INSTALLATION ACTION PLAN

For

RADFORD ARMY AMMUNITION PLANT

March 2001

PURPOSE

The purpose of the Installation Action Plan (IAP) is to outline the total multi-year restoration program for an installation. The plan will define Installation Restoration Program (IRP) requirements and propose a comprehensive approach and associated costs to conduct future investigations and remedial actions at each Solid Waste Management Unit (SWMU) at the installation and other areas of concern.

In an effort to coordinate planning information between the IRP manager, major army commands (MACOMs), installations, executing agencies, regulatory agencies, and the public, an IAP has been completed for the Radford Army Ammunition Plant (RFAAP). The IAP is used to track requirements, schedules and tenative budgets for all major Army installation restoration programs.

All site specific funding and schedule information has been prepared according to projected overall Army funding levels and is therefore subject to change during the document's annual review. Under current project funding, all remedies will be in place at the RFAAP by the end of 2014.

CONTRIBUTORS TO THIS YEAR'S IAP

NAME	ORGANIZATION
Steve Cole	Restoration Advisory Board
Rob Davie	Radford Army Ammunition Plant
George Gricius	HQ, Forces Command
Joe King	HQ, Army Environmental Center
Jim McKenna	Radford Army Ammunition Plant
Jerry Redder	Alliant Ammunition and Powder
Pete Rissell	HQ, Army Environmental Center
Tony Spaar	HQ, U.S. Army Operations Support Command
John Tesner	U.S. Army Corps of Engineers, Baltimore District
Rob Thomson	U.S. Environmental Protection Agency, Superfund Division
Katie Watson	IRP Support
Sher Zaman	U.S. Army Corps of Engineers, Baltimore District

APPROVAL

RADFORD ARMY AMMUNITION PLANT

JAMES J. MCKENNA
Remedial Project Manager
Radford Army Ammunition Plant

RODNEY K. ALSTON
LTC, CM Commanding
Radford Army Ammunition Plant

CONCURRENCE

ARMY MATERIEL COMMAND

JEWELL SIMMONS
Environmental Restoration Program Manager
ARMY MATERIEL COMMAND

APPROVAL FY2001

RADFORD ARMY AMMUNITION PLANT

TOM JACKSON

Environmental Counsel, OSC

TONY SPAAR

MSC Environmental Restoration Program Manager, OSC

ACRONYMS & ABBREVIATIONS

µg/dL	micrograms per deciliter
µg/g	micrograms per gram
µg/L	micrograms per liter
135TNB	1,3,5-trinitrobenzene
13DNB	1,3-dinitrobenzene
2,4-D	2,4-dichlorophenoxyacetic acid
246TNT	2,4,6-trinitrotoluene
24DNT	2,4-dinitrotoluene
26DNT	2,6-dinitrotoluene
ACD	Air Curtain Destructor
Acetone	a compound used in propellant manufacture
ACM	asbestos-containing material
ACO	Administrative Contracting Officer
Alliant Ammunition and Powder Company, L.L.C.	Operating Contractor for Radford Army Ammunition Plant
AOP	ammonia oxidation process
argillaceous	containing clay or clay minerals, clayey
AST	aboveground storage tank
bgs	below ground surface
Blacksburg, Virginia	located approximate 10 miles east of Radford, Virginia
BRA	baseline risk assessment
Braddock Loam	one of four major soil types occurring in all the areas of concern of the Main Section of RFAAP, it underlies 14 SWMUs located in the interior region of the Horseshoe Area
breccia	rock consisting of sharp fragments embedded in a fine-grained matrix
BTAG	Biological Technical Assistance Group
CaCO3	calcium carbonate
CAMBL	Continuous Automated Multi-Base Line
CASBL	Continuous Automated Single-Base Line
CaSO4	calcium sulfate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIL	Canadian Industries, Limited
cm/sec	centimeters per second
CMS, CMI	Corrective Measures Study, Investigation
COC	chemical of concern
cryolite	potassium aluminum fluoride
DES	Design
DCA	1,1-dichloroethane
di-n-butyl phthalate	an inert, gelatinizing agent used in propellant manufacture to improve physical and processing characteristics, including decreasing the propellant ignitability
diphenylamine	a principal stabilizer for nitrocellulose
dolomite/dolostone	CaMg(C03)2, a compact limestone / a sedimentary carbonate rock composed of the mineral dolomite, which differs from limestone in not reacting as vigorously to hydrochloric acid

ACRONYMS & ABBREVIATIONS

DSERTS	Defense Site Environmental Restoration Tracking System
dye trace study	a study to identify groundwater flow paths
EE/CA	Engineering Evaluation/Cost Analysis
Elbrook Formation	a geologic formation underlying most of RFAAP, characterized by Cambrian-aged carbonates and clastic rocks
EM	electromagnetic
EP	extraction procedure
ethyl centralite	stabilizer for nitrocellulose
FAL	Fly Ash Landfill
FLFA	Former Lead Furnace Area
FS	Feasibility Study
ft/day	feet per day
ft/ft	feet per foot
ft/yr	feet per year
FY	Fiscal Year
Geoprobe	trade name for a truck-mounted drilling unit designed to advance surface and subsurface soil borings
GOCO	government-owned, contractor-operated
GPR	ground-penetrating radar
GQA	groundwater quality assessment
HBN	health-based number
HCOC	hazardous constituent of concern
HMX	Her Majesty's Explosive, a colorless solid used in various kinds of explosives and rocket fuels; also known as cyclotetramethylenitetranitramine
Horseshoe Area	Part of the Main Manufacturing Area
HWMU	hazardous waste management unit
ICF KE	ICF Kaiser Engineers, a contractor used by RFAAP
IDW	Investigative-Derived Waste
IRA	Interim Remedial Action
IRDMIS	Installation Restoration Data Management Information System
IRP	Installation Restoration Program
ISP	Incinerator Spray Pond
IT	The IT Group, a contractor used by RFAAP
karst	geology consisting of sinkholes, caverns, and caves
LAP	Load, Assemble and Pack
LOEL	lowest-observed-effect-level
LTM	Long-Term Monitoring
Max Meadows Breccia	a geologic rock unit abundant in the southeastern region of the Horseshoe Area
MCA	Military Construction Army
McCrady/Price Formation	a geologic formation underlying the eastern border of RFAAP, characterized by Mississippian-aged shales and mudstones

ACRONYMS & ABBREVIATIONS

methyl centralite	stabilizer for nitrocellulose
mg/kg	milligrams per kilogram
mgd	million gallons per day
MMA	Main Manufacturing Area, one of the two installation areas, which includes the Horseshoe Area
msl	mean sea level
MTBE	methyl tert-butylether, an oygenate compound blended in gasoline as an octane enhancer
NAC	nitric acid concentration
NC	Nitrocellulose
ND	not detected
NE	not evaluated
New River	a river that flows through the MMA of RFAAP and forms the Horseshoe Area
NFA	No Further Action
NG	nitroglycerin
nitrated glycols	an energetic plasticizer used in propellant manufacture
Nitrocellulose Line A-Rainwater Ditch	Area A
nitroglycerin	an energetic plasticizer used in propellant manufacture
N-nitrosodiphenylamine	a principal stabilizer for nitrocellulose
NPDES	National Pollutant Discharge Elimination System
NQLs	nominal quantification limits
NROW	New River Ordnance Works
NRU	New River Unit, one of the two installation areas, which is located about one mile north of Claytor Lake
nt	not tested
Oakite	an acidic rust stripper consisting of phosphoric acid and butyl cellosolve
OB	Open Burn
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PFWWTP	Peppers Ferry Wastewater Treatment Plant
phenanthrene	a polynuclear aromatic compound generally associated with petroleum products
POL	Petroleum, Oil and Lubricants
potassium aluminum fluoride	cryolite
potassium nitrate	an alkali metal salt used as a flash reducer in propellant manufacture
potassium sulfate	an alkali metal salt used as a flash reducer in propellant manufacture
ppb	parts per billion
ppm	parts per million
PQL	Practical Quantitation Limit
psi	pounds per square inch

ACRONYMS & ABBREVIATIONS

QA/QC	quality assurance/quality control
QC	quality control
RA	Remedial Action
RA (C)	Remedial Action-Construction
RA (O)	Remedial Action-Operation
RAB	Restoration Advisory Board
Radford, Virginia	location of RFAAP, approximately 10 miles west of Blacksburg, Virginia, and 47 miles southwest of Roanoke, Virginia
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	Royal Dutch Explosive, a white powder used as an explosive and in combination with other ingredients in explosives; also known as cyclonite
red water	a waste product generated during TNT production that includes alpha-, beta-, and gamma-TNT isomers and TNT sodium disulfates
REM	Removal
RFAAP	Radford Army Ammunition Plant
RFA	RCRA Facility Assessment
RfD	reference dose
RFI	RCRA Facility Investigation
RI	remedial investigation
RIP	Remedy In Place
ROD	Record of Decision
ROW	Radford Ordnance Works
RQD	rock quality density
RRSE	Relative Risk Site Evaluation
SAC	sulfuric acid concentration
saprolite	soft, disintegrated, usually more or less decomposed rock remaining in its original place
SAR	sulfuric acid regeneration
SARA	Superfund Amendments and Reauthorization Act
SCS	Soil Conservation Service
sellite	sodium sulfite
SOP	Standard Operating Procedure
SO3	sulfur trioxide
soda ash	sodium carbonate
SOP	standard operating procedure
SSL	soil screening level
Stroubles Creek	largest local tributary of the New River, it flows through the southeast sector of RFAAP
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TAL	target analyte list
TCE	trichloroethylene

ACRONYMS & ABBREVIATIONS

TCL	target compound list
TCLP	Toxicity Characteristic Leachate Procedure
TETRYL	2,4,6-trinitrophenylmethylnitramine, an intermediary detonating agent for less sensitive high explosives and as a booster charge in certain military munitions, its use was discontinued in the United States in 1979
TIC	tentatively identified compound
TKN	total kjeldahl nitrogen
TNT	trinitrotoluene
TNT Waste Acid Neutralization Pits	SWMU 51
TOC	total organic carbon
TOX	total organic halogen
TPH	total petroleum hydrocarbon
UBK	uptake biokinetic
Underground Fuel Oil Spill	Area O
Unison-Urban Land Complex	one of four major soil types occurring in all the areas of concern of the Main Section of RFAAP, it underlies most of the Manufacturing Area
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency (replaced by USACHPPM)
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency (replaced by USAEC)
USCS	Unified Soil Classification System
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
Valley and Ridge Province	a physiographic division of the Appalachian Mountain chain, the environmental location of the RFAAP Main Section and NRU, which is characterized by a series of long, narrow, flat-topped mountain ridges separated by valleys of varying widths
VDEQ	Virginia Department of Environmental Quality
VDWM	Virginia Department of Waste Management
VHWMR	Virginia Hazardous Waste Management Regulations
VI	Verification Investigation
VOC	volatile organic compound
VPDES	Virginia Pollutant Discharge Elimination System
vug	a small cavity in a rock or vein, often lined with crystals
Wheeling Sandy Loam	one of four major soil types occurring in all the areas of concern of the Main Section of RFAAP, it constitutes about 25 percent of the upland regions of the Horseshoe Area at RFAAP
XRF	X-ray fluorescence spectrometry

SUMMARY

STATUS

RCRA Corrective Action Permit (Sept 2000) - EPA and Virginia
HRS of 43 (Internal Score)

NUMBER OF DSERTS SITES:

44 DSERTS sites
- 30 Active ER.A Eligible Sites
- 14 Response Complete

DIFFERENT DSERTS SITE TYPES:

Burn Areas	
Contaminated Buildings	Above Ground Storage Tank
Landfills	Storage Areas
Surface Impoundment/Lagoons	Spill Site Areas
Underground Storage Tanks	Other

CONTAMINANTS OF CONCERN:

Explosives, Metals, POL, VOCs, SVOCs

MEDIA OF CONCERN:

Groundwater, Soil, Sediment, Surface Water

COMPLETED REM/IRA/RA:

- IRM at RAAP-003,SWMU #69, 1994 ($80,000)
- IRM at RAAP-023,SWMU #43, 1997 ($105,000)
- IRM at RAAP-033,SWMU #68, 1997 ($147,702)
- IRM at RAAP-040, FLFA, 1998 ($98,673)
- IRM at RAAP-045, NRU, 1998 ($395,533)
- IRM at RAAP-014, SWMU #54, 1998 & 1999 ($1,899,900)
- IRM at RAAP-045, NRU, 1999 ($107,400)

CURRENT IRP PHASES:

RC at 14 sites
RFI at 26 sites
LTM at 5 sites

PROJECTED IRP PHASES:

CMS at 11 sites	RD at 13 sites	CMI at 13 sites
CMO at 1 sites	LTM at 11 sites	RC at 16 sites

IDENTIFIED POSSIBLE REM/IRA/RA:

Source removal at 15 sites
Air Sparging at one site.
Capping at 2 sites.

FUNDING:

PRIOR YEAR THROUGH 2000:	$ 15,959.9 K
FY2001:	$ 2,775.8K
FUTURE REQUIREMENTS:	$ 40,637.2 K
TOTAL:	$ 59,372.9 K

DURATION:

YEAR OF IRP INCEPTION:	1990
YEAR OF IRP COMPLETION EXCLUDING LTM:	2014
YEAR OF IRP COMPLETION INCLUDING LTM:	2020

INSTALLATION INFORMATION

LOCALE

RFAAP is located in the western part of Virginia, approximately 40 miles west of Roanoke. RFAAP consists of 4,000 acres in mountainous terrain. The New River flows through the installation. Land usage in the area is primarily agricultural with some residential use.

COMMAND ORGANIZATION

MAJOR COMMAND: U.S. Army Materiel Command; Engineering, Housing, Environmental and Installation Logistics, Environmental Quality Division

SUBCOMMAND: U.S. Army Operations Support Command

INSTALLATION: RFAAP, Restoration Program Manager. RFAAP is a government owned, contractor operated facility. Alliant Techsystems Corporation is the operating contractor.

INSTALLATION RESTORATION PROGRAM (IRP) EXECUTING AGENCY

- Investigation Phase Executing Agency: Radford Army Ammunition Plant and U.S. Army Corps of Engineers (ACE), Baltimore District
- Remedial Design/Action Phase Executing Agency: The U.S. Army Corps of Engineers (ACE), Baltimore Districts as well as some IRAs conducted through Radford Army Ammunition Plant.

