August 31, 2015

Dr. Robert Cherry, Radiation Safety Officer
U.S. Army Installation Management Command
11711 North IH35, Suite 110
San Antonio, TX 78233-5498

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - TECHNICAL REVIEW OF THE U.S. ARMY'S APPLICATION TO ADMEND THE SOURCE MATERIALS LICENSE FOR DEPLETED URANIUM FROM DAVY CROCKETT M101 MUNITIONS - (SUC-1593, DOCKET NO. 40-09083)

Dear Dr. Cherry:

The U.S. Army Installation Management Command (Army) submitted its license amendment application (Agency-wide Documents Management System (ADAMS) Accession No. ML15161A454), dated June 1, 2015, to address the 15 sites subject to License Condition No. 12 of Source Materials License No. SUC-1593 (ADAMS Accession No. ML13259A062). The Army proposes to use a programmatic approach to license 15 sites on multiple Army installations as well as the sites located on the two Army installations located in Hawaii which are already licensed under Source Materials License No. SUC -1593. On August 25, 2015, the U.S. Nuclear Regulatory Commission (NRC) accepted the Army's application for review (ADAMS Accession No. ML15194A497).

The NRC staff has reviewed the Army's application and has determined that the additional information is needed in order for the NRC staff to complete its review of the programmatic Physical Security Plan, the programmatic Radiation Safety Plan, the programmatic Environmental Radiation Monitoring Plan, and the performance assessment modeling portions of the Army's application. The NRC staff's Request for Additional Information (RAI) is provided in the enclosure. Note, that at this time, the NRC staff determined that no additional information is needed for the NRC staff to complete its review of the decommissioning cost estimate. Provide a response to the enclosed RAIs within 30 days of receipt of this letter or an alternative response schedule with justification for the NRC staff's consideration.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," 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 ADAMS. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions, please contact me at 301-415-6822 or by e-mail at amy.snyder@nrc.gov.

Sincerely,

/RA/

Amy M. Snyder, Senior Project Manager
Materials Decommissioning Branch
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket Number: 040-09083
License Number: SUC-1593

Enclosure:
Request for Additional Information

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Davy Crockett Amendment Application, date June 1, 2015, Source Materials License No. SUC-1593

Request for Additional Information

Programmatic Physical Security Plan

1. The U.S. Nuclear Regulatory Commission (NRC) staff understands that the Physical Security Plan (PSP) is a programmatic plan document that will apply to each Radiation Controlled Area (RCA) identified in the U.S. Army Installation Management Command's (Army's) application and that it is meant to be a stand-alone document:

    a. Clarify whether any of the information provided in the Army's completed NRC Form 313 and any of the other attachments applies to the PSP. If so, how will the information be used in association with the PSP?
    b. Clarify why the training described in the PSP is not reflected in the NRC Form 313.
    c. Clarify why the waste management requirements identified in the PSP are not reflected in the NRC Form 313?

2. In Section 1.0, Introduction, the Army states, "NRC will be informed of any significant changes to the PSP, and if appropriate, they will be approved before implementation:"

    a. Define what type of changes the Army considers significant or define what significant means.
    b. Clarify when the NRC will be informed of significant changes to the PSP.
    c. Clarify that NRC approval is needed for changes to the PSP before implementation. Alternatively, define the criteria or the types of changes not requiring NRC approval for NRC review.

3. In Section 1.2, Purpose, the Army states, "The purpose of this PSP is to address physical security issues involving M101 spotting round DU in RCAs on IMCOM Ranges. The goals are to protect the health and safety of Army personnel and of members of the public; maintain security of licensed material (DU); and meet all applicable Federal, Department of Defense, and Army regulations:"

    a. Define or clarify what are the physical security issues that exist involving M101 spotting round DU in RCAs on Army ranges. If there are no issues, then clearly define the purpose of the PSP.
    b. Under a programmatic approach, the NRC anticipates that the Army will develop a PSP that establishes the programmatic requirements, rather than goals, which will aid in ensuring that the necessary precautions will be taken to prevent the inadvertent exposure of workers, other personnel located on installations, and members of the public to radiation in excess of the limits established per Title 10 of the *Code of Federal Regulations* (10 CFR) Part 20, "Standards for Protection Against Radiation." Clarify the purpose of the PSP as it relates to the Radiation Safety Plan (RSP) and specifically, as it relates to the applicable requirements in Subpart I – Storage of Control of Licensed Material, Subpart J - Precautionary Procedures, Subpart K - Waste Disposal, Subpart L - Records and Subpart M - Reports of 10 CFR Part 20.

