

**FY2012**

**REDSTONE ARSENAL**

**Army Defense Environmental Restoration Program**

**Installation Action Plan**

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## Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multiyear cleanup program for an installation. The plan identifies environmental cleanup requirements at each site or area of concern (AOC) and proposes a comprehensive, installation-wide approach, along with the costs and schedules associated with conducting investigations and taking the necessary remedial actions (RA).

In an effort to coordinate planning information between the restoration manager, the US Army Environmental Command (USAEC), Redstone Arsenal (RSA), the Installation Management Command (IMCOM), the executing agencies, regulatory agencies and the public, an IAP was completed. The IAP is used to track requirements, schedules, and budgets for all major Army installation cleanup programs.

All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is, therefore, subject to change.

## Acronyms

AI	Active/Inactive
AAFES	Army, Air Force Exchange Services
ABMA	US Army Ballistic Missile Agency
ACA	Army Contracting Agency
ADEM	Alabama Department of Environmental Management
AEDB-CC	Army Environmental Database - Compliance-related Cleanup
AEDB-R	Army Environmental Database-Restoration
AHWMMA	Alabama Hazardous Wastes Management and Minimization Act
AMC	Army Materiel Command
AMCOM	Aviation and Missile Command
AOC	Area of Concern
AP	Armor Piercing
ARBCA	Alabama Risk Based Corrective Action
ARFO	Artillery Ammunition Returned from Overseas
ARS	Advance Range Survey
AST	Aboveground Storage Tank
BA	Borrow Area
bgs	below ground surface
BHC	Beta-hexachlorocyclohexane
BHHRA	Baseline human health risk assessment
BRAC	Base Realignment and Closure
BSV	background screening value
BTEX	Benzene, Ethylbenzene, Toluene and Xylene
CAIS	Chemical Agent Identification Set
CAP	Corrective Action Plan
CC	Compliance-related Cleanup
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CG	Chlorine Phosgene
CMI	Corrective Measures Implementation
CMI(C)	Corrective Measures Implementation (Construction)
CMI(O)	Corrective Measures Implementation (Operation)
CMS	Corrective Measures Study
COC	Contaminant of Concern
CR	Compliance Restoration
CTC	Cost-to-Complete
CTT	Closed, Transferred or Transferring
CVAA	Chloro Vinyl Arsenous Acid (a breakdown product of lewisite)
CWM	Chemical Warfare Materials
CWS	Chemical Warfare System
cy	cubic yard
D.O.T.	Department of Transportation
DAF	Dilution Attenuation Factor
DCA	dichloroethane
DCE	Dichloroethylene
DD	Decision Document

## Acronyms

DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethene
DDT	Dichlorodiphenyltrichloroethane
DERP	Defense Environmental Restoration Program
DGM	Digital Geophysical Mapping
DIA	Defense Intelligence Agency
DMM	Discarded Military Munitions
DNAPL	Dense Non-aqueous Phase Liquid
DoD	Department of Defense
DOI	Department of Interior
DPT	Direct-push Technology
DRMO	Defense Reutilization and Marketing Office
DRO	Diesel-range Organics
DWEL	Drinking Water Equivalent Level
EDS	Explosive Detection System
EE/CA	Engineering Evaluation/Cost Analysis
EOD	Explosive Ordnance Disposal
ER,A	Environmental Restoration, Army
ERH	Electrical Resistive Heating
ERM	Environmental Restoration Manager
ESTCP	Environmental Security Technology Certification Program
FFA	Federal Facilities Agreement
FFS	Focused Feasibility Study
FRA	Final Remedial Action
FRCM	Final Report of Corrective Measure
FS	Feasibility Study
ft	feet
FTA	Fire Training Area
FUDS	Formerly Used Defense Site
FY	Fiscal Year
GAF	General Aniline and Film Corporation
GCD	Gulf Chemical Depot
GCWS	Gulf Chemical Warfare Service
gpm	gallons per minute
GRO	Gasoline Range Organics
GW	Groundwater
H	mustard
HAL	Health Advisory Level
HC	Hexachloroethane
HE	High Explosive
HMX	Cyclotetramethylenetetranitramine
HRC	Hydrogen Releasing Compound
HRR	Historical Records Review
HSB	Huntsville Spring Branch
HVA	Huntsville Arsenal

## Acronyms

HVAC	Heating, ventilating, and air conditioning
IAP	Installation Action Plan
IBF	Incendiary Bomb Filled
IC	Indian Creek
IM	Interim Measure
IMCOM	Installation Management Command
IOU	Integrator Operable Unit
IRA	Interim Remedial Action
IRFA	Interim RCRA Facility Assessment
IROD	Interim Record of Decision
IRP	Installation Restoration Program
ISP	Internet Service Provider
ISTD	In Situ Thermal Destruction
IW	Installation-Wide
K	thousand
kg	kilogram
L	Lewisite
LDA	Large Diameter Augers
LDR	Land Disposal Restrictions
LF	Landfill
LNAPL	Light Nonaqueous Phase Liquid
LSA	Limited Site Assessment
LTM	Long-Term Management
LTO	Long-Term Operations
LUC	Land Use Control
mag	Magnetometer
MBOCA	Methylene bis 2,4 aniline
MC	Munitions Constituent
MCL	Maximum Contaminant Level
MEC	Munitions and Explosives of Concern
mg/kg	milligrams per kilogram
MICOM	US Army Missile Command
mm	millimeter
MMRP	Military Munitions Response Site
MNA	Monitored Natural Attenuation
MOA	Memorandum of Agreement
MPE	Multiphase Extraction
MRA	Munitions Response Area
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
MSFC	George C. Marshall Space Flight Center
MTBE	Methyl Tertiary Butyl Ether (Gasoline additive)
N/A	Not Applicable
NAPL	Non-aqueous Phase Liquid
NASA	National Aeronautics and Space Administration

## Acronyms

NBA	Northern Burial Area
NC	Nitrocellulose
NDAA	National Defense Authorization Act
NFA	No Further Action
NG	Nitroglycerin
NPL	National Priorities List
NTCRA	Non-Time-Critical Removal Action
O&M	Operations and Maintenance
OB	Open Burning
OD	Open Detonation
ODUSD(I&E)	Office of the Deputy Under Secretary of Defense for Installations and Environment
OE	Ordnance and Explosives
OMEMS	Ordnance Munitions and Electronics Maintenance School
OSA	Open Storage Area
OU	Operable Unit
OWS	Oil/Water Separator
P&T	Pump-and-Treat
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbons
PBA	Performance-Based Acquisition
PBC	Performance-Based Contract
PCB	Polychlorinated Biphenyl
PEO	Program Executive Office
PF	Petroleum Free
PLM	Professional Labor Management
PMC	Program Management Contract
POL	Petroleum, Oil and Lubricants
POW	Prisoner of War
PP	Proposed Plan
PRE	Preliminary Risk Evaluation
PRG	Preliminary Remediation Goal
PRO	Petroleum Range Organics
PSA	Potential Source Area
PSV	Preliminary Screening Value
PTSM	Principal Threat Source Material
R&D	Research and Development
RA	Remedial Action
RA(C)	Remedial Action (Construction)
RA(O)	Remedial Action (Operation)
RAB	Restoration Advisory Board
RAGS	Risk Assessment Guidance for Superfund
RARE	Redstone Arsenal Rocket Engine
RAWP	Response Action Work Plan
RBC	Risk-Based Concentration
RC	Response Complete

## Acronyms

RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	Triazacyclohexane
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RGO	Remedial Goal Option
RIP	Remedy-in-Place
ROD	Record of Decision
ROP	Redstone Ordnance Plant
RSA	Redstone Arsenal
RSL	regional screening level
SAC	Site Access Control
SC&RA	Site Characterization and Removal Assessment
SED	Software Engineering Directorate
sf	square feet
SHPO	State Historical Preservation Office
SI	Site Inspection
SLERA	Screening Level Ecological Risk Assessment
SMF	Smoke Munitions Filling
SPLP	Synthetic Precipitation Leachate Procedure
SRA	Screening Risk Assessment
SSL	Site-specific Screening Level
STP	Sewage Treatment Plant
STS	Space Transportation System
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TAPP	Technical Assistance for Public Participation
TC	Thionyl Chloride
TCA	Trichloroethylene
TCE	Trichloroethylene
TCLP	Toxicity Characteristic Leaching Protocol
TCRA	Time-Critical Removal Action
TDG	Thiodiglycol
TERC	Total Environmental Restoration Contract
TI	Technical Impracticability
TNT	Trinitrotoluene
TO	Task Order
TOW	Tube-launched, Optically-Aimed, Wired-Guided
TPH	Total Petroleum Hydrocarbons
TSA	Temporary Storage Area
TVA	Tennessee Valley Authority
ug/L	micrograms per liter
UIC	Underground Injection Control

## Acronyms

USACE	US Army Corps of Engineers
USAEC	US Army Environmental Command
USATHAMA	US Army Toxic and Hazardous Material Agency
USEPA	US Environmental Protection Agency
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound
VSI	Visual Site Inspection
WMM	Waste Military Munitions
WP	White Phosphorus
WWII	World War II

## Acronym Translation Table

### CERCLA

Preliminary Assessment(PA)  
Site Inspection(SI)  
Remedial Investigation/Feasibility Study(RI/FS)  
Remedial Design(RD)  
Remedial Action (Construction)(RA(C))  
Remedial Action (Operation)(RA(O))  
Long Term Management(LTM)  
Interim Remedial Action(IRA)

### RCRA

= RCRA Facility Assessment(RFA)  
= Confirmation Sampling(CS)  
= RCRA Facility Investigation/Corrective Measures Study(RFI/CMS)  
= Design(DES)  
= Corrective Measures Implementation (Construction)(CMI(C))  
= Corrective Measures Implementation (Operation)(CMI(O))  
= Long Term Management(LTM)  
= Interim Measure(IM)

### CERCLA

Preliminary Assessment(PA)  
Remedial Investigation(RI)  
Feasibility Study(FS)  
Remedial Design(RD)  
Remedial Action (Construction)(RA(C))  
Remedial Action (Operation)(RA(O))  
Long Term Management(LTM)  
Interim Remedial Action(IRA)

### RCRA Underground Storage Tank (UST) Site Phase Terms

= Initial Site Characterization(ISC)  
= Investigation(INV)  
= Corrective Action Plan(CAP)  
= Design(DES)  
= Implementation (Construction)(IMP(C))  
= Implementation (Operations)(IMP(O))  
= Long Term Management(LTM)  
= Interim Remedial Action(IRA)

## Site Alias List

### AEDB-R Site ID to Alias List

<b>AEDB-R #</b>	<b>Alias</b>
CCRSA-266	RSA-266
CCRSA-308	RSA-308
CCRSA-309	RSA-309
CCRSA-310	RSA-310
CCRSA-311	RSA-311
CCRSA-314	RSA-314
CCRSA-315	RSA-315
CCSWMU-003	RSA-003
CCSWMU-008	RSA-008
CCSWMU-009	RSA-009
CCSWMU-028	RSA-028
CCSWMU-030	RSA-030
CCSWMU-031	RSA-031
CCSWMU-035	RSA-035
CCSWMU-116	RSA-116
CCSWMU-143	Bldg 3234
CCSWMU-222	RSA-222
CCSWMU-240	RSA-240
CCSWMU-241	RSA-241
CCSWMU-242	RSA-242
CCSWMU-243	RSA-243
CCSWMU-245	RSA-245
CCSWMU-246	RSA-246
CCSWMU-247	RSA-247
CCSWMU-248	RSA-248
CCSWMU-268	RSA-268
CCSWMU-283	RSA-283
CCSWMU-284	RSA-284
CCSWMU-286	RSA-286
CCSWMU-287	RSA-287
CCSWMU-288	RSA-288
CCSWMU-289	RSA-289
CCSWMU-290	RSA-290
CCSWMU-291	RSA-291
CCSWMU-293	RSA-293
CCSWMU-304	RSA-304
CCSWMU-305	RSA-305
CCSWMU-306	RSA-306
CCSWMU-E	RSA-E
CCSWMU-F	RSA-F
MSFC-003-R-01	MSFC-003
MSFC-027	
MSFC-033A	MSFC-033A

## Site Alias List

MSFC-034	
MSFC-035	
MSFC-053	
PBA@MR Redston	
PBCatRedstone	FY05 PBC
RSA-005	OU-02
RSA-013	OBOD
RSA-014	OBOD
RSA-032	GCWD
RSA-045	PA3
RSA-048	DA
RSA-049	HA1
RSA-050	
RSA-053	DDT
RSA-054	DA
RSA-056	HA2
RSA-057	HA2
RSA-058	DDT
RSA-059	DA
RSA-060	DDT
RSA-065	GCWD
RSA-067	GCWD
RSA-069	GCWD
RSA-072-R-01	RSA-282
RSA-083	OFFSITE
RSA-087	OFFSITE
RSA-088	OFFSITE
RSA-095	OFFSITE
RSA-096	OFFSITE
RSA-109	DEMIL
RSA-112	DEMIL
RSA-113	DEMIL
RSA-114	DEMIL
RSA-115	
RSA-117	DDT
RSA-122	HA2
RSA-126	HA2
RSA-134	DEMIL
RSA-135H	SP
RSA-138M	NP
RSA-139	HA2
RSA-140	DA
RSA-141-R-01	RSA-141

## Site Alias List

RSA-142	OFFSITE
RSA-143	Bldg 3240
RSA-145	GW
RSA-146	GW
RSA-147	GW
RSA-148	GW
RSA-149	GW
RSA-150	GW
RSA-151	GW
RSA-152	GW
RSA-153	GW
RSA-154	GW
RSA-155	GW
RSA-156	GW
RSA-157	GW
RSA-183	HA1
RSA-187	NP
RSA-191	NP
RSA-192	OFFSITE
RSA-193	NP
RSA-194	NP
RSA-195	OFFSITE
RSA-198	OFFSITE
RSA-199	NP
RSA-200	OFFSITE
RSA-201	NP
RSA-203	NP
RSA-204	OFFSITE
RSA-205	NP
RSA-206	OFFSITE
RSA-207	OFFSITE
RSA-208	SP
RSA-209	OFFSITE
RSA-210	SP
RSA-211	SP
RSA-212	SP
RSA-213	SP
RSA-215	OFFSITE
RSA-217	ROP SERVIC
RSA-218	ROP SERVIC
RSA-219	ROP SERVIC
RSA-220	ROP SERVIC
RSA-221-R-01	RSA-221

## Site Alias List

RSA-225	PA3
RSA-226	DA
RSA-227	DA
RSA-228	PA3
RSA-230	DA
RSA-231	PA3
RSA-233	PA3
RSA-234-R-01	RSA-234
RSA-237	SP
RSA-238	HAMUST56
RSA-239	NP
RSA-249-R-01	RSA-249
RSA-250	HAMUST56
RSA-252	DDT
RSA-253	POL
RSA-255	GCWD
RSA-258	TA2
RSA-261	TA2
RSA-262	GCWD
RSA-263	POL
RSA-265	GCWD
RSA-269	TA2
RSA-271	POL
RSA-272	POL
RSA-273	NP
RSA-274	SP
RSA-275	ROP SERVIC
RSA-276	POL
RSA-278-R-01	RSA-278
RSA-280-R-01	RSA-280
RSA-285-R-01	RSA-285
RSA-294-R-01	RSA-294
RSA-312-R-01	RSA-312
RSA-313-R-01	RSA-313
RSA-A	SP

# Installation Information

## Installation Locale

**Installation Size (Acreage):** 38300

**City:** Huntsville

**County:** Madison

**State:** Alabama

## Other Locale Information

The RSA occupies approximately 38,300 acres in Madison County, Alabama. The Department of Interior (DOI) owns approximately 4,100 acres of this property and the Tennessee Valley Authority (TVA) owns 2,900 acres. Another 1,841 acres in the interior of RSA comprise the George C. Marshall Space Flight Center (MSFC) of the National Aeronautics and Space Administration (NASA).

The RSA is bounded on the north and east by the city of Huntsville, on the west by the city of Madison, on the west and southwest by Wheeler National Wildlife Refuge, and on the south by the Tennessee River. Huntsville has a population of nearly 165,000; Madison County population is about 320,000. Approximately 330 military families reside in government quarters on RSA and approximately 34,000 government employees and contractors work at the facility.

## Installation Mission

The primary mission of RSA is the development, acquisition, testing, fielding, and sustainment of aviation and missile weapon systems. Most of the installation tenants support this effort; however, RSA is also home to such diverse activities as training for handling explosives and ordnance devices, Defense Intelligence Agency (DIA) activities, and the production of iron carbonyl. The RSA is home to over 70 different tenant organizations.

## Lead Organization

### Lead Executing Agencies for Installation

US Army Corps of Engineers (USACE)

Army Contracting Agency (ACA)

### Regulator Participation

#### Federal

US Environmental Protection Agency (USEPA), Region IV, Atlanta, Georgia  
US DOI, Fish and Wildlife Service, Decatur, Alabama

#### State

Alabama Department of Environmental Management (ADEM), Special Projects Office,  
Montgomery, Alabama  
Alabama Partnering Initiative (Risk Managers Partnering Agreement)

### National Priorities List (NPL) Status

A score of 33.5 was recorded on 01-JUN-94.

**Date for RA(C) Completion:** 201704

**Date for NPL Deletion:** TBD

### Installation Restoration Advisory Board (RAB)/Technical Review Committee (TRC)/Technical Assistance for Public Participation (TAPP) Status

The community has expressed no sufficient, sustained interest in a RAB.

### Installation Program Summaries

#### IRP

**Primary Contaminants of Concern:** Chemical weapon munitions (CWM)/Chemical agent, Explosives, Metals, Perchlorate, Pesticides, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC), White Phosphorous

**Affected Media of Concern:** Groundwater, Other (Surface and Subsurface Soil), Sediment, Soil, Surface Water

#### MMRP

**Primary Contaminants of Concern:** Munitions and explosives of concern (MEC)

**Affected Media of Concern:** Soil

#### CR

**Primary Contaminants of Concern:** Metals, Perchlorate, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

**Affected Media of Concern:** Groundwater, Soil

## 5-Year / Periodic Review Summary

### 5-Year / Periodic Review Summary

Status	Start Date	End Date	End FY
Complete	201104	201209	2012

### Last Completed 5-Year / Periodic Review Details

Associated ROD/DD Name	Sites
DECISION DOCUMENT FOR RSA-215	RSA-215
RECORD OF DECISION FOR RSA-049	RSA-049
RECORD OF DECISION FOR RSA-057	RSA-057
RECORD OF DECISION FOR RSA-145	RSA-145
RECORD OF DECISION FOR RSA-146	RSA-146
RECORD OF DECISION FOR RSA-149	RSA-149
RECORD OF DECISION FOR RSA-150	RSA-150
RECORD OF DECISION FOR RSA-151	RSA-151
RECORD OF DECISION FOR RSA-152	RSA-152
RECORD OF DECISION FOR RSA-153	RSA-153
RECORD OF DECISION FOR RSA-154	RSA-154
RECORD OF DECISION FOR RSA-155	RSA-155
RECORD OF DECISION FOR RSA-156	RSA-156

**Results** The installation wide groundwater and RSA-057 remedies are currently considered protective of human health and the environment.

Results at RSA-049 indicate that more groundwater data is needed in order to make a determination.

**Actions** The Memorandum of Agreement (MOA) with surrounding local and state governments is still being negotiated.

RSA-049: several wells could not be sampled due to a lack of water.

RSA-057: Vapor intrusion had not been investigated at the site.

**Plans** Continue coordination with surrounding government agencies to establish a final MOA document.

Replacement wells are being proposed for monitoring at RSA-049.

An evaluation of vapor intrusion will occur prior to construction at RSA-057

### Recommendations and Implementation Plans:

--

## Land Use Control (LUC) Summary

**LUC Title:** Groundwater IOD

**Site(s):** RSA-145, RSA-146, RSA-147, RSA-148, RSA-149, RSA-150, RSA-151, RSA-152, RSA-153, RSA-154, RSA-155, RSA-156, RSA-157

**ROD/DD Title:** Installation-wide Groundwater IROD

**Location of LUC**

Installation-wide control on the use of groundwater, including seeps and springs

**Land Use Restriction:** Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Media specific restriction - restrict withdrawal or use of groundwater for agricultural/irrigation purposes, Media specific restriction - restrict withdrawal or use of groundwater w/out treatment

**Types of Engineering Controls:** Markers, Signs

**Types of Institutional Controls:** Construction Permit, Deed Notices, Deed Restrictions, Dig Permits, Notations in Master Plan, Restrictions on Groundwater Withdrawal

**Date in Place:** 200907

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** N/A

**LUC Enforcement:** Annual Inspections, 5 Year Reviews, Markers, Transferee Reporting

**Contaminants:** METALS, NITRATE/NITRITE, NITROAROMATICS, ORGANICS, PCBs, PESTICIDES, PETROLEUM HYDROCARBON, VOC

**Additional Information**

N/A

**LUC Title:** LUC for RSA-049

**Site(s):** RSA-049

**ROD/DD Title:** RECORD OF DECISION FOR RSA-049

**Location of LUC**

RSA-049 site boundary. North of Digney Rd., West of Toftoy.

**Land Use Restriction:** Landfill restriction - Prohibit activities that would impact the LF cap (or cover system) and drainage system, Landfill restriction - Prohibit excavation on LF cap or cover system, Landfill restriction - Prohibit installation of utility system lines through the site, Landfill restriction - Restrict access to the site, Landfill restriction - Restrict construction of buildings that may interfere with LF cap or cover system, Landfill restriction - Restrict plantings that interfere LF cap or cover system (roots that penetrate the cap or cover system), Landfill restriction - Restrict vehicular traffic, Media specific restriction - Prohibit, or otherwise manage excavation, Media specific restriction - Prohibit, or otherwise manage excavation below a specified depth, Media specific restriction - restrict drinking water well installation, Media specific restriction - restrict withdrawal or use of groundwater for agricultural/irrigation purposes, Media specific restriction - restrict withdrawal or use of groundwater w/out treatment, Restrict land use - Mitigation area(s) protection, Restrict land use - No daycare/hospital/school use, Restrict land use - No residential use

**Types of Engineering Controls:** Fences, Signs

**Types of Institutional Controls:** Construction Permit, Deed Restrictions, Dig Permits, Notations in Master Plan, Restrictions on Groundwater Withdrawal, Restrictions on land use

**Date in Place:** 200805

**Modification Date:** N/A

## Land Use Control (LUC) Summary

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 200805

**LUC Enforcement:** Annual Inspections, 5 Year Reviews, Markers, Transferee Reporting

**Contaminants:** METALS

**Additional Information**

N/A

**LUC Title:** RSA-057 Land use control

**Site(s):** RSA-057

**ROD/DD Title:** RECORD OF DECISION FOR RSA-057

**Location of LUC**

RSA-057, 1700 ft. South-southwest of intersection of Patton and Martin Roads.

**Land Use Restriction:** Media specific restriction - Prohibit, or otherwise manage excavation below a specified depth, Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Media specific restriction - restrict drinking water well installation, Media specific restriction - restrict withdrawal or use of groundwater for agricultural/irrigation purposes, Media specific restriction - restrict withdrawal or use of groundwater w/out treatment, Restrict land use - No daycare/hospital/school use, Restrict land use - No residential use

**Types of Engineering Controls:** Signs

**Types of Institutional Controls:** Construction Permit, Deed Notices, Dig Permits, Notations in Master Plan, Notices (in the grantor/grantee index, newspapers, etc.), Restrictions on land use, Zoning

**Date in Place:** 201101

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Installation

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 201101

**LUC Enforcement:** Annual Inspections, 5 Year Reviews, Markers

**Contaminants:** METALS

**Additional Information**

N/A

# Cleanup Program Summary

## Installation Historic Activity

The RSA is an active US Army installation and is currently home to the US Army Aviation and Missile Command (AMCOM) and various other tenant organizations. On Oct. 1, 2003 the US Army Garrison - RSA became part of the US Army Installation Management Agency (now the IMCOM) - Southeast Region Office. The Redstone Army Garrison is responsible for the physical facilities and real property including environmental compliance and the installation restoration program (IRP) associated with that property.

The land area of the present RSA includes three separate military facilities originally established in 1941: the Redstone Ordnance Plant (ROP) (later Redstone Arsenal), the Huntsville Arsenal (HVA), and the Gulf Chemical Warfare Depot. These three facilities worked together to produce conventional and chemical munitions for use during World War II (WWII) from 1942 to 1945. The responsibilities for weapon production were separated as follows:

### HVA

The HVA covered the largest area and was composed of three production plants (Plant No. 1, No. 2, and No. 3), an airfield and associated bomb and other test ranges, and administrative/support areas. The three plants produced a variety of chemical warfare materials (CWM). Both Plant No. 1 and Plant No. 2 produced chemical warfare agents [mustard gas (H) and lewisite (L)], chlorine phosgene (CG), and white phosphorous (WP). Later tear/vomit gas - adamsite was produced in a plant south of the original Plant No. 3 boundary and thionyl chloride (TC) in a plant northwest of the Plant No. 2 chlorine facility. Plant No. 3 produced smoke munitions and gel-type incendiaries. Ultimately, HVA became the sole manufacturer of colored smoke munitions. During WWII more than 27 million items of chemical munitions were produced.

To support the development and proof testing of munitions, HVA included an airfield and test ranges for aerial bombing, mortar and other munitions testing. These areas were located on the northwest and western portion of the current facility. Over eight million pounds of munitions were dropped or fired at these test range areas.

Since the facilities were designed to be self-sufficient, each facility had a power plant and sewage treatment facilities as well as other administrative and support facilities (motor pool, warehouses, etc.).

### ROP

Munitions (artillery shells, mortars, bombs, etc.) were filled with CWM (H, L, WP, CG, smoke, gel-type incendiary material, etc.) at one of the three HVA facilities and then transported by railroad to ROP for final assembly, including installation of any fusing, burster tube, or other explosive configuration. The ROP also produced explosives items, primarily explosive blocks poured from tetryl or composition B. The ROP consisted of six assembly/production lines. Like the HVA, the open style construction enabled rapid change-over from production of one type of munitions item to another.

Prior to arrival at the ROP, the munitions casing was filled but not explosively configured (weaponized). After final assembly of explosively configured munitions, they were transported to Gulf Chemical Depot (GCD) for storage in bunkers, igloos, and other structures meeting explosives-safety requirements.

From the depot, they were transported off-site by either railroad or ship from the dock area. There were two railroad classification yards that were used to load and assemble ordnance trains for movement. In January 1943, the name was changed to the RSA.

### GCD

The GCD stored and shipped the munitions as well as bulk chemicals and equipment associated with decontamination. Numerous chemical manufacturing plants were operated at the three facilities to produce raw material for toxic agents, as well as to manufacture the agents themselves.

The depot facilities in 1942 included seven warehouses, 370 igloos, 55 aboveground magazines, and outdoor areas to store various types of ammunition, bombs, and chemicals. The toxic gas yard received 500,000 pounds of H as its initial shipment in early-1942. Shipments of phosgene, carbon tetrachloride, and WP followed.

The primary receipt and shipment location was the dock area located on the southwest corner of the facility. Immediately after WWII, the GCD stopped processing ammunition for shipment, and in turn became a focal point for the return of munitions from shipping ports or overseas. In November 1945, an average of 869 tons were received per day. The depot demilitarized, decontaminated, and stored surplus chemical munitions and agents, as well as captured German chemical agents.

# Cleanup Program Summary

## Installation Historic Activity

Between 1945 and 1949, all three military units reduced activities to standby status levels. On Jan. 15, 1947, the functions of the GCD were incorporated into those of the HVA, and subsequently the HVA was declared surplus. On March 31, 1949, the Army planned to sell HVA and designated the RSA as caretaker of the HVA properties. Due primarily to the nature of CWM produced at the facility and demilitarization/decontamination activities after WWII, a decision was made not to sell the facility.

In February 1949 the research and development (R&D) division, forerunner of the Ordnance Rocket Center, was established at RSA. The RSA was reactivated on June 1, 1949 to perform basic R&D in rocketry. The Chief of Ordnance designated RSA as the site of the Ordnance Rocket Center and the three separate facilities were combined in 1950 into the present day installation. On Oct. 28, 1949, the Secretary of the Army approved the transfer of the Ordnance R&D Division Sub-Office (Rocket) at Fort Bliss, Texas, to RSA. In 1956, the US Army Ballistic Missile Agency (ABMA) was created. The aerospace-related activities of ABMA were transferred to NASA in 1960 and the MSFC was established in the center of the RSA within the former HVA Plants Area. Real property, equipment, and personnel were transferred from the RSA to provide the MSFC with resources in 1960 per an executive order. The MSFC was instrumental in supporting space exploration, including the Mercury, Gemini, and Apollo programs of the 1960s and 1970s. Currently, the MSFC commands all Spacelab operations during space transportation system [(STS), e.g., space shuttle] missions and tests, and manufactures space vehicles and components.

On Aug. 1, 1962 the US Army Missile Command (MICOM), a major subordinate command of the US Army Materiel Command (AMC), was established at RSA. The MICOM was responsible for integrated commodity management of free rockets, guided missiles, ballistic missiles, target missiles, and associated equipment. The MICOM was also responsible for direction and control of assigned installations and activities, basic, and supporting research. On Oct. 1, 1997, the MICOM and the US Army Aviation and Troop Command were consolidated to form the AMCOM as part of a base realignment and closure (BRAC) 1995 decision.

The military R&D efforts at RSA have been continually supported from 1949 to present by civilian contractors. The first government contracts were issued in 1949 to the Rohm and Haas Company and the Thiokol Corporation. Both contractors developed, manufactured, and tested solid propellant rocket motors and developed various types of rocket propellants in support of the Army, Navy, Air Force, and NASA. Rohm and Haas performed R&D on rocket and jet propulsion for various military programs. The Raytheon Company later conducted similar R&D activities, rocket motor assembly, and missile production in the buildings previously occupied by Rohm and Haas.

Chemical manufacturing facilities were constructed for the government contractors to provide materials for these R&D activities.

During WWII the area of RSA currently referred to as the RSA Rocket Engine (RARE) complex was the original pilot, and later production, plant for trinitrotoluene (TNT) shell loading lines. In 1949, a small portion of this complex was made available under a cost type contract to Thiokol Chemical Corporation for the experimental and developmental effort associated with solid propellant for the Army's tactical rocket motor program. The original contract was for Army programs only; however, in an effort to keep overhead costs under control, the Army later allowed Thiokol to contract with other government agencies, i.e., Navy, Air Force and NASA. This was later expanded to commercial and foreign military sales. These later agreements resulted in a contract lease arrangement whereby Thiokol was allowed to contract commercial or foreign sales that resulted in rental payment to the Army. This rent factor was based on a percentage of facilities used for support of such programs. Thiokol vacated these facilities in December 1996.

Subsequent to WWII, the chemical manufacturing facilities used to produce bulk chemicals for the war effort were leased by the Army to privately-owned firms for production of commercial chemicals and pesticides. The manufacturing of pesticides, including dichlorodiphenyltrichloroethane (DDT), began in 1948. The firms involved were the Alabama Chemical Company (manufacturer of DDT), Solvay Process Division of the Allied Chemical and Dye Corporation (intermediate chemical manufacturer), and John Powell and Company, Inc. (chemical blending, processing, formulating, and bagging). In 1954 Olin Mathieson Chemical Corporation acquired these firms and continued to produce pesticides until 1970. From 1970 to 1971, Olin Corporation, the principal DDT manufacturer, manufactured methoxychlor at the plant under a sub-lease. Reportedly, the average production of pesticides was approximately 12,500 tons per year.

The manufacture of DDT and other pesticides resulted in significant amounts of pesticide contamination as waste product. Thousands of pounds of contaminated wastes were buried in landfills (LF) throughout RSA. In addition to solid waste, large quantities of contaminated wastewater were discharged to surface water. In July 1979 the US Army initiated an extensive DDT abatement program. From July 1979 to August 1982, DDT wastes, including highly-contaminated soil and sediment, were excavated from the DDT manufacturing areas, the DDT drainage ditch, lagoon, and former DDT disposal sites.

# Cleanup Program Summary

## Installation Historic Activity

Approximately 10,500 cubic feet of pesticide-contaminated solid waste was placed in clay-lined disposal cells of the DDT waste soil landfill (RSA-107). The manufacturing plant structures were dismantled and demolished. In 1983 Olin Corporation began DDT cleanup procedures under a US Justice Department consent decree. This RA was officially completed in 1987. According to the documentation, DDT contamination was remediated at RSA-101, RSA-102, RSA-103, RSA-105, and RSA-106. A groundwater, surface water, and fish monitoring program will continue until residual levels of pesticides and their breakdown products are reduced to acceptable levels.

The basis for the Olin DDT-related remedial work was not consistent with current Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) risk assessment guidance for Superfund (RAGS) (USEPA, 2004) protocols, but was focused almost exclusively on human ingestion of fish. The nature and extent of contamination assessment did not include other raw or precursor chemicals such as chlorobenzene in soil, sediment, surface water or groundwater. No ecological risk assessments were performed.

Other former commercial operations included Stauffer Chemical Corporation, which produced chlorine and caustic chemical products, and currently, International Specialty Products, Inc. [formerly General Aniline and Film Corporation (GAF)], which operates an iron carbonyl production plant under a lease from the Army.

RSA is home to over 70 different tenant organizations. The primary mission of the installation is the development, acquisition, testing, fielding, and sustainment of aviation and missile weapon systems. Most of the installation's tenants support the aviation and missile weapon systems effort; however, Redstone is also home to such diverse activities as training for handling explosives and ordnance devices, DIA activities, and the production of iron carbonyl.

On May 31, 1994 RSA (US Army/NASA) was named to the final national priorities list (NPL) (Federal Register, Vol. 59, No. 103). The effective date was June 30, 1994. The hazard rating system (HRS) score for RSA was 33.4. The NPL listing was fence to fence. The USEPA, Region 4, is the lead regulator for NPL activities on Redstone.

Redstone is also operating under a hazardous waste facility permit issued by the ADEM. The permit was originally issued on April 15, 1998 and was modified on Sept. 17, 2003. A renewed hazardous waste permit was issued to Redstone on Sept. 30, 2010. It requires all cleanup of hazardous waste sites to be done under the auspices of the Solid Waste Disposal Act (SWDA) Corrective Action regulations.

Prior to the issuance of the renewed permit, some of the hazardous waste sites on RSA were being addressed under CERCLA, for which the USEPA, Region 4 is the lead regulator. Other hazardous waste sites on Redstone were being addressed under Resource Conservation and Recovery Act (RCRA) Corrective Action regulations per the permit requirements, for which the ADEM is the lead regulator. Redstone still does not have a federal facilities agreement (FFA) in place due to ongoing RCRA/CERCLA issues. The USEPA issued a two-party FFA to the Army in March 2010 requesting the Army to sign. Because of the ongoing issues regarding RCRA/CERCLA integration and the imminence of the permit renewal, the Army chose to wait until the permit was issued to decide how to address the FFA. With the renewed permit requiring all cleanup under RCRA, the Army has proposed to USEPA a version of the two-party FFA that does not include any sites under the direct control of the FFA because the sites are being addressed under the RCRA permit.

The following issues have had an impact on the scope and schedule for the restoration activities:

- the lack of an FFA and/or clear RCRA/CERCLA integration agreements for RSA,
- poorly identified potential source areas (PSAs) during the early years of the restoration activities
- confirmation of significant perchlorate releases on RSA and subsequent delay in obtaining agreement between the Department of Defense (DoD) and the USEPA as to how to address these releases,
- the need to consider the wetland areas all throughout RSA as integrator areas for the receipt of contamination from various sites,
- uncertain regulatory status of DDT manufacturing releases on RSA,
- very complex groundwater flow pathways due to karstic conditions and faulting at RSA, and
- the relationship between the Army and NASA in regard to Army-responsible sites located in the NASA-controlled MSFC.

## Installation Program Cleanup Progress

## Cleanup Program Summary

### IRP

- Prior Year Progress:** No further action decisions were received from ADEM on installation restoration (IR) sites RSA-189, RSA-190, and RSA-C. Corrective Measure Studies/Feasibility Studies (CMS/FS) were completed for IR sites RSA-053, RSA-058, and RSA-060. RCRA facility investigations (RFIs) have been submitted or will be submitted for 18 IR sites in FY 2012. CMI Work Plans have been submitted or will be submitted in fiscal year (FY)12 for 9 sites.
- Future Plan of Action:** 68 RFIs are planned to be submitted to ADEM for review and comment or concurrence in FY13. RFIs at 21 sites are planned to be contracted and will begin in FY13. CMSs are planned for 4 sites in FY13. Corrective measure implementation plans (CMIP) will be in progress for 4 sites. Corrective measures are planned to be completed at IR site RSA-122 and will commence at 2 sites in FY12. Implementation of corrective measures are planned to begin at 6 sites in FY13.

### MMRP

- Prior Year Progress:** Final Site-specific Work Plans and draft Explosive Siting Plans were submitted for RSA-072-R-01, RSA-141-R-01, and RSA-234-R-01 in FY 2011. Commencement of RFI field activities are pending approval from USATCES of the above site-specific Explosive Siting Plans.
- Future Plan of Action:** RFIs at munitions response (MR) Sites RSA-072-R-01, RSA-141-R-01, and RSA-234-R-01 are planned to be completed. RFIs at MR sites RSA-221-R-01, RSA-249-R-01, RSA-280-R-01, RSA-285-R-01, RSA-312-R-01, and RSA-313-R-01 are planned to proceed under the RSA PMC Task Order OOO4, upon contract award.

### CR

- Prior Year Progress:** Technical review comments were received from ADEM on aging RFI reports for sites CCSWMU-003, CCSWMU-008, CCSWMU-009, CCSWMU-030, and CCSWMU-031. ADEM concurred with a land use control (LUC) decision for site CCSWMU-008.
- Future Plan of Action:** RFIs WILL be completed at 6 sites, and will begin at 13 other sites. Sites CCSWMU-116, CCSWMU-222, CCSWMU-240, CCSWMU-246, and CCSWMU-248 may also begin RFIs if required by ADEM. Corrective Measure Studies are underway and will be completed under RSA program management contract (PMC) TO 4 at sites CCSWMU-003, CCSWMU-009, CWMU-035, and CCSWMU-268. RFIs at 11 CR other sites will begin in FY12 with the award of RSA PMC Task Order 4.

**REDSTONE ARSENAL**  
**Army Defense Environmental Restoration Program**  
**Installation Restoration Program**

# IRP Summary

**Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count:** 246/134

## Installation Site Types with Future and/or Underway Phases

4	Burn Area (RSA-013, RSA-014, RSA-126, RSA-134)
4	Chemical Disposal (RSA-050, RSA-112, RSA-113, RSA-114)
13	Contaminated Ground Water (RSA-145, RSA-146, RSA-147, RSA-148, RSA-149, RSA-150, RSA-151, RSA-152, RSA-153, RSA-154, RSA-155, RSA-156, RSA-157)
1	Contaminated Soil Piles (MSFC-033A)
1	Disposal Pit/Dry Well (MSFC-035)
51	Industrial Discharge (MSFC-034, MSFC-053, RSA-045, RSA-057, RSA-083, RSA-095, RSA-096, RSA-117, RSA-122, RSA-135H, RSA-138M, RSA-142, RSA-183, RSA-187, RSA-191, RSA-192, RSA-193, RSA-194, RSA-195, RSA-198, RSA-199, RSA-200, RSA-201, RSA-203, RSA-204, RSA-205, RSA-206, RSA-207, RSA-208, RSA-209, RSA-210, RSA-211, RSA-212, RSA-213, RSA-215, RSA-225, RSA-231, RSA-233, RSA-237, RSA-238, RSA-239, RSA-250, RSA-252, RSA-258, RSA-261, RSA-263, RSA-269, RSA-273, RSA-274, RSA-275, RSA-A)
6	Landfill (RSA-048, RSA-053, RSA-054, RSA-058, RSA-059, RSA-060)
1	Sewage Treatment Plant (RSA-228)
4	Spill Site Area (RSA-143, RSA-271, RSA-272, RSA-276)
16	Storage Area (RSA-005, RSA-032, RSA-065, RSA-067, RSA-069, RSA-087, RSA-088, RSA-217, RSA-218, RSA-219, RSA-220, RSA-226, RSA-253, RSA-255, RSA-262, RSA-265)
5	Surface Disposal Area (CCRSA-315, MSFC-027, RSA-109, RSA-140, RSA-230)
5	Surface Impoundment/Lagoon (PBCatRedstone, RSA-049, RSA-056, RSA-115, RSA-139)
1	Washrack (RSA-227)

## Most Widespread Contaminants of Concern

Chemical weapon munitions (CWM)/Chemical agent, Explosives, Metals, Perchlorate, Pesticides, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC), White Phosphorous

## Media of Concern

Groundwater, Other (Surface and Subsurface Soil), Sediment, Soil, Surface Water

## Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
RSA-107	CLOSED DDT CONTAM.SOILS/DEBRIS LANDFILL	FRA	CAPPING	1982
RSA-107	CLOSED DDT CONTAM.SOILS/DEBRIS LANDFILL	FRA	FENCE OR OTHER SITE ACCESS CONTROL MEASURES	1982
RSA-101	ENCAPSULATED PESTICIDE CONTAM. SED. AREA	FRA	WASTE REMOVAL - SOILS	1987

## IRP Summary

### Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
RSA-101	ENCAPSULATED PESTICIDE CONTAM. SED. AREA	FRA	DRAINAGE CONTROLS	1987
RSA-101	ENCAPSULATED PESTICIDE CONTAM. SED. AREA	FRA	CAPPING	1987
RSA-101	ENCAPSULATED PESTICIDE CONTAM. SED. AREA	FRA	WASTE REMOVAL - SLUDGES	1987
RSA-102	DISMANTLED PESTICIDE MFG. PLANT SITE	FRA	WASTE REMOVAL - SOILS	1987
RSA-102	DISMANTLED PESTICIDE MFG. PLANT SITE	FRA	DRAINAGE CONTROLS	1987
RSA-102	DISMANTLED PESTICIDE MFG. PLANT SITE	FRA	CAPPING	1987
RSA-102	DISMANTLED PESTICIDE MFG. PLANT SITE	FRA	WASTE REMOVAL - SLUDGES	1987
RSA-103	CAPPED PESTICIDE SETTLING LAGOON	FRA	CAPPING	1987
RSA-103	CAPPED PESTICIDE SETTLING LAGOON	FRA	WASTE REMOVAL - SLUDGES	1987
RSA-103	CAPPED PESTICIDE SETTLING LAGOON	FRA	DRAINAGE CONTROLS	1987
RSA-103	CAPPED PESTICIDE SETTLING LAGOON	FRA	WASTE REMOVAL - SOILS	1987
RSA-105	INACTIVE CLOSED DDT DRAINAGE DITCHES	FRA	DRAINAGE CONTROLS	1987
RSA-105	INACTIVE CLOSED DDT DRAINAGE DITCHES	FRA	WASTE REMOVAL - SOILS	1987
RSA-105	INACTIVE CLOSED DDT DRAINAGE DITCHES	FRA	CAPPING	1987
RSA-105	INACTIVE CLOSED DDT DRAINAGE DITCHES	FRA	WASTE REMOVAL - SLUDGES	1987
RSA-106	EARTHEN RETENTION DAMS FOR DDT MIGRATION	FRA	DRAINAGE CONTROLS	1987
RSA-106	EARTHEN RETENTION DAMS FOR DDT MIGRATION	FRA	WASTE REMOVAL - SOILS	1987
RSA-106	EARTHEN RETENTION DAMS FOR DDT MIGRATION	FRA	CAPPING	1987
RSA-106	EARTHEN RETENTION DAMS FOR DDT MIGRATION	FRA	WASTE REMOVAL - SLUDGES	1987
RSA-041	REMOVED USED OIL UST SITE, TANK #3636	FRA	REMOVAL	1992
RSA-039	REMOVED #2 FUEL OIL UST SITE, TANK #3338	FRA	REMOVAL	1993
RSA-043	REMOVED USED OIL UST SITE, TANK #3665	FRA	REMOVAL	1993
RSA-038	REMOVED USED OIL UST SITE, TANK #3240D	FRA	REMOVAL	1996
RSA-040	REMOVED USED OIL UST SITE, TANK #3617	FRA	REMOVAL	1996
RSA-130	INACTIVE PHOTOLAB SEPTIC TANK-BLDG.7345	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1998
RSA-130	INACTIVE PHOTOLAB SEPTIC TANK-BLDG.7345	FRA	WASTE REMOVAL - SOILS	1998

## IRP Summary

### Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
RSA-143	UNDERGROUND STORAGE TANK SPILL SITE	FRA	CHEMICAL REDUCTION/OXIDATION	2004
MSFC-002	INACTIVE ABANDONED DRUM DISPOSAL SITE	IRA	REMOVAL	2007
RSA-049	CAPPED ARSENIC WASTE LAGOONS-WEST	FRA	INSTITUTIONAL CONTROLS	2008
RSA-057	INACTIVE ARSENIC WASTE LAGOON-EAST	FRA	WASTE REMOVAL - SOILS	2008
RSA-229	FORMER PX SERVICE STATION	FRA	NATURAL ATTENUATION	2008
RSA-252	INCENDIARY BOMB FACILITY PLANT 2	IRA	WASTE REMOVAL - SOILS	2008
RSA-056	CAPPED ARSENIC WASTE PONDS-SOUTH	FRA	INSTITUTIONAL CONTROLS	2009
RSA-139	CAPPED ARSENIC WASTE POND-NORTH	FRA	INSTITUTIONAL CONTROLS	2009
RSA-122	DISMANTLED LEWISITE MFG. PLANTS SITE	FRA	WASTE REMOVAL - SOILS	2011
RSA-122	DISMANTLED LEWISITE MFG. PLANTS SITE	FRA	CAPPING	2011
RSA-122	DISMANTLED LEWISITE MFG. PLANTS SITE	FRA	INSTITUTIONAL CONTROLS	2011
RSA-097	CHLORINATED-SOLVENT DISTILLATION UNIT 4	IRA	WASTE REMOVAL - SOILS	2012
RSA-183	FORMER LEWISITE PRODUCTION FACILITY	FRA	CAPPING	2012

### Duration of IRP

**Date of IRP Inception:** 197710

**Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC):** 203109/203109

**Date of IRP completion including Long Term Management (LTM):** 204212

# IRP Contamination Assessment

## Contamination Assessment Overview

The cleanup program was initiated in 1970 when the US Army Environmental Hygiene Agency conducted a field survey to characterize the domestic and industrial waste being discharged from RSA and to determine if water pollution problems were being caused by the waste discharges. The study identified water pollution problems from two sewage treatment plants (STP), and discharges from Olin Corporation's DDT manufacturing operations.

