Closed, Transferring and Transferred Range/Site Inventory Report

Closed, Transferring and Transferred Range/Site Inventory Report

RADFORD ARMY AMMUNITION PLANT

VIRGINIA

U.S. Army Materiel Command (AMC)

November 2002

MALCOLM PIRNIE

Final CTT Inventory Report

U.S. Army Corps of Engineers

Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, VA 24143-0100
USA

July 15, 2005

Mr. Robert Thomson
U. S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Subject: Newly Identified Site: RFAAP-001-R-01, Army Reserve Small Arms Range,
Radford Army Ammunition Plant
EPA ID# VA1 210020730

Dear Mr. Thomson:

Per Part II. L. of the RCRA Corrective Action Permit and your July 14, 2005 conversation with Mr. Jim McKenna, Radford AAP is notifying the Environmental Protection Agency and the Department of Environmental Quality of the above newly identified site. Attached are excerpts from the draft FY 2006 Radford AAP Installation Action Plan. These pages are intended to address the information requested in L. 1. a. through d. Note this draft plan was prepared from the April 27 and 28, 2005 workshop you attended in Blacksburg, VA. Also note that the US Army Environmental Center is the executing agency for this site or any Military Munitions Response Site at Radford AAP.

Please coordinate with and provide any questions or comments to myself at (540) 639-8658, Jerry Redder of my staff (540) 639-7536 or Jim McKenna, ACO Staff (540) 639-8641.

Sincerely,

Paige W. Holt

Paige Holt, Acting Environmental Manager
Alliant Ammunition and Powder Company LLC

Enclosure

c: Russell Fish, P.E., EPA Region III

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Env. File

05-815-134
JMcKenna/JJRedder

FINAL

U.S. ARMY CLOSED, TRANSFERRING and TRANSFERRED RANGE/SITE INVENTORY

for

RADFORD ARMY AMMUNITION PLANT, VA

12 November 2002

Prepared for

U.S. Army Environmental Center
and
U.S. Army Corps of Engineers,
Baltimore District

Prepared by

Malcolm Pirnie, Inc.
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ABBREVIATIONS / ACRONYMS

AEC	Army Environmental Center
A/I	Active/Inactive
APG	Aberdeen Proving Grounds
ARID	Army Range Inventory Database
ARNG	Army National Guard
ARS	Advance Range Survey
ASR	Archive Search Report
BRAC	Base Realignment and Closure
CADD	Computer Aided Drafting and Design
CTC	Cost to Complete
CTT	Closed/Transferring/Transferred
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
DOE	Department of Energy
DSERTS	Defense Site Environmental Restoration Tracking System
EOD	Explosive Ordnance Disposal
FFID	Federal Facility Identification
FUDS	Formerly Used Defense Site
FY	Fiscal Year
GIS	Geographic Information System
IR	Installation Restoration
IRA	Interim Remedial Action
IRP	Installation Restoration Program
LPA	Limited Public Access
LTM	Long Term Monitoring
MACOM	Major Command
MC	Munitions Constituents
MMRP	Military Munitions Response Program
MR	Munitions Response
N/A	Not Applicable
NGB	National Guard Bureau
NPA	No Public Access
OB	Open Burn
OD	Open Detonation
PA	Preliminary Assessment
PM	Project Manager
POC	Point of Contact
QA	Quality Assurance
QC	Quality Control
RAC	Risk Assessment Code
RAO	Remedial Action (Operations)
RC	Response Complete
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
RIP	Remedy in Place
RMIS	Restoration Management Information System

ABBREVIATIONS / ACRONYMS

RPA	Restricted Public Access
SI	Site Inspection
STARC	State Area Command
SWD	Southwestern Division
TIC	Technical Information Center
UPA	Unrestricted Public Access
U.S.	United States
USACE	United States Army Corps of Engineers
USARC	United States Army Reserve Command
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance

Site Specific Acronyms

RAAP	Radford Army Ammunition Plant

EXECUTIVE SUMMARY

Purpose of the Closed, Transferring, and Transferred Inventory

To meet immediate, short-term, and long-term needs, the United States (U.S.) Army is conducting its range inventory in three phases. The first phase (Phase 1) involved a data call issued to each U.S. Army Major Command (MACOM) requesting general information about ranges on their installations. This phase was also referred to as the Advance Range Survey (ARS). The ARS allowed the Army to meet its immediate needs; however, a more detailed inventory was necessary. The Army decided to divide the detailed follow-on inventory into two parts, an active and inactive (A/I) inventory (Phase 2) and a closed, transferring, and transferred (CTT) inventory (Phase 3).

The results of the Phase 2 inventory for the installation were documented in an A/I range inventory binder submitted to the Army Environmental Center (AEC), the respective MACOM, and the installation. The Phase 2 binder contains maps that delineate the A/I range boundaries. The remainder of the property inside the installation's boundary is designated as non-A/I property by default. If the Phase 2 inventory was conducted at an installation, the data was provided to the Phase 3 team prior to starting the data collection effort.

This Phase 3 inventory began as an inventory of just Army CTT ranges. However, as a result of the congressional requirements outlined in the Defense Authorization Act of 2002 (Public law 107-107) and resultant changes to the Defense Environmental Restoration Program (DERP), the Phase 3 Inventory is a comprehensive history of both CTT ranges and other CTT sites with unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC). All locations previously or currently owned, leased or possessed by the Department of Defense (DoD) (except those currently classified as A/I ranges or permitted military munitions treatment and/or disposal facilities) are included in this inventory. The U.S. Army Corps of Engineers (USACE) is the predominant executor of the Phase 3 inventory. The inventory specifically focused on the non-A/I areas as defined in Phase 2 and areas around the installation that may have been used in the past for munitions-related testing, training, or disposal.

Specific requirements of the Phase 3 inventory include: 1) mapping the CTT ranges and sites with UXO, DMM,or MC; 2) collecting and preparing data to be uploaded into the Army Range Inventory Database (ARID); 3) conducting an assessment of explosives safety risk using the Risk Assessment Code (RAC) methodology for each CTT range or site with UXO or DMM identified in the inventory; and 4) determining which sites on the inventory potentially qualify for the Military Munitions Response Program (MMRP).

The data collection portion of the CTT inventory was conducted on February 21, 2002. While on site, the data collection team reviewed historical records and interviewed installation personnel concerning potential CTT ranges, disposal areas, and other UXO, DMM, or MC sites. This report summarizes the CTT inventory conducted at Radford Army Ammunition Plant (RAAP) and presents the results.

Purpose of the Range Inventory Report

The purpose of this report is to present the results of the Phase 3 CTT inventory. The report includes individual CTT maps for the installation, a copy of the data tables that will be submitted electronically to AEC for uploading into the ARID, completed RAC worksheets for all CTT ranges and sites with UXO or DMM, DERP eligibility determination, and identification of which ranges/sites potentially qualify for the MMRP. Although the inventory did not require exhaustive archive searches to be performed, it did require historical research to identify sites subject to this inventory, locations, periods of use, the types of munitions used, and other specific information regarding the site. The majority of this data was obtained by reviewing installation records and interviewing personnel at, or involved with, the installation. Although the data presented in this report is believed to be accurate, it has not been verified by field sampling.

Summary of Results

RAAP occupies approximately 6,900 acres consisting of two non-contiguous areas, the Main Manufacturing Area and the New River Unit. The Phase 3 inventory identified three closed sites totaling 5.4 acres, all of which are part of the installation.

The Army Reserve Small Arms Range (part of the Main Manufacturing Area) was used for training from approximately 1946 to 1967. The Northern and Western Burning Grounds (part of the New River Unit) were used to burn propellant during World War II.

As part of the inventory, the data collection team performed an assessment of explosives safety risk using the RAC process for each range and site with UXO and DMM in the inventory. The RAC process requires the completion of a worksheet that consists of a series of questions regarding the area. Based on the results of the worksheet, a relative overall score (RAC score) for each area is assigned. The RAC score is an estimate of the relative explosives safety risk, which is reported as a number from 1 (high explosives safety risk) to 5 (negligible explosives safety risk).

The results of the Phase 3 inventory for this installation are summarized in Table ES-1 below.

Table ES-1: CTT Range and Site

Installation Name	Range / Site Name	Classification	Total Area (Acres)	Munitions Constituents	RAC [1] Score	DERP Eligibility
RADFORD AAP	ARMY RESERVE SMALL ARMS RANGE	CLOSED	3	Unknown	5	MR
Munitions Type(s) SMALL ARMS						
RADFORD AAP	NORTHERN BURNING GROUNDS	CLOSED	2			IR
Munitions Type(s) PROPELLANTS (SOLID, LIQUID)						
RADFORD AAP	WESTERN BURNING GROUND	CLOSED	0 4			IR
Munitions Type(s) PROPELLANTS (SOLID, LIQUID)						

[1] "0" indicates that the site is a Munitions Constituent (MC) site and therefore, RAC scores have not been prepared.

Note: A TD at the end of the Range/Site name indicates a Transferred portion of a site. If a site extends past the installation boundary and is therefore identified as transferred, that transferred portion is given the same name as the site within the installation boundary and a "TD" is added to the end to indicate that it has been identified as transferred.

