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

November 30, 2020

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:

This letter responds to your June 23, 2020 request for additional information (RAI) on our December 27, 2019 submittal of the Revised Final Decommissioning Funding Plan (DFP) for Material License SUC-1593, dated October 28, 2019.

We enclose a table summarizing our responses to your RAI. We also enclose a new DFP, revised in accordance with statements in our response. Per your November 9, 2020 letter (ML20309A254), the statement of intent that we included in our December 27, 2019 submittal is at the end of the new DFP.

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

Enclosures

Army Responses to NRC 23 June 2020 Requests for Additional Information

NRC Request	Army Response
(1) Include a certification of financial assurance (10 CFR 40.36(d)(1)(iv); NUREG-1757, Vol. 3, Rev. 1, Appendix A, Section A.2)	In a November 9, 2020 letter (ML20309A254), the NRC informed the Army that NRC staff had decided "that no changes to the SOI included in the December 27, 2019 Army submittal and no separate CFA are required for this update." As the NRC suggested in that letter, the Army will "consider ... the submittal of a CFA during the next triennial update for License No. SUC-1593."
(2) Demonstrate that the signatory of the SOI has the authority to request funding from an external funding body and provide associated supporting documentation (NUREG-1757, Vol. 3, Rev. 1, Appendix A, Section A.11; Interim Staff Guidance on Decommissioning Funding Plans for Materials Licensees)	See "Extracts from Army Regulations Relevant to IMCOM CG's Authority and Responsibility to Represent IMCOM in the Statement of Intent to the Nuclear Regulatory Commission" in the pages that follow this table.
(3) Identify the bases for key assumptions and justify key changes in assumptions between the 2016 DFP and 2019 Revised Final DFP Update (10 CFR 40.36(d)(1)(ii); NUREG-1757, Vol. 3, Rev. 1, Appendix A, Section A.3.1)	As follows below:
(3A1) How is the total volume (4,192 m^3) of M101 spotting rounds, fragments, and impacted soil divided into quantities for each installation, as shown in Table 2-12?	We added the following footnote to Table 2-12, "On 1 June 2015, the Army provided the NRC an application to amend SML SUC-1593 (ML15161A458). Within the License Amendment Application, the Army supplied an estimated number of M101 spotting rounds at each Installation. The estimated number of M101 spotting rounds at each Installation has been multiplied by the average volume of fragments and impacted soil requiring remediation for each M101 spotting round (0.138 m^3) to determine the total

NRC Request	Army Response
	volume of M101 spotting rounds, fragments, impacted soil at each Installation."
(3A2) How is the total area (46.5 km^2) determined for the individual RCAs, as shown in Table 2-13 (i.e., what is the area calculated for each RCA based on)? Please add the reference for the calculated area as a footnote to Table 2-13.	We added the following footnote to Tables 2-1 and 2-13, "The quantity, location, and areal extent of the RCAs/Ranges at the 18 Army Training Ranges is based on "M101 Impact Areas" dated 16 February 2018 (ML18064A140) and incorporated into SML SUC-1593 as condition #11."
(3A3) Table 2-1 and several text sections note that there are 35 Radiation Control Areas (RCAs) at 18 Army Training Areas included on License SUC-1593. The 2016 DCE documents 29 impact areas on 16 installations on Table A.1. The SER for Amendment 2 (ADAMS Accession No. ML16343A163) documents "The total number of Davy Crockett RCAs is 38". Please correct Table 2-1 and the text of the Revised Final DFP to reflect the correct number of RCAs and ensure that decommissioning costs were calculated for all the RCAs on the license.	The definitive enumeration and locations of the RCAs is in "M101 Impact Areas," February 16, 2018 (ADAMS Accession No. ML18064A140), incorporated into the license by license condition 11. It lists 16 installations, two of which have geographically separated sub-posts. It shows thirty maps with most displaying only one RCA. The Fort Polk map shows two RCAs, the Joint Base Lewis-McChord maps shows three RCAs, the Yakima Training Center map shows two RCAs, and the Pohakuloa Training Area map shows three adjacent areas (areas 1, 2, 3, and 4) that we count as a single RCA, for a total of 35 RCAs. This will be our official count of RCAs henceforth and we will adjust this number in the Revised Final DFP accordingly. We have verified that the calculated decommissioning costs in the Revised Final DPF account for all 35 RCAs.
(3B1) To ensure that adequate funding is available at the time of decommissioning, provide a narrative explanation identifying and justifying which key assumptions changed that resulted in this significant decrease in the DCE.	We added the following paragraph to Section 2.6, "Except for the Packaging, Transportation, and Disposal Costs presented in Table 2-12, the currentproportional one square kilometer cost estimate also was applied to

NRC Request	Army Response
Alternatively, correct the cost estimate for Pohakuloa Training Area and Schofield Barracks in Hawaii.	Pohakuloa Training Area and Schofield Barracks in Hawaii and was used to develop the decommissioning cost estimates. This is a deviation from the previously submitted DFP dated 9 February 2016 where the decommissioning cost estimates for the RCAs located in Hawaii were carried over from the cost estimates submitted on 17 January 2015 (ML14057A365 and ML14057A366). These cost estimates were developed using a method from the current one. This change allows for consistency between the cost estimates presented for all the RCAs."
(3B2) Similarly, the DCE does not explain other departures from assumptions contained in the 2016 DCE that are relied upon as the bases for the 2019 DCE. Specifically, the DCE states that the source for several workday estimates is the 2016 DCE. However, these workday estimates differ in several places from the workday estimates in the 2016 DCE. For example, Table 2-2 states that its source is Table A.3.1.2.1(a) in the 2016 DCE but includes additional decommissioning activities (i.e., Administrative Fees), makes changes to labor categories, and provides for 73 more Planning and Preparation workdays per square kilometer than did Table A.3.1.2.1(a). As 10 CFR 40.36(d)(1)(ii) requires that the DFP justify the key assumptions contained in the DCE and NUREG- 1757, Vol. 3, Rev. 1, Appendix A, Section A.3.1 states that labor estimates "should have a clear and reasonable basis," provide a narrative explanation clarifying the basis of the 2019 DCE's workday estimates.	We added the following footnotes to their respective tables: • **Table 2-2**: The source of the professional labor workdays per km^2 in Table 2-2 is Table A.3.1.2.1 (a) from the DFP dated 9 February 2016 except for three deviations. The first deviation from the DFP dated 9 February 2016 is hours that we estimated for specific activities where we expected NRC Staff involvement and review. The second deviation from the DFP dated 9 February 2016 is the addition of the "Administrative Fees (such as procurement fees for third-party contractor, legal fees, financial assurance fees, and coordination with NRC staff)." We added this activity to Table 2-2 as presented in Table A.3.6 of NUREG-1757, Volume 3. The third deviation from the DFP dated 9 February 2016 is the titles of the labor categories that were changed in order to align with the labor category titles in RACER™ 11.5 and the labor hours underneath

NRC Request	Army Response
	the re-titled labor categories were slightly shifted based on professional judgment." • **Table 2-4:** The source of the professional labor workdays per km^2 in Table 2-4 is Table A.3.1.2.1 (a) from the DFP dated 9 February 2016 except for one deviation. The one deviation from the DFP dated 9 February 2016 is the titles of the labor categories that we changed in order to align with the labor category titles in RACER™ 11.5. • **Table 2-5:** Source of the workdays per km^2 in Table 2-5 is the earlier Davy Crockett DFP Table A.3.1.2.1 (c) dated 9 February 2016 except for one deviation. The one deviation from the DFP dated 9 February 2016 is the titles of the labor categories that we changed in order to align with the labor category titles in RACER™ 11.5. • **Table 2-6:** Source of the workdays per km^2 in Table 2-6 is the earlier Davy Crockett DFP Table A.3.1.2.1 (d) dated 9 February 2016 except for two deviations. The first deviation from the DFP dated 9 February 2016 is hours that we estimated for specific activities where we expected NRC Staff involvement and review. The second deviation from the DFP dated 9 February 2016 is the titles of the labor categories were changed in order to align with the labor category titles in RACER™ 11.5 and the labor hours underneath the re-titled labor categories were slightly shifted based on professional judgment.

