December 16, 2011

Dr. Robert N. Cherry, Jr.
Radiation Safety Staff Officer
U.S. Army Installation Management Command
ATTN: IMSO/301
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Ft. Sam Houston, Texas 78234-1223

SUBJECT: US NUCLEAR REGULATORY COMMISSION STAFF REVIEW OF THE US ARMY INSTALLATION MANAGEMENT COMMAND'S ENVIRONMENTAL RADIATION MONITORING PLANS FOR THE SCHOFIELD BARRACKS AND POHAKULOA TRAINING AREAS

Dear Dr. Cherry:

By letters dated November 1, 2011, and November 15, 2011, the U.S. Army Installation Management Command (IMCOM) staff submitted the Environmental Radiation Monitoring Plans (ERMPs) for the U.S. Army's Schofield Barracks and Pohakuloa Training Areas (Agencywide Document Access and Management System (ADAMS) Accession Nos. ML11312A143 and ML11326A258, respectively) to the U.S. Nuclear Regulatory Commission (NRC) staff for review. The ERMPs were submitted in support of the Army's request for an NRC license to possess depleted uranium (DU), in the form of spent spotting rounds from the Davy Crockett weapons system, at ranges on the U.S. Army's Hawaiian installations.

On November 30, 2010, NRC staff provided IMCOM staff with detailed guidance on the scope and content of an acceptable ERMP (ML103160239, ML102770230, and ML102790074), to aid IMCOM staff in its development of the site-specific ERMPs for its installations.

The NRC staff has reviewed the ERMPs and has concluded that, as currently written, they will not meet the stated intent of the ERMPs, namely detecting the migration of DU from the ranges to the surrounding environs, nor do they include the type of information discussed in the NRC staff guidance. The NRC staff comments are summarized in the enclosure to this letter. In addition, I have enclosed the ERMP guidance that was provided to IMCOM staff on November 30, 2010. IMCOM staff should review the NRC staff's comments and this guidance for insights into the approach that should be used to determine the appropriate media, locations and frequency of environmental sampling that the NRC staff expects to be reflected in ERMPs for the Army's installations that include ranges that were used for training on the Davy Crockett weapons system.

To ensure that the IMCOM staff fully understands the NRC staff's concerns, we suggest that, after you have reviewed the NRC staff comments and the guidance, we meet, either in person or by teleconference, to discuss our comments. This discussion would be open to observation by interested members of the public and the NRC staff will make arrangements for interested individuals to observe the meeting. We suggest that this meeting occur as soon as possible in January 2012, bearing in mind that NRC staff has certain obligations to provide adequate notice

of the meeting (notice must be posted at least 10 calendar days prior to the meeting). Please contact me at your earliest convenience to arrange this meeting.

In accordance with 10 CFR 2.390 of the NRC "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions concerning the NRC staff comments, please contact me at 301-415-6749 or by email at Dominick.orlando@nrc.gov

Sincerely,

/RA/ by P. Michalak for

Dominick A. Orlando, Senior Project Manager
Special Projects Branch
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No.: 040-09083
Enclosures:
1. RAIs
2. ERMP Guidance, November 30, 2010

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Comments on US Army Environmental Radiation Monitoring Plans (ERMPs) for the Schofield Barracks and Pohakuloa Training Area

Comments below are keyed to the Schofield Barracks (SB) Environmental Radiation Monitoring Plan (ERMP), unless otherwise noted. However, they are applicable to the Pohakuloa Training Area (PTA) ERMP and should be addressed as the PTA ERMP is revised. U.S. Army Installation Management Command (IMCOM) staff should also review the guidance provided by Nuclear Regulatory Commission (NRC) staff by letter dated November 30, 2010, (included herein) as they revise the ERMP.

1. Section 1.1 states "The objective of this ERMP is to define the strategy and associated procedures for sampling environmental media within and surrounding the Radiation Control Area (RCA) at the SB and to provide the basis for determining whether NRC-licensed M101 depleted uranium (DU) is migrating out of the RCA. The scope of this plan is limited to the SB RCA and its immediate environs and to sampling media to determine the presence or absence of DU. DU concentrations will be compared to screening levels to determine if follow-up action is necessary."

   Because depleted uranium is not ubiquitous in the environment, and is not expected to be found in the background at the SB, the rationale for comparison of DU concentrations to screening levels as an indicator of DU migration is not clear. A more appropriate approach would be to evaluate the radionuclide ratios for Uranium (U) U^{234}/U^{238} and/or U^{235}/U^{238} in environmental samples (Section 6.2 cites one ratio), and perform a statistically based trending analysis. If uranium at these ratios is identified in any environmental media at the SB it would indicate the presence of DU from the Davy Crockett round and warrant additional investigation.

   Please provide the rationale for using screening levels as an indicator of DU migration at the SB or revise the ERMP as discussed above.