A. INTRODUCTION

The United States (U.S.) Army is in the process of inventorying all of its past and current ranges to support its Range Sustainment Program and the Military Munitions Response Program (MMRP). The Army is conducting the inventory in three phases. The first and second phases only address properties meeting the definition of a range. The third and final phase is an inventory of closed, transferring and transferred (CTT) ranges and sites with unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC). Both ranges and other sites with explosive hazards, such as UXO or munitions disposal areas, are included.

This report documents the results of the CTT range and site inventory for Radford Army Ammunition Plant (RAAP) located approximately 40 miles southwest of Roanoke, Virginia.

Background

To meet immediate, short-term, and long-term needs, the Army is conducting its range inventory program in three phases. The first phase (Phase 1) involved a data call issued through the Army Environmental Center (AEC) requesting general information about ranges on various installations under each U.S. Army Major Command (MACOM). The Phase 1 inventory was conducted using a questionnaire called the Advance Range Survey (ARS). The ARS allowed the Army to meet the short-term data goal of supporting the Department of Defense's (DoD) preparation of Senate Report 106-50.

Mr. Douglas Day, Safety and Risk Manager for RAAP, completed the ARS for RAAP in November 2000. No CTT ranges were identified in the ARS for RAAP. The RAAP ARS data was submitted to AEC and compiled into a master database of U.S. Army installations.

The ARS allowed the Army to meet its short-term needs; however, the Army's long-term needs required a more detailed inventory of its ranges that was not achievable based on the information in the ARS. For management and budgetary reasons, the Army divided the detailed follow-on inventory into two phases. The Phase 2 inventory addressed active and inactive (A/I) ranges (operational ranges), while Phase 3 covers CTT ranges and sites with UXO, DMM, or MC.

Malcolm Pirnie also reviewed the U.S. Army A/I Range Inventory Information / Schedule List for RAAP and found that a Phase 2 inventory was not performed at this facility; therefore, no A/I map was prepared for this location.

This Phase 3 inventory includes all CTT ranges and UXO, DMM, and MC sites that are currently or have been owned, leased, or operated by the Army or DoD. Properties currently classified as A/I ranges or permitted military munitions treatment and/or disposal facilities are excluded from the Phase 3 inventory. Closed ranges and sites are no longer in use, but are still located on Army property. Transferred ranges and sites are no longer in use and are located on property that is no longer under military control. Transferred ranges that qualify for the Formerly Used Defense Site (FUDS) program are not included in the Phase 3 inventory. However, transferred sites that qualify for FUDS, but are not on the FUDS docket, and transferred sites that do not qualify for FUDS (transferred after 1986) are included in this inventory. A range or site is referred to as "transferring" if it is no longer used and is proposed for imminent release from military control.

RAAP was visited on February 21, 2002. While on site, the data collection team reviewed historical records and interviewed installation personnel concerning CTT ranges and UXO, DMM, and MC sites.

The Phase 3 inventory is specifically focused on the non-A/I range areas (as defined in the Phase 2 inventory) and on areas outside the current installation boundary that may have been used in the past for munitions-related disposal, testing or training.

The inventory itself represents a summary or "snap shot" in time of the areas associated with the U.S. Army's munitions disposal, training, and testing and should be updated as the Army changes how it uses training ranges or gathers additional data over time.

Project Drivers

There are several drivers for the Phase 3 inventory, including the Defense Environmental Restoration Account (DERA), as amended by the Defense Authorization Act of 2002 (Public Law 107-107, signed into law January 2002); federal financial accounting standards; and DoD guidance. The most important driver is the DERA. DERA requires that an "inventory of defense sites that are known or suspected to contain UXO, DMM, or MC" be conducted and completed by May 31, 2003. The revised Management Guidance for the Defense Environmental Restoration Program (DERP) (September, 2001) created the MMRP and outlines the specific program requirements for the CTT inventory. Federal financial accounting standards require DoD to estimate the cost of cleaning up sites under the MMRP and report this cost in its annual financial statements. A complete inventory of CTT ranges and other sites with UXO, DMM and MC will ensure that future financial reporting estimates are defensible and supported by accurate data.

Report Objectives

The objective of this report is to present the results of the CTT inventory for this installation. Although this assignment did not require that an exhaustive archive search be performed, it did require historic research to identify CTT ranges and sites subject to this inventory, and the locations, periods of use, and associated types of UXO, DMM, or MC. The majority of this data was obtained by reviewing installation records and interviewing personnel at, or involved with, the installation. Although the data presented in this report is believed to be accurate, it has not been verified by field sampling.

Project Participants

AEC is the Program Manager for the Army's CTT inventory. AEC provides overall management and guidance, identifies significant issues, develops and maintains the Army Range Inventory Database (ARID), defines achievable schedules and milestones, coordinates with relevant U.S. Army organizations, and reports on the inventory's status. The Project Manager (PM) for AEC is Ms. Mary Ellen Maly.

The U.S. Army Corps of Engineers (USACE) is the executing organization for Phase 3 and was responsible for conducting the record searches; gathering, compiling, and validating data; and submitting the validated data to AEC in the specified file formats. USACE Baltimore District was responsible for completing the Phase 3 inventory for this installation. The PM for USACE Baltimore is Ms. Ann Wood.

Malcolm Pirnie, Inc., under contract with the USACE Baltimore District, provided personnel to help USACE collect and analyze inventory data and to document the results. The data collection team leader for the RAAP CTT inventory was Mr. Frank Czajkowski. Data collection support staff included Ms. Denise Weaver.

RAAP offices and personnel were contacted and interviewed as part of the CTT inventory. The primary POC for the RAAP CTT inventory was Mr. Brad Jennings, Environmental Engineer at RAAP.

B. DEFINITIONS AND DATA REQUIREMENTS

Before the results of the inventory can be presented, it is helpful for the reader to have an understanding of the definitions and data requirements associated with the inventory. This section defines the terms used in this report and the data requirements established by the Army.

Inventory Definitions

The following definitions are applicable to the Army's Range Inventory Program.

Defense Site: Locations that are or were owned by, leased to, or otherwise possessed or used by DoD. Does not include: operational ranges, operating storage or manufacturing facilities or facilities that are or were permitted for the treatment or disposal of military munitions.

Military Munitions: All ammunition products and components produced or used by or for the DoD or the U.S. Armed Services for national defense and security, including military munitions under the control of the DoD, the U.S. Coast Guard, the U.S. Department of Energy (DOE), and National Guard personnel. The term military munitions includes: confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes and incendiaries used by DoD components, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, and mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof. Military munitions do not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components thereof. However, the term does include nonnuclear components of nuclear devices, managed under DOE's nuclear weapons program, after all required sanitization operations under the Atomic Energy Act of 1954, as amended, have been completed.

Discarded Military Munitions (DMM): Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage facility for the purpose of disposal. Does not include: UXO or military munitions that are being held for use or planned disposal or that have been disposed of properly.

Unexploded Ordnance (UXO): Military munitions that have been primed, fused, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or

	material; and remain unexploded either by malfunction, design, or any other cause.
Munitions Constituents (MC):	Any materials that originate from UXO, DMM or other military munitions, including explosive and non-explosive materials, and emission, degradation or breakdown elements of such ordnance or military munitions.
Military Range:	A designated land or water area set aside, managed and used to conduct research on, develop, test, and evaluate military munitions and explosives, other ordnance, or weapon systems, or to train military personnel in their use and handling. Ranges include firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, and buffer zones with restricted access and exclusionary areas.
Active Range:	A military range that is currently in service and is being regularly used for range activities. For the purposes of the inventory, "in service" is defined as currently in operation, construction, maintenance, renovation, or reconfiguration to meet current Army training and/or test requirements. An active range qualifies as an operational range.
Inactive Range:	A military range that is not currently being used, but that is still considered by the Army to be a potential range area, and that has not been put to a new use that is incompatible with range activities. An inactive range qualifies as an operational range.
Closed Range:	A military range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a DoD component. Closed ranges cannot occupy an area that has been identified as an A/I range. Closed ranges are those areas of land that used to be operational, are still owned by the Army, but are now used for non-range purposes.
Transferred Range:	A military range that is no longer under military control and has been leased, transferred, or returned by DoD to another entity, including Federal entities. This includes a military range that is no longer under military control, but that was once used by the Army. This includes use under the terms of an executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the Federal land manager.