REGULATOR PARTICIPATION

FEDERAL: U.S. Environmental Protection Agency (EPA), Region III (RCRA and Office of Superfund)

STATE: Virginia Department of Environmental Quality

REGULATORY STATUS

- Non-NPL (National Priorities List), but future listing is probable. EPA Region III, Office of Superfund has shown strong interest in RFAAP-044, The New River Unit in Dublin, VA.
- Resource Conservation and Recovery Act (RCRA) Permit, September 26, 2000

MAJOR CHANGES TO ACTION PLAN FROM PREVIOUS YEAR (FY 00)

- The Baltimore District is now the executing agency.
- The first IAP Workshop was conducted in September, 2000.

INSTALLATION DESCRIPTION

Radford Army Ammunition Plant (RFAAP) is located in the mountains of southwest Virginia in Pulaski and Montgomery Counties. RFAAP consists of two noncontiguous areas: Main Manufacturing Area (MMA) and New River Unit (NRU). The MMA is located approximately 5 miles northeast of the city of Radford, Virginia which is approximately 10 miles west of Blacksburg and 47 miles southwest of Roanoke. The New River Unit is located about 6 miles west of the Main Area, near the town of Dublin.

RFAAP lies in one of a series of narrow valleys typical of the eastern range of the Appalachian Mountains. Oriented in a northeast-southwest direction, the valley is approximately 25 miles long, 8 miles in width at southeast end and narrowing to 2 miles in the northeast end. RFAAP lies along the New River in the relatively narrow northeastern corner of the valley. The New River divides RFAAP into two areas. The "Horseshoe Area" (which is part of the Main Manufacturing Area) exists within a meander of the New River.

RFAAP's primary mission, the manufacturing of propellants, began in 1941 and continues today. Since 1968, RFAAP has also produced TNT on an intermittent basis. RFAAP's TNT facilities have been in stand-by status since the mid 1980s. The working population at RFAAP varies greatly with mission requirements. There are currently about 1,500 employees at RFAAP.

DSERTS / SWMU CHART

DSERTS to SWMU CONVERSION

RFAAP-001	(SWMU 51)
RFAAP-002	(SWMU 71)
RFAAP-003	(SWMU 69)
RFAAP-004	(SWMU 74)
RFAAP-005	(SWMU 13)
RFAAP-006	(Area F)
RFAAP-007	(SWMU 28)
RFAAP-008	(SWMU 27)
RFAAP-009	(SWMU 40)
RFAAP-010	(SWMU 8, 9, 35, 36, 38, Area A)
RFAAP-011	(SWMU 41)
RFAAP-012	(SWMU 6)
RFAAP-013	(SWMU 49)
RFAAP-014	(SWMU 54)
RFAAP-015	(SWMU 26)
RFAAP-016	(SWMU 39)
RFAAP-017	(SWMU 53)
RFAAP-018	(SWMU 48)
RFAAP-019	(SWMU 32)
RFAAP-020	(SWMU 29)
RFAAP-021	(SWMU 46)
RFAAP-022	(SWMU 57)
RFAAP-023	(SWMU 43)
RFAAP-024	(SWMU 45)
RFAAP-025	(SWMU 50)
RFAAP-026	(SWMU 31)
RFAAP-027	(SWMU 58)
RFAAP-028	(SWMU 59)
RFAAP-029	(SWMU 52)
RFAAP-030	(SWMU 17)
RFAAP-031	(Area Q)
RFAAP-032	(SWMUs 61,75,76)
RFAAP-033	(SWMU 68)
RFAAP-035	(SEWERLINES)
RFAAP-036	(SWMU 10)
RFAAP-037	(Area P)
RFAAP-038	(Area O)
RFAAP-039	(HWMU 16)
RFAAP-040	(FLFA)
RFAAP-041	(HWMU 4)
RFAAP-042	(HWMU 5)
RFAAP-043	(HWMU 7)
RFAAP-044	(N.R.U.)
RFAAP-045	(BLDG 4343)

SWMU / DSERTS CHART

SWMU to DSERTS CONVERSION

SWMU 6	(RFAAP-012)
SWMUs 8, 9, 35, 36, 38, Area A	(RFAAP-010)
SWMU 10	(RFAAP-036)
SWMU 13	(RFAAP-005)
SWMU 17	(RFAAP-030)
SWMU 26	(RFAAP-015)
SWMU 27	(RFAAP-008)
SWMU 28	(RFAAP-007)
SWMU 29	(RFAAP-020)
SWMU 31	(RFAAP-026)
SWMU 32	(RFAAP-019)
SWMU 39	(RFAAP-016)
SWMU 40	(RFAAP-009)
SWMU 41	(RFAAP-011)
SWMU 43	(RFAAP-023)
SWMU 45	(RFAAP-024)
SWMU 46	(RFAAP-021)
SWMU 48	(RFAAP-018)
SWMU 49	(RFAAP-013)
SWMU 50	(RFAAP-025)
SWMU 51	(RFAAP-001)
SWMU 52	(RFAAP-029)
SWMU 53	(RFAAP-017)
SWMU 54	(RFAAP-014)
SWMU 57	(RFAAP-022)
SWMU 58	(RFAAP-027)
SWMU 59	(RFAAP-028)
SWMUs 61,75,76	(RFAAP-032)
SWMU 68	(RFAAP-033)
SWMU 69	(RFAAP-003)
SWMU 71	(RFAAP-002)
SWMU 74	(RFAAP-004)
Area F	(RFAAP-006)
Area O	(RFAAP-038)
Area P	(RFAAP-037)
Area Q	(RFAAP-031)
HWMU 4	(RFAAP-041)
HWMU 5	(RFAAP-042)
HWMU 7	(RFAAP-043)
HWMU 16	(RFAAP-039)
BLDG 4343	(RFAAP-045)
FLFA	(RFAAP-040)
N.R.U.	(RFAAP-044)
SEWERLINES	(RFAAP-035)

CONTAMINATION ASSESSMENT

In a RCRA Facility Assessment completed by EPA in 1987, 98 Solid Waste Management Units (SWMUs) were identified. The initial requirements for the corrective action process were specified in a RCRA permit issued by EPA in 1989. A new permit which governs corrective action was issued in Fall, 2000. The first phase of investigations at the SWMUs was completed in October 1992. Various investigations and actions have since been completed and submitted to the EPA and the Commonwealth of Virginia. EPA and the Commonwealth of Virginia are currently reviewing results of these investigations. In some cases SWMUs are grouped together based on similar histories or proximity.

The primary contaminants of concern at RFAAP include metals and explosives. Groundwater within the RFAAP boundaries has been impacted. Groundwater is believed to eventually discharge to the New River. Off-post groundwater has not been impacted. Efforts are underway to delineate impacts to groundwater. These efforts are complicated due to the presence of karst geology (highly fractured and channelized limestone).

PREVIOUS STUDIES

The following documents were submitted to the EPA in accordance with the 1989 RCRA permit:

1. Verification Investigation Report, Dames and Moore, October 29, 1992 Draft Final.

2. The following sections of the 1992 VI were revised by: Draft Section 7.0 SWMUs 10 and 35, Dames and Moore, September 8, 1994; Draft Section 9.0 SWMUs 27,29 and 53, Dames and Moore, August 19, 1994; Draft Section 11.0 SWMU 39,Dames and Moore August 31, 1994; Draft Section 24.0 SWMU 71, Dames and Moore, August 19, 1994.

3. RCRA Facility Investigation Report, Dames and Moore, October 29, 1992, Draft Final.

4. Draft Section 8.0, SMWU O, Dames and Moore, September 16, 1994 of the 1992 RFI report.

5. SWMU 69 Closure Report, Dames & Moore, Draft. August 1994.

6. RCRA Facility Investigation for Solid Waste Management Units 17, 31,48, 54, Parsons Engineering and Science, Inc., Draft. January 1996.

7. New River and Tributaries Study, Radford Army Ammunition Plant, Parsons Engineering Science, Inc. December 1997.

8. Site Management Plan, ICF Kaiser Engineers, Inc., May 1997 and May 1998.

9. RFAAP Master Workplan, Draft Final, April 1998.

10. SWMU 68 Closure Report, Draft Final. April, 1998.

11. Ecological Risk Assessment Approach, Main Manufacturing Area and New River Unit, October 1998.

12. Closure Documentation for Solid Waste Management Unit 10, Biological Treatment Plant Equalization Basin, Radford Army Ammunition Plant, Radford, VA, Final. December 8, 1998.

13. Closure Report for the Eastern Lagoon of SWMU 8. Final December 1998.

14. Supplemental RFI for SWMU 54, Draft, December 1998.

15. RCRA Facility Investigation Report for SWMUs 31, 39,48,49,& 58, Draft, ICF Kaiser, January 1999.

PREVIOUS STUDIES

16. Workplan Addenda for SMWU 54 Interim Stablilization Measure, ATK, Draft Final January 1999.

17. Workplan Addendum 8: RI/FS for the Northern and Western Burning Grounds (at the NRU) and RFI for Building 4343, ICF Kaiser, June 1999.

18. Draft Screening Ecological Risk Assessment Report , The IT Group, September 1999.

19. Workplan Addendum 009: RFI Activities at Solid Waste Management Units 31, 48, and 49 and Horseshoe Area Groundwater Study, The IT Group, November 1999.

20. Workplan Addendum 010: Background Study, August 2000.

ER, A DSERTS SITES

RFAAP-001 SWMU NO. 51
TNT WASTE ACID NEUTRALIZATION PITS

SITE DESCRIPTION

SWMU 51 is located on a plateau in the southeastern section of the Horseshoe Area and consists of one unlined trench, approximately 20 feet wide by 200 feet long. An estimated 10 tons of red water ash was reportedly disposed of in the trench from 1968- 1972. Additionally, the trench was used for disposal of TNT neutralization sludge from the treatment of red water in the 1970's. The pits were backfilled and revegetated.

A RCRA Facility Investigation (Dames & Moore 1992) evaluated groundwater and soil samples and a CMS was recommended. The concentrations of COCs exceeded health based numbers (HBNs) and could indicate risk under an industrial worker scenario.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
metals,explosives, VOCs, and SVOC
MEDIA OF CONCERN:
Soil and Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI, LTM

PROPOSED PLAN

Collect groundwater and soil samples for the site screening process and for a quantitative human health risk assessment, as applicable. Due to the nature of the karst geology, source removal is recommended.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS		539					
IRA							
RD				41			
RA(C)					1143		
RA(O)							
LTM					78.6	25.6	513

PROJECTED TOTAL: $1,883,500

RFAAP-002 SWMU NO. 71
FLASH BURN PARTS AREA

SITE DESCRIPTION

SWMU 71 consists of an open, hard-packed gravel area approximately 25 feet wide by 50 feet long. The SWMU was used between 1962 to 1982 to flash-burn metal process pipes contaminated with propellant. The pipes were then reused or sold for scrap.

A RCRA Verification Investigation (VI) (Dames & Moore 1992) detected metals and total petroleum hydrocarbons (TPH) from soil samples which led to a Supplementary VI (Dames & Moore 1994). A dye-trace study (Engineering-Science 1993) indicated a conduit to the New River.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
metals and total petroleum hydrocarbons
MEDIA OF CONCERN:
Groundwater, Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

PROPOSED PLAN

Soil samples will be collected to confirm previous investigative results and provide additional data to support a quantitative human health risk assessment. No further action is anticipated.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS						224.5	
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $224,500

RFAAP-003 SWMU NO. 69
POND BY CHROMIC ACID TREATMENT TANKS

SITE DESCRIPTION

SWMU 69 was an unlined settling pond that received SWMU 68 neutralized wastewater from rocket encasement cleaning activities. Before 1974, runoff consisted of neutralized chromic acid (pH=8.6), which had been treated with sulfuric acid, sodium metabisulfate, and calcium lime. After 1974 up to the time operations ceased,"Oakite 33," an acidic rust stripper consisting of phosphoric acid and butyl cellosolve mixture, was used to clean rocket encasements. Oakite 33 was adjusted to a pH of 5.0 with soda ash before discharge to SWMU 69.

A Verification Investigation (VI) (Dames & Moore 1992) performed a qualitative human health risk assessment. The VI recommended interim corrective measures to remove all accumulated pond water, pond sediments, and adversely impacted surficial soil. Impacted soils and sediments were removed as indicated by confirmatory samples (Dames & Moore 1994).

PROPOSED PLAN

No further action is recommended for this SWMU.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
Metals, VOC's
MEDIA OF CONCERN:
Groundwater, Soil, and Sediment
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

RFAAP-004 SWMU NO. 74
INERT LANDFILL NO 3

SITE DESCRIPTION

SWMU 74 is a four acre, unlined landfill located in the central portion of the Horseshoe Area. In May 1984, the Virginia Department of Health issued Permit No. 433 for "Inert Landfill No. 3". The SWMU was permitted to receive construction and demolition waste, wood, tree trimmings, stumps, and inert waste materials. The landfill is currently about half filled, and the estimated remaining life of the landfill is two to three years.

A RCRA Verification Identification (Dames & Moore 1992) installed of one well downgradient of the landfill to a depth of 50.4 feet and was sampled for metals, VOCs, SVOCs, TOC, TOX, metals, and pH. The results from the chemical analysis of 74MW1 do not indicate the presence of contamination downgradient of Inert Landfill No. 3. Groundwater is monitored in accordance with the permit.

PROPOSED PLAN

This site is not eligible for ER,A funding, therefore no further action under the IRP. The operation and closure of SWMU 74 are addressed under state permit No. 433.

IRP STATUS

RRSE RATING: Low Risk (3A)
CONTAMINANTS OF CONCERN:
Metals, VOC's, SVOC's
MEDIA OF CONCERN:
Groundwater, Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

RFAAP-005 SWMU NO. 13
WASTE PROPELLANT BURNING GROUND

SITE DESCRIPTION

SWMU 13, approximately 20 acres in size, is located in the southeast section of the Horseshoe Area on the northern bank of the New River within the 100-year floodplain. The SWMU has been used for the burning of waste explosives, propellants, and laboratory wastes (propellant and explosive residues, samples, and analytical residues) since manufacturing operations began at RFAAP in 1941. Until 1985 burning was conducted on the soil. From that time burning is performed in pans.