In 1977 the US Army Toxic and Hazardous Material Agency (USATHAMA) completed the installation assessment which identified possible disposal areas. Pesticide contamination was confirmed and a decision subsequently made that RA was necessary. The resulting DDT cleanup program occurred at RSA between 1983 and 1988.

In September 1989 the USEPA conducted an interim RCRA facility assessment (IRFA) at RSA and another at MSFC (which is operated by NASA). This study resulted in the identification of 110 sites at RSA and 77 sites at MSFC. Between 1989 and 1990, the US Army reevaluated the USEPA IRFA and identified additional sites on RSA, including property located on RSA that is owned by the TVA and the Wheeler Wildlife Refuge. A total of 286 sites were identified in this follow-on study. In addition, the PSA investigation has resulted in a number of sites being added to the program for a total of 471 sites. Additional sites were added due to areas removed from active ranges and a used oil tank/spill site for a total of 474 sites within Redstone boundaries.

Of the 474 sites, the Army has responsibility for 390 sites, Olin Chemical Corporation is responsible for one DDT site, one site is the Internet service provider (ISP) facility and NASA is responsible for 83 sites. Some of the NASA sites are listed in the Army permit. All but six of the Army sites are covered under the RCRA permit. The Olin site is also listed in the permit, but deferred to the 1983 consent order. The permit lists the sites under the following tables:

- Table VI.2 RCRA Facility Assessment (RFA) (211 sites)
- Table VI.3 No further action (NFA) (144 sites)
- Table VI.4 Permitted storage and open burn(OB)/open detonation (OD) (11 sites)
- Table VI.5 Interim Measures (17 sites)
- Table VI.6 Corrective measures implementation(CMI) (18 sites)
- Table VIII.1 LUCs (7 sites) and installation-wide (IW) groundwater

There is some overlap of sites between tables. The total number of sites listed in the permit is 383.

The IRP sites were originally organized into 20 operable units (OU). The arsenal was divided into OUs based on watershed locations, critical and sensitive ecological habitats, soil types, and land use. These 20 OUs continue to be used for surface media site purposes. Interpretation of investigative work conducted prior to 2002 was complicated by findings of contaminants in wells on multiple sites which did not appear to be related to site operational activities.

Based on this finding and the basic awareness of the potential for significant interconnection between groundwater at one location and groundwater at other locations in karst formations, an installation-wide hydrogeological study was initiated. The final site-wide karst hydrogeologic investigation, Phase I report of findings (Shaw 2003), which has become known as the karst report, documented the highly interconnected nature of groundwater at the facility and the potential for rapid and long distance contaminant transport. It also documented significant connection between groundwater and surface water.

These interconnections provide conduits for contaminant transfer from groundwater to surface media via springs and other artesian structures, as well as opportunities for contaminants in surface water to enter groundwater via sinkholes, features in losing reaches of streams and other mechanisms.

Based on these findings, a decision was made to separate surface media (primarily surface and subsurface soil) from groundwater. Thirteen groundwater sites have been established based on data from the karst report. This should allow more focused interpretation of surface media contaminants as posing either human or ecological risks from surface soil or sediment exposure pathways, or principle threat source material serving to contaminate groundwater locally or at distance. Based on recent seismic and dye trace studies, some of the groundwater sites have been combined for a total of seven groundwater sites. An RSA groundwater cleanup strategy was developed and approved by the regulatory agencies in FY10.

In addition to the groundwater cleanup strategy, RSA has also prepared a strategy for the cleanup of contaminated wetlands on the arsenal. This document describes how the Army intends to address wetlands on RSA.

As mentioned earlier, Redstone currently does not have an FFA in place. In March 2010, due to ongoing RCRA/CERCLA issues associated with the FFA, the USEPA proposed an FFA that does not include the state as a signatory. The Army responded with

# IRP Contamination Assessment

## Contamination Assessment Overview

a version of the FFA submitted to the USEPA in March 2011 that does not require the sites covered under the permit to also be covered under the FFA.

Off-site migration of chlorinated solvents and perchlorate in groundwater has been confirmed along the eastern boundary of Redstone. This contaminated groundwater surfaces in springs feeding an unnamed tributary that meanders off and on the installation along the eastern boundary, as it flows down to the Tennessee River. Both chlorinated solvents and perchlorate have also been detected in nested monitoring wells located along the Tennessee River.

Two pump-and-treat (P&T) facilities were installed in the 1990s to address the source areas of the off-site contamination along the eastern boundary; however, the plants treated only the chlorinated solvents, allowing perchlorate-laden effluent to be discharged to the Huntsville Spring Branch (HSB). Subsequent investigation indicated that the current configuration of the plants may not be optimal for containing the contaminated groundwater. Therefore, RSA began a study to determine if these plants could be used as an effective remedy for this area. The initial findings of this study were presented in the RSA-146 Phase I remedial investigation (RI) report (August 2005). A follow-on sampling initiative was begun in 2006 to determine whether or not the plants were containing the plumes. The study has been completed, and the indication is that the plants did not contain the chlorinated solvent plume or the perchlorate plume.

Another P&T facility, designed to treat a chlorinated solvent release, was located at an area along the Tennessee River. Like the contaminated groundwater along the eastern boundary, the groundwater in this area near the Tennessee River was also found to be a commingled plume, containing both chlorinated solvents and perchlorate. Like the other P&T facilities, no provisions for treating perchlorate had been included in the design. Therefore, the effluent was found to contain high levels of untreated perchlorate. Because the discharge from this plant was located at the Tennessee River, one mile upstream of the arsenal's drinking water intake, this plant has been shut down until decisions can be made in regard to perchlorate. Regulatory interest in RSA remains high, with both the USEPA, Region 4 and the ADEM participating in the restoration activities.

There are a number of complicating factors and uncertainties associated with the RSA IRP. They include:

- The lack of an FFA and/or clear RCRA/CERCLA integration agreements for RSA. The RCRA/CERCLA integration issues are of high importance to the program due to the hazardous waste facility permit in place at RSA. With the issuance of the RCRA permit in 2010, the cleanup program is transitioning primarily to RCRA oversight while trying to meet the substantive requirements of the NPL as best as possible.
- Poor identification of PSAs during the early years of the restoration activities. A major effort was put into identifying the PSAs on RSA during FY03 and FY04. All of the draft documents describing the historical search, site visits, and sampling were submitted to the regulatory agencies. Comments on the 51 remaining unresolved PSAs for the Compliance cleanup program are currently being resolved between the ADEM and the Army. The status of all of the PSAs under the IRP has now been resolved.
- Confirmation of significant perchlorate releases on RSA and the subsequent delay of agreement between the DoD and the USEPA, as to how to address these releases, have adversely affected the RSA IRP schedule. Many of the sites with the most significant chlorinated solvent releases have also been impacted by perchlorate releases.
- The need to use an integrator approach due to commingling of releases to groundwater, and the subsequent upwelling of the commingled plumes into wetlands and surface water bodies on Redstone. The integrator concept is intended to establish common sampling points and points of compliance for records of decision (ROD) from the multiple sites. The effort to establish and develop the integrator approach was initiated in 2004 and continues to evolve as information is obtained and discussions are held. Boundaries were established in 2007 and a wetlands strategy was developed and approved in 2010. However, the use of the integrator areas was one of the tools developed under CERCLA protocols. Since the cleanup effort at Redstone is transitioning to RCRA, the use of the integrators has been put on hold for the time being.
- The uncertain regulatory status of DDT manufacturing releases on Redstone. A consent order was signed by Olin Chemical, the USEPA, and the ADEM in 1983 for DDT contamination in the HSB and Indian Creek (IC) watersheds. The cleanup levels required by the consent order do not meet current CERCLA expectations for protection of human health and the environment. The former DDT manufacturing process and subsequent contamination are located on RSA. The DDT manufacturing areas and landfills are sites listed in the permit and are being addressed under RCRA. The migration of the DDT into the HSB and IC was deferred by the permit to the 1983 consent order.
- The very complex groundwater flow pathways, due to karstic conditions and faulting at Redstone, have added to the uncertainty and complexity of the RSA IRP. The unpredictable nature of the groundwater flow pathways has significantly impacted the Army's ability to quickly and efficiently characterize and delineate groundwater contamination. Additionally, data indicate that contamination from off-site sources may also be affecting groundwater and surface water quality on Redstone. A series of perimeter wells were installed to help determine if/where contamination from off-site sources may be entering the installation. Finally, data from the wells along the Tennessee River was interpreted by regulators to indicate that contamination

# IRP Contamination Assessment

## Contamination Assessment Overview

from RSA may be undercutting the river. A series of sampling events, at locations south of the Tennessee River, indicated that it is unlikely that contamination is migrating under the river. Additional boundary well flow-meter surveys and Tennessee River sampling were performed to confirm this, but the regulators are still requesting wells be established south of the river.

- The relationship between the Army and NASA, in regard to Army-responsible sites located in the NASA-controlled MSFC, has added a complicating factor to the RSA IRP. The MSFC is located in the heart of Redstone Arsenal. There is a need to clearly define responsibility for contamination, particularly in groundwater.

The RSA enjoys a very good relationship with the neighboring communities. To date, the public has been supportive of Redstone's IRP efforts; however, very little public interest has been expressed for forming a RAB at RSA. The public is solicited on a biannual basis to determine if there is a sustained public interest in forming a RAB.

To date, RODs have been signed for the following sites: RSA-099, RSA-047, RSA-011, RSA-057, RSA-049, MSFC-002/087, RSA-056, RSA-139, RSA-122, RSA-183, RSA-094, and RSA-196 (which includes RSA-098). A remedy is in place to address petroleum contamination at RSA-143 under the state's underground storage tank (UST) regulations. Additionally, an interim record of decision (IROD) was signed to implement LUC for the groundwater underneath RSA. The following sites have also been closed either through an administrative letter or a decision document (DD) following a site investigation or removal action: RSA-B, RSA-084, RSA-108, RSA-130, MSFC-074, RSA-223, RSA-251, RSA-224, RSA-236, RSA-D, and MSFC-077. Three UST sites have also been closed through the state's Alabama risk based corrective action (ARBCA) program: RSA-229, RSA-232, and RSA-235.

## Cleanup Exit Strategy

In an effort to organize and program the site restoration efforts in a more efficient manner, a grouping strategy for managing the RSA IRP was adopted in FY06. The grouping strategy was used to re-define the OUs at RSA in FY08. The site groupings were established primarily on the basis of historical processes and functions. The rationale for grouping by historical function is that the contaminants of concern (COC) and the release mechanisms and locations will be similar for the sites in a specific group. Many of the sites in a group also happen to be located in the same general geographical location on the arsenal. Smaller teams comprised of various members of the much larger Tier I team were established in 2007 to work sites within the groupings. Those teams worked well in FY08 to expedite the cleanup efforts. The PMC was awarded to Shaw E&I in August 2009.

As part of the effort required under this contract, Shaw has proposed a number of grouping strategies to achieve more cleanup efficiencies at RSA. Redstone is currently in the process of transitioning the cleanup program to RCRA in order to comply with the 2010 RCRA permit. Multiple contract actions are underway to facilitate the transition. These contract actions should be completed in late FY11 and early FY12. The program will be compliant with the permit; however, the amount of compliance with the NPL requirements is still being determined.

## IRP Previous Studies

Year	Title	Author	Date
1959	Analysis of Existing Facilities	Redstone Arsenal	JUN-1959
1962	Redstone Arsenal Complex Chronology Part II: Nerve Center of Army Missilery, 1950-1962, Section A: The RSA Era (1950-55)	US Army	JAN-1962
	Redstone Arsenal, AL Report on Water Control Plans	USACE (Mobile District)	JAN-1962
	Redstone Arsenal Complex Chronology Part II: Nerve Center of Army Missilery, 1950-1962, Section B: The ABMA/AOMC Era (1956-1962)	US Army	NOV-1962
1966	Preliminary Engineering Report on Industrial Waste Treatment	Whitman, Requardt and Associates	JAN-1966
	Final Report Industrial Waste, Stream Pollution Survey RSA, AL	COE, Mobile District	FEB-1966
	NASA Waste Study, 1966	NASA	FEB-1966
1970	Sanitary Engineer Survey & Industrial Waste RSA, AL	US Army Environmental Hygiene Agency	MAY-1970
1972	Final Report - Conceptualization, Evaluation, Definition, and Development of a MSFC Environmental Quality Program	UAH & MSFC	MAY-1972
1974	Water Quality Monitoring Consultation No. 24-060-74/75 RSA, AL	US Army Environmental Hygiene Agency	APR-1974
1975	Master Plan Basic Information Maps	US Army	SEP-1975
1976	Potable/Recreational Water Quality and Wastewater Engineering Survey No. 24-0606-77 RSA, AL	US Army Environmental Hygiene Agency	AUG-1976
1977	Water Quality Monitoring RSA, AL	US Army Environmental Hygiene Agency	FEB-1977
	Water Quality Engineering Special Study - Miscellaneous Point Source Discharges	US Army Environmental Hygiene Agency	JUN-1977
	Water Quality Evaluation of Environmental Degradation from prior DDT Waste Disposal RSA, AL	US Army Environmental Hygiene Agency	JUN-1977
	Installation Assessment of Redstone Arsenal, AL, Record Evaluation Report # 118	Department of the Army, Office of the Project Manager for Chemical Demilitarization and Installation Restoration	DEC-1977
1978	Draft Environmental Impact Statement	US Army	MAY-1978
	Report of Site Investigation for DDT Landfill Site at RSA, AL	Testing, Inc.	OCT-1978
	Report of Evaluation and Recommendations for Calgon Corporation Carbon Absorption Facility, RSA, AL	Testing, Inc.	NOV-1978

## IRP Previous Studies

1979	Title	Author	Date
	Report of Geohydrology Characterization and Well/Lysimeter Installation at RSA, AL	Testing, Inc	JAN-1979
	Summary of DDT Contamination at RSA	RSA	JUL-1979
	Report of Geohydrology Characterization, Survey of Wells & Lysimeter Locations and Monitor Well Installation at RSA, AL	Testing, Inc	DEC-1979
	Infiltration/Inflow Analysis for Plant No. 4 (Subsystems: 5, 6, 7, 7A, 8, 9, and 10) Sewer System	Barge, Waggoner, Sumner & Cannon	DEC-1979
1980			
	Final Contract Report - Engineering and Environmental Study of DDT Contamination of Huntsville Spring Branch, Indian Creek and Adjacent Lands and Waters, Wheeler Reservoir, AL, Vol. I, II, & III	Water & Air Research, Inc	NOV-1980
1981			
	Preliminary Survey, DDT Abatement Program Monitoring and Surveillance RSA, AL	Hittman Associates, Inc.	JUN-1981
	Ground Water Monitoring Program	US Army MICOM	JUN-1981
	Report of Geohydrology Characterization, Survey of Wells and Monitor Well Installation at RSA, AL	Testing, Inc.	OCT-1981
1983			
	RSA Installation Restoration Program Summary, Final Report, Vol. I, II, & III	Water & Air Research, Inc	MAR-1983
	Ground Water & Surface Water Monitoring Program	US Army MICOM	MAR-1983
	Ground Water Quality Assessment RSA, AL	US Army Environmental Hygiene Agency	SEP-1983
1984			
	Phase I - Ground Water Quality Assessment RSA, AL	US Army Environmental Hygiene Agency	JUN-1984
	Historic Properties Report - Final Report July 1984	Building Technology Incorporated,	JUL-1984
	Surface Water and Ground Water Monitoring Data	US ARMY MICOM EMO	DEC-1984
1985			
	404/26A Permit Application for the Huntsville Remedial Action Plan RSA, AL	Waldemar S. Nelson and Company, Inc	JUN-1985
	Environmental Analysis for the HSV. Remedial Action Plan	Waldemar S. Nelson and Company, Inc	JUN-1985
	Technical Specifications for the Huntsville (Hsv.) Remedial Action	Waldemar S. Nelson and Company, Inc	JUN-1985
	Environmental Assessment and Permit Workbook on Refuse Fired Steam Plant Supplying 200 PSIG Steam to RSA, AL	Hayden-Wegman Consulting Engineers	JUL-1985
1986			
	Final Environmental Impact Study For Regulatory Actions Associated with the Olin Corp. Remedial Action Plan to Isolate DDT from the people and environment in the Hsv. Spring Branch - Indian Creek System, Wheeler Reservoir, AL	Water and Air Research, Inc	FEB-1986
	RSA Part B Permit and Application. Prepared by US Army MICOM, March 1986.	V.J. Ciccone & Associates, Inc	APR-1986

## IRP Previous Studies

1986	Title	Author	Date
	RCRA Closure Certification Report Shields Road Yard NASA-MSFC. Site OU15, RSA 32, Redstone Arsenal, Alabama	Harmon Engineering & Associates, Inc	JUN-1986
	Site MSFC-27 RCRA Closure Certification Report Shields Road Yard NASA-MSFC	Harmon Engineering & Associates, Inc	JUN-1986
	Report on the Remedial Action to Isolate DDT from people and the environment in the Hsv. Spring Branch - Indian Creek System, Wheeler Reservoir, AL (US v. Olin Corp. Consent Decree) May 31, 1983 - June 30, 1986	USEPA (Reg. IV)	JUL-1986
	404/26A Permit Application for the Huntsville Remedial Action Plan, Redstone Arsenal, AL, Lower Reach A	Waldemar S. Nelson and Company, Inc	SEP-1986
1987			
	Chemical Weapons Movement History Compilation	Department of the Army, Office of the Project Manager for Chemical Demilitarization and Installation Restoration	FEB-1987
	Geotechnical Requirements for Drilling, Monitoring Wells, Data Acquisition, and Reports	US Army Toxic & Hazardous Materials Agency	MAR-1987
	Chemical Weapons Movement History Compilation	William R. Brankowitz	APR-1987
	Final Standard Operating Procedures - Remedial Investigation / Feasibility Study, RSA, AL	P. E. LaMoreaux & Associates, Inc	JUL-1987
	Huntsville Spring Branch / Indian Creek Long-Term Monitoring Program Annual Report	Olin-Environmental Affairs Dept	AUG-1987
	Work Plan for Baseline Environmental Monitoring Study, US Army/ GAF Chemical Corp. HSV., AL Plant.	AWARE, Inc	OCT-1987
1988			
	Remedial Action Decision Document for the DDT Contaminated Areas on Redstone Arsenal	US Army Toxic & Hazardous Materials Agency	JAN-1988
	Baseline Environmental Monitoring Study US Army/GAF Chemical Corp. HSV, AL Pla	AWARE, Inc	MAR-1988
	Preliminary Assessment and Site Inspection for MSFC	Harmon Engineering & Associates, Inc	APR-1988
	Final Confirmation Report - Unit 3 Investigations Vol. I & VI. Sites 48, 49, 53, 60, 59, 54/55, 66, 68, Redstone Arsenal, AL	P.E. LaMoreaux & Associates, Inc	JUL-1988
	Remedial Action Plans for RSA, AL - Unit 1 (DDT and Sanitary Landfills) and Unit 2 (Open	P.E. LaMoreaux & Associates, Inc	SEP-1988
	Final Remedial Investigation Engineering Report for RSA, AL Unit 1- (DDT & Sanitary Land-fills) and Unit 2-(Open Burn/ Open Demolition Area) Vol. I & VII. Sites 10, 12, 13, 14, 131, 132, 133, Redstone Arsenal, AL	P.E. LaMoreaux & Associates, Inc.	SEP-1988
	Surface Water and Ground Water Monitoring Data	US ARMY MICOM EMO	NOV-1988
1989			
	Preliminary Assessment of CERCLA Candidate Sites and Related Sites of Possible Environmental Significance - MSFC Hsv, AL	Harmon Engineering & Associates, Inc	FEB-1989
	RCRA Facility Assessment - Preliminary Review Report MSFC - Hsv., AL	A.T. Kearney, Inc	MAR-1989

## IRP Previous Studies

1989

Title	Author	Date
MICOM Environmental Program Plan - RSA, AL	US Army MICOM EMO	MAR-1989
Redstone Arsenal, AL Environmental Program	Redstone Arsenal	MAR-1989
Ambient Air Quality Consultant - Redstone Arsenal Support Activity RSA, AL	US Army Environmental Hygiene Agency	MAR-1989
Technical Escort Attachment Activities Huntsville, AL	Department of the Army, Office of the Project Manager for Chemical Demilitarization and Installation Restora	MAR-1989
Upgrade - Confirmation Report and Assessment of Remedial Alternatives for Selected Unit 3 Sites (RSA): Vol. I (text); Vol. II (App. A); Vol. III (App. B); Vol. IV (App. B (cont.)); Vol. V (App. B (concluded)). Sites 49, 48, 53, 60, 59, 54/55, 66, 68, Redstone Arsenal, AL.	P.E. LaMoreaux & Associates, Inc	APR-1989
Results and Conclusions - Sampling Rounds 1-4 for RSA Unit 4 (Perimeter Wells) Investigations, Vol. I & II	P.E. LaMoreaux & Associates, Inc	MAY-1989
Interim RCRA Facility Investigation of the MSFC Hsv., A	A.T. Kearney, Inc	JUL-1989
Interim RCRA Facility Assessment of the RSA Hsv., AL	A.T. Kearney, Inc.	SEP-1989
Soil and Gas Sampling Plan - RCRA Facility Investigation for RSA Hsv., AL	Geraghty & Miller	OCT-1989
Surface Water and Groundwater Monitoring Data	US ARMY MICOM EMO	NOV-1989
Draft Work Plan- RCRA Facility Investigation Unit 1 for RSA, AL	Geraghty & Miller	NOV-1989

1990

Environmental Baseline Assessment ¿ Summary & Laboratory Reports, Vol. I, II, & III.	CH2M Hill, Inc	FEB-1990
Procedures for Accomplishing Collection, Sampling, and Analysis Services, Revision 1, RSA, AL.	BAMSI, Inc	MAR-1990
Huntsville Spring Branch / Indian Creek Long-Term Monitoring Program Annual Report No. 2.	Olin-Environmental Affairs Dept	APR-1990
Final Safety, Health, and Emergency Response Plan for RCRA Facility Investigation	Geraghty & Miller, Inc	JUN-1990
Final Work Plan - RCRA Facility Investigations at Unit 1, Unit 2, & Selected Unit 3 Areas. Sites 10, 12, 13, 14, 131, 132, 133, 49, 48, 53, 60, 59, 54/55, 66, 68, Redstone Arsenal, AL	Geraghty & Miller, Inc	JUN-1990
Surface Water and Groundwater Monitoring Data	US ARMY MICOM EMO	NOV-1990
Second Report on the Remedial Action to Isolate DDT from people and the environment in the Hsv. Spring Branch / Indian Creek System, Wheeler Reservoir, AL (US v. Olin Corp. Consent Decree), July 1, 1986 - June 30, 1990	USEPA (Reg. IV)	NOV-1990
First Quarterly Progress Report - RCRA Facility Investigations at Unit 1, Unit 2, & Selected Unit 3 Areas. Sites 10, 12, 13, 14, 131, 132, 133, 49, 48, 53, 60, 59, 54/55, 66, 68, Redstone Arsenal, AL	Geraghty & Miller Inc.	NOV-1990

1991

Identification and Evaluation of Potential SWMUs and Areas of Concern at RSA, AL.	Geraghty & Miller Inc	FEB-1991
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## IRP Previous Studies

1991

Title	Author	Date
Second Quarterly Progress Report ζ RCRA Facility Investigations Unit 1, Unit 2, & Selected Unit 3 Areas. Sites 10, 12, 13, 14, 131, 132, 133, 49, 48, 53, 60, 59, 54/55, 66, 68, Redstone Arsenal, AL	Geraghty & Miller Inc	FEB-1991
Huntsville Spring Branch / Indian Creek Long-Term Monitoring Program Annual Report No. 3.	Olin-Environmental Affairs Dept	APR-1991
Groundwater Quality Assessment Report ζ MSFC	ERC Environmental & Energy Services Co., Inc.,	JUN-1991
Groundwater Quality Assessment Report for 4740 WPCF Volume I	ERC	AUG-1991
RCRA Facility Investigation - Well Installation Report for SWMUs RSA-58, 115, 116, 129, 140 (Target Seeker Area), and 142 (RSA-G).	USACE (Mobile District),	SEP-1991
Final - Initial Sampling Plan for SWMUs RSA-58, 115, 116, 129, 140 (Target Seeker Area), and 142 (RSA-G)	Engineering Science Inc.	SEP-1991
Work Plan for Remedial Action Basement Area of Bldg. 5681	US COE, Omaha District	SEP-1991
Air Toxics Transport Task Report	Physical Research, Inc	OCT-1991
RCRA Facility Investigation - RFI Work Plan for RSA-58, 115, 116, 129, 140, and 14	Engineering Science Inc	NOV-1991
RSA - RCRA Facility Investigation - Quality Control Summary Report Attachment IV Laboratory Data Phase I, Vol. I-VII.	Geraghty & Miller, Inc	DEC-1991
RSA - RCRA Facility Investigation - Quality Control Summary Report Attachment I (A - E Quality Control Sheets) and Attachment II (Chain of Custody Records)	Geraghty & Miller, Inc	DEC-1991

1992

Quality Control Summary Report - Phase I - RCRA Facility Investigation at Units 1, 2, & 3	Geraghty & Miller, Inc	JAN-1992
Final Preliminary Site Inspection for RSA, AL	Advanced Sciences, Inc	JAN-1992
Final Draft Report - Review of Hsv. Spring Branch / Indian Creek Remedial Plan and Monitoring Program	Woodward-Clyde Consultants	JAN-1992
Final - RCRA Facility Investigation - Health and Safety Plan for SWMUs RSA-58, 115, 116, 129, 140 (Target Seeker Area), and 142 (RSA-G)	Engineering Science Inc	MAR-1992
Industrial Waste Treatment Facility - Groundwater Quality Assessment Report for MSFC	CH2M Hill, Inc	APR-1992
Final - Phase I Report - RCRA Facility Investigations at Unit 1, Unit 2, and Selected Unit 3 Areas, Vol. I & II. Sites 10, 12, 13, 14, 131, 132, 133, 49, 48, 53, 60, 59, 54/55, 66, 68, Redstone Arsenal, AL	Geraghty & Miller Inc	MAY-1992
Huntsville Spring Branch / Indian Creek Long-Term Monitoring Program Annual Report No. 4	Olin-Environmental Affairs Dept	MAY-1992
Final Project Report Remediation of the Basement Area of Building 5681	OHM Corp	JUN-1992
Final Draft - Hazard Ranking System, Score Summary Report for RSA, AL.	Advanced Sciences, Inc	JUL-1992
Surface Water and Groundwater Monitoring Data	US ARMY MICOM EMO	NOV-1992
RSA - RCRA Facility Investigation - Quality Control Summary Report Attachment III (Field Sampling Logs Phase I)	Geraghty & Miller, Inc	NOV-1992
RSA - RCRA Facility Investigation - Quality Control Summary Report Phase II, Vol. I; IV Laboratory Data	Geraghty & Miller, Inc	NOV-1992

## IRP Previous Studies

1992	Title	Author	Date
	Huntsville Spring Branch Hydrographic Map	Woodward-Clyde Consultants	DEC-1992
1993	RCRA Facility Investigation - Work Plan at MSFC	CH2M Hill, Inc	JAN-1993
	Corrective Measures Studies - Unit 1 (Waste Oil Pits & Closed Landfill) RSA, AL. Site 10, Redstone Arsenal, AL	Environmental Science & Engineering, Inc	JAN-1993
	Corrective Measures Studies - Unit 1 (Waste Oil Pits & Closed Landfill) RSA, AL. Site 10, Redstone Arsenal, AL	Environmental Science & Engineering, Inc	JAN-1993
	RCRA Facility Investigation - Phase I Report for SWMUs RSA-58, 115, 116, 129, 140 (Target Seeker Area), and 142 (RSA-G), Volumes I & II (Vol. II contains analytical results).	Engineering Science Inc	FEB-1993
	Work Plan for Remedial Action Drum Removal	OHM Remediation Services Corp	FEB-1993
	Final - Work Plan Interim Corrective Measure Design at Unit 2, RSA, AL. Sites 12, 13, 14, 131, 132, 133, Redstone Arsenal, AL	Ebasco	FEB-1993
	RCRA Facility Investigation Addendums I and II to the RCRA Facility Investigation Work Plan for SWMUs RSA-58, 115, 116, 129, 140 (Target Seeker Area), and 142 (RSA-G).	Environmental Science & Engineering, Inc	MAR-1993
	Quality Control Summary Report Phase II RCRA Facility Investigations at Unit 1, Unit 2, and Selected Unit 3 Areas. Sites 10, 12, 13, 14, 131, 132, 133, 49, 48, 53, 60, 59, 54/55, 66, 68, Redstone Arsenal, AL	Geraghty & Miller Inc	MAR-1993
	Corrective Measures Studies for RSA, AL, Draft Comments and Responses	Environmental Science & Engineering, Inc	MAR-1993
	Corrective Measures Studies for RSA, AL	Environmental Science & Engineering, Inc	APR-1993
	RCS 1383 Report for RSA	Environmental Science & Engineering, Inc	APR-1993
	Final Work Plan RCRA Facility Investigation of SWMUs RSA-99, 117, 130, RSA, AL	Ebasco	APR-1993
	Final Field Sampling and Chemical Data Acquisition Plan & Soil Boring and Monitoring - Well Installation Plan - RCRA Facility Investigation of SWMU RSA-130, RSA, AL	Ebasco	APR-1993
	Final Field Sampling and Chemical Data Acquisition Plan & Soil Boring and Monitoring - Well Installation Plan - RCRA Facility Investigation of SWMU RSA-117, RSA, AL	Ebasco	APR-1993
	Final Field Sampling and Chemical Data Acquisition Plan & Soil Boring and Monitoring - Well Installation Plan - RCRA Facility Investigation of SWMU RSA-99, RSA, AL	Ebasco	APR-1993
	Final Site Safety and Health Plan - RCRA Facility Investigation of SWMUs RSA-99, 117, 130, RSA, AL	Ebasco	APR-1993
	Final - Phase II Addendum - RCRA Facility Investigation at Unit 1, Unit 2, & Selected Unit 3 Areas. Sites 10, 12, 13, 14, 131, 132, 133, 49, 48, 53, 60, 59, 54/55, 66, 68, Redstone Arsenal, AL	Geraghty & Miller Inc	APR-1993

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Title	Author	Date
Draft Final - Corrective Action Management Plan for RSA, AL	Environmental Science & Engineering, Inc	MAY-1993
Environmental Management Office - RCRA Facility Investigation for RSA, AL, Vol. I & II	MICOM Environmental Management Office	MAY-1993
60% Submittal Construction Specifications - Interim Corrective Measure Design at Unit 2, sites 12, 13, 14, 131, 132, 133, RSA, AL	Ebasco	MAY-1993
60% Submittal-System Design Analysis/Health & Safety Design Analysis - Interim Corrective Measure Design at Unit 2, sites 12, 13, 14, 131, 132, 133, RSA, AL	Ebasco	MAY-1993
Final - Work Plan Interim Corrective Measure Design at RSA-G, site 142	Ebasco	JUN-1993
Draft - Final Report - Rapid Response Contract, Vol. I & II, RSA, AL	OHM Remediation Services, Inc	JUN-1993
Revised Draft Final Work Plan Interim Corrective Design at Unit 1, site 10, RSA, AL	Ebasco	AUG-1993
Health and Safety Plan, RSA Hsv., AL	Layne Safety & Environmental Health Services	AUG-1993
Storm Water Sampling Plan for NPDES Industrial Storm Water Discharge	USACE (Mobile District)	SEP-1993
Draft Final Site Safety and Health Plan - Site Characterization Work Plan of SWMUs RSA-46, 47, 51, 56, 122, 139 at RSA, AL	Environmental Science & Engineering, Inc	SEP-1993
Final Installation Community Relations Program, RSA, AL	Ebasco	SEP-1993
Final Public Involvement and Response Plan During Installation Restoration Program Activities at Unit 2, RSA, AL	Ebasco	SEP-1993
Review of Past Environmental Studies, RSA, AL	Advanced Sciences, Inc	NOV-1993
Non-Stockpile Chemical Materiel Program Survey and Analysis Report	Program Manager for Non-Stockpile Chemical Materiel	NOV-1993
Erosion and Deposition in Huntsville Spring Branch and Indian Creek	Woodward-Clyde Consultants	DEC-1993
Report of Preliminary Site Contamination Assessment Proposed Branch Exchange Service Station	LAW Engineering	DEC-1993

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Surface Water and Groundwater Monitoring Data.	US ARMY MICOM EMO	JAN-1994
Final Site Characterization Work Plan of SWMUs 46, 47, 51, 56, 122, and 139	Environmental Science & Engineering, Inc	FEB-1994
Revised Final Work Plan Interim Measure Corrective Design at site RSA-49 (Area F	Ebasco	FEB-1994
Final Report Development of Groundwater Monitoring Database Phase I Support Task, RSA, AL	Vista Technologies	FEB-1994
Environmental Chemistry and Fate of Chemical Warfare Agents	Southwest Research, Inc.	MAR-1994
Best Management Practice, US Army, MICOM EMO	US ARMY MICOM EMO	APR-1994
Draft Final Work Plan to Prepare BRAs at 16 SWMUs, RSA, AL	Environmental Science & Engineering, Inc.	APR-1994
Revised Final Work Plans Interim Corrective Measures Design at Unit 2, sites 12, 13, 14, 131, 132, 133, RSA, AL	Ebasco	MAY-1994

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1994

Title	Author	Date
Interim Remedial Design at sites RSA-56 and 139	USACE (Huntsville District)	MAY-1994
Final Work Plan Interim Corrective Measure Design at Unit 2, sites RSA-13, 14, 132, 133, RSA, AL	Ebasco	MAY-1994
Final Field Sampling and Analysis Plan - Test Well Installation at Unit 2, sites RSA-13, 14, 132, & 133, RSA, AL	Ebasco	MAY-1994
Final Site Safety & Health Plan Field Sampling Program at Unit 2, sites RSA-12, 13, 14, 131, 132, 133, RSA, AL	Ebasco	MAY-1994
Huntsville DDT Remedial Action Huntsville Spring Branch, Indian Creek, Long-Term Monitoring Program Annual Report No. 6.	Olin-Environmental Affairs Dept	JUN-1994
Final Characterization of Investigative Derived Wastes in Drums at Six RCRA Sites.	Engineering Science Inc	AUG-1994
Revised Final Work Plan to Prepare Baseline Risk Assessments at 16 SWMUs	USCOE, Huntsville District	SEP-1994
Final Work Plan to Prepare Feasibility Studies at RSA Unit1, Unit 2, and various sites in Unit 3.	Environmental Science & Engineering, Inc	SEP-1994
Final Work Plan Interim Corrective Measure Design at site RSA-10 (Unit 1)	Enserch Environmental Corp	OCT-1994
Final Field Sampling and Analysis Plan Test Well Installation at site RSA-10 (Unit 1), RSA, AL	Enserch Environmental Corp	OCT-1994
Final Site Safety & Health Plan Test Well Installation at site RSA-10 (Unit 1), RSA, AL.	Enserch Environmental Corp	OCT-1994
Revised Final Work Plan Interim Corrective Measure Design at site RSA-142 (RSA-G)	Enserch Environmental Corp	OCT-1994
Field Sampling and Analysis Plan / Site Safety and Health Plan - Test Well Installation at site RSA-142 (RSA-G).	Enserch Environmental Corp	OCT-1994
Draft Final Work Plan for Evaluating and Disposing of Investigative Derived Wastes	Vista Technologies	OCT-1994
MSFC Sites Proposed for No Further Action, sites MSFC-1, 6, 7, 11, 12, 13, 17, 18, 22, 23, 24, 25, 26, 28, 30, 31, 32, 37,	CH2M HILL	OCT-1994
Final Work Plan Field Sampling and Chemical Data Acquisition Plan Phase I Remedial Investigation of SWMUs RSA-126 and 134	Ebasco	NOV-1994
Final Site Safety and Health Plan Phase I Remedial Investigation of SWMUs RSA-126 and 134	Ebasco	NOV-1994
Final Public Involvement and Response Plan during Installation Restoration Program Activities at site RSA-49	Foster Wheeler Corp	NOV-1994
Final Public Involvement and Response Plan During Installation Restoration Program Activities at site RSA-10, Unit 1, RSA, AL	Foster Wheeler Corp	NOV-1994
Final Report Magnetometer Survey & Intrusive Operations - NASA Site 141, RSA, AL.	El Dorado Engineering, Inc	NOV-1994
95% Submittal Construction Specifications Interim Corrective Measure Design at site RSA-49, RSA, AL.	Ebasco	DEC-1994
Final Environmental Assessment for Redstone Arsenal.	Foster Wheeler Corp	DEC-1994
95% Submittal System Design Analysis Interim Corrective Measure Design at site RSA-49, RSA, AL	Ebasco	DEC-1994
95% Submittal Installation and Maintenance Plan/Health and Safety Design Analysis Interim Corrective Measure Design at site RSA-49, RSA, AL	Ebasco	DEC-1994

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Title	Author	Date
Revised Draft Final Environmental Assessment on Unit 2 (Open Burn / Open Demolition Area). Sites 12, 13, 14, 131, 132, 133, RSA, AL	Gulf Engineers & Consultants, Inc	DEC-1994
Technical Review Committee Meeting #2	RSA	DEC-1994
95% Submittal Construction Specifications Interim Corrective Measure Design at site RSA-13, RSA, AL	Foster Wheeler Corp	DEC-1994
95% Submittal Health and Safety Design Analysis Interim Corrective Measure Design at site RSA-13, RSA, AL	Foster Wheeler Corp	DEC-1994
95% Submittal Installation and Operation Plan Interim Corrective Measure Design at site RSA-13, RSA, AL	Foster Wheeler Corp	DEC-1994
95% Submittal System Design Analysis Interim Corrective Measure Design at site RSA-13, RSA, AL	Foster Wheeler Corp	DEC-1994
Hydrogeologic and Biologic Factors Related to the Occurrence of the Alabama Cave Shrimp (Palaemonias Alabamae) Madison County, Alabama-Bulletin 161	Rheams, Moser and McGregor	DEC-1994

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Final Site Safety and Health Plan Test Well Installation at site RSA-142 (RSA-G)	Foster Wheeler	JAN-1995
US Army Chemical Demilitarization and Remediation Activity Non-Stockpile Chemical Materiel Program Implementation Plan	Department of the Army, Office of the Project Manager for Chemical Demilitarization and Installation Restoration	JAN-1995
Installation Action Plan	MICOM Environmental Management Office	FEB-1995
Installation Restoration Program Management Plan	MICOM Environmental Management Office	FEB-1995
Final RCRA Facility Investigation Report for SWMUs RSA-58, 115, 116, 129, 140, 142, Vol. I & II	Engineering Science Inc	FEB-1995
Invitation for Bid Water Treatment System, site RSA-13 (Open Burn / Open Detonation Area).	USACE (Savannah district),	FEB-1995
Construction of Multilayer Clay Cap at Area F, site RSA-49 (Closed Arsenic Ponds Area).	USACE (Savannah district)	FEB-1995
Site Management Plan	CH2M Hill, Inc	MAR-1995
Final Technical Report - Test Well Installation at site RSA-13 (Unit 2), RSA, AL	Enserch Environmental Corp	MAR-1995
Confirmatory Sampling Report $\delta$ MSFC. Sites MSFC-4, 5, 8, 9, 10, 36, 42, 61, 63, 64, 66, 67, 78, 83, RSA, AL	CH2M HILL	MAR-1995
Final Work Plan "Evaluating and Disposing of Investigative Derived Wastes $\delta$ for all RSA sites	Vista Technologies	MAR-1995
Final RCRA Facility Investigation Report, RCRA Facility Investigation of SWMUs RSA-99, 117, 130, Vol. I & II, RSA, AL	Ebasco	APR-1995
Final Report - Finding of No Significant Impact and Environmental Assessment for Interim Remedial Action at site RSA-13 (Open Burn/ Open Detonation Area).	USACE (Savannah district)	APR-1995
Final Report Finding of No Significant Impact and Environmental Assessment for Interim Remedial Action at site RSA-49 (Closed Arsenic Impoundments).	USACE (Savannah district)	APR-1995
Decision Document for Interim Remedial Action at site RSA-13, Open Burn / Open Detonation Area, RSA	USACE (Savannah district)	APR-1995