NRC Request	Army Response
	• **Table 2-7:** Source of the workdays per km^2 in Table 2-7 is the earlier Davy Crockett DFP Table A.3.1.2.1 (e) dated 9 February 2016 except for two deviations. The first deviation from the DFP dated 9 February 2016 is hours that we estimated for NRC Staff and Army Oversight Safety involvement and review of the Initial Five-Year Review. The second deviation from the DFP dated 9 February 2016 is the titles of the labor categories were changed in order to align with the labor category titles in RACER™ 11.5 and the labor hours underneath the re-titled labor categories were slightly shifted based on professional judgment.
(3B3) Provide a narrative explanation clarifying the basis of the 2019 DCE's workday estimates for Table 2-6.	We added the 'Reporting' activity to Table 2-6 and incorporated the resulting revisions to the labor hours and estimated costs into Tables 2-8, 2-10, 2-11, and 2-13. All other activities listed in Table 2-6 are the same as in the 2016 DFP. Comment 3B2 addresses the other deviations in Table 2-6 from the 2016 DFP.
(3B4) Table 2-12, footnotes "The source of the costs for the Hawaii installations presented in Table 2-12 is the previous Davy Crockett DFP Tables A.3.1.2.2.a. l, A.3.1.2.2.a.2, A.3.1.2.2.b. and A.3.1.2.2.c dated 9 February 2016." However, staff are not able to recreate the $3,991,113, based on the referenced 2016 tables. Please correct the estimate or delete the footnote (and any other footnotes that do not apply).	We corrected the error in Table 2-12. All footnotes are still applicable.

NRC Request	Army Response
(3B5) Please include relevant portions of the RACER file output as an appendix to the 2019 DCE, where it is useful to support the cost estimate breakdown and assumptions.	We only used RACER™ 11.5 to supply the Salary & Fringe ($/year) and Overhead Rate (%) information shown in Table 2-9 for contractor personnel. We have no RACER™ file output to present for the labor rate information.

Army Regulation 600–20, Army Command Policy, 24 July 2020

Applicability. This regulation applies to the Regular Army, ..., unless otherwise stated.

Chapter 1, Introduction

1–1. Purpose

This regulation prescribes the policies and responsibilities of command, ...

1–4. Responsibilities

g. The Commanding General, Army Materiel Command (AMC) is responsible for the execution and delivery of Soldier, Civilian, and Family programs and services at the installation in support of total force Readiness and Resilience. Installation Management Command (IMCOM) is a major subordinate command to AMC.

1–6. Command

a. Privilege to command. Command is exercised by virtue of office and the special assignment of members of the Armed Forces of the United States holding military grade who are eligible to exercise command. A commander is, therefore, a commissioned or warrant officer (WO) who, by virtue of grade and assignment, exercises primary command authority over a military organization ... that is recognized as a "command" under pertinent official directives. ...

b. Elements of command. The key elements of command are authority and responsibility. Formal authority for command is derived from the policies, procedures, and precedents presented in chapters 1 through 3.

Chapter 2, Command Policies

2–1. Chain of command

b. Commanders are responsible for everything their command does or fails to do.

2–5. Command of installations, activities, and units

b. Command of installations. Command of Army installations is subject to policies, procedures, and regulations promulgated by HQDA.

(3) Roles and responsibilities

(d) Installations managed by Army Materiel Command. The SECARMY designated IMCOM as a major subordinate command of Army Materiel Command (AMC) .... AMC manages Army garrisons assigned to it, executes installation readiness missions, provides equitable installation base operations services and facilities, optimizes resources, sustains

the environment, and enhances the well-being of the military community. AMC integrates and delivers support to enable readiness within the strategic support area for a globally responsive Army through the supporting relationships illustrated in figure 2–1.

1. IMCOM, as a subordinate command to AMC, commands the garrisons assigned to it.
2. IMCOM and its subordinate organizations are in direct support ... to the [senior commander (SC)] on AMC-managed installations. ... The SC commands the installation, but funding and processes for most base operations flow through IMCOM.

2–13. Responsibility of successor

A commander who succeeds to any command or duty assumes the duties of his or her predecessor. The successor will assume responsibility for all orders in force and all the public property and funds pertaining to the command.

Army Regulation 1–1, Planning, Programming, Budgeting, and Execution, 23 May 2016

Chapter 1, Introduction

1–1. Purpose

This regulation prescribes policy and assigns responsibilities for the Army planning, programming, budgeting and execution (PPBE) process, as a constituent part of the Department of Defense (DOD) PPBE process. ...

Chapter 2, Responsibilities

2–20. Commanders of Army commands, Army service component commands, direct reporting units, and other operating agency heads

This group (collectively referred to as “commanders” in this regulation) includes commanders of Army commands (ACOMs), ... The term “command” is used to represent all organizations that receive funds from HQDA. Commanders responding to HQDA calls to submit program and budget data will—

a. Plan, program, and budget for assigned missions, responsibilities, and functions. As required, they will provide—
   (1) Mission and operating requirements.
   (2) Views on prospective programs.
   (3) Commander’s program assessments.

Chapter 3, About Planning, Programming, Budgeting, and Execution

Section I, Department of Defense Planning, Programming, Budgeting, and Execution

3–1. Department of Defense decision support systems

a. DOD’s PPBE process, the Joint Capabilities Integration and Development System (JCIDS), and the Defense Acquisition System are DOD’s primary

decision support processes that provide capabilities to support the National Security Strategy (NSS), National Defense Strategy (NDS), and National Military Strategy (NMS). They collectively govern much of DOD's activities. PPBE is DOD's annual resource allocation process. DOD's PPBE satisfies the demands of the national strategies by means of a milestones-driven and synchronized process constrained by Congress, the OMB, and DOD. The result is a constrained annual budget used to manage resource execution, which is based on a multiyear program informed by plans that meet long-term national security goals and objectives.

3–2. Department of Defense planning, programming, budgeting, and execution process overview

c. Budgeting. The DOD Components develop and submit a detailed budget estimate submission (BES) for their programs ...

3–3. Annual cycle

a. The DOD PPBE process is an annual process to support the requirement to submit a budget to Congress annually. ...

Chapter 6, Programming Phase

Section I, Army Programming

6–6. Command participation

Commands participate in the PPBE process. Commands make mission and operating requirements known through commander's program assessments, command-requested changes, briefings to the PPBC, and additional data submissions prescribed by the integrated program and budget data call instructions. ASCCs integrate operational requirements of the CCMD into their program and budget input. In addition, CCMDs highlight their pressing requirements in an IPL that receives close review during program development by HQDA, the Joint Staff, and OSD.

Chapter 7, Budgeting Phase

Section I, Army Budget Development

7–2. Guidance

a. Integrated program-budget data call. Beginning in the fall of the year prior to submission of the POM and BES to OSD, HQDA issues periodic data calls to commands, providing detailed instructions and due dates for submitting program and budget input to HQDA.

REVISED FINAL

DECOMMISSIONING FUNDING PLAN FOR MATERIAL LICENSE SUC-1593

November 30, 2020

Submitted By:

U.S. ARMY INSTALLATION MANAGEMENT COMMAND
ATTN: IMSO, Building 2261
2405 Gun Shed Road, Fort Sam Houston, Texas 78234-1223

Submitted To:

U.S. NUCLEAR REGULATORY COMMISSION
Office of Nuclear Material Safety and Safeguards
11545 Rockville Pike, Two White Flint North, Rockville, Maryland 20852-2738

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ACRONYMS AND ABBREVIATIONS

CADD	Computer-Aided Design
CFR	Code of Federal Regulations
DFP	Decommissioning Funding Plan
DoD	U.S. Department of Defense
DU	Depleted Uranium
IMCOM	Installation Management Command
km^2	Square Kilometers
LLRW	Low-Level Radioactive Waste
m^3	Cubic Meters
NRC	U.S. Nuclear Regulatory Commission
NUREG	U.S. Nuclear Regulatory Commission Regulation
PPE	Personal Protective Equipment
RACER™	Remedial Action Cost Engineering Requirements
RCA	Radiation Control Area
RSO	Radiation Safety Officer
RSSO	Radiation Safety Support Officer
SML	Source Material License
TA	Training Area
TRACES	Tri-Service Automated Cost Engineering System
UPB	Unit Price Book
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance

1.0 INTRODUCTION

This Decommissioning Funding Plan (DFP) has been developed for the U.S. Army's U.S. Nuclear Regulatory Commission (NRC) source material license (SML) SUC-1593. This DFP provides an updated detailed site-specific cost estimate for decommissioning of the 35 Radiation Control Areas (RCAs) located within 18 U.S. Army installations included in SML SUC-1593 to meet the criteria for unrestricted use in 10 Code of Federal Regulations (CFR) 20.1402. This document meets the requirements and elements set forth in U.S. Nuclear Regulatory Commission Regulation (NUREG)-1757, Volume 3, Revision 1, "Consolidated Decommissioning Guidance: Financial Assurance, Recordkeeping, and Timeliness" (NRC 2012) for the DFP.