Enclosure

c. Some of the topics in the PSP also appear in the RSP. Identify any unique requirements that the Army intends to implement to address physical security of radioactive material in the PSP. If the Army intends to address the same topics in its RSP, the Army should ensure that the information between the two Plans is consistent.
d. Provide sufficient detail in the PSP that fully describe the Army's methodology for implementing the programmatic PSP. The NRC anticipates that the Army will follow the guidance provided in the enclosure to the September 25, 2014 Meeting Summary (ADAMS Accession No. ML14293A129) regarding the level of detail needed for a programmatic approach to licensing. The NRC anticipates that the Army will have programmatic plans, such as a PSP, that clearly identify the applicable regulatory requirements that must be met, identify its commitment to the follow the requirements by the use of "shall" or "will" statements, and identify its plans to implement the programmatic plan through practices such as using documented procedures and requiring the appropriate personnel be trained to those procedures before implementation.
e. If specific elements (i.e., procedures, site-specific checklists or plans, training programs, etc.) identified in the PSP have not yet been developed, identify them, explain their basis (i.e., methodology, criteria, rationale) and provide a schedule (separate from the PSP) for their development and implementation; for the NRC staff's consideration regarding whether license conditions and associated milestones will be needed as described in the September 25, 2014, Meeting Summary (ADAMS Accession No. ML14293A129).

4. In Section1.4, Applicability, the Army states, "The requirements of this plan are applicable to all personnel, including members of the public, who may seek access to an RCA:"

   a. Clarify the term "visitor". It appears that the Army has identified more than one type of visitor ("Visitor" is used in Section 2.6 of the PSP and "one-time visitors" is used in Section 9, and "official visitors" is used in Section 5.3)
   b. It is unclear what requirements are being referred to? Clearly identify the applicable requirements that must be met and who must meet them.
   c. Clearly identify when the requirements apply.

5. In Section 1.5, The Unexpected and the Unanticipated, the Army states, "While all physical security contingencies are intended to be addressed by this plan, something unexpected or unanticipated may arise. If this occurs, the Garrison RSO will promptly establish appropriate procedures and then inform the License RSO. These procedures will be documented by including them in this plan or as an addendum to it."

   a. Clarify what is meant by "all physical security contingencies" as related to the DU.
   b. Explain the specific types of changes that the Army may need to make to the PSP.
   c. Explain how changes will be made. Since the PSP, once approved, will become part of the license, clarify in the PSP that any changes to the PSP will need NRC approval before implementation or alternatively propose criteria for changes that do not need NRC approval with supporting rationale for NRC staff review.

6. In Section 2.3, License Radiation Safety Officer, the Army states, “Regarding physical security of DU, the License RSO will:” Provide necessary information on all aspects of physical security to personnel at all levels of responsibility, pursuant to Title 10, Code of Federal Regulations (CFR), Parts 19 and 20, and any other applicable regulations…. [and] “Conduct training programs and otherwise instruct personnel in the proper procedures:”

    a. For a PSP under a programmatic approach to licensing, general statements, such as the ones above, are unclear, not specific, and generally do not meet the intent of the programmatic approach because the NRC staff cannot independently evaluate them. Identify or reference the applicable specific requirements that apply to physical security at the RCAs containing DU.
    b. Identify the types of information the Army considers “necessary” or clarify the statement.
    c. Explain what the training programs consist of, how they will be maintained, and how they will be implemented.
    d. Clarify how the specific training topics identified in the PSP relate to these training programs.
    e. Identify the “proper procedures” or the types of procedures that the Army will require be established for the physical security of DU to aid in the protection of health and safety.

