



August 1, 2008

DCN: NMED-2008-09

Mr. David Cobrain
Hazardous Waste Bureau
2905 Rodeo Park Dr. E/Bldg 1
Santa Fe, NM 87505



RE: Draft Technical Review Comments on the Phase III Resource Conservation and Recovery Act Facility Investigation (RFI) Report for the High Energy Laser System Test Facility (HELSTF) Sites, White Sands Missile Range, New Mexico

Dear Mr. Cobrain:

This letter serves as a draft deliverable and contains technical review comments on the *Phase III RFI Report for HELSTF at White Sands Missile Range, New Mexico*. Per request, our comments focused on the groundwater and background soil statistical elements of the report. However, per discussion with Cheryl, the groundwater background locations appear to have been collected in areas that have been impacted by site activities. Given the poor quality of these data, no decisions regarding comparison of site groundwater data to background could be conducted with any degree of confidence.

Some of the difficulty in this review was that the Phase III report did not provide an adequate discussion of data previously collected as part of the Phase I and Phase II investigations. Overall, the report was not well-written and it was difficult to assess whether sites had sufficient data to understand the nature and extent of contamination, especially related to soil. It appears that either data related to the Phase I and Phase II investigations needed to be more clearly addressed, or that possibly additional data may be needed. As an example, for most sites, soil data did not appear available for soil between the surface and 20 feet below ground surface. In addition, it appears that there are several unknowns with respect to groundwater. It is assumed that the perched groundwater zones will "go away" with the removal of the ponds. Monitoring is appears to be the immediate proposed course of action. However, I do not believe that a clear understanding of the communication between the perched groundwater zones and the regional aquifer is fully understood, nor is the fate and transport of contaminants in the perched groundwater. These issues should be more clearly defined and addressed as part of the Corrective Measure Study (CMS) reports.

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Comments should not be evaluated as a final work product*

If you or any of your staff have questions, please contact me at (801) 451-2864 or via email at paigewalton@msn.com.

Thank you,

A handwritten signature in black ink that reads "Paige Walton". The signature is written in a cursive style with a large, sweeping initial "P".

Paige Walton
AQS Senior Scientist and Project Lead

cc: Cheryl Frischkorn, NMED (electronic)
Joel Workman, AQS (electronic)

Draft Technical Review Comments on the Phase III RFI Report – HELSTF Sites

1. Globally, the report was very difficult to follow; data were not presented in a useful manner. Please revise the report to include a summary table of all data results for each Solid Waste Management Unit (SWMU) to include the constituents, range of detections, mean concentration, background reference value (where appropriate) and screening level (where appropriate). This should include data from Phases I-III investigations.
2. As part of the evaluation of constituents detected at the High Energy Laser System Test Facility (HELSTF) sites, a comparison of observed results was conducted against the New Mexico Environment Department's (NMED) Soil Screening Levels (SSLs) for a residential scenario (dated 2006). In the event a SSL was not available, a Region 6 medium specific screening level (MSSL) was applied. Please note that NMED is currently in the process of updating their SSLs and will be making these revisions available on-line this summer. In addition, a new database of Regional screening levels (SLs) was published in June 2008. These Regional SLs were drafted by Regions 3, 6, 9; the Regional SLs now supersede the Region 6 MSSSLs (as well as the Region 3 and 9 screening criteria). The Regional SLs may be found at <http://epa-prgs.ornl.gov/chemicals/index.shtml>. One of the primary differences between the new Regional SLs and the former MSSSLs and NMED SSLs is a change in hierarchy of toxicity data. The Regional SLs do not include National Center for Environmental Assessment (NCEA) data, which are typically not peer-reviewed or publically available data, as part of the toxicological hierarchy. The hierarchy applied in the Regional SLs will also be adopted by NMED and will be reflected in the updated NMED SSLs. As part of the review of this Phase III RFI, reported data were compared to the revised (still in draft) NMED SSLs as well as the new Regional SLs. With the exception of the following, there were no significant differences and the overall conclusion of the screening assessment from comparison of site concentrations to the updated/new SLs did not change. However, for all revisions to this report and all future evaluations, either the updated NMED SSLs (once available) and/or the Regional SLs should be used in lieu of the 2006 NMED SSLs and the Region 6 MSSSLs.
 - a. Table 4-4. Organic Compounds Detected in Diesel Spill Zone, page 43. Screening levels for 1-methylnaphthalene and 2-methylnaphthalene are listed as not established. The new Regional SLs include toxicological data for these compounds and these data will be included in the updated NMED SSLs. For 1-methylnaphthalene a residential SL was established as 220 mg/kg (carcinogenic risk adjusted to the NMED target risk level of 1E-05) and for 2-methylnaphthalene 310 mg/kg (noncarcinogenic). It is noted that the maximum observed results in the diesel spill zone are below these SLs, and thus additional evaluation of 1-methylnaphthalene and 2-methylnaphthalene at this site is not warranted.
 - b. The SSL for ethylbenzene is under review, however, the maximum observed value at this site is less than the Regional SL of 57 mg/kg (carcinogenic risk adjusted to the New Mexico target risk level of 1E-05), and thus the conclusion that additional evaluation for fluorine is not required does not change.