A RCRA Facility Investigation (Dames & Moore 1992) evaluated groundwater quality and potential soil contamination for explosives, VOCs, SVOCs, and heavy metals.

The concentrations of these COCs exceeded health based numbers (HBNs) and could indicate risk under an industrial worker scenario.

PROPOSED PLAN

The RFI will be completed. Groundwater monitoring will continue to ensure that the COCs are not migrating beyond the burning ground boundaries. Soil contamination will be addressed as part of the Closure Plan when closure occurs. The proposed remedy is a RCRA quality cap.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
Metals, VOC's, SVOC's, explosives
MEDIA OF CONCERN:
Groundwater, Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI, LTM

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS						676.3	
IRA							
RD						172.8	
RA(C)							5231.9
RA(O)							
LTM							1207.1

PROJECTED TOTAL: $7,288,100

RFAAP-006 AREA F
FORMER DRUM STORAGE AREA

SITE DESCRIPTION

Area F is a gravel lot located in the Main Manufacturing Area southeast of Warehouse No. 2 (9387-2) approximately 50 feet long by 50 feet wide. The area was used to stage empty drums that were used throughout RFAAP before being sold. Storage of drums on this lot was discontinued in 1991 when a second lot was constructed 150 feet to the east, west of Building 4934-1.

A RCRA Verification Investigation (Dames & Moore 1992) evaluated four surface soil samples that were collected beneath stained gravel from both the former drum storage area and the new storage lot and analyzed for VOCs and SVOCs. Analytical results demonstrated that there had been no releases to surface soils as a result of spillage of drum residues.

PROPOSED PLAN

No further action is necessary in this area.

IRP STATUS

RRSE RATING: Medium Risk (2A)
CONTAMINANTS OF CONCERN:
VOCs, SVOCs
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

RFAAP-007 SWMU NO.28
CLOSED SANITARY LANDFILL

SITE DESCRIPTION

SWMU 28 is a landfill located in the southeast section of the Horseshoe Area. It replaced the sanitary landfill immediately to the south (SWMU 52), that was closed in 1984. SWMU 28 is contiguous with the Closed Hazardous Waste Landfill (HWMU 16) and is also approximately 200 feet northeast of the TNT Neutralization Sludge Disposal Area (SWMU 51). SWMUs 28, 16, and 52 encompass an area of approximately 15 acres. In April 1983 Virginia Department of Health issued Permit 401 for SWMUs 28 and 52. It was permitted as a sanitary landfill to receive municipal solid, agricultural, debris, inert, and asbestos wastes. The asbestos waste was placed in a designated area, now identified as SWMU 30.

SWMU 28 was capped in 1992 in accordance with VDEQ. Landfill plans for SWMU 28 included five trenches to be excavated, filled, and covered with clean soil to prevent erosion of cover. A RCRA Facility Investigation (Dames & Moore 1992) was performed that included the installation and sampling of four monitoring wells. Chemicals of concern are metals, explosives, VOCs and SVOCs. Groundwater is monitored in accordance with the requirements for HWMU-16.

PROPOSED PLAN

Any potential necessary action will be addressed under RFAAP-039.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

RFAAP-008 SWMU 27
CA SO4 TREATMENT/DISPOSAL AREA

SITE DESCRIPTION

SWMU 27, the Calcium Sulfate Landfill, is a closed, unlined earthen landfill located in the southeastern section of the Horseshoe Area and is covered under Permit 353. It is located within the boundary of Fly Ash Landfill (FAL) No. 2 (Permit 353, SWMU 29) and is also contiguous with SWMU 53. The landfill was used for disposal of calcium sulfate sludge generated from the neutralization of sulfuric acid at the A-B Line and C-Line acidic wastewater treatment plants between 1981 and 1982. The landfill has been described as triangular-shaped and approximately 150 feet long. Since disposal operations ceased, this unit has been completely covered by FAL No. 2.

In 1980, a land disposal study was conducted, and it was determined that the site was geologically suitable for ash landfill operations. A RCRA Verification Investigation (VI) (Dames & Moore 1992) was performed that included the collection and analysis of one surface water sample and three sediment samples. Supplemental VI activities (Dames & Moore 1994) included the collection and analysis of groundwater samples.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
explosives
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

PROPOSED PLAN

This site is not eligible for ER,A funding, therefore no further action under the IRP.

RFAAP-009 SWMU NO. 40
LANDFILL NITRO AREA

SITE DESCRIPTION

SWMU 40 was reportedly used as a sanitary landfill in the 1970s and early 1980s for the disposal of uncontaminated paper, municipal refuse, cement, and rubber tires. It is not known whether hazardous wastes or wastes containing hazardous constituents were ever disposed of in the landfill. 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 the unit was closed with a soil cap and grass cover. The landfill is approximately 1 acre in size.

A RCRA Verification Investigation (Dames & Moore 1992) attempted to install four monitoring wells, which could not be sampled as the four borings were dry. A dye-trace study was conducted in the adjacent area (Engineering-Science 1993 and 1994) to identify groundwater flow paths in the south-central section of the Main Manufacturing Area. A RCRA Facility Investigation Study (Parsons Engineering-Science 1996) included the collection and analysis of one groundwater sample. The groundwater sample collection location is not known.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil, Groundwater, Surface Water
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

PROPOSED PLAN

Soil and groundwater sampling will be conducted.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS	265						
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $265,000

RFAAP-010 SWMU NO. 8
CASO4 TREATMENT/DISPOSAL AREA

SITE DESCRIPTION

SWMU 8 consists of two unlined, below-grade earthen lagoons located in the northeast section of the Main Manufacturing Area along the south bank of the New River. The lagoons were designed to neutralize acidic wastewater from the NC A-B Line Acidic Wastewater Treatment Plant with hydrated lime. The supernatant is discharged to the New River via Outfall 007. Sludge was dredged from the lagoons and was placed in the adjacent drying beds. Between 1982 and 1991, the dried sludge removed from the beds was disposed of in Fly Ash Landfill No. 2 (SWMU 29). In December 1998 the Eastern Lagoon was closed and replaced with a concrete tank. Operations ceased at the Western Lagoon in November 1999.

The Verification Investigation (Dames & Moore, 1992) collected one sludge sample from each of the two lagoons to determine whether concentrations exceeded HBNs specified in the permit for VOCs, SVOCs, and TCLP metals. The results of these samples indicated that all constituents were reported less than regulatory levels specified in 40 CFR 261.24.

PROPOSED PLAN

This site is not eligible for ER,A funding. No further action under IRP.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
metals
MEDIA OF CONCERN:
Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

CaSO4 DRYING BED SWMU 8

RFAAP-010 SWMU NO. 9
CaSO4 TREATMENT LAGOONS

SITE DESCRIPTION

SWMU 9 consists of two unlined, below-grade earthen lagoons located in the northwest section of the Main Manufacturing Area. The lagoons were designed to neutralize acidic wastewater from the NC C-Line Acidic Wastewater Treatment Plant with hydrated lime. The supernatant is discharged to the New River via Outfall 005. SWMU 9 ceased operations as a sludge settling lagoon in 1993. Sludge was dredged from the lagoons and was placed in the adjacent drying beds. Between 1982 and 1991, the dried sludge removed from the beds was disposed of in Fly Ash Landfill No. 2 (SWMU 29).

In 1987, a RCRA Facility Assessment was conducted by the USEPA that included a preliminary data review, evaluation, and visual site inspection. A Verification Investigation (1992 Dames & Moore) collected one sludge sample from each lagoon to determine whether concentrations exceeded HBNs specified in the permit for VOCs, SVOCs, and TCLP metals. The results of these samples indicated that all constituents were reported less than regulatory levels specified in 40 CFR 261.24.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

SWMU 9, CaSO4 DRYING BED

PROPOSED PLAN

This site is not eligible for ER,A funding. No further action under IRP.

RFAAP-010 SWMU NO. 35
CASO4 DRYING BED

SITE DESCRIPTION

SWMU 35 is an unlined Calcium Sulfate Drying Bed 160 feet by 80 feet with approximately 8 feet of sediment remaining in the basin. The SWMU is located along the New River in the northeast section of the Main Manufacturing Area immediately east of SWMU 10 and west of and adjacent to SWMU 8. Calcium sulfate sludge was dredged from SWMU 8 prior to 1980 and pumped into SWMU 35. RFAAP reported that sediment from SWMU 10 was also deposited in SWMU 35 during the early 1980s.

A RCRA Verification Investigation (VI) (Dames & Moore 1992) and a Supplemental VI (Dames & Moore 1994) were performed that included groundwater sampling. Explosives and metals in soil, groundwater, surface water and sediment exceeded HBNs.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
explosives, metals
MEDIA OF CONCERN:
Soil, Groundwater, Sediment, Surface Water
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI

SWMU 35, CaSO4 DRYING BED

PROPOSED PLAN

Collect samples from available media to support an Engineering Evaluation/Cost Analysis (EE/CA).

Approximately 1500 cy of soil will be removed, transported and disposed as hazardous waste.

The funding reflected on this site page includes activities for the following SWMUs: 35, 37, 38, and Area A.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS		396					
IRA							
RD				272			
RA(C)					1431.2		
RA(O)							
LTM							

PROJECTED TOTAL: $1,854,400

RFAAP-010 SWMU NO. 36
CASO4 DRYING BED

SITE DESCRIPTION

SWMU 36 consists of three separate unlined drying beds located in the northeast section of the Main Manufacturing Area adjacent to SWMU 8. The north bed, located closest to the New River, is approximately 200 feet long, 50 feet wide, and 10 feet deep, and appears to be the original drying bed. The adjacent south bed appears to be the next oldest and is also approximately 200 feet long, 50 feet wide, and 10 feet deep. The east bed is approximately 60 feet wide by 200 feet long. The depth of this bed is unknown. Sludge was last deposited in 1999.

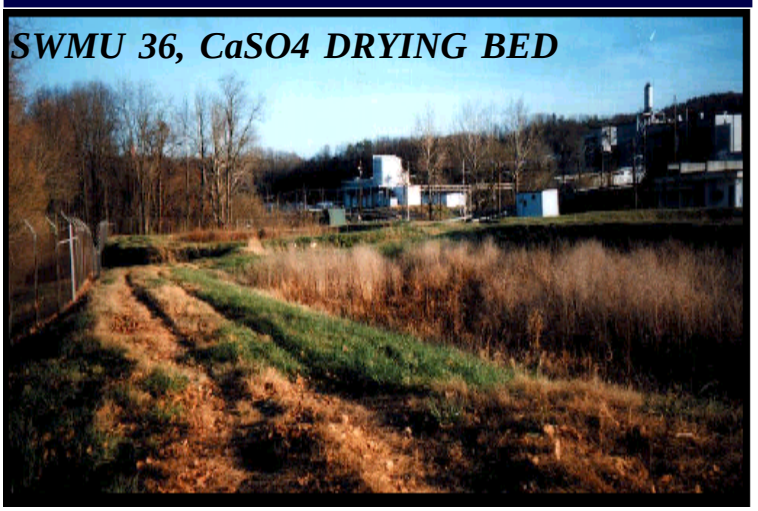
The RCRA Verification Investigation (VI) (Dames & Moore 1992) included the collection of one composite sludge sample from each SWMU 36 drying bed to determine whether concentrations exceeded permit levels for VOCs, SVOCs, and TCLP metals. Although VOCs and SVOCs were detected, reported results were below permit levels.

PROPOSED PLAN

This site is not eligible for ER,A funding. No further action under IRP.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC



RFAAP-010 SWMU NO. 37
CASO4 DRYING BED

SITE DESCRIPTION

SWMU 37 is an unlined drying bed approximately 100 feet long, 80 feet wide, and 8 feet deep located in the northwest section of the Main Manufacturing Area. The SWMU is immediately southwest of and adjacent to SWMU 9 and received calcium sulfate sludge. Beds have been inactive since the 1980s.

A RCRA Verification Investigation (VI) (Dames & Moore 1992) included the collection of one composite sludge sample to determine whether concentrations exceeded permit levels for VOCs, SVOCs, and TCLP metals. Although VOCs and SVOCs were detected, reported results were below permit levels.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
metals, explosives
MEDIA OF CONCERN:
Soil, Groundwater, Surface Water
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI

SWMU 37, CaSO4 DRYING BED

PROPOSED PLAN

Collect samples from available media to support an EE/CA.

Funding associated with this site is reflected on the site page for SWMU-35.

RFAAP-010 SWMU NO. 38
$CaSO_4$ DRYING BED

SITE DESCRIPTION

SWMU 38 is an unlined drying bed approximately 225 feet long, 40 feet wide, and 8 feet deep located in the northwest section of the Main Manufacturing Area. The drying bed received calcium sulfate sludge and, when it reached capacity, the overflow was pumped to Area Q via pipes that ran through a depression in the berm surrounding the drying bed. Beds have been inactive since the 1980s.

A RCRA Verification Investigation (VI) (Dames & Moore 1992) included the collection of one composite sludge sample to determine whether concentrations exceeded permit specifications for VOCs, SVOCs, and TCLP metals. The limited data indicates no exceedances of 1989 HBNs.

PROPOSED PLAN

Collect samples from available media to support a site evaluation.

Funding associated with this site is reflected on the site page for SWMU-35.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
Explosives, metals
MEDIA OF CONCERN:
Soil, Groundwater, Surface Water
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI

SWMU 38, CaSO4 DRYING BED

RFAAP-010 SWMU NO. AREA A NITROCELLULOSE RAINWATER DITCH

SITE DESCRIPTION

Area A is located in the eastern portion of the Main Manufacturing Area, near Building 1558 in the Nitrocellulose Line-A production area. It was identified during the April 1987 Visual Site Inspection as a 1-foot-deep soil depression that received runoff from the A-Line (Visual Inspection Field Notes 1987). The area was void of vegetation and exhibited discolored soil. The nature and extent of contamination associated with Area A is not known.

PROPOSED PLAN

A historical background study will be conducted. No further action is anticipated.

Funding associated with this site is reflected on the site page for SWMU-35.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
metals
MEDIA OF CONCERN:
Sediment
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

RFAAP-011 SWMU NO. 41
RED WATER ASH BURIAL GROUND

SITE DESCRIPTION

SWMU 41 is located in the Main Manufacturing Area and consists of two non-contiguous disposal areas for red water ash. The northern area consisted of an an unlined lagoon approximately 50 feet by 70 feet, which was backfilled. The southern area consisted of a clay-lined disposal area approximately 100 feet by 150 feet. Prior to the 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. The ash produced from these kilns was disposed of in SWMU 41 from 1967 to 1971.