Transferring Range:	A military range that is proposed to be leased, transferred, or returned by the DoD to another entity, including federal entities. This includes a military range that is used under the terms of a withdrawal, executive order, special-use permit or authorization, right of way, public land order, or other instrument issued by the federal land manager or property owner. A range will not be considered a "transferring range" until the transfer is imminent.
Operational Range:	A military range that is currently in service and is being regularly used for range activities, or a military range that is not currently used, but that is still considered by the Military to be a potential range area, and that has not been put to a new use that is incompatible with range activities. Active and inactive ranges qualify as operational ranges.
Base Realignment and Closure (BRAC):	A DoD program that focuses on compliance and cleanup efforts at military installations undergoing closure or realignment, as authorized by Congress in four rounds of base closures for 1988, 1991, 1993, and 1995. A BRAC parcel is eligible for the MMRP if the release occurred prior to September 30, 2002; the release is not an operational range, FUDS, active munitions demilitarization facility, or active WMM treatment or disposal unit that operated after September 30, 2002; and the site was not identified or included in the Restoration Management Information System (RMIS) prior to September 30, 2002.
Formerly Used Defense Site (FUDS):	A DoD program that focuses on compliance and cleanup efforts at sites that were formerly used by the DoD. A property is eligible for the FUDS program if the release occurred prior to October 17, 1986; the property was transferred from DoD control prior to October 17, 1986; and the property or project meets other FUDS eligibility criteria.
Restoration Management Information System (RMIS) Site:	A site included in the DoD's RMIS database. Includes any building, structure, impoundment, landfill, storage container, or other site or area where a hazardous substance was or has come to be located. Installations and ranges may have more than one RMIS site. The RMIS is used to track DoD sites under the DERP.
DSERTS Site:	A site included in the Army's Defense Site Environmental Restoration Tracking System (DSERTS) database. DSERTS is the database the Army uses to track IRP sites under DERP.

Inventory Data Requirements

The goal of the inventory was to identify locations, periods of use, and types of munitions used on CTT ranges and sites with UXO, DMM or MC associated with the installation. Specific inventory data requirements included: 1) mapping out the CTT ranges and sites with UXO, DMM and MC, 2) collecting and preparing data to be uploaded into the ARID, 3) conducting an assessment of explosives safety risk using the Risk Assessment Code (RAC) methodology for each CTT range and UXO and DMM site identified in the inventory, and 4) determining which sites in the inventory qualify for the MMRP. Data requirements for range and site maps, ARID, and the RAC methodology are described below.

Range and Site Map Requirements

A CTT range and site map (or multiple maps depending on the specific installation) was generated for the CTT inventory of the installation. The map shows all the ranges and sites associated with the installation, including the A/I range areas (from Phase 2); closed, transferred, and transferring ranges and sites; and the non-range, UXO, DMM, and MC sites. The range and site map is provided in section E. Based on data collected and site conditions, multiple maps may be included in section E. An electronic version (.pdf file) of the map has been provided as an upload to ARID.

ARID Data Requirements

The CTT inventory data is driven by the requirements of ARID. The ARID Upload Instructions (19 September 2002) describe the minimum data elements required for completing the range inventory. According to the instructions, the following files are required for the inventory:

- Points of Contact
- Installation
- Range
- Munitions
- Ownership
- Land Use Restrictions and Access Controls
- Range Demographics
- Map
- RMIS Site Information
- DSERTS Site Information

A printed copy of each file submitted to ARID is provided in Section F.

Risk Assessment Code Methodology

The inventory team was required to perform an explosives safety risk assessment on each CTT range and UXO or DMM site identified during the inventory using the RAC methodology. RAC scores are not calculated for MC only sites. The RAC methodology is a process that the USACE designed to evaluate the relative explosives safety risk associated with past ordnance-related disposal, testing or training. The RAC score assists in prioritizing and sequencing projects. The RAC process is described in Appendix B of USACE Engineering Pamphlet 1110-1-18, Ordnance and Explosive Response (24 April 2000) and referenced in the updated management guidance for the DERP. The analysis involves a worksheet that, when completed, assigns a relative score (RAC score) to the sites. The RAC score is a number ranging from 1 (highest explosives safety risk) to 5 (negligible explosives safety risk). A summary of the calculated RAC scores and the completed RAC worksheets are included in Tab G.

DERP Eligibility Determination

The inventory team was required to determine the DERP eligibility of each range and site included in the inventory. This was done to ensure that ranges/sites are not double counted if already included under the Installation Restoration Program (IRP). It is also performed to ensure only ranges with UXO, DMM, or MC that meet the requirements identified in the DERP Management Guidance, September 01, are included in the MMRP. Results of the DERP eligibility determination include IRP, MMRP, or other (not eligible). To make this determination the following must be considered (when applicable):

- Whether or not the site has a DSERTS Site ID,
- Whether or not the current DSERTS cost to complete (CTC) includes a response to all UXO, DMM, and MC,
- Whether or not the DSERTS site has a BRAC UXO flag, and
- Whether or not the DSERTS site is listed as response complete (RC) because of ineligibility of funding due to UXO or munitions, where applicable.

After determining whether or not the ranges and/or sites (including their associated UXO, DMM, and MC aspects) are currently covered under the IRP, it must be determined if the range/site is eligible for the MMRP. If the range/site is not currently covered under IRP and not eligible for the MMRP, it should be classified as "other." As appropriate based on the eligibility determination, RMIS range ID and RMIS site ID numbers are then assigned.

C. INSTALLATION SUMMARY

This section provides a brief summary of the history of the installation and a summary of the data collection portion of the CTT inventory, including the types of records reviewed and personnel contacted.

Installation Overview and Description

Located in the mountains of southwest Virginia in Pulaski and Montgomery Counties, RAAP consists of two separate areas totaling approximately 6,900 acres. The Main Manufacturing Area (approximately 4,087 acres) is located in Pulaski and Montgomery Counties approximately 40 miles southwest of Roanoke, Virginia. The New River Unit (approximately 2,813 acres) is about six miles west of the Main Manufacturing Area, near the town of Dublin in Pulaski County. Approximately 1,000 acres of the New River Unit have been sold or transferred for other uses (FUDS C03VA0047).

Construction at RAAP began on September 7, 1940, when the U.S. Congress saw a need to increase ammunition production facilities for the country's likely involvement in World War II. RAAP initially consisted of two areas -- a smokeless powder plant (Radford Ordnance Works) and a bag manufacturing and loading plant for artillery, cannon, and mortar projectiles (New River Ordnance Works). Each operated separately through 1945. That year, the Radford Ordnance Works was renamed "Radford Arsenal" and assumed the New River Ordnance Works as a subpost. At the end of World War II, the New River Ordnance Works was closed and classified as surplus; however, in April 1946 the magazine area was withdrawn from surplus and placed in stand-by status. In 1950, New River Ordnance Works (now known as the New River Unit) became an integral part of the Radford Arsenal. The New River Unit was used for the loading of propellants and igniter charges and the manufacture of igniter charge bags. Production at the New River Unit ended after World War II, and the plant was officially designated as part of the RAAP installation. The arsenal was renamed "Radford Ordnance Plant" in 1961, and RAAP in 1963.

RAAP is still manufacturing propellants at the Main Manufacturing Area, its primary mission since 1941. The plant has also produced TNT on an intermittent basis since 1968. RAAP's TNT facilities have been on standby since the mid-1980s. The installation is operated by Alliant Techsystems, Inc., for the Army's Industrial Operations Command through a facilities use contract.

Contractor Team Composition

The CTT inventory contractor team (CTT team) for RAAP was staffed by Malcolm Pirnie, Inc. The CTT Team Leader for RAAP was Mr. Frank Czjakowski. Additional team members included Ms. Denise Weaver as researcher, Mr. Svend Egholm as the Geographic Information System (GIS) Specialist, and Mr. Conrad Bernier as the Quality Assurance/Quality Control Manager.

Installation Points of Contact (POCs)

The primary CTT inventory POC for RAAP was Mr. Brad Jennings, Environmental Engineer. Mr. Jim McKenna, Installation Restoration Program (IRP) Manager for RAAP also helped with the inventory.

Nature of Data Collection and Coordination

Each installation is unique in terms of the amount and quality of data available regarding CTT ranges and sites with UXO, DMM, and MC, as well as the depth of experience and knowledge of the personnel available for interviews. The data collection team attempts to contact as many applicable offices and review as many record repositories as possible.

Specific to RAAP, the data collection team had access to records, reports, and maps at the environmental office and also conducted on-site interviews. In addition to contacting various RAAP installation offices, the inventory team also contacted Mr. John Tesner, RAAP Project Manager for USACE Baltimore District. The inventory team also visited the Radford University Library and researched the RAAP IRP website.

Specific records and maps reviewed are listed in the document log (see Section I).

Summary of Critical Data Sources

Certain data sources (records and interviews) proved to be of particular value and interest to the data collection team and were critical to develop the CTT inventory at RAAP. The following is a summary of these critical data sources.

The RAAP IRP website contained information about the IRP program at RAAP, including information about investigative activities. The website also contained a data repository that included the 2002 Installation Action Plan which provided general information about the installation, as well as details about the DSERTS sites at RAAP.

Numerous reports chronicling the history of RAAP where found at the Radford University Library. These reports helped clarify the history and organization of RAAP and the New River Unit.

D. INSTALLATION CTT RANGE AND SITE DATA

This section presents information on the CTT ranges and sites with UXO, DMM or MC on or associated with the installation. It includes a summary of the total range and site area in acres, a summary of each individual CTT range and site, a table listing the details of each CTT range and site, a table with ownership and accessibility information, and a table illustrating the DERP eligibility determination.

