RADFORD ARMY AMMUNITION PLANT

Army Cleanup Program

Installation Action Plan Final

June 2024

TABLE OF CONTENTS

STATEMENT OF PURPOSE

The Installation Action Plan (IAP) provides evidence that the Army is firmly committed to expeditious identification and cleanup of environmental contamination, and that the installation has a credible, organized program to carry out that commitment. The IAP provides an outline of the total multi-year environmental cleanup program for each site with ongoing or future planned restoration activity and includes the (1) environmental restoration requirements, (2) the rationale for the selected technical approach, and (3) foundation to develop corresponding financial needs for each cleanup site.

INSTALLATION OVERVIEW

Installation Name: RADFORD ARMY AMMUNITION PLANT

Installation City: RADFORD

Installation County: PULASKI

Installation State: VA

Regulatory Participation - Federal: US Environmental Protection Agency (USEPA), Region III

Regulatory Participation - State: Virginia Department of Environmental Quality (VDEQ)

ACRONYMS

Acronym	Definition
AOPI	Area of Potential Interest
ASD	Alternate Source Demonstration
BDDT	Building Debris Disposal Trench
BLA	Bag Loading Area
CAP	Corrective Action Plan
CC	Compliance-related Cleanup
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CMS	Corrective Measures Study
COC	Contaminant of Concern
CORA	Corrective Action Permit
CRL	Cleanup Restoration & Liabilities
DD	Decision Document
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
ENV	Environmental
EOD	Explosive Ordnance Detachment
ER,A	Environmental Restoration, Army
FS	Feasibility Study
ft	feet
FY	Fiscal Year
HBN	Health-Based Numbers
HHRA	Human Health Risk Assessment
HWMU	Hazardous Waste Management Unit
IAA	Igniter Assembly Area
IAW	In Accordance With
IM	Interim Measure
IR	Installation Restoration
IRA	Interim Remedial Action
IRP	Installation Restoration Program
LTM	Long-Term Management
LUC	Land Use Control
MR	Munitions Response
MMA	Main Manufacturing Area
MNA	Monitored Natural Attenuation
NFA	No Further Action

Acronym	Definition
NBG	Northern Burning Ground
NRU	New River Unit
PBA	Performance Based Acquisition
PCCP	Post-Closure Care Permit
PFAS	Per- and Polyfluoroalkyl Substances
PR	Periodic Review
RA	Remedial Action
RAB	Restoration Advisory Board
RAAP	Radford Army Ammunition Plant
RA(C)	Remedial Action (Construction)
RACR	Remedial Action Completion Report
RA(O)	Remedial Action (Operations)
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RIP	Remedy-in-Place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
RY	Rail Yard
SC	Site Closeout
SI	Site Inspection
SLERA	Screening-level Ecological Risk Assessment
SSA	Site Screening Area
SSP	Site Screening Process
SVOC	Semi-volatile Organic Compound
SWMU	Solid Waste Management Unit
TAPP	Technical Assistance for Public Participation
TCE	Trichloroethylene
TNT	Trinitrotoluene
USACE	US Army Corps of Engineers
USACHPPM	US Army Center for Health Promotion and Preventive Medicine
USAEC	US Army Environmental Command
USEPA	US Environmental Protection Agency
UU/UE	Unlimited Use Unlimited Exposure

Acronym	Definition
VDEQ	Virginia Department of Environmental Quality
VI	Verification Investigation
VOC	Volatile Organic Compound
WBG	Western Burning Ground
WPA	Work Plan Addendum

PHASE TRANSLATION TABLE

CERCLA Phase	RCRA Phase	RCRA UST Phase
Preliminary Assessment (PA)	RCRA Facility Assessment (RFA)	Initial Site Characterization (ISC)
Site Inspection (SI)	Confirmation Sampling (CS)	Investigation (INV)
Remedial Investigation/ Feasibility Study (RI/FS)	RCRA Facility Investigation/Corrective Measures Study (RFI/CMS)	Corrective Action Plan (CAP)
Remedial Design (RD)	Design (DES)	Design (DES)
Interim Remedial Action (IRA)	Interim Measure (IM)	Interim Remedial Action (IRA)
Remedial Action (Construction) (RA(C))	Corrective Measures Implementation (Construction) (CMI(C))	Implementation (Construction) (IMP(C))
Remedial Action (Operations) (RA(O))	Corrective Measures Implementation (Operations) (CMI(O))	Implementation (Operations) (IMP(O))
Long-Term Management (LTM)	Long-Term Management (LTM)	Long-Term Management (LTM)

PROGRAM SUMMARY

Number of Open Sites with Response Complete/Total Open IR Sites: 15/16

Number of Open Sites with Response Complete/Total Open MR Sites: 1/2

Number of Open Sites with Response Complete/Total Open CC Sites: 0/0

SITE-LEVEL INFORMATION

51565.1001_RAAP-001_TNT WASTE ACID NEUTRALIZATION P

Env Site ID: RAAP-001

Cleanup Site: TNT WASTE ACID NEUTRALIZATION P

Alias: SWMU 51

Regulatory Driver: RCRA-C

RIP Date: 9/15/2009

RC Date: 9/15/2009

RC Reason: All Required Cleanup(s) Completed

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	10/15/1984	12/15/1984
CS:	10/15/1984	12/15/1984
RFI/CMS:	7/15/2002	1/15/2008
DES:	9/15/2007	2/15/2008
IRA:	- -	- -
CMI(C):	9/15/2007	9/15/2009
CMI(O):	- -	- -
LTM:	6/15/2011	6/15/2054

Site Narrative: Solid waste management (SWMU) 51 is located on a plateau in the southeastern section of the horseshoe area and consists of one unlined trench, approximately 20 feet (ft) wide by 200 ft long. From 1968 through 1972, an estimated 10 tons of red water ash was reportedly disposed of in the trench. The trench also was used in the 1970s for disposal of trinitrotoluene (TNT) neutralization sludge from the treatment of red water. The pits were backfilled and revegetated. A 1992 Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) by evaluated groundwater and soil samples and a corrective measures study (CMS) was recommended. The soil and groundwater concentrations of contaminants of concern (COC) exceeded health-based numbers (HBN) in the 1989 RCRA corrective action permit (CORA) and could indicate risk under an industrial worker scenario. In fiscal year (FY)04 the soil samples for the site-screening process, a quantitative human health risk assessment (HHRA), and a screening-level ecological risk assessment (SLERA) were collected. Groundwater and soil samples were collected and analyzed for semi-volatile organic compounds (SVOC), volatile organic compounds (VOC) and explosives to support a HHRA. Due to the nature of the karst geology, source removal was recommended. SWMUs 28 and 52 are in the same vicinity. In September 2006, a performance-based acquisition (PBA) was awarded. In 2007 additional samples were collected in accordance with work plan addendum (WPA) 019 that was approved by the stakeholders. In 2008 an RFI/CMS report was prepared and approved by the stakeholders that contained a recommendation for source removal (clean closure) as groundwater was not affected. A follow-on interim measure work plan was prepared and similarly approved to implement this recommendation. The interim measure (IM) effort was completed in 2009. Closeout documentation was submitted in accordance with (IAW) the CORA. On April 1, 2010, the regulators approved the closeout report and its recommendation of no further action (NFA) with land use control (LUC) to prevent excavation below 15 ft. The LUC is documented in the CORA. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still protective. The long-term management (LTM) phase is open to address LUCs and periodic reviews. LTM is anticipated to last indefinitely. The LUCs are to maintain the site in its current industrial/ commercial state as a closed SWMU and to prevent excavation below 15 ft.

LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for unlimited use unlimited exposure (UU/UE), five-year remedy reviews will continue until UU/UE is achieved.

51565.1005_RAAP-005_WASTE PROPELLANT BURNING GROUND

Env Site ID: RAAP-005

Cleanup Site: WASTE PROPELLANT BURNING GROUND

Alias: SWMU 13

Regulatory Driver: RCRA-C

RIP Date: 8/15/2010

RC Date: 8/15/2010

RC Reason: Study Completed, No Cleanup Required

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	10/15/1984	12/15/1984
CS:	10/15/1984	12/15/1984
RFI/CMS:	5/15/2005	8/15/2010
DES:	- -	- -
IRA:	- -	- -
CMI(C):	8/15/2010	8/15/2010
CMI(O):	- -	- -
LTM:	6/15/2011	6/15/2054

Site Narrative: SWMU 13 constitutes about 20 acres in the southeast section of the horseshoe area on the northern bank of the New River within the 100-year floodplain. Since manufacturing operations began at Radford Army Ammunition Plant (RAAP) in 1941, the SWMU has been used to burn waste explosives, propellants, and laboratory wastes (propellant and explosive residues, samples and analytical residues). Until 1985 burning was conducted on the soil. Since then, burning has been performed in pans. A 1992 RFI evaluated groundwater quality and potential soil contamination for explosives, VOCs, SVOCs, and heavy metals. The concentrations of COCs exceeded HBNs in the 1989 CORA. In FY04, a site screening process (SSP) sampling was performed. The SSP effort identified off-site migration associated with activities before 1986. A final SSP report was submitted in May 2007; it contained a recommendation for further investigation that was subsequently approved on June 7, 2007, by the US Environmental Protection Agency (USEPA) and on April 13, 2007, by the Virginia Department of Environmental Quality (VDEQ) on an earlier draft. In FY05, in anticipation of those approvals, an RFI/CMS was procured. Also, in FY05, a permit was issued by the VDEQ governing burning operations at the open burning ground. A groundwater and soil monitoring program are part of the permit. In 2008, WPA 023 was prepared and approved by the stakeholders for sampling the area from the fence to the river (i.e. outside of the active unit). In November 2008, sampling was performed in accordance with WPA 023. In July 2009 the draft RFI report was submitted. The SWMU 13 RFI Report Final July 2010 addressed the area outside of the permitted unit from the fence to the river (about 30 to 50 ft) which is mostly a steep slope and recommended NFA beyond implementing LUCs to prevent digging in this area. On Aug. 26, 2010, USEPA/VDEQ approved the final RFI report. The LUC is documented in the CORA. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still protective. Per the final RFI report, NFA beyond LUCs was approved by the regulatory agencies and was incorporated into the CORA. The LUC is to prevent digging at the site, which is a narrow strip of land between the permitted unit and the river. The LTM phase is open to address the LUC and periodic reviews. LTM is anticipated to last indefinitely. LUCS, yearly inspections and periodic reviews are needed

indefinitely.). Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1009_RAAP-009_LANDFILL NITRO AREA (S40)

Env Site ID: RAAP-009

Cleanup Site: LANDFILL NITRO AREA (S40)

Alias: SWMU 40

Regulatory Driver: RCRA-C

RIP Date: 6/15/2011

RC Date: 6/15/2011

RC Reason: All Required Cleanup(s) Completed

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	10/15/1984	12/15/1984
CS:	10/15/1984	12/15/1984
RFI/CMS:	5/15/2001	9/15/2009
DES:	7/15/2010	6/15/2011
IRA:	- -	- -
CMI(C):	7/15/2010	6/15/2011
CMI(O):	- -	- -
LTM:	6/15/2011	6/15/2054

Site Narrative: In the 1970s and early-1980s, SWMU 40, which is approximately 1.5 acres, was reportedly used as a sanitary landfill to dispose of uncontaminated paper, municipal refuse cement, and rubber tires. Whether hazardous wastes or wastes containing hazardous constituents were ever disposed of in the landfill is not known. Between 1991 and 1992, a fenced enclosure for asbestos storage was constructed over the northeast corner of this SWMU. The unit was strictly an area fill and was covered with soil and grass. A 1992 RCRA verification investigation (VI) attempted to install four monitoring wells which could not be sampled because the four borings were dry. In 1993 and 1994 a dye-trace study was conducted in the adjacent area to identify groundwater flow paths in the south-central section of the Main Manufacturing Area (MMA); however, this site is not believed to affect groundwater. This site and SWMU 71 (RAAP-02) were combined for the RFI. In FY01 a contract to perform an RFI/CMS was procured and in FY03 field investigations were completed. Soil samples were collected to confirm previous investigative results and provide additional data to support a quantitative HHRA and SLERA. A portion (20 cubic yards) of the investigative derived material was determined to be hazardous waste (lead) and was stabilized and disposed of in a permitted treatment storage and disposal facility. In FY04, the RFI was submitted to the VDEQ and the USEPA for review. Stakeholders agreed that additional sampling was needed to address soil and groundwater data gaps, and in FY06 additional sampling was procured. In 2008, a new RFI/CMS report was submitted. Regulatory comments were addressed, and a final RFI/CMS report was submitted in April 2009. It was approved June 30, 2009. In June 2010, a PBA was awarded to implement the CMS recommendation. In December 2010 a work plan was submitted and was approved Aug.26, 2011 by the USEPA and the VDEQ. RAAP subsequently repaired the landfill cap, installed an additional groundwater monitoring well and began LTM in accordance with the work plan. In May 2015, a remedy review report was submitted. It indicated that the remedy is protective and recommended that no further groundwater monitoring is necessary. On July 7, 2015, the USEPA and VDEQ approved this report. the LUCs are documented in the CORA. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still

protective. The LTM phase is open to address LUCs and periodic reviews. LTM is anticipated to last indefinitely. The LUCs are to maintain the site in its current industrial/commercial state as a closed SWMU and to prevent residential use. LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1011_RAAP-011_RED WATER ASH BURIAL GROUND (S4