A RCRA Verification Investigation (Dames & Moore 1992) 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 soil and SVOCs and metals in groundwater above HBNs.

PROPOSED PLAN

An RFI will be performed.

A one-acre cap/cover will be constructed.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
Metals, Explosives, SVOC's
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI, LTM

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS		504.9					
IRA							
RD				66.4			
RA(C)						664.2	
RA(O)							
LTM						42.9	756.1

PROJECTED TOTAL: $2,034,500

RFAAP-012 SWMU NO. 6
ACID WASTEWATER LAGOON

SITE DESCRIPTION

The Acidic Wastewater Lagoon (SWMU 6) was an unlined surface impoundment "tear-dropped" or "triangular" in shape, approximately 80 feet long by 30 feet wide at its widest point. The lagoon received overflows and rinse waters from an acid storage tank area in the C-Line NC manufacturing area from 1974 to 1980. These wastewaters typically exhibited the characteristic of a corrosive liquid (D002). The C-Line NC manufacturing area and the acid wastewater lagoon were shut down between 1980 and 1987. The lagoon was filled with soil in 1987.

A RCRA Verification Investigation (Dames & Moore 1992) collected and evaluated soil and groundwater samples for metals. Metal concentrations were detected below health-based levels.

A construction project is scheduled in the area of this site. Excavation and confirmation sampling will be included in the construction project.

PROPOSED PLAN

Closure documentation will be prepared.

IRP STATUS

RRSE RATING: Medium Risk (2A)
CONTAMINANTS OF CONCERN:
Explosives, metals
MEDIA OF CONCERN:
Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS	387						
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $387,700

RFAAP-013 SWMU NO. 49
RED WATER ASH BURIAL #2

SITE DESCRIPTION

SWMU 49 is approximately 75 feet by 50 feet and is located in the Horseshoe Area, contiguous with SWMUs 48, 50 and 59. The four SWMUs were classified together during the 1980s because no distinction could 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 the part of the SWMU 48 lower disposal unit. SWMU 49 reportedly received 10 tons of redwater ash during its active life.

A RCRA Verification Investigation (VI) (Dames & Moore 1992) and a RCRA Facility Investigation (RFI) (Parsons Engineering-Science 1996) were conducted to determine the impacts to groundwater quality and soil. Supplementary RFI activities (ICF Kaiser 1998) included the verification of previous RFI results. Metals, VOCs and SVOCs were detected above HBNs.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
Explosives, metals, SVOC's, VOCs
MEDIA OF CONCERN:
Groundwater, Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
LTM
FUTURE IRP PHASE:
RC

PROPOSED PLAN

Closure documentation for SWMU-49 only will be prepared under this DSERTS site.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS							78.6
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $78,600

RFAAP-014 SWMU NO. 54
PROPELLANT BURNING ASH DISPOSAL AREA

SITE DESCRIPTION

SWMU 54 is an inactive disposal area situated on approximately 5 acres within the easternmost section of the Horseshoe Area. The SWMU was used during the 1970s for disposal of the Propellant Burning Ground (SWMU 13) ash.

A RCRA Verification Investigation (Dames & Moore 1992), a RCRA Facility Investigation (Parsons Engineering-Science 1996) and a Supplemental RFI (ICF Kaiser 1997) were conducted. Soil and groundwater samples were taken in these efforts. Soil data indicates the presence of metals, VOCs and explosives in exceedance of HBNs.

An interim removal action (Parallax 1999) was performed to remove "hot spots" associated with lead. However, there is reason to believe that contaminated soil still exists.

IRP STATUS

RRSE RATING: High Risk (1A)
CONTAMINANTS OF CONCERN:
Explosives, Metals, VOC's
MEDIA OF CONCERN:
Groundwater, Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI, LTM

PROPOSED PLAN

An RFI will be conducted. It is anticipated that approximately 1675 cy of soil will be excavated and disposed as hazardous waste.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS	655.1						
IRA							
RD		49.7					
RA(C)				1243.8			
RA(O)							
LTM				25.3	44.5	11.1	22.2

PROJECTED TOTAL - $2,051,700

RFAAP-015 SWMU NO. 26
FLY ASH LANDFILL #1

SITE DESCRIPTION

SWMU 26 is a closed, unlined landfill approximately 1,100 feet long by 250 feet wide originally called FAL No. 1, located in the south-central section of the Horseshoe Area.

Fly ash disposal at SWMU 26 began in 1971 (USATHAMA 1984). The VADEQ granted a solid waste management permit (Permit No. 399) to operate the landfill in April 1983, and it is currently monitored quarterly as a solid waste disposal unit. In addition to fly ash, unknown quantities of calcium sulfate sludge from SWMUs 36, 37, and 38 and asbestos were reportedly disposed of in the landfill (USEPA 1987).

The landfill reached capacity and was closed in 1987. A RCRA Verification Investigation (Dames & Moore 1992) was performed. Quarterly groundwater monitoring is ongoing as required by the VADEQ.

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
SVOC's
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

PROPOSED PLAN

This site is not eligible for ER,A funding. No further action under IRP. SWMU 26 is a closed fly ash landfill under state permit No. 399.

RFAAP-016 SWMU NO. 39
WASTEWATER PONDS FROM PROPELLANT INCINERATOR

SITE DESCRIPTION

SWMU 39 consists of two unlined earthen ponds located in the north-central section of the Horseshoe Area, adjacent to and associated with SWMU 14 (Hazardous Waste Incinerator). The settling ponds were excavated approximately 6 to 8 feet into the natural grade. These ponds received overflow from the former incinerator spray pond. Caustic was reportedly added to neutralize the water. The incinerator spray pond has been clean closed for soil. Sludges have never been removed from the ponds.

A RCRA Verification Investigation (Dames & Moore 1992) and a Supplemental VI (Dames & Moore 1994) which installed and sampled three monitoring wells near the ponds. Metals exceeding HBNs were detected in the soil and groundwater.

A RCRA Facility Investigation (ICF Kaiser 1998) is underway to further characterize potential site releases and refine the hydrogeologic understanding.

PROPOSED PLAN

Evaluate existing data to support a quantitative human health risk assessment

Approximately 7400 cy of soil will be excavated. It is anticipated that approximately 1800 cy of soil will be disposed as hazardous waste. The remaining soil will be disposed as appropriate.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI, LTM

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS	214.7						
IRA							
RD					46.2		
RA(C)						185.5	
RA(O)							
LTM						54.2	116.6

PROJECTED TOTAL: $2,286,700

RFAAP-017 SWMU NO. 53
ACTIVATED CARBON DISPOSAL AREA

SITE DESCRIPTION

SWMU 53 (Permit 353) is an unlined earthen landfill located in the southeastern section of the Horseshoe Area. It is located within the boundary of Fly Ash Landfill (FAL) No. 2 (SWMU 29) and is also contiguous with SWMU 27. When observed in 1986, the disposal area was described as a 500-foot-long-by-50-foot-wide plateau of an unknown height. Although the date of disposal is unknown, it is assumed that disposal occurred before October 1981 when FAL No. 2 (SWMU 29) was constructed. It was reported but not confirmed that the activated carbon disposed of at SWMU 53 was from alcohol recovery units (USEPA 1987). Since 1986, the disposal area has been completely covered by subsequent fly ash landfilling operations.

A RCRA Verification Investigation (VI) (Dames & Moore 1992) and a Supplemental VI (Dames & Moore 1994) collected groundwater, surface water and sediment samples. Chemicals of concern are explosives.

PROPOSED PLAN

This site is not eligible for ER,A funding, therefore no further action under the IRP.

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
Explosives
MEDIA OF CONCERN:
Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

RFAAP-018 SWMU NO. 48
OILY WATER BURIAL AREA

SITE DESCRIPTION

USEPA reported this unit as contiguous to SWMU 49 (Red Water Ash Disposal Area), SWMU 50 (Calcium Sulfate Disposal Area) and SWMU 59 (Bottom Ash Pile), with no distinction possible by visual observation. It is estimated that 200,000 gallons or more of oil-contaminated wastewater were disposed in unlined trenches at this unit prior to off-plant used oil recycling.

A RCRA Verification Investigation (Dames & Moore 1992) and a RCRA Facility Investigation (RFI) (Parsons Engineering-Science 1996) was conducted to evaluate potential groundwater contamination releases and installed and sampled four monitoring wells. Soil data from the VI indicated the presence of metals and explosives above HBNs. Groundwater data from the VI indicated the presence of chlorinated solvents and metals above HBNs.

Ongoing supplemental RFI activities (ICF Kaiser 1998) include the verification of previous RFI results and the determination of potential site contamination releases. Soil data from the RFI indicated the presence of metals above HBNs.

PROPOSED PLAN

Perform supplemental RFI activities at SWMUs, 48, 49, and 50 to further refine the site conceptual model and support a quantitative human health risk assessment.

Approximately 23,703 will be excavated, but only 5000 cy of soil will be removed, transported and disposed as hazardous waste and the remainder will be disposed as appropriate.

Long term monitoring will be performed for 5 years.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
Explosives, Metals
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI, LTM

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS	214.7						
IRA							
RD				209.2			
RA(C)							5242.7
RA(O)							
LTM							179.6

PROJECTED TOTAL - $5,846,200

RFAAP-019 SWMU 32
INERT LANDFILL NO. 1

SITE DESCRIPTION

SWMU 32 is a closed, unlined, 8-acre landfill located in the Horseshoe Area of RFAAP. The unit reportedly began receiving plastics, excavated soil, and inert wastes in 1978 and was permitted by the Virginia Department of Health (Permit No. 400) in April 1983. The unit reached capacity and was closed sometime between July 1986 and April 1987 (USEPA 1987) with a 2-foot clay cap. One area of the landfill is covered with gravel and used for trailer parking.

A RCRA Verification Investigation (Dames & Moore 1992) was performed that consisted of the installation and sampling of two groundwater monitoring wells. Chemical results demonstrated that groundwater quality had not been impacted by the landfill.

PROPOSED PLAN

This site is not eligible for ER, A funding. No further action under the IRP. SWMU 32 is closed inert landfill under a state permit.

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

RFAAP-020 SWMU NO. 29
FLY ASH LANDFILL # 2

SITE DESCRIPTION

SWMU 29 was constructed in 1981 and was originally listed as an active, unlined earthen landfill located in the southeast section of the Horseshoe Area. The SWMU is approximately 200 feet east of the Closed Sanitary Landfill (SWMU 25). The 10-acre unit was permitted by the Virginia Department of Health in May 1982 (Permit No. 353) as an industrial waste landfill designated to receive fly ash, calcium sulfate sludge, and sludge from water treatment plants.

A Land Disposal Study conducted in 1980 concluded that the site was geologically suitable for ash landfill operations. A RCRA Verification Investigation (VI) (Dames & Moore 1992) collected surface water and sediment samples. Supplemental VI activities (Dames & Moore 1994) were undertaken to evaluate groundwater characteristics.

PROPOSED PLAN

This site is not eligible for ER,A funding, therefore no further action under the IRP.

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
explosives and metals
MEDIA OF CONCERN:
Soil and Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

RFAAP-021 SWMU NO. 46
PROPELLANT BURIAL

SITE DESCRIPTION

The reported location of SWMU 46 is a small depression with no outward drainage. Approximately 1 ton of propellants and propellant-contaminated soil were reportedly disposed of at this location because of a railroad derailment in the 1950s (USATHAMA 1976). The actual size of the Waste Propellant Disposal Area is not known. During a March 1990 facility visit, a broken-off sign identifying "BURIED EXPLOSIVE WASTE" was found in a low area between the railroad tracks and the driveway leading to Building 456.

A RCRA Verification Investigation (Dames & Moore 1992) collected two soil samples for metals and explosives. No contamination was detected.

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
Metals and explosives
MEDIA OF CONCERN:
Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

PROPOSED PLAN

Closure documentation will be prepared. Based on previous investigation results, no further action is recommended at this time.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS		38.7					
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $38,700

RFAAP-022 SWMU NO. 57
POND BY BLDS 4931 & 4932

SITE DESCRIPTION

SWMU 57 is designated as an acid settling pond in RFAAP facility drawings and is located in the western section of the Horseshoe Area. SWMU 57 is approximately 30 feet in diameter, surrounded by a gravel berm, and is enclosed by a perimeter fence. The pond is reportedly connected to Building 4931 by an underground pipe. However, available construction plans for the adjacent chromic acid treatment plant do not show this pond.

A RCRA Verification Investigation (Dames & Moore 1992) collected one surface water and one sediment sample. No contamination was detected.

IRP STATUS

RRSE RATING: Low Risk (3A)
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Sediment, Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

PROPOSED PLAN

Closure documentation will be prepared.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS		38.7					
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $38,700

RFAAP-023 SWMU NO. 43
SANITARY LANDFILL NO. 2

SITE DESCRIPTION

SWMU 43 is a closed, unlined sanitary landfill located immediately adjacent to the New River in the northeast section of the RFAAP Main Manufacturing Area that 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. Site was regraded in accordance with VI recommendation. A RCRA Verification Investigation (Dames & Moore 1992) installed six groundwater monitoring wells. Groundwater and surface water data indicates the presence of metals and VOCs which did not exceed HBNs.

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
Metals and VOCs
MEDIA OF CONCERN:
Groundwater, Soil, Surface Water
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

PROPOSED PLAN

Collect confirmatory samples of available media for closure documentation.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS							199,1
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $199,100

RFAAP-024 SWMU NO. 45
LANDFILL NO. 3

SITE DESCRIPTION

SWMU 45 is an inactive sanitary landfill located in the north-central section of the Main Manufacturing Area that 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 has been observed in the area.

A RCRA Verification Investigation (Dames & Moore 1992) included monitoring well installation, a geophysical survey, and a baseline human health risk assessment.

PROPOSED PLAN

Limited soil sampling will be performed and existing wells will be resampled. No further action is anticipated.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
SVOC's
MEDIA OF CONCERN:
Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS				255.5			
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $255,500

RFAAP-025 SWMU NO. 50
CASO4 TREATMENT/DISPOSAL AREA

SITE DESCRIPTION

SWMU 50 is an open area south of SWMU 48 approximately 300 feet long by 300 feet and is located within the Horseshoe Area. Until 1982, SWMU 50 was one of the major disposal areas at RFAAP for sludge removed from the calcium sulfate drying beds (SWMUs 35, 36, 37, 38, and Area Q).