1.1 PURPOSE

NRC issued SML SUC-1593 in October 2013 and SUC-1593 authorized the U.S. Army to possess depleted uranium (DU) at two sites, Schofield Barracks and Pohakuloa Training Area (TA), in Hawaii. In March 2016, NRC approved an amendment to SML SUC-1593, and the U.S. Army was authorized to possess DU at an additional 16 installations. While SML SUC-1593 continues to cover the Schofield Barracks and Pohakuloa TA (Hawaii), it also was applied to Forts Benning and Gordon (Georgia); Fort Bragg (North Carolina); Forts Campbell and Knox (Kentucky); Fort Carson (Colorado); Fort Hood (Texas); Fort Hunter Liggett (California); Fort Jackson (South Carolina); Fort Polk (Louisiana); Fort Riley (Kansas); Fort Sill (Oklahoma); Donnelly TA, Fort Wainwright (Alaska); Joint Base Lewis-McChord and Yakima Training Center (Washington); and Joint Base McGuire-Dix-Lakehurst (New Jersey). In order to support the SML, the U.S. Army is required to submit a detailed site-specific cost estimate for decommissioning based on the costs of an independent contractor to meet the criteria for unrestricted use in 10 CFR 20.1402. The document is required to include the following:

- Key assumptions used to develop the site-specific cost estimate for decommissioning
- A description of the means for adjusting the cost estimate and associated funding level periodically over the life of the facility
- Certification of financial assurance and the signed originals of the financial instruments provided as financial assurance.

In accordance with NUREG-1757, Volume 3, the U.S. Army will evaluate and adjust the decommissioning cost estimates on a 3-year cycle to ensure costs accurately reflect changes in material inventory and possession limits, contamination of applicable environmental media, facility modifications, remediation costs, and disposal costs. In addition, the U.S. Army will ensure any revisions to cost estimates also include inflation, for other changes in the prices of goods and services, for changes in facility conditions or operations, and for changes in expected decommissioning procedures. This DFP provides an update to the site-specific cost estimate for decommissioning included in the previously submitted DFP dated 9 February 2016.

1.2 FACILITY DESCRIPTION

The Davy Crockett Weapon System was in the U.S. Department of Defense's (DoD's) inventory of weapons between 1961 and 1971. The Davy Crockett was a battalion-level, nuclear-capable recoilless weapon used by infantry, armored, airborne, and mechanized divisions. This system consisted of the M28 (Light Weapon), which was deployed between 1961 and 1968, and the M29 (Heavy Weapon), which was used until 1971. This nuclear-capable weapon system fired practice projectiles that contained high explosives during training. The M101 20mm spotting round, which was only used with the M28 Light Weapon, was used to verify the aiming point of the weapon system. The spotting rounds emitted white

smoke on impact but did not explode. Remnants of the tail assemblies remain at sites where the U.S. Army trained on the weapons system. The M101 spotting round was a small (about 8 inches in length and 1 inch in diameter), low-speed projectile weighing about 1 pound and containing 6.7 ounces of DU. Unlike modern munitions that use DU as penetrators to defeat enemy armor, the DU in the M101 spotting round was used to provide weight sufficient for the spotting round to simulate the flight of the super-caliber Davy Crockett projectile. Approximately 75,000 M101 spotting rounds were manufactured. The U.S. Army demilitarized approximately 44,000 of these M101 spotting rounds at the original manufacturing facility (U.S. Army 2011).

The Atomic Energy Commission, NRC's predecessor, gave the U.S. Army a license to make, test, and distribute the M101 spotting rounds. Under that license, the U.S. Army distributed the rounds for training. The license expired in 1978, after the U.S. Army had stopped producing and distributing the M101 spotting rounds. In 2005, the U.S. Army found tail assemblies from the M101 spotting rounds at Schofield Barracks. This discovery prompted a review of all sites that trained with the system. The U.S. Army found DU at other sites, including Pohakuloa TA. Under NRC regulations, the U.S. Army must have a license to possess this material. The U.S. Army applied for a possession-only license in November 2008. The U.S. Army Corps of Engineers (USACE) researched the identity of U.S. Army ranges in the United States where the M101 spotting round may have been used. Once this records review identified a potential range, USACE conducted site surveys or worked with the local U.S. Army office to determine whether evidence exists that live-fire training with the M101 occurred at a range. The U.S. Army would have conducted training with the Davy Crockett Weapon System at Department of the Army major and subordinate installations. In 2011, the U.S. Army identified all of the ranges where it used the Davy Crockett system. At that time, NRC and the U.S. Army decided to continue with licensing the two installations in Hawaii and to address the remaining installations through an amendment. The amendment request to add the remaining installations was approved in March 2016, and SML SUC-1593 allows the U.S. Army to possess up to 5,700 kilograms of DU at 35 RCAs located within 18 U.S. Army installations and limits the amount of DU the U.S. Army can possess at each installation.

1.3 ESTIMATED VOLUME OF CONTAMINATED MATERIAL

For the purposes of this site-specific cost estimate, the estimated volume of contaminated material is 4,192 cubic meters and includes the M101 spotting rounds, fragments, and impacted soil within the 35 RCAs. The following bullets summarize the assumptions utilized to develop the estimated volume of contaminated material for remediation.

- The DU-containing portion of the M101 spotting round is estimated to be 8.3 centimeters in length and 2.0 centimeters in diameter.
- The high density and subsequent low spatial mobility of the M101 spotting round fragments and DU weathered components result in material localization near the original impact site of each round.
- As a conservative, lower bounding volume per M101 spotting round, it is assumed for intact, deformed, or nearly intact M101 spotting rounds, fragments and impacted soil requiring remediation would be located within a 10-centimeter radius of the original impact site of the round. A cylindrical volume of 0.011 cubic meters of material is assumed as a lower bounding volume based on a 22-centimeter diameter and 28.3-centimeter length.
- As a conservative, upper bounding volume per M101 spotting round, it is assumed that the M101 spotting round is significantly fragmented and extensively oxidized from weathering. The fragments and impacted soil requiring remediation would be located within a 0.75-meter radius of the original impact site of each round. Note that the round was not a penetrator-type munition and it would have only penetrated into the subsurface to a limited depth. It is estimated

that M101 spotting rounds, fragments, and impacted soils would be located between the ground surface and 15 centimeters below the ground surface. A cylindrical volume of 0.265 cubic meters is assumed as an upper bounding volume based on a 1.5-meter diameter and 15-centimeter height.

- A wide array of conditions ranging from intact with little degradation to highly fragmented and corroded has been observed at the RCAs. An average of the upper (0.265 cubic meters) and lower (0.011 cubic meters) is assumed to be a reasonable estimate of volume of fragments and impacted soil requiring remediation for each M101 spotting round. The average is 0.138 cubic meters.

Table 1-1 summarizes the facility description, including the volume of contaminated materials, as required in Table A.3.4 of NUREG-1757, Volume 3.