7. In Section 2.5, Personnel in the RCA, the Army states, “Personnel entering the RCA will receive physical security and DU awareness training (essentially on provisions of this PSP applicable to them) from the Garrison RSO at a level commensurate with their activities in the RCA as the Garrison RSO determines and documents. Each person who enters the RCA is responsible for strict adherence to physical security rules and regulations:

    a. For a PSP under a programmatic approach to licensing, general statements such as the ones above, are unclear, not specific, and generally do not meet the intent of the programmatic approach because the NRC staff cannot independently evaluate them. Specifically, describe the purpose, objective and content of the physical security training and DU awareness training, how each type of training differs for different activities in the RCA, when they are conducted, how they are documented, and how the Army will determine whether the training is effective.
    b. The PSP identifies that there is different types of training for different types of individuals. For example, the PSP states that certain training is for “all personnel except one-time visitors” and indicates that there is DU physical security training for “non-physical security personnel. Clarify how each type of training differs for different types of individuals and whether each type of training identified in Section 2.5 differs from other training that is identified in Section 9 of the PSP.
    c. If there are other types of training for physical security of DU, for each type of training, provide a response that addresses the request in 7a.
    d. Identify the “physical security rules and regulations”; when they apply (i.e., while in the RCA, when performing activities in the RCA, etc.) and whether they will be part of the training that the Army is requiring.
    e. Explain what actions the Army will take to correct noncompliance (for example, establish a corrective action program or lessons learned program, conduct retraining, corrective action reporting, etc.).

8. In Section 2.6, Visitors, the Army states, “All visitors to the RCA are required to comply with the requirements of this PSP. The Garrison RSO or his or her designee will brief authorized visitors requiring entry to the RCA on the presence of DU in the RCA. Visitors will be escorted at all times in the RCA. Unauthorized visitors, and visitors not meeting the specified qualifications, will not be permitted within the RCA.”

It is unclear what “specified qualifications” are. Clarify or reference the qualifications that visitors must have.

9. In Section 5, Radiation Controlled Areas, the Army states “The St. Louis District of the US Army Corps of Engineers performed the Archive Search Report (ASR) Project from 2006 to 2011. The result was a report with annexes for specific installations that described Army efforts to identify Army ranges where the Army fired M101 Davy Crockett spotting rounds.”

   It appears that the Archive Search Report (ASR) is being used a part of the technical basis for licensing. If so, it should be submitted as part of the Army’s application. As indicated in the September 24, 2014, meeting summary (ADAMS Accession No. ML14293A129), for the two DU installations already licensed, the Army, in its license amendment application, could reference the work already approved in the license in its generic program plan descriptions. However, the technical basis for the current license only applies to the Hawaiian sites. Clarify how the ASR applies to the programmatic PSP, and elsewhere in the application.

10. In Section 5, Radiation Controlled Areas, the Army states, “The Garrison RSO and License RSO will be notified when M101 spotting round debris (or any other previously unknown radioactive material) is found on IMCOM Ranges. The sizes and locations of the RCAs will be adjusted and the requirements of this PSP will be extended accordingly:”

    a. Clarify whether the NRC will be notified regarding discovery of “unknown radioactive material” and proposed changes to a RCA.
    b. Clarify how the Army will ensure that if the size and location of a RCA needs to be adjusted, changes to the PSP will be updated and implemented upon NRC approval. Alternatively, include proposed criteria for the types of changes to the RCA that the Army believes do not need NRC approval for NRC review.

11. In Section 4, Posting Requirements, the Army states, “The Garrison RSO shall post “CAUTION - RADIOACTIVE MATERIAL” signs at a sufficient number of locations around the Radiation Control Area to ensure that individuals entering the Radiation Control Area are aware of the presence of DU.”

    10 CFR Part 20 posting requirements direct the use of a radiation symbol in addition to specific words to make individuals aware of potential radiation exposures and to minimize the exposures. Clarify how the Army plans to address all the applicable requirements of 10 CFR 20.1902.

12. In Section 4, Posting Requirements, the Army states, “The Garrison RSO, in consultation with explosive ordnance disposal (EOD) personnel and the License RSO, will determine whether it is more reasonable to pick up the DU and hold it for appropriate disposal than it is to leave it in place:”

a. For a PSP under a programmatic approach, general statements, such as the one above, are unclear, not specific, and generally do not meet the intent of the programmatic approach because the NRC staff cannot independently evaluate them. Specifically, identify the types of information the Army would need or the criteria and associated rationale for the criteria that the Army proposes to use to make such a decision.
b. If the DU is left in place, clarify what types of information will be documented? How will the information be used with regard to RCA access training?

