
SAFETY EVALUATION REPORT

Source Materials License

No. SUC-1593

Depleted Uranium from
Davy Crockett M101 Spotting Rounds –
Amendment No. 4

Docket No. 040-09083

U.S. Army Installation Management Command



Office of Nuclear Material Safety and Safeguards

November 2019

Contributors

Bob Nelson

Christianne Ridge

Priya Yadav

Contents

Introduction	1
Regulatory Requirements and Guidance	1
Summary of the Staff's Findings	2
Background	2
Safety Evaluation	3
1.0 Radiation Safety Plan.....	3
1.1 Regulatory Requirements	3
1.2 NRC Staff Review and Analysis	4
1.3 Evaluation Findings	6
1.4 Conclusions	6
2.0 Revised RCA Map.....	6
2.1 NRC Staff Review and Analysis	7
2.2 Conclusions	7
3.0 License Conditions	8
4.0 Consultations with Other Agencies	9
5.0 National Environmental Policy Act	10
6.0 Acronyms and Initialisms	11
7.0 References	12

Introduction

In a letter dated December 19, 2017 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML18009A452), the U.S. Army Installation Management Command (Army) requested an amendment to Source Materials License No. SUC-1593 for the addition of specific sections to the Programmatic Radiation Safety Plan (RSP), "Radiation Safety Plan for IMCOM Ranges Affected by M101 Davy Crockett Spotting Round Depleted Uranium," dated December 31, 2015, (ADAMS Accession No. ML16004A369), for Fort Jackson, South Carolina and Fort Hunter Liggett, California (Army, 2017). The Army submitted additional pages to the Programmatic RSP that would allow Army personnel relief from RSP requirements during training, vehicle passage (i.e., personnel and equipment riding in vehicles and the vehicles themselves), and/or road maintenance in the radiation control areas (RCAs) at these two installations, specifically Range C8 RCA at Fort Hunter Liggett and Range 62 RCA at Fort Jackson). This Programmatic RSP (Army, 2015) is currently incorporated in license condition 11 of Source Materials License No. SUC-1593.

In addition, the Army requested in license amendment application dated February 16, 2018, (ADAMS Accession No. ML18064A140) to correct the location of the RCA at Donnelly Training Area in Fort Wainwright, Alaska based on coordinate translation errors identified while the Army was conducting a historical document review. The request (Army, 2018a) encloses a revised map to replace the previous version found in "Maps of the locations of the RCAs, 'M101 Impact Areas'" dated December 31, 2015 (ADAMS Accession No. ML16048A358), which is also currently incorporated in license condition 11 of Source Materials License No. SUC-1593.

In a letter dated June 6, 2019 (ADAMS Accession No. ML19148A296), the U. S. Nuclear Regulatory Commission (NRC) staff informed the Army that they completed their acceptance review of the applications and found that the two requests contained sufficient information for the staff to begin their detailed technical review. On July 2, 2019, a notice of an opportunity to request a hearing and to petition for leave to intervene on this licensing proceeding was published on the NRC public website. No requests were submitted.

Because the staff considers these two amendment applications to be actions related to the possession and management of depleted uranium (DU) military munitions, they are considered to fall within the Categorical Exclusions under Title 10 of the *Code of Federal Regulations* (10 CFR) 51.22(c)(14)(xv) and no environmental review is needed.

Regulatory Requirements and Guidance

This safety evaluation report (SER) summarizes the NRC staff's review of the December 19, 2017, and February 16, 2018, requests to amend Source Materials License No. SUC-1593. The staff conducted its review in accordance with the applicable requirements of 10 CFR Part 20, "Standards for Protection Against Radiation", 10 CFR Part 40, "Domestic Licensing of Source Material", and the applicable guidance in NUREG-1556, Vol. 7, Revision 1, "Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Academic, Research and Development, and Other Licenses of Limited Scope Including Electron Capture Devices and X-Ray Fluorescence Analyzers" (NRC, 2018a). The NRC staff considered both the amendment applications as Amendment 4 to Source Materials License No. SUC-1593.