Env Site ID: RAAP-011

Cleanup Site: RED WATER ASH BURIAL GROUND (S4

Alias: SWMU 41

Regulatory Driver: RCRA-C

RIP Date: 9/15/2011

RC Date: 9/15/2011

RC Reason: All Required Cleanup(s) Completed

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	10/15/1984	12/15/1984
CS:	10/15/1984	12/15/1984
RFI/CMS:	7/15/2002	9/15/2011
DES:	- -	- -
IRA:	- -	- -
CMI(C):	3/15/2011	9/15/2011
CMI(O):	- -	- -
LTM:	9/15/2011	6/15/2054

Site Narrative: SWMU 41 is located in the MMA and consisted of two noncontiguous disposal areas for red water ash. The northern area (41A) consisted of an unlined lagoon approximately 50 ft by 70 ft, which was backfilled. The southern area (41B) consisted of a clay-lined disposal area approximately 100 ft by 150 ft. Prior to construction of the red water treatment plant, red water was concentrated by evaporation and burned in four rotary kilns located in the TNT manufacturing area. From 1967 to 1971 the ash produced from these kilns was disposed of in SWMU 41B. A 1992 RCRA VI included the collection and analysis of groundwater samples near the landfill, ash and soil samples from the lagoon north of the landfill and a surface water sample from Stroubles Creek. Data from the VI indicate explosives and metals in the soil and SVOCs and metals in the groundwater above 1989 RCRA CORA permit HBNs. The soil samples for the SSP, a quantitative HHRA and a SLERA, were collected in FY04. In September 2006 a PBA was awarded. In 2007, additional samples were collected in accordance with WPA 019. In December 2009, a draft RFI report was submitted. In the process of addressing regulatory comments, a well was installed and sampled at 41A in October 2010. Data from the effort supports NFA at 41A. LUC was recommended for 41B to prevent residential use. A revised SWMU 41, RFI Final Document, February 2011, was submitted in February 2011 with the same recommendations and approved March 23, 2011, by the USEPA and the VDEQ. LUCs are documented in the CORA. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still protective. Per the RFI report and 2010 groundwater data, NFA was obtained for SWMU 41A and LUCs were implemented at SWMU 41B and were incorporated into the CORA. The LUCs are to maintain SWMU 41B in its current industrial/commercial state as a closed SMWU and to prevent residential use. The LTM phase is open to address LUCs at SWMU 41B and periodic reviews. LTM is anticipated to last indefinitely. LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1013_RAAP-013_RED WATER ASH BURIAL #2 (S49)

Env Site ID: RAAP-013

Cleanup Site: RED WATER ASH BURIAL #2 (S49)

Alias: SWMU 49

Regulatory Driver: RCRA-C

RIP Date: 5/15/2014

RC Date: 5/15/2014

RC Reason: All Required Cleanup(s) Completed

SC Date: 9/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	10/15/1984	12/15/1984
CS:	10/15/1984	12/15/1984
RFI/CMS:	12/15/1997	5/15/2014
DES:	- -	- -
IRA:	- -	- -
CMI(C):	- -	- -
CMI(O):	- -	- -
LTM:	6/15/2014	9/15/2054

Site Narrative: SWMU 49 is approximately 75 ft by 50 ft and is located in the horseshoe area, contiguous with SWMUs 48, 50, and 59. The four SWMUs were classified together during the 1980s because a distinction could not be made between the areas by visual observation. SWMU 48 was later divided into an upper and a lower disposal area, and SWMU 49 was determined to be part of the SWMU 48 lower disposal unit. SWMU 49 reportedly received 10 tons of red water ash during its active life. A 1992 RCRA VI and a 1996 RFI were conducted to determine the impacts to groundwater quality and soil. A 1999 draft RFI included the verification of previous RFI results. Metals, VOCs, and SVOCs were detected above 1989 RCRA CORA permit HBNs. The RFI sampling was completed in FY02. In September 2006, a PBA was awarded for SWMUs 49, 48, 50, and 59, which are close to each other. In 2007, additional samples were collected in accordance with WPA 019 that was approved by the stakeholders. In February 2009 a draft RFI/CMS report was submitted. Regulatory review comments were addressed via an IM (source removal) at SWMU 48 and subsequent submittal of a revised RFI/CMS report. A SWMU 48 IM work plan was approved by USEPA and the VDEQ on July 20, 2011, with subsequent execution from July 2011 through February 2012. An RFI/CMS report was submitted in June 2012 to USEPA and VDEQ. USEPA and VDEQ comments on the RFI/CMS were sent on Nov. 5, 2012. After various discussions the document was edited to incorporate responses to comments and resubmitted as SWMUs 48 and 49 RFI Report, Draft Document, January 2014 to the regulators on Jan. 14, 2014, which recommended NFA for soil at SWMUs 48 and 49 and monitored natural attenuation (MNA)/LTM for VOCs primarily carbon tetrachloride and trichloroethylene (TCE) in groundwater at SWMU 49. The USEPA and VDEQ approved the RFI on May 30, 2014; however, in August 2014 the USEPA issued a Final Decision and Response To Comments that implements land and groundwater use controls at SWMUs 48 and 49. The LUCs are documented in the CORA. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still protective. The RFI outlines the effort needed to address this site and was incorporated into the CORA. Due to the contiguous nature of SWMUs 49, 48, 50, and 59 local groundwater issues are to be addressed under an MNA/LTM plan for SWMU 49. NFA was obtained for

soil at SWMU 49 and at SWMU 48 was attained through source removal. MNA/LTM is needed for groundwater at and in the vicinity of SWMUs 49 and 48. The LUCs are to restrict groundwater use. LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1014_RAAP-014_PROPELLANT BURNING ASH DISPOSAL

Env Site ID: RAAP-014

Cleanup Site: PROPELLANT BURNING ASH DISPOSAL

Alias: SWMU 54

Regulatory Driver: RCRA-C

RIP Date: 9/15/2011

RC Date: 9/15/2011

RC Reason: All Required Cleanup(s) Completed

SC Date: 9/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	10/15/1984	12/15/1984
CS:	10/15/1984	12/15/1984
RFI/CMS:	1/15/1996	10/15/2008
DES:	7/15/2009	9/15/2011
IRA:	8/15/1998	1/15/2000
CMI(C):	9/15/2010	9/15/2011
CMI(O):	- -	- -
LTM:	9/15/2011	9/15/2054