13. Section 5, Access Control, the Army states, "This section provides specific guidance for access to RCAs. For convenience and reference purposes, it also provides relevant excerpts (with minor edits to suit context) from US Army regulations and official policy for control of access to Army installations and ranges."

    a. For a PSP under a programmatic approach, general statements, such as the ones above, are unclear, not specific, and generally do not meet the intent of the programmatic approach because the NRC staff cannot independently evaluate them. Clarify how the Army regulations and official policy for control of access to Army installations and ranges relate to access control with regard to DU located in a RCA.
    b. Clarify the Army's methodology or criteria or process the Army plans on requiring be used for access control of the DU located in a RCA and describe how the Army plans to implement it.

14. In Section 5.3, RCAs, the Army states "All RCAs are within impact areas in Army training areas and range facilities. Hence, the controls discussed in Section 5.2 apply to all RCAs as well."

    Clarify if any of the "controls" serve to address the ALARA requirement in 10 CFR Part 20. If so, provide an explanation of how each control individually or collectively, contributes to reducing or limiting exposure to the DU.

15. In Section 5.3, RCA, the Army states, "Personnel otherwise qualified to enter the RCA will escort official visitors."

    Clarify what is meant by the term "otherwise qualified"?

16. In Section 5.3, RCA, the Army states, "The Garrison RSO will refer to the License RSO for additional guidance as necessary."

    For a PSP under a programmatic approach to licensing, general statements, such as the one above, are unclear, not specific, and generally do not meet the intent of the programmatic approach because the NRC staff cannot independently evaluate them. Explain the types of conditions that could exist in which additional guidance would be needed and identify the types of information that would be provided.

17. In Section 6, Markings on Containers and Equipment, the Army states, “Title 10 CFR Part 20, § 20.1904 requires that all containers that contain more than 100 micro curies of ^{238}U or of natural uranium be properly labeled with a “CAUTION—RADIOACTIVE MATERIALS” sign or label. The label will also provide information, such as the radionuclides present (DU), an estimate of the quantity of radioactivity, the date for which the activity is estimated, radiation levels, and kinds of materials, to permit individuals handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposures.”

    The above information appears to be a statement about the regulation, rather than a commitment to comply or abide by this regulation. Clarify how the Army intends to meet the applicable requirements of 10 CFR 20.1904.

18. In Section 6, Markings on Containers and Equipment, the Army states, “The only containers of M101 spotting round DU on the installations should be containers of DU held for disposal as radioactive waste.” And in Section 7, Radioactive Waste, the Army describes in general terms how certain aspects of the waste is to be handled:

    a. Clarify how the Army intends to meet the applicable requirements in 10 CFR Part 20, Subpart I - Storage and Control of Licensed Material, Subpart J - Precautionary Procedures, Subpart K - Waste Disposal, Subpart L - Records, and Subpart M – Reports (i.e., require procedures be used, etc.) that relate to disposal of the DU.
    b. Identify the elements (i.e., processes, procedures, checklists, site-specific directives, etc.), if any, besides the PSP itself that the Army will require be used to implement the DU disposal requirements identified in the PSP. For those elements that are not yet developed, provide a schedule (separate from the PSP) for their development and implementation.

19. Section 8, Program Audits, the Army states, “Each Radiation Safety Program audit will include an assessment of the effectiveness of this PSP. The License RSO or his or her designee will review the physical security program content and implementation and document the results of this review at least annually to ensure the following:”

    a. Clarify why the above requirement is not identified or referenced in the RSP.
    b. Identify the criteria that the Army will use to determine whether a PSP is effective for a specific period of performance.
    c. Considering that the PSP applies to all RCAs that possess DU from the Davy Crockett M101 Spotting rounds, clarify the scope of the assessment of the effectiveness of the PSP? Will the assessment cover all RCAs that possess DU from the Davy Crocket M101 Spotting Round throughout the Command, each RCA, or several RCAs?
    d. Will the assessment of the effectiveness of the PSP be documented?
    e. Explain how the Army intends to use the results of the assessment (i.e., incorporate the results in a lessons learned program or corrective action program, share the assessment among the RSOs, inform updates to the PSP, etc.)
    f. Clarify what the “physical security program” is in context of Source Materials License No. 1593; how does it relate to the programmatic Physical Security Plan or PSP.
    g. Clarify what is a “Radiation Safety Program” in context of Source Materials License No. 1593; how does it relate to the programmatic Radiation Safety Plan or RSP?