2. Sections 2.3.1 and 2.3.2 discuss the Scoping and Characterization surveys that have been performed to determine, among other things, the current areal extent of contamination by the Davy Crockett round at the SB ranges.

   Because DU is already present at the ranges, a pre-licensing or "baseline" survey of the ranges is not possible and NRC and IMCOM staff will have to rely on these Scoping and Characterization surveys to demonstrate that the DU is confined to the ranges as described in the ERMP. In order to fully evaluate, and verify, the areal extent of DU contamination at the SB ranges NRC staff will need to review these surveys.

   Please provide the surveys discussed in Section 2.3.2. They may be provided either in hard copy or electronic format, as long as they are in compliance with NRC requirements for submitting documents electronically.

3. Section 2.3.3 discusses the storm water sampling at the SB and concludes that none of the U^{234}/U^{238} ratios indicate the presence of DU. The section states that the sampling program did not identify any storm water samples that were in excess of the 10 CFR Part 20 limits for liquid effluents. The section also states that background samples were

collected at the Hali'au'au and Waikele Streams, but the uranium concentrations from these sampling locations are not included in the section.

As discussed above, the rationale for using values, other than background values, as a basis for demonstrating that DU from the Davy Crockett round has not, or is not, migrating from the ranges is not clear. Rather, NRC would expect that the Army would provide background ratios and concentrations for U^{234}/U^{238} and/or U^{235}/U^{238} based on a scientifically defensible approach, and use these background ratios and concentrations as the basis for determining if DU is migrating from the SB range. In addition, as discussed above, in establishing the background ratios and concentrations that will be used at the SB in the sampling program, NRC staff will need to verify the values before they can approve the ERMP.

Please provide the results of the previous storm water sampling program to NRC, including the background samples that were collected at the Hali'au'au and Waikele Streams.

4. Section 2.3.4 discusses air monitoring and describes the air monitoring results from reference, test and range burns. In addition, the ERMP indicates that occasional uncontrolled fires may occur on the range. As the results of the controlled burns are the basis for establishing the air monitoring procedures for the SB it is important that NRC staff review and verify the results. In addition, the Radiation Safety Plan (RSP) (June 2011, ML11193A228, pp 4-1) for the SB and PTA indicates that air sampling will occur during Blow-in-Place Explosive Ordnance Disposal (BIP/EOD) activities and that the Licensee Radiation Safety Officer will evaluate other activities expected to produce dust clouds to determine if air sampling is appropriate.

   Please provide the air sampling results of the burns that are used to establish the air monitoring program. Also, please clarify if air sampling will occur during non-scheduled brush fires at the range, during BIP/EOD activities and during other activities that may generate dust clouds.

5. Section 3.2 provides that Data Quality Objectives (DQOs). Please note that the DQOs as stated will likely not satisfy the intent of the environmental monitoring plan and will need to be revised based on the comments contained herein. In addition, there are contradictory statements in this section, such as the statement that it will be determined if DU contamination is migrating to places outside the RCA, yet it defines the study boundary (step 5) as the RCA only and does not mention sample locations outside the RCA.

   Please provide revised DQOs, as appropriate and clarify the contradictory statements in Section 3.2.

6. Table 1 provides the sampling plan for the SB and proposes screening values for DU in various environmental media. However, as stated on page 13, DU is not present in background and any DU detected is assumed to be from the RCA. As such, the presence of any DU in a sample is an indication that DU has or is migrating from the range. Table 1 also discusses frequency and types and samples and it appears that

soil/sediment sampling is the only routine media to be included. Table 1 also indicates that IMCOM will contact NRC if the screening values are exceeded, but it is not clear why IMCOM would wait 90 days before re-sampling a location if DU was detected in a sample (regardless of the trigger value).

It is not clear why IMCOM has chosen to use the exceedence of screening values, or a portion of a screening value, as an indicator of DU migration from the SB or PTA ranges. Please provide additional justification for the use of screening values and why IMCOM intends to wait 90 days before re-sampling. Again, the NRC must emphasize that early identification of contaminated migration is normally based on a trending analysis to a baseline or background condition.

Finally, IMCOM will need to be more specific on what constitutes a "significant release" that would require additional groundwater and surface water monitoring. NRC's expectation is that any detection of DU outside the RCA provides evidence of potential migration and would warrant confirmation of the result and additional investigations. Likewise for air sampling, the text states that "air sampling will be performed during prescribed burns **if appropriate**" (emphasis added) but it is not clear when or how this determination will be made especially since IMCOM states that ". . . the most likely scenario involving production of transportable forms of DU is the occurrence of brush fires in RCAs whether prescribed or naturally occurring" (section 3.3.5.1).

7. Section 3.3.1 provides a detailed discussion, including RESRAD evaluations, of why groundwater sampling is not appropriate, primarily because any DU in the soil at the range will not reach the water table until 12,500. However, the Army commits to performing groundwater sampling if DU is detected in other environmental media.