Summary of the Staff's Findings

The Army's technical basis for the license amendment request to provide an exemption to the Programmatic RSP for Fort Hunter Liggett, CA, Range C8 and Fort Jackson, SC, Range 62 is a combination of safety controls provided by the Garrison RSO and the low likelihood of Army personnel in training and road maintenance workers encountering any M101 spotting rounds in these RCAs, given the relatively small amount of DU spotting rounds projected to be located in these RCAs (USACE, 2011). The NRC staff evaluated this approach and found it to be acceptable because the type and manner of the Army training and road maintenance in these two RCAs and the Army commitments about the conduct of activities there (as described in new proposed Sections 4.5 and 4.6 of the Programmatic RSP) are essentially the same as those in the approved Programmatic RSP. In addition, the staff finds that the proposed changes are bounded by the dose assessment for the souvenir hunter at Jefferson Proving Ground (JPG) (NRC, 2019).

Specifically, in accordance with 10 CFR 40.32(b) and (c), the NRC staff finds that the Army is qualified by reason of training and experience to use source material for the purpose it requested. The NRC staff further finds that the Army's proposed equipment and procedures in the Programmatic RSP, including the two additional sections provided in this license amendment request, are adequate to protect health and safety and minimize danger to life or property.

Furthermore, staff finds that the correction of the RCA map for Donnelly Training Area in Fort Wainwright, Alaska is an administrative correction as it was proactively discovered by the Army during a historical document review that there were coordinate translation errors in the version of the RCA map incorporated into the license.

The staff concludes that the findings described in this SER support the issuance of a license amendment incorporating the Army's revised M101 RCA map for Fort Wainwright, AK and revisions to the Programmatic RSP regarding training, vehicle passage, and/or road work maintenance at Fort Hunter Liggett, CA and Fort Jackson, SC by reference in License Condition No. 11. The NRC staff will also revise the license to reflect the change in certifying official submitted by the Army on September 13, 2019 (Army, 2019).

Therefore, in accordance with 10 CFR 40.32(d), the NRC staff finds that issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public. The staff find that the requested license amendment is in accordance with the standards and requirements of the Atomic Energy Act of 1954, as amended, as well as the NRC's rules and regulations.

Background

Source Materials License No. SUC-1593 (ADAMS Accession No. ML18242A352) applies to 16 active Army installations that may have DU present from Davy Crockett M101 spotting rounds. These sites are located at: Fort Benning, Georgia; Fort Bragg, North Carolina; Fort Campbell, Kentucky; Fort Carson, Colorado; Fort Gordon, Georgia; Fort Hood, Texas; Fort Hunter Liggett, California; Fort Jackson, South Carolina; Fort Knox, Kentucky; Fort Polk, Louisiana; Fort Riley, Kansas; Fort Sill, Oklahoma; Donnelly Training Area, Fort Wainwright, Alaska, Joint Base Lewis-McChord/Yakima Training Center, Washington; Joint Base McGuire-Dix-Lakehurst, New Jersey; and Schofield Barracks/Pohakuloa Training Area (PTA), Hawaii.

Detailed background information on the Army's use of Davy Crockett DU M101 spotting rounds can be found in the SER for License Amendment No. 1 (NRC, 2016). A brief background is included in this SER.

Between 1962 and 1968, the Army received and used DU, which the NRC licenses as source material, in the form of Davy Crockett M101 spotting rounds at firing ranges at all the installations mentioned above. As a result, DU was scattered throughout a limited number of ranges at each Army installation that had been used for Davy Crockett weapon system practice and qualification. The Army discontinued firing these spotting rounds at these ranges by 1968.

On November 6, 2008, the Army submitted a license application to the NRC for a possession-only license for DU (ADAMS Accession No. ML090070095) at the two Army installations located in Hawaii (Schofield Barracks and PTA), which the Army considers to be one site. On October 23, 2013, the NRC issued Source Materials License No. SUC-1593 (ADAMS Accession No. ML13259A062) to the Army for possession of DU from Davy Crockett M101 spotting rounds at these two Army installations. In June 2015, the Army submitted its license amendment application (ADAMS Accession No. ML15161A454) to add an additional 15 sites to License SUC-1593, and this was approved by the NRC in Amendment 1, issued March 21, 2016 (NRC, 2016)¹.