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Title	Author	Date
Decision Document for Interim Remedial Action at site RSA-49, Closed Arsenic Ponds Area, RSA	USACE (Savannah district),	APR-1995
Final Report Site Inspection Work Plan for RSA-84, 87, 88, 89, 104, 109, 110, 118,128, 141, 142, 143, A, B, C, D, E, F at RSA, AL	RUST	MAY-1995
Final Site Safety and Health Plan TEU/EOD Plan for RSA-5, 32, 50, 52, 57, 61, 62, 63, 65, 67, 108, 112, 113, 114	RUST	JUN-1995
Final Phase I Remedial Investigation Work Plan for RSA-5, 32, 50, 52, 57, 61, 62, 63, 65, 67, 108, 112, 113, 114	RUST	JUN-1995
Redstone Arsenal Investigative Derived Wastes Disposal Activity Report	Environmental Science & Engineering, Inc	JUN-1995
Decision Document for Removal Action at site RSA-130	AMCOM,	JUN-1995
Final Submittal Interim Corrective Measures Design at site RSA-142, Installation and Operation Plan	Foster Wheeler Corp	JUN-1995
Draft Final Baseline Risk Assessment for sites RSA-48, 49, 54/55, 59	Environmental Science & Engineering, Inc	JUL-1995
Natural Resources Management Plan for Redstone Arsenal, Parts I, II, III, IV, V, VI for all RSA sites	US ARMY MICOM	JUL-1995
Health and Safety Design Analysis for Interim Corrective Measures at site RSA-142	Foster Wheeler Corp	AUG-1995
Construction of Multilayer Clay Cap at Area F, site RSA-49, Field Sampling and Analysis Plan	Vector Enterprises, Inc	AUG-1995
Interim Holding Facility Plan, RSA Non-Stockpile Chemical Materiel	Program Manager for Chemical Demilitarization	AUG-1995
Non-Stockpile Chemical Materiel Program Implementation Plan	Program Manager for Chemical Demilitarization	AUG-1995
Final Submittal Interim Corrective Measures Design at site RSA-142, Construction Specifications	Foster Wheeler Corp	OCT-1995
Final Design Analysis Report, Interim Corrective Measure Design at site RSA-142	Foster Wheeler Corp	OCT-1995
Natural Heritage Inventory of RSA.	Nature Conservancy, Alabama Natural Heritage Program	OCT-1995
Technical Report for Test Well Installation at site RSA-10	Foster Wheeler Corp	NOV-1995
Final Supplemental RI/BRA Work Plan for sites RSA-99, 117, and 130	RUST	NOV-1995
Field Program Technical Report Test Well Installation at site RSA-142	Foster Wheeler Corp	DEC-1995
Disposal Report Evaluation and Disposal of Investigative Derived Wastes from sites RSA-58, 115, 116, 129, and 142	Vista Technologies	DEC-1995
Finding of No Significant Impact/Environmental Assessment for Interim Remedial Action at site RSA-142	USACE, Savannah District	DEC-1995
Internal Draft BRA for sites RSA-10, 53, and 6	ESE	DEC-1995
Unit 4 Groundwater Sampling and Analysis Task for RSA	Vista Technologies	DEC-1995

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RCRA Facility Investigation Addendums I and II to the RCRA Facility Investigation Work Plan for SWMUs	Engineering Science Inc	JAN-1996
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Title	Author	Date
RSA-58, 115, 116, 129, 140 (Target Seeker Area), and 142 (RSA-G). Addendum II		
Final Site Characterization Report for sites RSA-46, 47, 51, 56, 122, and 139 (Group X1)	ESE	JAN-1996
Quality Control Summary Report for sites RSA-99, RSA-117, and RSA-130	Rust E&I	FEB-1996
Redstone Arsenal Extended Pump Test at site RSA-10	ICF Kaiser	FEB-1996
Report of Findings in Support of the Proposed Plan for Mitigation of site RSA-10	Foster Wheeler	MAR-1996
Final Work Plan, Field Sampling & Chemical Data Acquisition Plan, and Site Safety & Health Plan Phase I Remedial Investigation of SWMUs at sites RSA-126 and 134	Foster Wheeler	MAR-1996
Site Safety & Health Plan for Test Well Installation at site RSA-10	ICF Kaiser	APR-1996
Final Phase I Environmental Baseline Study Redstone Rocket Engine Assembly Facility South Plant	Brown & Root Environmental	MAY-1996
Final Comprehensive Work Plan Addendum for sites RSA-8, 9, 11 (Group C1), 45 (Group L8), and 82 (Group L14)	SAIC	MAY-1996
Installation Action Plan for Redstone Arsenal	MICOM Environmental Office	MAY-1996
Redstone Arsenal, site RSA-10, Remedial Investigation Feasibility Study	USCOE, Savannah district	MAY-1996
Final Site Inspection Work Plan for sites RSA-94, 95, 96, 97, and 9	Rust E&I	JUN-1996
Environmental Resource Document, Marshall Space Flight Center	CH2M Hill	JUN-1996
Huntsville DDT Remedial Action Huntsville Spring Branch Indian Creek Long-Term Monitoring Program Annual Report No. 8	Olin	JUN-1996
Working File and Sampling Data for Building 5681	US Army	JUN-1996
Draft Final General RI/FS Work Plan for Unit 2 and Group X4B, Sites 13, 14, 53, 60, 66, 68, 132, 133	Parsons	SEP-1996
Draft Final Unit 2 Site-specific Work Plan for RSA-13, 14, 132, and 133	Parsons	SEP-1996
Draft Final Group X4B Site-specific Work Plan for RSA-53 and 60	Parsons	SEP-1996
Draft Final Group X4B(u) Site-specific Work Plan for RSA-66 and	Parsons	SEP-1996
Surface and Groundwater Monitoring 1995	Northrup Grumman	OCT-1996
Hydrogeologic Evaluation of Landfill Site RSA-010	Geological Survey of Alabama	OCT-1996
Draft Final Remedial Investigation for sites RSA-126 and 134	Foster Wheeler	OCT-1996
Site Inspection Report for Redstone Arsenal Site Inspections Project Solid Waste Management Units, sites RSA-8, 9, 11 (Group C1), site RSA-45 (Group L8), and site RSA-82 (Group L14).	SAIC	OCT-1996
Final Waste Disposition Report for Site Inspections at RSA-8, 9, 11 (Group C1), RSA-45 (Group L8), and RSA-82 (Group L14)	SAIC	NOV-1996

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1996	Title	Author	Date
	Phase I Environmental Baseline Study - Redstone Arsenal Rocket Engine Facility North Plant	CRA	NOV-1996
	Final Report Development of Groundwater Monitoring Database	DEMP	NOV-1996
	RCRA Part B Permit Submittal for the Hazardous Waste Storage Area	Vista Technologies	DEC-1996
1997			
	Draft Final Work Plan to Conduct Baseline Risk Assessment and Feasibility Study at sites RSA-58, 115, 116, 129, and 140	Parsons ES	JAN-1997
	Environmental Assessment of the Natural Resources Management Plan	US Army MICOM	JAN-1997
	Draft Final Feasibility Study for sites RSA-49 and RSA-55/54	ESE	FEB-1997
	US E.P.A. Interchange File Format (IFF) Data for Solid Waste Management Units RSA-46, 47, 51, 56, 122, and 139	ESE	FEB-1997
	Draft Final Report of MSFC Background Sampling	CH2M Hill	FEB-1997
	Installation Action Plan for Redstone Arsenal	MICOM	MAR-1997
	Final Supplemental RCRA Facility Investigation Report for site RSA-115	Parsons	MAR-1997
	Group X4B Site Characterization Report (sites RSA 53 and 60).	Parsons	MAY-1997
	Investigation Derived Waste Disposal Report. Sites 46, 47, 51, 56/122/139, 49, 14, 142, and Perimeter Wells, Redstone Arsenal, AL	IT Corp	JUN-1997
	Draft Final Installation Wide Work Plan	IT Corp	JUN-1997
	RARE North Plant Phase II EBS Sampling and Analysis Plan and Site-Specific Safety and Health Plan	CH2M Hill	JUN-1997
	Installation-Wide Sampling and Analysis Plan	IT Corp	JUN-1997
	Group X4B(u) Site Characterization Report (sites RSA-66 and RSA-68)	Parsons	JUN-1997
	Site-specific Field Sampling Plan Attachments. Sites RSA-46, 47, 51/51S, 56/122/139, 49, 14, 142, Redstone Arsenal, AL	IT Corp	JUN-1997
	Site-specific Safety and Health Plan Attachments. Sites RSA-14, 142, 51/51S, 56/122/139, 49, Redstone Arsenal, AL	IT Corp	JUN-1997
	Final Site Inspection Work Plan for sites RSA-64, 69, and 70, MSFC-2, 3, 27, 34, 53, 55, 60, 65, 74, 77, 82, and D	Rust E&I	JUL-1997
	Draft Non-Stockpile Chemical Materiel Project Implementation Plan	US Army Project Manager for Non-Stockpile Chemical Materiel	JUL-1997
	Draft Final Supplemental Remedial Investigation/Baseline Risk Assessment Report for sites RSA-99, 117, and 130	Rust E&I	AUG-1997
	Draft Final Report of Findings Phase II Environmental Baseline Survey for the Redstone Arsenal Rocket Engine Facility, South Plant	CH2M HILL	AUG-1997
	Draft Final Site-Specific Safety and Health Plan Attachment for the Time-Critical Removal Action at site	IT Corp	AUG-1997

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1997

Title	Author	Date
RSA-130		
Draft Final Work Plan for the Time-Critical Removal Action at site RSA-130, Operable Unit 9	IT Corp	AUG-1997
Draft Final Decision Document for No Further Action at site RSA-108, Rocket Impact Area Operable Unit 16	IT Corp	AUG-1997
Draft Final Decision Document for No Further Action at site RSA-B, Abandoned Army Propellant Manufacturing Building Operable Unit 11	IT Corp	AUG-1997
Draft Final Decision Document for No Further Action at site RSA-84, Temporary Storage Area Operable Unit 10	IT Corp	AUG-1997
Draft Baseline Water Quality Monitoring Program Report, First Quarterly Event of perimeter wells.	IT Corp	AUG-1997
Draft Final Screening Remedial Investigation Report for sites RSA-5, 32, 84, 87, 88, 89, 104, 108, 118, 143, A, B, C, D, E, and F	Rust E&I	SEP-1997
Draft Final Field Sampling and Analysis Plan for OU1 (site RSA-143).	ICF Kaiser	SEP-1997
Draft Final Field Sampling and Analysis Plan for OU-6a (site MSFC-74).	ICF Kaiser	SEP-1997
Final Proposed Plan for the Interim Record of Decision at Operable Unit 6 for site RSA-55/54, Closed Sanitary and Industrial Landfill	IT Corp	OCT-1997
Final Proposed Plan for the Interim Record of Decision at Operable Unit 5 for site RSA-49, Former Arsenic Ponds North	IT Corp	OCT-1997
Final Site-Specific Work Plan and Site-Specific Field Sampling Plan for RSA Screen Remedial Investigation at Operable Unit 2, Sites RSA-D, 5, 8, and 45	SAIC	OCT-1997
Site Safety & Health Plan for RSA Site Inspection Project at OU 2, Sites RSA-D, 5, 8, and 45	SAIC	OCT-1997
Final Proposed Plan for the Interim Record of Decision at Operable Unit 6A for site RSA-10	ICF Kaiser	OCT-1997
Draft Final Feasibility Study for sites RSA-48 and RSA-59	ESE	OCT-1997
Non-Stockpile Chemical Warfare Materiel Programmatic Environmental Impact Statement	DA Program Manager for Chemical Demilitarization	OCT-1997
Finding of Suitability to Lease, RSA Rocket Engine Facility North Plant	RSA	NOV-1997
Control Monuments	PDR	DEC-1997
Biological, Geological and Hydrological Investigations in Bobcat, Matthews, and Shelta Caves and Other Selected Caves in North Alabama, Bulletin 166	McGregor, O'Neil, Rheams, Moser and Blackwood	DEC-1997

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Final Bedrock Monitoring Well Installation Work Plan for site RSA-142	Rust E&I	JAN-1998
Treatability Studies Report for site RSA-142, Degreaser at Building 7664	IT Corp	JAN-1998
Treatability Studies Report for site RSA-14, Contaminated Waste Trenches	IT Corp	JAN-1998
Initial Long-Term Monitoring Report Closed Arsenic Waste Lagoons, Area F, site RSA-49	IT Corp	JAN-1998
Draft Final Phase I Remedial Investigation Report for	Rust E&I	FEB-1998

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1998

Title	Author	Date
sites RSA-50, 52, 57, 61, 62, 63, 65, 67, 109, 110, 112, 113, 114, and 128		
Operation and Maintenance Manual for the Groundwater Recovery and Treatment System Interim Corrective Measure at site RSA-13 (Volumes I and II)	WATEC	FEB-1998
Installation Action Plan for Redstone Arsenal, Alabama	US Army Aviation and Missile Command	MAR-1998
Draft Final Site Screening Remedial Investigation Report for sites RSA-94, 95, 96, 97, and 98	Rust E&I	MAR-1998
Installation Action Plan for Redstone Arsenal	AMCOM	MAR-1998
Bedrock Monitoring Well Installation Report for OU-10. Prepared by Rust E&I, March 1998.	IT Corp	APR-1998
Draft Final Report of Findings Phase II Environmental Baseline Survey for the Redstone Arsenal Rocket Engine Facility, North Plant, OU-10	CH2M Hill	APR-1998
Architectural Assessment of the World War II Military and Civilian Works, US Army Aviation and Missile Command	Panamerican Consultants, Inc	APR-1998
US Army Aviation and Missile Command Hazardous Waste Facility Permit	ADEM,	APR-1998
Draft Final Site-Specific Field Sampling Plan Attachments for Operable Unit 6	IT Corp	MAY-1998
Draft Final Site-Specific Field Sampling Plan Attachments for Operable Unit 7	IT Corp	MAY-1998
Draft Final Site-Specific Field Sampling Plan Attachments for Operable Unit 18	IT Corp	MAY-1998
Draft Final Site-Specific Field Sampling Plan Attachments for Operable Unit 8	IT Corp	MAY-1998
Draft Final Site-Specific Field Sampling Plan Attachments for Operable Unit 10	IT Corp	MAY-1998
Interim Record of Decision Closed Sanitary and Industrial Landfill, sites RSA-55/54, OU-6	IT Corp	MAY-1998
Final Groundwater Monitoring Plan for site RSA-10	ICF Kaiser	MAY-1998
Draft Final Proposed Plan for the Interim Record of Decision at site RSA-99, Former Plating Shop, Building 7614 in Operable Unit 10	IT Corp	JUN-1998
Draft Final Closure Report Time-Critical Removal Action at site RSA-130, Operable Unit 9	IT Corp	JUN-1998
Final Modified Phase I Environmental Baseline Study for the Proposed FBI Training Center	PDR	JUN-1998
RSA OU-6A, site MSFC-74, Secondary Site Investigation Report.	USCOE, Savannah District	JUN-1998
Draft Final Remedial Investigation Report for Operable Unit	IT Corp	JUL-1998
Draft Final Field Sampling and Analysis Plan for site RSA-143 (OU-1), Secondary Investigation Phase II	ICF Kaiser	AUG-1998
Final Site Safety and Health Plan Amendment 1 to the Final Site Safety and Health Plan for Site MSFC-74 for site RSA-10 (OU-6A), Long Term Groundwater Monitoring Program.	ICF Kaiser	SEP-1998
Draft Final Site-Specific Field Sampling Plan Attachments for Operable Unit 5	IT Corp	SEP-1998
Draft Final Baseline Risk Assessment Report for OU-13, OU-12 (RSA-140), and OU-7 (RSA-129 and	Parsons	SEP-1998

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1998	Title	Author	Date
	RSA-58), Volumes 1-3		
	Draft Final Site-Specific Field Sampling Plan Attachments for Operable Unit 15	IT Corp	OCT-1998
	Draft Final Site Screening Remedial Investigation Report for sites RSA-64, 69, and 70, MSFC-2, 3, 27, 34, 53, 55, 60, 65, 74, 77, and 8	Rust E&I	OCT-1998
	Draft Final Site-Specific Field Sampling Plan Attachments for Operable Unit 11	IT Corp	OCT-1998
	Redstone Arsenal, OU-6A, site MSFC-74, Secondary Site Investigation Report	USCOE, Savannah district	OCT-1998
	Draft Final Installation-Wide Safety and Health Plan for Site Investigation Activities	IT Corp	DEC-1998
	Baseline Water Quality Monitoring Program Report Volume I: Groundwater and Volume II: Surface Water	IT Corp	DEC-1998
	Draft Final Site-Specific Field Sampling Plan Attachments for Operable Unit 5	IT Corp	DEC-1998
	Interim Record of Decision at site RSA-99, Former Plating Shop, Building 7614, OU-10	IT Corp	DEC-1998
1999			
	Draft Final Remedial Investigation/Feasibility Report for site RSA-10 (Operable Unit-6a).	ICF Kaiser	FEB-1999
	Redstone Arsenal site RSA-10 Remedial Investigation Feasibility Study	USCOE, Savannah District	FEB-1999
	Focused Feasibility Study Former Liquid Caustic Manufacturing Plant, site RSA-117	IT Corp	MAR-1999
	Redstone Arsenal Ecological Risk Assessment for OU-6A	USCOE, Savannah District	MAR-1999
	Draft Final Site-Specific Field Sampling Plan Attachments for Operable Unit 17	IT Corp	APR-1999
	Draft Final Site-Specific Field Sampling Plan Attachments for Operable Unit 12	IT Corp	APR-1999
	Final Proposed Plan for the Record of Decision for Operable Unit 3	IT Corp	APR-1999
	Draft Final Design Basis Report and Report of Construction Activities for the Interim Remedial Action (IRA) at site RSA-14, Contaminated Waste Burn Trenches	IT Corp	APR-1999
	Final Decision Document for an Interim Remedial Action Soil Vapor Extraction Treatment System for site RSA-14, Inactive Unlined Earthen Open Burn Trenches in OU-14 Open Burn/Open Demolition Area	AMCOM	APR-1999
	Draft Final Supplemental Site Investigation at sites RSA-126 and RSA-134	SAIC	APR-1999
	Real Property Master Plan Land Use Anal	Parsons	APR-1999
	Redstone OU-14 Pump & Treat System	IT Corp	APR-1999
	Final Decision Document for an Interim Remedial Action for Design and Construction of a Clay Cap for sites RSA-56 and RSA-139, Closed Arsenic Waste Lagoons	AMCOM	MAY-1999
	Huntsville/Redstone Arsenal Document Research Project.	PHR Environmental Consultants	MAY-1999
	Draft Final Summary Baseline Human Health Risk Assessment RSA-50 (Operable Unit 17)	IT Corp	JUN-1999

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1999

Title	Author	Date
Results of Well Performance and Pilot Groundwater Recovery Testing, sites RSA-95 and RSA-96, Operable Unit 10	IT Corp	JUN-1999
Decision Document Fencing and Signs for OU-8 (sites RSA-52, 61, and 62), The Inactive Munitions Demilitarization & Chemical Disposal Area	AMCOM	JUN-1999
Decision Document Interim Remedial Action Groundwater Pump-and-Treat System for RSA-96 (OU-10), Former Degreaser Unit and TCE/TCA Solvent Still 3	AMCOM	JUN-1999
Decision Document Interim Remedial Action Groundwater Pump-and-Treat System for RSA-95 (OU-10), Former Degreaser Unit and TCE/TCA Solvent Still 2	AMCOM	JUN-1999
Technical Memorandum for Geophysical Surveys and Groundwater Extraction Well Installation at Operable Unit 14	IT Corp	JUL-1999
Decision Document For an Interim Remedial Action Fencing and Signage Installation for sites RSA-112, 113, and 128 (OU-7)	AMCOM	JUL-1999
Decision Document for No Further Action at site MSFC-60 Drainage System for the Historic Redstone Test Site in OU-18	IT Corp	AUG-1999
Final Evaluation of Groundwater Treatment Alternatives for sites RSA-95 and RSA-96 (OU-10)	IT Corp	AUG-1999
Draft Final Summary Baseline Human Health Risk Assessment for site RSA-67 (Operable Unit 15).	IT Corp	AUG-1999
Final Record of Decision for site RSA-10 (Operable Unit 6A)	ICF Kaiser	AUG-1999
Draft Final Focused Feasibility Study for OU-13 (site RSA-115/116)	Parsons	AUG-1999
Decision Documents for Institutional Controls Using Fence and Signage for Selected Sites Within OU-2 (site RSA-48), OU-6 (sites RSA-53, 54, 55, 56, 59, 60), and OU-15 (sites RSA-65, 66, 67, 68, 69, 70, 110)	AMCOM	AUG-1999
Final Record of Decision for Operable Unit 3. Prepared by IT Corp, September 1999.	IT Corp	SEP-1999
Redstone Arsenal OU-10 Poster Session	IT Corp	SEP-1999
Redstone Arsenal, site RSA-10, Long-Term Pumping Test Summary Report, June 1996 - August 1999	US COE, Savannah District	SEP-1999
Sampling and Analysis Plan OU-14 Groundwater Extraction and Treatment System (site RSA-13) and Soil Vapor Extraction and Treatment System (site RSA-14).	IT Corp	OCT-1999
Redstone Arsenal Independent Technical Review (ITR) Final Recommendation Report for OU-14 (site RSA-13), OU-10 (site RSA-142), OU-7 (site RSA-58), OU-15 (site RSA-68), and OU-4 (site RSA-114).	USAEC	NOV-1999
Final Army Decision Document for OU-10, site RSA-83	EMP-IR	DEC-1999
Final Army Decision Document for OU-10, site RSA-97	EMP-IR	DEC-1999

2000

Draft Final Air Emissions Inventory and Compliance Demonstration for Operational and Proposed Soil and	IT Corp	JAN-2000
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2000

Title	Author	Date
GW Remediation Systems for sites RSA-10, 13, 14, 95, 96, 97, and 142, Revision 1		
Draft Final Site-Specific Field Sampling Plan Attachments for sites RSA-122, RSA-126 and RSA-139, OU6b	IT Corp	FEB-2000
Draft Final Supplemental Remedial Investigation for OU-14 (sites RSA-13, 14, 132, and 133)	IT Corp	MAR-2000
Installation Action Plan 2000	EPW-EQ-IR	MAR-2000
Activities Supporting Attempt to form a Restoration Advisory Board	IRP	MAR-2000
Redstone Arsenal site RSA-143 (OU-1), Technical memorandum for OU-1 Groundwater Contaminant Plume Source Delineation	USCOE, Savannah District	MAR-2000
Draft Final Supplemental Remedial Investigation Report, site RSA-46, OU 12, VOL I and II	IT Corp	APR-2000
Wheeler Permits for fence construction, quarterly monitoring and sampling	US Fish & Wildlife	APR-2000
Draft Final Site Investigation Report for OU-10, sites RSA-87, 88, 89	IT Corp	MAY-2000
Draft Final Installation Wide Work Plan for Fencing and Trench Marker Installation for OU 4-8, 15 and 17	IT Corp	MAY-2000
Land Use Control Memorandum of Agreement at RSA	EPA, ADEM, and RSA	MAY-2000
Draft Final Action Memorandum for Time Critical Removal Action at site RSA-66, OU 1	IT Corp	JUN-2000
Remedial Investigation and Baseline Risk Assessment for OU-2 (sites RSA-D, 5, 8, 45, and 48).	SAIC	JUN-2000
Alabama Risk-Based Corrective Action Plan OU-1, site RSA-143	IT Corp	JUN-2000
Proposed Plan for RSA-50, OU-17	IT Corp	JUL-2000
Environmental Restoration Summary for OU-14 (sites RSA-13, 14, 132, and 133) through August 2000	IT Corp	AUG-2000
Summary of Findings and Recommendations for Decision for the Former Stauffer Chemical Company Plant (site MSFC-55) and the Surface Drainage Ditch and Infiltration Area near Building 4241 (site MSFC-65).	IT Corp	AUG-2000
White Paper Review and Reevaluation of Human Health Risk Assessment; Results and Discussion of Target Organ Analysis and Comparison to Background, site RSA-99, Former Plating Shop, OU-10.	IT Corp	AUG-2000
Operation and Maintenance Manual Groundwater Treatment System at site RSA-13, Volumes 1 & 2	IT Corp	AUG-2000
Draft Final Site Investigation Report for OU-11, RSA-A, C, 82, 135H and 144 and the Supplemental Bedrock Groundwater Investigation	IT Corp	SEP-2000
Engineering and Construction Cost Evaluation for Treating Groundwater from site RSA-142, OU-10	IT Corp	SEP-2000
Third Report on the Remedial Action to Isolate DDT from People and the Environment in the Huntsville Spring Branch-Indian Creek System in Wheeler Reservoir, Alabama.	EPA	SEP-2000
Draft Final Installation-Wide Ordnance and Explosives Management Plan for Support of Hazardous, Toxic and	IT Corp	NOV-2000

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**2000**

Title	Author	Date
Radiological Waste Activities and Construction Activities		
Soil Vapor Extraction (SVE) Operation and Monitoring Report for site RSA-14, Northern Contaminated Waste Burn Trench, January 1999 to December 31, 1999	IT Corp	NOV-2000
Draft Final Design Basis Report for a TCRA, closed South Arsenic Waste Ponds (site RSA-56) and Former Arsenic Trichloride Manufacturing and Disposal Area (site RSA-139W)	IT Corp	DEC-2000
Draft Final Action Memorandum and Work Plan for a TCRA, Closed South Arsenic Waste Ponds (site RSA-56) and Former Arsenic Trichloride Manufacturing and Disposal Area (site RSA-139W).	IT Corp	DEC-2000
Draft Final Interim Remedial Action Operation and Maintenance Manual OU-10 Groundwater Recovery and Treatment System	IT Corp	DEC-2000
Long-Term Groundwater Monitoring Report for site RSA-10 - July 1999 Sampling Event	US COE, Savannah District	DEC-2000
Technical memorandum for Health Effects Assessment for Ammonium Perchlorate	IT Corp	DEC-2000

**2001**

Draft Final Remedial Investigation Report for site RSA-53, OU-6A	USAEC	JAN-2001
Draft Final Closure Report, Time-Critical Removal Action at site RSA-66, Inactive Ash Disposal Site, OU-15	IT Corp	JAN-2001
Final Proposed Plan Fact Sheet for the Inactive Closed Construction Debris Rubble Fill at site RSA-59, OU-6	IT Corp	JAN-2001
TVA Permit for Fence Work at OU-15	TVA	JAN-2001
Final Background Distributions of Naturally Occurring Inorganic Constituents in Groundwater. (Revised Oct 2001)	IT Corp	JAN-2001
Geophysical Investigation Plan for Sites RSA-71, RSA-72, RSA-73, and RSA-74	USCOE, Mobile District	JAN-2001
Huntsville DDT Remedial Action at Huntsville Spring Branch Indian Creek	Olin	FEB-2001
Redstone Arsenal Basic Information Maps	EPW-EQ-IR	MAR-2001
Redstone Arsenal 2001 Installation Action Plan	EPW-EQ-IR	MAR-2001
OU-5 Industrial Sewer Lines Videos	IT Corp,	MAR-2001
Air Stripper Test Summary and Recommendations for sites RSA-95, RSA-96, and RSA-142 Groundwater Treatment Plants	IT Corp,	APR-2001
CD of the posters for the Redstone Arsenal Public Information Meeting and Open House held at the Sparkman Center on May 22, 2001	IT Corp	MAY-2001
Installation-wide Karst Slide Presentation of May 22, 2001 Public Meeting	IT Corp	MAY-2001
Internal Draft Scoping Document, Sites OU-6b and 6d	Shaw	MAY-2001
Interim Remedial Action Quarterly Monitoring Report May 2000-December 2000, sites RSA-96/96 Groundwater Recovery and Treatment System	IT Corp	MAY-2001

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2001

Title	Author	Date
Screening Remedial Investigation and Baseline Risk Assessment for OU-2 sites	US COE, Savannah District	MAY-2001
Time-Critical Removal Action Construction Report for site RSA-56, Closed Arsenic Waste Ponds, and site RSA-139, Former Arsenic Trichloride Manufacturing and Disposal Area (OU-6B).	IT Corp	MAY-2001
Final Work Plan for Groundwater Treatment Plant Modifications at site RSA-142	IT Corp	JUN-2001
Treatability Study Quarterly Monitoring Report January 2001-March 2001, OU-10, sites RSA-95/96, Groundwater Recovery and Treatment System	IT/Shaw Corp	JUN-2001
Treatability Study Quarterly Monitoring Report January 2001-March 2001, OU-10, site RSA-142, Groundwater Recovery and Treatment System	IT/Shaw Corp	JUL-2001
US Army Active/Inactive Range Inventory	AMC	JUL-2001
Draft Final Site-Specific Safety and Health Plan for the Remedial Investigation at OU-10 sites	IT Corp	JUL-2001
Treatability Study Quarterly Monitoring Report April 2001-June 2001, OU-10, sites RSA-95/96, Groundwater Recovery and Treatment System	IT/Shaw Corp	OCT-2001
CD of OU-10 Slide Presentation from October 23, 2001 Public Meeting	IT Corp	OCT-2001
CD of the posters for the Redstone Arsenal (OU-10) Public Information Meeting and Open House held October 23, 2001	IT Corp	OCT-2001
Field Sampling and Analysis Plan for site RSA-10/OU-6A Long-Term Groundwater Monitoring Program	IT Corp	OCT-2001
Treatability Study Quarterly Monitoring Report April 2001-June 2001, OU-10, site RSA-142, Groundwater Recovery and Treatment System	IT/Shaw Corp	NOV-2001
Technical and Business Proposal Central RSA Dye Trace Studies and Seismic Surveys, Perchlorate Treatability Study, Base-wide Spring Evaluation Continuous Surface Water and Groundwater Monitoring, and OU-10 Remedial Investigation	Shaw	DEC-2001

2002

Treatability Study Quarterly Monitoring Report July 2001-September 2001, OU-10, sites RSA-95/96 Groundwater Recovery and Treatment System	IT/Shaw Corp,	JAN-2002
Final Central Redstone Arsenal (OU-5, 6, 7, 18) Dye Trace Study Field Sampling and Analysis Plan and Safety and Health Plan Addendum	Shaw	JAN-2002
Redstone Arsenal 2002 Installation Action Plan	Engineering & Environment, Inc.	FEB-2002
Huntsville DDT Remedial Action Huntsville Spring Branch Indian Creek Long-Term Monitoring Program Annual Report No. 14	Olin Corporation	FEB-2002
Treatability Study Quarterly Monitoring Report July 2001-September 2001, OU-10, site RSA-142 Groundwater Recovery and Treatment System	IT/Shaw Corp	FEB-2002
Redstone Arsenal Project Review Meeting	IT/Shaw Corp	FEB-2002
Treatability Study Quarterly Monitoring Report October 2001-December 2001, OU-10, sites RSA-95/96,	IT/Shaw Corp	APR-2002

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2002

Title	Author	Date
Groundwater Recovery and Treatment System		
Treatability Study Quarterly Monitoring Report October 2001-December 2001, OU-10, site RSA-142, Groundwater Recovery and Treatment System	IT/Shaw Corp	APR-2002
Redstone Arsenal Natural Resources Management Plan	RASA	MAY-2002
Redstone Arsenal Implementation Plan, FY2002	IT/Shaw Corp	JUN-2002
Safety Submission Volumes I & II, site RSA-14	Foster Wheeler	AUG-2002
Closed, Transferring and Transferred Range/Site Inventory Report	Malcolm Pirnie	SEP-2002
Site-Specific Safety and Health Plan Pre-Corrective Action Sampling Activities, site RSA-143, Underground Storage Tank Spill Site	IT/Shaw Corp	SEP-2002
Technical and Business Proposal CERCLA Investigation	IT/Shaw Corp	SEP-2002
Treatability Study Quarterly Monitoring Report May 2000-December 2000, OU-10, site RSA-146, Treatment Plant #2	Shaw	OCT-2002
Final Design Basis Report for site RSA-146 Treatment Plant #2 for the Treatability Study at OU-10	Shaw	OCT-2002
Construction Report for the RSA-146 Treatment Plant #2 for the Treatability Study at OU-10	IT Corp	OCT-2002
Presentation Posters Redstone Arsenal Public Meeting, 23 October 2003	Shaw	OCT-2002
Appendix C Site Safety and Health Plan Amendment	Bhate	NOV-2002
Confirmatory Sampling of Solid Waste Management Units	Bhate	NOV-2002
Environmental Baseline Study Southern Bypass Route	EMR	DEC-2002

2003

Redstone Arsenal Fact Sheet Issue 13	Shaw	FEB-2003
Permit Application for Class V Underground Injection Control (UIC) Permit Application for Site RSA-143, OU-1	Shaw	MAR-2003
Redstone Arsenal 2003 Installation Action Plan	Shaw	MAR-2003
Final Exit Pathway Monitoring Well Installation Work Plan	IT Corp	APR-2003
Final Seismic Surveys of OU-18, OU-5, OU-6, OU-7, OU-14 and Work Plan and Safety and Health Plan Addendum for Seismic Surveys at OU-5, -6, -7, -14, and -18	Shaw	APR-2003
Redstone Arsenal World War II Resource Study	New South Associates	APR-2003
Redstone Arsenal Environmental Site Access Control Program	US Army Garrison	MAY-2003
Decision Document for site RSA-143, Underground Storage Tank Spill Site	DES	MAY-2003
Final Time-Critical Removal Action Closeout Report Fencing and Trench Marker Installation, Select Sites in OU-4 through 8, 12, 15, and 17	Shaw	MAY-2003
Final Site-wide Karst Hydrogeologic Investigation,	Shaw	JUN-2003

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2003

Title	Author	Date
Phase I Report of Findings.		
Supporting Backup for DODIG Audit of FY02 Environmental Liabilities of Select Sites	Shaw	JUL-2003
Redstone Arsenal Program Review		AUG-2003
Final Site-Specific Health and Safety Plan for site RSA-122 Phase II Remedial Investigation, Dismantled Lewisite Manufacturing Plants Site	Shaw	SEP-2003
Final Site-Specific Safety and Health Plan Attachment, Remedial Investigation at site MSFC-2	Shaw	SEP-2003
Final Closeout Report Non-Time Critical Removal Action at site RSA-49, Cap Installation Over the Former Arsenic Ponds, OU-5	Shaw	SEP-2003
Final Site-Specific Safety and Health Plan Supplemental Remedial Investigation at site RSA-53 and RSA-60, OU-6A	Shaw	SEP-2003
Final Issuance of Modification No. 1 AHWMMMA Hazardous Waste Storage/SWMU Corrective Action/Subpart X Permit	ADEM	SEP-2003
Final Supplemental Information Relevant to Fact Sheet 20 for Updating the Administrative Record File for Time-Critical Removal Actions, Non-Time-Critical Removal Actions, and Treatability Studies at RSA	Shaw	OCT-2003
Final Site-Specific Safety and Health Plan Attachment for Corrective Action Activities site RSA-143, Underground Storage Tank Spill Site	Shaw	OCT-2003
Work-to-Date Summaries for Multiple Sites: April-June 2002, November 2002, and May-June 2003	Shaw	OCT-2003
Presentation Posters Redstone Arsenal Public Meeting, 23 October 2003	Shaw	OCT-2003
Final Methodology for the Comparison of Site and Background Data	Shaw	NOV-2003
Public Health Assessment for RSA and MSFC	ATSDR	NOV-2003
Final Site-Specific Safety and Health Plan for the Remedial Investigation at OU-10 Sites.	Shaw	DEC-2003

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Final Treatability Study Technical Work Plan for Groundwater and Soil at OU-10	Shaw	JAN-2004
Final Base-wide Spring/Seep Sampling Plan and Health and Safety Plan Addendum	Shaw	JAN-2004
Final Site-Specific Safety and Health Plan Supplemental Remedial Investigation at site RSA-10, OU-6A	Shaw	JAN-2004
Final Activity Specific Safety and Health Plan, Surface Water and Sediment Background Study	Shaw	JAN-2004
Seismic Reflection Profiling Project at OU-5, 6, 7 and 18	Shaw	JAN-2004
Site RSA-146 Site-Specific Field Sampling Plan Attachment, Potential Source Area Investigation, Limited Site Assessments	Shaw	MAR-2004
Geophysical Survey at the Marshall Space Flight Center, sites SA-12 and SA-13	Technos, Inc	MAR-2004
Revision 1, Submittal of Draft Activity-Specific Safety and Health Plan and Activity-Specific Munitions and	Shaw	APR-2004

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2004

Title	Author	Date
Explosives and Concern (MEC) and Site-Specific Safety and Health Plan Attachments, Investigation of Potential Source Areas, Limited Site Assessments		
Redstone Arsenal 2004 Installation Action Plan	RSA	APR-2004
Final Site-Specific Field Sampling Plan Pre-Corrective Action Sampling Activities, site RSA-143, UST Spill Site	Shaw,	JUN-2004
Final Supplemental Remedial Investigation Report RSA-99, Abandoned Plating Shop Tanks and Sump, OU-10	Shaw	JUL-2004
Community Relations Plan	Shaw	JUL-2004
Final Base-wide Spring/Seep Sampling Report of Findings	Shaw	JUL-2004
Final Site-Specific Field Sampling Plan Attachment, Supplemental Remedial Investigation at site RSA-10, OU-6A	Shaw	JUL-2004
Final Site-Specific Field Sampling Plan Surface Water and Sediment Background Study	Shaw	JUL-2004
Final Perchlorate Treatability Study Summary Report Prospective Treatment Alternatives for Groundwater, Soil, and Surface/Spring Water	Shaw,	JUL-2004
Final Continuous Surface Water Monitoring Report 2000-2002	Shaw	JUL-2004
NASA Site Management Plan	NASA	SEP-2004
Draft Final Technical Memorandum Limited Indoor Air and Soil Gas Sampling Investigation at MSFC.	CH2M Hill	SEP-2004
Final Record of Decision site RSA-99, Abandoned Plating Shop Tanks and Sump, Building 7614, OU-10	Shaw	SEP-2004
Site RSA-143 Free Product Recovery Report (September 2004)	DPW-EM-IR	SEP-2004
Contaminants in the Subsurface: Source Zone Assessment and Remediation	National Research Council	NOV-2004
Final site RSA-114 Safety Submission	Tetra Tech	NOV-2004

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SWMU Assessment Report RSA-223, RSA-224, RSA-225, RSA-226 and RSA-227.	Shaw	JAN-2005
Potential Source Area Investigation Report	Shaw	JAN-2005
Draft RSA-146 Potential Source Area Investigation Report	Shaw	JAN-2005
Second Resubmittal of the Draft FFA for RSA	RSA	FEB-2005
Draft Revision 1 RI Report for RSA-011, OU-10, Former Sewage Treatment Plant #1.	Shaw	FEB-2005
Draft Cap Effectiveness Report for RSA-049	Shaw	FEB-2005
Long Term Groundwater Monitoring Trend Analysis Report for RSA-010, OU-6A	Shaw	MAY-2005
SWMU Assessment Report RSA-228, RSA-229, RSA-230, RSA-231, RSA-232, RSA-233, RSA-235, and RSA-236.	Shaw	MAY-2005
Final Site-Specific Safety and Health Plan Attachment for RSA-143, OU-1 Free-Product Delineation.	Shaw	MAY-2005

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2005

Title	Author	Date
Public Health Assessment for RSA and MSFC	ATSDR	JUL-2005
Draft-Final Phase II Remedial Investigation/Feasibility Study Report for RSA-057, Inactive Arsenic Waste Lagoons, East, OU-6B	Shaw	SEP-2005
Limited Site Assessments Addendum: Supplemental Assessments.	Shaw	SEP-2005
Final MSFC-074 Secondary Site Investigation Report, OU-6A	Shaw	OCT-2005
Draft-Final Remedial Investigation Report for RSA-011, OU-10 Former Sewage Treatment Plant #1.	Shaw	OCT-2005
Draft Demonstration Plan for Permeable Mulch Biowall for Anaerobic Bioremediation of Perchlorate in Groundwater at Site RSA-013 (OU-14).	Parsons	OCT-2005
Draft Site-Specific Field Sampling Plan Attachment for Supplemental RI at RSA-097, Solvent Degreaser Distiller at Bldg 7726	Shaw	NOV-2005
Draft Phase II RI Report for RSA-122, Dismantled Lewisite Manufacturing Plant Sites, OU-6B.	Shaw	NOV-2005
Draft Addendum to Site-wide Remedial Investigation/Feasibility Study Work Plan to Address Additional Sampling at OU-3 at MSFC	NASA/CH2M Hill	NOV-2005
Draft Proposed Plan for RSA-057, Inactive Waste Lagoons East, OU-6B	Shaw.	DEC-2005
Draft RI Report for RSA-087, Temporary Storage Area at Bldg 7368, OU-10	Shaw.	DEC-2005
Draft RI Report for RSA-094, Solvent Degreaser Distiller at Bldg 7625, OU-10	Shaw.	DEC-2005
Draft RI Report for RSA-088, Temporary Storage Pad at Bldg 7625, OU-10	Shaw.	DEC-2005
Report of Limited Environmental Site Assessment Huntsville Southern Bypass	MACTEC	DEC-2005

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Draft Site-Specific Field Sampling Plan for RI at RSA-058, Inactive Rubble Fill and Waste Pile. OU-7.	Shaw	JAN-2006
Draft RI Report for MSFC-002, Drum Disposal Area, and MSFC-087, Inactive Cyanide Lagoon, OU-18	Shaw	JAN-2006
Final Community Relations Plan	Shaw	MAR-2006
RSA-146 Perimeter Groundwater Monitoring Work Plan	Shaw	APR-2006
Final Report of Geophysical Survey to Investigate Geologic and Karst Conditions MSFC.	Technos	APR-2006
Draft Record of Decision Surface Media at RSA-057, Inactive Arsenic Waste Lagoons, East OU-6		APR-2006
Draft RSA-150, 153, 154, and 155 Potential Source Area Investigation Report	Shaw	APR-2006
Final Statement of Basis/Proposed Plan RSA-057, Inactive Arsenic Waste Lagoons-East, OU-6.	Shaw	MAY-2006
Final Phase II Remedial Investigation/Feasibility Study Report RSA-057, Inactive Arsenic Waste Lagoons, East, OU-6	Shaw	MAY-2006
Addendum to the Draft-Final Site-Specific Field Sampling Plan Attachment Phase II Remedial Investigation at RSA-183 Former Lewisite Plant 1 Lines 1 and 2, OU-5.	Shaw	JUN-2006

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2006

Title	Author	Date
Redstone Arsenal 2006 Installation Action Plan	RSA and USAEC	SEP-2006

2007

Video Survey of the Abandoned Industrial Sewer at RSA-183	Shaw E&I	JAN-2007
Final Cap Effectiveness Report RSA-049, Capped Arsenic Waste Ponds - West, OU-5	Shaw E&I	MAY-2007
Final Investigation Work Plan for RSA-229, RSA-232 and RSA-235	Shaw E&I	JUN-2007
Final Site-Specific Field Sampling Plan for Remedial Investigation, RSA-142, Chlorinated Solvent Spill Including Buildings 7663-7665, 7676-7684 and Associated Sewer Lines, OU-10	Shaw E&I	JUN-2007
Final Site-Specific Field Sampling Plan for Remedial Investigation, RSA-196, Test Stand and Cleaning Building, OU-10	Shaw E&I	JUN-2007
Final Site-Specific Field Sampling Plan, Remedial Investigation, RSA-096, Solvent Degreaser Distiller at Building 7740, OU-10	Shaw E&I	JUN-2007
Final Remedial Investigation Report, Baseline Human Health Risk Assessment and Screening-Level Ecological Risk Assessment for RSA-011, Former Sewage Treatment Plant No. 1, OU-10	Shaw E&I	JUL-2007
Final Statement of Basis/Proposed Plan for Surface Media at RSA-011, Former Sewage Plant No. 1, OU-10	Shaw E&I	JUL-2007
Final Proposed Plan, Interim Remedial Action for Installation-Wide Groundwater	Shaw E&I	JUL-2007
Final Focused Feasibility Study/Statement of Basis/Proposed Plan for Surface Media, RSA-049, Capped Arsenic Waste Ponds - West, OU-5	Shaw E&I	JUL-2007
Final Removal Action Work Plan MSFC-002: Inactive Abandoned Drum Disposal Site and MSFC-087: Inactive Cyanide Lagoon, OU-18	Shaw E&I	AUG-2007
Final Record of Decision for Surface Media at RSA-011, Former Sewage Treatment Plant No. 1, OU-10	Shaw E&I	AUG-2007
Final Record of Decision for Surface Media at RSA-057, Inactive Arsenic Waste Lagoons - East, OU-6	Shaw E&I	AUG-2007
Final Indoor Air Vapor Intrusion Evaluation, Supplement to the Final Phase II Remedial Investigation/Feasibility Study Report, RSA-057, Inactive Arsenic Waste Lagoons - East OU-6	Shaw E&I	AUG-2007
Final Phase II Remedial Investigation, Baseline Human Health Risk Assessment and Screening-Level Ecological Risk Assessment for RSA-122, Dismantled Lewisite Manufacturing Plant Sites, OU-6, Volume 1 and 2 Replacement Figures	Shaw E&I	AUG-2007
Final Record of Decision for Surface Media at RSA-049, Capped Arsenic Waste Ponds - West, OU-5	Shaw E&I	AUG-2007
Final Interim Record of Decision, Interim Remedial Action for Installation-Wide Groundwater	Shaw E&I	SEP-2007
Final Record of Decision for RSA-047, Former Chemical Training Facility, OU-3	Shaw E&I	SEP-2007
Final Remedial Investigation Report, Baseline Human Health Risk Assessment and Screening-Level	Shaw E&I	SEP-2007