A RCRA Verification Investigation (Dames & Moore 1992) collected two subsurface soil samples. Metals, VOCs and SVOCs were detected above HBNs.

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
metals, explosives, SVOCs, VOCs
MEDIA OF CONCERN:
Soil and Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

PROPOSED PLAN

Closure documentation for SWMU-50 only will be prepared under this DSERTS site.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS							78.6
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $78,600

RFAAP-026 SWMU NO. 31
COAL ASH SETTLING LAGOONS

SITE DESCRIPTION

SWMU 31 consists of three unlined settling lagoons located in the northwest section of the Horseshoe Area and received flyash wastewater flow from Power House No. 2 when it was operating and filter backwash from the active potable water plant.

A RCRA Verification Investigation (Dames & Moore 1992) and a RCRA Facility Investigation (RFI) (Parsons Engineering-Science 1996) collected sludge, groundwater, and subsurface soil samples to determine the migration of metals from the lagoons. Supplemental RFI activities are ongoing (ICF Kaiser 1998) to complete data gaps and to determine future action.

PROPOSED PLAN

Collection of soil, groundwater, and surface water samples to support a no-further action recommendation for SWMU 31.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
Metals, SVOCs
MEDIA OF CONCERN:
Groundwater, Surface Water, Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS	1037						
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $1,037,700

RFAAP-027 SWMU NO. 58
RUBBLE PILE

SITE DESCRIPTION

SWMU 58 is a rubble pile located in the south-central portion of the Horseshoe Area. The rubble pile is approximately 50 feet high and roughly triangular in shape, with each side approximately 300 feet long. Erosion of the soil cover is evident. The SWMU was reportedly used as a disposal site in 1979. Prior to construction clearing activities, pine trees and surface debris were pushed into a pile and then covered with dirt and fill material. It is believed that no other materials were disposed of at SWMU 58.

A RCRA Verification Investigation (Dames & Moore 1992) and a RCRA Facility Investigation (ICF Kaiser 1998) was performed to evaluate potential subsurface soil contamination. Analytical results indicate the presence of metals in exceedance of HBNs.

IRP STATUS

RRSE RATING: Medium Risk 2A
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

PROPOSED PLAN

Soil sampling will be conducted to confirm the VI data.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS					204.5		
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $204,500

RFAAP-028 SWMU NO. 59
BOTTOM ASH PILE

SITE DESCRIPTION

SWMU 59, the Bottom Ash Pile, is located near SWMUs 48 and 50 in the Horseshoe Area of RFAAP, approximately 3,400 feet east of the main bridge over the New River. Although there is currently no bottom ash accumulation piles, bottom ash has been spread within the immediate SWMU vicinity.

A RCRA Verification Investigation (Dames & Moore 1992) collected soil samples. Soil data indicates metals in exceedance of HBNs. Groundwater data indicates VOCs in exceedance of HBNs.

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
Metals, VOC's
MEDIA OF CONCERN:
Groundwater, Soil
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI, LTM

PROPOSED PLAN

Approximately 3,700 cy of soil will be removed, transported and disposed as hazardous waste.

Long term monitoring will be performed for 5 years.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS			573.4				
IRA							
RD				86			
RA(C)							3453.3
RA(O)							
LTM							139.2

PROJECTED TOTAL: $4,251,900

RFAAP-029 SWMU NO. 52
CLOSED SANITARY LANDFILL

SITE DESCRIPTION

SWMUs 52 and 28 are closed sanitary landfill (Permit 401) in the southeastern section of the Horseshoe Area contiguous to and immediately south of the closed RFAAP Hazardous Waste Landfill (HWMU 16). The SWMU reportedly contains three trenches, each approximately 35 feet wide by 500 feet long by 14 feet deep. SWMU 52 was first used in 1976 and was closed in 1984. The landfill was used primarily for the disposal of municipal refuse, though asbestos (in double plastic bags) was also disposed of in this area (USACE 1981).

A RCRA Facility Investigation (Dames & Moore 1992) installed four monitoring wells near SWMUs 28 and 52. Because of the proximate nature of SWMUs 28 and 52 and the similar disposal methods used at each SWMU, one combined study area was delineated for the RFI. Explosives, metals, VOCs and SVOCs have been detected in wells located at HWMU-16. The contamination is not attributed to SWMUs 28 and 52.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

PROPOSED PLAN

Actions to be addressed under RFAAP-039 (HWMU-16)

RFAAP-030 SWMU NO. 17
AIR CURTAIN DESTRUCTOR & OPEN BURNING GROUND

SITE DESCRIPTION

SWMU 17 is located in the south-central part of the Main Manufacturing and is used for burning wastes potentially contaminated with explosives or propellants. The SWMU is subdivided into five separate areas (A through E) based on history and operations. SWMU 17A, the Stage and Burn Area, is used to stage large metallic and combustible items contaminated with propellants and explosives. Decontaminated scrap metal is removed and sold for recycling. SWMU 17B is the Air Curtain Destructor (ACD) Staging Area. SWMU 17C, the Air Curtain Destructor (ACD), is where contaminated wastes small enough to feed into the burn chamber are burned. SWMU 17D, the Ash Staging Area, is used for accumulating and storing ACD ash and scrap metal prior to disposal. SWMU 17E, the Runoff Drainage Basin is an unlined settling basin that receives surface water runoff from the ACD and Ash Staging Area.

The RCRA Facility Investigation (Dames & Moore 1992) collected surface and subsurface soil, surface water, and sediment samples in the five component areas of the unit. A dye-trace study (Engineering-Science 1994) identified a direct conduit between 17A and the New River, evidenced by the recovery of dye within a 24-hour period of injection.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
Metals, VOC's, SVOC's
MEDIA OF CONCERN:
Groundwater, Soil, Surface Water
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

PROPOSED PLAN

This site is not ER,A eligible. No further action under IRP.

When operations cease, groundwater, surface water, and sediment samples to confirm previous RFI results and support a quantitative human health risk asessment.

RFAAP-031 AREA Q
CASO4 TREATMENT/DISPOSAL AREA

SITE DESCRIPTION

Area Q is an abandoned lagoon located in the northwest section of the Main Manufacturing Area. Area Q is immediately northwest and adjacent to SWMU 38 and was reported to be used as a sludge drying bed when SWMU 38 reached capacity. Sludge was pumped from SWMU 38 to Area Q via pipes that ran through a depression in the berm surrounding the drying bed.

A RCRA Verification Investigation (VI) (Dames & Moore in 1992) collected one composite sludge sample. Explosives and metals were detected.

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
Metals, explosives
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

PROPOSED PLAN

Soil and groundwater samples will be collected.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS							230
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $230,000

RFAAP-032 SWMU NO. 61
MOBILE USED OIL TANKS

SITE DESCRIPTION

A number of oil/water separators and waste storage tanks located throughout RFAAP are used for the collection of used oil generated primarily from machinery and vehicle engines. Oil from these locations was collected in the Mobile Used Oil Tanks (SWMU 61) for either shipment offsite or reuse. Leaks and spills of used oil during handling and collection are managed in accordance with the RFAAP Spill Control and Countermeasures Plan and the Installation Spill Contingency Plan (SPCC/ISCP).

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
N/A
MEDIA OF CONCERN:
N/A
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

PROPOSED PLAN

This site is not ER,A eligible. No further action is recommended for SWMU 61 under IRP.

RFAAP-032 SWMU NO. 75
USED OIL STORAGE TANK (INERT GAS PLANT)

SITE DESCRIPTION

This Underground Storage Tank (UST) was located in the Main Manufacturing Area, 20 feet west of the Inert Gas Compressor Building A-421. It was removed as part of the UST removal program in April 1985. The UST was reportedly a single-walled tank with a capacity of 600 to 700 gallons. It was used to store used oil and hydraulic fluids that are generated in the inert gas plant compressor house. The contents of the UST were periodically pumped out into 55-gallon drums for the use as fuel at the Hazardous Waste Incinerator (USEPA 1987). Drips and spills around the tanks access ports that occurred when filling the tank were cleaned up before employees left the job site (Procedure 4-27-120; Section 29.1.1). Contaminated soil was removed from the premises and was properly disposed of. Spills from overfilling would have been treated as an emergency, and procedures described in the Emergency Response Plan (Procedure 4-14-44; Section 29.1.2) were followed.

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
N/A
MEDIA OF CONCERN:
N/A
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

PROPOSED PLAN

This site is not eligible for ER,A funding. No further action is recommended for SWMU 75. UST closure documentation will be submitted to EPA.

RFAAP-032 SWMU NO. 76
OIL TANKS

SITE DESCRIPTION

SWMU 76 consists of two used oil USTs that were located within the Stage and Burn Area (SWMU 17A) in the south-central part of the Main Manufacturing Area. The capacities of the two tanks were 5,500 gallons and 2,640 gallons, respectively. Used oil from machinery and vehicle engines throughout RFAAP was collected in the Mobile Used Oil Tanks (SWMU 61) and then stored in the SWMU 76 tanks. The used oil was then sold to an off-post firm for reclamation or used to fuel fires in the Contaminated Waste Stage and Burn Area (SWMU 17A).

A release of approximately 250 gallons of oily waste water and sludge occurred in 1991 during the removal of the 5,500-gallon UST. Impacted materials were analyzed to determine proper disposal procedures (Hercules 1991). Approximately 13 cubic yards of dirt/absorbed material were removed from the area and disposed of offsite as a hazardous waste because of lead and chromium concentrations. The SWMU 76 UST closure report concluded that the USTs no longer presented an environmental concern or threat.

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
N/A
MEDIA OF CONCERN:
N/A
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

PROPOSED PLAN

This site is not eligible for ER,A funding. No further action is recommended for SWMU 76. UST closure documentation will be submitted to EPA.

RFAAP-033 SWMU 68
CHROMIC ACID TREATMENT TANKS

SITE DESCRIPTION

SWMU 68 is located 100 feet northwest of SWMU 57 where the plateau of the Horseshoe Area begins sloping towards the New River. The unit previously contained two 4,000-gallon aboveground tanks, which were used to neutralize wastewater generated from the cleaning of rocket encasements (USEPA 1987). Neutralized wastewater was subsequently discharged to the finishing pond, previously located at SWMU 69.

A RCRA Verification Investigation (Dames & Moore 1992) detected metals in surface soil samples above the RCRA permit HBNs. A RCRA Facility Investigation (ICF Kaiser 1997) was conducted to evaluate potential subsurface contamination and included upgradient surface and subsurface soil samples to establish SWMU-specific background metals concentrations. The results of confirmation samples demonstrated that previous SWMU process-related activities had not adversely impacted subsurface conditions and associated contamination sources had been removed.

PROPOSED PLAN

Site screening/closure documentation will be prepared.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil
COMPLETED IRP PHASE:
RFA, IRA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS		$					
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $8,000

RFAAP-035
SEWAGE LINES

SITE DESCRIPTION

An investigation of the acid and industrial sewers was required by the RCRA permit. The video investigation is complete of the Acid Sewers and the report was submitted to the EPA. No major leaks were detected. The industrial sewer investigation is ongoing.

PROPOSED PLAN

The sewer line investigation is ongoing. It was fully funded in FY99.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
Metals, explosvives
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

RFAAP-036 SWMU NO. 10
BIOPLANT BASIN

SITE DESCRIPTION

SWMU 10 is located in the north-central part of the Main Manufacturing Area and consists of the biological plant equalization basin, which was constructed over a former NC lagoon. The biological treatment system was built between 1978 and 1979 and became operational in 1980. The system had been used to treat wastewater from propellant manufacturing, pretreated wastewater from NG manufacturing and alcohol rectification, and waste associated with ethyl ether recovery (USEPA 1987).

Groundwater in the SWMU 10 vicinity was characterized during the RCRA Verification Investigation (VI) (Dames & Moore 1992) and supplemental VI (Dames & Moore 1994).

The VADEQ certified that clean closure for soils had been attained for the equalization basin. Groundwater is still being monitored by the operating contractor.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
Metals, explosives, SVOCs
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC
FUTURE IRP PHASE:
RC

PROPOSED PLAN

The Bioplant Basin has received clean closure for soils. No further action is recommended for this SWMU.

RFAAP-037 AREA P
BATTERY STORAGE AREA

SITE DESCRIPTION

The Spent Battery Storage Area (Area P) consists of an open lot several acres in size that is used for the storage of shredded scrap metal, decommissioned tanks, powder cans and batteries prior to off-post shipment. This area is approximately 50 feet by 200 feet long and is located within the scrap metal salvage yard 600 feet west of the Biological Treatment Plant (SWMU 10).

A RCRA Verification Investigation (Dames & Moore 1992) evaluated surface and subsurface soils within the SWMU to determine the impact of spent battery acid spillage. Data from the soil sampling indicates metals in exceedance of HBNs.

PROPOSED PLAN

Collect groundwater and soil samples to confirm previous investigation results.

IRP STATUS

RRSE RATING: Low Risk 3A
CONTAMINANTS OF CONCERN:
Metals and explosives
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/ES							435.1
IRA							
RD							7
RA(C)							159.8
RA(O)							
LTM							

PROJECTED TOTAL: $601,900

RFAAP-038 AREA O
UNDERGROUND FUEL OIL SPILL

SITE DESCRIPTION

Area O consists of one 269,000-gallon fuel oil AST that is situated on a concrete base and surrounded by a concrete secondary containment system. The Underground Fuel Oil Spill was located in the east section of the Main Manufacturing Area, southwest of the Inert Gas Plant.

An Oil Audit was conducted by USACE in 1982 placed fuel leakage of an underground pipeline at approximately 3,000 gallons. In 1983, four monitoring wells were installed to characterize groundwater flow and quality at the site.

The RCRA Facility Investigation (RFI) (Dames & Moore 1992) and a Phase II RFI (Dames & Moore 1994) collected groundwater samples at previously sampled wells. VOCs and SVOCs exceeded HBNs.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
VOCs, SVOCs
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI, CMO, LTM

PROPOSED PLAN

An RFI will be performed.