Table 1-1. Facility Description Summary
(based on NUREG-1757, Volume 3, Table A.3.4)

NRC license numbers and types (i.e., Parts 30, 40, 70, and 72): License number: SUC-1593 License type: Part 40
Types and quantities of materials authorized under the licenses listed above: Material type: Depleted uranium (DU) metal, alloy, and/or other forms Material quantity: up to 5,700 kilograms
Description of how licensed materials are used: Possession only
Description of facility, including buildings, rooms, grounds, and description of where particular types of materials are used: As described above, the area covered under the Nuclear Regulatory Commission (NRC) source material license (SML) SUC-1593 encompasses a total of 46.5-[square kilometer] km^2) where M101 spotting rounds containing DU were fired during the U.S. Army's historical munitions testing program. Unexploded ordnance (UXO) is or is suspected to be present within most M101 impact areas or Radiation Control Areas (RCAs) at an unknown density.
Quantities of materials or waste accumulated before shipping or disposal: Generally, each garrison will accumulate no materials or waste before shipping or disposal. On occasion, an M101 spotting round is recovered on a range and held for disposal in accordance with the Radiation Safety Plan. The U.S. Department of Defense (DoD) Executive Agency for Low-Level Radioactive Waste (LLRW) has primary responsibility for DoD LLRW disposal. The agency conducts periodic waste removals from U.S. Army installations worldwide. If the U.S. Army recovers any DU, the U.S. Army will secure and hold the DU for the next scheduled pickup. The Executive Agency will properly dispose of the DU in accordance with all applicable Federal and DoD regulations, including disposal site conditions.
Volume of contaminated material, including that in the subsurface, containing residual radioactivity that will require remediation: In preparing this Decommissioning Funding Plan (DFP), the U.S. Army estimated that 4,192 cubic meters of M101 spotting rounds, fragments, and impacted soil will require disposal. The U.S. Army estimates that an additional 176 cubic meters of contaminated personal protective equipment (PPE) and other items will require disposal. The total volume of contaminated materials, including soil and M101 spotting rounds and fragments, is estimated to be 4,368 cubic meters.

2.0 DETAILED SITE-SPECIFIC COST ESTIMATE

This section includes a detailed, site-specific cost estimate for all phases of decommissioning of the RCAs included in SUC-1593 to meet the criteria for unrestricted use in 10 CFR 20.1402. The cost estimate was prepared based on the assumptions presented in the December 2015 DFP. These assumptions (e.g., professional labor workdays) were based on analyses performed using Remedial Action Cost Engineering Requirements (RACER™), which draws primarily from the Unit Price Book (UPB). UPB is a module of the Tri-Service Automated Cost Engineering System (TRACES). The cost estimate is divided into the following major decommissioning tasks, as noted in NUREG-1757, Volume 3 (NRC 2012):

- Planning and Preparation
- Decontamination or Dismantling of Radioactive Facility Components
- Restoration of Contaminated Areas on Facility Grounds
- Final Radiation Survey
- Site Stabilization and Long-Term Surveillance.

Table 2-1 summarizes the relevant features of the facility, including the dimension of contaminated materials in the RCAs, as required in Table A.3.5 of NUREG-1757, Volume 3. Further presentation of the volumes estimated for remediation in each RCA and/or installation is presented in Table 2-12.

2.1 PLANNING AND PREPARATION

The planning and preparation task was subdivided into the following subcomponents, as noted in NUREG-1757, Volume 3 (NRC 2012):

- Preparation of documentation for regulatory agencies
- Submittal of a Decommissioning Plan to NRC when required by 10 CFR 30.36(g)(1), 40.42(g)(1), or 72.54(g)
- Development of Work Plans
- Procurement of special equipment
- Characterization of radiological conditions of the facility
- Administrative fees.

Table 2-2 provides an estimate of workdays for individuals classified as professional labor along with the assumptions used to develop the workday estimate, as required in Table A.3.6 of NUREG-1757, Volume 3. Table 2-3 provides the overall estimated costs for materials, equipment, laboratory, and/or miscellany during each of the subcomponents of the planning and preparation task, as required in Table A.3.15, Table A.3.16, and Table A.3.17 of NUREG-1757, Volume 3. The estimates presented in Tables 2-2 and 2-3 represent one square kilometer and assumes that the labor and non-labor costs are the same for each RCA.

2.2 DECONTAMINATION OR DISMANTLING OF RADIOACTIVE FACILITY COMPONENTS

As presented in Table 2-1, no facilities or structures require decontamination or dismantling of radioactive facility components. The decontamination or dismantling of radioactive facility task will focus solely on the remediation of the RCAs. The remediation subcomponents include unexploded anomaly avoidance, DU retrieval, excavation of impacted soil, and the transportation and offsite disposal of

low-level radiological waste (LLRW). Estimates for the packaging, shipping, and disposal of radioactive wastes have been presented separately in Table 2-12. The estimates assume that the LLRW would be transported to the following LLRW disposal facilities:

- LLRW from Donnelly TA, Fort Wainwright (Alaska); Fort Carson (Colorado); and Joint Base Lewis-McChord/Yakima Training Center (Washington) will be transported to US Ecology in Richmond, Washington for disposal.
- LLRW from Fort Jackson (South Carolina) will be transported to Energy Solutions in Barnwell County, South Carolina for disposal.
- LLRW from all the remaining installations will be transported to Energy Solutions in Clive, Utah for disposal.

Table 2-4 provides an estimate of workdays for individuals classified as professional labor along with the assumptions used to develop the workday estimate, as required in Table A.3.7 of NUREG-1757, Volume 3. The estimate presented in Table 2-4 represents 1 square kilometer. The U.S. Army assumes that the professional labor hours and the equipment/supplies and laboratory costs are the same for each RCA, while the non-labor costs for packaging, transportation, and disposal presented in Table 2-12 were generated by scaling the costs linearly to the volume of M101 spotting rounds, fragments, and impacted soil assumed to be located at each of the 35 RCAs.

2.3 RESTORATION OF CONTAMINATED AREAS ON FACILITY GROUNDS

No costs were assumed for the restoration of contaminated areas on facility grounds task, since minimal disturbance is expected during the remediation activities and the property will continue to be utilized as training ranges within the U.S. Army installations. Table 2-5 provides an estimate of workdays for individuals classified as professional labor along with the assumptions used to develop the workday estimate, as required in Table A.3.8 of NUREG-1757, Volume 3.

2.4 FINAL RADIATION SURVEY

This cost estimate includes a gamma walkover survey over the remediated area and the sampling of relevant environmental media. The results of the gamma walkover survey and sampling will be summarized in a final report. Table 2-6 provides an estimate of workdays for individuals classified as professional labor along with the assumptions used to develop the workday estimate, as required in Table A.3.9 of NUREG-1757, Volume 3. Table 2-3 provides the overall estimated costs for materials, equipment, laboratory, and/or miscellany during the final radiation survey task, as required in Table A.3.15, Table A.3.16, and Table A.3.17 of NUREG-1757, Volume 3. The estimates presented in Tables 2-3 and 2-6 represent 1 square kilometer and assumes that the labor and non-labor costs are the same for each RCA.

2.5 SITE STABILIZATION AND LONG-TERM SURVEILLANCE

This cost estimate includes an initial 5-year review of the RCAs following the remediation to unrestricted use. Table 2-7 provides an estimate of workdays for individuals classified as professional labor along with the assumptions used to develop the workday estimate, as required in Table A.3.9 of NUREG-1757, Volume 3.

2.6 OTHER KEY ASSUMPTIONS

This cost estimate does not take credit for any salvage value that the U.S. Army might realize from the sale of potential assets, including the sale of recovered materials or equipment utilized during or after the decommissioning.

This cost estimate represents the cost to the U.S. Army if all decommissioning activities were performed by an independent contractor.

Except for the Packaging, Transportation, and Disposal Costs presented in Table 2-12, the current proportional one square kilometer cost estimate also was applied to Pohakuloa Training Area and Schofield Barracks in Hawaii and was used to develop the decommissioning cost estimates. This is a deviation from the previously submitted DFP dated 9 February 2016 where the decommissioning cost estimates for the RCAs located in Hawaii were carried over from the cost estimates submitted on 17 January 2015 (ML14057A365 and ML14057A366). These cost estimates were developed using a method that differs from the current one. This change allows for consistency between the cost estimates presented for all the RCAs.

The U.S. Army has included a 25 percent contingency factor applied to all estimated costs associated with decommissioning.