Summary of CTT Range and UXO, DMM and MC Sites

The following is a summary of the range area at RAAP:
A/I Range Area - N/A
CTT Range Area - 5.4 acres
Total Range Area (A/I and CTT combined) - 5.4 Acres

One CTT range and one CTT MC site were discovered during the Phase 3 inventory. Both CTT areas are shown in Figure E-1. The CTT team did not discover any records of accidents or UXO-related incidents or sightings during this investigation.

Both CTT areas are owned by DoD. The CTT acreage figures for DoD ownership are provided below in Table D-1.

Table D-1: Ownership Summary Table

INSTALLATION NAME	RANGE / SITE NAME	OWNER	CTT ACREAGE
RADFORD AAP	ARMY RESERVE SMALL ARMS RANGE	DOD	3
RADFORD AAP	NORTHERN BURNING GROUNDS	DOD	2
RADFORD AAP	WESTERN BURNING GROUND	DOD	0.4

CTT Range and Site Summaries

Below are summaries for the individual CTT ranges and/or sites inventoried at the installation. Each summary typically includes a brief history of the range or site, total acreage, relative location, types of ordnance used or discarded, periods of use, information on any UXO responses conducted, and current usage. Only the non-A/I range area is reported to ARID to avoid duplicate Phase 2 and 3 reporting. The level of detail reported in these summaries is based on the level of data available. The ranges and sites are listed in alphabetical order.

ARMY RESERVE SMALL ARMS RANGE -- The closed Army Reserve Small Arms Range occupied approximately 3 acres. It was used for small arms training from approximately 1941 to 1967. The closed range is located along the southeastern boundary of RAAP. A berm (approximately 200 feet long by 10 feet high) is still present and indicates that the direction of fire was southeast. The berm is adjacent to a stream which forms the installation boundary. This range likely contained 10-15

stations. The "Radford Ordnance Works Historic Investigation" states that 155,375 rounds of ammunition were "expended in the pistol range by the RAAP police department from October 1941 to October 1945." The range may have also been used by the local rifle club (1946-1967).

Although public access to all of RAAP is currently restricted, the former small arms range is not within the secure manufacturing area and public access may have been possible in the past. The former range is currently a grass field surrounded by an unlocked fence. The field was once used as a baseball field accessible by the public. The field is still used for baseball although the frequency of use has decreased due to the increase in security at RAAP.

NORTHERN BURNING GROUND --The closed Northern Burning Ground occupies approximately 2 acres of the New River Unit located about six miles west of the RAAP main manufacturing area, near the town of Dublin, Virginia. Approximately 1,000 acres of the New River Unit have been sold or transferred for other uses (FUDS C03VA0047), but the Northern Burning Ground remains the property of the U.S. Army.

Between 1940 and 1945, personnel at the New River Unit loaded propellants and igniter charges and manufactured igniter charge bags. Between 1943 and 1945, operations were expanded to include an additional bag-loading line, rolled powder operations, flash-reducer loading lines, and black powder drying facilities. Production at the New River Unit ended after World War II. The Northern Burning Ground was used during this timeframe to burn propellants.

As part of the IRP at RAAP, a remedial investigation (RI) sampling effort was undertaken at the New River Unit during which surface soil, sludge, and water samples were collected. According to the Installation Action Plan, the RI effort is proposed to continue, including contaminated soil excavation, transportation, and disposal. A groundwater investigation may be undertaken depending on the vertical extent of soil contamination. The Northern Burning Ground is managed in the IRP with the DSERTS ID RFAAP-044.

WESTERN BURNING GROUND -- The closed Western Burning Ground occupies approximately 0.4 acres of the New River Unit. The Western Burning Ground has the same characteristics as the Northern Burning Ground, including the same DSERTS ID (RFAAP-044).

CTT Range and Site Details Table

The CTT Range and Site Details Table (Table D-2) provides detailed information on the CTT areas included in the inventory.

Table D-2: CTT Site Details Table

INSTALLATION AND RANGE / SITE NAME	CLASSIFICATION	TOTAL AREA	MUNITIONS CONSTITUENTS	RAC SCORE*	HISTORIC USE
RADFORD AAP ARMY RESERVE SMALL ARMS RANGE	CLOSED	3	UNKNOWN	5	SMALL ARMS
MUNITIONS TYPE(S) *SMALL ARMS*					
RADFORD AAP NORTHERN BURNING GROUNDS	CLOSED	2			OB/OD
MUNITIONS TYPE(S) *PROPELLANTS (SOLID, LIQUID)*					
RADFORD AAP WESTERN BURNING GROUND	CLOSED	0.4			OB/OD
MUNITIONS TYPE(S) *PROPELLANTS (SOLID, LIQUID)*					

* The RAC score is a prioritization and sequencing tool used to rank the explosives safety risk at a site; 1 is the highest explosives safety risk, 5 is the lowest explosives safety risk. The RAC score is discussed further in section G. The RAC Score is only developed for range, UXO and DMM sites, not MC sites.

The area data reported in ARID is adjusted to account for CTT range and site overlaps with A/I range areas inventoried in Phase 2 to ensure that no area is reported more than once. By definition, if a portion of the CTT range/site is considered an A/I range and is reported in Phase 2, the range/site portion is not reported again in the Phase 3 acreage (where applicable).

CTT Range and Site Ownership, Use and Access Control Summary Table

The Range and Site Ownership Table (Table D-3) provides a summary of the owner, current use and access restrictions associated with each CTT site in the inventory.

Table D-3: CTT Range and Site Ownership, Use and Access Control Summary Table

INSTALLATION AND RANGE / SITE NAME	OWNER	CURRENT USE	RESTRICTIONS
RADFORD AAP ARMY RESERVE SMALL ARMS RANGE	DOD	RECREATIONAL	FENCES
RADFORD AAP NORTHERN BURNING GROUNDS	DOD	UNDEVELOPED	
RADFORD AAP WESTERN BURNING GROUND	DOD	UNDEVELOPED	

DERP Eligibility Table

The RMIS Information Table (Table D-4) and the DERP Eligibility Table (Table D-5) provide a summary of the process for determining a site's DERP eligibility. Specifically, the team determined whether a site should be covered under the MMRP program or if it was already addressed under the IRP and should remain under that program. For those sites that are not DERP eligible due to a lack of UXO, DMM, or MC contamination (e.g., bayonet ranges and drop zones), the table identifies the DERP eligibility as "other."

Table D-4: RMIS Information Table

INSTALLATION AND RANGE NAME	DSERTS SITE ID	DSERTS CTC INCLUDES UXO-DMM	DSERTS SITE ID HAS BRAC UXO FLAG	DSERTS RC FLAG	RC REASON	ACTIVE DSERTS PHASE(S)
RADFORD AAP ARMY RESERVE SMALL ARMS RANGE	N/A	N	N	N	N/A	N/A
RADFORD AAP NORTHERN BURNING GROUNDS	RFAAP-044	Y	N	N	N/A	REMEDIAL INVESTIGATION/ FEASIBILITY STUDY
RADFORD AAP WESTERN BURNING GROUND	RFAAP-044	Y	N	N	N/A	REMEDIAL INVESTIGATION/ FEASIBILITY STUDY

Reason Codes:
A- All Required Cleanup(s) Completed, B- Study completed, No Cleanup Required,
C- Not Eligible for DERA/BRAC Funding, D- Other, N/A - Not Applicable,
Y-Yes, N-No

Table D-5: DERP Eligibility Table

INSTALLATION	RANGE/SITE NAME	RANGE	DERP ELIGIBILITY	RMIS RANGE ID	RMIS SITE ID
RADFORD AAP	ARMY RESERVE SMALL ARMS RANGE	Y	MR	RFAAP-001-R	RFAAP-001-R-01
RADFORD AAP	NORTHERN BURNING GROUNDS		IR	N/A	N/A
RADFORD AAP	WESTERN BURNING GROUND		IR	N/A	N/A

DERP Eligibility:
MR = Munitions Response Program Eligible, IR = Installation Response Program Eligible,
Other = Not Eligible for MR or IR Programs, Y = Yes, N = No

E. RANGE AND SITE MAPS

Individual CTT range and site maps were generated for the purposes of the Phase 3 inventory of this installation. The individual CTT range and site maps show all the range and site areas associated with the installation, including the A/I range areas (from Phase 2); closed, transferring, and transferred sites; and the non-range, UXO, DMM, or MC areas. An electronic version (.pdf file) of the map has been provided as an upload to ARID. The individual CTT maps for the installation are included in this section.