The assumed remedial action for soil is removal and disposal of approximatley 500cy. Groundwater remedial action is assumed to be air sparging.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS				209.8			
IRA							
RD					68		
RA(O)						1,034.1	
RA(O)							
LTM							232.7

PROJECTED TOTAL - $1,544,600

RFAAP-039 HWMU NO. 16
HAZARDOUS WASTE LANDFILL

SITE DESCRIPTION

HWMU 16 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 closed landfill used for lab chemicals, burning ground, and incinerator residue.

Groundwater data indicates the presence of elevated concentrations of explosives and chlorinated solvents.

There are indications that the groundwater contamination at HWMU-16 is migrating to the areas of SWMU-28 and 52.

Long-term monitoring is required by the State. The State is also requiring a post-closure permit.

PROPOSED PLAN

An RFI will be performed to delineate a larger area of concern, encompassing the areas of SWMU-28 and 52.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
Explosives, VOCs
MEDIA OF CONCERN:
Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC with LTM

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS	122	122	122	729.1			
IRA							
RD							
RA(C)							
RA(O)							
LTM					122	122	2276

PROJECTED TOTAL: $3,615,100

RFAAP-040
FORMER LEAD FURNACE AREA

SITE DESCRIPTION

The former lead furnace area is located in the south-central portion of the Main Manufacturing Area adjacent to SWMU 17A (Stage and Burn Area) and was operational during World War II. Typically, lead recovered during routine operations would be melted in the furnace and cast into ingots for salvage. It is not known precisely how long the Lead Furnace was in operation. The SWMU location has apparently been used for various activities and is listed in the RCRA Permit as a used oil and transfer location.

The former Lead Furnace Area was added to the Dames and Moore Verification Investigation of 1992 by USTHAMA after the discovery of solid lead slag in the soil during the removal of used oil tanks in SWMU 76. The Verification Investigation (VI) included the sampling and analysis of subsurface soil in the vicinity of the FLFA, located within SWMU 17A. A RCRA Facility Investigation (ICF Kaiser 1998) was conducted to verify VI results and included the sampling/removal of lead "hot spots" and the collection and analysis of subsurface soil samples. The report is not yet available.

PROPOSED PLAN

Closure documentation will be prepared. No further action is recommended for the Former Lead Furnace Area.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
RC

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS		78.6					
IRA							
RD							
RA(C)							
RA(O)							
LTM							

PROJECTED TOTAL: $78,600

RFAAP-041 HWMU NO. 4
SURFACE IMPOUNDMENT #4

SITE DESCRIPTION

HWMU 4 is located in the eastern area of the Main Manufacturing Area. It was a surface impoundment and was used an equalization basin for acidic wastewaters.

The source removed in 1988 in accordance with an approved state closure plan.

The site was clean-closed for soil by the VADEQ in 1997 Long-term groundwater monitoring is required by the State. The State is also requiring a post closure permit.

PROPOSED PLAN

Long-term monitoring will be performed for 5 years. Clean-closure for groundwater will be pursued to negate the need for a state-mandated post-closure permit.

IRP STATUS

RRSE RATING: High Risk 1B
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RC with LTM
FUTURE IRP PHASE:
RC with LTM

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS							
IRA							
RD							
RA(C)							
RA(O)							
LTM	122	122	122	122	122		

PROJECTED TOTAL: $610,000

RFAAP-042 HWMU NO. 5
SURFACE IMPOUNDMENT #5

SITE DESCRIPTION

HWMU 5 is located in the middle of the Main Manufacturing Area. 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. Long-term monitoring is required by the State. In April 2000 a post closure care permit reapplication was submitted to the VADEQ.

Groundwater monitoring has been performed for the past 15 years. DNT was recently detected. This appears to be an anomaly, given the original function and use of the lagoon.

PROPOSED PLAN

Clean-closure will be pursued as a cost effective alternative to long-term monitoring. Approximately 100cy will be excavated and disposed of as hazardous waste.

IRP STATUS

RRSE RATING: High Risk 1B
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
DES
FUTURE IRP PHASE:
CMI, LTM

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS							
IRA							
RD	122	122	139.4				
RA(C)				246.4			
RA(O)							
LTM					122	122	

PROJECTED TOTAL: $873,800

RFAAP-043 HWMU #7
SURFACE IMPOUNDMENT #7

SITE DESCRIPTION

HWMU 7 is located in the western section of the Main Manufacturing Area along the New River. It was a surface impoundment used for acidic wastewaters. Long-term monitoring is required by the State. The State issued a post-closure permit in 1999.

IRP STATUS

RRSE RATING: High Risk 1B
CONTAMINANTS OF CONCERN:
Heavy Metals
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
DES
FUTURE IRP PHASE:
CMI, LTM

PROPOSED PLAN

Clean-closure will be pursued as a cost effective alternative to long-term monitoring. Approximately 100cy will be excavated and disposed of as hazardous waste.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS							
IRA							
RD	122	139.4					
RA(C)			246.4				
RA(O)							
LTM				122	122		

PROJECTED TOTAL: $751,800

RFAAP-044
NEW RIVER UNIT

SITE DESCRIPTION

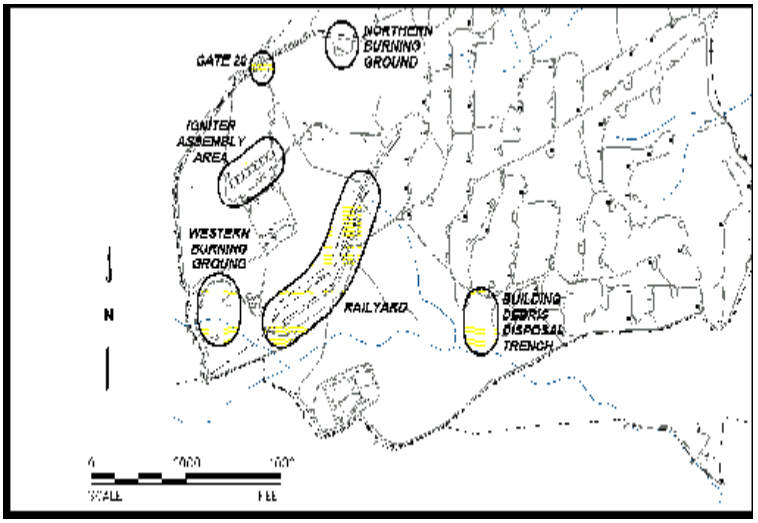
The New River Unit (NRU) is located approximately 6 miles west of the RFAAP Main Manufacturing Area and consists of approximately 2,813 acres. Between 1940 and 1945, the NRU was used for the loading of propellants and igniter charges and the manufacturing of igniter charge bags. Between 1943 and 1945, operations were expanded to include an additional bag-loading line, rolled powder operations, flash-reducer loading lines, and blackpowder drying facilities. Production ended after World War II, and the plant was officially designated as part of the RFAAP installation. Since 1947, approximately 1,000 acres in the western section of the plant have been sold or transferred for other uses.

There is conductive flooring in several buildings. The material is comprised of barium, copper, asbestos, and lead. It is exposed to the elements and is leaching to surrounding soil.

A Remedial Investigation (ICF Kaiser 1998) sampling effort included the collection of surface soil, sludge, and water samples. Metals have been detected in exceedance of the HBNs. Five areas within the New River Unit are being investigated: the Igniter Assembly Area (IAA), Northern Burning Grounds (NBG), Western Burning Grounds (WBG), Rail Yard (RY), and the Building Debris Disposal Trench (BDDT). Of the five sites, three require additional work.

IRP STATUS

RRSE RATING: High Risk 1B
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
PA/SI
CURRENT IRP PHASE:
RI
FUTURE IRP PHASE:
RD, RA(C)



PROPOSED PLAN

Continue RI effort after completing the inorganic background study effort.

Planned remedial actions include excavation and disposal of 9100cy of soil (2700 cy haz waste) at the Northern Burning Ground. A treatability study for the conductive flooring will be performed and a removal action is likely to be required.

Need to consult further with EPA on location of alleged transformer site. RFAAP could not locate it.

A decision regarding a groundwater investigation will be made once the vertical extent of soil contamination is determined. The need for long-term monitoring is not anticipated.

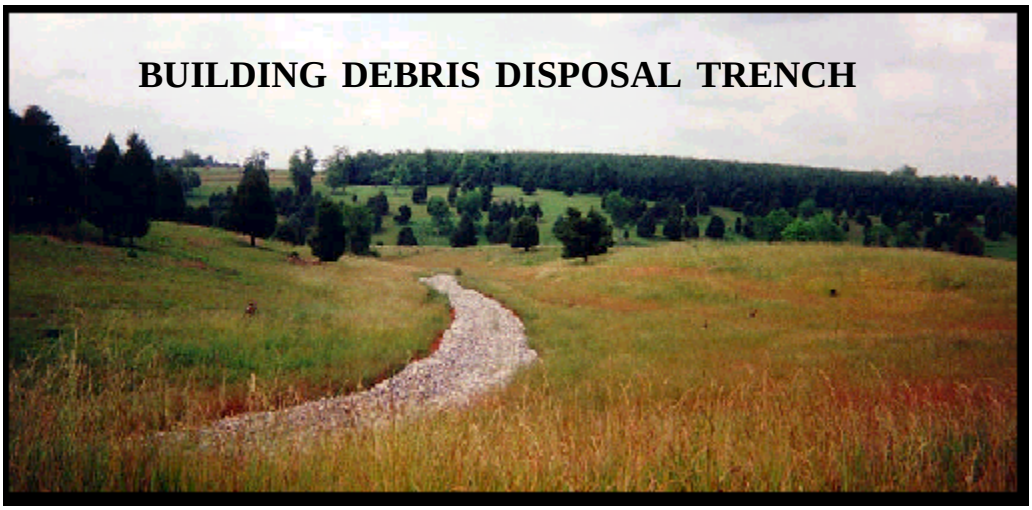
CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS	795.9						
IRA							
RD						132.1	
RA(C)							4070.4
RA(O)							
LTM							

PROJECTED TOTAL: $4,998,400

RFAAP-044
NEW RIVER UNIT

BUILDING DEBRIS DISPOSAL TRENCH



IGNITER ASSEMBLY AREA

NORTHERN BURNING GROUND

RFAAP-044
NEW RIVER UNIT

WESTERN BURNING GROUND

RAIL YARD

RFAAP-045
BLDG 4343

SITE DESCRIPTION

Building 4343 is located within the Pilot B Area of the Rocket Manufacturing Area, which is situated within the Horseshoe Area.

In 1956, the building was converted from a Fire Water Pump House to support Nike igniter grain cadmium plating operations. Conversion activities included the installation of a drying cabinet, cadmium plating baths, an exterior lead catch tank (which was discharged to the ground), and an exhaust system. The pump and pump engine were removed and floor sumps were filled to level.

Surface soil evaluation was performed (Alliant Techsystem 1996) found cadmium exceeded regulatory limits for TCLP analysis. A RCRA Facility Investigation (ICF Kaiser 1998) was conducted to evaluate potential contamination releases associated with former cadmium plating activities.

PROPOSED PLAN

RFI activities will continue.

Approximately 450cy of contaminated soil will be excavated and disposed of as hazardous waste.

Long-term monitoring will be performed for 5 years.

IRP STATUS

RRSE RATING: High Risk 1A
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN:
Soil, Groundwater
COMPLETED IRP PHASE:
RFA
CURRENT IRP PHASE:
RFI
FUTURE IRP PHASE:
CMS, DES, CMI, LTM

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS			384.7				
IRA							
RD				32.6			
RA(C)					545.6		
RA(O)							
LTM					31.3	53.7	30.3

PROJECTED TOTAL: $1,078,200

SITE SCREENING AREAS

There are approximately 40 areas discussed in the RCRA Facility Assessment which were incorporated into the new RCRA Corrective Action Permit issued in Fall, 2000. Although it is not likely that these areas impact human or ecological health, they will be screened for potential releases to the environment by USACHPPM. At least half of the areas are currently in active use.

It is possible that some further remedial investigation and subsequent action at a small number of these areas may be required in the future. Should this occur and they meet all other ER,A eligibility requirements, the areas will be designated as new DSERTS sites.

SCHEDULE

PAST MILESTONES

1990
Verification Investigation Initiation

1992
Verification Investigation Completion

1994
Interim Remedial Action RFAAP-003(SWMU 69)
RCRA Facility Investigation Initiation

1995
Initiated Interim Remedial Design
RFAAP-007(SWMU 28)
RFAAP-23(SWMU43)
RFAAP-029(SWMU52)

1997
Completed RCRA Facility Investigation
Completed IRA at SWMU 43
Completed IRA at SWMU 68
Completed New River and Tributaries Study

1998
Completed Master Work Plan
Completed Site Management Plan
Initiated RFI/CMS for SWMU 39
Initiated IRM at SWMU 54

1999
Completed IRM at SWMU 54
Initiated and completed RI/RFI sampling at NRU & Bldg 4343

2000
Initiated and completed sampling for Inorganic Background Study

PROJECTED MILESTONES

2001
Initiate screening at SWMU 6
Initiate screening at SSAs
Initiate RFIs at SWMUs 17 & 40
Initiate treatability study at NRU

2002 - 2014
Initiate and complete follow up investigations, studies and actions for the remaining sites.