On February 9, 2017, the NRC issued Amendment 2 (ADAMS Accession No. ML16343A161) to License No. SUC-1593 that incorporates the Army's submitted site-specific environmental radiation monitoring plans (ERMP) for each installation on License No. SUC-1593. On June 1, 2017 (ADAMS Accession No. ML17158B356), the Army requested to replace three of the site-specific ERMPs with revised final versions for Fort Polk, Louisiana, Fort Riley, Kansas, and PTA, Hawaii, all dated April and May 2017. On October 30, 2018, the NRC approved this request and issued Amendment 3 to License SUC-1593 (NRC, 2018b).

This SER documents changes to the license from Amendment 3.

Safety Evaluation

1.0 Radiation Safety Plan

1.1 Regulatory Requirements

The following regulations apply to the requested amendment to the Army's approved Programmatic RSP:

- 10 CFR 20.1101(a) requires that each licensee develop, document, and implement a radiation protection program commensurate with the scope and extent of licensed activities and sufficient to comply with the provisions of 10 CFR Part 20, "Standards for Protection Against Radiation."

¹ In the amendment 1 application, the Army identified 16 Army installations with sites where DU from Davy Crockett M101 spotting rounds are located, as opposed to 17 Army installations with sites where DU from the Davy Crockett M101 spotting rounds are located. The Army considers the Schofield Barracks/PTA, HI, as one Army installation, similar to a joint base for this license.

- 10 CFR 40.32(b) requires that licensees are qualified by training and experience to use the source material for the purpose requested in a manner that protects health and minimizes danger to life or property.
- 10 CFR 40.32(c) requires that the licensee's equipment, facilities and procedures are adequate to protect and minimizes danger to life or property.

1.2 NRC Staff Review and Analysis

In a letter dated December 19, 2017 (Army, 2017), the Army requested an amendment to Source Materials License No. SUC-1593 for the addition of specific sections to the Programmatic RSP dated December 31, 2015, for Fort Jackson, South Carolina and Fort Hunter Liggett, California. The letter submits additional pages to the Programmatic RSP that would allow Army personnel relief from RSP requirements during training, vehicle passage, and/or road maintenance in RCAs at these two installations, specifically Range C8 RCA at Fort Hunter Liggett and Range 62 RCA at Fort Jackson. The Army believes the controls "are impediments to effective and efficient training at each location" and that "the Archive Search Report annexes for Fort Jackson and for Fort Hunter Liggett both say that minimal M101 spotting round debris is expected to be found in the radiation control areas at each installation" (Army, 2017).

In this license amendment request, the Army submitted a new Section 4.5 to the Programmatic RSP for Fort Hunter Liggett, CA, Range C8. This section notes that "all personnel directly involved in Improvised Explosive Device (IED) Defeat Lane training events in the Fort Hunter Liggett Range C8 RCA are exempt from the radiation safety requirements of this RSP." The Army notes that all personnel entering the IED training area will receive instructions to leave any ordinance that they may encounter undisturbed, including any M101 spotting rounds. Training events in the Range C8 may involve between 50 to 150 soldiers. Vehicles involved in training will be restricted to the IED Defeat Lane road, within the Range C8 RCA. Training units will only be permitted to maneuver on foot within 200 yards of this road.

In addition, Section 4.5.2 of the revised RSP submits that road maintenance at Fort Hunter Liggett, CA, Range C8 also be included in this exemption from the Programmatic RSP requirements, if the maintenance workers remain in their vehicles. These workers are required to inform the Garrison Radiation Safety Officer (RSO) before maintenance begins, so that the Garrison RSO can provide instructions to the workers. The proposed Section 4.5.2 also states that if workers perform road maintenance outside of their vehicles, the Garrison RSO will perform contamination surveys in accordance with Section 11 of the Programmatic RSP and relevant Army Standard Operating Procedures.

