outliers drive the concentration term and illustrates the high bias pre-remediation concentrations introduce into the pathway screening."

NMED Comment: It is agreed that as currently being derived, a few outliers could have significant impact on the EPC. Using a complete dataset and assessing EPCs on a SWMU/AOC-specific basis will help mitigate the impact of outliers and should lessen overall estimates of risk across the FWDA.

22. Attachment 1, Beef Ingestion Pathway, Section 6.0, Conclusions, p 21

Permittee's Statement: "Based upon this site-specific evaluation, significant risk will result from the beef ingestion pathway and no further evaluation of this pathways [sic] is required."

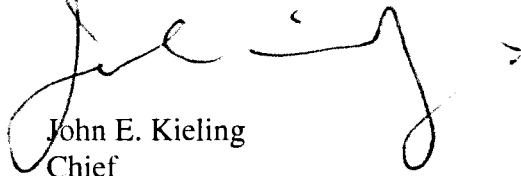
NMED Comment: Based on the evaluation provided in this Memo, it is agreed that significant risk could result from the beef ingestion pathway. Given this, it is not clear why additional evaluation is not required. It appears additional evaluation and refinement is required to meet the overall data quality objective of clean closure and land transfer to the Tribal Trust.

The Permittee must consider the comments provided in this letter when conducting site-specific risk assessments in the future.

Messrs. Patterson and Smith
July 15, 2016
Page 11 of 11

If you have any questions regarding this letter, please contact Ben Wear at (505) 476-6041.

Sincerely,



John E. Kieling
Chief
Hazardous Waste Bureau

cc: Dave Cobrain, NMED, HWB
Ben Wear, NMED, HWB
Chuck Hendrickson, EPA-6PD-N
Tony Perry, Navajo Nation
Val Panteah, Governor, Pueblo of Zuni
Clayton Seoutewa, Southwest Region BIA
Rose Duwyenie, Navajo BIA
Judith Wilson, BIA
Eldine Stevens, BIA
Robin White, BIA
Christy Esler, Sundance Consulting, Inc.

File: FWDA 2016 and Reading, SSLs, FWDA-16-003