Site Narrative: SWMU 54 is an inactive disposal area situated on approximately five acres within the easternmost section of the horseshoe area. This SWMU was used during the 1970s to dispose of the propellant burning ground (SWMU 13) ash. A 1992 RCRA, VI a 1996 RFI, and a 1997 supplemental RFI were conducted. Soil and groundwater samples were taken in these efforts. Soil data indicates the presence of metals and VOCs and explosives exceeding the 1989 RCRA CORA permit HBNs. A 1999 interim removal action was performed to remove hot spots associated with lead. A contract to perform an RFI/CMS was procured in FY01. From FY03 through FY06 RFI sampling was conducted. More sampling was needed per the March 29, 2006, to March 30, 2006, meeting of RAAP, US Army Environmental Command (USAEC), US Army Corps of Engineers (USACE), US Army Center for Health Promotion and Preventive Medicine (USACHPPM,) VDEQ and USEPA. In FY06, additional sampling was procured, and the field effort was completed in fall 2007. The SWMU 54 RFI/CMS Report Final, September 2008 was prepared and approved by the USEPA and the VDEQ on Oct. 16, 2008. The report recommended source removal (clean closure) to prevent further leaching to groundwater and allow for continued MNA. In 2010 the source removal effort was physically complete. In 2011 the source closeout report and MNA work plan were submitted. On April 11, 2011, the MNA work plan was approved by the USEPA and the VDEQ. On July 11, 2011, the source closeout report, aka interim measures completion report, was approved by USEPA and the VDEQ. The MNA/LTM and LUC effort continues. The LUCs are documented in the CORA. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still protective. The RFI/CMS report approved by the regulatory agencies contained a recommendation for source removal to prevent further leaching to the groundwater and allow for MNA with LTM and were incorporated into the CORA. The LUCs are to restrict groundwater use. LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1018_RAAP-018_OILY WATER BURIAL AREA (S48)

Env Site ID: RAAP-018

Cleanup Site: OILY WATER BURIAL AREA (S48)

Alias: SWMU 48

Regulatory Driver: RCRA-C

RIP Date: 1/15/2012

RC Date: 1/15/2012

RC Reason: All Required Cleanup(s) Completed

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	9/15/1984	10/15/1984
CS:	10/15/1984	12/15/1984
RFI/CMS:	12/15/1997	3/15/2011
DES:	- -	- -
IRA:	- -	- -
CMI(C):	3/15/2011	1/15/2012
CMI(O):	- -	- -
LTM:	1/15/2012	6/15/2054

Site Narrative: An estimated 20,000 gallons or more of oil contaminated wastewater were disposed of in unlined trenches at this unit prior to the off-plant recycling of used oil. This unit is contiguous to SWMU 49 (red water ash disposal area), SWMU 50 (calcium sulfate disposal area), and SWMU 59 (bottom ash pile). A 1992 RCRA VI and a 1996 RFI were conducted to evaluate potential groundwater contamination. Four monitoring wells were installed and sampled. Soil data from the VI indicated the presence of metals and explosives above 1989 RCRA CORA permit HBNs. Groundwater data from the VI indicated the presence of chlorinated solvents and metals above 1989 RCRA CORA permit HBNs. In 1999, a draft RFI was submitted. Soil data from the RFI indicated the presence of metals above 1989 RCRA CORA permit HBNs. In FY02, the RFI sampling was completed. In September 2006, a PBA was awarded with a remedy-in-place (RIP) of September 2009 at SWMUs 49. 48. 50, and 59 which are in proximity to each other. In 2007, additional samples were collected in accordance with WPA 019. In February 2009 a draft RFI/CMS report was submitted. Regulatory review comments were addressed via an IM (source removal) at SWMU 48 and subsequent submittal of a revised RFI/CMS report. A SWMU 48 IM work plan was approved by USEPA and the VDEQ on July 20, 2011, with subsequent execution from July 2011 through February 2012. RFI/CMS report was submitted in June 2012 to USEPA and VDEQ. Later this effort was combined into the SWMU 48 and 49 RFI report which recommended NFA for the soil at SWMU 48 and MNA/LTM for the groundwater in the vicinity of SWMUs 48 and 49. The USEPA and VDEQ approved the RFI on May 30, 2014. The LUCs are documented in the CORA. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still protective. The RFI outlines the effort needed for this site and was incorporated into the CORA. Due to the contiguous nature of SMWUs 49, 48, 50, and 59, local groundwater issues are to be addressed under an MNA/LTM plan for SWMU 49. Source removal was previously performed at SWMU 48 as these two sites are thought to be the likely source areas. NFA for soil was attained at SWMU 49 and at SWMU 48. MNA/LTM is needed for groundwater at and in the vicinity of SWMUs 49 and 48. The LUCs are to restrict groundwater use. LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances,

pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1023_RAAP-023_SANITARY LANDFILL NO.2 (S43)

Env Site ID: RAAP-023

Cleanup Site: SANITARY LANDFILL NO.2 (S43)

Alias: SWMU 43

Regulatory Driver: RCRA-C

RIP Date: 1/15/2011

RC Date: 1/15/2011

RC Reason: Study Completed, No Cleanup Required

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	9/15/1984	10/15/1984
CS:	10/15/1984	12/15/1984
RFI/CMS:	10/15/2006	1/15/2011
DES:	- -	- -
IRA:	- -	- -
CMI(C):	1/15/2011	1/15/2011
CMI(O):	- -	- -
LTM:	6/15/2011	6/15/2054

Site Narrative: SWMU 43 is a closed, unlined sanitary landfill of approximately two acres, located immediately adjacent to the New River in the northeast section of the RAAP MMA. It operated from 1958 to 1969. The exact boundaries of the unit have not been determined because of the unavailability of a site plan or documents. The site was regraded in accordance with a VI recommendation. A 1992 RCRA VI installed six groundwater monitoring wells. Groundwater and surface water data indicated the presence of metals and VOCs which did not exceed 1989 RCRA CORA permit HBNs. In September 2006, a PBA contract was awarded to produce an RFI/CMS by September 2009. The SWMU 43 RFI Report Final Document January 2011 was submitted and recommended NFA beyond LUCs. The regulators approved this report on Jan. 28, 2011. The LUCs are documented in the CORA. Periodic reviews were completed in March 2014 and August 2018. Per the final RFI report, NFA beyond LUCs was approved by the regulatory agencies and were incorporated into the CORA. The LTM phase is open to address LUCs. LTM is anticipated to last indefinitely. The LUCs are to maintain the site in its current industrial/commercial state as a closed SWMU and to prevent residential use. LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1024_RAAP-024_LANDFILL NO.3 (S45)

Env Site ID: RAAP-024

Cleanup Site: LANDFILL NO.3 (S45)

