NEW MEXICO ENVIRONMENT DEPARTMENT

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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

February 26, 2013

Thomas A. Ladd, Director
Environment and Safety Directorate
U.S. Army White Sands Missile Range
White Sands Missile Range,
New Mexico 88002-5000

RE: DISAPPROVAL
SOIL STUDY BACKGROUND REPORT
SWMU 80, SEWAGE TREATMENT PLAN SLUDGE WASTE PILE SWMUS 12, 14, 16, 17, 21, AND 22, MAIN POST SITES, AND
SWMU 140, FORMER LC-37 PAINT DUMP
WHITE SANDS MISSILE RANGE
EPA ID# NM2750211235
WSMR-12-006

Dear Mr. Ladd:

The New Mexico Environment Department (NMED) has completed its review of White Sands Missile Range's (Permittee) *Revised Soil Study Background Work Plan SWMU 80, Sewage Treatment Plan Sludge Waste Pile (WSMR-30) SWMUs 12, 14, 16, 17, 21, and 22, Main Post Sites (WSMR-60, WSMR-33, WSMR-79, WSMR-73, WSMR-31, and WSMR-32), and SWMU 140, Former LC-37 Paint Dump (WSMR-84)* (Report), dated August 2012 and submitted September 2012. NMED has reviewed the Report and hereby issues this Disapproval and provides the following comments.

Comment 1
In the Abstract section page ii, Section 1.0 (Introduction), and Section 8.0 (Recommendations), the Permittee recommends all of the sites for corrective action

complete without controls status. For all of the sites the Permittee believes are eligible for corrective action complete (CAC), the Permittee must submit a separate request for a permit modification. Documentation to be submitted with the permit modification request generally must include: a summary of the site history and use; a summary of site investigations and the results; a summary of monitoring results showing sufficient decreases in contaminant concentrations; a summary of any remedial actions and the verification of remedy completion (remedy completion report or remediation sampling verification reports including summary of any sampling that showed that the remediation is not complete); demonstration that residual site contamination does or does not exceed the target risk levels of $1x10^{-5}$ for carcinogens, a hazard index of 1.0 for human and ecological receptors and does not exceed established groundwater cleanup levels. The summaries must reference the corresponding documents (including page numbers, where appropriate) that have been submitted, reviewed, and approved by NMED for verification purposes. The decision to designate sites as corrective action complete with or without controls must be defensible. The permit modification request must also comply with the public notice requirements in 40 CFR 270.42(c) incorporated by 20.4.900 NMAC. In the revised Report, remove all references to corrective action complete, the Report is a reference document and not an appropriate submittal for asserting that sites are recommended for corrective action complete.

Comment 2

Comment 4 of NMED's February 15, 2012 Approval with Modifications required that "[i]n lieu of pre-selecting the distribution test for determining the [upper confidence limits] (UCL), the Permittee must ensure that the data will be evaluated for its distribution and the most appropriate test, based on that distribution be used." However, there are several inconsistencies regarding the calculation of background tolerance values:

1) The UCL of the mean concentrations for the background data sets for each SWMU and the Main Post were calculated and displayed in Tables 5-2 through 5-10. It is not clear how or if the Permittee intends to use the UCLs to conduct site versus background comparisons. Site-to-background comparisons must be based on two-sample hypothesis tests, or point-by-point comparisons utilizing 95% UTLs, 95% upper prediction limits (UPLs), or upper percentiles.

2) It appears that the selection of the UCL computational methods was done incorrectly. Section 4.4 (Evaluation of Distributional Assumptions) indicates that distributional tests were conducted on the background data sets. However, it does not appear that the selected UCL computational methods were based on the distribution of the data sets. In Section 4.5 (Calculation Summary of Statistics), the Permittee states, "[t]he 95th UCL of the mean was calculated using the nonparametric 95 percent bootstrap-t method for elements with no nondetect

concentration. The Kaplan-Meier 95 percent bootstrap-t method was used to calculate the 95th UCL of the mean for elements with one or more nondetects." The Environmental Protection Agency (EPA)'s ProUCL 4.1 User's Guide states that the UCL computational method selected should depend on the distribution of the data set (rather than the number of detects/nondetects). Therefore, the UCLs listed in Tables 5-2 through 5-10, in most cases, are not the appropriate values that should have been selected based on the distributions of the data sets.