CTT Ranges, UXO-DMM-MC Sites
Radford AAP, VA

MALCOLM PIRNIE

Figure E-1

Area	Acres
A/I Ranges	N/A
Closed	5.4
Transferring	0
Transferred	0

Legend

- Installation Boundary
- Roads
- Counties
- Contours
- Streams
- Water
- A/I Ranges
- Closed
- Transferring
- Transferred
- Non Range, Non UXO-DMM-MC Area

Projection	**UTM, Zone 17**
Horizontal Datum	**NAD83**
Units	**Meters**
Grid	**500 Meters**

N W E S

1:12,000

0 0.2 0.4 0.8 1.2 Kilometers

0 0.1 0.2 0.4 0.6 Miles

Installation Location

CTT Ranges, UXO-DMM-MC Sites
Radford AAP, VA

Source: Produced for the U.S. Army Corps of Engineers by Malcolm Pirnie, Inc. under contract DACA 31-00-D-0043

Edition: Final Report

Date: November 2002

CTT Ranges, UXO-DMM-MC Sites
Radford AAP, VA

MALCOLM PIRNIE

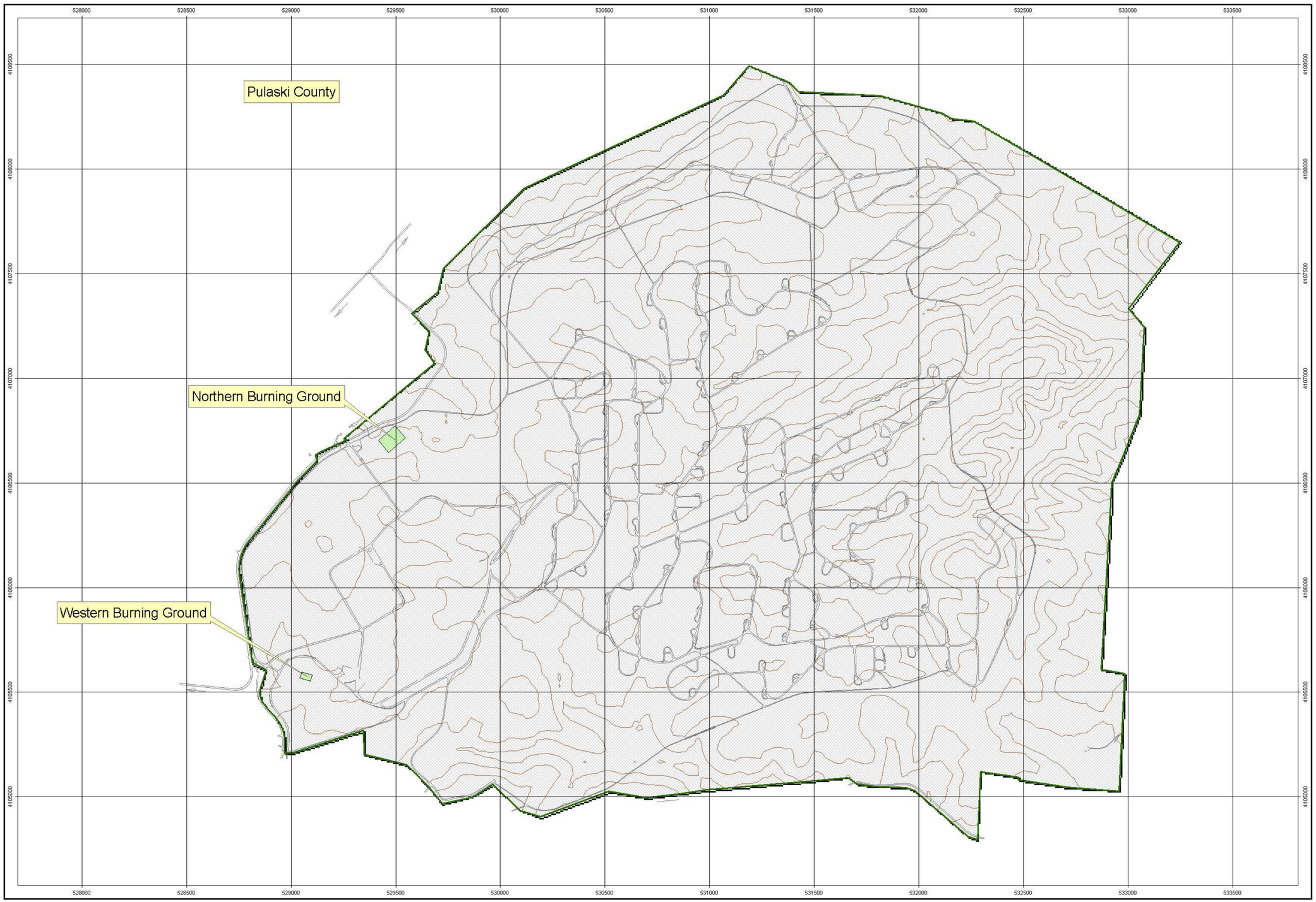


Figure E-2

Area	Acres
A/I Ranges	N/A
Closed	5.4
Transferring	0
Transferred	0

The area reported includes the total area shown in both maps E-1 and E-2.

Legend

- Installation Boundary
- Roads
- Contours
- A/I Ranges
- Closed
- Transferring
- Transferred
- Non Range, Non UXO-DMM-MC Area

Projection	**UTM, Zone 17**
Horizontal Datum	**NAD83**
Units	**Meters**
Grid	**500 Meters**

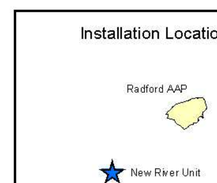
N
W E
S

1:9,000

0 0.1 0.2 0.4 0.6 0.8 Kilometers

0 0.1 0.2 0.4 0.6 Miles

Installation Location



CTT Ranges, UXO-DMM-MC Sites
Radford AAP, VA

Source: Produced for the U.S. Army Corps of Engineers by Malcolm Pirnie, Inc. under contract DACA 31-00-D-0043

Edition: Final Report

Date: November 2002

F. ARID DATA FILES

This section contains a printout of the ARID data files submitted to AEC for the Phase 3 CTT Inventory for this installation. The files were set up according to the guidelines in the ARID Upload Instructions (19 September 2002). The following files are included:

- Points of Contact
- Installation
- Range
- Munitions
- Ownership
- Land Use Restriction and Access Controls
- Range Demographics
- RMIS Site Information
- DSERTS Site Information

POC Table

11/12/2002

INSTALLATION NAME	FFID	LAST NAME	FIRST NAME	POC TITLE	POC ORG
RADFORD AAP	VA213820730	JENNINGS	BRAD	ENVIRONMENTAL ENGINEER	RAAP

POC TYPE: CTT

PHONE		ADDRESS
PHONE	540-639-7417	RADFORD ARMY AMMUNITION PLANT
DSN		PO BOX 2
FAX	540-639-8635	
EMAIL	BRAD_JENNINGS@ATK.COM	RADFORD, VA 24141-0099
		UNITED STATES

Installation Table

11/12/2002

INSTALLATION NAME	FFID	MACOM	MSC	PARENT INSTALLATION	A/I RANGE	CTT RANGE	BRAC ROUND	DERA FLAG	FUDS FLAG
RADFORD AAP	VA213820730	AMC			N	Y	N/A	Y	N

Range Table

11/12/2002

RMIS RANGE ID: RFAAP-001-R

INSTALLATION NAME	FFID	RANGE/SITE NAME	STATUS	SEVERITY SCORE	PROBABILITY SCORE	RAC SCORE
RADFORD AAP	VA213820730	ARMY RESERVE SMALL ARMS RANGE	CLOSED	V	NA	5

RANGE DESCRIPTION

The closed Army Reserve Small Arms Range occupied approximately 3 acres. It was used for small arms training from approximately 1941 to 1967. The closed range is located along the southeastern boundary of RAAP. A berm is still present and indicates that the direction of fire was southeast. The berm is adjacent to a stream which forms the installation boundary. The range may have also been used by the local rifle club (1946-1967). Although public access to all of RAAP is currently restricted, the former small arms range is not within the secure manufacturing area and public access may have been possible in the past. The former range is currently a grass baseball field surrounded by an unlocked fence.

CTT TOTAL ACRES	MMR ACRES IDENTIFIED	MMR ACRES SUSPECTED	MMR ACRES NOT SUSPECTED
3	0	3	0

UTM ZONE	UTM DATUM	UTM X	UTM Y	CONSTRUCTION DATE	RIP RC DATE
17	NAD83	542089	4115377	1/1/41	

COMMENT

TOPOGRAPHY	VEGETATION	SOIL TYPE
FLAT	LOW GRASS AND FEW SHRUBS	CLAY/SAND WITH STONE

		START YEAR
CURRENT USE 1	RECREATIONAL	1967
CURRENT USE 2	N/A	
CURRENT USE 3	N/A	

		START YEAR	END YEAR
HISTORIC USE 1	SMALL ARMS	1941	1967
HISTORIC USE 2	N/A		

Range Table

11/12/2002

RMIS RANGE ID: RFAAP-001-R

HISTORIC USE 3 N/A

Range Table

11/12/2002

RMIS RANGE ID:

INSTALLATION NAME	FFID	RANGE/SITE NAME	STATUS	SEVERITY SCORE	PROBABILITY SCORE	RAC SCORE
RADFORD AAP	VA213820730	NORTHERN BURNING GROUNDS	CLOSED	NA	NA	

RANGE DESCRIPTION

The closed Northern Burning Ground occupies approximately 2 acres of the New River Unit located about six miles west of the RAAP main manufacturing area, near the town of Dublin, Virginia. Approximately 1,000 acres of the New River Unit have been sold or transferred for other uses (FUDS C03VA0047), but the Northern Burning Ground remains the property of the U.S. Army. Between 1940 and 1945, personnel at the New River Unit loaded propellants and igniter charges and manufactured igniter charge bags. Production at the New River Unit ended after World War II. The Northern Burning Ground was used during this timeframe to burn propellants.