2.7 TOTAL ESTIMATED COSTS

The total estimated costs, including the contingency costs, for all phases of decommissioning the RCAs included in SUC-1593 to meet the criteria for unrestricted use is $312M. Table 2-8 summarizes the total professional labor workdays for each task/component of the decommissioning, as required in Table A.3.11 of NUREG-1757, Volume 3. Table 2-9 includes estimated professional labor rates (including salary, fringe benefits, and corporate overhead) for the labor categories included in the cost estimate analyses, as required in Table A.3.12 of NUREG-1757, Volume 3. Table 2-10 is the resulting professional labor costs for each major decommissioning task, as required in Table A.3.13 of NUREG-1757, Volume 3. Table 2-13 summarizes the total estimated costs, including the contingency costs, and the percentages of each task as they represent the subtotal, as required in Table A.3.18 of NUREG-1757, Volume 3.

2.8 ADJUSTING THE COST ESTIMATE

In accordance with NUREG-1757, Volume 3, the U.S. Army will evaluate and adjust the decommissioning cost estimates on a 3-year cycle to ensure costs accurately reflect changes in material inventory and possession limits, contamination of applicable environmental media, facility modifications, remediation costs, and disposal costs. In addition, the U.S. Army will ensure any revisions to cost estimates also include inflation, for other changes in the prices of goods and services, for changes in facility conditions or operations, and for changes in expected decommissioning procedures. At present, the U.S. Army will continue to use the updated versions of RACER™.

The assumptions presented in the previously submitted DFP dated 9 February 2016 remained the same except for the deviations noted in Section 2.6 (i.e., Schofield Barracks and Pohakuloa Training Area estimation methodology) and their supporting tables. In addition, the estimated professional labor rates (including salary, fringe benefits, and corporate overhead) for the labor categories included in the cost estimate analyses were updated using RACER™ 11.5 professional labor rates. Unit costs presented in the updated DFP were updated using the average annual inflation rate published by the Bureau of Labor Statistics as noted in Tables 2-3 and 2-11.

In addition, the U.S. Army has no plans to change facility conditions or operations at the RCAs included in SUB-1593 in a way that would require another license amendment.

Table 2-1. Number and Dimensions of Facility Components (based on NUREG-1757, Volume 3, Table A.3.5)

Component	Number of Components	Dimensions of Component	Total Dimensions
Glove Boxes			
Fume Hoods			
Lab Benches			
Sinks			
Drains			
Floors			
Walls			
Ceilings			
Ventilation/Ductwork			
Hot Cells			
Equipment/ Materials			
Soil Plots	35	35 Radiation Control Areas/Ranges at 18 Army Training Areas	46.5 km^2
Storage Tanks			
Storage Areas			
Radwaste Areas			
Scrap Recovery Areas			
Maintenance Shop			
Equipment Decontamination Areas			
Total	**35**		**46.5 km^2**

The quantity, location, and areal extent of the RCAs/Ranges at the 18 Army Training Ranges is based on "M101 Impact Areas" dated 16 February 2018 (ML18064A140) and incorporated into SML SUC-1593 as condition #11.

Table 2-2. Planning and Preparation (Workdays and per km^2) (based on NUREG-1757, Volume 3, Table A.3.6)

Activity	NRC Staff	IMCOM RSSO	Installation RSO	Army Oversight Health Physicist	Army Oversight Safety	UXO Program Manager	UXO Project Manager	Project Engineer	Certified Health Physicist
Preparation of Documentation for Regulatory Agencies	10	10	1	10	5	1	2	0	0
Submittal of Decommissioning Plan to NRC when required by 10 CFR 30.36(g)(1), 10 CFR 40.42(g)(1), 10 CFR 70.38(g)(1), or 10 CFR 72.54(g)	10	10	1	10	1	1	5	20	20
Development of Work Plans	10	10	2	10	6	0	0	10	10
Procurement of Special Equipment	0	0	0	0	0	0	1	2	1
Staff Training	0	1	0	1	0	0	1	0	1
Characterization of Radiological Condition of the Facility (including sampling, soil and tailing analysis, or groundwater analysis, if applicable)	0	0	0	0	0	0	0	0	0
Administrative Fees (such as procurement fees for third-party contractor, legal fees, financial assurance fees, and coordination with NRC staff)	10	10	2	10	10	0	0	0	0
Total Workdays	**40**	**41**	**6**	**41**	**22**	**2**	**9**	**32**	**32**

Table 2-2. Planning and Preparation (Workdays and per km^2) (based on NUREG-1757, Volume 3, Table A.3.6) (Continued)

Activity	Word Processing/ Clerical	Drafter/ CADD	UXO Safety Officer	Senior UXO Supervisor	UXO Technician III (Supervisor)	UXO Technician II	Field Health Physicist	Field Technician
Preparation of Documentation for Regulatory Agencies	5	0	0	0	0	0	0	0
Submittal of Decommissioning Plan to NRC when required by 10 CFR 30.36(g)(1), 10 CFR 40.42(g)(1), 10 CFR 70.38(g)(1), or 10 CFR 72.54(g)	2	2	2	1	2	0	2	0
Development of Work Plans	2	4	2	1	1	1	1	0
Procurement of Special Equipment	0	0	1	0	0	0	0	0
Staff Training	0	0	1	1	1	1	1	0
Characterization of Radiological Condition of the Facility (including sampling, soil and tailing analysis, or groundwater analysis, if applicable)	0	0	0	0	0	0	0	0
Administrative Fees (such as procurement fees for third-party contractor, legal fees, financial assurance fees, and coordination with NRC staff)	0	0	0	0	0	0	0	0
Total Workdays	**9**	**6**	**6**	**3**	**4**	**2**	**4**	**0**

The source of the professional labor workdays per km^2 in Table 2-2 is Table A.3.1.2.1 (a) from the DFP dated 9 February 2016 except for three deviations. The first deviation from the DFP dated 9 February 2016 is hours that were estimated for specific activities where NRC Staff involvement and review is expected. The second deviation from the DFP dated 9 February 2016 is the addition of the "Administrative Fees (such as procurement fees for third-party contractor, legal fees, financial assurance fees, and coordination with NRC staff)." This activity was added to Table 2-2 as presented in Table A.3.6 of NUREG-1757, Volume 3. The third deviation from the DFP dated 9 February 2016 is the titles of the labor categories that were changed in order to align with the labor category titles in RACER™ 11.5 and the labor hours underneath the re-titled labor categories were slightly shifted based on professional judgment.

Table 2-3. Equipment/Supply, Laboratory, and Miscellaneous Costs per km^2 (based on NUREG-1757, Volume 3, Tables A.3.15, A.3.16, and A.3.17)

Equipment/Supplies/Laboratory	Total Cost per km^2
Monthly Facility Cost	$10,833
Monthly Instrument Cost	$97,496
Monthly Consumable Cost	$32,499
Monthly Vehicle Cost	$43,332
Monthly PPE Cost	$4,333
Subtotal for Equipment and Supplies per km^2	**$188,493**
Laboratory Costs (per km2)	
Sampling	$0
Transportation of Samples	$36,171
Testing and Analysis	$723,423
Other (specify)	$0
Laboratory Costs per km^2	**$759,595**
Miscellaneous Costs (per km^2)	
License Fees	$50,000
Government Contract Acquisition	$81,247
Taxes	$0
Airfare	$27,082
Per Diem	$31,862
Contractor Fee	$324,988
Other (specify)	$0
Subtotal for Miscellaneous Costs per km^2	**$433,932**
TOTAL per km^2	**$1,382,020**

Source of the costs presented per km^2 in Table 2-3 is the previously submitted Davy Crockett DFP Tables A.3.1.2.2 (d), (e), and (f) dated 9 February 2016. The average annual inflation rate published by the Bureau of Labor Statistics for 2015 (0.12%), 2016 (1.26%), 2017 (2.13%), 2018 (2.44%), and 2019 (2.25%) were used to calculate the present day value of the 2015 costs.

