



DEPARTMENT OF THE ARMY  
US ARMY INSTALLATION MANAGEMENT COMMAND  
2405 GUN SHED ROAD  
JOINT BASE SAN ANTONIO FORT SAM HOUSTON, TX 78234-1223

REPLY TO  
ATTENTION OF

December 15, 2017

ATTN: Document Control Desk  
Deputy Director, Division of Decommissioning, Uranium Recovery and Waste Programs  
Office of Nuclear Material Safety and Safeguards  
Mailstop T8 F5  
US Nuclear Regulatory Commission  
Washington, DC 20555-0001

Dear Deputy Director:

Enclosed is our response to your November 29, 2017, letter, subject: Request for Information Regarding the 10 CFR 2.206 Petition for the Pohakuloa Training Area (Source Materials License no. SUC-1593, docket number 040-09083).

If you have any questions concerning this letter, please contact me by telephone at (210) 466-0368 or by email at robert.n.cherry.civ@mail.mil.

Sincerely,

Robert N. Cherry  
License Radiation Safety Officer

Enclosure

NMSSOL

# REQUEST FOR LICENSEE TO VOLUNTARILY PROVIDE INFORMATION AS RELATED TO THE MARCH 16, 2017 2.206 PETITION ON SUC-1593

## COMMENT

The site-specific Environmental Radiation Monitoring Plan (ERMP) for the Pohakuloa Training Area (PTA) indicates that the U.S. Army Installation Management Command (Army) intends to use composite samples for sediment sampling. Additional information is needed to support the Army's plan to composite "at least 10 subsamples" to assess the potential effects of sample dilution.

## BASIS

"When analytical sampling results from locations outside of the Radiation Control Area indicate that the U-238/U-234 activity ratio exceeds 3, the licensee shall notify NRC within 30 calendar days and collect additional environmental samples within 30 calendar days of the notification of NRC, unless prohibited by the absence of the sampling media (e.g., lack of well water)."

The site-specific Environmental Radiation Monitoring Plan (ERMP) indicates that each sediment sample will be composed of as "at least 10 subsamples collected from various areas of the stream bed." No further information is provided regarding how composite sampling affects the comparison of analytical results to the U-238/U-234 ratio required by License Condition (LC) 17. As described in Section 14.3 of NUREG-1505, "A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys" (ADAMS Accession No. ML061870462) and explained in more detail in the document "Technical Bases and Guidance for the Use of Composite Soil Sampling for Demonstrating Compliance with Radiological Release Criteria" (ADAMS Accession No. ML13101A090), radiological threshold criteria should be adjusted to account for the potential effects of sample dilution when composite samples are taken. In this case, the concern is that taking multiple subsamples will lower the U-238/U-234 ratio in the composite sample to below 3, even if some of the sub-samples, if analyzed individually, would have a U-238/U-234 ratio above 3 (i.e., indicative of the presence of depleted uranium (DU)). This guidance indicates that a statistically-informed sampling regime should be followed if composite sampling is used over an area (i.e., not just at one sample location). The detailed guidance referenced above recommends (1) retaining sub-samples in case further analysis is needed, (2) establishing an adjusted limit that would trigger analysis of individual subsamples, and (3) using sub-samples of the same volume.

Additional information is needed to determine the potential for sample dilution to affect compliance with License condition 17. Specifically, additional information is needed on the basis for the Army's selection of "at least 10" subsample locations, the Army's plans to retain individual subsamples, and the criterion that the Army will use to trigger evaluations of individual sub-samples.

## BASIS

Oak Ridge Institute for Science and Education. "Technical Bases and Guidance for the Use of Composite Soil Sampling for Demonstrating Compliance with Radiological Release Criteria," Oak Ridge, Tennessee, 2012. (ADAMS Accession No. ML13101A090).

U.S. Nuclear Regulatory Commission. "A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys: Interim Draft Report for Comment and Use." NUREG-1505; Rev. 1. Washington, DC, 1998. (ADAMS Accession NoML061870462).