CTT TOTAL ACRES	MMR ACRES IDENTIFIED	MMR ACRES SUSPECTED	MMR ACRES NOT SUSPECTED
2	0	2	0

UTM ZONE	UTM DATUM	UTM X	UTM Y	CONSTRUCTION DATE	RIP RC DATE
17	NAD83	529482	4106709	1/1/40	

COMMENT

The potential exists for munitions items; however, no reports were available to confirm. The Northern Burning Ground and Western Burning Ground have the same DSERTS ID.

TOPOGRAPHY	VEGETATION	SOIL TYPE
FLAT	FOREST	CLAY/SAND WITH STONE

		START YEAR
CURRENT USE 1	UNDEVELOPED	1945
CURRENT USE 2	N/A	
CURRENT USE 3	N/A	

		START YEAR	END YEAR
HISTORIC USE 1	OB/OD	1940	1945
HISTORIC USE 2	N/A		
HISTORIC USE 3	N/A		

6

Range Table

11/12/2002

RMIS RANGE ID:

INSTALLATION NAME	FFID	RANGE/SITE NAME	STATUS	SEVERITY SCORE	PROBABILITY SCORE	RAC SCORE
RADFORD AAP	VA213820730	WESTERN BURNING GROUND	CLOSED	NA	NA	

RANGE DESCRIPTION

The closed Western Burning Ground occupies approximately 2 acres of the New River Unit located about six miles west of the RAAP main manufacturing area, near the town of Dublin, Virginia. Approximately 1,000 acres of the New River Unit have been sold or transferred for other uses (FUDS C03VA0047), but the Western Burning Ground remains the property of the U.S. Army. Between 1940 and 1945, personnel at the New River Unit loaded propellants and igniter charges and manufactured igniter charge bags. Production at the New River Unit ended after World War II. The Western Burning Ground was used during this timeframe to burn propellants.

CTT TOTAL ACRES	MMR ACRES IDENTIFIED	MMR ACRES SUSPECTED	MMR ACRES NOT SUSPECTED
0.4	0	0.4	0

UTM ZONE	UTM DATUM	UTM X	UTM Y	CONSTRUCTION DATE	RIP RC DATE
17	NAD83	529071	4105575	1/1/40	

COMMENT

The potential exists for munitions items; however, no reports were available to confirm. The Northern Burning Ground and Western Burning Ground have the same DSERTS ID.

TOPOGRAPHY	VEGETATION	SOIL TYPE
FLAT	FOREST	CLAY/SAND WITH STONE

		START YEAR
CURRENT USE 1	UNDEVELOPED	1945
CURRENT USE 2	N/A	
CURRENT USE 3	N/A	

		START YEAR	END YEAR
HISTORIC USE 1	OB/OD	1940	1945
HISTORIC USE 2	N/A		
HISTORIC USE 3	N/A		

Munitions Table

11/12/2002

INSTALLATION NAME	FFID	RANGE/SITE NAME
RADFORD AAP	VA213820730	ARMY RESERVE SMALL ARMS RANGE

DODIC	DODIC DESCRIPTION	START DATE	END DATE	MUNITIONS EXPENDED
CTT16	SMALL ARMS	01/1941	01/1967	

INSTALLATION NAME	FFID	RANGE/SITE NAME
RADFORD AAP	VA213820730	NORTHERN BURNING GROUNDS

DODIC	DODIC DESCRIPTION	START DATE	END DATE	MUNITIONS EXPENDED
CTT29	PROPELLANTS (SOLID, LIQUID)	01/1940	01/1945	

INSTALLATION NAME	FFID	RANGE/SITE NAME
RADFORD AAP	VA213820730	WESTERN BURNING GROUND

DODIC	DODIC DESCRIPTION	START DATE	END DATE	MUNITIONS EXPENDED
CTT29	PROPELLANTS (SOLID, LIQUID)	01/1940	01/1945	

** Not all items listed under the DODIC Description may be present at the range/site.

Ownership Table 11/12/2002

INSTALLATION NAME	FFID	RANGE/SITE NAME	ALL ARMY OWNED	OWNER	OWNER DESCRIPTION
RADFORD AAP	VA213820730	ARMY RESERVE SMALL ARMS RANGE	Y	DOD	N/A

FEDERAL LEASE FLAG	STATE LEASE FLAG	LOCAL LEASE FLAG	TRIBAL LEASE FLAG	PRIVATE LEASE FLAG	OTHER LEASE FLAG	OTHER LEASE DESCRIPTION	LEASE TERMINATED	REVOCATION OF LAND
N	N	N	N	N	N	N/A	N	N

INSTALLATION NAME	FFID	RANGE/SITE NAME	ALL ARMY OWNED	OWNER	OWNER DESCRIPTION
RADFORD AAP	VA213820730	NORTHERN BURNING GROUNDS	Y	DOD	N/A

FEDERAL LEASE FLAG	STATE LEASE FLAG	LOCAL LEASE FLAG	TRIBAL LEASE FLAG	PRIVATE LEASE FLAG	OTHER LEASE FLAG	OTHER LEASE DESCRIPTION	LEASE TERMINATED	REVOCATION OF LAND
N	N	N	N	N	N	N/A	N	N

INSTALLATION NAME	FFID	RANGE/SITE NAME	ALL ARMY OWNED	OWNER	OWNER DESCRIPTION
RADFORD AAP	VA213820730	WESTERN BURNING GROUND	Y	DOD	N/A

FEDERAL LEASE FLAG	STATE LEASE FLAG	LOCAL LEASE FLAG	TRIBAL LEASE FLAG	PRIVATE LEASE FLAG	OTHER LEASE FLAG	OTHER LEASE DESCRIPTION	LEASE TERMINATED	REVOCATION OF LAND
N	N	N	N	N	N	N/A	N	N

Land Use Restriction Table 11/12/2002

INSTALLATION NAME	FFID	RANGE/SITE NAME	RESTRICTION TYPE	RESTRICTION	PUBLIC ACCESS
RADFORD AAP	VA213820730	ARMY RESERVE SMALL ARMS RANGE	ACCESS CONTROL	FENCES	LPA

DESCRIPTION: THE INSTALLATION IS FENCED AND GUARDED, AND THE FORMER RANGE IS SURROUNDED BY AN UNLOCKED FENCE AND STREAM. SINCE THE FORMER RANGE IS ACCESSIBLE ONCE ON THE INSTALLATION, THERE IS LPA.

INSTALLATION NAME	FFID	RANGE/SITE NAME	RESTRICTION TYPE	RESTRICTION	PUBLIC ACCESS
RADFORD AAP	VA213820730	NORTHERN BURNING GROUNDS			LPA

DESCRIPTION: THE NEW RIVER UNIT IS FENCED; HOWEVER, THE INDIVIDUAL BURNING GROUNDS ARE NOT FENCED SO THERE IS LPA.

INSTALLATION NAME	FFID	RANGE/SITE NAME	RESTRICTION TYPE	RESTRICTION	PUBLIC ACCESS
RADFORD AAP	VA213820730	WESTERN BURNING GROUND			LPA

DESCRIPTION: THE NEW RIVER UNIT IS FENCED; HOWEVER, THE INDIVIDUAL BURNING GROUNDS ARE NOT FENCED SO THERE IS LPA.

PUBLIC ACCESS DEFINITIONS

NPA = No Public Access: The public does not have any access to the range/site.

LPA = Limited Public Access: The public does have some access to the range/site, but that access doesn't involve any digging, only surface access, such as livestock grazing or use as a wildlife preserve or refuge.

RPA = Restricted Public Access: The public does have some access to the range/site and that access may involve some surface disturbance, such as agricultural use, forestry, recreation, and vehicle or supply storage facility use.

UPA = Unrestricted Public Access: There are no restrictions on the use of the range/site (excavation is allowed).