Table 2-4. Decontamination or Dismantling of Radioactive Facility Components (Workdays and per km^2) (based on NUREG-1757, Volume 3, Table A.3.7)

Component	Decontamination Method	NRC Staff	IMCOM RSSO	Installation RSO	Army Oversight Health Physicist	Army Oversight Safety	UXO Program Manager	UXO Project Manager	Project Engineer
Glove Boxes									
Fume Hoods									
Lab Benches									
Sinks									
Drains									
Floors									
Walls									
Ceilings									
Ventilation/Ductwork									
Hot Cells									
Equipment/Materials									
Soil Plots	UXO Avoidance, Retrieval, Transportation, and Offsite Disposal	0	0	0	0	0	0	0	0
Storage Tanks									
Storage Areas									
Radwaste Areas									
Scrap Recovery Areas									
Maintenance Shop									
Equipment Decontamination Areas									
Other									
Total Workdays		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table 2-4. Decontamination or Dismantling of Radioactive Facility Components (Workdays and per km^2) (based on NUREG-1757, Volume 3, Table A.3.7) (Continued)

Component	Certified Health Physicist	Word Processing/ Clerical	Drafter/ CADD	UXO Safety Officer	Senior UXO Supervisor	UXO Technician III (Supervisor)	UXO Technician II	Field Health Physicist	Field Technician
Glove Boxes									
Fume Hoods									
Lab Benches									
Sinks									
Drains									
Floors									
Walls									
Ceilings									
Ventilation/Ductwork									
Hot Cells									
Equipment/Materials									
Soil Plots	0	0	0	0	0	50	0	50	100
Storage Tanks									
Storage Areas									
Radwaste Areas									
Scrap Recovery Areas									
Maintenance Shop									
Equipment Decontamination Areas									
Other									
Total Workdays	**0**	**0**	**0**	**0**	**0**	**50**	**0**	**50**	**100**

The source of the professional labor workdays per km^2 in Table 2-4 is Table A.3.1.2.1 (a) from the DFP dated 9 February 2016 except for one deviation. The one deviation from the DFP dated 9 February 2016 is the titles of the labor categories that were changed in order to align with the labor category titles in RACER™ 11.5.

Table 2-5. Restoration of Contaminated Areas on Facility Grounds (Workdays and per km^2) (based on NUREG-1757, Volume 3, Table A.3.8)

Activity	NRC Staff	IMCOM RSSO	Installation RSO	Army Oversight Health Physicist	Army Oversight Safety	UXO Program Manager	UXO Project Manager	Project Engineer	Certified Health Physicist
Backfill and Restore Site	0	0	0	0	0	0	0	0	0
Total Workdays	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Activity	Word Processing/ Clerical	Drafter/ CADD	UXO Safety Officer	Senior UXO Supervisor	UXO Technician III (Supervisor)	UXO Technician II	Field Health Physicist	Field Technician
Backfill and Restore Site	0	0	0	0	0	0	0	0
Total Workdays	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Source of the workdays per km^2 in Table 2-5 is the earlier Davy Crockett DFP Table A.3.1.2.1 (c) dated 9 February 2016 except for one deviation. The one deviation from the DFP dated 9 February 2016 is the titles of the labor categories that were changed in order to align with the labor category titles in RACER™ 11.5.

Table 2-6. Final Radiation Survey (Workdays and per km^2) (based on NUREG-1757, Volume 3, Table A.3.9)

Activity	NRC Staff	IMCOM RSSO	Installation RSO	Army Oversight Health Physicist	Army Oversight Safety	UXO Program Manager	UXO Project Manager	Project Engineer	Certified Health Physicist
First Pass Gamma Walkover	0	0	0	0	0	0	0	0	0
Re-Survey of Decontaminated Areas	0	0	0	0	0	0	0	0	0
Sample Collection	0	0	0	0	0	0	0	0	0
Field Effort Oversight and Management	4	4	4	36	36	4	4	4	7
Reporting	20	20	1	4	4	0	1	5	10
Total Workdays	**24**	**24**	**5**	**40**	**40**	**4**	**5**	**9**	**17**

Activity	Word Processing/ Clerical	Drafter/ CADD	UXO Safety Officer	Senior UXO Supervisor	UXO Technician III (Supervisor)	UXO Technician II	Field Health Physicist	Field Technician
First Pass Gamma Walkover	0	0	0	0	165	0	165	33
Re-Survey of Decontaminated Areas	0	0	0	0	17	0	17	3
Sample Collection	0	0	0	0	124	0	124	0
Field Effort Oversight and Management	4	36	76	36	36	0	0	0
Reporting	2	5	1	0	0	0	0	0
Total Workdays	**6**	**41**	**77**	**36**	**342**	**0**	**306**	**36**

Source of the workdays per km^2 in Table 2-6 is the earlier Davy Crockett DFP Table A.3.1.2.1 (d) dated 9 February 2016 except for two deviations. The first deviation from the DFP dated 9 February 2016 is hours were estimated for specific activities where NRC Staff involvement and review is expected. The second deviation from the DFP dated 9 February 2016 is the titles of the labor categories were changed in order to align with the labor category titles in RACER™ 11.5 and the labor hours underneath the re-titled labor categories were slightly shifted based on professional judgment.

Table 2-7. Site Stabilization and Long-Term Surveillance (Workdays and per km^2)
(based on NUREG-1757, Volume 3, Table A.3.10)

Activity	NRC Staff	IMCOM RSSO	Installation RSO	Army Oversight Health Physicist	Army Oversight Safety	UXO Program Manager	UXO Project Manager	Project Engineer	Certified Health Physicist
Initial Five-Year Review	15	5	5	20	5	0	0	0	0
Total Workdays	**15**	**5**	**5**	**20**	**5**	**0**	**0**	**0**	**0**

Activity	Word Processing/ Clerical	Drafter/ CADD	UXO Safety Officer	Senior UXO Supervisor	UXO Technician III (Supervisor)	UXO Technician II	Field Health Physicist	Field Technician
Initial Five-Year Review	0	0	0	0	0	0	0	0
Total Workdays	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Source of the workdays per km^2 in Table 2-7 is the earlier Davy Crockett DFP Table A.3.1.2.1 (e) dated 9 February 2016 except for two deviations. The first deviation from the DFP dated 9 February 2016 is hours that were estimated for NRC Staff and Army Oversight Safety involvement and review of the Initial Five-Year Review. The second deviation from the DFP dated 9 February 2016 is the titles of the labor categories were changed in order to align with the labor category titles in RACER™ 11.5 and the labor hours underneath the re-titled labor categories were slightly shifted based on professional judgment.

Table 2-8. Total Workdays by Labor Category (Workdays and per km^2)
(based on NUREG-1757, Volume 3, Table A.3.11)

Activity	NRC Staff	IMCOM RSSO	Installation RSO	Army Oversight Health Physicist	Army Oversight Safety	UXO Program Manager	UXO Project Manager	Project Engineer	Certified Health Physicist
Planning and Preparation (Totals from Table 2-2)	40	41	6	41	22	2	9	32	32
Decontamination or Dismantling of Radioactive Facility Components (Totals from Table 2-4)	0	0	0	0	0	0	0	0	0
Restoration of Contaminated Areas on Facility Grounds (Totals from Table 2-5)	0	0	0	0	0	0	0	0	0
Final Radiation Survey (Totals from Table 2-6)	24	24	5	40	40	4	5	9	17
Site Stabilization and Long-Term Surveillance (Totals from Table 2-7)	15	5	5	20	5	0	0	0	0
Total Workdays	**79**	**70**	**16**	**101**	**67**	**6**	**14**	**41**	**49**

Activity	Word Processing/ Clerical	Drafter/ CADD	UXO Safety Officer	Senior UXO Supervisor	UXO Technician III (Supervisor)	UXO Technician II	Field Health Physicist	Field Technician
Planning and Preparation (Totals from Table 2-2)	9	6	6	3	4	2	4	0
Decontamination or Dismantling of Radioactive Facility Components (Totals from Table 2-4)	0	0	0	0	50	0	50	100
Restoration of Contaminated Areas on Facility Grounds (Totals from Table 2-5)	0	0	0	0	0	0	0	0
Final Radiation Survey (Totals from Table 2-6)	6	41	77	36	342	0	306	36
Site Stabilization and Long-Term Surveillance (Totals from Table 2-7)	0	0	0	0	0	0	0	0
Total Workdays	**15**	**47**	**83**	**39**	**396**	**2**	**360**	**136**

Table 2-9. Worker Unit Cost Schedule (based on NUREG-1757, Volume 3, Table A.3.12)