Similarly, in this license amendment request, the Army submitted a new Section 4.6 to the Programmatic RSP for vehicle passage through and road maintenance within Range 62 at Fort Jackson, SC. All personnel and equipment riding in vehicles passing through the Range 62 RCA and the vehicles themselves (including road maintenance vehicles on the main road) are requested to be exempt from the radiation safety requirements of the Programmatic RSP. The additional RSP section requires that no one will exit the vehicle while it is in the RCA except for emergencies or vehicle breakdowns, that road maintenance workers are restricted to the main road (North Tower Road), that the Garrison RSO will provide instructions to the workers before maintenance begins, and that departures for more than 10 feet from this roadway require implementation of all pertinent Programmatic RSP requirements. This section also states that if

workers perform road maintenance outside of their vehicles, the Garrison RSO will perform contamination surveys in accordance with Section 11 of the Programmatic RSP and relevant Army Standard Operating Procedures.

The Army's justification for this exemption is that it is unlikely that persons involved in these activities will encounter DU, based on the fact that "less than 30 kilograms of DU (estimated 135 M101 rounds) are in three RCAs with a total area of 3 square kilometers (about 740 acres) at Fort Hunter Liggett and that encountering a random M101 round is unlikely" (Army, 2017). Similarly, at Fort Jackson, less than 30 kilograms of DU are projected to be in the RCA with a total area of 1 square kilometer (about 247 acres). The NRC staff concluded in the SER for Amendment 1 that the methods that the Army used to estimate the type of material potentially present at the RCAs, its chemical and physical form, and the mass of DU at each installation are reasonable in the SER for Amendment 1 (NRC, 2016). For the license amendment request discussed in this SER, the NRC staff concludes that this method that the Army used continues to be acceptable. Therefore, NRC staff believes that the Army's statements about the quantities of potential M101 rounds present in these RCAs and the likelihood that persons involved in these activities will encounter DU are reasonable.

For the requested amendment discussed in this SER, the NRC staff determined that exemptions of Programmatic RSP requirements could be applied to Fort Hunter Liggett, CA and Fort Jackson, SC on the basis that given the amount of DU potentially present and the controlled training exercises, roadwork maintenance, and/or vehicle passage that could occur and that it would be unlikely for Army personnel to encounter DU. In addition, the Army commits that the personnel involved in these activities will receive instructions to leave any ordinance that they may encounter undisturbed, including any M101 spotting rounds. The staff determined that this instruction is appropriate to prevent unintended contact with DU.

Furthermore, as part of the review of this license amendment request to revise the Programmatic RSP for Fort Hunter Liggett and Fort Jackson, the NRC staff also reviewed the SER for Amendment 20 (ADAMS Accession No. ML19088A306) to the Army's Source Materials License No. SUB-1435 for the Jefferson Proving Ground (JPG) and the Army's souvenir hunter scenario dose assessment for JPG (Army, 2018b). In the souvenir hunter scenario, the Army evaluated the projected dose to an individual who finds a DU penetrator onsite, takes the penetrator home as a souvenir, removes corrosion products by sanding or grinding, and is incidentally exposed to the penetrator and contaminated dust periodically throughout a year.

The Army evaluated the souvenir hunter scenario for JPG because recreational users are allowed on the JPG site. The Army considered the souvenir hunter scenario at JPG to be unlikely because recreational users are not allowed near the DU impact area and because any recreational users that are allowed on site are warned not to interact with the unexploded ordinance onsite. The scenario appears to be less likely for an active military range such as those under consideration in this license amendment request; however, it is described here as a bounding case. In the context of JPG, the Army assumed the source term for the souvenir hunter would be one DU penetrator fragment weighing 2.64 kg (5.82 pounds), which is approximately 10 times more DU than an M101 spotting round, which contains about 0.190 kg of DU (USACE, 2011). The total projected dose to the souvenir hunter was 0.67 mSv/yr (67 mrem/yr) (Army, 2018b). Although the projected dose in a souvenir hunter scenario does not scale directly with the penetrator mass, the NRC staff expects the dose to similar "souvenir hunter" who takes an M101 spotting round from the site would be less than the dose projected for a JPG penetrator. Therefore, the NRC staff concludes that in the extremely unlikely case an

individual takes an M101 spotting round offsite, removes corrosion products by sanding or grinding, and is incidentally exposed to the spotting round and contaminated dust through a year, the dose to that individual would be less than the 10 CFR 20.1301(a)(1) public dose limit of 1 mSv/yr (100 mrem/yr) TEDE. Given the administrative controls in place (i.e., instructions from the Garrison RSO to leave any ordinance in place), a souvenir hunter is not expected to occur from the soldier or maintenance worker population at these RCAs.