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2007	Title	Author	Date
	Ecological Risk Assessment for RSA-183 (Formerly Part of RSA-049), Former Lewisite Plants 1 and 2, OU-5, Volume 1 & 2 Replacement Figures		
	Final Preliminary Risk Evaluation (PRE) for RSA-223, Former Railroad Classification Yard	Shaw E&I	SEP-2007
	Closure Administrative Letter for Surface Media at RSA-223	Shaw E&I	SEP-2007
	Closure Letter and Well Abandonment Letter for RSA-232 and RSA-235	Shaw E&I	SEP-2007
	Final Site-Specific Field Sampling Plan for Remedial Investigation RSA-144, Chlorinated-Solvent Distillation Unit 6, OU-11.	Shaw	OCT-2007
2008			
	Draft Tennessee River Surface Water Sampling Plan	Shaw	JAN-2008
	Draft Remedial Investigation Report, RSA-196, Test Stand and Cleaning Building, OU-10	Shaw	JAN-2008
	Draft Site Management Plan	Shaw	JAN-2008
	Draft Remedial Investigation Report, Baseline Human Health Risk Assessment and Screening-Level Ecological Risk Assessment RSA-142, Chlorinated Solvent Spill Including Buildings 7663-7665, 7676-7684 and Associated Sewer Lines OU-10.	Shaw	JAN-2008
	Draft Final Remedial Investigation RSA-097, Solvent Degreaser Distiller at Building 7726 and RSA-089, Temporary Storage Pad at Building 7726.	Shaw	JAN-2008
	Draft Remedial Investigation Report, RSA-096, Solvent Degreaser Distillation at Building 7740, OU-09.	Shaw	FEB-2008
	Final Site-Specific Field Sampling Plan Attachment for the Expanded Site Investigation MSFC-077, Former Burn Pit Area, OU-18.	Shaw	FEB-2008
	RSA-200 Stage I Data Summary and Recommendations for Stage II Investigation Activities.	Shaw	FEB-2008
	Preliminary Summary of Supplemental Remedial Investigation Findings for the RSA-138M Building 7722 Storage Pad and Sump; Building 7721 Aluminum Paste Mixer/Ferric Chloride Grinding; and Building 7724 Degreasing and Propellant Mixing Facility OU-9.	Shaw	FEB-2008
	Draft Closeout Report for the Time Critical Removal Action RSA-252: Building 5681, Former Oil Incendiary Filling Plant, OU-6.	Shaw	FEB-2008
	Final Closure Report for Non-Time Critical Removal Action at MSFC-002/087: Inactive Abandoned Drum Disposal Site/Inactive Cyanide Lagoon, OU-18.	Shaw	FEB-2008
	Final Tennessee River Surface Water Sampling Plan.	Shaw	FEB-2008
	Final Statement of Basis/Proposed Plan for Surface Media at MSFC-002/087: Inactive Abandoned Drum Disposal Site/Inactive Cyanide Lagoon, OU-18.	Shaw	FEB-2008
	Final Remedial Action Work Plan for RSA-057, Inactive Arsenic Waste Lagoons-East.	Shaw	MAR-2008
	Draft Focused Feasibility Study for RSA-122, Dismantled Lewisite Manufacturing Plant Sites; RSA-056, Closed Arsenic Waste Ponds and RSA-139 Former Arsenic Trichloride Manufacturing Disposal	Shaw	MAR-2008

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2008

Title	Author	Date
Area.		
Draft Focused Feasibility Study for RSA-183, Former Lewisite Manufacturing Plants 1 and 2.	Shaw	MAR-2008
Draft Final Underground Storage Tank Corrective Action Plan RSA-143, OU-1.	Shaw	MAR-2008
Letter transmitting the Commencement of Remedial Action Activities RSA-057, Inactive Arsenic Waste Lagoons.	Shaw	MAR-2008
Letter transmitting the RSA-251 Request for No Action.	Shaw	MAR-2008
Final Statement of Basis/Proposed Plan for Surface Media MSFC-002/087: Inactive Abandoned Drum Disposal Site/Inactive Cyanide Lagoon, Rev.1, OU-18.	Shaw	MAR-2008
Final RSA-146 Phase I Remedial Investigation Report.	Shaw	APR-2008
Final Remedial Investigation Report, Baseline Human Health Risk Assessment and Screening-Level Ecological Risk Assessment for MSFC-002/087: Inactive Abandoned Drum Disposal Site/Inactive Cyanide Lagoon, OU-18.	Shaw	APR-2008
Final Record of Decision for Surface Media at MSFC-002/087: Inactive Abandoned Drum Disposal Site/Inactive Cyanide Lagoon, OU-18.	Shaw	MAY-2008
Final Remedial Investigation Report, Baseline Risk Assessment and Screening-Level Ecological Risk Assessment, RSA-094, Solvent Degreaser Distiller at Building 7625, OU-10.	Shaw	MAY-2008
Notification of Remedial Action Activities Schedule for RSA-057, Inactive Arsenic Waste Lagoon.	Shaw	JUN-2008
MSFC-077 Former Burn Pit Area, OU-18, Request for No Action.	US Army Garrison-Redstone	JUL-2008
Final Statement of Basis/Proposed Plan for Surface Media at RSA-094, Chlorinated Solvent Distillation Unit 1, OU-10.	Shaw	JUL-2008
Final Statement of Basis/Proposed Plan for Surface Media at RSA-196, Test Stand and Cleaning Building, OU-10.	Shaw	JUL-2008
Final Remedial Investigation Report, Baseline Risk Assessment and Screening-Level Ecological Risk Assessment, RSA-097, Solvent Degreaser Distiller at Building 7726 and Former RSA-089, Temporary Storage Pad at Building 7726.	Shaw	JUL-2008
Final Expanded Site Investigation Report MSFC-077, Former Burn Pit Area, OU-18	Shaw	AUG-2008
Request for No Further Action for RSA-229, Former PX Service Station (UST ID No. 15057-089-002590, Release No. UST-07-06-03) Redstone Arsenal.	US Army	SEP-2008
MSFC-077, Former Burn Pit Area, OU-18, Request for No Action.	Shaw	SEP-2008
Final Site Investigation Report and Preliminary Risk Evaluation for RSA-224, Former Ton Container and 55-Drum Storage Area.	Shaw	SEP-2008
Final Site Investigation Report and Preliminary Risk Evaluation for RSA-D, Former Paint Shop (Building 3546) and Storage Shed.	Shaw	SEP-2008

## IRP Previous Studies

	<b>Title</b>	<b>Author</b>	<b>Date</b>
<b>2008</b>	Final Site Investigation Report and Preliminary Risk Evaluation for RSA-236, Former Grenade Packing & Assembly, Building 3563.	Shaw	SEP-2008
<b>2011</b>	See Appendix A to IAP- Previous Studies FY09-Feb11	Redstone Arsenal	FEB-2011

**REDSTONE ARSENAL**  
**Installation Restoration Program**  
**Site Descriptions**

**Site ID: CCRSA-315**  
**Site Name: Abandoned Drum Area**  
**Alias: RSA-315**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** NOT EVALUATED

Contaminants of Concern: Petroleum, Oil and Lubricants (POL)

Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	201102.....	201103
RFI/CMS.....	201205.....	201504
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201504	

**SITE DESCRIPTION**

RSA-315 is an abandoned drum area along the northeast edge of the RSA Golf Course, north of Goss Road. During a site visit in February 2011, approximately 15 (5-gallon) steel containers, 4 (55-gallon) steel drums, tire casings, concrete and metal debris were observed distributed across three locations. The rusted condition of the steel containers indicated that they were exposed to the elements for a long period of time. The exact origin of the containers is unknown. However, the possibilities for the origin include construction efforts that were completed in the area and the operation or maintenance of the golf course. As such, these containers may have contained petroleum products, fertilizers, pesticides, or herbicides. Due to the rusted condition of the drums, none of the drums contained any contents at the time they were discovered.

Soil sampling was completed for the areas and the drums removed. The sample results indicated that metals were present above screening levels in one of the three areas. Based on the soil sampling, RSA-315 was identified as a new solid waste management unit (SWMU) in notification provided to the Alabama Department of Environmental Management on March 29, 2011.

**CLEANUP/EXIT STRATEGY**

The path forward is to complete an RFI to fulfill requirements in the RSA RCRA permit. The Alabama Department of Environmental Management (ADEM) issued the Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Permit #AL7 210 020 742, on September 30, 2010 to the Army. It is anticipated that the risk assessment will determine that no further action is required.

**Site ID: MSFC-027**

**Site Name: INACTIVE WASTE ACCUMULATION AREA**

**Alias: None**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Pesticides, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB)

Media of Concern: Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199510.....	199809
RFI/CMS.....	200906.....	201308
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201308	

## SITE DESCRIPTION

New historical information from the archive search indicates that MSFC-027 was a large (about 5.5 million gallons) fuel and other hydrocarbon tank farm. Subsequent use included a contractor laydown yard and a former paint-spray booth, which was operated by NASA. The site is located near Observatory Road and is approximately 24 acres. The site is located near the east-central MSFC boundary and is relatively flat. Portions of the site are wooded, but the majority is gravel or asphalt-paved area within a fence. The site previously included several large aboveground fuel storage tanks. Miscellaneous materials were stored in the area, including scrap metal of all types, waste oils, solvents, and sludge.

The site boundary includes MSFC and RSA property. Site MSFC-081 is located within the site boundary. Dye trace studies have indicated rapid transport from this site downgradient within RSA-148. Chlorinated hydrocarbons have been detected in the groundwater; however, the groundwater contamination is not believed to be from this site.

## CLEANUP/EXIT STRATEGY

### Problems Warranting Action

- Sufficient analytical data are not available to assess the potential for historical releases from multiple aboveground storage tanks (AST) formerly located across the site.
- Potential VOC sourcing to groundwater concern in the vicinity of monitoring well E27-RS850 based on existing groundwater data.
- Site data have not been reported.
- Portions of three existing MSFC sites with identified contamination are within the MSFC-027 boundary.

### Technical Approach

- Based on the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA) Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required for MSFC-027.
- An RFI field investigation will be conducted including collection of soil samples and groundwater samples from existing overburden monitoring wells to determine the potential of a release associated with the former ASTs and sourcing to groundwater in compliance with the Alabama Environmental Investigation and Remediation Guidance.
- An RFI/CMS and statement of basis documenting the remedy of NFA (RC) will be completed. A permit modification will follow the statement of basis documenting the selection of NFA (RC).

**Site ID: MSFC-033A**  
**Site Name: Surface Soils East of Bldg 4816**  
**Alias: MSFC-033A**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	201010.....	201012
RFI/CMS.....	201205.....	201503

**RIP Date:** N/A

**RC Date:** 201503

**SITE DESCRIPTION**

MSFC-033A is an area where soil was inadvertently relocated from a portion of site MSFC-033, which is a site included on the FFA for Marshal Space Flight Center. NASA site MSFC-033 was a waste accumulation area for the MSFC Maintenance and Supply Operations area at the Redstone Army Airfield Buildings 4815, 4816, and 4817. The unit was approximately 3 feet (ft) by 16 ft concrete apron adjacent to Building 4815. Waste handled included waste mineral spirits and lube oil, waste sand blast residue and waste JP-4 fuel. Wastes were collected and transferred to the MSFC Hazardous Waste Storage Facility before off-site disposal. MSFC-033 is no longer present and has been covered by an addition to Building 4815. During the construction of this building addition in 2011, soils from MSFC-033 were relocated immediately adjacent to the eastern wall of the addition, which resulted in the creation of Army site MSFC-033A. MSFC-033A is located on the east side of Building 4815 which is adjacent to the Redstone Army Airfield runway.

To evaluate the nature and extent of potential contaminants at MSFC-033A, surface soil and subsurface soil samples were collected and PAH compounds were identified as exceeding soil screening levels. This area was identified as a new RCRA SWMU in December 2010 as requested by ADEM.

**CLEANUP/EXIT STRATEGY**

The path forward is to complete an RFI to fulfill requirements in the RSA RCRA permit. The ADEM issued the RCRA Hazardous Waste Facility Permit #AL7 210 020 742, on Sept. 30, 2010 to the Army. It is anticipated that the risk assessment will determine that no further action is required.

**Site ID: MSFC-034**

**Site Name: FORMER CHEMICAL PRODUCTION AREA**

**Alias: None**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Chemical weapon munitions (CWM)/Chemical agent, Metals, Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199510.....	199909
RFI/CMS.....	200906.....	201412
DES.....	200906.....	201602
CMI(C).....	200906.....	201610

**RIP Date:** N/A

**RC Date:** 201708

## SITE DESCRIPTION

Site MSFC-034 is located on approximately 54 acres, in the northern part of MSFC. This site includes all plants associated with WWII HAS mustard production and filling facilities, not just the 4481 sump (as previous listed). There are 24 USTs (16 ethanol and 8 fuel oil) associated with the production and filling facilities believed to still be in place at the site. Mustard scrubbing and decon facilities and potential PCBs from transformers are additional areas of concern. Soil borings indicate subsurface soils and groundwater have been impacted with chemical agents and their degradation products and VOCs (carbon tetrachloride). The exact source of the release is unknown, but may be related to industrial sewer lines or fluid storage tanks. In 1959, MSFC took control of these buildings. There are 5 NASA sites located within the MSFC-034 site boundary including the industrial sewer system. The Army may be required to assume the responsibility for these 5 sites including the industrial sewer within the MSFC-034 boundary. This decision is contingent upon the FFA and the Army-NASA MOA negotiations. A Hazardous Waste Facility Permit was issued September 30, 2010 pursuant to the Alabama Hazardous Waste Management and Minimization Act (AHWMMA). Table VI.2 of the Permit stipulates that this site achieve an approved RCRA Facility Investigation (RFI) in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

To address the problems warranting action in surface media Army will excavate soils at Buildings 4471 and 4481 that are contaminated with mustard and residual fuel components. Excavations will be performed from the following areas: two sump pits; two storage pits; two liquid level pits

It is anticipated that LUCs will be required due to the highly developed nature of the area and the potential presence of residual chemical agent even after the removal of the major chemical agent sources. Successful implementation of the LUC will require coordination with NASA.

**Site ID: MSFC-035**

**Site Name: INACTIVE SUMP/TILED DRAIN FIELD-EAST TA**

**Alias: None**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Pesticides, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199510.....	201111
RFI/CMS.....	201103.....	203109
IRA.....	201103.....	202909
LTM.....	203109.....	204209

**RIP Date:** N/A

**RC Date:** 203109

## SITE DESCRIPTION

Site MSFC-035 is a concrete-lined sump and tile drain field that was believed to have been operational for a few years during WWII. The unit is located at the north end of the MSFC east test stand area, immediately south of Perimeter Road and 350 feet (ft) east of the paved scrap storage pad north of the MSFC Test Complex 300. The sump is a brick/concrete above ground structure with a steel manhole cover on top. The drain field is a grassy open field of about one acre.

The 1989 follow-on study to the preliminary assessment (PA)/site inspection (SI) (Harmon, 1989) determined that the unit was part of a latrine and shower area that received raw domestic sewage and gray water from the German prisoner of war (POW) camp during prisoner captivity during WW II. Domestic waste from this unit most likely leached into the surface drainage system via groundwater infiltration. In 1989, Geraghty & Miller, Inc. summarized the work Harmon performed and formulated the PA/SI for the site.

A 1948 document identifies the inspection of the facility in connection with storing of goop drums and installation of facilities, roads, and pits for burning goop.

The 2004 visual site inspection (VSI) revealed that the current area for MSFC-035 is paved with several large pieces of equipment parked in the area.

On Sept. 30, 2010 the ADEM issued the RCRA hazardous waste facility permit No. AL7 210 020 742 to the Army. This RCRA permit governs the storage, treatment, and disposal of hazardous waste, as well as corrective measures for multiple SWMUs and AOCs in accordance with RCRA. Part VI of the RCRA permit requires that interim measure (IM) and/or source removal be completed at this suspect CWM site.

## CLEANUP/EXIT STRATEGY

The ADEM issued the RCRA Hazardous Waste Facility Permit #AL7 210 020 742, on September 30, 2010 to the Army. This RCRA Permit governs the storage, treatment, and disposal of hazardous waste, as well as corrective measures for multiple SWMUs and AOCs in accordance with RCRA. Part VI of the RCRA Permit requires that IM and/or source removal be completed at this suspect CWM site.

A phase 1 and 2 Interim Removal Action, RFI, and LTM are expected.

**Site ID: MSFC-053**

**Site Name: FORMER PROPELLANT STORAGE AREA**

**Alias: None**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198910.....	199009
CS.....	199510.....	199909
RFI/CMS.....	200906.....	201404
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201404	

**SITE DESCRIPTION**

MSFC-053 consists of an area formerly occupied by a series of concrete-lined liquid propellant test stands and cells and a liquid propellant storage building (Building 4717). The site is located in the area near Buildings 4751 and 4761 with Tiros St. to the north, Martin Road to the south, Gemini Ave. to the west, and Thor Avenue to the east. The site occupies an area of approximately 12 acres. Activities at the site began in 1951 with the construction of a liquid propellant test facility. Other units were constructed at the site at various times. All units were demolished in/by 1974. Activities at the site included the used of hydrocarbon-based rocket fuels and solvents for cleaning. VOCs in groundwater from identified off-site upgradient sources are the primary COCs. A Hazardous Waste Facility Permit was issued September 30, 2010 pursuant to the Alabama Hazardous Waste Management and Minimization Act (AHWMMA). Table VI.2 of the Permit stipulates that this site achieve an approved RCRA Facility Investigation (RFI) in accordance with AEIRG and ARBCA guidelines.

The NASA operates a metals plating shop within the MSFC-053 boundary.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- Existing data indicate that PAH compounds and two PCB have been detected in samples collected from one of the on-site drainage features at concentrations exceeding residential evaluation criteria.
- VOCs have been detected in groundwater samples exceeding evaluation criteria.
- MSFC-053 is hydraulically downgradient of two MSFC sites with identified elevated VOC contamination in soil and groundwater.

**Technical Approach**

- Based on the AHWMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required for MSFC-053.
- Conduct RFI field investigation including collection of soil samples and groundwater samples from existing overburden monitoring wells to determine the potential of a release associated with former site activities and sourcing to groundwater potential in compliance with the Alabama Environmental Investigation and Remediation Guidance.
- Complete an RFI/CMS and statement of basis documenting the remedy of NFA (RC). A permit modification will follow the statement of basis documenting the selection of NFA (RC).

**Site ID: PBCatRedstone**

**Site Name: FY05 PBC**

**Alias: FY05 PBC**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

Phases	Start	End
RFA.....	200412.....	200503
RFI/CMS.....	200412.....	201408
DES.....	200508.....	201408
CMI(C).....	200508.....	201409
CMI(O).....	200508.....	201410

**RIP Date:** 201409

**RC Date:** 201410

## SITE DESCRIPTION

This site is used to track the funding of two separate performance-based acquisitions (PBA) [or performance-based contracts (PBC)]: one was awarded in FY05 and the other is dated FY09.

### FY05 PBC

This contract covers all FY05 PBC remediation sites (RSA-048, RSA-054, RSA-056, RSA-057, RSA-059, RSA-113, RSA-122, RSA-126, RSA-134, RSA-139, RSA-183, RSA-223, RSA-224, RSA-229, RSA-232, RSA-235, RSA-236, and D) under this one site for the purpose of tracking the PBC funds.

The FY05 PBC has been awarded for these sites for SI through RIP, followed by five years of remedial action (operation) [RA(O)] and a five-year review. The FY05 PBC is fully funded; therefore all future costs shown in AEDB-R are associated with the FY09 PMC.

### FY09 PMC

Task order (TO) 1 under this contract funds the following sites through the indicated phases:

- Achieve approved DD by Feb. 28, 2010 for RSA-214 and RSA-197.
- Achieve approved DD by Dec. 30, 2010 for RSA-C.
- Achieve approved DD by Dec. 30, 2011 for RSA-032, RSA-045, RSA-052, RSA-058, RSA-060, RSA-061, RSA-063, RSA-065, RSA-066, RSA-067, RSA-068, RSA-110, RSA-141-R-01, RSA-147, RSA-148, RSA-149, RSA-191, RSA-192, RSA-194, RSA-195, RSA-198, RSA-199, RSA-202, RSA-205, RSA-206, RSA-207, RSA-209, RSA-238, RSA-252, RSA-253, RSA-262, RSA-281, and RSA-072-R-01 (alias RSA-282).
- Achieve RIP or RC by Dec. 30, 2011 for RSA-096, RSA-097, RSA-138M, RSA-189, RSA-190, RSA-225, and RSA-271.
- Achieve RIP or RC by Sept. 30, 2013 for RSA-135H, RSA-144, RSA-208, RSA-210, RSA-211, RSA-212, RSA-237, and RSA-274.
- Achieve RIP or RC Sept. 30, 2014 for MSFC-003-R-01, MSFC-027, MSFC-034, MSFC-035, MSFC-053, RSA-05, RSA-013, RSA-014, RSA-051, RSA-053, RSA-064, RSA-069, RSA-083, RSA-087, RSA-088, RSA-095, RSA-109, RSA-112, RSA-114, RSA-117, RSA-140, RSA-142, RSA-145, RSA-146, RSA-150, RSA-151, RSA-152, RSA-153, RSA-154, RSA-155, RSA-156, RSA-157, RSA-187, RSA-188, RSA-193, RSA-200, RSA-201, RSA-203, RSA-204, RSA-213, RSA-215, RSA-217, RSA-218, RSA-219, RSA-220, RSA-226, RSA-227, RSA-228, RSA-230, RSA-231, RSA-233, RSA-234-R-01, RSA-239, RSA-250, RSA-255, RSA-258, RSA-261, RSA-263, RSA-265, RSA-269, RSA-272, RSA-273, RSA-275, RSA-276, RSA-278-R-01, and RSA-A.
- Perform any necessary LTM or RA(O) for a duration of one year from the date of this TO award for RSA-049.

## CLEANUP/EXIT STRATEGY

**Site ID: PBCatRedstone**

**Site Name: FY05 PBC**

**Alias: FY05 PBC**

There are two distinct PBAs associated with this AEDB-R site: FY05 PBA and FY09 PBA.

Please see the individual sites for contract affiliation, cleanup strategies, media of concern, and COC.

Site ID: RSA-005

Site Name: INACTIVE WASTE ACCUMULATION AREA

Alias: OU-02

**STATUS**

Regulatory Driver: RCRA  
RRSE: LOW  
Contaminants of Concern: Metals  
Media of Concern: Sediment, Soil

Phases	Start	End
RFA.....	198903.....	198904
CS.....	199510.....	199609
RFI/CMS.....	200909.....	201309
DES.....	200909.....	201410
CMI(C).....	200909.....	201411
CMI(O).....	200909.....	201510
RIP Date:	201411	
RC Date:	201510	

**SITE DESCRIPTION**

RSA-005 is a former 0.2-acre waste accumulation area in the northeast portion of RSA, west of Patton Road and north of Neal Road. Two buildings are currently present on the north portion of the site. Building 3630 (approximately 12 ft by 11ft) is used for paint storage, and a temporary unnumbered building (approximately 10 ft by 8 ft) is used for storage of industrial oils which are in the process of being moved to Building 3630. Just east of the site boundary is RSA-287, which encompasses Building 3634 (vehicle maintenance and formerly a component storage warehouse) and RSA-006, which was a paint spray booth in the southern portion of Building 3634. Concentrations of lead and one PCB were detected in soil exceeding action levels. A Hazardous Waste Facility Permit was issued September 30, 2010 pursuant to the AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

An RFI/CMS, Statement of Basis, and Permit Modification will be prepared under existing PBA contracts. It is anticipated that a design (DES), CMI and LUCs will be required to address lead contaminated surface soils, which is not currently under contract. It is anticipated that 655 cubic yards (cy) of soil will require disposal. As a contingency, up to 10% of the soil may be classified as hazardous waste based on the toxicity characteristic leaching protocol (TCLP) results and may require off-site stabilization or treatment prior to disposal. Twenty-five confirmation samples will be collected to verify that all soils exceeding the action level have been removed. Following excavation, the ground surface will be re-graded to approximately the pre-disposal topography. LUCs (unrestricted for industrial, restricted for residential) are planned. Actions through the permit mod at this site are funded under the FY09 PBA contract. The cost-to-complete (CTC) for post-PBA actions are documented under this site in AEDB-R.

Site ID: RSA-013

Site Name: UNLINED INACTIVE OPEN BURN PADS

Alias: OBOD

### STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Perchlorate, Volatiles (VOC)

Media of Concern: Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199010.....	199109
RFI/CMS.....	200906.....	201604
DES.....	200906.....	201604
CMI(C).....	200906.....	201701
CMI(O).....	200909.....	201710
LTM.....	201710.....	204212

RIP Date: 201701

RC Date: 201710

### SITE DESCRIPTION

RSA-013 is located on TVA property that RSA has a memorandum of agreement (MOA) to use and within an operational range. TVA has to approve all plans for this site. RSA-013 covers an approximate 5 acres, and is located near the southwest corner of RSA, south of McAlpine Road, and northeast of the Tennessee River. The site consists of an open burn area where chlorinated solvents, solvent-contaminated materials, waste rocket motor propellant, and scrap metal were incinerated on the ground surface. The resulting ash was disposed of at the RSA-014 ash field, and RSA-066. The flashed metal was salvaged. The site also includes the former RSA-132 popping furnace area and the former RSA-133 rocket motor washout rack and sump area. A groundwater pump-and-treat system was operated from 1997-2000 for VOC contamination. High levels of perchlorate have been detected in the groundwater. Unexploded ordnance (UXO) is potentially present at the site. (RSA-013-R-01 has been opened but is listed as RC because this site is on an active range.)

A Hazardous Waste Facility Permit was issued September 30, 2010 pursuant to the AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RCRA Facility Investigation (RFI) in accordance with AEIRG and ARBCA guidelines.

### CLEANUP/EXIT STRATEGY

Complete the RFI, CMS, DES, corrective measures implementation (construction) [CMI (C)], corrective measures implementation (operations) [CMI (O)], and LTM for RSA-013. The Statement of Basis and Permit Modification will document the selection of the final remedy, which is likely to be soil removal actions and LUCs. Additional RFI/CMS is necessary due to the presence of trichloroethylene (TCE) in soil and the potential presence of perchlorate in soil (based upon substantial groundwater concentrations). TCE contamination/recontamination may be occurring due to fluctuating groundwater levels. If a surface media source of perchlorate is discovered, appropriate changes to the planned remedial actions will be required. At this time a RFI field investigation, CMI(C) (soil removal), LUCs, and two 5-year reviews are budgeted. An RFI field investigation will be conducted and will consist of sampling surface and subsurface soil, and groundwater from temporary piezometers. All samples will be analyzed for VOCs, nitroaromatics, perchlorate, and agent breakdown products. The CMI(C) is anticipated to include soil removal in two areas 40 x 50 each to a depth of 6 ft below ground surface (bgs), resulting in an approximate (rounded) total of 890 cy. Soil is anticipated to be disposed of as non-hazardous material. Ten confirmation samples will be collected and analyzed for VOCs, nitroaromatics, and perchlorate to verify that all soils exceeding established remedial goals have been removed. Following excavation, the ground surface will be re-contoured to the approximate local topography. Evaluate area for potential integrator operable unit development. Costs for the evaluation and development of the integrator operable unit are included as global tasks within the PBA CTC for the groundwater sites. (Groundwater will be sampled under RSA-151.) Actions through RIP are included in the FY09 PBA contract.

**Site ID: RSA-014**  
**Site Name: UNLINED INACTIVE BURN TRENCHES**  
**Alias: OBOD**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Explosives, Metals, Perchlorate, Volatiles (VOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199010.....	199109
RFI/CMS.....	200906.....	201510
DES.....	200906.....	201604
CMI(C).....	200906.....	201612
CMI(O).....	200906.....	201709
LTM.....	201709.....	204112

**RIP Date:** 201612

**RC Date:** 201709

**SITE DESCRIPTION**

Site RSA-14 is located in the southwest corner of RSA, south of McAlpine Road, northeast of the Tennessee River, and within an operational range. This site is located just outside and adjacent to TVA property and is approximately 9.8 acres. Two open trenches, dimensions 150 to 200 ft long, 35 ft wide and about six to 12 ft deep, were used to incinerate solid materials contaminated with rocket propellant, waste solvents, and solvent-contaminated materials.

A soil vapor extraction (SVE) system was operated from 1999 to 2000 for VOC contamination. Maximum TCE concentrations of 6,250 milligrams per kilogram (mg/kg) were in the soils beneath the northern trench. The southern trench soil sample indicated the presence of TCE, but in lower concentrations. Evidence exists that chemical munitions were disposed of at this site.

UXO is present at the site. (RSA-014-R-01 has been opened but is listed as RC because this site is on an active range.) The northern portion of the site reportedly contains trenches used in the disposal of beryllium along with lab chemicals, oxidizers and energetics.

**CLEANUP/EXIT STRATEGY**

Complete the RFI, CMS, DES, CMI (C), CMI (O), and LTM for RSA-014. The Statement of Basis and Permit Modification will document the selection of the final remedy, which is likely to be Monitored Natural Attenuation (MNA). Additional RFI/CMS is planned to include potential perchlorate contamination in soil and the potential presence of CWM. 1,4-Dithiane and oxathiane have been detected in groundwater samples collected from the site. These contaminants have not been addressed in soils to date. Contamination/recontamination may be occurring due to fluctuating groundwater levels. An RFI field investigation, CMI(C), LUCs, and six 5-year reviews are planned. A RFI field investigation will be conducted that will consist of sampling surface and subsurface soil and groundwater from 15 existing wells. All samples will be analyzed for VOCs, SVOCs, nitroaromatics, and perchlorate. The CMI will include an MNA plan. Costs for the evaluation and development of the integrator operable unit are included as global tasks within the PBA CTC for the groundwater sites. (Groundwater will be sampled under RSA-151.)

Site ID: RSA-032

Site Name: INACTIVE SCRAP METAL STORAGE AREA

Alias: GCWD

### STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199510.....	199709
RFI/CMS.....	200906.....	201502
DES.....	200906.....	201503
CMI(C).....	200906.....	201506
CMI(O).....	200906.....	201606
LTM.....	201606.....	204209

RIP Date: 201506

RC Date: 201606

### SITE DESCRIPTION

RSA-032 is located on 36 acres east of Shields Road and south of Buxton Road. The site is currently cleared in the center, with a gravel base, and fenced/locked. Approximately 14% of the site is covered in wetlands, primarily in the northern and southern portions of the site. The site is located within the former GCWD with waste staging beginning in the 1940s. The site was later used beginning in the 1960s for waste/material storage. Within RSA-032 is MSFC-026 which was a hazardous waste storage area operated by NASA. Localized areas of soil impact by VOCs and PAHs/PBCs have been identified exceeding action levels. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to the AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

### CLEANUP/EXIT STRATEGY

It is anticipated that a DES, CMI (C), CMI (O) will be required to address localized soil contamination (PAHs, zinc and VOCs). Based on requirements of the Permit, AEIRG and ARBCA, estimated field activities additional to the original scope necessary to complete the RFI are as follows:  
conduct approximately 15 soil borings, collect approximately 40 soil samples, collect approximately five groundwater samples, collect approximately two surface water/sediment samples.

A removal of approximately 4,500 cy is expected.

LTM is anticipated. Annual LUC inspections and 5-year reviews are planned.

**Site ID: RSA-045**  
**Site Name: SMOKE MUNITIONS PLANT 3**  
**Alias: PA3**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals, Pesticides, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199510.....	199909
RFI/CMS.....	200906.....	201406
DES.....	201406.....	201410
CMI(C).....	201406.....	201504
LTM.....	201603.....	204208
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201603	

**SITE DESCRIPTION**

This site is located east of Patton Road and north of Martin Road, in the north central parcel of RSA. Site RSA-45 is approximately 38.5 acres. Historical information indicates the site was used as an adamsite and tear gas filling plant, therefore, the site has been renamed the "Smoke Munitions Plant 3." The site was subsequently used as smoke munitions filing (SMF) Line 3 through the 1950s.

Previous investigations were limited to a UST area on the north side of the site. Investigation of the UST area found that soils were contaminated with DDT and PCBs. An RFI will be completed under the FY09 PMC contract.

**CLEANUP/EXIT STRATEGY**

Complete an RFI/CMS and statement of basis recommending site closeout (RC). A permit modification will follow the statement of basis documenting the selection of no action (RC). Additional RFI field investigation will be conducted as follows: conduct approximately 40 soil borings, collect approximately 180 soil samples, install approximately six overburden monitoring wells, collect approximately six groundwater samples.

A removal action of approximately 850 cy is anticipated. Annual groundwater monitoring is projected in the LTM phase. LUC inspections and five-year reviews are budgeted.

Site ID: RSA-048

Site Name: INACTIVE CLOSED SANITARY LANDFILL

Alias: DA

### STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Metals, Semi-volatiles (SVOC)

Media of Concern: Sediment, Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199010.....	199509
RFI/CMS.....	200509.....	201111
DES.....	200509.....	201308
CMI(C).....	200509.....	201308
LTM.....	201309.....	204209

RIP Date: N/A

RC Date: 201308

### SITE DESCRIPTION

Site RSA-048 is located north of the old railroad bed, east of Patton Road, west of McDonald Creek, and north of Martin Road in the northeast portion of RSA. This disposal area is approximately 4.5 acres and fenced. It was active from 1947 through the early 1950s and received construction rubble. Limited previous sampling indicates the presence of industrial waste constituents. The nature and extent of these waste materials is unknown. The disposal area was not capped, but has a thin layer of soil covering waste piles/trenches.

Low levels of SVOCs, lead and chromium have been confirmed in the soil. Environmental concerns are driven by the potential of contaminant release from the disposal of sanitary waste in the wetland.

The existing 2005 PBC at Redstone includes costs through RIP plus RA(O) and a five-year review.

### CLEANUP/EXIT STRATEGY

The FY05 PBC addresses this site to include remedy-in-lace, five years of LUC and a five-year review. Anticipated RIP date in FY13 due to delays in regulatory reviews with funding expiring in FY14.

Further risk evaluation presented in the FS concluded that exposure to surface media at RSA-048, including surface soil/sediment, total soil, and surface water, poses no unacceptable risks or noncancer health threats to industrial on-site workers. Institutional controls are the preferred alternative presented in the FS. ICs would be implemented to prevent residential use through zoning restrictions and may include signs to limit access.

LUCs are required at the site. Six five-year reviews are covered in the LTM phase under this site's CTC.

**Site ID: RSA-049**

**Site Name: CAPPED ARSENIC WASTE LAGOONS-WEST**

**Alias: HA1**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

**Contaminants of Concern:** Metals, Semi-volatiles (SVOC)

**Media of Concern:** Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198910.....	199009
CS.....	199010.....	199609
RFI/CMS.....	199610.....	200709
CMI(C).....	200710.....	200809
LTM.....	200810.....	204209

**RIP Date:** N/A

**RC Date:** 200809

## SITE DESCRIPTION

Site RSA-49 is located south of Neal Road at the Toftoy Thruway intersection. It is approximately 12.5 acres and consists of three closed and capped unlined industrial waste lagoons formerly used for the disposal of arsenic-contaminated waste generated from manufacturing operations during the early-1940s.

In 1999, an engineered cap with an impermeable liner was designed and constructed over the lagoon. The focused feasibility study (FFS)/statement of basis/proposed plan (PP) was finalized in July 2007. In September 2007, the final ROD was signed, which identifies adoption of the engineered cap, LUCs, and long-term monitoring as the final remedy for the site.

## CLEANUP/EXIT STRATEGY

Land use controls are necessary for the site for an indefinite period. The CTC includes five-year reviews, cap and fence maintenance, and LUCs.

**Site ID: RSA-050**

**Site Name: INACTIVE MUNITIONS DEMIL & DISPOSAL AREA**

**Alias: None**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Munitions and explosives of concern (MEC), White Phosphorous

Media of Concern: Groundwater, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198910.....	199004
CS.....	199005.....	199009
RFI/CMS.....	199510.....	201506

**RIP Date:** N/A

**RC Date:** 201506

**SITE DESCRIPTION**

RSA-050 is an inactive 18-acre munitions demilitarization and disposal site located in the western portion of RSA, south of Martin Road within the safety arc for Test Area 6. The site was active in the 1940s and 1950s for the demilitarization of high explosives, white phosphorus, and mustard gas, and potentially for mustard burial. All but 1-acre of the site lies within RSA-074 (High Explosive Impact Test Site, Area D) and is immediately south of RSA-254 (Range 1 Bombing Targets).

A Draft Final RI was submitted by Rust Environmental in 1998 for the site. A final proposed plan recommending no action for RSA-050 was submitted in July 2000 followed by preparation of an IROD. The final IROD was prepared and submitted for USEPA signature in February 2001. USEPA noted concerns about the adequacy of the site characterization effort in their final review of the IROD. In September 2001 the Army rescinded the IROD and agreed to pursue further investigation at the site. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA, requiring an RFI be completed for the site.

**CLEANUP/EXIT STRATEGY**

The site is within active Test Area (TA-6) and is considered to be under the operational range assessment program (ORAP). Post PBA actions will include: complete the RFI/CMS including ARBCA risk assessments in accordance with AEIRG, Statement of Basis and Permit Modification Request.

Site ID: RSA-053

Site Name: INACTIVE SANITARY & INDUSTRIAL LANDFILL

Alias: DDT

STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Metals, Pesticides, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199010.....	199309
RFI/CMS.....	200501.....	201107
DES.....	200906.....	201303
CMI(C).....	200906.....	201404
CMI(O).....	200906.....	201504
LTM.....	201504.....	204208

RIP Date: 201404

RC Date: 201504

SITE DESCRIPTION

RSA-053 is a closed unlined landfill located near the geographical center of RSA, east of RSA-10, north of Huntsville Spring Branch, west of Patton Road, and south of Mills Road. The site is bounded by the Wheeler Wildlife Refuge to the south. The landfill is approximately 41 acres and is comprised of trenches and pits that were used to dispose of industrial and sanitary wastes. It was active from 1963 to 1973 and received household, administrative, sanitary, and industrial wastes. In the northern area of the site are several inactive waste oil pits and a suspected pesticide burial pit. An approximately 2ft-thick soil layer covers the refuse in most of the trenches. The site fencing was completed in 2001. Soil and groundwater contamination includes VOCs (primarily chlorobenzene), SVOCs, metals, and residual pesticides. The bulk of the contamination is due to former DDT manufacturing processes. The original RSA-053 southern site boundary was included in the DDT Migration Abatement Program conducted from 1977 to 1982. Pesticides were excavated from the site and placed in disposal cells at RSA-107. It appears that the southern portions of the trenches may be inundated by groundwater on a seasonal basis. The site has been broken down into three different study areas: northern disposal area, trenches and the remaining area within site boundaries. The draft RI report was produced in September 2006. A final RI was submitted in June 2009. A draft FS was submitted in August 2010.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA re-classifying the site under the RCRA program. The Army was directed to begin the CMI workplan under the permit. This effort is currently underway.

CLEANUP/EXIT STRATEGY

Complete the CMI (C), CMI (O), and LTM Phases. Remedial action is expected to include: excavation, consolidation, soil cover, media monitoring, LUCs, electrical resistive heating (ERH), filtration, liquid-phase carbon adsorption, thermal oxidation, and sewer discharge. This includes relocation of approximately 42,500 cy of waste material associated with the trenches from the southern portion of the site to the northern portion; placement of an 8.2 acre soil cover on the contaminated area; monitoring of groundwater, condensate, and vapors; implementation of ERH for treatment of the chlorobenzene dense non-aqueous phase liquid (DNAPL) in the saturated zone at the RSA-148 groundwater DNAPL source; and LUCs. The combination of excavation and soil cover in the contaminated soil and the ERH treatment of the chlorobenzene DNAPL in the saturated zone would be protective of human health and would prevent future sourcing to groundwater in accordance with the remedial action objectives.

LTM is planned. Cap and fence maintenance, Groundwater monitoring, LUC inspections, and five-year reviews are budgeted.

Site ID: RSA-054

Site Name: INACTIVE SANITARY & INDUSTRIAL LANDFILL

Alias: DA

STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Metals, Pesticides, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199010.....	199309
RFI/CMS.....	200509.....	201111
DES.....	200509.....	201209
CMI(C).....	200509.....	201301
CMI(O).....	200509.....	201308
LTM.....	201308.....	204208

RIP Date: 201301

RC Date: 201308

SITE DESCRIPTION

RSA-54/55 is a single landfill comprising 45 acres in the central portion of RSA. This inactive, closed landfill was used during the 1960s and 1970s for disposal of household, administrative, and industrial waste. Wastes were disposed of in trenches that were later covered with a thin layer of soil. Wastes containing DDT were buried at various locations in the landfill between 1968 and 1973. These wastes were later excavated and moved to the DDT waste soils landfill at RSA-107. The site was fenced in 2001.

Pesticides were detected in the soil and chlorobenzene was detected in the groundwater.

Since RSA-054 and 055 are made up of one landfill, it will be funded under 054. RSA-055 will be considered RC in AEDB-R.

A PBC has been awarded to include RIP followed by five years of RA(O) and a five-year review. Those costs are shown under the "PBC at Redstone" site. LTM is required after the PBC concludes.

During the RI scoping, the team agreed that the previous RFI, human health and ecological risk assessments had satisfied the requirements of an RI report and that the next document produced would be an FS. The final FS was completed in 2010. ADEM issued an administrative letter in December 2010 indicating that a CMI work plan should be produced. This CMI work plan is currently underway. The facility desires to use this north area as parking area and the south area for expansion of the Prototype Integration Facility.

CLEANUP/EXIT STRATEGY

A PBC is in place to address this site through remedy in place followed by five years of LUCs and one five-year review. An FS was completed in 2010. A Hazardous Waste Facility Permit was issued Sept. 30, 2010. A Corrective Action Implementation Plan was submitted in April 2010. Corrective action will include capping over the northern portion of the site. Excavation is planned for the portion of the site south of Fowler Road with the waste consolidated within the northern portion of the landfill. Administration of LUCs and maintenance of cap and fence will be required.

**Site ID: RSA-056**

**Site Name: CAPPED ARSENIC WASTE PONDS-SOUTH**

**Alias: HA2**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

**Contaminants of Concern:** Metals

**Media of Concern:** Sediment, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198910.....	199009
CS.....	199010.....	199309
RFI/CMS.....	200509.....	200909
CMI(C).....	200509.....	200909
CMI(O).....	200909.....	201308
LTM.....	201308.....	204208

**RIP Date:** 200909

**RC Date:** 201308

## SITE DESCRIPTION

RSA-56 is a 4.5 acre area, located in the east-central part of the arsenal, north of Viper Road, west of Meteorology Road, and east of Calibration Road. It was an open, unlined surface impoundment that received arsenic-contaminated industrial waste sludge and wastewater from L manufacturing activities in the early-1940s. In the 1960s, the lagoons received demo debris from the L manufacturing facilities.