Activity	NRC Staff[a]	IMCOM RSSO	Installation RSO	Army Oversight Health Physicist	Army Oversight Safety	UXO Program Manager	UXO Project Manager	Project Engineer	Certified Health Physicist
Salary & Fringe ($/year)	NA	$137,800	$121,900	$121,900	$111,300	$186,397	$152,916	$98,219	$142,502
Overhead Rate (%)	NA	154%	154%	154%	154%	145%	145%	145%	145%
Total Cost Per Year	$551,200	$350,012	$309,626	$309,626	$282,702	$456,672	$374,644	$240,637	$349,129
Total Cost Per Workday[b]	$2,120	$1,346	$1,191	$1,191	$1,087	$1,756	$1,441	$926	$1,343

Activity	Word Processing/ Clerical	Drafter/ CADD	UXO Safety Officer	Senior UXO Supervisor	UXO Technician III (Supervisor)	UXO Technician II	Field Health Physicist	Field Technician
Salary & Fringe ($/year)	$54,324	$63,318	$93,901	$104,918	$78,495	$66,445	$65,742	$55,156
Overhead Rate (%)	145%	145%	145%	145%	145%	145%	145%	145%
Total Cost Per Year	$133,093	$155,129	$230,058	$257,049	$192,312	$162,791	$161,069	$135,132
Total Cost Per Workday[b]	$512	$597	$885	$989	$740	$626	$619	$520

Source: Salary & Fringe ($/year) and Overhead Rate (%) information shown for contractor personnel was taken from RACER™ version 11.5. The Overhead Rate (%) is assumed to be 145% for all contractor personnel.

[a]The total cost per workday for NRC Staff was calculated using the professional staff-hour rate of $265 per hour rate as published in 10 CFR 170.20.

[b]The total cost per workday assumes 260 workdays per year.

Table 2-10. Total Labor Costs by Major Decommissioning Task per km^2
(based on NUREG-1757, Volume 3, Table A.3.13)

Activity	NRC Staff	IMCOM RSSO	Installation RSO	Army Oversight Health Physicist	Army Oversight Safety	UXO Program Manager	UXO Project Manager	Project Engineer	Certified Health Physicist
Planning and Preparation (Totals from Table 2-2)	$84,800	$55,194	$7,145	$48,826	$23,921	$3,513	$12,968	$29,617	$42,970
Decontamination or Dismantling of Radioactive Facility Components (Totals from Table 2-5)	$0	$0	$0	$0	$0	$0	$0	$0	$0
Restoration of Contaminated Areas on Facility Grounds (Totals from Table 2-6)	$0	$0	$0	$0	$0	$0	$0	$0	$0
Final Radiation Survey (Totals from Table 2-7)	$50,880	$32,309	$5,954	$47,635	$43,493	$7,026	$7,205	$8,330	$22,828
Site Stabilization and Long-Term Surveillance (Totals from Table 2-8)	$31,800	$6,731	$5,954	$23,817	$5,437	$0	$0	$0	$0
Total Labor Costs per km^2	**$167,480**	**$94,234**	**$19,054**	**$120,278**	**$72,850**	**$10,539**	**$20,173**	**$37,947**	**$65,797**

Activity	Word Processing/ Clerical	Drafter/ CADD	UXO Safety Officer	Senior UXO Supervisor	UXO Technician III (Supervisor)	UXO Technician II	Field Health Physicist	Field Technician
Planning and Preparation (Totals from Table 2-2)	$4,607	$3,580	$5,309	$2,966	$2,959	$1,252	$2,478	$0
Decontamination or Dismantling of Radioactive Facility Components (Totals from Table 2-5)	$0	$0	$0	$0	$36,983	$0	$30,975	$51,974
Restoration of Contaminated Areas on Facility Grounds (Totals from Table 2-6)	$0	$0	$0	$0	$0	$0	$0	$0
Final Radiation Survey (Totals from Table 2-7)	$3,071	$24,463	$68,133	$35,591	$252,965	$0	$189,566	$18,711
Site Stabilization and Long-Term Surveillance (Totals from Table 2-8)	$0	$0	$0	$0	$0	$0	$0	$0
Total Labor Costs per km^2	**$7,678**	**$28,043**	**$73,442**	**$38,557**	**$292,907**	**$1,252**	**$223,018**	**$70,684**

Table 2-11. Total Decommissioning Costs per km^2
(based on NUREG-1757, Volume 3, Table A.3.17)

Task/Component	Cost per km^2	Percentage per km^2
Planning and Preparation	$332,105	9.75%
Decontamination or Dismantling of Radioactive Facility Components	$119,932	3.52%
Restoration of Contaminated Areas on Facility Grounds	$0	0.00%
Final Radiation Survey	$818,157	24.01%
Site Stabilization and Long-Term Surveillance	$73,739	2.16%
Labor per km^2 Subtotal	$1,343,933	
Equipment/Supply, Laboratory, and Miscellaneous Costs	$1,382,020	40.56%
Non-Labor per km^2 Subtotal	$1,382,020	
25% Contingency	$681,488	
TOTAL per km^2	**$3,407,441**	

Note that the decommissioning cost estimates presented in Table 2-11 do not include the non-labor costs for the packaging, shipment, and disposal of LLRW generated during the decontamination and decommissioning of the RCAs. These costs are summarized separately in Table 2-12.

Table 2-12. Total Packaging, Transportation, and Disposal Costs per Army Training Area

Army Training Ranges	Volume of M101 Spotting Rounds, Fragments, Impacted Soil (m^3)[a]	Volume of PPE (m^3)	Total Volume (m^3)[b]	Type of Container	Number of Containers	Unit Cost for Packaging[c]	Total Cost for Packaging
Donnelly Training Area, Fort Wainwright, Alaska	12.8	11	29	55-gallon drum	151	$108	$16,308
Fort Benning, Georgia	1,338.8	11	1,620	55-gallon drum	8,626	$108	$931,608
Fort Bragg, North Carolina	581.3	11	711	55-gallon drum	3,799	$108	$410,292
Fort Campbell, Kentucky	94.0	11	126	55-gallon drum	674	$108	$72,792
Fort Carson, Colorado	193.8	11	246	55-gallon drum	1,310	$108	$141,480
Fort Gordon, Georgia	18.6	11	36	55-gallon drum	188	$108	$20,304
Fort Hood, Texas	557.2	11	682	55-gallon drum	3,644	$108	$393,552
Fort Hunter Liggett, California	18.6	11	36	55-gallon drum	188	$108	$20,304
Fort Jackson, South Carolina	18.6	11	36	55-gallon drum	188	$108	$20,304
Fort Knox, Kentucky	549.9	11	673	55-gallon drum	3,595	$108	$388,260
Fort Polk, Louisiana	365.4	11	452	55-gallon drum	2,416	$108	$260,928
Fort Riley, Kansas	14.5	11	31	55-gallon drum	164	$108	$17,712
Fort Sill, Oklahoma	80.7	11	110	55-gallon drum	588	$108	$63,504
Joint Base Lewis-McChord, Washington/Yakima Training Center, Washington	242.3	11	304	55-gallon drum	1,624	$108	$175,392
Joint Base McGuire-Dix-Lakehurst, New Jersey	6.9	11	21	55-gallon drum	115	$108	$12,420
Pohakuloa Training Area/Schofield Barracks, Hawaii[c]	98.5	11	131				
Total							

Table 2-12. Total Packaging, Transportation, and Disposal Costs per Army Training Area (Continued)