3) Although Section 4.4 (Evaluation of Distributional Assumptions) indicates that distributional tests were conducted for determining the UTLs, the "Distribution Type" listed in Tables 5-2 through 5-10 are inconsistent with the data distribution results in the ProUCL output files. In addition, it does not appear that the selected UTL was based on the recommended data distribution. While Section 4.4 indicates that tests were conducted to determine whether the data were distributed normally and/or lognormally, it does not appear that the Permittee considered whether the data followed a gamma distribution or any other distribution (Tables 5-2 through 5-10 list the distribution types as either normal, lognormal, or nonparametric). Note that 'nonparametric' does not describe the distribution of the data set, but rather assumes no specific distribution.

4) Many of the UTLs listed in Tables 5-2 through 5-10 are well above the maximum detected concentrations. The UTL is meant to be an upper bound estimate of the maximum concentration and a not-to-exceed value used for point-by-point comparisons. Therefore, the calculated UTL must not be greater than the maximum detected concentration.

5) A coverage coefficient of 95% was selected when computing UTLs. The use of this less conservative coefficient may contribute to results that are larger than the actual background values. A default value of 90% is typically recommended for the coverage coefficient.

6) It does not appear that a statistical outlier test was performed. As instructed in ProUCL, "[w]hile computing reliable background statistics, it is essential that one is dealing with a single population representing site background without potentially impacted observations (outliers)."

The Permittee must correct these issues regarding the calculation of the UCLs. The Permittee must perform a statistical outlier test and remove any values that are outliers. The Permittee must also determine the specific and/or most appropriate distribution of each data set. Additionally, the Permittee must recalculate and propose new background values that are: 1) based on the distribution of the data; 2) upper bound estimates (95 % UTLs, 95% UPLs, or upper percentiles) of the maximum concentrations; 3) not greater

than the maximum detected concentration; and 4) calculated based on a 90% coverage coefficient. The Permittee must select appropriate UCLs that are based on the distributions of the data sets and in the revised Report update Tables 5-2 through 5-10 accordingly and revise the discussion of the statistics.

Comment 3
In Section 2.0 (Site Descriptions and Previous Background Investigation), the Permittee describes the Main Post SWMUs, SWMU 80, and SWMU 140. In the revised Report include additional information regarding previous investigations at the SWMUs; briefly summarize sampling results above residential soil screening levels (SSLs) for comparison to demonstrate that the background soil sampling results discussed in the Report were not affected by historical releases at the sites.

Comment 4
In Section 8.1 (Summary), the Permittee lists the arsenic background screening values for SWMU 80, the Main Post, and SWMU 140. NMED has some reservations regarding the low arsenic values at SWMU 80 and the Main Post. This was also a concern in NMED's December 8, 2006 *Notice of Deficiency Phase III RCRA Facility Investigation (RFI) Report Main Post Multiple Sites (SWMUs 8-17, 21, 22, 80, 140, and 156)*. The low values may effect environmental risk assessments (if the Permittee decides to perform them). It is important that the background values are realistic and representative. In the revised Report, the Permittee must add a discussion regarding the low values, similar to the discussion regarding the high values at SWMU 140 in Section 6 (Geochemical Processes).

Comment 5
In Section 1.0 (Introduction), the Permittee states, "[t]he geologic processes that control the distribution of the 23 TAL metals in soil across WSMR are variable and mandated the development of independent background concentrations for each of these areas." In Section 2.2 (Geology and Soil) the Permittee discusses site-specific geology for the Main Post (Section 2.2.2), SWMU 80 (Section 2.2.3), and SWMU 140 (Section 2.2.4) in general terms and references previous geologic studies, but does not discuss the soils investigated during the field work or during previous investigations in much detail. In the revised Report, the Permittee must include a discussion regarding the site specific geology and its effect on the metals detected at the sites and the background values established by the study in more detail or reference the sections that do discuss these topics.

Comment 6
The Permittee did not include ProUCL files with the Report and submitted them at a later date by NMED request. In the revised Report, include the ProUCL files as an appendix.

The Permittee must address all comments in this Disapproval and submit a revised Report. The revised Report must be accompanied with a response letter that details where all revisions have been made, cross-referencing NMED's numbered comments. In addition, an electronic version of the revised Report must be submitted identifying where all changes were made to the Report in redline strike-out format. The revised Report must be submitted to NMED no later than **May 28, 2013**.

If you have any questions regarding this letter, please contact Kristen Van Horn at (505) 476-6046.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
K. Van Horn, NMED HWB
J. Gallegos, WSMR
B. Avalos, WSMR

File: WSMR 2013 and Reading
WSMR-12-006