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## RESPONSE

The composite sediment sampling procedure described in the site-specific Environmental Radiation Monitoring Plan (ERMP) for Pohakuloa Training Area (PTA) was developed to be consistent with historical sampling procedures at PTA and the other 17 installations included in SUC-1593.

During the December 4, 2017 teleconference between the Army and NRC, attendees realized that perhaps some had misunderstood the actual methodology used to collect the composite sediment samples. To clarify, samplers always collect subsamples within a few meters, and usually within a couple feet, of the approved sampling location identified in each site-specific ERMP. The primary reason for collecting multiple subsamples is to ensure that sufficient sample volume is available for laboratory processing and analysis, particularly in water bodies with bedrock streambeds where sediment for sampling is often limited. A secondary benefit of compositing subsamples is to ensure the collection of samples comprised of varying particle sizes often present within a single streambed. Although the site-specific ERMP specifies that "... at least 10 subsamples ..." will be collected, samplers have not found it necessary to collect more than 10 subsamples at any sampling location during the three quarterly events completed to date.

The radiochemistry laboratory has certain sample size preferences. The laboratory dries and grinds a portion for alpha spectrometric analysis. It also retains some native sample for ICP-MS analysis. The aliquot actually used for the alpha spectrometric analysis is 0.5 gram (g) to 2 g and the aliquot for ICP-MS is 0.5 g to 1 g. However, it is difficult to sample a representative aliquot at such a low weight. That is why the laboratory prefers to receive about 250 milliliters of sample. This includes enough matrix for reanalysis, if needed. This also eliminates the challenges of drying and grinding samples smaller than about 100 g. To assure our samplers meet its requirements, the laboratory provides eight-ounce glass jars to our samplers. The samplers do not have to fill each jar because the laboratory is not concerned if a smaller-size aliquot is all that is available.

The Army will use no criterion "to trigger evaluations of individual sub-samples." As described above, the samplers combine each such set of sub-samples in the field into a single sample that they send to the laboratory. The samplers do not send individual sub-samples to the laboratory for analysis.

To alleviate potential future misunderstanding, the NRC could require a revision to Section 3.2 of the site-specific ERMPs as follows (changes annotated in *italics*):

### 3.2 SEDIMENT SAMPLING

The collection of the sediment sample will consist of *a discrete sample at each sample location. If necessary, multiple aliquots (no more than 10) will be collected from a 1-meter radius of the sample location in order to collect the required volume from the stream bed.* Sediment samples will be collected from the stream bed using a clean, disposable plastic scoop. Sampling locations within the stream bed should be selected where the intermittent surface water flow is low and/or deposition is most likely. The sediment sampling procedure is as follows:

1. The individual performing the sampling will don clean gloves and prepare a disposable tray or sealable plastic bag and a plastic scoop.

2. Use a disposable scoop to remove the loose upper sediment uniformly. Do not exceed 3 centimeters in depth into the sediment. Collect a sufficient quantity of sediment for QA/QC.
3. Place sediment into a disposable tray or sealable plastic bag (e.g., Ziploc®).
4. Remove rocks, large pebbles, large twigs, leaves, or other debris.
5. Remove excess water from the sediment. This may require allowing the sample to settle.
6. Thoroughly mix (homogenize) the sediment within the disposable tray or bag.
7. Fill the appropriate sample containers.
8. Mark the sample location with a stake and log its coordinates using a differential global positioning system (DGPS) unit.
9. Collect digital photographs and document data in the field logbook.

Additional details of the sediment sampling and the field procedures are provided in Annex 19. Once samples are collected, the samples and all QA/QC samples will be shipped to the selected laboratory for analysis. Sample handling (i.e., labeling, packaging, and shipping) and CoC procedures will follow those detailed in Annex 19.

Alternatively, rather than requiring a change to the ERMP annexes, the NRC could incorporate this response into the license by reference.

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