Due to a notice of violation issued in 1992 from the ADEM for high levels of arsenic in a bordering stream, a 4.5 acre area was capped with compacted clay in 1995. The RFI report was completed in 1996.

High levels of arsenic were found in the soils and sediment. The site was fenced and soil (clay) cap was extended in 2001 to cover the entire contaminated area.

A combined FS for RSA-056, RSA-122, and RSA-139 was completed in 2009. The ROD was signed in September 2009. The final Remedial Action Work Plan (RAWP) was initially submitted in July 2010. A Hazardous Waste Facility Permit was issued Sept. 30, 2010. Revisions to the CMIP/RAWP were submitted in January 2011, July 2011, and January 2012 to address ADEM comments.

Costs through the RIP, plus five years of RA(O) and a five-year review, are covered under the existing Redstone PBA awarded in 2005. LTM is required after the PBC concludes.

## CLEANUP/EXIT STRATEGY

The PBC at Redstone site in AEDB-R includes the costs for remedy-in-place followed by two years of LUCs and a five-year review. An FS, PP and ROD for RSA-056 combined with RSA-122 and RSA-139 were completed in September 2009 under the FY05 PBC contract. RIP is expected in FY12 with one (1) year of LUCs and cap/fence maintenance. One 5-year review (2012) is included under the FY05 PBC contract. LTM after the FY13 PBC will consist of continued LUCs, cap and fence maintenance, and six five-year reviews.

The Post-PBA costs and actions during the LTM phase are documented under this site. Administration of LUCs and maintenance of cap and fence will be required. Post-PBA five-year reviews are scheduled during the LTM phase.

**Site ID: RSA-057**

**Site Name: INACTIVE ARSENIC WASTE LAGOON-EAST**

**Alias: HA2**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** HIGH

**Contaminants of Concern:** Metals

**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198910.....	199004
CS.....	199005.....	199509
RFI/CMS.....	200301.....	200709
CMI(C).....	200705.....	200802
CMI(O).....	200802.....	201302
LTM.....	201302.....	204202

**RIP Date:** 200802

**RC Date:** 201302

## SITE DESCRIPTION

Site RSA-57 is an eight-acre site located in the east-central part of the arsenal, west of Patton Road and south of Martin Road and was designed as a surface impoundment, but was also used as a former L production waste disposal area. L raw materials were disposed of at an acetylene sludge lagoon (currently bermed on three sides) and in a smaller arsenic sludge lagoon to the northwest. Low levels of arsenic and VOCs were detected in the groundwater. Based on site operational history, the VOCs are believed to have originated from other areas such as RSA-122.

Arsenic and mercury are the primary contaminants in the soil.

In May 2006 the RI/FS and the PP were finalized. In September 2007, the final ROD was signed, which specified excavation and off-site disposal, followed by LUCs as the remedy for the site. The RA fieldwork was completed in 2008.

Costs through RIP, plus LTM and a five-year review, are included under the "PBC at Redstone" site. Additional LTM is required after the PBC concludes.

## CLEANUP/EXIT STRATEGY

The PBC awarded in FY05 includes remedy-in-place, plus five years of LUCs and a five-year review in the CMI(O) phase. Remedial action, which includes excavation and off-site disposal of soils, was completed in 2008. LTM is required after the PBC concludes. LUC maintenance and five-year reviews are budgeted.

Site ID: RSA-058

Site Name: INACTIVE CLOSED RUBBLE FILL & WASTE PILE

Alias: DDT

STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Pesticides, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199010.....	199409
RFI/CMS.....	200601.....	201106
DES.....	201109.....	201306
CMI(C).....	201306.....	201406
CMI(O).....	201306.....	201506
LTM.....	201506.....	204204

RIP Date: 201406

RC Date: 201506

SITE DESCRIPTION

RSA-058 is approximately 34 acres and is located east of Patton Road. McDonald Creek and Huntsville Spring Branch border it on the east and south, respectively. This landfill received incineration ash from demilitarization operations, rubble (e.g., concrete blocks and slabs, tires, 55-gallon drums, 5-gallon cans, metal debris), damaged PCB transformers and building materials from a nearby Olin DDT manufacturing site. The site was fenced in 2001. Surface water and groundwater from this site drain into the Wheeler Wildlife Refuge. Both Huntsville Spring Branch and McDonald Creek are main drainage channels for the city of Huntsville. Pesticides, SVOCs, VOCs, metals and explosives were found in the soil and sediments. All RI fieldwork has been completed.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to the AHWMMMA re-classifying the site under the RCRA program. An FS was prepared recommending excavation and off-site disposal of contaminated soil in conjunction with LUCs as the preferred remedy. A CMI work plan is required based on the terms of the permit.

CLEANUP/EXIT STRATEGY

Under the current task order, complete the CMS including additional delineation sampling. These tasks are under contract. Under a future task order, complete the DES, CMI (C), CMI (O), and LTM. Remedial action is expected to include: excavation of approximately 8,955 cy and disposal. As a contingency, up to 10% of the soil may be classified as hazardous waste based on the TCLP results and may require off-site stabilization or treatment prior to disposal. Confirmation soil samples will be collected to verify that all soils exceeding the action level have been removed. Following excavation, the ground surface will be re-graded to approximately the pre-disposal topography. Development of the wetland restoration plan and re-vegetation with native wetland plants will be subcontracted to a wetlands restoration specialist. Five-year reviews and LUCs are planned.

**Site ID: RSA-059**

**Site Name: INACTIVE CLOSED CONSTRUCTION RUBBLE FILL**

**Alias: DA**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Polycyclic Aromatic Hydrocarbons (PAH), Volatiles (VOC)

Media of Concern: Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199010.....	199309
RFI/CMS.....	200509.....	201111
CMI(C).....	200509.....	201308
LTM.....	201308.....	203908

**RIP Date:** N/A

**RC Date:** 201308

## SITE DESCRIPTION

Site RSA-59 is located in the central portion of RSA, south of Mills Road and west of Patton Road. It is bounded on the north, east, and south sides by wetlands. Site RSA-59 is a closed unlined landfill previously used for disposal of rubble, construction debris (primarily railroad ties), sanitary and industrial waste. It was intermittently active from the late-1940s to the mid-1970s. Originally, the site was a fill borrow area (BA) for early construction activities. A thin layer of soil covers the landfill waste and the site is well vegetated with grasses, small trees, and brush. The site has not been capped and no remediation has occurred.

During recent investigations, the size was determined to be greater than the original 12 acres, but the entire landfill has not been delineated. The site was partially fenced in 2001. The southeastern boundary could not be fenced due to the wetlands nature of the lower area.

Low concentrations of VOCs were detected in the groundwater, and a coal disposal area (likely source of PAH) was discovered. A draft FS was submitted in August 2008.

The 2005 PBC at RSA includes costs through RIP plus LUCs and a five-year review. Additional LTM is required after the PBC concludes.

## CLEANUP/EXIT STRATEGY

A PBC has been awarded and funded to include remedy-in-place followed by five years of LUCs and one five-year review. Regulatory delays resulted in anticipated RIP date of FY13 with funding expiring in FY12. Based on requirements of the permit, AEIRG, and ARBCA, additional funding may be necessary to complete the CMI(C) to meet the performance objective. Administration of LUCs is required beyond the PBC. Five-year reviews and LUCs are budgeted.

**Site ID: RSA-060**

**Site Name: INACTIVE SANITARY & INDUSTRIAL LANDFILL**

**Alias: DDT**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** HIGH

Contaminants of Concern: Metals, Pesticides, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Sediment, Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199010.....	199309
RFI/CMS.....	200601.....	201212
DES.....	201111.....	201501
CMI(C).....	201301.....	201511
CMI(O).....	201308.....	201610
LTM.....	201610.....	204207
<b>RIP Date:</b>	201511	
<b>RC Date:</b>	201610	

## SITE DESCRIPTION

Site RSA-60 is a closed unlined landfill of approximately 22 acres located near the geographic center of RSA, southeast of RSA-53, north of the HSB, and south of Mills Road. It is downgradient of the former Olin pesticide manufacturing plant. A large portion of the site is within the Wheeler National Wildlife Refuge. This site consists of several covered disposal unlined trenches, running northeast-southwest, which were used for sanitary and industrial waste disposal. Pesticides (off-spec products from the Olin manufacturing facility) were also buried throughout the site.

The soil is contaminated with VOCs (primarily chlorobenzene), SVOCs, metals and pesticides including dichlorodiphenyldichloroethane (DDD), dichlorodiphenyldichloroethene (DDE) and DDT. These same pesticides are also present in sediments.

The final RI was completed in June 2009. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to the AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

Site actions through completion of the DD are funded under the FY09 PBA contract, and as such, are recorded in the CTC for that PBA site in AEDB-R. The Final RI was completed in June 2009. A CMS will be completed as the DD for the PBA contract under the RCRA permit. Complete a DES, CMI (C), CMI (O), and LTM to be consistent with future land uses. The original path contemplated LUCs to manage site risks, however, under RCRA, this site is considered too complex and a corrective measure may be warranted. Sediment south of the boundary of RSA-060 will be addressed in the anticipated Integrator OU along this segment of Huntsville Spring Branch.

CMI(O) and LTM will include LUCs and five-year reviews.

Site ID: RSA-065

Site Name: FORMER CHEMICAL DRUM STORAGE AREA

Alias: GCWD

### STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Metals, Other (CWM), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199510.....	199709
RFI/CMS.....	201012.....	201305
DES.....	201305.....	201402
CMI(C).....	201403.....	201405
LTM.....	201405.....	204205

RIP Date: N/A

RC Date: 201405

### SITE DESCRIPTION

Site RSA-065 is a 147-acre fenced area located within an operational range in the southern part of the arsenal south of Buxton Road within the floodplain of the Tennessee River. During the 1940s and 1950s it was used for aboveground drum storage for chemical warfare agents, including L and H. The chemical materials were shipped off-post for disposal or were demilitarized at other locations at RSA. The site is generally flat with numerous rectangular storage cells; each cell occupies about 200 square feet (sf). The storage cells create a grid pattern over the site and are clearly visible on aerial photographs. Beavers have impounded water on the site, resulting in the development of marshy areas. The site was fenced in 2001.

Low levels of metals were detected in surface water, and elevated levels of TCE and carbon tetrachloride were detected in groundwater during the SI.

In 2004 a decision was made that the potential CWM will be addressed as part of this site.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA.

### CLEANUP/EXIT STRATEGY

It is anticipated that a DES, CMI (C), CMI (O) will be required to address localized soil contamination (VOCs). Five-year reviews are budgeted with annual groundwater monitoring and reporting. It is anticipated that LUCs will be required due to the potential presence of CWM. Based on requirements of the Permit, AEIRG and ARBCA, estimated field activities additional to the original scope necessary to support the performance objective are as follows: conduct approximately six soil borings, collect approximately 12 soil samples, collection of approximately two groundwater samples, collect approximately 18 surface water/sediment samples.

Site ID: RSA-067

Site Name: FORMER CHEMICAL DRUM STORAGE AREA

Alias: GCWD

### STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Chemical weapon munitions (CWM)/Chemical agent, Metals, Semi-volatiles (SVOC)

Media of Concern: Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199110.....	199509
RFI/CMS.....	200906.....	201304
DES.....	201303.....	201402
CMI(C).....	201402.....	201405
LTM.....	201405.....	204205

RIP Date: N/A

RC Date: 201405

### SITE DESCRIPTION

RSA-067 is an inactive 45-acre drum storage area used in the 1940s and 1950s for aboveground storage of mustard gas. Originally, the site was separated into storage cells by unlined earthen berms, rail car tracks, and/ or trails. RSA-067 is located in the southern part of RSA, adjacent to another former chemical agent storage area, RSA-065 and within an operational range. Most of the northern part of this area is wooded. The majority of the unit is inundated with water. The site was fenced in 2001. A phosgene container was discovered at the site. In 2004, it was decided that the potential CWM would be addressed as part of this site. A Hazardous Waste Facility Permit issued Sept. 30, 2010 pursuant to the AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines. As required by Army, a CMS will also be developed under the current PBA contract.

### CLEANUP/EXIT STRATEGY

Additional work is necessary to complete an RFI to meet the requirements of the permit, AEIRG, and ARBCA. In the CMI(C) phase, it is anticipated that LUCs will be implemented due to the potential presence of CWM. In the LTM phase, five-year reviews are budgeted with annual groundwater monitoring and LUC reporting. Additional monitoring will depend on initial data.

Site ID: RSA-069

Site Name: FORMER CHEMICAL DRUM STORAGE AREA

Alias: GCWD

### STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Chemical weapon munitions (CWM)/Chemical agent, Metals, Volatiles (VOC)

Media of Concern: Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199510.....	199809
RFI/CMS.....	200906.....	201304
DES.....	200906.....	201402
CMI(C).....	200906.....	201405
LTM.....	201405.....	204205

RIP Date: N/A

RC Date: 201405

### SITE DESCRIPTION

RSA-069 is located on 80 acres west of Patton Road and south of Buxton Road. The site is heavily wooded with a large percentage (90 percent) covered in wetlands. The site was used in the 1940s and 1950s for above ground drum storage of H and L. Chemical agents were stored in one-ton steel containers and 55-gallon steel drums. The site contains approximately 170 square storage cells, each about 200 sf with earthen berms. The site was fenced in 1949-1950 and then re-fenced in 2001 as part of a TCRA due to potential CWM. Currently, the site is located within operational Range 0701 and access is controlled by the Army's SAC Program. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA.

The VOCs and CWM breakdown products were found in the groundwater, but the source cannot be conclusively attributed to this site. H breakdown products have been detected in overburden and bedrock groundwater to the south of the site. The TCE has been detected in the northeast section of the site at high levels in groundwater.

Currently, there is no distinction between RSA-069 and RSA-070. Therefore, site RSA-070 was listed as RC in AEDB-R, and any additional needed action will be addressed under RSA-069. The storage area now occupies approximately 72 acres.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA.

### CLEANUP/EXIT STRATEGY

An RFI/CMS, Statement of Basis, Permit Modification and LUC DES will be prepared. It is anticipated that LUCs will be required due to the potential presence of CWM. Based on requirements of the Permit, AEIRG, and ARBCA, additional work is necessary to complete an RFI. Five-year reviews are budgeted with annual groundwater monitoring and reporting for in the post-PBA LTM phase. Additional RFI field activities include the following: conduct approximately five soil borings, collect approximately 15 soil samples, collect approximately five groundwater samples, collect approximately 12 surface water/sediment samples.

Site ID: RSA-083

Site Name: INACTIVE SPRAY PAINT BOOTH SUMP

Alias: OFFSITE

### STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Metals, Volatiles (VOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	198810.....	198909
CS.....	199510.....	201101
RFI/CMS.....	200906.....	201304
DES.....	200906.....	201404
CMI(C).....	200906.....	201412
CMI(O).....	200906.....	201509
LTM.....	201510.....	204110

RIP Date: 201412

RC Date: 201509

### SITE DESCRIPTION

This site consists of a sump associated with a former water-curtain paint operation located at Building 7344 in the northwest section of the former RARE Facility North Plant. Large missile casings were painted at this building. The unit collected excess paint mist emissions from missile spray painting operations. The water-curtain trapped excess paint mist. Water was re-circulated through the sump/ water-curtain during the painting operation. Paint that collected on the surface of the sump was removed and contained in drums. Supernatant was discharged to a septic tank and field drainage system. TCE was the primary solvent used for these activities. Building 7344 is currently being used as a guided missile research facility. Historical sampling at RSA-083 included analyses for VOCs, SVOCs, pesticides/PCBs, metals, PAH compounds, perchlorate, and explosives. VOCs are the only COCs at RSA-083. TCE was detected in groundwater at a concentration of 13,000 micrograms per liter (ug/L) (in well K83-RS709) in 2009, continuing a declining trend from a high of 170,000 ug/L in 1997. This steady TCE decrease has been accompanied by increases in the concentrations of TCE degradation products cis-1,2-DCE and vinyl chloride in the same well, suggesting that natural attenuation is actively reducing contaminant concentrations in site groundwater. Stable- to-decreasing concentrations in nearby wells suggest that the groundwater plume is not migrating. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA.

### CLEANUP/EXIT STRATEGY

Conduct RFI field investigation with soil and groundwater sampling. Complete an RFI, CMS, DES, CMI (C), CMI (O), and LTM to be consistent with future land uses. Sampling from K83-RS709 and adjacent RSA-083 monitoring wells is needed to confirm and track the progress of natural attenuation processes and to confirm that the plume is not migrating. As part of monitoring for TCE plume degradation and progress of natural attenuation processes, a record of groundwater chemical conditions favorable to natural attenuation is required. Five existing wells will be used to perform a baseline MNA study. Soils have been further investigated and are not a source for TCE migration to groundwater. The main building has been demonstrated safe for current uses. The CMI will likely specify natural attenuation monitoring with LUCs. The Statement of Basis and Permit Modification will document the selection of the final remedy.

**Site ID: RSA-087**

**Site Name: INACTIVE PROPELLANT WASTES STORAGE PAD**

**Alias: OFFSITE**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

**Contaminants of Concern:** Perchlorate, Volatiles (VOC)

**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198910.....	199009
CS.....	199410.....	199909
RFI/CMS.....	200301.....	201208
DES.....	200912.....	201309
CMI(C).....	200912.....	201406
CMI(O).....	200912.....	201507
<b>RIP Date:</b>	201406	
<b>RC Date:</b>	201507	

## SITE DESCRIPTION

Site RSA-087 is located at Building 7368 and consists of two concrete pads (200 sf) which were used to store drummed cuttings from finished perchlorate propellant. New sheds and storage pads were added adjacent to the older pads at a later date. Although the groundwater underneath the pads is contaminated with TCE, this site is not the source area. A former degreaser, located at Building 7368 (RSA-95), appears to be the source of the TCE contamination. The PP indicates that groundwater will be addressed under RSA-146.

Additional sources of perchlorate have been identified to the north and northwest of RSA-087 as RSA-196 and RSA-198, following completion of the preliminary site assessment effort. The draft RI report was submitted in December 2005. Perchlorate and TCE were found in soil and groundwater at the site.

A draft final RI was submitted in October 2007; regulatory review is pending.

Sites RSA-087, RSA-088, and RSA-089 were all used for the same purpose. These sites are located in the east central portion of the arsenal at the former RARE facility - north plant. These units provided temporary waste storage for plant waste generation points either on concrete pads or as designated spaces on asphalt for 1.3 explosive class waste propellants. Prior to RARE north plant operations, these areas were part of RSA ordnance plant burster and assembly lines. The areas investigated as RSA-087, RSA-088, and RSA-089 represent the waste storage pads associated with specific activities related to the solid rocket manufacturing, testing and research.

## CLEANUP/EXIT STRATEGY

An excavation of approximately 5,500 cubic yards to a depth of 17ft is planned and budgeted. Confirmation samples will be collected for VOCs and perchlorate.

**Site ID: RSA-088**

**Site Name: INACTIVE PROPELLANT WASTES STORAGE PAD**

**Alias: OFFSITE**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

**Contaminants of Concern:** Perchlorate, Volatiles (VOC)

**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198910.....	199009
CS.....	199410.....	199909
RFI/CMS.....	200301.....	201208
DES.....	200912.....	201309
CMI(C).....	200912.....	201409
CMI(O).....	200912.....	201511
<b>RIP Date:</b>	201409	
<b>RC Date:</b>	201511	

## SITE DESCRIPTION

Site RSA-088 is located at Building 7625 and consists of a concrete pad (200 sf) which was used to store drummed cuttings from finished perchlorate propellant. A newer shed and pad were added on at a later date. This location rather than the degreaser in Building 7625 (RSA-94) appears to be the source of the TCE and perchlorate plumes in this area.

A draft final RI was submitted in September 2007.

Sites RSA-087, RSA-088, and RSA-089 were all used for the same purpose. These sites are located in the east central portion of the arsenal at the former RARE facility - north plant. These units provided temporary waste storage for plant waste generation points either on concrete pads or as designated spaces on asphalt for 1.3 explosive class waste propellants. Prior to RARE north plant operations, these areas were part of ROP burster and assembly lines. The areas investigated as RSA-087, -088, and -089 represent the waste storage pads associated with specific activities related to the solid rocket manufacturing, testing and research.

## CLEANUP/EXIT STRATEGY

An excavation of perchlorate contaminated soil, 40 ft x 40ft x 15 ft deep is expected.

**Site ID: RSA-095**

**Site Name: CHLORINATED-SOLVENT DISTILLATION UNIT 2**

**Alias: OFFSITE**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

**Contaminants of Concern:** Volatiles (VOC)

**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198910.....	199009
CS.....	199510.....	199609
RFI/CMS.....	200501.....	201107
DES.....	200906.....	201403
CMI(C).....	200906.....	201503
CMI(O).....	200906.....	201604

**RIP Date:** 201503

**RC Date:** 201604

## SITE DESCRIPTION

A PSA investigation in 2004 resulted in the expansion of the RSA-095 site boundary to include Buildings 7369 and 7370. These buildings served as ancillary operations to Building 7368. This site also includes RSA-093.

Sites RSA-094, RSA-095, RSA-096, RSA-097, and RSA-098 were solvent degreasing operations including stills used for distillation and recovery of solvent from vapor degreasers in the former Thiokol plants. The degreasing agent most commonly used at these units was TCE. During vapor degreasing for the rocket motors, the solvent fluid was volatilized with heating coils, circulated through the motors, condensed with cooling coils, reconditioned through the distillation unit, and recirculated through the system. Each degreaser unit was set inside a concrete pit and was equipped with a sump pump to recover solvent during operations.

The draft RI report was submitted in December 2007. Substantial and widespread VOCs and perchlorate have been detected.

## CLEANUP/EXIT STRATEGY

Complete the DES, CMI (C), and CMI(O). Remedial action is expected to include: excavation of perchlorate contaminated soil with off-site disposal, anaerobic Bioremediation, soil, vapor, and groundwater monitoring; Electrical resistance heating; Filtration, Liquid-Phase Carbon Adsorption, Thermal Oxidation, and Sewer Discharge. This treatment is designed to treat contaminated soil as well as DNAPL source material in the saturated zone and groundwater. This remedy would be protective of human health and would prevent future sourcing to groundwater in accordance with the remedial action objectives.

**Site ID: RSA-096**

**Site Name: CHLORINATED-SOLVENT DISTILLATION UNIT 3**

**Alias: OFFSITE**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199510.....	199609
RFI/CMS.....	200401.....	201107
DES.....	200906.....	201209
CMI(C).....	200906.....	201309
CMI(O).....	200906.....	201407

**RIP Date:** 201309

**RC Date:** 201407

## SITE DESCRIPTION

Site RSA-096 operations (case preparation) centered around Building 7740. The degreaser sump is located in the northwest corner of the building. Perchlorate contamination is also present in the soil and groundwater at the site. PSA investigation (2004) for the RSA-146 contributes this perchlorate to proposed CERCLA site RSA-197, Thiokol Static Test Stand.

A draft report of findings has been prepared. Part of the additional RI was funded in FY05. Results indicate that treatment of both subsurface soils and groundwater is required for TCE.

The RSA project 51899, Propulsion Systems Research Facility, phase I, is planned over the eastern end of this site.

Sites RSA-094, RSA-095, RSA-096, RSA-097, and RSA-098 were solvent degreasing operations including stills used for distillation and recovery of solvent from vapor degreasers in the former Thiokol plants. The degreasing agent most commonly used at these units was TCE. During vapor degreasing for the rocket motors, the solvent fluid was volatilized with heating coils, circulated through the motors, condensed with cooling coils, reconditioned through the distillation unit, and recirculated through the system. Each degreaser unit was set inside a concrete pit and was equipped with a sump pump to recover solvent during operations.

The draft RI was submitted in the second quarter of 2008.

## CLEANUP/EXIT STRATEGY

Complete the CMS, DES, CMI (C), CMI (O), and LTM. Remedial action is expected to include: ERH, filtration, liquid-phase carbon adsorption, thermal oxidation, and sewer discharge. This treatment is designed to treat contaminated soil as well as DNAPL source material in the saturated zone and groundwater. This remedy would be protective of human health and would prevent future sourcing to groundwater in accordance with the remedial action objectives.

**Site ID: RSA-109**

**Site Name: FORMER CHEMICAL MUNITIONS STAGING AREA**

**Alias: DEMIL**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Explosives, Metals, Pesticides, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Other (Surface and Subsurface Soil)

Phases	Start	End
RFA.....	198811.....	198909
RFI/CMS.....	199510.....	201407
DES.....	200906.....	201507
CMI(C).....	200906.....	201510
CMI(O).....	200906.....	201608
LTM.....	201608.....	204202

**RIP Date:** 201510

**RC Date:** 201608

## SITE DESCRIPTION

RSA-109 is an inactive 10-acre area used as a staging area in support of mustard gas production during the early 1940s and as a demolition dump for the disposal of materials from the chemical manufacturing plants in the late 1940s. Rubble, bricks, and ceramic charcoal columns remain in soil piles at the site. The piles are in two separate areas; one in the northwest portion of the site and the other in the southeast portion of the site. Concentrations of SVOCs, pesticides and metals (lead) were detected in soil with VOCs and metals in groundwater exceeding action levels. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to the AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

It is anticipated that a DES, CMI (C), CMI (O), LTM, and LUCs (unrestricted for industrial use, restricted for residential use) will be required to address lead contaminated surface soils. It is anticipated that 110 cy of soil will require disposal (80 cy associated with referenced soil piles and 30 cy associated with lead in surface soil). As a contingency, up to 25% of the soil may be classified as hazardous waste based on the TCLP results and may require off-site stabilization or treatment prior to disposal. Twenty-five confirmation samples will be collected to verify that all soils exceeding the action level have been removed. Following excavation, the ground surface will be re-graded to approximately the pre-disposal topography.

Five-year reviews and LUC inspections are expected for an indefinite time frame. Annual groundwater monitoring and reporting in the post-PBA LTM phase. Additional monitoring will depend on initial data.

Site ID: RSA-112

Site Name: FORMER DEMILITARIZATION & DISPOSAL SITE

Alias: DEMIL

STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC)

Media of Concern: Other (Surface and Subsurface Soil)

Phases	Start	End
RFA.....	198810.....	199009
CS.....	199510.....	199609
RFI/CMS.....	200906.....	202809
IRA.....	201103.....	202609
LTM.....	202809.....	204209

RIP Date: N/A

RC Date: 202809

SITE DESCRIPTION

Site RSA-112 is approximately 81 acres and is located in the east-central part of the arsenal adjacent to RSA-58, east of Patton Road, south of Martin Road, and northeast of Creek Road. It is in the 100-year floodplain of the HSB and surrounded by wetlands. This site is bounded on the west by Corkern Range. In addition, MEC is present at the site.

The site was used for demilitarization and disposal of chemical and conventional ordnance. This site consists of surface burn areas and one possible burn trench. The surface is littered with ordnance and debris.

Sites RSA-112 and RSA-128 were determined to be one demilitarized area. Site RSA-128 will be listed as RC in AEDB-R and all needed action will be funded under RSA-112. This brought the site size to 81 acres. The original RSA-112 is fenced (58 acres) and the remaining part of the site has restricted access. The fence was installed in 2001.

The ADEM issued the RCRA Hazardous Waste Facility Permit #AL7 210 020 742, on Sept. 30, 2010 to the Army. This RCRA permit governs the storage, treatment, and disposal of hazardous waste, as well as corrective measures for multiple SWMUs and AOCs in accordance with RCRA. Part VI of the RCRA permit requires that IM and/or source removal be completed at this suspect CWM site.

CLEANUP/EXIT STRATEGY

The ADEM issued the RCRA Hazardous Waste Facility Permit #AL7 210 020 742, on Sept. 30, 2010 to the Army. This RCRA Permit governs the storage, treatment, and disposal of hazardous waste, as well as corrective measures for multiple SWMUs and AOCs in accordance with RCRA. Part VI of the RCRA Permit requires that IM and/or source removal be completed at this suspect CWM site.

A Phase 1 and 2 IRA, RFI, and LTM are expected.

Site ID: RSA-113

# Site Name: INACTIVE DISPOSAL TRENCHES & BURN PITS

Alias: DEMIL

## STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Chemical weapon munitions (CWM)/Chemical agent, Explosives, Metals, Munitions and explosives of concern (MEC)

Media of Concern: Other (Surface and Subsurface Soil)

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199310.....	199509
RFI/CMS.....	200509.....	202201
IRA.....	201103.....	202001
LTM.....	202201.....	204201

RIP Date: N/A

RC Date: 202201

## SITE DESCRIPTION

Site RSA-113 consists of two inactive disposal trenches, each about 20 ft wide and 300 ft long, and a fuse disposal area, located in the east central portion of the arsenal, north of Creek Road, south of Martin Road, and east of Patton Road. Metal debris (e.g., decomposed drums, a rail cart, structural steel) is visible in sections of the uncovered areas of the trenches. The 10-acre area is overgrown with vegetation including brush, briars, and small trees. The site was fenced in 2001.

Ordnance is scattered on the surface throughout the site, in addition to MEC present on the surface. Metals, explosives and CWM breakdown products were detected in soils.

A draft RI work plan was submitted in August 2008.

The FY05 PBC option was funded to include completion of RIP, five years of LTM and a five-year review. The path forward changed based on the 2010 RCRA permit.

The ADEM issued the RCRA Hazardous Waste Facility Permit #AL7 210 020 742, on Sept. 30, 2010 to the Army. This RCRA permit governs the storage, treatment, and disposal of hazardous waste, as well as corrective measures for multiple SWMUs and AOCs in accordance with RCRA. Part VI of the RCRA permit requires that IM and/or source removal be completed at this suspect CWM site.

## CLEANUP/EXIT STRATEGY

The ADEM issued the RCRA Hazardous Waste Facility Permit #AL7 210 020 742, on Sept. 30, 2010 to the Army. This RCRA Permit governs the storage, treatment, and disposal of hazardous waste, as well as corrective measures for multiple SWMUs and AOCs in accordance with RCRA. Part VI of the RCRA Permit requires that IM and/or source removal be completed at this suspect CWM site.

A Phase 1 and 2 IRA, RFI, and LTM are expected.

**Site ID: RSA-114**

**Site Name: INACTIVE MADKIN MOUNTAIN ROCK QUARRY**

**Alias: DEMIL**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Chemical weapon munitions (CWM)/Chemical agent, Metals

Media of Concern: Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	198810.....	198909
CS.....	198910.....	199609
RFI/CMS.....	200906.....	202202
IRA.....	201103.....	202002
LTM.....	202202.....	204202

**RIP Date:** N/A

**RC Date:** 202202

## SITE DESCRIPTION

Site RSA-114 is an abandoned limestone rock quarry that is located on the south side of Madkin Mountain, near the geographical center of the arsenal, north of the intersection of Neal Road and Mills Road. The rectangular shaped, water-filled quarry is approximately four acres.

Approximately three acres of the surrounding area has been added as part of this site. The water level depth varies widely with seasonal fluctuations. After the quarry was closed during the mid-1940s, tons of surplus materials (e.g., soldier gas mask canisters, H chemical production plant filters) were disposed in the quarry. Large quantities of debris are currently visible above the water surface with the largest concentration being encompassed in two large piles on the southern side of the quarry. These two piles consist of gas mask canisters and large industrial charcoal canisters. The gas mask canisters and charcoal columns are believed to have been un-used. Underwater investigations have indicated the presence of intact, agent configured drums and 4.2 inch mortar rounds. This site was fenced in 2001.

The ADEM issued the RCRA Hazardous Waste Facility Permit #AL7 210 020 742, on Sept. 30, 2010 to the Army. This RCRA permit governs the storage, treatment, and disposal of hazardous waste, as well as corrective measures for multiple SWMUs and AOCs in accordance with RCRA. Part VI of the RCRA permit requires that IM and/or source removal be completed at this suspect CWM site.

## CLEANUP/EXIT STRATEGY

The ADEM issued the RCRA Hazardous Waste Facility Permit #AL7 210 020 742, on Sept. 30, 2010 to the Army. This RCRA Permit governs the storage, treatment, and disposal of hazardous waste, as well as corrective measures for multiple SWMUs and AOCs in accordance with RCRA. Part VI of the RCRA Permit requires that IM and/or source removal be completed at this suspect CWM site.

A Phase 1 and 2 IRA, RFI, and LTM are expected.

**Site ID: RSA-115**

**Site Name: INACTIVE EAST SIDE BLOWDOWN LAGOON**

**Alias: None**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

**Contaminants of Concern:** Metals, Perchlorate, Volatiles (VOC)

**Media of Concern:** Groundwater, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198910.....	199009
CS.....	199010.....	199109
RFI/CMS.....	201211.....	201508
DES.....	201508.....	201604
CMI(C).....	201604.....	201612
LTM.....	201612.....	204207

**RIP Date:** N/A

**RC Date:** 201612

## SITE DESCRIPTION

RSA-115 is located in the southern portion of the arsenal, south of Buxton and Pershing Roads, on the eastern side of Test Area 5 (an operational range). This area was a rocket motor test stand and blowdown lagoon and is approximately 7,500 sf. The site had an unlined holding basin that contained discharged cooling water during test firings of rocket motors from the adjacent Attitude Test Stand 8887. The wastewater was held in the lagoon until it evaporated and/or percolated through the soil. The cooling water mixed with the rocket motor exhaust containing unsymmetrical dimethyl hydrazine (UDMH) as the primary active fuel ingredient and red fuming nitric acid as the primary oxidant. The lagoon has an earthen berm and is surrounded by small pine trees. The lagoon was last used during horizontal test firing at the test stand during the 1960s. The site was first investigated in 2006 as part of the PSA investigation for the RSA-156 groundwater site.

## CLEANUP/EXIT STRATEGY

The path forward is to conduct an RFI field investigation in accordance with AEIRG to include collection of surface and subsurface soil samples using DPT to confirm existing data and investigate areas currently not evaluated. Preparation of an RFI report and ARBCA risk assessment will be required. A CMI(C) phase is expected to include excavation and disposal of contaminated soil. LTM is expected to include groundwater monitoring, LUC inspections, and five-year reviews.

**Site ID: RSA-117**

**Site Name: FORMER LIQUID CAUSTIC MFG. PLANT SITE**

**Alias: DDT**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Polychlorinated Biphenyls (PCB)

Media of Concern: Soil

Phases	Start	End
RFA.....	198810.....	198909
CS.....	198910.....	199009
RFI/CMS.....	200906.....	201401
DES.....	200906.....	201410
CMI(C).....	200906.....	201507
CMI(O).....	200906.....	201606
LTM.....	201606.....	204206

**RIP Date:** 201507

**RC Date:** 201606

## SITE DESCRIPTION

RSA-117 consists of the following nine surface sites and the underlying groundwater unit (RSA-147), which contains concentrations of VOCs characteristic of phase-separated product: Former Liquid Caustic Manufacturing Plant (RSA-117, original); Former Chlorine Manufacturing Plant; Former Brine Processing Plant; Former GAF Discharge (RSA-104); Former Ammonia Lagoon (RSA-118); Former DDT Manufacturing Plant/Thionyl Chloride Plant (RSA-102); Former DDT Settling Pond (RSA-103); Old and New DDT Drainage Ditches (RSA-105); and the New DDT Drainage Ditch Check Dams (RSA-106).

Operations within the RSA-117 site boundary include conveyance of wastewater containing DDT, metals, chlorinated organics, oils, ammonia, acids, caustics, and possibly PCBs through ditches and sewers from various manufacturing facilities; manufacturing of chlorine, caustic, and hydrogen from salt utilizing asbestos-diaphragm-cell technology. The potential exists at RSA-117 for several release points, including the brine processing area, cell building, including rectifier (mercury-arc) room and transformers, liquefaction area, caustic evaporator area, other PCB-containing electrical equipment, buried sewer or the inlet/outlet ditches and lagoon for discharges of wastewater from the GAF facility, chlor-alkali plant and drainage ditches that conveyed DDT wastewater from the Olin Chemical DDT Plant. Site-related contaminants identified from previous investigations include PCBs in the surface and subsurface soils at the Former Liquid Caustic Manufacturing Plant; pesticides in the surface water, soil, and sediments in the DDT ditches; chlorobenzene in the groundwater south of the DDT Manufacturing Areas and the Former Liquid Caustic Manufacturing Plant; TCE in the groundwater at RSA-104; and mercury in the soils at the Former Brine Processing Plants.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines. RSA-102, RSA-103, and RSA-106 are listed as sites requiring NFA in Table VI.3 of the RCRA permit (2010).

## CLEANUP/EXIT STRATEGY

Additional RFI work is needed to further delineate the 85-acre RSA-117 site. Tasks for this site include completing an RFI, CMS, DES, CMI (C), CMI (O), and LTM to be consistent with future land uses. RFI work is needed to further delineate the nature and extent of contamination at several of the former site process areas. The CMS will likely recommend remedial action at several of the process areas. A Statement of Basis and Permit Modification will document the selection of the final remedy, which is likely to be selective removal actions and LUCs (unrestricted for industrial use, restricted for residential use) based on the hazards associated with the identified compounds. Long-term management is also anticipated of for groundwater.

Site ID: RSA-122

Site Name: DISMANTLED LEWISITE MFG. PLANTS SITE

Alias: HA2

## STATUS

Regulatory Driver: RCRA

RRSE: HIGH

Contaminants of Concern: Chemical weapon munitions (CWM)/Chemical agent, Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA.....	198810.....	198909
CS.....	198910.....	199309
RFI/CMS.....	200301.....	200909
DES.....	201009.....	201107
CMI(C).....	200509.....	201109
CMI(O).....	200509.....	201308
LTM.....	201310.....	204110

RIP Date: 201109

RC Date: 201308

## SITE DESCRIPTION

This site of about 51 acres is located in the east central part of RSA, north of Viper Road and west of Meteorology Road. Site RSA-122 was the site of L manufacturing (Plant No. 2) during the mid-1940s. The area consisted of four production lines. Lines 3 and 4 were active while lines 5 and 6 were never operational for the production of L; however, the Line 5 area was used for decontamination of the one ton containers used for L storage and transportation. The area also includes an arsenic trichloride manufacturing plant whose waste was discharged to RSA-139. Subsequent development has partitioned the site. It is an active area with testing, measurement, and diagnostic equipment (Building 5435) and other operations. Disposal lagoons associated with this manufacturing area are identified as RSA-56, RSA-57, and RSA-139. Lines 3 and 4 discharged to RSA-56. Lines 5 and 6 were constructed to discharge to RSA-57. Mercury and arsenic contamination have been found in surface and subsurface soils as well as sediments.

In the 2004 supplemental RI, chloro vinyl arsenous acid (CVAA) was detected in subsurface soils at the waste collection pit. This is a highly industrialized area on the arsenal. This site also includes drainage for the entire area south across Mills Road ultimately to HSB. Site-related contaminants have been detected in springs in a tributary that feeds into HSB. The contamination in the springs will be addressed under RSA-147. The final RI report was produced in August 2007. The ROD was signed in September 2009. The final RAWP was initially submitted in July 2010. A Hazardous Waste Facility Permit was issued Sept. 30, 2010. Revisions to the CMIP/RAWP were submitted in January 2011, July 2011, and January 2012 to address ADEM comments.

The 2005 RSA PBA includes costs through RIP plus CMI(O) with a five-year review.

Additional LTM is required after the PBC concludes.

## CLEANUP/EXIT STRATEGY

A PBC is in place that includes the CTC for remedy-in-place, followed by five years of LUC monitoring and one five-year review during CMI(O). The ROD for the site specified hot spot removals, treatment, and disposal for soils. Sediment monitoring is also specified. LUCs and LTM will be necessary for the soils left in place. Surface and subsurface soil is currently being remediated under the PBC. Surface soil was initially remediated in 2010 based on the remedial goals presented in the 2009 ROD. Revision of the remedial goals based on ADEM comments requires an additional 8,800 cy of soil to be remediated. Based on requirements of the permit, AEIRG, and ARBCA, additional funding is necessary to complete the CMI(C) to meet the performance objective. CMI(C) is anticipated in FY12. The PBC funding will expire in FY13, allowing only one year of monitoring.

The CMI(O) and LTM phases will include groundwater monitoring, LUC inspections, and five-year reviews.

**Site ID: RSA-126**

**Site Name: INACTIVE OPEN BURN TRENCH**

**Alias: HA2**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

**Contaminants of Concern:** Metals

**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198910.....	199009
CS.....	199307.....	199609
RFI/CMS.....	200509.....	201303
IRA.....	200509.....	201210

**RIP Date:** N/A

**RC Date:** 201303

## SITE DESCRIPTION

Site RSA-126 is approximately seven acres located near the geographical center of the arsenal, southwest of the intersection of Martin and Patton Roads. This site consists of a trench previously used for OB. The trench is approximately 200 ft long by 20 ft wide based on surface geophysics previously conducted at the site. The trench is reportedly approximately two ft deep. No information is available regarding the types of materials burned or disposed in the trench. It was speculated in the 1996 RI report that the construction methods and size of the trench at RSA-126 are similar to trenches at other RSA sites that were used for demolition/burning of demilitarized munitions and 55-gallon drums reportedly containing sulfurous sludge and possibly small quantities of H agent. However, other anecdotal evidence (e.g., close proximity of site to other historical RSA activities, apparent lack of ferrous metal in trench, lack of VOC in groundwater) suggests that chemical agent demilitarization activities and drum burial did not occur at RSA-126. A long, narrow mound of soil is located at the west end of the trench, which is presumably the soil excavated from the trench. The site was fenced in 2001.

Metals were detected in the soil. A draft RI investigation work plan was submitted in Sept. 2008. Test pits were completed in 2009 in the trenches and mound. Only native soil was found in the mound, and construction debris (concrete, bricks, wire, etc.) was found in the trench. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. A draft-final Interim Corrective Measures Implementation Plan was submitted in April 2011 for proposed soil removal needed to achieve industrial re-use of the property.

The 2005 PBC was funded to include completion of RIP, CMI(O), and a five-year review. LTM is required after the conclusion of the PBC.

## CLEANUP/EXIT STRATEGY

A PBC awarded in FY05 addresses this site up to remedy-in-place; an interim corrective action to excavate and dispose of site soil is anticipated in FY12 with completion of the RSA-126 RFI report. The action will be followed by an anticipated four years of LUCs and a five year review during CMI(O). Due to delays in regulatory reviews, CMI(C) is anticipated in FY12, with funding expiring in FY12. Post-PBC LUC costs beginning in FY13 are included in this site-level MFR.

**Site ID: RSA-134**

**Site Name: INACTIVE DISPOSAL TRENCH & BURN PIT**

**Alias: DEMIL**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals

Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198810.....	198909
CS.....	198910.....	199009
RFI/CMS.....	200509.....	201302

**RIP Date:** N/A

**RC Date:** 201302

**SITE DESCRIPTION**

Site RSA-134 consists of a disposal trench and OB pit located east of Patton Road, south of Martin Road, and north of Creek Road. The site is located 100 ft from Creek Road in a marshy area. The trench is about 25 ft by 75 ft by four ft deep. It was reported to have been used as an OB pit and/or a disposal trench. No primary records have been found that support this description.

Current historical records do not enable definitive determination as to UXO/CWM status. Additional archive search activities should provide a final determination.

Metals were detected in the groundwater, surface water and soils. Additional groundwater and soil sampling was conducted in 2010. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA.

A PBC was funded to include completion of RIP, CMI(O), and the first five-year review.

Post-PBC costs for additional years of LTM are included in this site's CTC estimate.

**CLEANUP/EXIT STRATEGY**

A PBC awarded in FY05 addresses this site up to remedy-in-place; a surface sweep is anticipated. The final RFI report was issued in August 2011 recommending NFA.