1.3 Evaluation Findings

The Army's technical basis for the license amendment request to provide an exemption to the Programmatic RSP for Fort Hunter Liggett, CA, Range C8 and Fort Jackson, SC, Range 62 is a combination of safety controls provided by the Garrison RSO and the presumed low likelihood of Army personnel in training and road maintenance workers encountering any M101 spotting rounds in these RCAs, given the relatively small amount of DU spotting rounds projected to be located in these RCAs (USACE, 2011). The NRC staff evaluated this approach and found it to be acceptable because the type and manner of the Army training, road maintenance, and/or vehicle passage that could occur in these two RCAs and the Army commitments about the conduct of these activities (as described in new proposed Sections 4.5 and 4.6 of the Programmatic RSP) are essentially the same as those in the approved Programmatic RSP.

Furthermore, the dose assessment for a souvenir hunter at JPG, although not expected to occur at the RCAs in this license amendment request under review, can be considered a conservatively bounding assessment for Army soldiers in training and road maintenance workers. In the unlikely case it did occur, the dose to an individual would still meet the public dose limit.

1.4 Conclusions

The NRC staff conclude that the safety controls in the proposed additional sections (i.e., Sections 4.5 and 4.6) to the Programmatic RSP for Fort Hunter Liggett, CA, Range C8 and Fort Jackson, SC, Range 62 are consistent with the previously approved Programmatic RSP (Army, 2015). The staff find that the proposed changes are bounded by dose assessment for the souvenir hunter at JPG (NRC, 2019).

The staff find that the requested license amendment is in accordance with the standards and requirements of the Atomic Energy Act, as well as the NRC's rules and regulations, specifically 10 CFR 20.1101(a), 10 CFR 40.32(b), and 10 CFR 40.32(c).

See Section 3.0 for the revised license condition 11 that will incorporate the additional Sections 4.5 and 4.6 into the Programmatic RSP.

2.0 Revised RCA Map

The Army requested in a second license amendment application dated February 16, 2018, (Army, 2018a) to correct the location of the RCA at Donnelly Training Area in Fort Wainwright, Alaska based on coordinate translation errors found in the previous version, while the Army was conducting a historical document review. The request encloses a revised map to replace the previous version found in "Maps of the locations of the RCAs, 'M101 Impact Areas'" dated December 31, 2015 (ADAMS Accession No. ML16048A358), which is currently incorporated in license condition 11 of Source Materials License No. SUC-1593. The Army submittal notes that

the only change to the 2015 version of the M101 Impact Areas maps is for Fort Wainwright, Alaska, and that the remaining RCA maps are unchanged in the 2018 submittal. However, the Army submitted a complete version of the M101 RCA maps with their license amendment request for completeness.

2.1 NRC Staff Review and Analysis

The license amendment request encloses a memorandum from the U.S. Army Headquarters in Alaska that provides evidence and justification for the requested change for the RCA map for Fort Wainwright. The justification states, “during the site survey conducted as part of the initial investigation (in 2008) there were some errors in the reporting and recording of location information.... the map datum for this area has changed several times since the original location was recorded. Datum conversions also factor into the error in this case.” The license amendment request attaches a technical report from the Installation Range Officer and the Army’s Graphic Information System Analyst that notes that they have reviewed the records, found additional photographic and historical evidence, and conducted geo-referenced correlation. The Army believes the range location was incorrectly identified, confusing the location as Georgia Range, when in fact, the survey team was to the north on Colorado Range. The Army believes “there is a high probability that the survey team did not properly translate the coordinates as part of the change in map datum when it was converted to the current NAD83/WGS84. This conversion normally results in a difference of location of approximately 200-300 meters in grid location” (Army, 2018a).