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- c. The residential SSL for fluorine is listed as 2.66E+04 mg/kg but the correct SSL datum is 2.66E+03. Please revise accordingly. It is noted that the maximum observed value is still less than the corrected SSL, and thus the conclusion that additional evaluation for fluorine is not required does not change.
3. The purpose of this Phase III facility investigation is stated as being “to present a comprehensive evaluation of previously known contaminant releases and their associated risks at the HELSTF.” While it is not expected that a complete re-hash of the Phase I and Phase II investigations be provided in this Phase III report, some discussion as to the results of the previous investigations is warranted. It is unclear how this Phase III report represents a comprehensive evaluation of the sites.
 - a. Generally, please include a more detailed discussion of what data were included in this report from previous investigations.
 - b. In order to streamline the selection of constituents of potential concern (COPC), individual SWMU sites were combined into zones. The maximum detected concentration from a specific zone was compared to the background data set. If the maximum detected concentration was less than background, the constituent was eliminated as a COPC for the entire zone. It does not appear that any data other than that collected as part of the Phase III investigation were used in the determination of COPCs. As the report does not address previously collected data, it can not be assessed whether higher concentrations of potential COPCs were identified in previous investigations. In order to eliminate a constituent as a COPC, data from all investigations must be considered. Please discuss on a site-by-site case whether soil data from Phases I and II exist, and if so, include a comparison of the cumulative data set to background.
4. At several sites, the Screening Level Ecological Risk Assessment (SLERA) concluded that there were potentially complete exposure pathways and possible ecological impact. For these sites, the maximum detected concentration of various constituents was compared to ecological screening levels. For most sites, there was only one chemical of concern, and thus this approach was acceptable. However, for other sites, such as SWMU 146, there were two COPCs: arsenic and chromium. When assessing ecological impact, cumulate risk must be considered. Overall risk is determined through the calculation of hazard quotients and then summing the individual quotients to determine the hazard index. The hazard index is then compared to the NMED target hazard level of 1.0 for ecological receptors. This process is conducted as it is possible for each COPC to be below a screening level, but the cumulative hazard be in excess of acceptable risk. For each SWMU where a more detailed analysis of COPCs to screening levels is conducted, please provide the associated hazard quotients and where multiple COPCs are present the resulting hazard index. In addition, for each SWMU, please discuss whether any other soil data were available from the Phase I and/or Phase II investigations and if these data were used in determining the maximum detected concentration for the screening assessment.