SCHEDULE

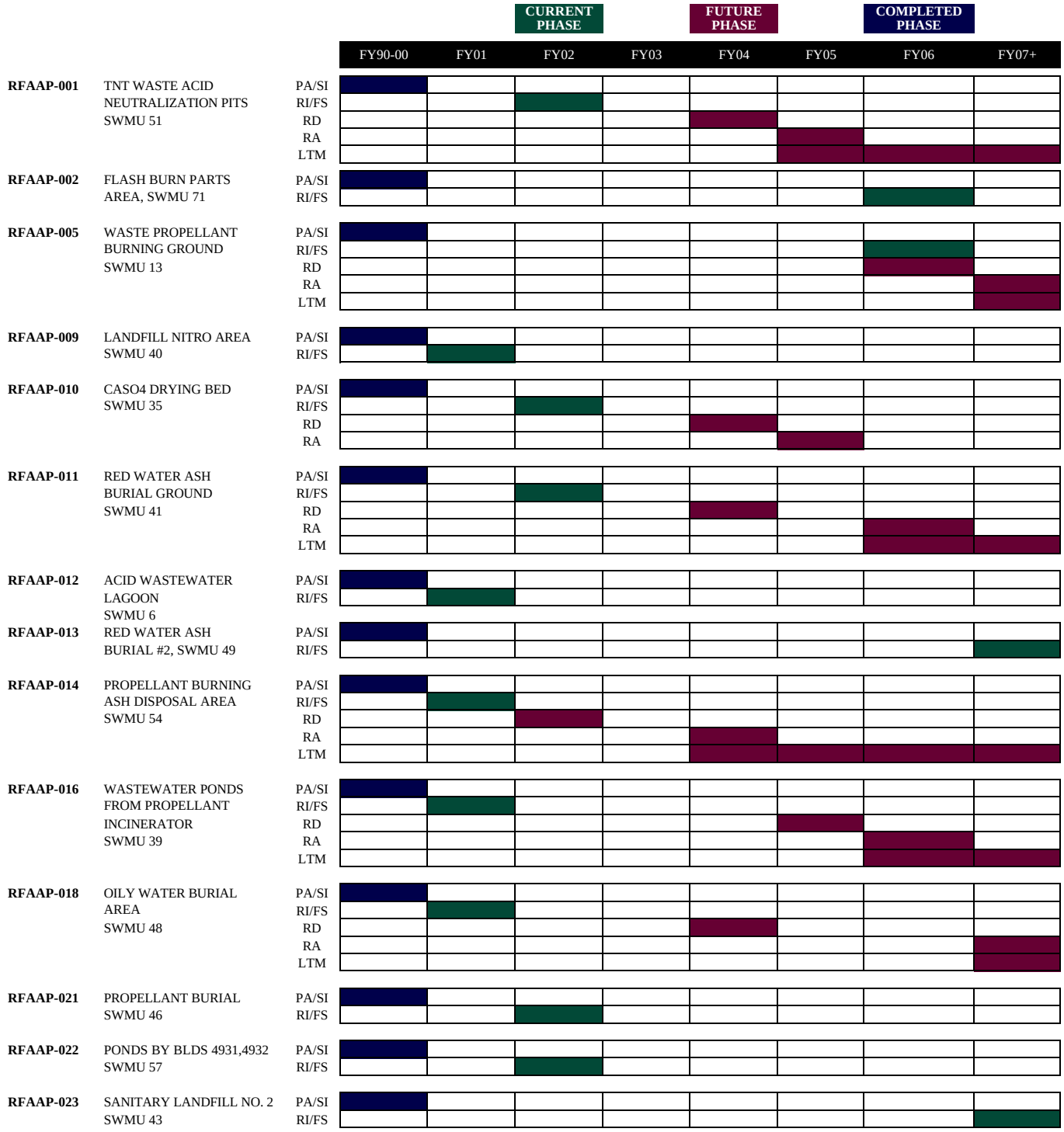
NO FURTHER ACTION SITES

The following sites currently require no further action (excluding LTM) under the ER,A program:

RFAAP-003
RFAAP-004
RFAAP-006
RFAAP-007
RFAAP-008
RFAAP-015
RFAAP-017
RFAAP-019
RFAAP-020
RFAAP-029 with LTM
RFAAP-030
RFAAP-032
RFAAP-033
RFAAP-036
RFAAP-041 with LTM

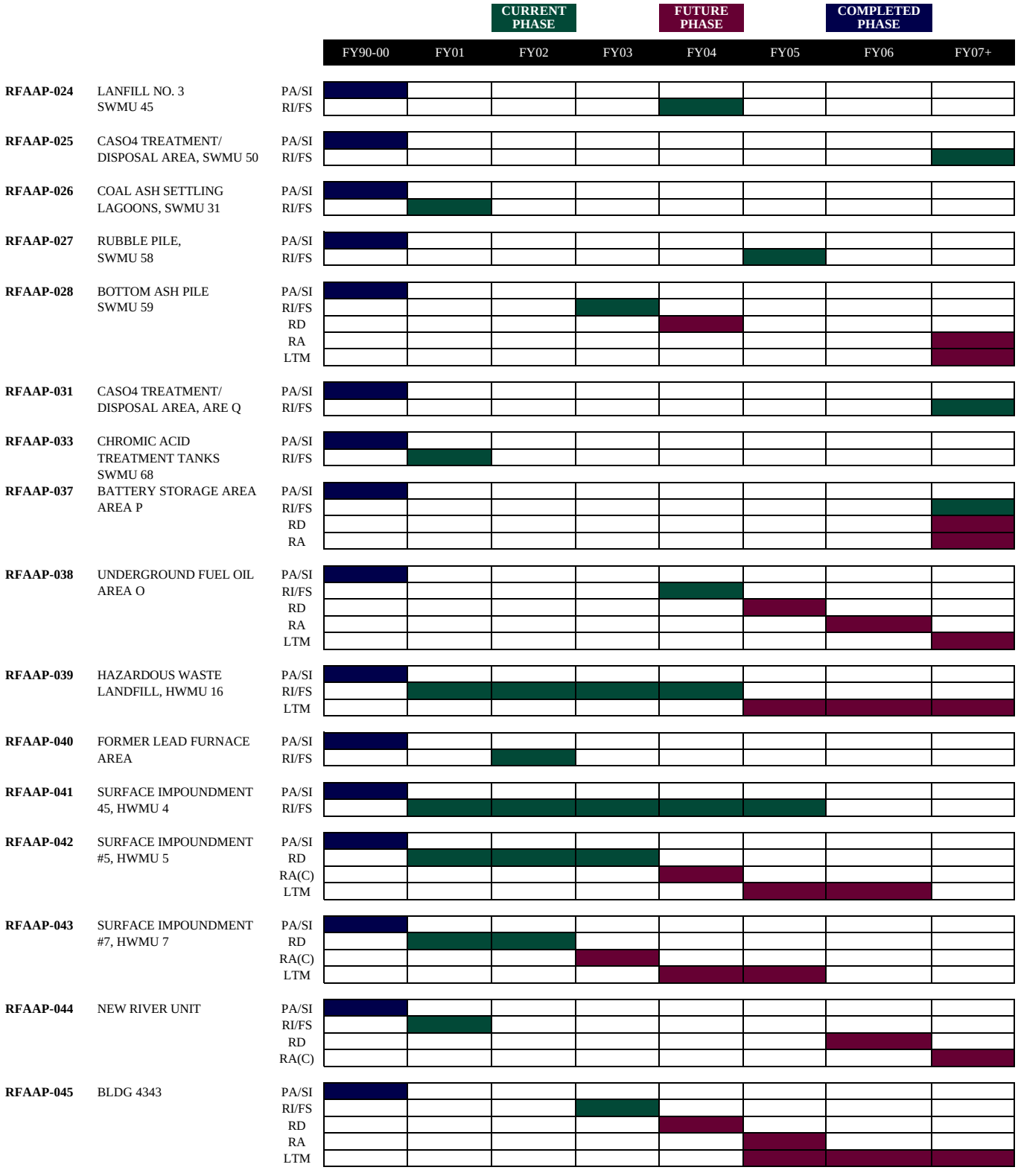
Radford Army Ammunition Plant IRP Schedule

(Based on current funding constraints)



Radford Army Ammunition Plant IRP Schedule

(Based on current funding constraints)



DEFENSE SITE ENVIRONMENTAL RESTORATION TRACKING SYSTEM

Site, 3. State Phase Summary Report 10/23/00

State: VA
Programs: BRAC I, BRAC II, BRAC III, BRAC IV, IRP

Subprograms: Compliance, Restoration, UXO
Installation count for Programs: 1

NPL Options: Delisted, No, Proposed, Yes

Installations count for Programs and NPL: 1
Site count for Programs and NPL: 44

				Phase / Status / Sites						
		PA						**SI**		
	C	**U**	**F**	**RC**		**C**	**U**	**F**	**RC**	
	44	0	0	1		42	0	0	1	
		RI / FS						**RD**		
	C	**U**	**F**	**RC**		**C**	**U**	**F**		
	12	16	13	12		0	0	20		
		RA(C)						**RA(O)**		
	C	**U**	**F**	**RC**		**C**	**U**	**F**	**RC**	
	1	0	20	1		0	0	0		
					LTM					
				C	**U**	**F**	**N**			
				0	4	28	12			
				Remedy / Status / Sites (Actions)						
					IRA					
		C			**U**			**F**		
	1	(1)			( )				( )	
					FRA					
	C				**U**			**F**		
	1	(1)			( )			20	(20)	
RIP Total:		0								
RC Total:		15								
								Reporting Period End Date:		09/30/2000

DEFENSE SITE ENVIRONMENTAL RESTORATION TRACKING SYSTEM

Site, 9. RISK INSTALLATION ACTION PLAN REPORT 10/23/2000

Installation: RADFORD AAP
Major Command: AMC

SubCommand: OSC
Program Options: IRP, BRAC I, BRAC II, BRAC III, BRAC IV

Subprogram Options: Compliance, Restoration, UXO

			Media	Phase (s)		Phase (s)	Phase (s)	#IRA		#IRA	#IRA	LTM	RIP	RC
Site		RRSE	Evaluated	Completed		Underway	Future	Completed		Underway	Future	Status	Date	Date
RAAP-001		1A	GW	PA			RAC					F		200809
				SI			RD							
							RI							
RAAP-002		1A	SL	PA			RAC					F		200909
				SI			RD							
							RI							
RAAP-003		1A	SH	PA								N		199408
			SL	RI										
			WH	SI										
RAAP-004		3A	GW	PA			RAC					F		201209
				SI			RD							
							RI							
RAAP-005		1A	GW	PA		RI	RAC					F		200809
			SH	SI			RD							
			SL											
RAAP-006		2A	SL	PA								N		199210
				RI										
				SI										
RAAP-007		1A	GW	PA		RI						F		200609
				SI										
RAAP-008		1A	GW	PA			RAC					F		200909
			SH	SI			RD							
			WH				RI							
RAAP-009		1A	GW	PA			RAC					F		200609
			SL	SI			RD							
							RI							
RAAP-010		1A	SH	PA		RI	RAC					F		200909
				SI			RD							
RAAP-011		1A	GW	PA			RAC					F		200909
			SL	SI			RD							
			WH				RI							
RAAP-012		2A	GW	PA								N		199210
			SL	RI										
				SI										
RAAP-013		1A	GW	PA								F		199809
			SL	RI										
				SI										
RAAP-014		1A	GW	PA		RI	RAC	1				F		200409
			SH	SI			RD							
			SL											
RAAP-015		3A	GW	PA			RI					F		200709
				SI										
RAAP-016		1A	GW	PA		RI	RAC					F		200909
			SH	SI			RD							
			SL											
RAAP-017		3A	SH	PA								N		198412
				SI										
RAAP-018		1A	GW	PA		RI	RAC					F		200709
			SL	SI			RD							
RAAP-019		3A	GW	PA								N		199210
				RI										
				SI										
RAAP-020		3A	SH	PA			RI					N		201209
				SI										
RAAP-021		3A	SL	PA			RI					N		200209
				SI										
RAAP-022		3A	SH	PA								F		199210
			WH	RI										

Site		RRSE	Media Evaluated	Phase (s) Completed		Phase (s) Underway	Phase (s) Future	#IRA Completed		#IRA Underway	#IRA Future	LTM Status	RIP Date	RC Date
				SI										
RAAP-023		3A	SL	PA			RI					F		200709
				SI										
RAAP-024		1A	GW	PA			RAC					F		200609
				SI			RD							
							RI							
RAAP-025		3A	SL	PA								F		199809
				RI										
				SI										
RAAP-026		1A	GW	PA		RI						F		200210
			SL	SI										
RAAP-027		2A	SL	PA		RI						F		200509
				SI										
RAAP-028		3A	SL	PA		RI	RAC					F		200709
				SI			RD							
RAAP-029		1A	GW	PA		RI	RAC					F		200409
				SI			RD							
RAAP-030		1A	GW	PA		RI	RAC					F		200809
			SH	SI			RD							
			SL											
			WH											
RAAP-031		3A	SL	PA		RI	RAC					F		201109
				SI			RD							
RAAP-032		3A	SL	PA								N		198706
RAAP-033		1A	SL	PA								N		199804
				RI										
				SI										
RAAP-035		1A	SL	PA		RI						N		200212
				SI										
RAAP-036		1A	GW	PA								N		199812
			SH	RI										
			SL	SI										
			WH											
RAAP-037		3A	SL	PA			RAC					F		200709
				SI			RD							
							RI							
RAAP-038		1A	GW	PA			RAC					F		200609
				SI			RD							
							RI							
RAAP-039		1A	GW	PA								U		198812
			SL	RI										
				SI										
RAAP-040		1A	SL	PA		RI						N		200509
				SI										
RAAP-041		1B	GW	PA								U		198801
				RI										
				SI										
RAAP-042		1A	GW	PA								U		198810
				RI										
				SI										
RAAP-043		1A	GW	PA								U		198810
				RAC										
				SI										
RAAP-044		1B	SEF	PA		RI	RAC					F		200809
			SH	SI			RD							
			SL											
RAAP-045		1A	GW	PA		RI	RAC					F		200606
			SL				RD							
RRSE - Relative Risk Site Evaluation; Risk Category - 1=High, 2=Medium, 3=Low;														
Legal Agreement - A = with agreement, B = without agreement; C = Complete, U = Underway, F = Future, N = Not Applicable														
											Reporting Period End Date:		09/30/2000	

REM/IRA/RA ASSESSMENT

PAST REM/IRA/RA

- RFAAP-003, SWMU69: interim remedial measure (IRM) Excavated and properly disposed of soils in pond with high concentrations of metals from plating operation.
- RFAAP-023, SWMU 43: IRM Re-graded the site to prevent ponding of storm water and to improve site drainage.
- RFAAP-033, SWMU 68: IRM Excavated and properly disposed of soils similar to those at RFAAP-003, SWMU69.
- RFAAP-040, FLFA: IRM Excavated and properly disposed of soils with high concentrations of lead.
- RFAAP-044, NRU: IRM Excavated and properly disposed of soils and debris at the Building Debris Disposal Trench.
- RFAAP-044, NRU: IRM Excavated and properly disposed of soils with high concentrations of lead at the Western Burning Ground.

CURRENT REM/IRA/RA

- None underway. These will be identified in onging study efforts.