The license amendment request summarizes the Army’s procedures in correcting this error. It notes “the analytical process used in determining the accurate location of the firing point required both ortho-correcting imagery so that the scale was on the same from one picture to the next. Then the imagery was geo-referenced to the maps so that the imagery matched the available mapping. Additionally, care was taken to ensure that the appropriate map datum was used/derived based on the timeframe of the source information. This methodology was applied throughout the process to maintain accuracy of the data derived.”

The NRC staff independently evaluated the supporting information and the Army’s methods for adjusting the coordinates of the RCA and found the Army’s new coordinates to be reasonable, within an acceptable margin of error. The NRC staff agrees with the Army’s conclusion that the RCA location would shift to the west and slightly to the south due largely to failing to account for the datum shift and partly to changing where the firing location must have been. The NRC staff finds the Army’s methods for correcting the location of the RCA at Donnelly Training Area in Fort Wainwright, Alaska to be reasonable. The staff finds that the correction of the RCA map is an administrative correction, as it was proactively discovered by the Army during a historical document review that there were coordinate translation errors in the version incorporated into the license.

2.2 Conclusions

The staff find that the requested license amendment is in accordance with the standards and requirements of the Atomic Energy Act, as well as the NRC’s rules and regulations. See Section 3.0 for the revised license condition 11 that will incorporate the revised M101 Impact Areas, RCA maps into License No. SUC-1593.

3.0 License Conditions

The existing license in effect October 30, 2018, (after Amendment 3 to SUC-1593) can be found at ADAMS Accession No. ML18242A352. The “Programmatic RSP” and the “Maps of the locations of the RCAs, M101 Impact Areas” (along with clarifying emails) are currently incorporated in license condition 11, as shown below.

During its review, the staff identified one other administrative change that should be made to the license. The Army submitted a letter dated September 13, 2019 (Army, 2019), notifying the NRC of a change in the certifying official for this license. This portion of the License Amendment No. 4 is administrative.

Proposed License Conditions:

Revisions from the license conditions in Amendment 3 due to license Amendment 4 are shown in bold and deletions are shown in strikethrough. These changes are shown as they would appear on Form 374, “Materials License” for Amendment No. 4, but without the bolding and strikethrough.

Sections 1 through 10, and Sections 12 through 20: no changes

Proposed License Condition No.11:

11. Except as specifically provided otherwise, the licensee shall conduct operations in accordance with the commitments, representations, and statements contained in the license amendment applications:
 - Programmatic Radiation Safety Plan, “Radiation Safety Plan for IMCOM [Installation Management Command] Ranges Affected by M101 Davy Crockett Spotting Round Depleted Uranium,” dated December 31, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16004A369) **as amended by additional pages found in ADAMS Accession No. ML18009A452, in letter dated December 19, 2017;**
 - Programmatic Physical Security Plan, “Physical Security Plan for U.S. Army Installation Management Command Ranges Affected by Depleted Uranium in M101 Davy Crockett Spotting Rounds,” dated December 31, 2015 (ADAMS Accession No. ML16004A369);
 - Form 313, “Application for Materials License,” items 1 - 7, dated June 1, 2015 (ADAMS Accession No. Pkg. ML15161A454, Form 313 at ADAMS Accession No. ML15161A458);
 - Attachment 3, “Calculation of TEDE [Total Effective Dose Equivalent] to Individual Likely to Receive Highest Dose,” dated June 1, 2015 (ADAMS Accession No. Pkg. ML15161A454, Attachment 5 at ADAMS Accession No. ML1516A459);
 - Attachment 4, “How the Army Determined the M101DU RCAs [Radiation Control Areas],” dated September 30, 2015 (ADAMS Accession No. Pkg. ML15294A276, Attachment 4 at ADAMS Accession No. ML15294A278);
 - Attachment 5, “Bounding Calculations Using RESRAD 7.0 and RESRAD-OFFSITE 3.1,” dated June 1, 2015 (ADAMS Accession No. Pkg. ML15161A454, Attachment 5 at ADAMS Accession No. ML15161A459);
 - Email clarifying RCAs at Fort Knox, KY, dated January 29, 2016 (ADAMS Accession No. ML16041A107);