Site ID: RSA-135H

# Site Name: INACTIVE SUMP FOR 1.1 PROPELLANT WASTES

Alias: SP

## STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Explosives, Metals, Volatiles (VOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	198910.....	199009
RFI/CMS.....	199510.....	201305

RIP Date: N/A

RC Date: 201305

## SITE DESCRIPTION

This site is located on the west side of Building 7593 in the former RARE - south plant. It is an inactive captive sump (no outlet) for containment of Department of Transportation (D.O.T.) 1.1 propellant (explosive) wastes. The building was constructed in 1959 for cleanup of propellant de-aeration in the manufacturing of rocket propellant. Site RSA-135H collected building wash down water. The concrete-lined sump is five ft by nine ft by six ft deep and is covered by a wooden lid. The sump was periodically cleaned out and contents disposed of at the OB/OD area on Redstone. In 2004, the site boundary was expanded to include the waste storage pad (Buildings 7593 and 7594). The site is now 2.2 acres.

## CLEANUP/EXIT STRATEGY

### Problems Warranting Action

- Perchlorate was detected in several historic soil and groundwater samples. The groundwater plume map suggests the site historically was a source for perchlorate and TCE. Additional characterization of PSAs was needed.

### Technical Approach

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- The RFI field investigation was conducted (January 2011) to further characterize perchlorate impacts and potential for sourcing to groundwater in compliance with the Alabama Environmental Investigation and Remediation Guidance.
- Complete an RFI report documenting the remedy of NFA.
- Perform baseline human health risk assessment (BHHR)/screening level ecological risk assessment (SLERA) to show there are no unacceptable human health or ecological risks.
- Demonstrate there is no sourcing threat to groundwater using borehole averaging and SPLP data as necessary.
- Demonstrate metals are at background levels using calculated background screening levels, geochemical analysis of background, and other weight-of-evidence considerations.
- Prepare a permit modification application following approval of the RFI documenting the selection of NFA.

Site ID: RSA-138M

Site Name: INACTIVE TEMPORARY STORAGE AREA

Alias: NP

STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Perchlorate, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199610.....	200109
RFI/CMS.....	200701.....	201311
IRA.....	201102.....	201212

RIP Date: N/A

RC Date: 201311

SITE DESCRIPTION

This site is more accurately described as the ROP tetryl processing line. The RSA-146 PSA effort identified additional process related facilities in this area that are now included in this site. It encompasses Buildings 7721 (146-PS-02A-01), 7722 (original 138M), 7723 (146-PS-02A-07), 7724 (146-PS-02A-06), 7725 (146-PS-02A-08) and associated ramps and drains in the former RARE facility north plant. The expanded site boundary is now 8.8 acres. During the 1940s, this area was part of RSA ordnance plant burster Line No. 2 which produced tetryl-based explosives components. After 1950, the buildings were used for various activities, including paint spraying and rocket motor propellant operations using D.O.T. 1.3 and 1.1 class explosives.

Explosives, perchlorate, SVOCs, VOCs and metals have been found in the soil. The groundwater is contaminated with perchlorate and VOCs, primarily TCE.

In 2004 this site was expanded to include Buildings 7721, 7724, 7723, 7725 and 7722 and a TSA that supported the burster Line 2.

The RSA project 51899, Propulsion Systems Research Facility, phase I, is planned over the entire area.

An RI report was submitted in FY08. An FS, PP, and ROD are planned under the FY09 PBA. Groundwater will be addressed under RSA-146.

CLEANUP/EXIT STRATEGY

The anticipated path is to delineate and excavate the extent of TCE contaminated soil, and complete an IM closure report and RFI report recommending NFA. The Permit Modification for RSA-138m will identify site closure for unrestricted use for surface media and for the groundwater site to address groundwater contamination. No Post-PBA actions will be necessary.

The following tasks are expected:

- (1) Perform soil excavation with a volume of 36 ft x 48 ft x 16 ft,
- (2) dispose of soil as nonhazardous waste,
- (3) Collect 20 confirmation samples analyzed for VOCs and perchlorate,
- (4) prepare IM closure report recommending NFA.

**Site ID: RSA-139**

**Site Name: CAPPED ARSENIC WASTE POND-NORTH**

**Alias: HA2**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198810.....	198909
CS.....	198910.....	199309
RFI/CMS.....	200509.....	200909
CMI(C).....	200509.....	200909
CMI(O).....	200909.....	201308
LTM.....	201308.....	204208

**RIP Date:** 200909

**RC Date:** 201308

## SITE DESCRIPTION

Site RSA-139 is a site of about half an acre located in the east-central part of the arsenal, north of Viper Road, west of Meteorology Road, and east of Calibration Road. It was an open, unlined surface impoundment that received waste discharge from arsenic trichloride manufacturing (included in RSA-122) facilities in the early-1940s. The site was capped with compacted clay and fenced in 1995. The soil/sediment contains high levels of metals, mainly arsenic.

A combined ROD for RSA-056, RSA-122, and RSA-139 has been signed under the FY05 PBA contract. The ROD was signed in September 2009. The final RAWP was initially submitted in July 2010. A Hazardous Waste Facility Permit was issued Sept. 30, 2010. Revisions to the CMIP/RAWP were submitted in January 2011, July 2011, and January 2012 to address ADEM comments.

## CLEANUP/EXIT STRATEGY

A PBA is in place to address this site up to remedy-in-place followed by LUCs. One five-year review was included. One year of LUCs and cap/fence maintenance will occur. LTM beyond the FY05 PBA will consist of continued LUCs, cap and fence maintenance, and five-year reviews.

**Site ID: RSA-140**  
**Site Name: INACTIVE DISPOSAL AREA**  
**Alias: DA**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** LOW

**Contaminants of Concern:** Metals

**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199110.....	199209
SI.....	199210.....	199309
RI/FS.....	200906.....	201311

**RIP Date:** N/A

**RC Date:** 201311

**SITE DESCRIPTION**

Site RSA-140 is located in the southeastern section of RSA, north of Buxton Road and south of the Defense Reutilization and Marketing Office (DRMO) area. The site consists of two separate disposal mound areas (heights up to seven ft) covering a total area of 320 sf. The disposal mounds were found to contain construction-type materials (e.g., metallic objects, cement blocks, glass, charcoal, and insulation) dating from the 1960s to the 1970s.

New historical search information indicates that RSA-140 and RSA-046 once were part of a former range.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- The most recent surface or subsurface soil analytical data was collected in 1993. Sample collection methods and analytical procedures during that time period do not meet current standards.
- Screening criteria were exceeded for PAH and PCB compounds in surface and subsurface soil samples and for VOCs in the groundwater samples.
- No permanent monitoring wells are located within the boundary of RSA-140.
- The source of TCE in groundwater beneath the site has not been determined. Adequate nature and extent data do not exist for vadose zone soils at RSA-140.
- The extent and boundaries of the disposal areas have not been defined. The disposal area/debris pile contents have not been adequately characterized for the nature and extent of chemical constituents.
- The trench feature or adjacent mounded soil pile that was identified during the May 2010 RFI/RI scoping activities has not been sampled or characterized.

**Technical Approach**

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including trenching and sample collection in debris piles, collection of soil and groundwater samples from installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the AEIRG.
- Complete an RFI report documenting the expected remedy of NFA.
- Describe the nature and extent of contamination.
- Perform BHHRA/SLERA to document potential human health or ecological risks.
- Evaluate the potential threat to groundwater from the soil-to-groundwater migration pathway.
- Prepare a permit modification application following approval of the RFI documenting NFA.

**Site ID: RSA-142**

**Site Name: CHLORINATED-SOLVENT SPILL AREA**

**Alias: OFFSITE**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

**Contaminants of Concern:** Metals, Perchlorate, Volatiles (VOC)

**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	199110.....	199209
CS.....	199210.....	199509
RFI/CMS.....	200606.....	201107
DES.....	200906.....	201302
CMI(C).....	200906.....	201403
CMI(O).....	200906.....	201501

**RIP Date:** 201403

**RC Date:** 201501

## SITE DESCRIPTION

This site initially included vapor degreasing operations in former Building 7664. Additional buildings now included in the site are 7663 (146-PS-03A-14), 7676 (146-PS-03A-12), 7683 (146-PS-03EE), 7665 (146-PS-03A-08) and other associated facilities in the area. This area now includes a portion of the original ROP buster Line 1. Subsequent Thiokol operations involved case prep, solid rocket motor loading and cleanup operations.

The degreaser unit at this site was a vapor degreaser with a distillation unit similar to the degreaser/distillation units at RSA-094 through RSA-098. In 1989 a valve malfunction on the solvent reclamation still of the degreaser resulted in a reported spill of 30 gallons of TCE to a nearby ditch. Prior to connection to the sewer line, trench drains along the building feature discharged to the ditch and drained east toward the wetlands across East Line Rd. Data indicates significant releases of TCE and perchlorate to soil and groundwater. The degreaser building was removed in the late-1990s.

The RI work began early in the 1990s. There are significant levels of TCE and perchlorate in the soil.

In 2004, the site boundary was expanded to 9.2 acres. In 2006, the site boundary was adjusted to 8.7 acres.

The final RI report was produced in the first quarter of 2008.

## CLEANUP/EXIT STRATEGY

Complete the CMS, DES, CMI (C), CMI (O), and LTM. Remedial action is expected to include: ERH, filtration, liquid-phase carbon adsorption, thermal oxidation, and sewer discharge. This treatment is designed to treat contaminated soil as well as DNAPL source material in the saturated zone and groundwater. This remedy would be protective of human health and would prevent future sourcing to groundwater in accordance with the remedial action objectives.

**Site ID: RSA-143**

**Site Name: UNDERGROUND STORAGE TANK SPILL SITE**

**Alias: Bldg 3240**

**STATUS**

**Regulatory Driver:** RCRA  
**RRSE:** MEDIUM  
 Contaminants of Concern: Metals, Volatiles (VOC)  
 Media of Concern: Groundwater, Soil

Phases	Start	End
ISC.....	199310.....	199409
INV.....	199410.....	199609
CAP.....	199610.....	200405
IMP(C).....	200405.....	200409
IMP(O).....	200409.....	201503

**RIP Date:** 200409

**RC Date:** 201503

**SITE DESCRIPTION**

Site RSA-143 is located near the intersection of Goss Road and Vincent Drive, east of an existing service station, Building 3240. It is a gasoline spill site and was created by leaking USTs and past operations. Originally, four USTs that serviced the closed Army, Air Force Exchange Services (AAFES) service station operated at this site for about 28 years. The tanks, as well as soils around the tanks and lines, were removed and the excavation was backfilled with clean soil and closed.

The groundwater is contaminated with high concentrations of lead, gasoline additive [methyl tertiary butyl ether (MTBE)], benzene, ethylbenzene, toluene and xylenes (BTEX). The design for in situ oxidation remediation was completed in 2001.

A new service station (Class VI, Building 3234) was opened in 1996 upgradient to the west, a release from which has contributed to the BTEX plume. This area is not part of RSA-143 and will be funded under the Compliance-related Cleanup (CC) program.

Chemical injections were initiated in August 2004. Subsequent monitoring revealed the presence of free-product in wells where it was not previously detected. The initial injections were unsuccessful in treating the dissolved phase plume due to residual light non-aqueous phase liquid (LNAPL) presence.

The free-product has been delineated. Enhanced fluid recovery has been performed. Groundwater monitoring and an updated Tier II report have been prepared. An engineering evaluation/cost analysis (EE/CA) document was prepared in May 2007, in which excavation by large diameter augers (LDA) and installation of a multi-phase extraction (MPE) system were selected as the best technologies to address soil, groundwater, and smear zone contamination. An MPE pilot study was performed in July 2007.

A corrective action plan (CAP) was prepared in October 2007. The LDA excavation and disposal fieldwork was completed in June 2008. Startup activities related to the MPE system began in January 2009.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- For the Building 3234 area of RSA-143, the release of gasoline has resulted in a need for evaluation and action at this area of the site.
- For the Building 3240 area of the site, a CAP has been implemented.

**Technical Approach**

**For Building 3224 Area**

- Complete a work plan, field investigation and ARBCA report including calculation of site-specific threshold levels.
- Complete a CAP including supplemental data needed for this plan.
- Implement the corrective action.

**Site ID: RSA-143**

**Site Name: UNDERGROUND STORAGE TANK SPILL SITE**

**Alias: Bldg 3240**

- Prepare a letter report that documents the corrective action has been implemented.
- Perform quarterly effectiveness monitoring for the corrective action.

For Building 3240 Area

- Continue operation and maintenance of dual phase extraction system.
- Perform quarterly effectiveness monitoring for the corrective action.

**Site ID: RSA-145**  
**Site Name: GROUNDWATER UNIT GW-01**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA  
**RRSE:** MEDIUM  
 Contaminants of Concern: Volatiles (VOC)  
 Media of Concern: Groundwater

Phases	Start	End
RFA.....	199001.....	199102
CS.....	199406.....	199709
RFI/CMS.....	199710.....	201404
DES.....	200906.....	201501
IRA.....	200709.....	201509
CMI(C).....	200906.....	201511
CMI(O).....	201509.....	201612
LTM.....	201612.....	204209
<b>RIP Date:</b>	201511	
<b>RC Date:</b>	201612	

**SITE DESCRIPTION**

This groundwater site includes the following active surface sites: RSA-45, RSA-47, RSA-58, RSA-112, RSA-113, RSA-134, RSA-143, RSA-228 through RSA-236, RSA-290-R-01, and RSA-D.

Current groundwater data indicates that there may be sources other than those within RSA-145 that are contributing to groundwater contamination. Multiple contaminated off-site groundwater and surface flows enter this site. Groundwater contaminants surface through multiple springs, resulting in surface water contamination, much of which occurs at Wheeler Wildlife Refuge. TCE has been found to stay consistent at low levels along creeks as they flow through the arsenal. There are both losing and gaining reaches of stream segments. Based on these findings, the use of an integrator OU and perimeter well network is required to evaluate the cumulative effects of these inputs. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, DES, statement of basis permit modification, CMI(C), and closure report for the groundwater site.

The RSA-145 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, completion of RFI/CMS investigation at surface media sites with respect to their contributions to groundwater contamination to RSA-145 will be coordinated in terms of timing. Based on the current data available for the site, it is assumed that the CMS will recommend MNA and LUCs as the final remedy for the site, based on the lack of significant ongoing sources of groundwater contamination (DNAPL) and the protections provided by the existing ROD for the installation-wide groundwater.

In FY08, a perimeter well network was to be installed. Additional wells will be installed during the upcoming RFI field investigation. It is expected that once the RFI has been completed and the potentially contributing sites to groundwater contamination have been addressed, monitoring of the existing well network and integrator OUs will be an integral part of the final remedy. It is anticipated that no further groundwater corrective action will be necessary beyond monitoring.

Groundwater monitoring [32 wells (25 percent of existing wells)], five-year reviews and LUCs are planned during both the CMI(O) and LTM phases. Well abandonment (14 two-inch wells, each 150 ft deep) is planned for the LTM phase.

**Site ID: RSA-146**  
**Site Name: GROUNDWATER UNIT GW-02**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** HIGH

Contaminants of Concern: Explosives, Metals, Perchlorate, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
RFA.....	199009.....	199102
CS.....	199406.....	199709
RFI/CMS.....	199710.....	201403
DES.....	200906.....	201412
IRA.....	200709.....	201303
CMI(C).....	200906.....	201510
CMI(O).....	201509.....	201611
LTM.....	201611.....	204210

**RIP Date:** 201510

**RC Date:** 201611

**SITE DESCRIPTION**

This groundwater site includes the following active surface sites: RSA-11, RSA-64, RSA-83, RSA-87, RSA-88, RSA-94 through RSA-97, RSA-135H, RSA-138M, RSA-140, RSA-142, RSA-144, RSA-187 through RSA-215, RSA-217 through RSA-221-R-01, RSA-237, RSA-239, RSA-271 through RSA-276, RSA-281, RSA-A, and RSA-C.

This groundwater site is the source of the off-post groundwater and surface water contamination. TCE and perchlorate have been found in the groundwater and surface water. Several DNAPL sources are present. Indoor air vapor intrusion issues on-post are a concern. Contamination from the source areas is commingled and widespread. The drinking water for this area comes from the Tennessee River. The phase I RI was submitted to the USEPA and the ADEM in July 2005. Comments were received in FY07.

In 1997, a P&T was installed at RSA-142. In 2000, a P&T system was installed for RSA-095/096. Operations of both systems ceased in August 2003 due to perchlorate in the effluent and cost-effectiveness in treating the TCE. After the system was shut down, off-site plume sampling indicated that the plume concentrations remained stable. The Phase I RI was submitted to USEPA and ADEM in July 2005. Comments were received in FY07, and the final Phase I RI was submitted in April 2008. A Phase II RI field investigation was initiated during 2009. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMA. Supplemental Phase II RI field investigation was performed during 2011.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, DES, Statement of Basis Permit Modification, CMI(C), and RA Closure Report for the groundwater site. A final phase of RFI field investigation activities will be performed to fill data gaps from the Phase II investigation and prepare the final RFI Report.

The RSA-146 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, RFI/CMS investigation of surface-media sites will be coordinated with the RSA-146 investigation with respect to surface-media site contributions to RSA-146 groundwater contamination. It is assumed that the CMS will recommend source remediation, followed by MNA and LUCs as the final remedy for the site, based on remediation of significant DNAPL sources and the protections provided by the existing interim ROD for Installation-Wide Groundwater. The CMS will recommend in situ thermal desorption (ISTD) at 11 DNAPL hot spots. In situ enhanced bioremediation (ISEB) will follow ISTD at each location. Following successful remediation of all 11 DNAPL hot spots, MNA will be performed. In addition, groundwater beneath 13 sites with contamination that does not warrant thermal treatment will be treated with ISEB, followed by MNA.

Groundwater monitoring (40 wells @ 50 ft deep for 10 years), and two five-year reviews are included during CMI(O). Ten years of

**Site ID: RSA-146**  
**Site Name: GROUNDWATER UNIT GW-02**  
**Alias: GW**

LUCs and abandonment of 300 wells (six inch diameter, 70 ft deep) also are assumed.

The LTM phase will include annual surface water (17 locations), sediment (17 locations), and groundwater (60 wells) monitoring for 17 years; LUCs for 17 years and four five-year reviews. (FY26-42, inclusive).

**Site ID: RSA-147**  
**Site Name: GROUNDWATER UNIT GW-03**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
RFA.....	199006.....	199102
CS.....	199407.....	199709
RFI/CMS.....	199710.....	201503
DES.....	201311.....	201602
IRA.....	200709.....	201405
CMI(C).....	201412.....	201701
CMI(O).....	201509.....	201801
LTM.....	201801.....	204210
<b>RIP Date:</b>	201701	
<b>RC Date:</b>	201801	

**SITE DESCRIPTION**

This groundwater site includes the following active surface sites: RSA- 54/55, RSA-56, RSA-57, RSA-59, RSA-117, RSA-122, RSA-126, RSA-139, RSA-223 through RSA-227, RSA-238, and RSA-279-R-01.

The contaminants in this groundwater site consist primarily of metals and TCE. There are still several unknown sources of the contamination, since the known sources do not include all the contaminants in the groundwater.

Groundwater contaminants surface through multiple springs, resulting in surface water contamination. Several springs within the HSB, to the south of this groundwater site, contain high levels of chlorinated solvents. The central dye trace study indicates the possible interconnection of groundwater sites RSA-147, RSA-148 and RSA-149.

Groundwater investigation from both existing and new source areas will continue. Opportunities to include multiple sites into integrator OUs will be evaluated. Remediation may include a reactive wall for arsenic at the former HVA Plant No. 2 L area (RSA-122, RSA-56, RSA-57, RSA-139). Ultimate remedial design (RD)/RA selection will be based on treatability study results and individual site parameters.

Based on an evaluation of the groundwater data within RSA-147 during 2007, the Army recommended to USEPA and ADEM that sufficient data are currently available to prepare an RI Report without collecting any new groundwater data. At a November 2009 RI scoping meeting with USEPA and ADEM, the regulators approved the Army's recommendation, and the draft RI Report was submitted in May 2010. In regulatory comments on the draft RI report received in October 2010 and subsequent meetings, ADEM and USEPA indicated that additional groundwater data are required to complete the investigation. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMA. RFI fieldwork was initiated during 2011.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, DES, Statement of Basis and Permit Modification for the groundwater site. The RSA-147 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, RFI/CMS investigation of surface-media sites will be coordinated with the RSA-147 investigation with respect to surface-media site contributions to RSA-147 groundwater contamination. It is assumed that the CMS will recommend source remediation, followed by MNA and LUCs as the final remedy for the site, based on remediation of the significant ongoing source of groundwater contamination (DNAPL) in the vicinity of surface site RSA-117 indicated by available data and the protections provided by the existing interim ROD for IW groundwater. The CMS will recommend ISTD at the DNAPL hot spot located near surface site RSA-117, followed by ISEB in this same area of the plume, followed by MNA for the entire plume. The groundwater plume at RSA-183 also warrants ISEB to accelerate the MNA process. The size of these treatment

**Site ID: RSA-147**  
**Site Name: GROUNDWATER UNIT GW-03**  
**Alias: GW**

areas are not known at this time.

CMI(O) will consist of monitoring of the existing well network and integrator operable units. Groundwater monitoring (25 wells @100 ft for VOCs and metals for 10 years) will follow. Planned abandonment of 75% of 148 current wells is included. CMI(O) will consist of 10 years of monitoring and LUC monitoring & enforcement, two five-year reviews and the abandonment of 111 groundwater wells (100 ft deep, six inch diameter). The LTM will include an additional two five-year reviews and seven years of LUC monitoring/enforcement.

**Site ID: RSA-148**  
**Site Name: GROUNDWATER UNIT GW-04**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
RFA.....	199006.....	199102
CS.....	199407.....	199709
RFI/CMS.....	199710.....	201503
DES.....	201503.....	201602
IRA.....	200709.....	201701
CMI(C).....	201602.....	201701
CMI(O).....	201701.....	201801
LTM.....	201801.....	204211
<b>RIP Date:</b>	201701	
<b>RC Date:</b>	201801	

**SITE DESCRIPTION**

This groundwater site includes the following active surface sites: MSFC-35, RSA-49, RSA-53, RSA-60, RSA-61, RSA-114, RSA-148, RSA-183, RSA-249, RSA-250, and RSA-252.

This groundwater site drains to the HSB, within the boundaries of the Wheeler National Wildlife Refuge. The primary COCs in this area are chlorinated solvents and DDT. Two plumes of chlorinated solvents in this groundwater site are commingled with plumes from the NASA area on the arsenal. There are several springs that empty into the HSB that contain very elevated levels of chlorinated solvents. This site is likely to be significantly impacted by contamination originating at the MSFC.

Several springs discharge elevated concentrations of chlorinated solvent contamination into Huntsville Spring Branch. This site is likely to be significantly impacted by contamination originating at MSFC. Both MSFC and RSA have surface-media sites within RSA-148 that contribute to the commingled groundwater contamination. Based on an evaluation of the groundwater data within RSA-147 during 2007, the Army recommended to USEPA and ADEM that sufficient data are currently available to prepare an RI Report without collecting any new groundwater data. At a November 2009 RI scoping meeting with USEPA and ADEM, the regulators approved the Army's recommendation, and the draft RI Report was submitted in May 2010. In regulatory comments on the draft RI report received in October 2010 and subsequent meetings, ADEM and USEPA indicated that additional groundwater data are required to complete the investigation. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. RFI fieldwork was initiated during 2011. Estimate for RSA-148 includes the costs for global tasks such as evaluation and investigation of Integrator OUs, site access control, exit pathway wells, and indoor air quality evaluations.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, Statement of Basis, Permit Modification, CMI(C) and CMI Closure Report for the groundwater site. The RSA-148 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, RFI/CMS investigation of surface-media sites will be coordinated with the RSA-148 investigation with respect to surface-media site contributions to RSA-148 groundwater contamination. It is assumed that the CMS will recommend DNAPL source area remediation be performed at RSA-053 and RSA-183, followed by MNA and LUCs as the final remedy for the site, and the protections provided by the existing interim ROD for IW groundwater. The DNAPL source area remediation likely will involve thermal treatment followed by in situ enhanced bioremediation. The MNA also may be insufficient to remediate the plume in the area of RSA-060, but only limited data is available at this time. It is expected that once the CMI(O) has been completed and the potentially contributing sites to groundwater contamination have been addressed, monitoring of the existing well network and integrator operable units will be an integral part of the final remedy. It is anticipated that no further active groundwater remedial action will be necessary beyond LTM monitoring. The CMI(O) and LTM phases include: groundwater monitoring,

**Site ID: RSA-148**  
**Site Name: GROUNDWATER UNIT GW-04**  
**Alias: GW**

five five-year reviews, LUCs, well abandonment and residual waste management (RWM).

The costs for actions through Permit Modification completion are included in the PBA awarded in FY09, and are tracked separately under that site in AEDB-R.

**Site ID: RSA-149**  
**Site Name: GROUNDWATER UNIT GW-05**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
RFA.....	199006.....	199102
CS.....	199407.....	199709
RFI/CMS.....	199710.....	201411
DES.....	201411.....	201511
IRA.....	200709.....	201609
CMI(C).....	201511.....	201609
CMI(O).....	201511.....	202011
LTM.....	202011.....	204211

**RIP Date:** 201609

**RC Date:** 202011

**SITE DESCRIPTION**

This groundwater site of about nine square miles includes the following active surface sites: MSFC-002, MSFC-003-R-01, MSFC-053, MSFC-077, RSA-052, RSA-063, RSA-109, RSA-141-R-01, and a possible new source area, the Railroad Spring disposal area.

Several plumes, commingled with plumes from NASA activities, are located within this groundwater site. Data indicates that not all source areas and flow pathways have been identified. Due to karst geology, this groundwater moves to the springs emptying into the HSB within Wheeler National Wildlife Refuge. This site is significantly impacted by contamination originating at the MFSC.

The presence of a threatened small fish species (Alabama Darter) will increase the ecological concern.

Based on an evaluation of the groundwater data within RSA-149 during 2007, the Army recommended to USEPA and ADEM that sufficient data are currently available to prepare an RI Report without collecting any new groundwater data. At a November 2009 RI scoping meeting with USEPA and ADEM, the regulators approved the Army's recommendation, and the draft RI Report was submitted in May 2010. In regulatory comments on the draft RI report received in October 2010 and subsequent meetings, ADEM and USEPA indicated that additional groundwater data are required to complete the investigation. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMA. Because MSFC comprises a large portion of RSA-149, the Army's strategy includes incorporation of the finding of NASA's OU-3 RI, once approved by ADEM and USEPA, into the RFI for RSA-149 groundwater. Limited RFI fieldwork was initiated during 2011 to evaluate potential concerns not addressed by NASA's draft report. The PBA estimate for RSA-149 includes the costs for global tasks such as the evaluation and investigation of Integrator OUs, site access control, exit pathway wells, and indoor air quality evaluations.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, statement of basis and permit modification for the groundwater site.

The RSA-149 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, completion of RFI/CMS investigation at surface media sites with respect to their contributions to groundwater contamination will be coordinated in terms of timing.

Based on the current data available for the site, it is assumed that the CMS may potentially recommend source area remediation be performed at sites yet to be determined, followed by MNA and LUCs only as the final remedy for the site. Following completion of the CMI(O), LUCs and MNA only will be acceptable based on the removal of significant ongoing sources of groundwater contamination (DNAPL) and the protections provided by the existing ROD for the installation-wide groundwater.

**Site ID: RSA-149**  
**Site Name: GROUNDWATER UNIT GW-05**  
**Alias: GW**

It is expected that once the CMI(O) has been completed and the potentially contributing sites to groundwater contamination have been addressed, monitoring of the existing well network and integrator OUs will be an integral part of the final remedy. Following any source area remediation performed, it is anticipated that no further ongoing groundwater RA will be necessary beyond LTM monitoring.

**Site ID: RSA-150**  
**Site Name: GROUNDWATER UNIT 06**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
RFA.....	200401.....	200406
CS.....	200410.....	200709
RFI/CMS.....	200906.....	201404
DES.....	200906.....	201502
IRA.....	200709.....	201303
CMI(C).....	200906.....	201512
CMI(O).....	200906.....	201612
LTM.....	201612.....	204209

**RIP Date:** 201512

**RC Date:** 201612

**SITE DESCRIPTION**

Site RSA-150 is a groundwater site located on the north-central and western portions of the installation. Active surface sites include RSA-051 and RSA-253. The PSAs include the north railroad classification yard, a small arms range, and the airfield. Portions of Test Areas 3 and 6 are also located above this groundwater site. There is evidence of petroleum and solvent contaminants migrating to this site from off-post sources.

Based on an evaluation of the existing groundwater data within RSA-150, the Army recommended to USEPA and ADEM that additional field data be collected to fill data gaps necessary to prepare an RI Report for the site. An RI scoping meeting with USEPA and ADEM was held on Feb. 19, 2010 and a draft RI Work Plan was submitted on April 9, 2010. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. A draft-final version of the RFI work plan was submitted in January 2011. The work plan specifies the additional fieldwork required to obtain the supplemental data needed to complete the RFI and evaluate potential remedial measures in a subsequent CMS. The RFI fieldwork was initiated during 2011.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, DES, statement of basis and permit modification and LTM for the groundwater site.

The RSA-150 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, completion of RFI/CMS investigation at surface media sites with respect to their contributions to groundwater contamination will be coordinated in terms of timing.

Based on the current data available for the site, it is assumed that the CMS will recommend MNA and LUCs as the final remedy for the site, based on the lack of significant ongoing sources of groundwater contamination (DNAPL) and the protections provided by the existing ROD for the installation-wide groundwater. Additional wells will be installed during the upcoming RFI field investigation. It is expected that once the RFI has been completed and the surface sites potentially contributing to groundwater contamination have been addressed, monitoring of the existing well network and integrator OUs will be an integral part of the final remedy.

It is anticipated that no further groundwater RA will be necessary beyond LTM monitoring.

**Site ID: RSA-151**  
**Site Name: GROUNDWATER UNIT GW-07**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals, Perchlorate, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
RFA.....	199006.....	199102
CS.....	199407.....	199709
RFI/CMS.....	199710.....	201410
DES.....	200906.....	201507
IRA.....	200709.....	201605
CMI(C).....	200906.....	201605
CMI(O).....	201605.....	201706
LTM.....	201706.....	204209
<b>RIP Date:</b>	201605	
<b>RC Date:</b>	201706	

**SITE DESCRIPTION**

This site of about 1.5 square miles includes RSA-13, RSA-14, and RSA-110.

Previous investigations identified a large chlorinated solvent/perchlorate plume. DNAPL has been identified in likely source areas. This site is located along the Tennessee River, one mile upstream of the arsenal's drinking water intake. Site RSA-151 is located on TVA property. Work continues to determine if any of the contamination is moving into the river, where it would have the potential to impact the arsenal's drinking water. Perchlorate has not been characterized, but has been found in extremely elevated amounts in surface water and groundwater. The presence of archeological sites will increase the investigation cost. There is an active range with this site. A P&T system was operated (to treat VOC) in this area from 1997 to 1999 and was shut down because of perchlorate issues.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. A draft final version of the RFI work plan was submitted in January 2011. The work plan specifies the additional fieldwork required to obtain the supplemental data needed to complete the RFI and evaluate potential remedial measures in a subsequent CMS. The RFI fieldwork was initiated in 2011.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, DES, Statement of Basis, Permit Modification, CMI(C), and Closure Report for the groundwater site. The RSA-151 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, RFI/CMS investigation of surface-media sites will be coordinated with the RSA-151 investigation with respect to surface-media site contributions to RSA-151 groundwater contamination. It is assumed that the CMS will recommend ISEB, MNA and LUCs as the final remedy for the site, and the protections provided by the existing interim ROD for Installation-Wide Groundwater. This is based on the lack of DNAPL-level sources of groundwater contamination, but areas with contamination that is too high for MNA alone indicated by available data. Additional wells were installed during the 2011 RFI field investigation. ADEM requires that additional wells be installed on the other side of the Tennessee River to determine if the river is a hydraulic boundary to groundwater flow or if contamination flows to the south beneath the river. Evaluate and implement short term action for perchlorate in surface water (embayment) by monitoring the Redstone Arsenal drinking water intake (funded in FY05).

The CMI(O) phase includes technologies for Groundwater Monitoring, Five-Year Reviews, Well Abandonment, Residual Waste Management, and Administrative Land Use Controls. The LTM phase includes LUCs and five-year reviews.

**Site ID: RSA-152**  
**Site Name: GROUNDWATER UNIT GW-08**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
RFA.....	199006.....	199102
CS.....	199407.....	199709
RFI/CMS.....	199710.....	201408
DES.....	200906.....	201505
IRA.....	200709.....	201508
CMI(C).....	200906.....	201508
CMI(O).....	201601.....	201704
LTM.....	201704.....	204209
<b>RIP Date:</b>	201601	
<b>RC Date:</b>	201704	

**SITE DESCRIPTION**

Site RSA-152 is a groundwater site of about two square miles that includes the following surface media sites: RSA-32, RSA-65, RSA-66, RSA-67, RSA-68, and RSA-69/70. The groundwater contains elevated levels of chlorinated solvents and breakdown products of H agent. This unit is located along the Tennessee River, adjacent to the area where the arsenal's drinking water is pulled from the river. Very little characterization has been done in this groundwater site due to the amount of UXO on the surface/subsurface and the remote location on the arsenal.

Groundwater investigation will be finished at six existing sites. Characterization of possible principal threat source material (PTSM) areas will be completed in order to evaluate relative impact to groundwater contamination and overall risk assessment.

Ultimate RD/RA selection will be based on treatability study results and individual site parameters. Actions through RIP are included under the FY09 PBA. Groundwater extraction and treatment is expected at this unit. Groundwater monitoring will follow. Well abandonment, LUCs and five-year reviews are also anticipated.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. A draft final version of the RFI work plan was submitted in January 2011. The work plan specifies the additional fieldwork required to obtain the supplemental data needed to complete the RFI and evaluate potential remedial measures in a subsequent CMS. The RFI fieldwork was initiated in 2011.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, DES, Statement of Basis, Permit Modification, and CMI(C) for the groundwater site. The RSA-152 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, RFI/CMS investigation of surface-media sites will be coordinated with the RSA-152 investigation with respect to surface-media site contributions to RSA-152 groundwater contamination. It is assumed that the CMS will recommend ISEB, MNA and LUCs as the final remedy for the site, and the protections provided by the existing interim ROD for Installation-Wide Groundwater. This is based on the lack of DNAPL-level sources of groundwater contamination, but areas with contamination that is too high for MNA alone indicated by available data. Additional wells were installed during the 2011 RFI field investigation. It is anticipated that monitoring of the existing well network and integrator operable units will be an integral part of the final remedy once the RFI has been completed and any sites potentially contributing to groundwater contamination have been addressed. It is anticipated that no further active groundwater corrective action will be necessary beyond monitoring.

The CMI(O) phase includes technologies for monitoring, five-year reviews, well abandonment, RWM, and administrative land use controls. The LTM phase includes LUC inspections and five-year reviews.

**Site ID: RSA-153**  
**Site Name: GROUNDWATER UNIT 09**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200401.....	200406
CS.....	200410.....	200709
RFI/CMS.....	200906.....	201401
DES.....	200906.....	201410
IRA.....	200709.....	201508
CMI(C).....	200906.....	201508
CMI(O).....	200906.....	201609
LTM.....	201609.....	204209

**RIP Date:** 201508

**RC Date:** 201609

**SITE DESCRIPTION**

Site RSA-153 is a groundwater site located on the western side of Redstone Arsenal. There is a Public Supply well with low levels of TCE (source expected to be off-post).

Based on an evaluation of the existing groundwater data within RSA-153, the Army recommended to USEPA and ADEM that additional field data be collected to fill data gaps necessary to prepare an RI Report. An RI scoping meeting with USEPA and ADEM was held on Feb. 19, 2010 and a draft RI Work Plan was submitted on March 24, 2010. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. A draft-final version of the RFI work plan was submitted in January 2011. The work plan specifies the additional fieldwork required to obtain the supplemental data needed to complete the RFI and evaluate potential remedial measures in a subsequent CMS. The RFI fieldwork was initiated in 2011.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, DES, Statement of Basis and Permit Modification for the groundwater site. The RSA-153 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, RFI/CMS investigation of surface-media sites will be coordinated with the RSA-153 investigation with respect to surface-media site contributions to RSA-153 groundwater contamination. It is assumed that the CMS will recommend MNA and LUCs as the final remedy for the site, based on the lack of significant ongoing sources of groundwater contamination (DNAPL) indicated by available data and the protections provided by the existing interim ROD for Installation-Wide Groundwater. Additional wells were installed during the 2011 RFI field investigation. It is anticipated that monitoring of the existing well network and integrator operable units will be an integral part of the final remedy once the RFI has been completed and any sites potentially contributing to groundwater contamination have been addressed. It is anticipated that no further active groundwater corrective action will be necessary beyond monitoring.

The LTM phase includes LUCs and five-year reviews.

**Site ID: RSA-154**  
**Site Name: GROUNDWATER UNIT 10**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200401.....	200406
CS.....	200410.....	200709
RFI/CMS.....	200906.....	201407
DES.....	200906.....	201504
IRA.....	200709.....	201602
CMI(C).....	200906.....	201602
CMI(O).....	200906.....	201701
LTM.....	201701.....	204201

**RIP Date:** 201602

**RC Date:** 201701

**SITE DESCRIPTION**

RSA-154 is a groundwater site located in the southwestern part of Redstone Arsenal. Historical activities at this site include static test fire activities. Includes surface sites RSA-258, 261, 262, 263, and 268.

Based on an evaluation of the existing groundwater data within RSA-154, the Army recommended to USEPA and ADEM that additional field data be collected to fill data gaps necessary to prepare an RI Report. An RI scoping meeting with USEPA and ADEM was held on Feb. 12, 2010 and a draft RI Work Plan was submitted in March 2010. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. A draft-final version of the RFI work plan was submitted in January 2011. The work plan specifies the additional fieldwork required to obtain the supplemental data needed to complete the RFI and evaluate potential remedial measures in a subsequent CMS. The RFI fieldwork was initiated in February 2011.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, DES, Statement of Basis, Permit Modification, CMI(C), and Completion Report for the groundwater site. The RSA-154 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, RFI/CMS investigation of surface-media sites will be coordinated with the RSA-154 investigation with respect to surface-media site contributions to RSA-154 groundwater contamination. It is assumed that the CMS will recommend MNA and LUCs as the final remedy for the site, based on the lack of significant ongoing sources of groundwater contamination (DNAPL) indicated by available data and the protections provided by the existing interim ROD for Installation-Wide Groundwater. Additional wells were installed during the 2011 RFI field investigation. It is anticipated that monitoring of the existing well network and integrator operable units will be an integral part of the final remedy once the RFI has been completed and any sites potentially contributing to groundwater contamination have been addressed. It is anticipated that no further active groundwater corrective action will be necessary beyond monitoring.

The LTM phase includes groundwater monitoring, residual waste management, and five-year reviews.

**Site ID: RSA-155**  
**Site Name: GROUNDWATER UNIT 11**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
RFA.....	200401.....	200406
CS.....	200410.....	200709
RFI/CMS.....	200906.....	201407
DES.....	200906.....	201504
IRA.....	200709.....	201602
CMI(C).....	200906.....	201602
CMI(O).....	200906.....	201703
LTM.....	201703.....	204201

**RIP Date:** 201602

**RC Date:** 201703

**SITE DESCRIPTION**

RSA-155 is a groundwater site located in the southwestern part of Redstone Arsenal bounding the Tennessee River. Historical activities at this site include static test-fire activities. Includes surface sites RSA- 265 and 288. An RI scoping meeting with USEPA and ADEM was held on Feb. 12, 2010 and a draft RI Work Plan was submitted on March 18, 2010. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. A draft-final version of the RFI work plan was submitted in January 2011. The work plan specifies the additional fieldwork required to obtain the supplemental data needed to complete the RFI and evaluate potential remedial measures in a subsequent CMS. The RFI fieldwork was initiated in 2011.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, DES, Statement of Basis Permit Modification, CMI(C), and Closure Report for the groundwater site. The RSA-155 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, RFI/CMS investigation of surface-media sites will be coordinated with the RSA-155 investigation with respect to surface-media site contributions to RSA-155 groundwater contamination. It is assumed that the CMS will recommend MNA and LUCs as the final remedy for the site, based on the lack of significant ongoing sources of groundwater contamination (DNAPL) indicated by available data and the protections provided by the existing interim ROD for Installation-Wide Groundwater. In FY08, an upgradient perimeter well network was installed. Additional wells were installed during the 2011 RFI field investigation. It is anticipated that monitoring of the existing well network and integrator operable units will be an integral part of the final remedy once the RFI has been completed and any sites potentially contributing to groundwater contamination have been addressed. It is anticipated that no further active groundwater corrective action will be necessary beyond monitoring.

The LTM phase includes monitoring, RWM, and five-year reviews.

**Site ID: RSA-156**  
**Site Name: GROUNDWATER UNIT GW-12**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

**Contaminants of Concern:** Perchlorate, Volatiles (VOC)

**Media of Concern:** Groundwater

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	199006.....	199102
CS.....	199407.....	199709
RFI/CMS.....	200510.....	201406
DES.....	200906.....	201503
IRA.....	200709.....	201601
CMI(C).....	200906.....	201601
CMI(O).....	201601.....	201702
LTM.....	201702.....	204209
<b>RIP Date:</b>	201601	
<b>RC Date:</b>	201702	

**SITE DESCRIPTION**

RSA-156 is a groundwater site that includes the RSA-116 surface-media site. This groundwater site is located along the Tennessee River in the southernmost portion of the arsenal. TCE has been detected in groundwater. The Army recommended to USEPA and ADEM that additional field data be collected at the site to fill data gaps necessary to prepare an RI Report. An RI scoping meeting with USEPA and ADEM was held on Feb. 19, 2010, and a draft RI Work Plan was submitted on March 24, 2010. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. A draft-final version of the RFI work plan was submitted in January 2011. The work plan specifies the additional fieldwork required to obtain the supplemental data needed to complete the RFI and evaluate potential remedial measures in a subsequent CMS. The RFI fieldwork was initiated in 2011. Estimate for RSA-156 includes the costs for global tasks such as site access control.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, DES, Statement of Basis Permit Modification, CMI(C), and Closure Report for the groundwater site. The RSA-156 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, RFI/CMS investigation of surface-media sites will be coordinated with the RSA-156 investigation with respect to surface-media site contributions to RSA-156 groundwater contamination. It is assumed that the CMS will recommend MNA and LUCs as the final remedy for the site, based on the lack of significant ongoing sources of groundwater contamination (DNAPL) indicated by available data and the protections provided by the existing interim ROD for Installation-Wide Groundwater. In FY08, an upgradient perimeter well network was installed. Additional wells were installed during the 2011 RFI field investigation. It is anticipated that monitoring of the existing well network and integrator operable units will be an integral part of the final remedy once the RFI has been completed and any sites potentially contributing to groundwater contamination have been addressed. It is anticipated that no further active groundwater corrective action will be necessary beyond monitoring.

The CMI(O) phase includes: groundwater monitoring, five-year reviews, administrative land use controls and RWM. The LTM phase includes monitoring, RWM and five-year reviews.