Programmatic Radiation Safety Plan

20. Section 4.2 of the programmatic RSP provides a list of unauthorized range activities. A list of authorized activities expected to be conducted inside the RCA is required to allow evaluation of the programmatic RSP and Environmental Radiation Monitoring Plan (ERMP) to ensure they are adequate to protect public health and safety in accordance with the radiation protection standards of 10 CFR 20. Therefore, provide a list of authorized activities which would be permitted inside the RCA.

21. The Army states the programmatic RSP submitted is intended to be applied at all sites, which include the previously licensed Hawaiian sites already licensed. However, the programmatic RSP does not discuss of the RSP exemptions for the Schofield Barracks Battle Area Complex (BAX) which were previously described in section 4.4 of the "Radiation Safety Plan for US Army Garrison Hawaii Ranges Affected by M101 Davy Crockett Spotting Round Depleted Uranium" (ML13242A281) and approved by the NRC. In the programmatic RSP, the Army should specify all proposed RCA areas, such as the BAX, which it is requesting to be except from RSP requirements. Provide justification for any areas which the Army is requesting exceptions from any part of the RSP.

22. 10 CFR 40.32 requires the applicant to be qualified by reason of training and experience to protect health and minimize danger to life or property. The programmatic RSP provides qualifications for the License and Garrison Radiation Safety Officer (RSO). However, Section 11.1 of the RSP states the Garrison RSO may designate a worker to perform instrument scanning on personnel, vehicles, and equipment as they exit the RCA if the Garrison RSO is confident the worker is able to do so in accordance with the RSP when the Garrison RSO is unavailable. Provide specific qualifications and/or training requirements which will be used to determine if this worker would be able to conduct these activities in accordance with the RSP.

23. Attachment 2 to the application provides maps which appear to define the RCA for all sites:

    a. Provide a description of how the Army determined the areas it expects contain residual DU from M1011 Davy Crockett spotting rounds. Provide a statement that all areas identified by the Army are incorporated into RCAs depicted in Attachment 2 maps or provide justification as to why some areas were not incorporated.
    b. The current maps are not explicit as to what boundary defines the RCA area. For example, the map for Fort Carson provides 3 different impact areas which are overlapping and it is uncertain as to which one represents the RCA. Therefore, update the legends on all of the maps to clearly define the RCA or provide a written description for each map of what boundary is meant to define the RCA.

24. Provide clarity for the Fort Knox map as the legend states the green box is the Fort Campbell impact area boundary. Describe why the Fort Campbell boundary is shown instead of Fort Knox.

Programmatic Environmental Radiation Monitoring Plan

25. 10 CFR 20.1501 requires each licensee to make or cause to be made, surveys that are necessary for the licensee to comply with regulations in 10 CFR Part 20 and are reasonable under the circumstances to evaluate the magnitude and extent of radiation levels; concentrations or quantities of residual radioactivity; and the potential radiological hazards of the radiation levels and residual radioactivity detected. 10 CFR 20.1302 requires, in part, each licensee make or cause to be made, surveys of radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with dose limits for individual members of the public. Attachment 4 of the application provides the Army's proposed programmatic ERMP which would be used to create ERMP for each of the Army's individual sites to ensure compliance with these regulations. The NRC is requesting the following additional information regarding the programmatic ERMP:

    a. Section 3 of the programmatic ERMP states the site-specific ERMP will include criteria for adjusting sampling, such as increasing or reducing number of sample locations or to increase or reduce sampling frequencies. Provide a description of the criteria which would require samples to increase. Additionally, provide a description of the criteria which would allow for samples to decrease and when samples would need to increase. Provide a statement that the number of samples cannot be less than that described in the programmatic ERMP or justification of how the criteria would be used to ensure appropriate environmental monitoring is conducted if the number of samples is changed.
    b. Section 3 states the site-specific ERMP will provide a description of the physical environment of each RCA on the installation. Describe what actions would be taken if a RCA is determined to have a physical environment which has less conservative environmental transport parameters than that proposed in the RESRAD-bounding analyses.
    c. Section 5.f of the programmatic ERMP states surface water which routinely flows from the RCA will be sampled. However flow is not defined. Provide a description of the minimum flow rate or conditions which would be required to sample surface water and how the site-specific flow rate or conditions will be determined. Include a description of how surface water runoff will be located at each site. Additionally, provide a description of how sampling will be performed, including a description of the number and types of samples which will be collected.
    d. Section 5.i of the programmatic ERMP proposes to sample the existing wells potentially influenced by DU in the RCA for uranium analysis whenever sampling is performed for other purposes since, based on the cost-benefit ratio, additionally sampling would be highly unfavorable. Provide justification to not perform systematic groundwater sampling to evaluate groundwater DU contamination.
    e. Section 5.k of the programmatic ERMP proposes to sample soil outside the RCA if an area of soil is greater than 25 m^2 has clearly eroded from the RCA. Provide description of how the Army will determine if soil has eroded from the RCA, such as how often and the process used to evaluate the site for erosion.
    f. The programmatic ERMP proposes a sample plan based on migration due to environmental factors. However, no justification is provided to demonstrate that human activities do not transport DU beyond the RCA. Provide justification whether human activities at RCAs influence transport of DU beyond the RCA and describe whether or

not the Army will also base the proposed sample plan or develop a separate sample plan based on migration of DU due to human activities.

g. Section 6 of the programmatic ERMP states the Army proposes to identify samples with DU. However, the programmatic ERMP does not describe the actions each individual site or IMCOM would take if it identifies DU in its samples. Provide a description of or a list of these actions, including when and how the NRC would be notified if DU is identified.

h. The programmatic ERMP states a criterion in which a $^{238}U/^{235}U$ concentration or activity ratio greater than 3 is needed to identify presence of DU. Identify the conditions or criteria that will require a statistical based trending analysis to be conducted on a site-specific basis to verify this ratio and how this ratio and will be changed if necessary.

i. The programmatic ERMP does not provide a description of procedures which will be used to conduct environmental sampling. Provide a description and general list of requirements which will be included in the procedures which are necessary to ensure adequate application of site specific ERMP, such as quality control programs, sample identification, sample custody, procedures describing how samples locations will be determined and how samples will be collected for each media, shipment, recordkeeping and radiochemical analysis for both soil and liquid samples. If these procedures are not yet developed, separate from the RSP, provide a development and implementation schedule for incorporation in a license condition.

26. 10 CFR 20.1302 requires that licensees show compliance with the annual dose limit in 10 CFR 20.1301 by demonstrating by measurement or calculation that the total effective dose equivalent (TEDE) to the individual likely to receive the highest dose from the licensed operations does not exceed annual dose limit or demonstrate the annual average concentration of radioactive material released in gaseous and liquid effluents at the boundary of the unrestricted area do not exceed the values specified in Table 2 of Appendix B to Part 20. The Army provided 4 arguments in attachment 8, “Arguments against Air Sampling during HE Fire into RCAs,” to the application which provided calculations or justifications to demonstrate that an individual likely to receive the highest dose from high explosives (HE) fired into the radiation control areas (RCAs) would not receive a TEDE in excess of the annual-dose limit. The Army states in its Section 5.b of its proposed programmatic ERMP that these arguments would justify that air sampling is not required at any site. In the Army’s first proposed argument it provides a mathematical calculation to try to demonstrate the annual average concentration of radioactive material released in gaseous effluents at the boundary of the unrestricted area would not likely exceed the values specified in table 2 of appendix B to Part 20 during HE fire into the RCAs in accordance with 10 CFR 20.1302(b)(2)(i). The NRC is requesting the following additional information to complete the NRC staff’s evaluation of this calculation:

    a. The current calculation provides the number of rounds which would result in 10% of the maximum effluent concentration for ^{238}U. However, 10 CFR 20.1302 requires a calculation that the TEDE to the individual likely to receive the highest dose from the licensed operations does not exceed the annual dose limit. Therefore, for use of this argument to demonstrate compliance with this requirement, the Army needs to rearrange this calculation to calculate an expected maximum dose which an individual would receive and not the number of rounds. This would require an assumption regarding the number of rounds which would have to be suspended in air and blown

away from the RCA. The Army would be required to adequately justify this value, which could either be site-specific for each site or bounding for all sites. If a bounding value is given, provide justification for how this value bounds all sites.