- Attachment 8, “Estimating Public Exposure to Airborne Depleted Uranium Outside the U.S. Army Pohakuloa Training Area, Hawaii,” dated September 30, 2015 (Pkg. ADAMS Accession No. ML15294A276, Attachment 8 at ADAMS Accession No. ML15294A277);
- Attachment 9, “Examples of Army Range Fires,” dated September 30, 2015 (ADAMS Accession No. Pkg. ML15294A276, Attachment 9 at ADAMS Accession No. ML15294A277);
- Attachment 10, “Arguments against Air Sampling During HE [High Explosive] Fire into RCAs, Rev. 1,” dated September 30, 2015 (ADAMS Accession No. Pkg. ML15294A276, Attachment 10 at ADAMS Accession No. ML15294A277);
- Attachment 11, “‘Calculation of Public Dose’ SOP [Standard Operating Procedure],” dated September 30, 2015 (ADAMS Accession No. Pkg. ML15294A276, Attachment 11 at ADAMS Accession No. ML15294A277);
- Programmatic Environmental Radiation Monitoring Plan (ERMP), “Programmatic Approach for Preparation of Installation-specific Environmental Radiation Monitoring Plans”, dated September 15, 2016 (ADAMS Accession No. ML16265A218);
- “U.S. Army Decommissioning Funding Plan (DFP) for License Number SUC-1593,” dated February 9, 2016 (ADAMS Accession No. ML16042A232);
- ~~Maps of the locations of the RCAs, “M101 Impact Areas,” dated December 31, 2015 (but, sent February 12, 2016, (ADAMS Accession No. ML16048A358);~~ **“M101 Impact Areas,” dated February 16, 2018 (ADAMS Accession No. ML18064A140)**
- Emails clarifying M101 Target Areas [Radiation Control Areas], dated February 12, 2016 (ADAMS Accession No. ML16048A347), May 24, 2016 (ADAMS Accession No. ML16341C807), and December 7, 2016 (ADAMS Accession No. ML1651A092)
- Statement of Intent dated June 1, 2015 (ADAMS Accession No. ML15161A458);
- Final Site-Specific ERMPs and Associated Quality Assurance Plan, dated September 2016 (ADAMS Accession No. Pkg. ML16265A221) for all Davy Crockett RCAs except those located at Fort Polk, LA, Fort Riley, KS, and the PTA, HI;
- Revised Final Site-Specific ERMPs for Fort Polk, LA, Annex 11; Fort Riley, KS, Annex 12; and PTA, Annex 17 RCAs, dated May 2017, May 2017, and April 2017, respectively (ADAMS Accession No. ML17158B356) and associated Quality Assurance Plan, dated September 2016 (ADAMS Accession No. ML16265A233);
- Letter dated December 15, 2017 (ADAMS Accession No. ML18009A456), clarifying sediment sample collection;
- Letter dated February 24, 2010 (ADAMS Accession No. ML120950352), documenting the contact information for the License Radiation Safety Officer (RSO) for this license; and
- ~~Letter dated September 5, 2018~~ **September 13, 2019 (ADAMS Accession No. ML19281C335), identifying the Army licensing certifying official for this license.**

4.0 Consultations with Other Agencies

The NRC determined that consultation under Section 7 of the Endangered Species Act of 1973 (ESA), and Section 106 of the National Historic Preservation Act of 1966 (NHPA) are not required for this proposed amendment because it does not affect historic properties or endangered species.²

² 16 USC 470 et seq.

5.0 National Environmental Policy Act

The NRC determined an environmental assessment for this action is not required, because the proceeding was considered to fall within the Categorical Exclusion under 10 CFR 51.22(c)(14)(xv) and no environmental review is needed.