5. At several sites, organic constituents were detected in soil as well as groundwater. However, there is no discussion of risks associated with the vapor intrusion pathway. As noted in Environmental Protection Agency (EPA) guidance, the use of soil gas data is preferable to bulk soil data for evaluating vapor intrusion (see Johnson and Ettinger http://www.epa.gov/oswer/riskassessment/airmodel/johnson_ettinger.htm). It is not clear whether continued industrial use is realistic for the HELSTF. However, if any of the buildings or structures over contamination soil/groundwater is either occurring or potentially occur in the future, evaluation of the vapor intrusion pathway will be required. As an example, Table 7-2 indicates that SWMU 144 should be monitoring and proposed for no further action (NFA). However, the organics are present in subsurface soil to the lower perched water table. In order for SWMU 144 to qualify for NFA, evaluation of vapor intrusion will be required. Please note that additional investigation including the collection of soil gas data may be warranted.
6. Section 4.1, Identify Contaminations of Potential Concern (COPCs), page 29. The text indicates that only those COPCs for which a standard or screening level could be identified were retained as COPCs. However, all inorganic constituents detected above background levels and all organics should be retained as a COPC regardless of whether standards and/or screening levels are available. For those COPCs for which a reference for comparison is not available, a surrogate datum should be applied and if an appropriate surrogate toxicity datum is not available, potential exposure to the COPC should be addressed in an uncertainties section. Please revise the methodology for identification of COPCs accordingly. Please also identify any constituents that may have been eliminated from the assessments based upon the “lack of standards or screening levels.”
7. Section 4.1, Adopt a Conceptual Site Model, page 29. This section refers for Section 5 for the revised conceptual site model (CSM). While Section 5 does provide a summary of the results of additional groundwater investigation, a CSM was not provided nor specifically addressed. Revise the report to include a revised CSM for both human health and ecological receptors.
8. Section 4.1, Determine an Appropriate Exposure Point Concentration (EPC), page 29. The text discusses the use of upper confidence levels of the mean (UCLs) as exposure point concentrations. However, it does not appear that UCLs were determined at any of the SWMUs evaluated in this report; rather, site maximum concentrations were applied. Please clarify how EPCs were derived and incorporate a discussion on the use of maximum detected concentrations.
9. Section 4.2, Soil, page 30. The second sentence reads, “Samples for AOC-85 were collected at background locations. The remaining samples are from locations in potentially contaminated areas.” This is confusing and it is unclear why samples for Area of Concern (AOC) 85 (site groundwater) were collected from both areas of contamination and “clean” areas and how the groundwater AOC relates to the soil investigation. Please clarify and also distinguish between samples collected as part of the background study and those collected to assess potential impacts to groundwater from HELSTF activities.

10. Section 4.2.1, Background Soil Concentrations, page 33. There are several comments related to background as follows:
- a. Background summary statistics are provided for background (Appendix D). In reviewing the background data files, a total of six samples were used to derive the background reference values. It is assumed that the six samples are those collected from sample locations SB1 through SB6 identified on Figure 4-2 of the report. However, the notation on the ProUCL output files does not allow a clear understanding as to which sampling location/depth the data represent. For example, there are files noted as As 20.0, As 30.0, and As 40.0. First, please provide a summary table of all data used to derive the background data set. Second, clarify the notations used in ProUCL. Third, provide a summary table of the resulting background reference values.
 - b. Appendix D also contains derivation of subsurface background reference values. The report does not address how subsurface is defined or from where these samples were collected. From review of the ProUCL output files, it appears that approximately 30 samples were used to compile the datasets. These 30 sample locations are not obvious from reviewing Figure 4-2. First, please provide a discussion of what these subsurface samples represent. Second, please provide a figure showing the location of the sampling locations used to derive the background subsurface reference value. Third, please provide a summary table of the data used as input into ProUCL and provide a summary table of the resulting subsurface background reference values.
 - c. The locations of the background samples are provided on Figure 4-2. However, the report does not provide any justification for the selection of the location of this area as being appropriate for background. For example, the report should include a discussion of site history to justify that the background reference area has not been impacted for any activities at the White Sands Missile Range (WSMR). In addition, a comparison of soil types from the background samples to soil types noted in the HELSTF is typically conducted to verify that the background area has similar soil/geologic structure. Given that the location of the background location is in close proximity to the HELSTF, it is reasonable to assume likeness of soil. However, the close proximity also leads to concern whether this area have been impacted by site activities. Provide justification for the selection of this area as being representative of non-impacted soil.
 - d. Only six sample locations were selected for derivation of background. While statistically six samples is sufficient to conduct a UCL calculation, six samples collected from such a close proximity to each other does not provide an understanding of natural background variation. Please note that additional background samples may be warranted with future investigations in order to understand natural variations in reference soil at WSMR.