**Site ID: RSA-157**  
**Site Name: GROUNDWATER UNIT 13**  
**Alias: GW**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200401.....	200406
CS.....	200410.....	200801
RFI/CMS.....	200906.....	201406
DES.....	200906.....	201503
IRA.....	200709.....	201601
CMI(C).....	200906.....	201601
CMI(O).....	201601.....	201702
LTM.....	201702.....	204201

**RIP Date:** 201601

**RC Date:** 201702

**SITE DESCRIPTION**

RSA-157 is a groundwater site with three surface media sites: RSA-115, 266, and 289. This groundwater site is located along the Tennessee River in the southeastern portion of the arsenal. An RI scoping meeting with USEPA and ADEM was held on Feb. 19, 2010, and a draft RI Work Plan was submitted on March 24, 2010. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. A draft-final version of the RFI work plan was submitted in January 2011. The work plan specifies the additional fieldwork required to obtain the supplemental data needed to complete the RFI and evaluate potential remedial measures in a subsequent CMS. The RFI fieldwork was initiated in 2011.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, DES, Statement of Basis Permit Modification, CMI(C), and Closure Report for the groundwater site. The RSA-157 RFI/CMS will address groundwater and provide a summary of the actions being taken to address potential leaching of contaminants from the overlying surface sites. Accordingly, RFI/CMS investigation of surface-media sites will be coordinated with the RSA-157 investigation with respect to surface-media site contributions to RSA-157 groundwater contamination. It is assumed that the CMS will recommend MNA and LUCs as the final remedy for the site, based on the lack of significant ongoing sources of groundwater contamination (DNAPL) indicated by available data and the protections provided by the existing interim ROD for Installation-Wide Groundwater. In FY08, an upgradient perimeter well network was installed. Additional wells were installed during the 2011 RFI field investigation. It is anticipated that monitoring of the existing well network and integrator operable units will be an integral part of the final remedy once the RFI has been completed and any sites potentially contributing to groundwater contamination have been addressed. It is anticipated that no further active groundwater corrective action will be necessary beyond monitoring.

The CMI(O) phase includes: groundwater monitoring, five-year reviews, and administrative land use controls. The LTM phase includes monitoring, five-year reviews, LUCs, well abandonment and RWM.

**Site ID: RSA-183**

**Site Name: FORMER LEWISITE PRODUCTION FACILITY**

**Alias: HA1**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** HIGH

Contaminants of Concern: Chemical weapon munitions (CWM)/Chemical agent, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199010.....	199609
RFI/CMS.....	200301.....	200909
CMI(C).....	200509.....	201301
CMI(O).....	201002.....	201409
LTM.....	201409.....	204209

**RIP Date:** 201301

**RC Date:** 201409

## SITE DESCRIPTION

This site was created to include the L manufacturing lines 1 and 2 with the exception of the capped arsenic waste lagoon (RSA-49). This site also includes the large drainage feature approximately 1.5 miles to the south that could have potentially received all drainage from both RSA-183 and RSA-49. Site RSA-183 is located south of Neal Road at the Toftoy Thruway intersection and covers approximately 140 acres. Portions of the area are presently used as a parking lot for a series of trailers and buildings including Building 4381.

The surface soils in the production areas are contaminated with arsenic and mercury. In the 2004 supplemental RI, CVAA was detected in subsurface soils at the waste collection pit and chlorinated solvents (carbon tetrachloride) were detected in the groundwater. The draft RI report was submitted to the USEPA and the ADEM in June 2005. Additional sampling was conducted based on the review of that RI. The final RI report was produced in September 2007. An FS was drafted in March 2008. The final ROD was signed in September 2009. The final RAWP was initially submitted in July 2010. A Hazardous Waste Facility Permit was issued Sept. 30, 2010. A revised CMIP/RAWP was submitted in August 2011 and November 2011 to address ADEM comments.

## CLEANUP/EXIT STRATEGY

A PBC is in place to address this site from FS to remedy-in-place plus 2 years of groundwater monitoring and LUCs. PBC funding for this site expires in FY13. Surface and subsurface soil is currently being remediated under the PBC. Surface soil was initially remediated in 2010 based on the remedial goals presented in the 2009 ROD. Revision of the remedial goals based on ADEM comments requires an additional 2,900 cubic yards of soil to be remediated. Based on requirements of the Permit, AEIRG, and ARBCA, additional funding is necessary to complete the CMI(C) to meet the performance objective. Post-PBC LTM will include two five-year reviews and LUCs.

**Site ID: RSA-187**

**Site Name: NORTHERN THIOKOL MIXING FACILITY**

**Alias: NP**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals, Perchlorate, Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201312

**RIP Date:** N/A

**RC Date:** 201312

**SITE DESCRIPTION**

Buildings 7386 and 7387 (demolished) were constructed in 1965 for use by Thiokol as a propellant mixing facility. The primary activity was mixing batches of class 1.1 or 1.3 propellants. These buildings were located north of Sandpiper Road in the vicinity of the former Burning Ground No. 3.

Propellant was mixed and poured into casting cans within these facilities. The greatest potential for release was related to the mixing process (i.e., overflow or spilling) and pouring the propellant mixture from the mixers into the casting cans. Although not documented, the mixers possibly were cleaned on the premises. Therefore, solvents possibly were used to clean propellants from the mixers upon batch completion.

Concrete sumps (RSA-135d and 135e) were located on the northwest side of the buildings and reportedly used for collection of propellant wastes. In addition, TSA (RSA-136g and RSA-136h) located northeast of the buildings, were reportedly used to store propellant and solvent wastes. The sumps and TSA have been removed.

**CLEANUP/EXIT STRATEGY**

Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required. Additional soil and groundwater data will be collected in support of the RFI. This action is already funded under the PBA. No additional work beyond the RFI phase is planned.

**Site ID: RSA-191**

**Site Name: ROP LINE 1 SERVICE FACILITIES**

**Alias: NP**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals, Perchlorate, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201301
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201301	

**SITE DESCRIPTION**

Building 7643 was constructed in 1956 for use as a paint spray building. Thiokol used the building from 1958 to 1975 as a motor cleaning facility. Motors were cleaned by degreasing with solvents and petroleum free (PF) degreaser. From 1975 to 1986, Building 7643 was used for core cleaning and assembly. Each core was cleaned with solvents. From 1986 to 1996, this facility was used as a carpentry shop and maintenance facility. In 2004, low levels of perchlorate were detected in the soil and groundwater.

Building 7666 was originally constructed by the Army in 1942 and used as a packing and shipping building for Line 1. This facility probably received inert materials such as packing boxes, pallets, and steel strapping during ROP operation. Following acquisition by Thiokol in 1950, the building was used as a change house until the mid-1950s, when it became a control laboratory. The quality of finished rockets and manufactured propellants was tested in this facility. An X-ray evaluation and film development also may have occurred at this facility. In the early-1980s, it became a change house again until its demolition in the early-1990s. In 2004, low levels of perchlorate were detected in soil and groundwater and VOCs were detected in soil.

Building 7667 was originally constructed by the Army in 1942 and was used during early ROP operations as a change house for Line 1. Following acquisition by Thiokol in 1950, the building was used as a first-aid facility and a control laboratory. Materials testing took place in this facility. Details regarding laboratory operations are unavailable. The laboratories on the main floor and second floor had drains that reportedly drained to the sewer system. The basement contained a storage area and a boiler room. In 1996, three storage sheds were observed south of the building (one of which had a captive sump) and were reportedly used for waste solvents/explosives. Two of the sheds held five gallon containers of waste materials. An open-air wood rack also contained approximately 100 half-gallon glass jars of acids (acetic, nitric, sulfuric, and hydrochloric). Various gas cylinders were visible on storage racks located outside the building. In addition, a horizontal AST located on the southeast corner of the building contained air and nitrogen (N2) for a strand burner. In 2004, perchlorate was detected in soil and groundwater.

Building 7686 was originally constructed by the Army in 1942 and was used as a solvent storage shed. Following acquisition by Thiokol in 1950, Building 7686 remained a solvent storage shed until demolition in the mid-1980s. Solvents stored in this facility were used in the adjacent building (Building 7643) for cleaning and degreasing. In 2004, low levels of TCE were detected in the soil.

The RCRA sites RSA-178 and RSA-179 are located within the site boundary of RSA-191.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- Low levels of perchlorate were detected in soil and groundwater. There were minor exceedances of screening criteria in soil for metals, VOCs, and SVOCs.
- A potential sewer line leak and concrete slab (not investigated) were identified at former Building 7666.

**Technical Approach**

**Site ID: RSA-191**

**Site Name: ROP LINE 1 SERVICE FACILITIES**

**Alias: NP**

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples and installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the Alabama Environmental Investigation and Remediation Guidance.
- Complete an RFI report documenting the remedy of NFA.
- Perform BHHRA/SLEA to show there are no unacceptable human health or ecological risks.
- Demonstrate there is no sourcing threat to groundwater using borehole averaging, and SPLP data as necessary.
- Demonstrate metals are at background levels using calculated background screening levels, geochemical analysis of background, and other weight-of-evidence considerations.
- Prepare a permit modification application following approval of the RFI documenting NFA.

Site ID: RSA-192

Site Name: TETRYL AND IGNITER PROCESSING (ROP)

Alias: OFFSITE

STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Perchlorate, Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201309

RIP Date: N/A

RC Date: 201309

SITE DESCRIPTION

Building 7651 was built by the Army in 1942, for use by ROP as a tetryl service magazine. It was used to receive, store, and open tetryl. After acquisition by Thiokol, it was used as a thermal stability oven from 1950 to 1975. From 1975 to 1995, it was used for storage. In 2004, perchlorate and TCE were detected in groundwater; metals in soil.

Building 7652 was built by the Army in 1942 and used for ROP operations to screen and blend tetryl. Screened tetryl was transferred to Building 7653 for pelleting. From acquisition by Thiokol around 1950 until the late-1960s, Building 7652 was an ammonium perchlorate grinding facility. Ammonium perchlorate was put into a mill for grinding to a fine powder. During the 1970s, it was a freeze dryer where HMX and triazacyclohexane (RDX) were stored. From 1980 to 1995, it was an oxidizer grinding facility. In 2004 perchlorate was detected in the soil and the groundwater.

Building 7653 was built by the Army in 1942 as a blended tetryl rest house for ROP Line 1. After acquisition by Thiokol in 1950, it was used to grind 4,4-methylene-bis[2-chloroaniline] (MBOCA), nitramine drying, and propellant curing. In 2004, perchlorate was detected in groundwater.

Building 7654 was built by the Army in 1942 to support ROP operations as a tetryl pelleting facility for Line 1. Each pelleting press was cleaned with acetone after each shift. After acquisition by Thiokol in 1950, it was used as a reaction laboratory until the late-1970s. Operations in this facility likely involved testing of propellants and other rocket motor additives. Thiokol documentation notes that freeze drying of ammonium perchlorate took place here during the 1950s. From the late-1970s to the early-1990s, it was a small rocket motor manufacturing facility. Degreasing, painting, curing, and small scale mixing and casting likely took place here. In 1996, a waste sump (RSA-135L) was found associated with this building. Numerous storage pads around Building 7654 were used to store class-1.1 propellant wastes. PCE discharge to the industrial sewer system occurred here. In 2004 TCE was detected in the groundwater.

Building 7655 was built by Thiokol in 1956. From 1956 to 1991 documentation lists it as a machine cleaning facility until the late 1970s. Thereafter, the listed use was for pyrogen igniter manufacturing. In 2004 TCE and perchlorate were detected in the groundwater.

Building 7662 was built by the Army in 1942 as a tetryl pellet rest house for Line 1. After acquisition by Thiokol in 1950, it was used as a curing oven and class-1.3 propellant mixer building. Curing consisted of exposing propellants developed in Building 7654 to extreme temperatures in ovens to harden. See RSA-187 for process description. Building 7662 was probably a small mixer facility (batches less than five gallons). Propellant was mixed and then poured into casting cans here. The greatest potential for contaminant release was related to the mixing process and pouring the mixture from the mixers to the casting cans. In 2004, perchlorate was detected in the soil.

Building 7660 was built by Thiokol in 1958 as a tool cleaning facility. Tool cleaning involved removing propellant wastes and grime from tools and equipment from the motor assembly lines mixing facilities and casting facilities. Tools were cleaned using brushes, pressure spraying, and solvent degreasing in vats. Documentation indicates that four methylene chloride storage tanks were located here. In 1996 two trichloroethane (TCA) drums were noted on racks outside the northeast corner. One of the vats contained about 10 to 20 gallons of TCA. In 2004 perchlorate was detected in the groundwater.

**Site ID: RSA-192**

**Site Name: TETRYL AND IGNITER PROCESSING (ROP)**

**Alias: OFFSITE**

A propellant waste storage pad (RSA-138i) is north of the building. An east-west trending ditch to the south had very little vegetation, relatively speaking. A concrete pad was noted leading to the southwest and ending where equipment had been removed.

## **CLEANUP/EXIT STRATEGY**

### Problems Warranting Action

- Metals and SVOCs exceed industrial preliminary remediation goals (PRG) and DAF4 SSLs in surface and subsurface soil.
- There were minor exceedances of screening criteria in soil for metals, VOCs, and SVOCs. Perchlorate slightly exceeds SSLs in subsurface soils, except one detection of 27 mg/kg.
- Several data gaps have been identified.
- Groundwater plumes indicate this site was a historical source of TCE and perchlorate.

### Technical Approach

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples and installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the Alabama Environmental Investigation and Remediation Guidance.
- Plan and implement IM for removal of perchlorate contaminated soil.
- Complete an RFI report documenting the remedy of NFA.
- Perform BHHRA/SLEHA to show there are no unacceptable human health or ecological risks.
- Demonstrate there is no sourcing threat to groundwater using borehole averaging, and SPLP data as necessary.
- Demonstrate metals are at background levels using calculated background screening levels, geochemical analysis of background, and other weight-of-evidence considerations.
- Prepare a permit modification application following approval of the RFI documenting NFA.

Site ID: RSA-193

Site Name: THIOKOL IGNITER PREPARATION FACILIT

Alias: NP

STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Perchlorate, Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201312

RIP Date: N/A

RC Date: 201312

SITE DESCRIPTION

Building 7621 was constructed by Thiokol in 1957 as an igniter preparation facility. Currently, little is known about igniter preparation activities but may have included wrapping wire, stripping insulation from wrapped wire pair, dipping wires in a conductive primer, and finishing the igniter by dipping them in a sealer. Igniter manufacturing activities included degreasing, painting, stenciling, cleaning, and propellant handling. This building remained an igniter preparation facility until 1995.

Three auxiliary buildings were used to support igniter preparation at Building 7621. Building 7622 (also built in 1957) was originally used as a boiler house. Sometime during the late-1970s to early-1980s this facility became a storage facility and remained as such until 1995. Because Building 7622 was used as a boiler house, USTs or ASTs are assumed to have been located at or near this facility. Documentation supports that in the mid-1990s, a tank excavation took place north of Building 7622. Reportedly, a 6,000-gallon No. 2 fuel oil tank and a 500-gallon propane tank were removed from the location. Buildings 7623 and 7624 were built in 1957 and were originally used as rest houses for igniter manufacturing operations. These buildings remained storage facilities until 1995.

A 30-inch diameter sump (RSA-135k) was located adjacent to the east site of the building. Building 7621 drainage lines reportedly flow to a leach field east of the building. This leach field area has been included in the site boundary for RSA-193. In 2004 explosives and metals were detected in the soils and perchlorate was detected in the groundwater.

CLEANUP/EXIT STRATEGY

Problems Warranting Action

- There were minor exceedances of screening criteria in soil for metals and SVOCs. Several data gaps have been identified.

Technical Approach

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples and installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the Alabama Environmental Investigation and Remediation Guidance.
- Complete an RFI report documenting the remedy of NFA.
- Perform BHHRA/SLERA to show there are no unacceptable human health or ecological risks.
- Demonstrate there is no sourcing threat to groundwater using borehole averaging, and SPLP data as necessary.
- Demonstrate metals are at background levels using calculated background screening levels, geochemical analysis of background, and other weight-of-evidence considerations.
- Prepare a permit modification application following approval of the RFI documenting NFA.

**Site ID: RSA-194**

**Site Name: PHYSICAL TEST LABORATORY & STORAGE**

**Alias: NP**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals, Perchlorate, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200309.....	200406
CS.....	200406.....	200501
RFI/CMS.....	200909.....	201309
DES.....	201402.....	201408
CMI(C).....	201408.....	201506

**RIP Date:** N/A

**RC Date:** 201508

**SITE DESCRIPTION**

Buildings 7636 and 7637 were constructed in 1956 by Thiokol for use as a physical test laboratory (7636) and vacuum pump building (7637). Building 7636 remained a physical test lab until decommission in 1996. As a vacuum pump building, Building 7637 served as a "wet collector" for propellant dust generated in Building 7636. Building 7637 became a storage facility in support of Building 7636 operations during the late-1970s and early-1980s. From the early-1980s until 1996, Building 7637 was used as a mechanical equipment storage facility. For only a brief time during 1996, ammonium perchlorate was sieved for grinding operations in this facility.

Documentation suggests that operations at the physical test laboratory in Building 7636 may have included degreasing, curing, motor or ingredient soaking, painting, and/or grinding. Three outbuildings (7637, 7638, and 7639) supported operations in Building 7636. Building 7638 was a second stage dry collection (filter system) location, but was also converted to a storage facility in the mid to late-1970s. Building 7639 is a small igloo that was used to store propellants and explosives.

During a visit in 1996, numerous bays were noted in the north end of Building 7636 with a laboratory and office facilities on the south end. Trench drains located outside of the building lead to a captive sump (RSA-137h) at the northwest corner of the building. Reportedly, the propellant testing bays were washed out and wastewater would flow to the sump. The sump would then be pumped out and wastewater disposed of regularly. Another large sump was formerly located near the northeast corner of Building 7637. The sump had once drained to a culvert, but was no longer intact. Approximately 120 quart-size boxes of propellant were located in Building 7639. Two storage pads were observed nearby to the east and southeast (one of which is designated as RSA-176). In 2004, perchlorate was detected in soil.

**CLEANUP/EXIT STRATEGY**

Prepare an RFI, CMS, Statement of Basis, and Permit Modification under the FY09 PBA contract. RFI fieldwork conducted in 2011 indicated perchlorate impacted soils of concentration greater than 1.7 mg/kg. Additional delineation of this area of soil will be necessary prior to RFI report preparation.

The CMS will likely recommend removal of approximately 2,083 cy of perchlorate-impacted soils of concentration greater than 1.7 mg/kg associated with the storage pads. The Statement of Basis and Permit Modification will demonstrate that the selected remedy will remove source material to a level that any residual concentrations remaining will be shown by SPLP to not source to groundwater at concentrations greater than EPA's HAL times the accepted RSA-basewide DAF for site closeout (RC).

Site ID: RSA-195

Site Name: THIOKOL PROPELLANT MIX FACILITY #1

Alias: OFFSITE

## STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200501
RFI/CMS.....	200909.....	201211
DES.....	200909.....	201310
CMI(C).....	200909.....	201408

RIP Date: N/A

RC Date: 201408

## SITE DESCRIPTION

This site was a former propellant mixing facility with areas for aluminum powder mixing and storage.

Building 7363 was constructed by Thiokol in 1959 as a propellant mixing facility. From 1960 through the 1970s, the primary activity at this facility was mixing 300 gallon batches of 1.1 or 1.3 propellant in three steps.

Step 1: receiving the ground and dried oxidizer [ammonium perchlorate or cyclotetramethylenetetranitramine(HMX)] and the other ancillary ingredients from other facilities where they were prepped and pre-mixed;

Step 2: combining the binder, ammonium perchlorate or HMX, metal powder, stabilizers, curing agents, and burn rate modifiers in large mixers to a viscous slurry, and

Step 3: pouring the propellant slurry into casting cans.

The 1.1 and 1.3 propellants were mixed and then poured into casting cans at this facility. The greatest potential for release was related to the mixing process and pouring of the propellant mixture from the mixers to the casting cans. It is possible, though undocumented, that the mixers were cleaned on-site. Building 7359 was the casting can cleanout and Building 7373 was the tooling cleanup, but there is no documentation of a separate mixer cleanup facility. Therefore, solvents possibly were used at this facility to clean propellants from the mixers once a batch was complete.

From 1980 to 1996 Building 7363 was used to mix aluminum paste. Aluminum was mixed with various polymers to a paste-like consistency for use as a fuel in rocket motors. Building 7363-B was built in the late-1980s to store aluminum powder. One large mixer and a de-aeration pit were located within Building 7363. Trench drains were visible running around the outside of the building to a captive sump (RSA-135c) located on the north side of the building. In addition, a TSA (RSA-136F) is located outside of the building. Reportedly, the TSA was used to store inert waste.

Previous analytical data confirmed nitrocellulose (NC) and elevated metals in the groundwater and pentaerythritol tetranitrate, nitroglycerin (NG), NC, nitroguanidine, thiodiglycol (TDG), and metals in the on-site ditch soil. TDG was identified in one soil sample; however, it is not clear why TDG was tested for because there is no indication CWM was used at this site. Potential MEC include 155mm projectiles and other debris, and potential MC include explosives.

In 2004 a limited site assessment (LSA) indicated perchlorate was in the soil and TCE was in the soil and groundwater. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

A statement of basis and permit modification will be prepared demonstrating that a remedy has been selected which will remove source material to a level that any residual concentrations remaining will be shown by SPLP to not source to groundwater at concentrations greater than accepted groundwater protection levels. The in situ thermal treatment is assumed to cover an area of

**Site ID: RSA-195**  
**Site Name: THIOKOL PROPELLANT MIX FACILITY #1**  
**Alias: OFFSITE**

approximately 32 ft by 45 ft. The treatment interval is assumed to be from eight to 40 ft bgs, using a double-well setup. The system is assumed to be in operation for four months, after a one-week startup. The soil type is assumed to be clay. Site documentation is assumed to require work plan development, reporting and meetings for review and regulatory review.

**Site ID: RSA-198**

**Site Name: THIOKOL EQUIPMENT/TOOL CLEANING FAC**

**Alias: OFFSITE**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Perchlorate, Volatiles (VOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200501
RFI/CMS.....	200909.....	201309
DES.....	201309.....	201407
CMI(C).....	201309.....	201504

**RIP Date:** N/A

**RC Date:** 201504

## SITE DESCRIPTION

Building 7359 was constructed by Thiokol in 1967 to serve as a casting can, bowl, and equipment cleanout. Casting cans were cleaned by spraying a hot water-detergent-caustic solution into the cans at high pressures. Through this method, the propellant was washed from the can and trapped and collected in a filtering basket located over an explosive-type industrial containment basin. Reportedly, the collected propellant wastes were emptied daily. Degreasing operations were also performed; therefore, solvents were also used to clean at this facility. Documentation supports the location of one 220-gallon tank and one 100-gallon solvent storage tank on-site.

Two TSAs, RSA-085 and RSA-086, are located adjacent to Building 7359. These TSAs were used to store 1.3 propellant wastes and solvent wastes collected during cleanup activities. Each TSA originally consisted of a concrete pad with no runoff controls. During the early-1990s, each TSA was converted to an enclosed building with containment sumps (RSA-138c and RSA-138d). A third TSA (RSA-138e) is located northwest of the building.

Some of the highest concentrations of perchlorate on the arsenal were detected at RSA-085 and RSA-086. The RI/FS will be followed by development of a PP and DD.

## CLEANUP/EXIT STRATEGY

Complete the RFI, CMS, DES, CMI(C), and CMI(O). The statement of basis and permit modification will document the selection of the final remedy, which is likely to be soil removal actions. The PMC contractor will implement RFI fieldwork consisting of soil and groundwater sample collection to complete delineation of perchlorate. An RFI report will be prepared compiling all available site data, followed by a CMS recommending removal of approximately 40 cy of perchlorate-impacted soils greater than five mg/kg associated with the storage pads. Based on synthetic precipitation leachate procedure (SPLP) evaluations to date, perchlorate at less than five mg/kg does not appear to pose a threat of sourcing to groundwater requiring action. The statement of basis and permit modification will demonstrate that the remedy selected will remove source material to a level that any residual concentrations remaining will be shown by SPLP to not source to groundwater at concentrations greater than the drinking water equivalent level (DWEL) times the accepted RSA-basewide DAF for site closeout(RC).

**Site ID: RSA-199**

**Site Name: THIOKOL PROPELLANT MIX FACILITY #2**

**Alias: NP**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

**Contaminants of Concern:** Metals, Perchlorate, Volatiles (VOC)

**Media of Concern:** Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201401

**RIP Date:** N/A

**RC Date:** 201401

## SITE DESCRIPTION

Building 7382 was constructed by Thiokol in 1959 to serve as a propellant mixing facility. From 1959 to 1996, the primary activity at this facility was mixing of 420-gallon batches of propellant. The general procedure for propellant mixing at Thiokol was a stepped approach to make batches of 1.1 or 1.3 propellants at various quantities in three steps.

Step 1: receiving the ground and dried oxidizer (ammonium perchlorate or HMX) and the other ancillary ingredients from other facilities where they were prepped and pre-mixed;

Step 2: combining the binder, ammonium perchlorate or HMX, metal powder, stabilizers, curing agents, and burn rate modifiers in large mixers to a viscous slurry., and

Step 3: pouring the propellant slurry into casting cans.

The 1.1 and 1.3 propellants were mixed and then poured into casting cans at this facility. The greatest potential for release was related to the mixing process (i.e., overflow or spilling) and pouring of the propellant mixture from the mixers to the casting cans. It is possible, though undocumented, that the mixers were cleaned on-site. Building 7359 was the casting can cleanout and Building 7373 was the tooling cleanup, but there is no documentation of a separate mixer cleanup facility. Therefore, solvents possibly were used at this facility to clean propellants from the mixers once a batch was complete.

Site TSA (RSA-167) is located west of the building and reportedly stored 1.3 waste propellants/solvents.

## CLEANUP/EXIT STRATEGY

### Problems Warranting Action

- Existing data identify perchlorate in soil exceeding leachability criteria, although highest concentrations are likely influenced by the water table.
- Groundwater plumes indicate this site was a historical source of perchlorate.

### Technical Approach

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples and installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the AEIRG.
- Plan and implement IM for removal of perchlorate contaminated soil.
- Complete an RFI report documenting the remedy of NFA.
- Perform BHHRA/SLERA to show there are no unacceptable human health or ecological risks.
- Demonstrate there is no sourcing threat to groundwater using borehole averaging, and SPLP data as necessary.
- Demonstrate metals are at background levels using calculated background screening levels, geochemical analysis of background, and other weight-of-evidence considerations.
- Prepare a permit modification application following approval of the RFI documenting NFA.

Site ID: RSA-200

Site Name: ROP LINE 5 AREA OPERATIONS FACILITY

Alias: OFFSITE

STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Perchlorate, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200501
RFI/CMS.....	200701.....	200907
DES.....	201107.....	201310
CMI(C).....	200912.....	201501

RIP Date: N/A

RC Date: 201602

SITE DESCRIPTION

Buildings 7601, 7603, and 7608 were constructed in 1943 as part of the ROP Line 5, which was originally used for 155mm shell loading and assembly. After being acquired for use by Thiokol in 1950, Buildings 7601 and 7603 were used as a service facility for pilot line research operations and propellant mixing, respectively. Raw materials used in support of mixing and developmental operations were stored in Building 7608. From 1962 to 1982, Building 7603 was used as a laboratory to develop more efficient methods of production of rocket motors and propellant manufacturing. Activities in this facility would have included small-scale grinding [HMX, RDX, and armor piercing (AP)], mixing, casting, cleaning, degreasing, curing, sand/grit blasting, painting, assembly, and testing. Buildings 7603 and 7608 were demolished in 2001.

Building 7610 was constructed in 1944. Buildings 7602 and 7610 were the burster service magazines at Line 5. After being acquired for use by Thiokol in the early-1950s, both buildings were used as curing ovens. Historical records indicate that until 1992 Building 7610 also was used for solvent storage.

Building 7619 was constructed in 1943 for use by ROP as a paint storage building. Following acquisition by Thiokol in 1950, it served as a shop building and gas station. Based on building use, paints, solvents, and fuel are assumed to have been stored at this facility. A historical engineering drawing for this building revealed the location of the former UST. The UST was removed in 1998.

Thiokol constructed Building 7616 between 1950 and 1954 for use as a maintenance services building. Miscellaneous carpentry and facilities activities were operated out of this facility. A can of PCB-containing ballasts was located in a room on the east side of the building. Miscellaneous electrical parts, shop equipment, 30 gallon drums of oil, and smaller containers of solvents were observed in a room on the east side of the building.

Building 7618 was built in 1958 and used by Thiokol in the 1960s and 1970s as a cleaning facility. It was most recently used to store janitorial supplies. Chemicals used included acetone, methylene chloride and various propellants and solvents.

The PSA effort for the Line 5 area indicated high levels of perchlorate in the soil and groundwater, in addition to TCE in groundwater only.

The draft RI was produced in 2008.

CLEANUP/EXIT STRATEGY

Three excavation areas are planned: (1)A perchlorate area is assumed to be 100 ft. x 50 ft x 18 ft (2) A TCE area requires removal area of 10 ft x 10 ft x 12 ft (3) A PAH area of of 267 cubic yards is removed to a depth of one ft.

Nonhazardous waste disposal is assumed (3,644 cubic yards) transported 20 miles.

**Site ID: RSA-200**  
**Site Name: ROP LINE 5 AREA OPERATIONS FACILITY**  
**Alias: OFFSITE**

A CMI-C work plan is assumed for the DES phase at approximately 10% of the cost.

LUCs are not anticipated.

**Site ID: RSA-201**  
**Site Name: THIOKOL RESEARCH LABORATORY**  
**Alias: NP**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Perchlorate, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201401
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201401	

**SITE DESCRIPTION**

Building 7632 was constructed by Thiokol in 1955 for use as a chemistry laboratory. While a number of laboratory experiments were conducted in the facility, operations in this facility also included propellant mixing and curing.

During a site visit, numerous pipe stubs were observed in the lab that were of unknown purpose. It appeared that a boiler was previously located in the basement which would suggest that USTs or ASTs were/are located at this facility. Various oil stains were present on the floor of the building.

Floor drains were also located within the laboratory. These floor drains appeared to drain to an exterior sump located on the west side of the building. Three two-foot by two-foot concrete sumps with no outlets were visible on the west side of the building just outside of the propellant mixing bays. Located to the south were three small storage sheds (containing drummed wastes), a larger wood storage shed, and multiple concrete pads. A few empty drums and a 20-pound propane tank were noted along the side of the building. The drummed wastes in the storage shed consisted of (12) 55-gallon drums of unknown contents, (10) 30-gallon drums of waste propellant, and 25 smaller containers of materials such as acetone, PF degreaser, and aerosols.

Two TSAs to the southeast are now being addressed as RCRA sites RSA-173 and RSA-174.

**CLEANUP/EXIT STRATEGY**

Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required. An RFI field investigation will be conducted to include collection of soil and groundwater samples and installation of new monitoring wells to determine the potential of a release associated with historical site activities. Work will be in compliance with the Alabama Environmental Investigation and Remediation Guidance. The RFI report will be completed, documenting the remedy of NFA.

**Site ID: RSA-203**  
**Site Name: IGLOO AREA LOADING DOCK**  
**Alias: NP**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Explosives, Metals, Perchlorate, Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201311
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201311	

**SITE DESCRIPTION**

Building 7351 was constructed in 1942 for use by the ROP as a shipping dock. Materials and munitions were shipped and received at this location en route to and from storage in the igloo area.

Following acquisition by Thiokol in 1950, Building 7351 was used for packout of assembled rocket motors and as a shipping dock. Current building lists indicate that this building has most recently been used as a packout and shipping facility for assembled rocket motors. Activities consisted of receiving finished motors from the production lines, packing the rockets by palletizing and strapping, and loading the rocket motors onto rail cars or trucks for shipment.

During a 1996 visit, trench drains were observed in the truck loading area along the northern side of the building. Small storage pads (possibly former sheds) were located west of the building. One remaining shed contained two drum racks that housed two empty drums and one sealed drum, all unlabeled. TCE is the only chemical listed as having been used in the building.

**CLEANUP/EXIT STRATEGY**

The anticipated path is to complete the RFI, demonstrating that unrestricted use is appropriate for this site. The Permit Modification for RSA-203 will identify site closure for unrestricted use for surface media and for the groundwater site to address groundwater contamination.

**Site ID: RSA-204**  
**Site Name: THIOKOL OXIDIZER FACILITY**  
**Alias: OFFSITE**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Explosives, Metals, Perchlorate, Petroleum, Oil and Lubricants (POL), Volatiles (VOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201406
DES.....	200906.....	201506
CMI(C).....	200909.....	201601

**RIP Date:** N/A

**RC Date:** 201612

**SITE DESCRIPTION**

Site RSA-204, an area of about 8.5 acres, includes the Thiokol oxidizer facility located at the intersection of Eagle Road and Magazine Road in TA-10, which consisted of the following buildings:

- Building 7687: oxidizer service (storage) building
- Building 7688: class 1.1 nitramine (oxidizer) dying facility
- Building 7689: ammonium perchlorate grinding facility
- Building 7690: nitramine (HMX/RDX) grinding facility
- Building 7691: ammonium perchlorate processing facility

Oxidizer was received at the service facility and transported to the grinding and processing facilities, where it was screened and ground. The oxidizer passed through a screen and a magnetic separator immediately prior to entering a grinder or pulverizer to remove extraneous material. Dry oxidizers were ground to a very fine powder in impact-type mills. Dehumidifiers were used in the grinding facilities to enable the ground mixture to remain in a fine powder state. The powder was containerized and transported to nearby mixing facilities. Ammonium perchlorate, sodium chloride, HMX, RDX, isopropyl alcohol, and petroleum hydrocarbons are listed as having been used as part of these processes.

During the VSI, an east-west running trench drain was observed on the east side of Building 7690 that led east to an exterior captive sump (RSA-135m). Outside the east side of the building, a TSA labeled "AP/Inert Waste" that contained eight 30-gallon fiber drums (contents unknown) was observed. This TSA is recognized as RCRA site RSA-181. As of 2002 this site (CCSWMU-181) was NFA in the CC program. Floor drains were visible in the north end of Building 7691 leading to two exterior captive sumps (RSA-137k and RSA-137l). A waste storage bin labeled "AP/Inert Waste" and TSAs (RSA-138k and RSA-138l) were noted outside the building. There was some evidence of a small water treatment system located to the north of the building. The sumps and pads are still in place.

Results from the SI indicated elevated levels of perchlorate in soil and groundwater and TCE in groundwater. Groundwater will be addressed as part of RSA-146.

**CLEANUP/EXIT STRATEGY**

The anticipated path is to delineate the extent of perchlorate contaminated soil and complete the RFI. A CMI plan will be prepared for soil contamination. The CMI plan is expected to include excavation and off-site disposal of perchlorate contaminated soil.

Site ID: RSA-205

Site Name: PHOTO LAB & MOTOR SERVICE FACILITY

Alias: NP

### STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Metals, Petroleum, Oil and Lubricants (POL)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201211

RIP Date: N/A

RC Date: 201211

### SITE DESCRIPTION

Building 7628 was constructed by Thiokol in 1957 for use as a change house and photographic laboratory. The change house was used by employees working in Building 7625 (motor production) and had change rooms, lunch facilities, and lavatories. The photographic laboratory supported testing operations and involved the use of X-rays to inspect finished rocket motors. Photographic chemicals such as developers, fixers, and toners were used, stored, and disposed at this building. This facility contained a floor drain and sinks that drained to the sewer. In 2004 petroleum, oil and lubricants (POL) were detected in the soil and the groundwater.

### CLEANUP/EXIT STRATEGY

#### Problems Warranting Action

- Concentrations of petroleum range organics (PRO) in soil and groundwater are associated with a former UST.
- Soil samples have not been analyzed for SVOCs; therefore, unacceptable exposure or sourcing threat to groundwater is unknown.

#### Technical Approach

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples and installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the AEIRG.
- Complete an RFI report documenting the remedy of NFA.
- Perform BHHRA/SLERA to show there are no unacceptable human health or ecological risks.
- Demonstrate there is no sourcing threat to groundwater using borehole averaging, and SPLP data as necessary.
- Demonstrate metals are at background levels using calculated background screening levels, geochemical analysis of background, and other weight-of-evidence considerations.
- Prepare a permit modification application following approval of the RFI documenting NFA.

Site ID: RSA-206

Site Name: PROPELLANT MIXING FACILITY #2 & C

Alias: OFFSITE

## STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Perchlorate, Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201311
DES.....	200906.....	201410
CMI(C).....	200906.....	201505
CMI(O).....	200906.....	201602

RIP Date: 201505

RC Date: 201602

## SITE DESCRIPTION

Site RSA-206 includes Buildings 7339 and 7340 that were part of the propellant plant located along Snake Pit Road. These buildings were constructed in 1960 for use by Thiokol as a mixer building and secondary casting and finishing facility for rocket motors, respectively.

The primary activity at 7339 was mixing of 420-gallon batches of class-1.3 propellant. The greatest potential for release was related to the mixing process (i.e., overflow or spilling) and pouring the propellant mixture from the mixers into the casting cans. Historical documentation for Building 7339 indicates that ammonium perchlorate was washed into the industrial drain with large quantities of water. The industrial drain then flowed to a sump (RSA-137a) that ultimately discharged to the sanitary sewer. A generator (with a possible UST) was located southeast of the building. Fill and vent pipes were present, but the exact location of any UST is unknown. A TSA (RSA-160) is located to the north of Building 7339. This TSA was reported to store class-1.3 propellant wastes. Recent building lists indicate that Building 7339 is as an R&D facility (metal fabrication). During a site visit, a generator was noted outside to the southeast. It is likely that a UST is associated with this generator because fill and vent pipes were observed on the ground surface. Exterior concrete trenches were noted to be draining to a sump (RSA-137a). This sump drains to the sanitary sewer.

Activities at Building 7340 included casting propellants into rocket motors and finishing the motors by cutting off or removing excess propellant. Mixed propellants were received in casting cans. Casings were loaded with Teflon coated cores and then brought on racks to the casting area. Propellant was then poured into each casing using a vacuum method which aided in removing air from the propellant as the propellant was poured. Cast rocket motors were cured and finished. Finishing involved removing the core and cutting off any excess propellant.

Building 7340 contains a concrete sump (RSA-137b) with a metal separator along the northwest side of the building. The sump has a settling basin that collects particulate materials from class-1.3 propellant wastes and allowed liquids to drain to the sanitary sewer. TSAs (RSA-90 and RSA-138b) are visible outside the facility and were reportedly used to store class-1.3 propellant wastes and rocket motor insulation.

In 2004, VOCs and perchlorate were detected in soil and groundwater. The groundwater for this site will be addressed under site RSA-146.

## CLEANUP/EXIT STRATEGY

The anticipated path is to delineate the extent of groundwater contamination and complete the RFI. A CMI plan will be prepared for groundwater contamination. RA(O) for groundwater monitoring will be required. All actions are fully funded under existing contracts.

**Site ID: RSA-207**

**Site Name: ROHM & HAAS GORGAS LABORATORY**

**Alias: OFFSITE**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals, Perchlorate, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201303
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201303	

**SITE DESCRIPTION**

RSA-207, the Gorgas Laboratory, is located in Building 7770 and includes numerous surrounding facilities that have supported operations, such as Buildings 7767, 7768, and 7769 and Buildings 7771 through 7780.

Building 7770 was constructed by Rohm and Haas in 1951 for use as a propellant R&D laboratory. Propellants were modified and tested to improve mixtures and develop new propellants. Any of the following operations may have taken place at this facility (in small quantities): screening, grinding, mixing, casting, curing, and finishing. Various wastes were reportedly produced in small quantities, and waste disposal was reportedly well controlled. The only water used in cleaning and decontamination was for washing floors and equipment. Wash water reportedly flowed through sand filters into floor sumps, where solids were removed prior to discharge into drainage ditches. Solvents and solid wastes were routinely collected in hazardous-waste containers and desensitized prior to disposal. Reportedly, there was a 5,000-gallon fuel tank at this building for heating purposes, but the location is unknown.

Support facilities included storage magazines/buildings, oven shelters, and heater houses.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- Concentrations of metals and SVOCs in soil slightly exceed DAF4 SSLs.
- Existing data do not indicate risks or threat of sourcing to groundwater.
- Several data gaps have been identified.

**Technical Approach**

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples and installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the Alabama Environmental Investigation and Remediation Guidance.
- Complete an RFI report documenting the remedy of NFA.
- Perform BHHRA/SLERA to show there are no unacceptable human health or ecological risks.
- Demonstrate there is no sourcing threat to groundwater using borehole averaging, and SPLP data as necessary.
- Demonstrate metals are at background levels using calculated background screening levels, geochemical analysis of background, and other weight-of-evidence considerations.
- Prepare a permit modification application following approval of the RFI documenting NFA.

**Site ID: RSA-208**

**Site Name: SOUTH PLANT TESTING FACILITIES**

**Alias: SP**

**STATUS**

**Regulatory Driver:** RCRA  
**RRSE:** MEDIUM  
 Contaminants of Concern: Metals, Perchlorate, Volatiles (VOC)  
 Media of Concern: Groundwater, Soil, Surface Water

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201311
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201311	

**SITE DESCRIPTION**

Site RSA-208, the South Plant Testing Facilities, includes Buildings 7550, 7565, 7569, and 7587.

Building 7550 consists of two former firing stands. This facility was constructed in 1942 for use by the Army to test bazooka rockets. Reportedly, a liquid test stand used hydrazine, inhibited red fuming nitric acid, nitric acid oxidizer, and dinitrogen tetroxide.

Building 7565 was constructed in 1945 for use by the ROP as a paint house for Line 3 munitions; however, use of the facility was brief because all war-related operations were halted in 1946. The assumption is that operations in this building included cleaning with solvents. In 1950 Rohm and Haas converted the facility into a control building and static test stand (on the south end). Rocket motors were mounted on stands and fired. There was also a darkroom for processing photographs of testing operations. Various chemicals related to photograph development are assumed to have been used at this site. At the time that Building 7565 was being converted into a static test stand and control facility, an acceleration range was constructed just west of the facility. The acceleration range was attached to Building 7565 via an underground tunnel and was used to test shoulder-fired rockets. The static test stand and acceleration range were collectively referred to as the E-Range by Rohm and Haas employees.

Building 7569 was constructed in 1945 for use by the ROP as a remelt building for munitions operations on Line 3. Modifications were made to the facility by Rohm and Haas in 1956 to support rocket weapons testing. From 1956 to 1971, Rohm and Haas performed thousands of static test operations in the bunker area south of Building 7569. Raytheon used the facility for guided missile maintenance from 1977 to 1982. From 1985 to 1993 Thiokol used Building 7569 to store tube-launched, optically-aimed, wire-guided (TOW), and Hellfire missile casings. Reportedly, during the early years, an oil-burning heater supplied heat to the facility and a 250-gallon heating oil tank was stored on-site to fuel the burner. Documentation suggests that the tank was removed in 1956.

Building 7587 was constructed in 1962 by Rohm and Haas for use as a static test stand. Rockets were mounted and fired from this facility while instrumentation mounted on the north side of the building recorded measurements.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- Perchlorate, TCE, and RDX were detected in groundwater, but soil concentrations are below levels that indicate sourcing to groundwater.
- Several data gaps have been identified.

**Technical Approach**

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples and installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the AEIRG.
- Complete an RFI report documenting the remedy of NFA.

**Site ID: RSA-208**

**Site Name: SOUTH PLANT TESTING FACILITIES**

**Alias: SP**

- Perform BHHRA/SLERA to show there are no unacceptable human health or ecological risks.
- Demonstrate there is no sourcing threat to groundwater using borehole averaging, and SPLP data as necessary.
- Demonstrate metals are at background levels using calculated background screening levels, geochemical analysis of background, and other weight-of-evidence considerations.
- Prepare a permit modification application following approval of the RFI documenting NFA.