FUTURE REM/IRA/RA

Potential Accelerated Actions:

- RFAAP-001, SWMU 51: source removal
- RFAAP-005, SWMU 13: capping when operations cease
- RFAAP-010, SWMUs 35,37,38 & Area A: source removal
- RFAAP-011, SWMU 41: capping
- RFAAP-014, SWMU 54: source removal
- RFAAP-016, SWMU 39: source removal
- RFAAP-018, 013, 025, SWMUs 48, 49, 50: source removal
- RFAAP-028, SWMU 59: source removal
- RFAAP-038, AREA O: air sparging and source removal
- RFAAP-042, 043, HWMUs 5, 7: source removal
- RFAAP-044, NRU: source removal
- RFAAP-045, Bldg 4343: source removal

PRIOR YEAR FUNDING

FY76

INSTALLATION ASSESSMENT	$50.0 K

FY84

INSTALLATION REASSESSMENT	$50.0 K

FY90

VI/FI WORK PLANS	$270.7K
INSTALLATION SUPPORT	$29.2K
UNDERGROUND STORAGE TANKS (RFAAP)	$17.4K
	$317.3K

FY91

VI/FI FIELDWORK AND REPORT, PHASE I	$1,570.9K
INSTALLATION SUPPORT	$36.3K
	$1,607.2K

FY92

VI/FI PLANS, FIELDWORK, REPORT, PHASE II	$1,355.0K
SPLIT SAMPLES	$17.3K
	$1,372.3K

FY93

INSTALLATION SUPPORT (UNIT 69 RA)	$184.0K

FY94

$0K

FY95

CONDUCT RFIS AT SWMUS	$1,550.0K
CONDUCT VIS AT SWMU'S	$1,300.0K
	$2,850.0K

FY96

ACID SEWER INVESTIGATION	$752.0K
CMS AT SWMU 54	$263.0K
PHASE II VI/RFI (INCLUDED S68 IRA)	$330.0K
IRA AT SWMU 43	$100.0K
	$1,445.0K

PRIOR YEAR FUNDING

FY97

MONITORING	$558.0K
RD ON SWMUS 28/52	$15.0K
	$573.0K

FY98

RI/FS (SWMUs17,31,39,48,49,58 & NRU)	$1,804.2K
LTM	$160.0K
IRA (SWMU 54)	$1,899.9K
RD	$ 25.0K
	$3,889.1K

FY99

RFI/CMS (NRU& Bldg 4343)	$792.0K
RI/FS (Sewer Lines)	$360.7K
RFI/CMS (SWMU 48)	$915.3K
LTM (HWMUS 4,5,7,16	$429.5K
	$ 2497.5K

FY00

RI/FS Background Study, SWMUSs 54, 48, 39, 31)	$413.2 K
IRA (SWMU 54)	$ 305.4 K
RI/FS (NRU)	$ 127.1K
LTM (HWMUs 4,5,7,16)	$ 278.8K
	$1124.5K

Total prior year funds $15,959.9K

RADFORD ARMY AMMUNITION PLANT - 2001 COST TO COMPLETE - REQUIREMENTS

DSERTS NUMBER	SITE DESCRIPTION	RRSE	PHASE	2001	2002	2003	2004	2005	2006	2007+	SITE TOTAL	DESCRIPTION OF WORK
RAAP-001	TNT WASTE ACID NEUTRALIZATION PITS	HIGH	RI					539.0				RFI activities (soil and GW sampling); installation of 3 wells
	SWMU 51		RD						41.0			design for removal, treatment, and disposal of soil (haz waste); backfill, revegetate
			RAC							1,148.0		removal, treatment, and disposal of approx 900cy haz waste soil
			LTM							155.5	**1,883.5**	6 Wells, quarterly the first year, then 3 wells annually for 5 yrs
RAAP-002	FLASH BURN PARTS AREA SWMU 71	HIGH	RI							224.5	**224.5**	soil sampling
RAAP-005	WASTE PROPELLANT BURNING GROUND	HIGH	RI						676.3			RFI/CMS activities
	SWMU 13		RD							172.8		design for 20 acre site
			RAC							5,231.9		20 acre cap
			LTM							1,207.1	**7,288.1**	6 Wells, quarterly the first year, then 3 wells annually for 15 yrs
RAAP-009	LANDFILL NITRO AREA SWMU 40	HIGH	RI	265.0							**265.0**	RFI activities
RAAP-010	CASO4 DRYING BED	HIGH	RI							396.0		RFI at SWMU 35, 37, 38 and Area A
	SWMU 35		RD							27.2		design for removal, transportation and disposal of approx. 1500 cy of haz waste soil
			RAC							1,431.2	**1,854.4**	removal, transportation and disposal of approx. 1500 cy of haz waste soil
RAAP-011	RED WATER ASH BURIAL GROUND	HIGH	RI							504.9		RFI/CMS activities; includes installation of 3 wells
	SWMU 41		RD							66.4		design for cap/cover
			RAC							664.2		cap/cover construction
			LTM							799.0	**2,034.5**	4 wells, four wells will be sampled quarterly for one year, then 3 wells annually thereafter; five year reviews will be performed, LTM is anticipated to end in 2022.
RAAP-012	ACID WASTEWATER LAGOON, SWMU 6	HIGH	RI	38.7							**38.7**	closure documentation
RAAP-013	RED WATER ASH BURIAL 2 SWMU 49	HIGH	RI							78.6	**78.6**	closure documentation for SWMUs 49
RAAP-014	PROPELLANT BURNING ASH DISPOSAL AREA	HIGH	RI	655.1								RFI/CMS activities
	SWMU 54		RD			49.7						design for excavation and disposal of 1675 cy of haz waste soil
			RAC				1,243.8					excavation and disposal of 1675 cy of haz waste soil
			LTM				25.3	44.5	11.1	22.2	**2,051.7**	3 wells, quarterly the first year, then annually thereafter
RAAP-016	WASTEWATER PONDS FROM PROPELLANT INCINERATOR	HIGH	RI	214.7								RFI/CMS activities
	SWMU 39		RD			46.2						design for excavation and disposal of haz waste soil
			RAC							1,855.0		Approximately 7400 cy of soil will be excavated. It is anticipated that approximately 1800 cy of soil will be disposed as hazardous waste. The remaining soil will be disposed as appropriate.
			LTM							170.8	**2,286.7**	8 wells, sampled quarterly, then 8 wells annually thereafter.
RAAP-018	OILY WATER BURIAL AREA	HIGH	RI	214.7								RFI/CMS activities
	SWMU 48		RD				209.2					design for excavation
			RAC							5,242.7		Approximately 23,703 will be excavated, but only 5000 cy of soil will be removed, transported and disposed as hazardous waste and the remainder will be disposed as appropriate.
			LTM							179.6	**5,846.2**	8 wells, sampled quarterly, then 8 wells annually thereafter.

RADFORD ARMY AMMUNITION PLANT - 2001 COST TO COMPLETE - REQUIREMENTS

DSERTS NUMBER	SITE DESCRIPTION	RRSE	PHASE	2001	2002	2003	2004	2005	2006	2007+	SITE TOTAL	DESCRIPTION OF WORK
RAAP-021	PROPELLANT BURIAL SWMU 46	LOW	RI		38.7						**38.7**	closure documentation
RAAP-022	PONDS BY BLDS 4931, 4932 SWMU 57	LOW	RI							38.7	**38.7**	closure documentation
RAAP-023	SANITARY LANDFILL NO. 2 SWMU 43	LOW	RI							199.1	**199.1**	RFI activities (soil and groundwater sampling to verify data results from VI)
RAAP-024	LANDFILL NO. 3 SWMU 45	HIGH	RI				255.5				**255.5**	limited soil sampling and resampling of existing wells to confirm VI results
RAAP-025	CASO4 TREATMENT/ DISPOSAL AREA, SWMU 50	LOW	RI							78.6	**78.6**	closure documentation
RAAP-026	COAL ASH SETTLING LAGOONS, SWMU 31	HIGH	RI	103.7							**103.7**	limited soil, surface water and groundwater sampling to confirm VI results
RAAP-027	RUBBLE PILE, SWMU 58	MED	RI					204.5			**204.5**	soil sampling to confirm VI results
RAAP-028	BOTTOM ASH PILE SWMU 59	LOW	RI			573.4						RFI/CMS activities
			RD				86.0					design for excavation and disposal of 3700 cy of haz waste soil
			RAC							3,453.3		excavation and disposal of 3700 cy of haz waste soil
			LTM							139.2	**4,251.9**	6 wells, quarterly for one year, then annually thereafter
RAAP-031	CASO4 TREATMENT/ DISPOSAL AREA, AREA Q	LOW	RI							230.0	**230.0**	RFI activities (soil and groundwater sampling to verify data results from VI)
RAAP-033	CHROMIC ACID TREATMENT TANKS SWMU 68	HIGH	RI			8.0					**8.0**	site screening/closure documentation
RAAP-037	BATTERY STORAGE AREA AREA P	LOW	RI					435.1				RFI/CMS (soil and groundwater sampling; includes well installation, but Radford is considering hydropunch method)
			RD						7.0			design for removal, transportation and disposal of approx. 100 cy of haz waste soil
			RAC							159.8	**601.9**	removal, transportation and disposal of approx.100 cy of haz waste soil
RAAP-038	UNDERGROUND FUEL OIL SPILL AREA O	HIGH	RI				209.8					RFI/CMS
			RD					68.0				design for soil excavation and air sparge system
			RAC						1,034.1			The assumed remedial action for soil is removal and disposal of approximatley 500cy. Groundwater remedial action is assumed to be air sparging.
			LTM							232.7	**1,544.6**	3 wells, quarterly the first year, then annually thereafter
RAAP-039	HAZARDOUS WASTE LANDFILL	HIGH	RFI	122.0	122.0	122.0	729.1					Periodic GW monitoring for the first 3 years; 4th year will perform RFI.
	HWMU 16		LTM					122.0	122.0	2,276.0	**3,615.1**	LTM, 20 wells, quarterly for 10 years, then semi-annually for 20 yrs (explosives and VOCs)
RAAP-040	FORMER LEAD FURNACE AREA	HIGH	LTM					78.6			**78.6**	closure documentation
RAAP-041	SURFACE IMPOUNDMENT #4, HWMU 4	HIGH	LTM	122.0	122.0	122.0	122.0	122.0			**610.0**	10 wells, quarterly for 5 years
RAAP-042	SURFACE IMPOUNDMENT #5, HWMU 5	HIGH	RD	122.0	122.0	139.4						$17.4K for the design for removal, transportation and disposal of approx.100 cy of haz waste soil; $122 for GW sampling (10 wells quarterly)
			RA(C)				246.4					$124.6K for removal, transportation and disposal of approx.100 cy of haz waste soil; $122K for GW sampling
			LTM					122.0	122.0		**873.8**	10 wells, quarterly

RADFORD ARMY AMMUNITION PLANT - 2001 COST TO COMPLETE - REQUIREMENTS

DSERTS NUMBER	SITE DESCRIPTION	RRSE	PHASE	2001	2002	2003	2004	2005	2006	2007+	SITE TOTAL	DESCRIPTION OF WORK
RAAP-043	SURFACE IMPOUNDMENT #7, HWMU 7	HIGH	RD	122.0	139.4							$17.4K for the design for removal, transportation and disposal of approx.100 cy of haz waste soil; $122 for GW sampling (10 wells quarterly)
			RA(C)			246.4						$124.6K for removal, transportation and disposal of approx.100 cy of haz waste soil; $122K for GW sampling
			LTM				122.0	122.0			**751.8**	10 wells, quarterly
RAAP-044	NEW RIVER UNIT	HIGH	RI	795.9								RFI/CMS activities
			RD						132.1			design for excavation and disposal of approx. 9100cy, with 2700cy disposed as haz waste for the Northern Burning Area
			RAC							4,070.4	**4,998.4**	excavation and disposal of approx. 9100cy, with 2700cy disposed as haz waste
RAAP-045	BLDG 4343	HIGH	RI			384.7						RFI/CMS activities
			RD				32.6					design for excavation and disposal of approx. 450cy disposed as haz waste
			RAC					545.6				excavation and disposal of approx. 450cy disposed as haz waste
			LTM					31.3	53.7	30.3	**1,078.2**	6 wells, quarterly for one year, then 3 wells annually thereafter
			TOTAL:	**2,775.8**	**544.1**	**1,691.8**	**3,281.7**	**2,434.6**	**2,199.3**	**30,485.7**	**43,413.0**	
POM				**3043.0**	**2176.0**	**1540.0**	**3591.0**	**5000.0**	**7000.0**	**9000.0**		
DIFFERENCE				**-267.2**	**-1631.9**	**151.8**	**-309.3**	**-2565.4**	**-4800.7**	**21485.7**		
				2001	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**		

COMMUNITY INVOLVEMENT

The surrounding community for Radford AAP included the counties of Montgomery (Pop. 73,913), Pulaski (Pop. 34,496), Floyd (Pop. 12,005), Giles (Pop. 16,366) and the City of Radford (Pop. 15,940).

In February 1995 and January 1998 we conducted surveys to determine if enough community interest existed to sustain a Restoration Advisory Board.

February 1995 and January 1998, RFAAP with the assistance of the US Army Environmental Center conducted community interviews with residents of the surrounding counties and city, and placed two newspaper advertisements soliciting community members to volunteer for RAB positions. In June 1998, RFAAP held a public meeting to share information about the RFAAP cleanup program and about forming a RAB. August 1998, RFAAP held first RAB style meeting in which the Community Co-chair person was selected. In September 1999, an information repository was established at the Montgomery Floyd Regional Library, Christiansburg Branch consistent with RAB recommendation.

RAB activities to date have included bi-monthly meetings with regulators present, plant tours, and project and program status briefings.

RFAAP is committed to involving the public in the restoration program and will do all we can to make it a success.

DEFENSE SITE ENVIRONMENTAL RESTORATION TRACKING SYSTEM

Installation, 7. RAB REPORT 10/23/2000

Command: AMC **SubCommand** OSC
Installation: RADFORD AAP

RAB Established Date: 199807 **Reason RAB Not Establish:**
RAB Adjourned Date: **Reason RAB Adjourned:**

TRC Date:

RAB Community Members: **Total RAB Community Members: 7**
Business Community
RAB Government Members: **Total RAB Government Members: 7**
Environmental Protection Agency
RAB Activities:
Advice On Scope/Sch Studies/Cleanup
RAB Advice
Remedy Selection
TAPP Application Approval Date:
TAPP Project Title: 09/30/2000
TAPP Project Description:

Award Number	Purchase Order Award Date	Completion Date