Army Training Ranges	Distance to Disposal Facility(miles)	Number of Trips	Unit Cost for Transportation[c]	Total Transportation Cost	Unit Cost for Disposal (Cost/m^3)[c]	Total Disposal Cost	Total Estimated Costs[e]
Donnelly Training Area, Fort Wainwright, Alaska	2,863	2	$2.48	$14,200	$22,785	$650,740	$851,560
Fort Benning, Georgia	2,055	85	$2.48	$433,194	$22,785	$36,906,232	$47,838,792
Fort Bragg, North Carolina	2,233	38	$2.48	$210,438	$22,785	$16,194,667	$21,019,246
Fort Campbell, Kentucky	1,650	7	$2.48	$28,644	$22,785	$2,870,910	$3,715,433
Fort Carson, Colorado	1,183	13	$2.48	$38,140	$22,785	$5,599,642	$7,224,077
Fort Gordon, Georgia	2,087	2	$2.48	$10,352	$22,785	$809,323	$1,049,973
Fort Hood, Texas	1,320	36	$2.48	$117,850	$22,785	$15,535,724	$20,058,908
Fort Hunter Liggett, California	818	2	$2.48	$4,057	$22,785	$809,323	$1,042,106
Fort Jackson, South Carolina	77	2	$2.48	$382	$22,785	$809,323	$1,037,511
Fort Knox, Kentucky	1,666	35	$2.48	$144,609	$22,785	$15,336,128	$19,836,246
Fort Polk, Louisiana	1,629	18	$2.48	$72,719	$22,785	$10,291,529	$13,281,469
Fort Riley, Kansas	1,062	2	$2.48	$5,268	$22,785	$697,221	$900,251
Fort Sill, Oklahoma	1,163	6	$2.48	$17,305	$22,785	$2,507,261	$3,235,089
Joint Base Lewis-McChord, Washington/ Yakima Training Center, Washington	227	16	$2.48	$9,007	$22,785	$6,925,729	$8,887,660
Joint Base McGuire-Dix-Lakehurst, New Jersey	2,247	2	$2.48	$11,145	$22,785	$489,422	$641,234
Pohakuloa Training Area/Schofield Barracks, Hawaii[d]							$3,337,853
Total							**$153,957,406**

Footnotes:

[a] On 1 June 2015, the Army provided the NRC an application to amend SML SUC-1593 (ML15161A458). Within the License Amendment Application, the Army supplied an estimate of the number of M101 spotting rounds at each Installation. The estimated number of M101 spotting rounds at each Installation has been multiplied by the average volume of fragments and impacted soil requiring remediation for each M101 spotting round (0.138 m^3) to determine the total volume of M101 spotting rounds, fragments, impacted soil at each Installation.

[b]Total volume was calculated using a 20% fluff factor.

[c]The source of the unit costs presented in Table 2-12 is the previous Davy Crockett DFP Tables A.3.1.2.2.a.1, A.3.1.2.2.a.2, A.3.1.2.2.b, and A.3.1.2.2.c dated 9 February 2016. The average annual inflation rate published by the Bureau of Labor Statistics for 2015 (0.12%), 2016 (1.26%), 2017 (2.13%), 2018 (2.44%), and 2019 (2.25%) were used to calculate the present day value of the 2015 unit costs utilized in Table 2-12.

[d]The source of the costs for the Hawaii installations presented in Table 2-12 is the previous Davy Crockett DFP Tables A.3.1.2.2.a.1, A.3.1.2.2.a.2, A.3.1.2.2.b, and A.3.1.2.2.c dated 9 February 2016. The average annual inflation rate published by the Bureau of Labor Statistics for 2015 (0.12%), 2016 (1.26%), 2017 (2.13%), 2018 (2.44%), and 2019 (2.25%) were used to calculate the present day value of the 2015 costs utilized in Table 2-12.

[e]Total estimate costs includes a 25% contingency.

Table 2-13. Total Decommissioning Costs

Training Area	Radiation Control Area/Range	Area (km^2)	Total Costs	Percentage
Donnelly Training Area, Fort Wainwright, Alaska	Georgia	1.0	$4,259,001	1%
Fort Benning, Georgia	Hook	1.0	$8,722,863	3%
	Patton	1.0	$8,722,863	3%
	Buchanan	1.0	$8,722,863	3%
	Coolidge	1.0	$8,722,863	3%
	Brann	1.0	$8,722,863	3%
	Z-4 (Lae Field)	1.0	$8,722,863	3%
	K-18	1.0	$8,722,863	3%
	K-15	1.0	$8,722,863	3%
	Burma Hill	0.073	$5,564,165	2%
Fort Bragg, North Carolina	OP-5	1.0	$24,426,687	8%
Fort Campbell, Kentucky	OP2/OP3	1.0	$7,122,874	2%
Fort Carson, Colorado	141	1.0	$7,019,480	2%
	Battalion Field Training Area	1.0	$7,019,480	2%
Fort Gordon, Georgia	E	1.0	$4,457,415	1%
Fort Hood, Texas	Davy Crockett	1.0	$23,466,349	8%
Fort Hunter Liggett, California	C8	1.0	$3,754,810	1%
	B11	1.0	$3,754,810	1%
	B13	1.0	$3,754,810	1%
Fort Jackson, South Carolina	62	1.0	$4,449,547	1%
Fort Knox, Kentucky	Arms Knob (two overlapping ranges)	1.8	$16,051,517	5%
	O'Brien	1.0	$13,325,564	4%
Fort Polk, Louisiana	33	1.0	$10,048,176	3%
	34A	1.0	$10,048,176	3%
Fort Riley, Kansas	27A and 27B	1.0	$3,857,567	1%
	29	1.0	$3,857,567	1%
Fort Sill, Oklahoma	FP 182/West	1.0	$6,642,530	2%
Joint Base Lewis-McChord, Washington	Fort Lewis 52, OP8, and OP9 (three ranges)	3.0	$14,666,154	5%
	Yakima Training Center 14, 17, and 20 (three ranges)	3.0	$14,666,154	5%
Joint Base McGuire-Dix-Lakehurst, New Jersey	Frankford Arsenal Range	1.0	$4,048,675	1%
Pohakuloa Training Area/ Schofield Barracks, Hawaii	Areas 1, 2, 3, and 4 and M101 Impact Area	12.6	$46,271,612	15%
TOTAL			**$312,316,015**	

Note: The quantity, location, and areal extent of the RCAs/Ranges at the 18 Army Training Ranges is based on "M101 Impact Areas" dated 16 February 2018 (ML18064A140) and incorporated into SML SUC-1593 as condition #11.

3.0 FINANCIAL ASSURANCE

In accordance with the NRC's financial assurance regulations (10 CFR 30.35[e], 10 CFR 40.36[d], 10 CFR 70.25[b]), licensees must provide a certification of financial assurance by the licensee that financial assurance for the decommissioning has been provided in the amount of the decommissioning cost estimate and an originally signed duplicate of the financial instruments that provided financial assurance for decommissioning. A Statement of Intent and Proof of Authority to commit the funds in the amount of the decommissioning has been included in the Appendix.

4.0 REFERENCES

NRC (U.S. Nuclear Regulatory Commission). 2012. Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness. Final Report. NUREG-1757, Vol. 3, Rev. 1. U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Washington, DC 20555-0001. Prepared by K.M. Kline, C.M. Dean, T.L. Fredrichs, C.M. Maier, E.R. Pogue, and R.N. Young. Manuscript Completed: February 2012. Date Published: February 2012.

U.S. Army. 2011. Davy Crockett M101 Spotting Round, Information Guide. U.S. Army Public Affairs Office. August.

APPENDIX

STATEMENT OF INTENT AND PROOF OF AUTHORITY

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

IMSO

DEC 27, 2019

U.S. Nuclear Regulatory Commission
Washington, DC 20555

STATEMENT OF INTENT

As Acting Commanding General of the US Army Installation Management Command, I exercise express authority and responsibility to request from Headquarters, Department of the Army, funding for decommissioning activities associated with operations authorized by US Nuclear Regulatory Commission Material License No. SUC-1593. This authority is established by Department of Defense Financial Management Regulation 7000.14-R. Within this authority, I intend to request that funds be made available, if a decision is made to engage in decommissioning activities, in the amount of $350,000,000 to decommission license activities in their entirety. (The Decommissioning Funding Plan includes a partition of this amount by Army installation, should decommissioning activities not occur at all installations). I intend to request and obtain these funds sufficiently in advance of decommissioning to prevent delay of required activities.

A copy of the memorandum by which I assumed command, dated August 16, 2019, is enclosed as evidence that I am authorized to represent the US Army Installation Management Command in this transaction.

Sincerely,

Timothy P. McGuire
Major General, US Army
Acting Commander

Enclosure

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

IMCG

16 AUG 2019

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Assumption of Command by Authority of AR 600-20, Paragraph 2-8a(3)

The undersigned assumes command of the United States Army Installation Management Command (W6BDAA), effective 15 August 2019.

TIMOTHY P. MCGUIRE
Major General, USA
Acting Commander

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