6.0 Acronyms and Initialisms

AEA	Atomic Energy Act of 1954, as amended
CATEX	Categorical Exclusion
CFR	<i>Code of Federal Regulations</i>
DU	Depleted Uranium
ERMP	Environmental Radiation Monitoring Plan
IED	Improvised Explosive Device
IMCOM	U.S. Army Installation Management Command
JPG	Jefferson Proving Ground
MREM	millirem
NHPA	National Historic Preservation Act of 1980
NEPA	National Environmental Policy Act
NUREG	NRC technical report designation (<u>N</u> uclear <u>R</u> egulatory Commission)
RCA	Radiation Control Area
RESRAD	dose assessment code for RESidual RADioactive materials
RSP	Radiation Safety Plan
RSO	Radiation Safety Officer
SER	Safety Evaluation Report
SOP	Standard Operating Procedures
TEDE	Total Effective Dose Equivalent
USACE	U.S. Army Corps of Engineers

7.0 References

[AEA] Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2011 et seq., Pub. L. 83-703.

[Army, 2015] U.S. Army, Letter enclosing “Response to Requests for Additional Information: includes Decommissioning Funding Plan, M101 Impact Areas, Physical Security Plan, Programmatic Approach for Preparation of Installation-specific Environmental Radiation Monitoring Plans, Radiation Safety Plan”, December 31, 2015, ADAMS Accession No. ML16004A369.

[Army, 2017] U.S. Army, Letter requesting license amendment (with additional Radiation Safety Plan pages for Fort Jackson and Fort Hunter Liggett), dated December 19, 2017 (ADAMS Accession No. ML18009A452).

[Army, 2018a] U.S. Army, Letter requesting license amendment to correct the location of the RCA at Donnelly Training Area in Fort Wainwright, Alaska, dated February 16, 2018, (ADAMS Accession No. ML18064A140).

[Army, 2018b] U.S. Army, “Responses to Nuclear Regulatory Commission March 28, 2018 Requests for Additional Information for the Safety Evaluation Report and Environmental Assessment for the Proposed Amendment of Materials License Sub-1435, Jefferson Proving Ground Depleted Uranium Impact Area,” Rock Island, Illinois: U.S. Army and Louisville, Kentucky: U.S. Army Corps of Engineers. ADAMS Accession No. ML18156A002. May 25, 2018.

[Army, 2019] U.S. Army, Letter notifying NRC of change in certifying official for License No. SUC-1593 to Major General Timothy P. McGuire, dated September 13, 2019, (ADAMS Accession No. ML19281C335).

[NRC, 2016] U.S. Nuclear Regulatory Commission, “Safety Evaluation Report for the U.S. Army’s Possession License for Depleted Uranium from the M101 Spotting Round- Addition of 15 Sites, Amendment No. 1”, March 21, 2016 (ADAMS Accession No. ML16039A230).

[NRC, 2017] U.S. Nuclear Regulatory Commission, “Safety Evaluation Report for the U.S. Army’s Possession License for Depleted Uranium from Davy Crockett M101 Spotting Rounds – Amendment to Address License Conditions Nos. 18 and 19”, January 2017, (ADAMS Accession No. ML16343A163).

[NRC, 2018a] U.S. Nuclear Regulatory Commission, NUREG–1556, Vol. 7, “Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Academic, Research and Development, and Other Licenses of Limited Scope Including Electron Capture Devices and X-Ray Fluorescence Analyzers, Rev.1”, February 2018, (ADAMS Accession No. ML18065A006).

[NRC, 2018b] U.S. Nuclear Regulatory Commission, “Amendment 3 to Source Materials License No. SUC-1593”, Package (ADAMS Accession No. ML18158A322) Transmittal letter (ADAMS Accession No. ML18158A323), License (ADAMS Accession No. ML18242A352), SER (ADAMS Accession No. ML18158A324).

[NRC, 2019] U.S. Nuclear Regulatory Commission, “Safety Evaluation Report for the U.S. Army’s Possession Only License for Depleted Uranium Penetrator Rounds at Jefferson Proving

Ground, Madison, Indiana,” September 2019, ADAMS Accession No. ML19088A306.

[USACE, 2011] St Louis. Project Archive Search Report. Use of Cartridge, 20mm Spotting M101. St Louis, Missouri: US Army Corps of Engineers, St Louis District, 2011.

[Yu et al., 2016a] RESRAD, Version 7.2

[Yu et al., 2016b] RESRAD-OFFSITE, Version 3.2