Alias: SWMU 45

Regulatory Driver: RCRA-C

RIP Date: 3/15/2010

RC Date: 3/15/2010

RC Reason: Study Completed, No Cleanup Required

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	10/15/1984	12/15/1984
CS:	10/15/1984	12/15/1984
RFI/CMS:	3/15/2005	3/15/2010
DES:	- -	- -
IRA:	- -	- -
CMI(C):	3/15/2010	3/15/2010
CMI(O):	- -	- -
LTM:	6/15/2011	6/15/2054

Site Narrative: SWMU 45 is an inactive sanitary landfill of approximately five acres, located in the north-central section of the MMA. It operated between 1957 and 1961. The unit was never operated as a permitted landfill. Paper and municipal refuse were the only materials reportedly disposed of in SWMU 45. Evidence of burning was observed in the area. A 1992 RCRA VI included monitoring well installation, a geophysical survey, and a baseline HHRA. An SSP was procured in FY05. In late FY06, stakeholders agreed to the procurement of a geophysical delineation and groundwater assessment. In 2007 additional samples were collected in accordance with WPA 022. In 2009, a draft SSP which recommended NFA was submitted, and regulatory comments were addressed. The SWMU 45 SSP Report Final January 2010 was submitted which recommended NFA beyond LUCs. LUCs are to maintain the site in its current commercial/industrial state as a closed SWMU and to prevent residential use. This report was approved by the USEPA and VDEQ on March 29, 2010. The LUCs are documented in the CORA. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still protective. The LTM phase is open to address LUCs. LTM is anticipated to last indefinitely. The LUCs are to maintain the site in its current industrial/commercial state as a closed SWMU and to prevent residential use. LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1038_RAAP-039_HAZARDOUS WASTE LANDFILL (HWMU1

Env Site ID: RAAP-039

Cleanup Site: HAZARDOUS WASTE LANDFILL (HWMU1

Alias: HWMU 16

Regulatory Driver: RCRA-C

RIP Date: 10/15/2002

RC Date: 10/15/2002

RC Reason: All Required Cleanup(s) Completed

SC Date: 3/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	10/15/1984	12/15/1984
CS:	10/15/1984	12/15/1984
RFI/CMS:	10/15/2000	10/15/2002
DES:	- -	- -
IRA:	- -	- -
CMI(C):	- -	- -
CMI(O):	- -	- -
LTM:	10/15/2002	3/15/2054

Site Narrative: Hazardous Waste Management Unit (HWMU) 16 covers about two acres and is located in the horseshoe area of the plant between RAAP-007 (SWMU 28, Permit 401) and RAAP-029 (SWMU 52, Permit 401). The site is a landfill, closed in the early-1980s, which was used for lab chemicals and incinerator residue and as a burning ground. Groundwater data indicates the presence of elevated concentrations of explosives and chlorinated solvents. There were indications that the groundwater contamination at HWMU 16 is migrating to the areas of SWMU 28 and 52. In October 2002, a post-closure care permit (PCCP) requiring LTM and LUCs was issued by the VDEQ and then reissued in July 2014 with LTM and LUCs. On May 29, 2007, the RAAP submitted a Class 1 minor modification request for LTM reduction to the VDEQ which was approved on June 14, 2007. The LUCs are documented in the PCCP. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still protective. The LTM phase is open to address LUCs, and groundwater monitoring as required by the PCCP. LTM is anticipated to last indefinitely. The LUCs are to maintain the site in its current industrial/commercial state as a closed HWMU and to prevent residential use. Groundwater monitoring LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1041_RAAP-042_SURFACE IMPOUNDMENT #5 (HWMU #5

Env Site ID: RAAP-042

Cleanup Site: SURFACE IMPOUNDMENT #5 (HWMU #5

Alias: HWMU #5

Regulatory Driver: RCRA-C

RIP Date: 10/15/2002

RC Date: 10/15/2002

RC Reason: All Required Cleanup(s) Completed

SC Date: 3/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	10/15/1984	12/15/1984
CS:	10/15/1984	12/15/1984
RFI/CMS:	10/15/2000	10/15/2002
DES:	- -	- -
IRA:	- -	- -
CMI(C):	- -	- -
CMI(O):	- -	- -
LTM:	10/15/2002	3/15/2054

Site Narrative: HWMU 5 is located in the middle of the MMA. It was a surface impoundment used for acidic wastewaters. Sludge was removed, but contaminated soil below the sludge layer was left in place. The lagoon was filled and capped. The presence of residual waste precludes clean closure. Groundwater monitoring has detected dinitrotoluene and TCE in groundwater. TCE exceeded groundwater protection standards. In FY04 an alternate source demonstration (ASD) report for TCE was resubmitted to VDEQ. In the fall of 2002, an investigative effort was completed for HWMUs 5 and 7. The subsequent Draft Field Investigation Report and Risk Assessment for HWMUs 5 and 7 (2003) was submitted to the VDEQ. This report was to facilitate the elimination of groundwater monitoring. In October 2002, a PCCP, long-term monitoring and LUCs, were issued by the VDEQ and then reissued in July 2014 with LTM and LUCs. In 2007, several documents were submitted to the VDEQ to reduce or eliminate LTM; one of the documents was an ASD for TCE, later formalized in a multisite permit modification request. Soil data did not show TCE within and below HWMU 5, so there was merit in pursuing and ASD. The VDEQ review comments indicated that the ASD could not be approved with the current data because the TCE source was not identified. A new site, RAAP-047, was created to address TCE issues in the vicinity and to prepare and resubmit the HWMU 5 ASD. In February 2008, a PBA was awarded to achieve a HWMU 5 ASD by March 2009. Two sampling events occurred during May and July 2008 IAW WPA 025. Over the summer of 2008 several stakeholder discussions of the preliminary data and assessments occurred. It was concluded that an ASD could not be approved for TCE at HWMU 5; therefore, the process to modify the PCCP for HWMU 5 was begun to incorporate a corrective action plan (CAP). In December 2008 a draft CAP was prepared and put in public notice that proposed MNA/LTM as the cleanup remedy; however, the data and assessments did indicate that NFA was appropriate for RAAP-047. On Nov. 5, 2009, VDEQ approved the HMWU 5 CAP for MNA/LTM. The LUCs are documented in the PCCP. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still protective. The LTM phase is open to address LUCs and groundwater monitoring as required by the CAP and the PCCP. LTM is anticipated to last indefinitely. The LUCs are to maintain the site in its current

industrial/commercial state as a closed HWMU and to prevent residential use. Groundwater monitoring, LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1043_RAAP-044_NEW RIVER UNIT