b. This calculation assumes steady state for 50 years. However, 10 CFR 20.1301 requires calculation based on an annual dose. Modify equation to demonstrate annual dose.
c. This calculation has several assumptions used as inputs which can have substantial impact on the results. Therefore, provide justification that the assumptions made for the purpose of the calculation are conservative and bounding for each site. Justification is necessary for all assumptions, including:
    1) Average wind speed,
    2) Size of cross section of air that is exiting the RCA, including why a plume could not be smaller than 1000 m wide and that the height would not exceed 5 m,
    3) Relative activity abundance of ^{238}U in DU, and
    4) Distance between the RCA and the site boundary (where people are located)
d. Provide reference for given value for relative activity abundance of ^{238}U mass.
e. This calculation only considers dose from ^{238}U and not dose from other uranium isotopes present in the DU. Either incorporate dose from other uranium isotopes to ensure compliance with 10 CFR 20.1301 or provide the basis for their exclusion.

27. License condition 22 requires the licensee to submit an air sampling plan to the NRC prior to performing ground disturbing activities. Section 3.4.1 of the NRC's safety evaluation report (SER) (ML13259A081) describes the basis for this license condition. The SER states that the NRC staff concluded the Army would need to collect additional air sampling during ground disturbing activities on the PTA and Schofield ranges to demonstrate that residual DU from the M101 Davy Crockett spotting rounds are not hazardous to the personnel or public. In this application, the arguments against air sampling discussed in Attachment 13 focus on the DU concentrations in the air resulting from only one type of ground disturbing activity, aerosolization during HE fire. The NRC must evaluate the Army's current amendment application against this license condition applicable to the Hawaiian sites. The Army should also provide its technical basis for not requiring air sampling for the other ground disturbing activities which are expected to occur in the RCAs to address this license condition.

28. License Condition 23 requires the Army to submit a plant sampling plan to the NRC. Section 3.4.5 of the SER (ML13259A081) stated that the NRC staff concluded the Army would need to collect additional plant sampling on the PTA and Schofield ranges to demonstrate that residual DU from the M101 Davy Crockett spotting rounds are not hazardous to the personnel or public, especially during a controlled burn. It appears this information was not provided in this application. Therefore, provide either additional plant sampling data or justification why plant sampling is not necessary during activities such as controlled burns at these specific ranges.

29. 10 CFR 20.1101(d) requires, in part, that licensees establish a constraint on air emissions such that an individual member of the public likely to receive the highest dose will not be expected to receive a TEDE in excess of 10 mrem per year from these emissions. Additionally, if the licensee exceeds this dose constraint, the licensee shall report the exceedance and promptly take appropriate corrective actions to ensure against recurrence. In the programmatic ERMP and the arguments against air sampling, the Army provides

calculations and models to remove the requirement for all air sampling based on a public dose limit of 100 mrem described 10 CFR 20.1301. Provide an evaluation or justification that air emissions from ground-disturbing activities and burns are not expected to exceed the 10 mrem per year dose constraint and what method the site will use to ensure this constraint is not exceeded and how it will provide notification if it is.

30. 10 CFR 20.1301(a) requires a licensee to conduct operations to ensure the TEDE to individual members of the public from licensed operations does not exceed 100 mrem in a year, plus ALARA, exclusive of the dose contributions from background radiation, from any administration the individual has received, from exposure to individuals administered radioactive material and released under 10 CFR 35.75, from voluntary participation in medical research programs, and from the licensee's disposal of radioactive material into sanitary sewerage in accordance with 10 CFR 20.2003. The application provides evaluations to not require environmental sampling from specific media as dose from that media is not expected to exceed public dose limits. However, the application does not provide an example model or calculation which individual sites will use to ensure that the total dose from all pathways did not exceed this limit on an annual basis. Therefore, provide a model or calculation which sites will use (or reference as its technical basis) to ensure (or justify) that dose from all environmental pathways does not (or is not expected to) exceed the public dose limit in 10 CFR 20.1301. Clarify how the Army has addressed ALARA with respect to the public dose limit. Identify the conditions, if any, which would warrant the establishment of an environmental surveillance program to periodically confirm that the public dose limit has not been exceeded.