12

Range Demographics Table

11/12/2002

INSTALLATION NAME	FFID	RANGE/SITE NAME	TYPE	NAME	STATE	COUNTRY
RADFORD AAP	VA213820730	ARMY RESERVE SMALL ARMS RANGE	COUNTY	MONTGOMERY	VA	UNITED STATES
RADFORD AAP	VA213820730	NORTHERN BURNING GROUNDS	COUNTY	PULASKI	VA	UNITED STATES
RADFORD AAP	VA213820730	WESTERN BURNING GROUND	COUNTY	PULASKI	VA	UNITED STATES

RMIS Information Table 11/12/2002

INSTALLATION NAME	FFID	RANGE/SITE NAME	RMIS RANGE ID	RMIS SITE ID	ON RANGE FLAG
RADFORD AAP	VA213820730	ARMY RESERVE SMALL ARMS RANGE	RFAAP-001-R	RFAAP-001-R-01	Y

RMIS SITE USEAGE:

BUFFER AREA	DISPOSAL	OBOD	SMALL ARMS RANGE	SKEET RANGE	TESTING	TRAINING	WASTE MILITARY MUNITIONS	OTHER	OTHER DESCRIPTION
N	N	N	Y	N	N	Y	N	N	

DRINKING WATER	GROUNDWATER DEPTH (FT)	CONSTITUENT FLAG	UXO DENSITY
POTENTIAL	40	UNKNOWN	

INSTALLATION NAME	FFID	RANGE/SITE NAME	RMIS RANGE ID	RMIS SITE ID	ON RANGE FLAG
RADFORD AAP	VA213820730	NORTHERN BURNING GROUNDS			

RMIS SITE USEAGE:

BUFFER AREA	DISPOSAL	OBOD	SMALL ARMS RANGE	SKEET RANGE	TESTING	TRAINING	WASTE MILITARY MUNITIONS	OTHER	OTHER DESCRIPTION

DRINKING WATER	GROUNDWATER DEPTH (FT)	CONSTITUENT FLAG	UXO DENSITY

RMIS Information Table 11/12/2002

INSTALLATION NAME	FFID	RANGE/SITE NAME	RMIS RANGE ID	RMIS SITE ID	ON RANGE FLAG
RADFORD AAP	VA213820730	WESTERN BURNING GROUND			

RMIS SITE USEAGE:

BUFFER AREA	DISPOSAL	OBOD	SMALL ARMS RANGE	SKEET RANGE	TESTING	TRAINING	WASTE MILITARY MUNITIONS	OTHER	OTHER DESCRIPTION

DRINKING WATER	GROUNDWATER DEPTH (FT)	CONSTITUENT FLAG	UXO DENSITY

DSERTS Information Table 11/12/2002

INSTALLATION NAME	FFID	RANGE/SITE NAME	DSERTS SITE ID	DSERTS CTC INCLUDES UXO-DMM	DSERTS SITE ID HAS BRAC UXO FLAG	DERP ELIGIBILITY	RMIS SITE ID
RADFORD AAP	VA213820730	ARMY RESERVE SMALL ARMS RANGE	N/A	N	N	MR	RFAAP-001-R-01

DSERT PHASE	RESPONSE COMPLETE: FLAG	REASON
	N	N/A

INSTALLATION NAME	FFID	RANGE/SITE NAME	DSERTS SITE ID	DSERTS CTC INCLUDES UXO-DMM	DSERTS SITE ID HAS BRAC UXO FLAG	DERP ELIGIBILITY	RMIS SITE ID
RADFORD AAP	VA213820730	NORTHERN BURNING GROUNDS	RFAAP-044	Y	N	IR	

DSERT PHASE	RESPONSE COMPLETE: FLAG	REASON
RI	N	N/A

DSERTS Information Table

11/12/2002

INSTALLATION NAME	FFID	RANGE/SITE NAME	DSERTS SITE ID	DSERTS CTC INCLUDES UXO-DMM	DSERTS SITE ID HAS BRAC UXO FLAG	DERP ELIGIBILITY	RMIS SITE ID
RADFORD AAP	VA213820730	WESTERN BURNING GROUND	RFAAP-044	Y	N	IR	

	RESPONSE COMPLETE:	
DSERT PHASE	FLAG	REASON
RI	N	N/A

G. RISK ASSESSMENT CODE ANALYSIS

As part of the CTT Inventory, the data collection teams performed an assessment of explosives safety risk using the RAC process. The RAC process requires the completion of a worksheet that consists of a series of questions regarding the range or site. Based on the results of the worksheet, relative values for the severity and probability of explosives safety risk associated with the range area are assigned. The severity and probability values are then combined to arrive at an overall score (RAC score).The RAC score is an estimate of the relative explosives risk, which is reported as a number between 1 and 5. The following is a description of the RAC scores.

RAC 1 High Explosives Safety Risk - Highest priority for further action.

RAC 2 Serious Explosives Safety Risk - Priority for further action.

RAC 3 Moderate Explosives Safety Risk - Recommend further action.

RAC 4 Low Explosives Safety Risk - Recommend further action.

RAC 5 Negligible Explosives Safety Risk - No explosive related action necessary.

As designed by USACE, a site's RAC score is calculated and revised up to the end of the site's investigation as an expression of the explosives safety risk at the site. The RAC scoring performed under this CTT inventory is based on the munitions used, discarded, or disposed of at the CTT military range or site with UXO, DMM, or MC as determined through interviews, site visits and historic records and does not reflect any clean-up actions that may have already been performed at the site. If cleanup actions have been completed at the site, this is noted in the Narrative at the end of the RAC worksheet. Hence, the actual RAC score may reflect a higher than anticipated current risk at the site. DoD is currently developing a new priority assessment tool for site explosives safety risk. Until a new tool is approved for use, DoD is mandating the use of RAC scoring for the analysis of explosives safety risk associated with ranges and sites identified during this CTT inventory.

The area, probability value, severity value and overall RAC score for each of the CTT range, UXO and DMM sites in the inventory are provided in Table G-1 below.

Table G-1: Risk Assessment Code Analysis Results

INSTALLATION	RANGE NAME	ACRES	SEVERITY*	PROBABILITY**	OVERALL***
RADFORD AAP	ARMY RESERVE SMALL ARMS RANGE	3	V	NA	5
RADFORD AAP	NORTHERN BURNING GROUNDS	2	NA	NA	N/A
RADFORD AAP	WESTERN BURNING GROUND	0.4	NA	NA	N/A

* Severity – 5 possible classifications from I (catastrophic) to V (none)
** Probability – 5 possible classifications from A (frequent) to E (improbable).
*** "0" indicates that the site is a MC site and therefore, RAC scores have not been prepared.

According to the RAC worksheet instructions, if the severity value is V, the probability value does not need to be calculated, and a RAC score of 5 should be assigned to the range.

The completed RAC worksheet for each range in the CTT inventory is also included in this section. RAC worksheets were not prepared for MC sites.

RISK ASSESSMENT CODE WORKSHEETS

RISK ASSESSMENT CODE WORKSHEETS

Army Reserve Small Arms Range

Army Reserve Small Arms Range

RISK ASSESSMENT CODE WORKSHEETS

Site Name: Army Reserve Small Arms Range

Rater's Name: Denise Weaver

Site Location: RADFORD AAP

Phone: (410) 230-9963

Date Completed: 7/19/02

Organization: MPI

Score: RAC 5

Explosive Relative Risk Assessment:

This risk assessment procedure was developed in accordance with Military Standard 882C and Army Regulation 385-10. The Risk Assessment Code (RAC) score will be used by DoD and the U.S. Army to assist in the prioritization and sequencing of projects. The risk assessment is based on the best available information resulting from the data collection effort of the CTT inventory. This information is used to assess the explosive relative risk involved with the CTT ranges/sites identified in this inventory. The risk assessment is composed of two factors, hazard severity and hazard probability.

PART I. HAZARD SEVERITY

Hazard severity categories are defined to provide a qualitative measure of the worst credible event resulting from personnel exposure to various types and quantities of UXO.

TYPE OF ORDNANCE: (Circle all that apply)	**VALUE**
A. Conventional ordnance and ammunition:	
Medium/large caliber (20mm and larger)	☐ 10
Bombs, explosive	☐ 10
Grenades, hand or rifle, explosive	☐ 10
Landmine, explosive	☐ 10
Rockets, guided missile, explosive	☐ 10
Detonators, blasting caps, fuzes, boosters, bursters	☐ 6
Bombs, practice (w/spotting charges)	☐ 6
Grenades, practice (w/spotting charges)	☐ 4
Landmine, practice (w/spotting charges)	☐ 4
Small arms, complete round (.22 cal -.50 cal)	☐ 1
Small arms, expended	☑ 0
Practice ordnance (w/o spotting charges)	☐ 0

Conventional ordnance and ammunition (largest single value): 0

What evidence do you have regarding conventional unexploded ordnance?

Historical documents and interviews with site personnel indicate small arms were used on this range.

B. The Values for Pyrotechnics (for munitions not described above): **VALUE**

Munition (containers) containing White Phosphorus (WP) or other pyrophoric material (i.e.,spontaneously flammable)	☐ 10
Munition containing a flame or incendiary material (i.e., Napalm, Triethylaluminum metal incendiaries)	☐ 6
Flares, signals, simulators, screening smokes (other than WP)	☐ 4

Pyrotechnics (select the single largest value): *0*

What evidence do you have regarding pyrotechnics?

None found during site visit and document search.

C. Bulk High Explosives (HE) (not an integral part of conventional ordnance; uncontainerized): **VALUE**

Primary or initiating explosives (Lead Styphnate, Lead Azide, Nitroglycerin, Mercury Azide, Mercury Fulminate, Tetracene, etc.)	☐ 10
Demolition charges	☐ 10
Secondary explosives (PETN, Compositions A, B, C, Tetryl, TNT, RDX, HMX, HBX, Black Powder, etc.)	☐ 8
Military dynamite	☐ 6
Less sensitive explosives (Ammonium Nitrate, Explosive D, etc.)	☐ 3

High explosives (select the single largest value): *0*

What evidence do you have regarding bulk explosives?:

None found during site visit and document search.

D. Bulk propellants (not an integral part of rockets, guided missiles, or other conventional ordnance;

Solid or liquid propellants	☐ 6

Propellants: *0*

What evidence do you have regarding bulk propellants?