Env Site ID: RAAP-044

Cleanup Site: NEW RIVER UNIT

Alias: NRU

Regulatory Driver: CERCLA

RIP Date: 9/15/2011

RC Date: 9/15/2011

RC Reason: All Required Cleanup(s) Completed

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
PA:	5/15/1997	8/15/1997
SI:	12/15/1997	6/15/1998
RI/FS:	6/15/1998	9/15/2010
RD:	9/15/2010	9/15/2010
IRA:	- -	- -
RA(C):	9/15/2010	9/15/2011
RA(O):	- -	- -
LTM:	9/15/2011	6/15/2054

Site Narrative: The New River Unit (NRU) is located approximately six miles west of the RAAP MMA and consists of approximately 2,813 acres. Between 1940 and 1945 the NRU was used to load propellants and igniter charges and to manufacture 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 ended after World War II, and the plant was officially designated as part of the RAAP installation. Since 1947, approximately 1,000 acres in the western section of the plant have been sold or transferred for other uses. There was conductive flooring in several buildings. The material was made of barium, copper, asbestos, and lead. It was exposed to the elements and was leaching to surrounding soil. An RI sampling effort included the collection of surface soil, sludge, and water samples. Metals were detected in excess of the 1989 RCRA CORA permit HBNs; however, this site is not subject to any RCRA CORA permit. This site is being addressed under the Comprehensive Environmental Response and Liability Act of 1980 (CERCLA). Six areas within the NRU were investigated-Bag Loading Area (BLA), Igniter Assembly Area (IAA), Northern Burning Ground (NBG), Western Burning Ground (WBG), Rail Yard (RY), and Building Debris Disposal Trench (BDDT). In FY02, the RI fieldwork was completed. In FY04, effort from the work instructions was performed. In an e-mail dated Feb. 16, 2007, the USAEC confirmed that the BLA and IAA are eligible for Environmental Restoration, Army (ER,A) funding. In FY06, the USAEC decided to implement a PBA at the NRU. In February 2008 a PBA was awarded to achieve response complete (RC) by August 2010. In 2008 the Draft WPA 027 was submitted to the VDEQ. The VDEQ is the sole regulatory review agency under CERCLA and provided comments, but formal approval did not occur. In any case, sampling was performed in accordance with WPA 027 during summer 2008. In 2009 an engineering evaluation/cost analysis removal action was completed at the NBG and NFA was achieved. In November 2009, a draft RI/FS document was submitted for the remaining five areas and groundwater. On July 30, 2010, the final RI report was approved. On Oct. 22, 2010, the final feasibility study (FS) report was approved. A public comment period on the proposed plan was held from Sept. 26 through Oct. 26, 2010. A public meeting was held on Oct. 19, 2010. Public comments were

addressed during the preparation of the final decision document (DD). The proposed plan was approved Dec. 13, 2010. In November 2010, a final RA work plan was submitted, and RA started at that time and was completed in May 2011. VDEQ approved the IAA and BLA work plan on Dec. 9, 2011, and the WBG work plan on April 27, 2011. The results of the effort were that NFA was achieved at the WBG and the RY and LUCs are to be implemented at IAA, BLA, and BDDT to maintain them in their current industrial/commercial as closed sites and to prevent residential use. The final DD for RAAP NRU, November 2011, reflects that the above was signed by the USAEC on April 11, 2013. VDEQ concurred July 24, 2013. The LUCs are documented in the Land Use Control Implementation Plan, August 2013. A five-year review was completed in May 2018. The review concluded that remedies are still protective. The LTM phase is open to address LUCs. LTM is anticipated to last indefinitely. The LUCs (IAA, BLA, BDDT) are to maintain the site in its current industrial/commercial state as a closed site and to prevent residential use. LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1049_CC 001_OLEUM PLANT ACIDIC WASTEWATER SUM

Env Site ID: CC 001

Cleanup Site: OLEUM PLANT ACIDIC WASTEWATER SUM

Alias: SSA72

Regulatory Driver: RCRA-C

RIP Date: 1/15/2011

RC Date: 1/15/2011

RC Reason: All Required Cleanup(s) Completed

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	1/15/1986	12/15/1987
CS:	- -	- -
RFI/CMS:	1/15/2009	1/15/2011
DES:	- -	- -
IRA:	- -	- -
CMI(C):	1/15/2011	1/15/2011
CMI(O):	- -	- -
LTM:	6/15/2011	6/15/2054

Site Narrative: Site Screening Area (SSA) 72 was identified during the 1987 USEPA RFA and was subsequently put into the 2000 CORA permit. It is a sump in the Oleum Plant Area that received acidic wastewater. An SSP effort was conducted IAW the CORA. The Final SSP Report for SSAs 18, 72, 30, 79, 60, and 77, December 2010, was submitted that recommended NFA with LUC. The LUC is to maintain the site in its current industrial/commercial state as a closed SWMU and to prevent future residential use. The regulators approved this report on Jan. 28, 2011. The LUCs are documented in the CORA. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still protective. The LTM phase is open to address LUCs. LTM is anticipated to last indefinitely. The LUCs are to maintain the site in its current industrial/commercial state as a closed site and to prevent residential use. LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1050_CC 002_GARBAGE INCINERATOR (BLDG 7219)

Env Site ID: CC 002

Cleanup Site: GARBAGE INCINERATOR (BLDG 7219)

Alias: SSA77

Regulatory Driver: RCRA-C

RIP Date: 1/15/2011

RC Date: 1/15/2011

RC Reason: All Required Cleanup(s) Completed

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	1/15/1986	12/15/1987
CS:	- -	- -
RFI/CMS:	1/15/2009	1/15/2011
DES:	- -	- -
IRA:	- -	- -
CMI(C):	1/15/2011	1/15/2011
CMI(O):	- -	- -
LTM:	6/15/2011	6/15/2054

Site Narrative: SSA77 was identified during the 1987 USEPA RFA and was subsequently put into the 2000 CORA permit. It is an old garbage incinerator that operated from the 1940s until 1974. An SSP effort was conducted IAW the CORA. The Final SSP Report for SSAs 18, 72, 30, 79, 60, and 77, December 2010, was submitted that recommended NFA with LUC. The LUC is to maintain the site in its current industrial/commercial state as a closed SWMU and to prevent future residential use. The regulators approved this report on Jan. 28, 2011. The LUCs are documented in the CORA. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still protective. The LTM phase is open to address the LUCs. LTM is anticipated to last indefinitely. The LUCs are to maintain the site in its current industrial/commercial state as a closed site and to prevent residential use. LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1051_CC-003_ASBESTOS DISPOSAL TRENCHES 1 AND

Env Site ID: CC-003

Cleanup Site: ASBESTOS DISPOSAL TRENCHES 1 AND

Alias: SSA 30 79

Regulatory Driver: RCRA-C

RIP Date: 1/15/2011

RC Date: 1/15/2011

RC Reason: All Required Cleanup(s) Completed

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: IR

NPL Status: No

Hazardous Ranking Score: 0

RRSE:

MRSPP: N/A

Phase	Start	End
RFA:	1/15/1986	12/15/1987
CS:	- -	- -
RFI/CMS:	1/15/2009	1/15/2011
DES:	- -	- -
IRA:	- -	- -
CMI(C):	1/15/2011	1/15/2011
CMI(O):	- -	- -
LTM:	6/15/2011	6/15/2054

Site Narrative: SSAs 30 and 79 were identified during the 1987 USEPA RFA and was subsequently put into the 2000 CORA permit. Asbestos Disposal Trenches 1 and 2 were used for disposal of asbestos containing material. An SSP effort was conducted IAW the CORA. The Final SSP Report for SSAs 18, 72, 30, 79, 60, and 77, December 2010, was submitted that recommended NFA with LUC. The LUCs are to maintain the site in its current industrial/commercial state as a closed SWMU and to prevent future residential use. The regulators approved this report on Jan. 28, 2011. The LUCs are documented in the CORA. Periodic reviews were completed in March 2014 and August 2018. The reviews concluded that the remedy is still protective. The LTM phase is open to address the LUCs. LTM is anticipated to last indefinitely. The LUCS are to maintain the site in its current industrial/commercial state as a closed site and to prevent future residential use. LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1053_RAAP-046_PFAS

Env Site ID: RAAP-046
Cleanup Site: PFAS
Alias: #
Regulatory Driver: CERCLA
RIP Date: 2/2/2029
RC Date: 2/2/2029
RC Reason: Not assigned
SC Date: 2/2/2029
Program: ENV Restoration, Army
Subprogram: IR
NPL Status: No
Hazardous Ranking Score: 0
RRSE:
MRSPP: N/A

Phase	Start	End
PA:	5/21/2018	9/19/2019
SI:	9/19/2019	9/30/2022
RI/FS:	1/3/2022	2/2/2029
RD:	- -	- -
IRA:	- -	- -
RA(C):	- -	- -
RA(O):	- -	- -
LTM:	- -	- -

Site Narrative: Per direction from Deputy Chief of Staff G-9, the site was created to account for all per- and polyfluoroalkyl substances (PFAS) costs at the installation. As part of the PA for PFAS, a site visit was conducted in August 2019. Relevant data and documents were obtained, and areas were visually inspected to generate a list of areas of potential interest (AOPI). Visual surveying activities during the site visit at Radford Army Ammunition Plant were focused on known Teflon coating area, fire station areas, fire training event areas, aqueous film forming foam storage areas, chromium use/plating areas, and x-ray/photography areas. Five AOPIs were identified for sampling during the SI phase and a kick-off for the SI was held on Feb. 4, 2020. The SI is underway and a report will be completed in accordance with Defense Environmental Restoration Program (DERP) M §4.b.(2)(b). No interim and/or final remedial action activities are planned beyond the funded RI until such time the RI report confirms the (1) hazardous substances or pollutants or contaminants that are the responsibility of Department of Defense are present and (2) release of contaminants that pose a significant threat to human health or the environment. RIP and RC milestones are currently assumed as the end of the RI phase until confirmation of presence requiring action is determined.

51565.1045_RFAAP-001-R-01_ARMY RESERVE SMALL ARMS R

Env Site ID: RFAAP-001-R-01

Cleanup Site: ARMY RESERVE SMALL ARMS R

Alias: #

Regulatory Driver: RCRA-C

RIP Date: 1/15/2014

RC Date: 1/15/2014

RC Reason: All Required Cleanup(s) Completed

SC Date: 6/16/2054

Program: ENV Restoration, Army

Subprogram: MR

NPL Status: No

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: 10

Phase	Start	End
RFA:	2/15/2002	5/15/2003
CS:	3/15/2007	5/15/2009
RFI/CMS:	9/15/2009	1/15/2014
DES:	9/30/2009	1/15/2014
IRA:	- -	- -
CMI(C):	9/15/2009	1/15/2014
CMI(O):	- -	- -
LTM:	1/15/2014	6/15/2054

Site Narrative: The closed Army Reserve Small Arms Range occupied approximately 7.6 acres which was used for small arms training from about 1941 to 1967. This closed range is located along the southeastern boundary of RAAP. A berm (approximately 200 ft long by 10 ft 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 most likely contained between 10 and 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. From 1946 to 1967, the local rifle club also may have used the range. The former small arms range is not within the secure limited manufacturing area, but public access is restricted. The range is currently a grass field surrounded by an unlocked fence. It was once used as a baseball field and until the late-1960s it was accessible to the public. In 2009, a PBA was awarded to complete the RFI/CMS and contained options for future effort as needed. In June 2010, a draft work plan for a combined IMs and RFI/CMS was submitted. A final work plan was submitted on April 1, 2011, and was approved by USEPA and the VDEQ on April 11, 2011. The IM effort was completed and consisted of source removal. The RFI/IM report was submitted in February 2012 to USEPA and VDEQ. The report, Army Reserve Small Arms Range RFI/IM Completion Report, Final Document, November 2013 was revised to address their comments and was resubmitted in early December 2013. It was approved by USEPA and VDEQ on Jan. 14, 2014. It recommended LUCs to prevent residential use for the southeast hillside portion of the site. The LUCs are documented in the CORA. A periodic review was completed in August 2018. The review concluded that the remedy is still protective. The final RFI/IM completion report approved by the regulatory agencies recommended LUC for the southeast hillside portion of the site to prevent residential use and was incorporated into the CORA. The LTM phase is open to address LUCs. LTM is anticipated to last indefinitely. LUCs, yearly inspections and periodic reviews are needed indefinitely. Because hazardous substances, pollutants, or contaminants will remain at the site at concentrations exceeding levels that allow for UU/UE, five-year remedy reviews will continue until UU/UE is achieved.