Performance Assessment – Modeling

31. The Army's application (submittal) provides a bounding dose assessment using RESRAD and a combination of default and modified parameter values to calculate an overly conservative dose. By incorporating conservative parameter values, the Army proposes that this approach, when incorporated into the programmatic approach being proposed, will result in a dose that is conservative for all of the sites being considered in this license amendment and is in compliance with the annual dose limit in 10 CFR 20.1301. This approach differs from the typical dose assessment approach, which utilizes site-specific exposure scenarios and parameter values, whenever possible, to assess the dose for specific sites.

    Although the submittal provides the basis for the parameter values used in the RESRAD analyses for this programmatic approach, no details are provided that show that the selected values incorporate the characteristics of the sites being considered for inclusion on this license. Provide documentation to show that the parameter values associated with the RESRAD analyses used for this programmatic review incorporate the range of values for the specific sites being considered in this review. This documentation can include site-specific values for the individual sites or data from nearby sites that can provide some technical basis that the values incorporated into the programmatic RESRAD analyses either accurately describe the site or are conservative and bound the site.

32. The arguments against air sampling discussed in Attachment 13 focus on the DU concentrations in the air resulting from aerosolization during HE fire. The exposures and

corresponding dose calculations are based on models that consider these events to occur at regular time intervals and last for short periods of time, resulting in multiple acute exposures. Longer-term events that would lead to longer term acute exposures, such as unplanned range fires, and their impacts do not appear to have been considered as part of the Army's assessment of the air sampling program. Provide a description or summary of the impacts from long-term DU releases or the technical basis for their exclusion.

33. The third proposed argument against air sampling provides a discussion of a study (the Morrow report) that uses site-specific modeling to evaluate the potential impacts from the aerosolization of M101 rounds at the Pohakuloa Training Area (PTA) in Hawaii. The highly conservative scenario used in the study resulted in an average DU activity concentration in the air that marginally exceeds the NRC effluent standard while more realistic scenarios resulted in DU activity concentrations in the air that were less than the NRC effluent standard.

    Additional information on this study can also be found in the summary report "Potential Air Quality Impacts of Aerosolizing M-101 Spotter Rounds at Pohakuloa Training Area" (2008), which has not been docketed, and "Estimating Public Exposure to Airborne Depleted Uranium Outside the U.S. Army Pohakuloa Training Area, Hawaii," a report presented at the Air & Waste Management Association conference in 2011:

    a. If the Army is using these reports as part of its technical basis for licensing the RCAs, it should provide these reports as part of its submittal for docketing. A discussion should also be provided that documents the history of the study from prior to 2008 up to and including the conference paper presented in 2011, including what changes and updates to the study were made. If possible, the Army should also provide the entire report from which the 2008 summary was developed.
    b. The conclusions made in Argument 3, which are discussed in the Morrow report, are based on the data and results from the site-specific modeling of potential air quality impacts associated with exploded M101 rounds at PTA. Provide a technical basis demonstrating that the data and conclusions made in this study would apply to or bound the other sites being considered for inclusion in the license. The Army's technical basis should include how the use of the PTA site-specific data, the number of rounds being considered, and the size of the specific RCA area being evaluated are bounding of all the sites.
    c. The conclusions in the argument, which are based on the findings in the Morrow report, are based on a comparison of the activity content of U-238 in DU at PTA and the NRC effluent standard for U-238 in air. For this study, the activity content of U-238 is calculated by multiplying the average DU activity concentration by 0.875. Provide a reference or the technical basis for the use of 0.875 (i.e., 87.5%) for determining the percentage of U-238 activity in DU.
    d. In addition, there appears to be no consideration for the contributions from the other components of DU, including U-234 and U-235. Either incorporate the other isotopes into the analysis or provide the basis for their exclusion. Also, the comparison is with the NRC effluent standard for U-238 and not DU but the conclusion is that the "highly conservative scenario produces an average DU activity concentration in air that marginally exceeds the NRC effluent standard for DU in air." Demonstrate how a comparison of U-238 values can be used to make a conclusion regarding DU.