11. Section 4.2.3.1, Diesel Spill Zone, Page 42. Borings were completed and samples were collected every ten feet, with the exception of surface soil. Surface soil is usually defined as up to the top five feet (or less) of soil. However, based upon review of the data provided in Table 4-4, it appears the first sample was collected at 20 feet below ground surface (bgs). Please clarify specifically at what depths samples were collected and if the first organic was not detected until 20 ft bgs. In addition, detections of inorganics are not provided on Table 4-4. While the text indicates concentrations for inorganics were less than screening levels, the concentrations used as well as the screening levels should be included on Table 4-4 or a sub-table. Please revise accordingly.
12. Section 4.2.3.3, Wastewater Lagoons Zone, page 45. Text indicates that arsenic was the only inorganic detected above background and a residential screening level. This is slightly misleading, as several inorganics were detected above background (as noted in Table D-5). Please provide a summary table showing summary statistics of all constituents detected, background, and the appropriate screening level.
13. Section 4.4.1, SWMU 25 Waste Storage Area, page 62. The report indicates that while the concentrations of chromium and zinc are above background, there is no definitive evidence of a spill. Since evaluation of these constituents was carried forward to include review against NMED SSLs, this is not of significant concern. However, it should be noted that when site concentrations are only slightly above background, and additional lines of evidence are needed to justify exclusion of a constituent from additional consideration, a site attribution analysis may be conducted comparing dataset distributions.
14. Section 4.4.2, SWMU 26 Vapor Recovery Unit, page 62. Since no data were associated with this SWMU, it is unclear how NFA can be justified. Additional lines of evidence are warranted to justify NFA. In addition, since subsurface soil underneath SWMU 26 may be impacted by the diesel spill, clarification as to what constitutes SWMU 26 is needed. For example, it may be possible to justify surface soil up to a specific depth meets the criteria for NFA but that deeper subsurface soil impact by the diesel spill does not qualify for NFA. Please address these issues.
15. Table 7-1. Conclusions and Recommendations, page 96. This table is confusing as there is no differentiation between above-ground portions of the SWMUs and associated groundwater. For example, it appears that no further action will be sought for SWMU 26; however, part of this site is being included under SWMU 154 for assessment of the fuel leak. Please provide a more detailed recommendation for each of the SWMUs listed in this table.
16. Table 7-1. Conclusions and Recommendations, page 96. The table indicates that SWMU 150 meets the criteria for NFA and that appropriate documentation will be prepared to remove this site from further action. However, the conclusion of the ecological risk assessment was that additional analysis is needed to assess potential avian toxicity to lead in soil. Based upon this conclusion, the recommendation for SWMU 150 should be

additional ecological assessment (potentially additional sampling), not NFA. Please clarify the appropriate actions needed for SWMU 150.

17. References. Please note that subsequent to the drafting of this report, Region V updated the toxicological review for chromium (April 2008).
18. Appendix F, Attachment A, SLERA SWMUs 27-30. The assessment concludes that following evaporation of the water present in SWMUs 27-30, there will be no ecological contact with surface water or groundwater. However, the report does not address sediment/surface soil. The current action is to allow the ponds to evaporate and then once the ponds are dry, corrective measures will be addressed. While not specifically addressed in either this appendix or the report, it does not appear that any sediment samples have been collected (Figure 4-5 does not indicate any samples were collected in the vicinity of SWMUs 27-30) to assess potential ecological risk to receptors to pond sediment. The primary concern is potential ecological exposure to sediments and once the ponds are dry, to residual contamination in the surface soil of the former ponds. Based upon a review of data provided in this report, it does not appear that characterization of SWMUs 27-30 has been adequately defined. Additional sampling and characterization of surface soil at SWMUs 27-30 and re-evaluation of ecological risks may be required upon evaporation of water prior to assessing corrective action alternatives. Please also revise Table 7-1 (page 96 of the report) to reflect that additional actions, in addition to monitoring of water levels, will be required.