51565.1052_RFAAP-002-R-01_FORMER GUN AND MORTAR RAN

Env Site ID: RFAAP-002-R-01

Cleanup Site: FORMER GUN AND MORTAR RAN

Alias: #

Regulatory Driver: RCRA-C

RIP Date: 9/15/2027

RC Date: 9/15/2027

RC Reason: Not assigned

SC Date: 9/16/2057

Program: ENV Restoration, Army

Subprogram: MR

NPL Status: No

Hazardous Ranking Score: 0

RRSE: N/A

MRSPP: 4

Phase	Start	End
RFA:	5/15/2013	5/15/2013
CS:	9/15/2013	9/15/2018
RFI/CMS:	9/15/2018	9/15/2025
DES:	9/15/2025	9/15/2026
IRA:	- -	- -
CMI(C):	9/15/2026	9/15/2027
CMI(O):	- -	- -
LTM:	10/1/2027	9/15/2057

Site Narrative: The site is made up of two adjacent areas, the Gun Range Area (28 acres) and Trench Mortar Range Area (85 acres) that were apparently operational during WWII. The site is within and perhaps underneath the Nitroglycerin 2 and Automated Multi-Base Area. Only the Nitroglycerin 2 area is active, the Automated Multi-Base Area was built and never went into production and is being scrapped. Currently the procedure when mortar rounds are found through excavation or wash out is to call Explosive Ordnance Detachment (EOD). In April 2012, a 4.2-inch white phosphorus and 60 millimeters high explosive rounds were detonated by the 18th EOD from Fort Bragg. However, information gathered during the historical record review and interview process suggests that the test mortars did not contain high explosives. In addition, information regarding confirmation that the 4.2 inch-round contained white phosphorous was anecdotal and never confirmed. There were sporadic, undocumented finds over the years of inert rounds. An SI was completed in 2018. The SI report recommended further investigation. An RFI/CMS is underway. RFI/CMS and a LUC for safety management are the only future efforts anticipated at this time and LUC would continue indefinitely. Yearly inspections and periodic reviews are anticipated. The LTM phase is open to handle the LUC.

SITE SUMMARY

SITE CLOSEOUT SUMMARY

CRL ID	Site Name	Site Closeout Date
51565.1002	RAAP-002_FLASH BURN PARTS AREA (S71)	9/30/2009
51565.1003	RAAP-003_POND BY CR ACID TREATMENT TANKS	10/15/2007
51565.1004	RAAP-004_INERT LANDFILL NO3 (S74)	9/30/2000
51565.1006	RAAP-006_FORMER DRUM STORAGE AREA 9387-2	12/31/1992
51565.1007	RAAP-007_CLOSED SANITARY LANDFILL (S28)	9/30/2000
51565.1008	RAAP-008_CASO4 TREATMENT/DISPOSAL AREA (	9/30/2000
51565.1010	RAAP-010_CASO4 TRMT/DISP (8,9,35,36,37,3	11/30/2010
51565.1012	RAAP-012_ACID WASTEWATER LAGOON(S6)	9/30/2002
51565.1015	RAAP-015_FLY ASH LANDFILL #1 (S26)	9/30/2000
51565.1016	RAAP-016_WASTEWATER PONDS FROM PROP INCI	9/30/2009
51565.1017	RAAP-017_ ACTIVATED CARBON DISPOSAL AREA	9/30/2000
51565.1019	RAAP-019_INERT LANDFILL NO.1 (S32)	9/30/2000
51565.1020	RAAP-020_FLY ASH LANDFILL #2 (S29)	9/30/2000
51565.1021	RAAP-021_PROPELLANT BURIAL (S46)	10/31/2007
51565.1022	RAAP-022_POND BY BLDGS 4931 & 4928 (S57)	5/31/2011
51565.1025	RAAP-025_CASO4 TREATMENT/DISPOSAL AREA (	9/30/2009
51565.1026	RAAP-026_COAL ASH SETTLING LAGOONS (S31)	9/30/2009
51565.1027	RAAP-027_RUBBLE PILE(S58)	12/31/2004
51565.1028	RAAP-028_BOTTOM ASH PILE(S59)	9/30/2009
51565.1029	RAAP-029_CLOSED SANITARY LANDFILL (S52)	9/30/2000
51565.1030	RAAP-030_AIR CURTAIN DESTRUCTOR & OPEN B	9/30/2000
51565.1031	RAAP-031_AREA A NITROCELLULOSE RAINWTR D	9/30/2009
51565.1032	RAAP-032_MOBILE USED OIL TANKS (S61,75,7	6/30/1987
51565.1033	RAAP-033_CHROMIC ACID TREATMENT TANKS (S	10/31/2007
51565.1034	RAAP-035_SEWAGE LINES	5/31/2002

CRL ID	Site Name	Site Closeout Date
51565.1035	RAAP-036_BIOPLANT BASIN (S10)	12/31/1998
51565.1036	RAAP-037_BATTERY STORAGE AREA (P)	11/30/2010
51565.1037	RAAP-038_UNDERGROUND FUEL OIL SPILL (O)	4/30/2009
51565.1039	RAAP-040_FORMER LEAD FURNACE AREA	9/30/2009
51565.1040	RAAP-041_SURFACE IMPOUNDMENT #4 (HWM	9/30/2008
51565.1042	RAAP-043_SURFACE IMPOUNDMENT #7 (HWMU #7	6/15/2013
51565.1044	RAAP-045_FORMERCADMIUM PLATING FACILTY(B	9/30/2007
51565.1046	RFAAP-046_MMA GROUNDWATER STUDY	3/31/2007
51565.1047	PBC @ Radford_PBC site	12/31/2012
51565.1048	RAAP-047_TCE Plume at BLDGS 1549,1041&10	9/30/2009

COMMUNITY INVOLVEMENT

Community Involvement Plan (Date Last Reviewed):	1/15/2004
Technical Review Committee Establishment Date:	N/A
Restoration Advisory Board (RAB) Establishment Date:	7/15/1998
RAB Adjournment Date:	N/A
RAB Adjournment Reason:	N/A
Reasons for Not Establishing RAB:	N/A
RAB Date of Solicitation from Community:	Ongoing
RAB Results of Solicitation:	Est. Feb 2024
Current Technical Assistance for Public Participation (TAPP):	N/A
TAPP Title:	N/A
Potential TAPP:	N/A
Administrative Record Location:	Christiansburg Library as CDs and online at www.radfordaapirp.org
Information Repository Location:	Christiansburg Library as CDs and online at www.radfordaapirp.org

FIVE-YEAR / PERIODIC REVIEW SUMMARY

Status	Review Type	Start Date	End Date	Plans Narrative	Actions Narrative	Results Narrative
Underway	PR	3/1/2022	2/1/2024	The installation will attempt to increase the effectiveness of the RAB through providing refresher information about the role of the RAB; increase e-mailed information between RAB meetings to update members and stakeholders and utilize multiple forms of communication regarding upcoming meetings.	Completed public survey on how to improve outreach and communication to the public about the IRP program. This was conducted outside required communication and actions outlined in CERCLA and RCRA.	Conduct review of CIP in 3 years to determine if actions taken from community survey and mentioned above in the plans narrative have had an impact. Results will be described in the next update.
Planned	PR	3/1/2027	2/1/2029	N/A	N/A	N/A
Underway	FYR	8/1/2023	2/1/2024	TBD	TBD	TBD
Planned	FYR	8/1/2028	2/1/2029	N/A	N/A	N/A