None found during site visit and document search.

E. Chemical Warfare Materiel (CWM) and Radiological Weapons:	**VALUE**
Toxic chemical agents (choking, nerve, blood, blister)	☐ 25
War Gas Identification Sets	☐ 20
Radiological	☐ 15
Riot Control Agents (vomiting, tear)	☐ 5

Chemical and Radiological (select the single largest value): 0

What evidence do you have regarding chemical or radiological?

None found during site visit and document search.

TOTAL HAZARD SEVERITY VALUE (Sum of value A through E (maximum of 61): 0

Apply this value to Table 1 to determine Hazard Severity Category

TABLE 1
HAZARD SEVERITY*

DESCRIPTION	CATEGORY		HAZARD SEVERITY VALUE
CATASTROPHIC	I	☐	21 and/or greater
CRITICAL	II	☐	10 to 20
MARGINAL	III	☐	5 to 9
NEGLIGIBLE	IV	☐	1 to 4
**NONE	V	☑	0

*Apply Hazard Severity Category to Table 3
**If hazard severity value is 0, you do not need to complete Part II of this form. Proceed to Part III and use a RAC score of 5 to determine your appropriate action.

PART II. HAZARD PROBABILITY

The probability that a hazard has been, or will be, created due to the presence and other rated factors of unexploded ordnance or explosive materials on the range/site.

AREA, EXTENT, ACCESSIBILITY OF OE HAZARD (Circle all that apply)

A. Locations of OE hazards	**VALUE**
On the surface	☐ 5
Within tanks, pipes, vessels, or other confined areas	☐ 4
Inside walls, ceilings, or other building/structure	☐ 3
Subsurface	☐ 2

Location (select the single largest value): 0

What evidence do you have regarding the location of OE?

Not Applicable

B. Distance to nearest inhabited location/structure likely to be at risk from OE hazard (road, park, playground, building, etc.)	**VALUE**
Less than 1,250 feet	☐ 5
1,250 feet to 0.5 mile	☐ 4
0.5 mile to 1.0 mile	☐ 3
1.0 mile to 2.0 Miles	☐ 2
Over 2 miles	☐ 1

Distance (select the single largest value): 0

What are the nearest inhabited structures/buildings?

Not Applicable

C. Number(s) of building(s) within a 2-mile radius measured from the OE hazard area, not the installation boundary.

26 and over	☐ 5
16 to 25	☐ 4
11 to 15	☐ 3
6 to 10	☐ 2
1 to 5	☐ 1
0	☐ 0

Number of buildings (select the single largest value): *0*

Narrative:

Not Applicable

D. Types of Buildings (within a 2 mile radius)	**VALUE**
Educational, child care, residential, hospitals hotels, commercial, shopping centers	☐ 5
Industrial, warehouse, etc.	☐ 4
Agricultural, forestry, etc.	☐ 3
Detention, correctional	☐ 2
No buildings	☐ 0

Types of buildings (select the single largest value): *0*

Describe the types of buildings:

Not Applicable

E. Accessibility to site refers to access by humans to ordnance and explosives. Use the following guidance: **VALUE**

No barrier nor security system ☐ 5

Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing. ☐ 4

A barrier (any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site. ☐ 3

Security Guard, but no barrier. ☐ 2

Isolated site. ☐ 1

A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel continuously monitors and controls entry; or, an artificial or natural barrier (e.g., fence combined with a cliff) which completely surrounds the area; and, a means to control entry at all times through the gates or other entrances (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the area). ☐ 0

Accessibility (select the single largest value): *0*

Describe the site accessibility:

Not Applicable

F. Site Dynamics. **VALUE**

This deals with site conditions are subject to change in the future, but may be stable at the present. Examples would be excessive soil erosion on beaches or streams, increasing land development that could reduce distances from the site to inhabited areas or otherwise increase

Expected ☐ 5

None anticipated ☐ 0

Site Dynamics (select the single largest value): *0*

Desc Dynamics:

Not Applicable

TOTAL HAZARD PROBABILITY VALUE (sum of largest values for A through F (maximum of 30): 0

Apply this value to Hazard Probability Table 2 to determine the Hazard Probability Level.

TABLE 2
HAZARD PROBABILITY

DESCRIPTION	LEVEL	HAZARD PROBABILITY
FREQUENT	A ☐	27 or greater
PROBABLE	B ☐	21 to 26
OCCASIONAL	C ☐	15 to 20
REMOTE	D ☐	8 to 14
IMPROBABLE	E ☐	less than 8

*Apply Hazard Probability Level to Table 3.

PART III. RISK ASSESSMENT

The risk assessment value for this site is determined using the following Table. Enter the results of the Hazard Probability and Hazard Severity values.

TABLE 3

PROBABILITY LEVEL	FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
SEVERITY CATEGORY:					
CATASTROPHIC I	☐ 1	☐ 1	☐ 2	☐ 3	☐ 4
CRITICAL II	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
MARGINABLE III	☐ 2	☐ 3	☐ 4	☐ 4	☐ 5
NEGLIGIBLE IV	☐ 3	☐ 4	☐ 4	☐ 5	☐ 5

RISK ASSESSMENT CODE (RAC)

☐ RAC 1 High Risk - Highest priority for further action.

☐ RAC 2 Serious Risk - Priority for further action.

☐ RAC 3 Moderate Risk - Recommend further action.

☐ RAC 4 Low Risk - Recommend further action.

☑ RAC 5 Negligible Risk - Indicates that no DoD action is necessary.

PART IV. NARRATIVE

Summarize the documented evidence that supports this risk assessment. If no documented evidence was available, explain all the assumptions that you made:

A RAC score of 5 is assigned to the former Army Reserves Small Arms Range.

H. DIGITAL FILES

A compact disc is attached to this section of the report[1], which contains the Phase 3 inventory electronic ARID, GIS, and map files. The compact disc also includes the Phase 2 inventory electronic GIS files.

[1] Digital files are not included in the Draft Report.

I. DOCUMENT LOG

Reports

Advanced Sciences, Inc. "Preliminary Assessment Responses for Radford Army Ammunition Plant, Radford, Virginia." November 1990. U.S. Army Toxic and Hazardous Materials Agency.

Department of Sociology and Anthropology, Radford University. "The Radford Arsenal: Impacts and Cultural Change in an Appalachian Region." 2001.

Geo-Marine, Inc. "The World War II Ordnance Department's Government-Owned Contractor-Operated (GOCO) Industrial Facilities: Radford Ordnance Works Historic Investigation." U.S. Army Materiel Command Historic Context Series Report of Investigations Number 6A. February 1996. U.S. Army Corp of Engineers, Fort Worth District.

Radford Army Ammunition Plant, Radford, Virginia. "2002 Installation Action Plan."

Maps

Map 1: EWA Environmental Technologies, Inc. Site Map, Radford Army Ammunition Plant Redmap - FEMMS. Revised January 20, 1999.

Map 2: U.S. Army Environmental Center. Site Map, Main Manufacturing Facility, Radford Army Ammunition Plant, Virginia. October 19, 1999.

Interviews

Jennings, Brad. Environmental Engineer, Radford Army Ammunition Plant, Radford, Virginia. January 21, 2002.

McKenna, James. Installation Restoration Program Manager, Radford Army Ammunition Plant, Radford, Virginia. May 29, 2002.

Tesner, John. Project Manager, U.S. Army Corps of Engineers, Baltimore District, Baltimore, Maryland. May 29, 2002.

J. NOTES

RAAP was not inventoried during Phase 2; however, the Phase 3 data collection team discovered an active small arms range. As a result of increased security, the range is needed for guard training. The small arms range is southwest of the main administration building. The four-station range is approximately 100 feet wide and the hillside creates a natural backstop.

There is also potential for munitions at the Northern and Western Burning Grounds, but no reports were available to confirm this claim.

MALCOLM PIRNIE

MALCOLM PIRNIE, INC.
INDEPENDENT ENVIRONMENTAL ENGINEERS, SCIENTISTS & CONSULTANTS

November 13, 2002

Ms. Ann Wood

U.S. Army Corps of Engineers, Baltimore District
10 South Howard St.
CENAB-EN-HM (Attn: A. Wood RM 10000-F)
Baltimore, MD 21201

Re: Final CTT Range/Site Inventory Report, Radford Army Ammunition Plant, Virginia.
FFID: VA213820730
Army Range Inventory
Contract DACA-31-00-D-0043
Delivery Order No. 7

Dear Ms. Wood:

Malcolm Pirnie is pleased to provide to the Baltimore District this **Final Closed, Transferred, and Transferring (CTT) Range/Site Report, Radford Army Ammunition Plant, Virginia**. In total 4 copies of the Draft Report have been provided.

Comments on the Draft Report submitted by the Army Environmental Center, as well as template changes, have been incorporated into the Final Report.

Please call me at 813-241-1182 if you have any questions or comments.

Very truly yours,

Frank Czajkowski
MALCOLM PIRNIE, INC.
Team Leader

CC: RAAP – Mr. Brad Jennings (1 copy)
AEC – Mr. Samuel Bryant (1 copy)
AEC ROM – Mr. Pete Rissell (1 copy)