   It is not clear why IMCOM would commit to this additional action if the rationale for not sampling is that the DU cannot reach the water table until 12,500. In addition, it appears that IMCOM is sampling the groundwater at the SB for other non-radiological contaminants and will be evaluating groundwater under the Operational Range Assessment Program. Therefore, it is not clear why IMCOM will not include DU in the sampling program for the ranges.

   Please provide clarification on these issues.

8. Section 3.3.2.1 discusses surface water sampling and states that, because previous surface water samples did not indicate DU was present in concentrations greater than 10 percent of NRC's effluent discharge limits, surface water sampling is not included in the ERMP.

   As discussed above, the objective of the ERMP is to determine if DU is migrating from the SB range. Thus, the reliance on exceeding effluent limits or screening values is not appropriate for justifying the exclusion of an environmental pathway. It is also not clear from the discussion if the streams described in this section are perennial or ephemeral.

Please provide additional rationale why IMCOM does not intend to sample surface water at the SB, given the statements on page 20 regarding the activity contemplated for the Operational Range Assessment Program.

Section 3.3.2 of the PTA ERMP discusses the rationale for not sampling surface water at the PTA and states that surface water is not present due to the porous nature of the volcanic rock at the PTA. However, the ERMP states that at least seven intermittent streams drain surface water off the southwestern flank of Mauna Kea and lie within the same drainage area as the PTA. It is not clear why IMCOM will not sample one of these streams, specifically Popo's Gulch, which is the closest stream to the PTA.

Please provide additional justification for not sampling surface water at the SB and PTA.

9. Section 3.3.3 discusses soil sampling and states that soil sampling will be conducted annually at 3 RCA egress points. It is not clear from the discussion when during the year the sampling will occur nor why it would not occur more often, specifically after significant activity is conducted on the range that could potentially disturb DU in the soil on the range. It is also not clear why only points of egress are included in the sampling plan as military activities such as mechanized vehicle training on the range could result DU being transported off the range at points other than the egress points. In addition, the RSP (June 2011, ML11193A228, pp 11-1) for the Schofield Barracks and PTA states that vehicles exiting the RCA will be decontaminated if they exhibit contamination in excess of prescribed limits. This activity could result in soil at egress points being contaminated with DU.

   Please provide additional clarification regarding the rationale for soil sampling and address the manner in which soil at egress points that is contaminated from vehicle decontamination activities will be managed.

10. Section 3.3.4 discusses that sediment sampling will occur on an annual basis and states that screening values will be used as triggers for additional sampling. The proposed sampling points are referenced on Plate 6.

    As discussed above, the use of screening values is not appropriate for determining if DU is migrating off the range. It is also not clear when during the year sampling will occur and why it would not occur after an event that could disturb DU in soil at the SB range. Finally, it appears that the sampling points indicated on Plate 6 may be as far as 10 miles from the edge of the RCA, depending on which scale is used.

    Please provide additional justification for the use of screening values and the location and timing of the sediment sampling.

11. Section 5.1.4, discusses the soil sediment sampling program and states, in Step 4 that ". . . sediment samples will be collected only after the water sample has been collected". However, routine surface water sampling is not included in the ERMP.

    Please clarify this apparent contradiction.

12. Section 5.2.2 discusses the QA/QC procedures, specifically the collection of sample duplicates. It is important to note that field duplicates and replicates of soil samples may not provide much value in situations where discrete particles of DU material are present.

    Please discuss how the ERMP will address this situation.

13. Section 5.3.1.3 discusses sample collection and states that a sodium iodide gamma probe may also be used to support collection of soil and sediment samples. In such cases, a scan will be performed by holding the detector in close proximity to the ground surface and walking slowly while moving the detector in a serpentine motion. This scan will be performed over all reasonably accessible surfaces within five feet of the designated sample location.

    It is not clear why scanning of the areas with a sodium iodide probe is not always required and why it is limited to within 5 feet of the proposed sample location.

    Please clarify the use or omission of the use of a sodium iodide probe for scanning.

14. Section 6 discusses the sample analytical program. While generally acceptable, the staff notes that the ERMP does not provide details of the sample preparation procedures for liquids or the detection limits for the inductively coupled plasma-mass spectrometry analysis. In addition, a coverage factor of k=2 results in a 95% confidence interval which is preferable to the proposed coverage factor of k=1.

    Please provide the details of the sample preparation procedures and the justification for a coverage factor of k=1.

15. Section 8 discusses the ERMP report, but does not indicate if the report will be submitted to NRC for review.

    Please clarify if the report will be submitted to NRC.

16. The RCA depicted on Plate 5 of the ERMP is not consistent with the RCA depicted in the SB RSP (June 2011, ML11193A228 pp 24-2).

    Please review the RCA depicted in both documents and provide the correct SB RCA.

Enclosure 2

Letter re: U.S. NRC Staff Review of the U.S. Army's Application for a Radioactive Materials License for Depleted Uranium from the Davy Crocket Munitions System

ML103160239