**Site ID: RSA-209**

**Site Name: PROPELLANT CRUSHING/GRINDING & FUZE**

**Alias: OFFSITE**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals, Perchlorate, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201410

**RIP Date:** N/A

**RC Date:** 201410

## SITE DESCRIPTION

Constructed in 1955, Building 7568 was used by Rohm and Haas as an ammonium perchlorate and potassium perchlorate crushing and grinding facility until 1971. Grinding operations included receiving/storing raw materials and processing them through a hopper into large mills to grind the oxidizer into powder. Cleaning of the grinding machinery may also have taken place on the premises. Vacuums were typically used during grinding to mitigate dust. The western side of the building had seven bays that were used for grinding, analytical laboratories, ovens for removing solvent from NG, instrumentation, and storage. The southeastern corner of the building contained X-ray facilities, a photographic laboratory, an analytical laboratory, and an air conditioning room. The northeast corner of the building contained offices and two storage bays.

The Army regained control of the facility in 1971, and its use is undocumented until 1975. From 1975 to 1982, Raytheon used the facility for Dragon Missile production, but its specific function is unknown. Recent building lists indicate that this facility was used for fuse production in the early-1990s.

In 2004 perchlorate was detected in the groundwater.

## CLEANUP/EXIT STRATEGY

### Problems Warranting Action

- Perchlorate was detected (0.03 to 2.0 mg/kg) in soil, and the groundwater plume map suggests the site was a source, at least historically.

### Technical Approach

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples and installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the AEIRG.
- Plan and implement IM for removal of perchlorate contaminated soil.
- Complete an RFI report documenting the remedy of NFA.
- Perform BHHRA/SLERA to show there are no unacceptable human health or ecological risks.
- Demonstrate there is no sourcing threat to groundwater using borehole averaging, and SPLP data as necessary.
- Demonstrate metals are at background levels using calculated background screening levels, geochemical analysis of background, and other weight-of-evidence considerations.
- Prepare a permit modification application following approval of the RFI documenting NFA.

**Site ID: RSA-210**  
**Site Name: NITROGLYCERINE WASH HOUSE**  
**Alias: SP**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

**Contaminants of Concern:** Metals, Perchlorate, Volatiles (VOC)

**Media of Concern:** Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201311
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201311	

**SITE DESCRIPTION**

Building 7559 was constructed between 1950 and 1956 for use by the Army as an NG wash house. NG washing is a process of removing acids from NG by subjecting the compound to warm water and an alkaline solution. Subsequently, this facility was used as a heat treatment facility. Available historical documentation provides little information regarding heat treatment operations. Thiokol did not use this building, as it was demolished by the 1970s.

**CLEANUP/EXIT STRATEGY**

The anticipated path is to complete the RFI, demonstrating that unrestricted use is appropriate for this site. The Permit Modification for RSA-210 will identify site closure for unrestricted use for surface media and for the groundwater site to address commingled groundwater contamination. No further work beyond the RFI is anticipated.

**Site ID: RSA-211**

**Site Name: SOUTH PLANT STORAGE MAGAZINES**

**Alias: SP**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Perchlorate

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201311

**RIP Date:** N/A

**RC Date:** 201311

## SITE DESCRIPTION

The South Plant service magazines were constructed in 1953 to support Army activities in the area. The site is approximately 10 acres. These facilities include Buildings 7533 through 7539. Available historical documentation provides little information regarding materials stored in these magazines or the activities they supported.

The NG magazines occupy Buildings 7529 through 7531. These buildings are storage igloos with earthen mounds covering their south, east, and west sides. Available historical documentation provides little information regarding activities at these facilities. They are assumed to have been used to support R&D operations in the South Plant area. During 1993 or 1994, an incident occurred which required overpacking a drum of red fuming nitric acid. Building 7532 was reportedly the (electric) heater house for the NG storage magazines.

The propellant magazines were constructed between 1950 and 1956 to support Army R&D activities in the south plant area. This area includes Buildings 7523 and 7525, which were constructed in 1985 for use by Thiokol to store nitramine and ammonium perchlorate. By 1976, only Buildings 7527, 7528, and 7529 remained. By 2000 the remaining facilities were used for oxidizer storage. Ammonium perchlorate, HMX, and RDX are listed as having been stored in Buildings 7523, 7524, and 7525. The assumption is that the other buildings in this PSA stored similar materials.

The area occupied by Building 7524 was originally part of the propellant storage magazine facility. The current building was built in 1985 for use by Thiokol as a storage facility for nitramines and ammonium perchlorate. Materials were stored in this facility until needed for drying at Building 7522 or grinding at Building 7521. Available historical documentation provides little information regarding storage practices (handling, duration, etc.). Ammonium perchlorate, HMX, and RDX are listed as having been potentially stored in Building 7524.

## CLEANUP/EXIT STRATEGY

The anticipated path is to complete the RFI, demonstrating that unrestricted use is appropriate for this site. The Permit Modification for RSA-211 will identify site closure for unrestricted use for surface media and for the groundwater site to address groundwater contamination. No additional work beyond the RFI is anticipated.

**Site ID: RSA-212**  
**Site Name: PROPELLANT DRY HOUSES**  
**Alias: SP**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals, Perchlorate

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201406

**RIP Date:** N/A

**RC Date:** 201406

**SITE DESCRIPTION**

Buildings 7590 (north) and 7591 (south) were constructed by the Army in 1951 for propellant drying. These facilities were powered by Building 7589, an electric boiler house. Heaters and ovens were kept in the buildings, which were operated by an operations contractor until 1958. Rohm and Haas used the facilities from 1958 to 1971. The RSA regained control of the facilities in 1971 and used them for unknown purposes until 1976. Buildings 7590 and 7591 were used by Raytheon to store flammable materials from 1976 to 1982, when they were abandoned.

During a 1996 visit, the buildings were observed to be in disrepair, with stained floors, peeling paint, and debris scattered throughout. Oven doors in Building 7591 were labeled "Oxide and Explosive Storage."

The 2000 aerial photograph documents the recent storage of munitions within this site. The munitions appear for the first time in the 2000 aerial photograph but are not present in the 1992 photograph. For the purposes of this investigation, including sampling associated with the LSA, the focus is on Buildings 7590 and 7591, which were historically used for propellant drying and flammable-materials storage. Presumably, historical activities at these buildings were more likely to have been sources of contamination than the finished munitions being stored in the area during the recent past.

**CLEANUP/EXIT STRATEGY**

The anticipated path is to complete the RFI, demonstrating that unrestricted use is appropriate for this site. The Permit Modification for RSA-212 will identify site closure for unrestricted use for surface media and for the groundwater site to address commingled groundwater contamination. No additional work beyond the RFI is anticipated for the surface site.

**Site ID: RSA-213**

**Site Name: ROP LINE 4 AREA OPS FACILITY**

**Alias: SP**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Perchlorate, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201311
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201311	

**SITE DESCRIPTION**

During ROP operations from 1942 to 1945 a chemical ammunition assembly line and a munitions renovation line were both operated as Line 4 within RSA-213, which is approximately 15.3 acres. In general, all major components such as cartridge cases and empty shells came from manufacturers throughout the country. Components such as fuses, boosters, propellant charges, and primers were produced at other ordnance works or plants and shipped to RSA as free issue. The RSA manufactured the chemical component of the ammunition and the burster charge. The ROP was responsible for assembling the completed rounds on Line 4.

Subsequent to ROP operations, which ceased in 1945, Rohm and Haas gradually modified and expanded Line 4 to facilitate propellant development and testing. By 1957, Line 4 consisted primarily of propellant R&D operations. Operations may have included small-scale oxidizer grinding and drying, propellant mixing, casting, and finishing, motor assembly, and core and liner preparation (including degreasing and painting). Cast propellants were treated in the heat treating facility. An X-ray facility was used to evaluate propellants produced by various casting and pouring operations. The facility also included an inert storage facility for nearby R&D activities.

Raytheon and Thiokol used several of the facilities in the area subsequent to Rohm and Haas occupation, which ended in the early-1970s. Raytheon used the facilities to support development of the Dragon missile. Thiokol used several facilities for propellant and rocket motor production as part of the RARE south plant, which was active from 1950 to 1996.

Buildings included in these operations include 7571, 7574, 7578, 7585, 7575, 7581, and 7549.

**CLEANUP/EXIT STRATEGY**

The anticipated path is to complete the RFI, demonstrating that unrestricted use is appropriate for this site. The Permit Modification for RSA-213 will identify site closure for unrestricted use for surface media and for the groundwater site to address groundwater contamination. No further action for the surface site beyond an RFI is anticipated.

**Site ID: RSA-215**

**Site Name: RSA-146 HISTORIC SERVICE FACILITIES**

**Alias: OFFSITE**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals, Pesticides, Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201312

**RIP Date:** N/A

**RC Date:** 201312

## SITE DESCRIPTION

RSA-215, consisting of about 17.5 acres, includes various historical service facilities. The site includes the following buildings:

- Building 7103 (built in 1942) A machine shop to support general maintenance, currently designated as a laboratory and storage facility
- Building 7104 (built in 1943) A carpentry shop and change house, currently designated as a post engineer and welding shop
- Building 7106 (built in 1945) A motor pool wash and grease rack
- Building 7119 (built in 1943) A generating station and machine shop
- Building 7141 (built between 1943 and 1950) An oil storage facility
- Building 7107 (built in 1942) A gas station
- Building 7140 (built in 1942) A maintenance field office, subsequently used as a taxi dispatch station and a paint storage shed in support of motor pool activities.

Available historical documentation provides little information regarding these operations. During the 2003 VSI, primary features observed were concrete pads, flammable materials storage areas, a subterranean pit in the interior floor of Building 7104, old and new electrical transformers, and areas of slag and metallic debris. The primary features observed in Building 7106 were a sump, cracked pavement, a former gas pump/UST area, and surface drainage channels.

Two historical drawings from 1984 and 1991 were reviewed which showed the location of two former 2,000-gallon gasoline USTs which are still in place. In 2004, high levels of pesticides were detected in the soil.

TCE and other contaminants in the groundwater will be addressed under RSA-146.

## CLEANUP/EXIT STRATEGY

The anticipated path is to complete the RFI, demonstrating that unrestricted use is appropriate for this site. The Permit Modification for RSA-215 will identify site closure for unrestricted use for surface media and for the groundwater site to address groundwater contamination. No additional efforts beyond the RFI are anticipated for the surface media site.

**Site ID: RSA-217**

**Site Name: INERT STORAGE WAREHOUSE FACILITIES**

**Alias: ROP SERVIC**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
RFI/CMS.....	200912.....	201309

**RIP Date:** N/A

**RC Date:** 201309

**SITE DESCRIPTION**

The Inert Storage Warehouse Area was built by the Army in 1942 and includes Buildings 7417, 7437, 7441, 7442, 7421, and 7425.

The ammunition division stored inert munitions components and shipping supplies in Buildings 7417, 7437, and 7441. They were used as warehouses until needed on the assembly or manufacturing lines.

Since 1957, Building 7417 has been listed as a warehouse reclamation shop. Available historical documentation provides little information regarding reclamation operations.

In 1957, Building 7437 was listed as a laboratory and engineering building. The facility housed engineering management space for the laboratory chief. During this time, Building 7437 contained a data reduction center. By 1968, Building 7437 had been converted to an administrative building. Current building lists indicate that use of the facility has not changed since 1968.

Building 7441 was subsequently used as a photographic laboratory when it was joined to Building 7442 in 1959. Available historical documentation provides little information regarding laboratory and engineering operations.

Building 7442 was used first in 1943 and subsequently as an office, a photographic laboratory, and a laboratory. Very little is known about the activities that took place or the materials that were used in this building.

Building 7421 was subsequently used as a laboratory. Available historical documentation provides little information regarding laboratory operations. Current building lists indicate that use of this facility has not changed over time.

Building 7425 was subsequently used as an administrative facility where a small boiler with a 1,500-gallon fuel oil tank was used to heat the area. Available historical documentation provides little information regarding the location and type of fuel oil tank (UST or AST) at the building. Current building lists indicate that use of this facility has not changed over time.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- Historical information is limited regarding laboratory operations at Building 7421.
- The outfall from a former UST at Building 7425 has not been assessed.
- The reclamation process at Building 7417 may have released selected metals based on previous sampling results.

**Technical Approach**

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples from installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the AEIRG.
- Complete an RFI report documenting the expected remedy of NFA.

**Site ID: RSA-217**

**Site Name: INERT STORAGE WAREHOUSE FACILITIES**

**Alias: ROP SERVIC**

- Describe the nature and extent of contamination.
- Perform BHHRA/SLERA to document potential risks human health or ecological risks.
- Evaluate the potential threat to groundwater from the soil-to-groundwater migration pathway.
- Prepare a permit modification application following approval of the RFI documenting NFA.

**Site ID: RSA-218**  
**Site Name: DRMO OPEN STORAGE AREA**  
**Alias: ROP SERVIC**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals

Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200309.....	200406
RFI/CMS.....	200912.....	201310

**RIP Date:** N/A

**RC Date:** 201310

**SITE DESCRIPTION**

This area of approximately 27 acres is identifiable on aerial photographs as early as 1943 as an open storage area (OSA). The DRMO managed open storage of materials in this area. Aerial photography shows activity continuing until at least 2002 (within the fenced area). Portions of the area are represented on the 1975 basic information maps as "Open Storage". During the 2003 VSI the primary features observed were piles of scrap metal, a large concrete slab, and two large areas of debris.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- The site has the potential for a release of metals from activities related to the storage of materials and supplies and the piling of metal and concrete debris.

**Technical Approach**

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples from installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the Alabama Environmental Investigation and Remediation Guidance.
- Complete an RFI report documenting the expected remedy of NFA.
- Describe the nature and extent of contamination.
- Perform BHHRA/SLERA to document potential risks human health or ecological risks.
- Evaluate the potential threat to groundwater from the soil-to-groundwater migration pathway.
- Prepare a permit modification application following approval of the RFI documenting NFA.

Site ID: RSA-219

Site Name: CHEMICAL STORAGE AREA IN SALVAGE YD

Alias: ROP SERVIC

### STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Metals, Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
RFI/CMS.....	200912.....	201309

RIP Date: N/A

RC Date: 201309

### SITE DESCRIPTION

Surface storage of various materials is documented to have occurred within this area of approximately three acres. Aerial photography shows activity from 1950 until at least 2000. The materials that were stored in the area are unknown. This area is represented on the 1975 building information maps as an "Open Storage" area. During the 2003 VSI, the primary features observed were the reported location of a former chemical storage barn and an area of scrap metal. Salvage yard personnel stated that the area was used to store drums of solvents (e.g., TCE) associated with Thiokol in the mid-1980s. Some of the drums reportedly had leaked. In the PP this site is still being used as a scrap metal storage. The IRP will only address the VOC contamination from the old chemical storage, the metals contamination will be address with non-IRP funds.

### CLEANUP/EXIT STRATEGY

#### Problems Warranting Action

- The site has the potential for a release of metals and TCE to site soils and a drainage swale due to materials handling at the DRMO salvage yard.
- Need to determine whether TCE in groundwater is related to this site or to activities at the motor pool facility immediately to the south of this site

#### Technical Approach

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples from installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the Alabama Environmental Investigation and Remediation Guidance.
- Complete an RFI report documenting the expected remedy of NFA.
- Describe the nature and extent of contamination.
- Perform BHHRA/SLERA to document potential risks human health or ecological risks.
- Evaluate the potential threat to groundwater from the soil-to-groundwater migration pathway.
- Prepare a permit modification application following approval of the RFI documenting NFA.

**Site ID: RSA-220**

**Site Name: CONSTRUCTION MATERIAL STORAGE YARD**

**Alias: ROP SERVIC**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200309.....	200406
RFI/CMS.....	200912.....	201312

**RIP Date:** N/A

**RC Date:** 201312

**SITE DESCRIPTION**

The construction materials yard on aerial photographs of this site of approximately 8.3 acres is identifiable as early as 1956. Open storage of various construction debris and surplus is documented to have occurred on the surface in the area. Aerial photography shows activity continuing until at least 2002 (within the fenced area). Disposal via debris mounds may have occurred. The 1975 building information maps label the area as the "Contractors Construction Materials Yard." Part of this site is in an active range. During the 2003 VSI the primary features observed were a concrete pad, two debris piles, a large railroad loading dock, and a drum.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- The site has the potential for a release of metals from activities related to the storage of materials and supplies and the piling of metal and concrete debris.

**Technical Approach**

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples from installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the AEIRG.
- Complete an RFI report documenting the expected remedy of NFA.
- Describe the nature and extent of contamination.
- Perform BHHRA/SLERA to document potential risks human health or ecological risks.
- Evaluate the potential threat to groundwater from the soil-to-groundwater migration pathway.
- Prepare a permit modification application following approval of the RFI documenting NFA.

**Site ID: RSA-225**  
**Site Name: FUSE MODIFICATION LINE 7**  
**Alias: PA3**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200402.....	200405
RFI/CMS.....	200906.....	201304
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201304	

**SITE DESCRIPTION**

Building 5429 is located on Jungerman Road, one block south of its intersection with Fowler Road. Buildings 5478 and 5479 were also located here. Building 5429 (formerly 729) was constructed in 1942 as a general warehouse with railroad access by RR 20 spur No. 6. Engineering drawings dated 1950 and other documentation dated 1951 indicate that Building 5429 was converted to the No. 7 fuse modification line and became active in the late-1950s, probably in support of the Korean War. The type of fuses undergoing modification has not been determined; however, historical documentation notes that Calabama Chemical Corporation had requested to lease two buildings (722/5438 and 726/5426) near Building 5429. This request was denied because the buildings were located within the "quantity-distance safety zone" for the No. 7 fuse modification line indicating the operation included materials with the potential for explosion.

The 1954 building utilization list associates the following five buildings with Building 5429 activities: Building 721 (change house/lockers), Building 5477 (magazine), Building 5478 (729B) (paint house), Building 5479 (magazine), and Building 730 (lunch room). Engineering drawings detail additions of a loading ramp and dock connected to the southeast end of Building 5429. Additional modifications to Buildings 5429, 5477, and 5479 were documented on the 1954 building utilization map and a 1956 aerial photograph. These two references showed connecting ramps constructed among the three buildings, to support the fuse modification activities.

A 1957 engineering drawing details the modification of the connecting ramps between Buildings 5479 and 5477 (attached to Building 5429 by a walkway) to that of an infrared dark tunnel to support research in guidance and control. Other modifications to Building 5429 are documented on a 1965 engineering drawing that shows ventilation for liquid hydrogen to support a recording spectrophotometer, formerly located in a laboratory in the southern one-half of the building. The intended material(s) for spectrophotometric analyses are currently unknown.

Sampling to date has indicated the points of concern for the Fuse Modification process to be centered around Buildings 5429, 5478 (paint house), and 5479 (magazine). In the PP, part of this area is still used as a satellite accumulation area. The IRP site will only address contamination resulting from former uses related to the fuse modification process.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- Existing data indicate detected concentrations of SVOCs (PAH compounds) in surface soil exceeding residential evaluation criteria. Explosives were detected in surface soil at concentrations below residential evaluation criteria with the exception of the exceedence of the DAF4 SSL for one compound.
- The VOCs have been detected in screening-level groundwater data; however, definitive-level data are not currently available.

**Technical Approach**

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required for RSA-225.
- Conduct RFI field investigation including collection of soil samples to define extent of PAHs, install overburden monitoring wells for collection of definitive-level groundwater samples to define nature and extent of contamination, evaluate risk potential, and

**Site ID: RSA-225**  
**Site Name: FUSE MODIFICATION LINE 7**  
**Alias: PA3**

determine potential sources to groundwater in compliance with the AEIRG.

- Complete an RFI/CMS and statement of basis recommending NFA and site closeout (RC). A permit modification will follow the statement of basis documenting the selection of NFA (RC).

**Site ID: RSA-226**  
**Site Name: OPEN STORAGE 54-2**  
**Alias: DA**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Pesticides, Polychlorinated Biphenyls (PCB)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200402.....	200405
CS.....	200406.....	200501
<b>RFI/CMS.....</b>	<b>200912.....</b>	<b>201311</b>
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201311	

**SITE DESCRIPTION**

Site RSA-226 has been defined as the storage area outside Building 5488. Building 5488 is located north of the intersection of Mills Road and Stewart Road. Documentation indicates that chemicals (unknown or unidentified) were stored in the area as well as other electrical items including transformer storage (1.5 to 150 kilovolt-ampere capacities). The outside storage area is opposite the former rail spur that serviced the southwest side of Building 5488. Review of the 1943, 1950, and 1964 aerial photographs indicated that there was activity (presumably continuous) at the storage area during this time frame. Documentation of building use from 1961 indicated that the building was occupied by three separate occupants: field service, industrial operations, and a central office. Because transformer storage was documented at the "open storage 54-2" (and possibly in the warehouse), a release of dielectric fluid possibly may have occurred.

The outside storage area is opposite the former rail spur that serviced the southwest side of Building 5488 from 1943 to 1964. Review of the 1943, 1950, and 1964 aerial photographs indicated that there was activity (presumably continuous) at the storage area during this time frame. A Hazardous Waste Facility Permit issued Sept. 30, 2010 pursuant to AHWMMMA, requires that a RFI be completed for this site in accordance with Table VI.2. As required by Army, a CMS will also be developed under the current PBA Task Order 0001 acquisition.

**CLEANUP/EXIT STRATEGY**

The revised anticipated path is to complete a RFI, demonstrating that unrestricted use is appropriate for this site. The Permit Modification for RSA-226 will identify site closure for unrestricted use for surface media and for the groundwater site to address commingled groundwater contamination. No further efforts beyond the RFI are anticipated for the surface site.

**Site ID: RSA-227**  
**Site Name: INACTIVE WASHRACK**  
**Alias: DA**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	200402.....	200405
CS.....	200405.....	200501
RFI/CMS.....	200909.....	201411
DES.....	200909.....	201508
CMI(C).....	200909.....	201603
CMI(O).....	200909.....	201703

**RIP Date:** 201603

**RC Date:** 201703

**SITE DESCRIPTION**

Site RSA-227 is an inactive washrack adjacent to Building 5492 just north of Mills Rd. in the maintenance shop complex (Buildings 5494/5495). The VSI confirmed the presence of the washrack and sump located on the south side of the building. Documentation as to the date of construction or specifying years of use have not been found; however, interviews with site personnel suggest the washrack has not been used since before 1984. Subsequent to this use, the area was used as a parking area for maintenance equipment. Based on the limited information available, the estimated period of operation is believed to be from 1962 to 1984. There does not appear to be an oil/water separator (OWS) connected to the inactive washrack. The sump discharges to the south to a surface drainage feature. The site is currently used for parking of maintenance equipment. A Hazardous Waste Facility Permit issued Sept. 30, 2010 pursuant to AHWMMMA, requires that a RFI be completed for this site in accordance with Table VI.2.

**CLEANUP/EXIT STRATEGY**

The anticipated path forward is to conduct additional soil and groundwater sampling needed to complete the RFI. Following the RFI, a CMI work plan is anticipated. In the CMI(C) phase, it is expected that the washrack will be demolished and any contaminated sediment and concrete will be disposed off-site.

**Site ID: RSA-228**  
**Site Name: SEWAGE TREATMENT PLANT 2**  
**Alias: PA3**

**STATUS**

**Regulatory Driver:** RCRA  
**RRSE:** LOW  
 Contaminants of Concern: Metals  
 Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200311.....	200405
RFI/CMS.....	200405.....	201309
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201309	

**SITE DESCRIPTION**

The STP 2, Building 139 (later renumbered 3239) is located west of Patton Rd., west of McDonald Creek, and just south of Goss Rd. (3200 block area). The plant is believed to have been operational by 1942 and taken out of service in 1948. A 1943 Army completion report for HVA stated that the plant serviced the northern portion of the arsenal including the administration area (former hospital, base housing, etc.) and the temporary administration area (maintenance shop, washrack/garage, fire/police station, steam plant, and carpenter shop). Wastes from Plant Area No. 3 were not directed through this STP but were sent through Building 439 (RSA-9). Domestic sewage effluents received primary and secondary treatment through this plant before being discharged to the stream.

The plant used a separate sludge digestion and recirculating biofiltration units. The plant units included barscreens, primary clarifiers, biofilters, secondary clarifiers, recirculating pumps, chlorinators, chlorine contact chamber, sludge pumps, sludge digestion tanks, and open sludge drying beds.

The VSI confirmed the STP has been demolished and that most of the equipment has been removed. Remains of two of the clarifiers are present. An engineering drawing was used to georeference the probable location of the sludge drying beds. The area is fenced and heavily wooded. The discharge location (outfall) was not located, but an east-west drainage ditch flows into McDonald Creek.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- Existing data indicate detected concentrations of metals (arsenic and silver) in soil exceeding background screening value (BSVs) and residential evaluation criteria.
- Concentrations of 4-nitroaniline were detected in one screening-level groundwater sample exceeding the regional screening level (RSL). Definitive-level data are not currently available.
- Additional potential source areas were not targeted during previous investigation.

**Technical Approach**

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required for RSA-228.
- Conduct RFI field investigation including collection of soil samples, install overburden monitoring wells for collection of definitive-level groundwater samples to define nature and extent of contamination, evaluate risk potential, and determine potential sources to groundwater in compliance with the AEIRG.
- Complete an RFI/CMS and statement of basis recommending NFA and site closeout (RC). A permit modification will follow the statement of basis documenting the selection of NFA (RC).

**Site ID: RSA-230**  
**Site Name: ABANDONED RUBBLE PILE**  
**Alias: DA**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals, Pesticides

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200311.....	200405
CS.....	200405.....	200506
RFI/CMS.....	200912.....	201307

**RIP Date:** N/A

**RC Date:** 201307

**SITE DESCRIPTION**

The abandoned rubble pile north of Hansen Rd. was the original construction and debris disposal area for the Arsenal. It is located just north of Hansen Rd near the bend in the road, occupying approximately 4.3 acres. It is believed that this disposal area was active during the 1940s. When disposal was discontinued is not known.

During the VSI a number of soil mounds with metal debris, rusted drums, railroad ties, etc., were visible above grade. A nearby ditch also appears to have been used for disposal activities. This area was used for field training exercises from the 1960s through the 1990s. It is currently an active range for Ordnance Munitions and Electronics Maintenance School (OMEMS) field troop training. Posting in the area indicates the presence of MEC presumably from the OMEMS training activities.

The results of the SI indicate pesticides, NC and metals at low levels.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- Soil results for VOCs and SVOCs found no exceedances warranting further evaluation. However, further investigation is warranted for explosives, perchlorate, pesticides and metals to determine whether contamination is present at this site.
- VOCs, SVOCS, explosives, and perchlorate were detected in screening level groundwater samples. Based on these results, collection of definitive groundwater samples is warranted.

**Technical Approach**

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples from installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the Alabama Environmental Investigation and Remediation Guidance.
- Complete an RFI report documenting the expected remedy of NFA.
- Describe the nature and extent of contamination.
- Perform BHHRA/SLERA to document potential human health or ecological risks.
- Evaluate the potential threat to groundwater from the soil-to-groundwater migration pathway.
- Prepare a permit modification application following approval of the RFI documenting NFA.

**Site ID: RSA-231**

**Site Name: SMF #1 MIXING & PREP FACILITIES**

**Alias: PA3**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	200311.....	200405
CS.....	200405.....	200506
RFI/CMS.....	200906.....	201310
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201310	

**SITE DESCRIPTION**

RSA-231 is comprised of the SMF No. 1 Mixing and Prep Facilities. The buildings included in these operations are: 675/3475, 678/3478, 674/3474, 667/3490, and 679/3479.

Building 675/3475, the starter tube assembly building, was built in 1942 and supported the manufacture of a number of smoke munitions within SMF No. 1 in the early to mid-1940s. This building was designed and used as a starter tube assembly building for the 105mm M-1 canister. This building was also used to assemble the impregnated sleeve over the starter tube in the production of various smoke canisters (M-1, M-2). Two cubicles on the south end of the building were used to prepare delay train pellets wafers used in the manufacture of the M-88 and M-89 smoke shells. Scratcher mix was applied to the band for the M-1 smoke pot in this building. The building was demolished in 1983 and Building 3483 was constructed in its place.

Building 678/3478, the black powder mixing building, was built in 1943 and used for black powder mixing for various smoke munitions. Wet mixing of the impregnated sleeve mixture was also performed in this building for the 155mm M-4 and M-4 canisters. Building 3478 is currently being used for storage.

Building 674/3474, the starter mix building, was built in 1943 and used for blender mixing of starter mix, match head mix (may have contained small quantities of perchlorate), and scratcher mix for M-1 smoke pots. Blending of the starter mix for the 105mm M-1 and M-2 canisters, British Thermal Mixture, sulfurless meal powder mixture, and impregnated sleeve mixture for the 155mm M-3 and M-4 canisters was performed in Building 3474. Most of this building has been rebuilt and is currently being used as a fitness center.

Buildings 667/3490 and 667-2/3491, the mixing and blending buildings, were built in 1943 and used for mixing and blending of hexachloroethane (HC) smoke mixtures for the AN-M8 hand grenades, the M-1 smoke pots, and the M-88 and M-89 smoke shells. Building 3490 has been demolished, but Building 3491 is still standing, but unused at this time.

Building 679/3479, the sleeve impregnating building, was built in 1943 and used for the impregnation of starter sleeves for the 105mm M-1 canisters as well as the 155mm M-3 and M-4 canisters. Match head mix (may have used small quantities of perchlorate) was applied to discs and dried for use in M-1 smoke pots in this building. The drying of delay train pellets (starter wafers) for M-88 and M-89 smoke shells was also done here. The building has been used as a restaurant/cafeteria and is currently used as a barber shop, a military clothing store, and human resources office.

**CLEANUP/EXIT STRATEGY**

**Problems Warranting Action**

- Existing data indicate detected concentrations of PAH compounds in soil exceeding residential evaluation criteria, but less than DAF4 SSLs.
- Concentrations of VOCs, explosives and 4-nitroaniline were detected in screening-level groundwater samples exceeding evaluation criteria. Definitive-level data are not currently available.
- Additional PSAs were not targeted during previous investigation.

**Site ID: RSA-231**

**Site Name: SMF #1 MIXING & PREP FACILITIES**

**Alias: PA3**

Technical Approach

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required for RSA-231.
- Conduct RFI field investigation including collection of soil samples, install overburden monitoring wells for collection of definitive-level groundwater samples to define nature and extent of contamination, evaluate risk potential, and determine potential sources to groundwater in compliance with the AEIRG.
- Complete an RFI/CMS and statement of basis recommending NFA and site closeout (RC). A permit modification will follow the statement of basis documenting the selection of NFA (RC).

**Site ID: RSA-233**

**Site Name: SMF#2 MIXING AND PREPARATION FACILI**

**Alias: PA3**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200311.....	200405
CS.....	200405.....	200906
RFI/CMS.....	200906.....	201402

**RIP Date:** N/A

**RC Date:** 201402

## SITE DESCRIPTION

RSA-233 lies just west of the intersection of Patton Road and Hansen Road in the northeast portion of RSA. The site occupies approximately 0.7 acres. RSA-233 consists of four noncontiguous building areas that were used in the 1940s for the mixing and blending of smoke mixes, black powder, and starter mix for the various smoke munitions manufactured in the former Smoke Munitions Filling #2 site. PAHs in soil and VOCs and explosives in groundwater exceed action levels. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines. As required by Army, a CMS will also be developed under the current PBA acquisition.

## CLEANUP/EXIT STRATEGY

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required for RSA-233.
- Conduct RFI field investigation including collection of soil samples, install overburden monitoring wells for collection of definitive-level groundwater samples to define nature and extent of contamination, evaluate risk potential, and determine potential sources to groundwater in compliance with the AEIRG.
- Complete an RFI/CMS and statement of basis recommending NFA and site closeout (RC). A permit modification will follow the statement of basis documenting the selection of NFA (RC).

Site ID: RSA-237

Site Name: PROPELLANT CUTTING AND DRYING

Alias: SP

### STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201311

RIP Date: N/A

RC Date: 201311

### SITE DESCRIPTION

Building 7556 was constructed in 1942 for use by the ROP as a primer storage magazine. Primers were offloaded from railcars and stored until needed for charge assembly in Building 7555. From 1950 to 1971, Rohm and Haas occupied the facility and used it for air drying propellant powders produced after mixing with liquid solvents at Building 7555. Solvent, binder, and propellant mixtures were brought to this facility to air dry. Once dry, the propellant was coated with the binder. The coated propellant was cut to the necessary size for R&D.

Subsequent occupation of the facility by Raytheon from 1971 to 1982 was for unknown purposes. The Army again controlled the facility from 1982 to 1985 and used it for general storage. After being acquired by Thiokol in 1985, this building was used for general storage until 1996.

During the VSI, numerous floor stains were noted. The building appeared to have been used for welding and painting.

Evaluation of the analytical results from the LSA performed indicates that this site is a probable source of TCE contamination in groundwater. Although VOC detections in soil do not exceed screening criteria, TCE was detected in groundwater. Data and operational histories from surrounding areas indicate this site to be the most probable source.

### CLEANUP/EXIT STRATEGY

The anticipated path is to complete the RFI, demonstrating that unrestricted use is appropriate for this site. The Permit Modification for RSA-237 will identify site closure for unrestricted use for surface media and for the groundwater site to address commingled groundwater contamination. No additional efforts are anticipated beyond the RFI for the surface site.

**Site ID: RSA-238**

**Site Name: HVA PLANT #2 MUSTARD LINES 5 & 6**

**Alias: HAMUST56**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

**Contaminants of Concern:** Metals, Pesticides

**Media of Concern:** Sediment, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200402.....	200405
CS.....	200405.....	200506
RFI/CMS.....	200906.....	201507
DES.....	200906.....	201605
CMI(C).....	201404.....	201609
LTM.....	201707.....	204202

**RIP Date:** N/A

**RC Date:** 201707

## SITE DESCRIPTION

RSA-238 is approximately 33 acres, and includes the WWII HVA Plant 2 facilities Mustard lines 5 and 6. These facilities were located in the central area of RSA on the east side of Stewart Road, south of Mills Road. The facilities started operation in September and November of 1942, respectively and were shut down in May of 1943. Chemicals used in the mustard manufacturing process included, but were not limited to: fuel oil, sulfur monochloride, ethyl alcohol, chlorine, carbon tetrachloride, kerosene, acetylene tetrachloride, and sodium hypochlorite solutions. Stockpiles of material, presumably coke was observed in aerial photographs near the Plant No. 6 facility. Coke was used in the ethylene scrubber operations. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

An RFI/CMS will be completed that includes the collection of soil samples, installation of monitoring wells, and collection of groundwater samples. An RFI, CMS, Statement of Basis, and Permit Modification will be prepared under the existing contract. It is anticipated that a DES, CMI (C), CMI (O), LTM (based on VOCs exceeding action levels in groundwater) and LUCs will be required due to the highly developed nature of the area and the potential presence of CWM. A LUC implementation plan will be developed in the CMI(C) phase. LUC inspections, five-year reviews, and annual groundwater monitoring and reporting are included in the LTM phase.

**Site ID: RSA-239**  
**Site Name: LINE # 1 BOILER HOUSE**  
**Alias: NP**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200309.....	200406
CS.....	200406.....	200906
RFI/CMS.....	200906.....	201309
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201309	

**SITE DESCRIPTION**

Building 7668 was originally constructed by the Army in 1942 as a boiler house. Following acquisition by Thiokol in 1950, it continued to be used as a boiler house and remains a boiler house today. A notation in 1996 indicated that the boilers were powered by No. 2 fuel oil that was supplied from four 10,000-gallon USTs located east of the building across the access road. An interview disclosed that two tanks were replaced in 1979 and that a leak was discovered in one of the new tanks in 1980. Approximately 10,000 gallons of fuel oil were estimated to have leaked into the soil as a result of a broken valve. Most of the spill reportedly flowed into the sewer line and was detected at the STP (RSA-11). Some of the fuel oil was pumped from the sewer and soil, but no sampling data was found to document the cleanup.

**CLEANUP/EXIT STRATEGY**

The anticipated path is to complete the RFI, demonstrating that unrestricted use is appropriate for this site. The Permit Modification for RSA-239 will identify site closure for unrestricted use for surface media and for the groundwater site to address groundwater contamination. No additional efforts beyond the RFI are anticipated for the surface site.

**Site ID: RSA-250**

**Site Name: FORMER STORAGE WAREHOUSE BLDG 778**

**Alias: HAMUST56**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals, Semi-volatiles (SVOC)

Media of Concern: Soil

Phases	Start	End
RFA.....	200309.....	200406
RFI/CMS.....	200406.....	201404
DES.....	200906.....	201502
CMI(C).....	200906.....	201503

**RIP Date:** N/A

**RC Date:** 201503

**SITE DESCRIPTION**

Site RSA-250 is the area around former Warehouse, Building 778, which is the northern building of three former warehouses that were eventually connected to form single Building 5678. The area for RSA-250 is about one acre. The building is located south of Fowler Road and on the west side of Hicks Road. These former warehouse buildings (constructed in 1943) had been used for the storage of coke (used in phosgene production), unidentified components, automotive parts, blank gas mask faceplates, conveyor lines (potentially for chemical warfare manufacturing), and other inert materials. In 1948, Building 778 was used for the storage of blank gas mask faceplates. Based on 1954 building utilization, the three buildings were designated as inert material storage warehouses for the Ammo Division. The 1957 building utilization indicates that these three buildings had been converted into one building (5678) for office use. Utilization of this building during the period of 1975 to 1991 was described as administration. Currently, Building 5678 serves as the project office for Program Executive Office (PEO) Aviation.

Most of the Building 5678 interior has been completely refurbished for office space. Evidence of the former rail spur (also noted on engineering drawings) could be observed along the west side of the building. Steam lines and HVAC systems now occupy the most of the west side. The former loading pads/loading docks were visible along the west side of the building, spaced evenly five on each side with some of the former docks converted into storage rooms. Most of the drainage from the building was to the west.

Metal and SVOC contamination was observed in soil with arsenic detected at a maximum of 596 mg/kg in surface soil near former Building 778 (north end of Building 5678). Chloroform was the only parameter detected above screening levels in groundwater.

**CLEANUP/EXIT STRATEGY**

The anticipated path forward is to conduct additional soil and groundwater sampling to complete the RFI. After the RFI is complete, it is anticipated that 190 cy of soil will require excavation and disposal. Twenty-five confirmation samples will be collected to verify that all soils exceeding the action level have been removed. Following excavation, the ground surface will be re-graded to approximately the pre-disposal topography. Land use controls are not anticipated.

Site ID: RSA-252

# Site Name: INCENDIARY BOMB FACILITY PLANT 2

Alias: DDT

## STATUS

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Metals, Pesticides, Polycyclic Aromatic Hydrocarbons (PAH), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200309.....	200406
CS.....	200406.....	200501
RFI/CMS.....	200906.....	201401
DES.....	201301.....	201403
IRA.....	200710.....	200802
CMI(C).....	201307.....	201410
CMI(O).....	201401.....	201508
LTM.....	201508.....	204005

RIP Date: 201410

RC Date: 201508

## SITE DESCRIPTION

Site RSA-252 occupies an area of ~16 acres located south of Mills Road, between Stewart and Refuge Roads. The main structure within RSA-252 is Building 5681. Building 5681 was constructed in 1943 initially as a mustard filling plant but not used as such; it was converted to an oil incendiary filling plant. The building had five sections; empty storage, manufacturing, filling, strapping and filled storage. Structures associated with this building included two gasoline pump houses, two gasoline storage tanks, three magazines along with various neighboring warehouses being used for storage of components. As of June 1945, the terminal date for manufacturing and filling operations, four different types of munitions had been produced at this plant. Chemicals used during incendiary operations included, but were not limited to: gasoline, stearic acid, calcium, isobutyl methacrylate, magnesium particles, sodium nitrate, asphalt, and caustics. Associated waste generated from these processes was reported to have been burned at the plant burning pit located ~ 200 yards west of the plant. In 1947 this building was used for the bagging of DDT. Additional insecticides produced in liquid and dust forms during the 1948 - 1950 time frame in building 5681 include, but are not limited to: toxaphene, parathion, dieldrin, malathion, chlordane, pyrethrins, beta-hexachlorocyclohexane, cube root, aldrin, and lindane. The 1957 building use list indicated that Building 5681 was utilized as an office/administration facility. Building decontamination was performed (1990s) prior to current usage as administration offices. Agency for Toxic Substances and Disease Registry (ATSDR) completed a Health Consultation for Building 5681 in 1997 that included samples of air, surface soil, subsurface soil, wipes, and concrete. In July 2007, three surface soil and three subsurface soil samples were collected at proposed fence locations around Building 5681. Metals and SVOCs contamination was observed in soil around Building 5681. Elevated DDT concentrations were also observed in soil. A TCRA was performed in November and December 2007 to support the installation of force protection measures around the building. The TCRA included the excavation and disposal of 135 cubic yards of soil, followed by site backfilling and site restoration.

A Hazardous Waste Facility Permit was issued September 30, 2010 pursuant to AHWMMMA. Table VI.2 of the permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

Conduct RFI field investigation with soil and groundwater sampling. Complete an RFI, CMS, DES, CMI(C), CMI(O), and LTM to be consistent with future land uses.

The CMI(C) phase consists of LUCIP preparation and Installation Master plan updates. The LUC inspections and five-year reviews will occur in the CMI(O) and LTM phases.

**Site ID: RSA-253**

**Site Name: UTILITY/FLAMMABLE MATERIALS STORAGE**

**Alias: POL**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

**Contaminants of Concern:** Metals, Other (PRO)

**Media of Concern:** Groundwater

<b>Phases</b>	<b>Start</b>	<b>End</b>
ISC.....	200402.....	200506
INV.....	200912.....	201310

**RIP Date:** N/A

**RC Date:** 201310

## SITE DESCRIPTION

Site RSA-253 is the location of the Flammable Materials Storage Area, Building 6109, that is northwest of RSA Airport near the northern boundary of RSA. Building 6109 was constructed in 1956 as a utility building to support Range 7 activities. Between 1991 and 2001, this metal structure was converted to storage facility for flammable materials.

In 2004 Building 6109 was in disrepair with the building and adjacent earthen berm overgrown with vegetation and abandoned for some time. Numerous 55-gallon drums, acetone containers, concrete, wood, trash, and other debris were scattered in the area. The interior of the building contained empty, red, rusted, and bent 55-gallon drums, munitions parts, old building materials, pipe, trash, and metal debris. The door at the concrete pad on the northwest end of the building serves as the primary entrance. The center of the concrete pad is cracked and broken. The large excavated area north of this building has served as a BA (BA No. 1) to support recent construction projects on the Arsenal, including the new housing area. A concrete pad north of the building is surrounded by general construction debris and empty ammunition canisters. An inactive water well was observed approximately 90 ft to the northeast. A 1975 historical document states the well is 100 ft deep and was used for drinking and toilet water supply. Another report indicates that Well P-74 was installed at Building 6109 near the horse farm west of Rideout Road in 1971 and that it was not operational as of 2003. Based on the documented installation date and mapped location (about 200 ft southeast of the building), this is not likely the same well observed during 2004.

In 2005 metals and low level PRO were detected in the soil. PRO was detected in the groundwater up to 230 ug/L (estimated). All samples were analyzed for VOCs, SVOCs, TAL metals, and PRO.

## CLEANUP/EXIT STRATEGY

Additional RFI work, consisting of the installation and sampling of new wells and the collection and analysis of soil samples during installation is necessary to complete investigation. Tasks for this site include completing an RFI, which is expected to support a NFA decision. A Statement of Basis and Permit Modification will recommend site close-out (RC) with unrestricted land use.

**Site ID: RSA-255**

**Site Name: MANGANESE ORE STORAGE AREA N. of RS**

**Alias: GCWD**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals

Media of Concern: Groundwater

Phases	Start	End
RFA.....	200402.....	200405
CS.....	200405.....	200906
RFI/CMS.....	200906.....	201310
DES.....	200906.....	201410
CMI(C).....	200906.....	201502
CMI(O).....	200906.....	201512

**RIP Date:** 201502

**RC Date:** 201512

## SITE DESCRIPTION

Site RSA-255 includes three manganese ore storage areas located in the southern area of RSA, south of the Gulf Chemical Warfare Service (GCWS) Depot Warehouse Area and Buxton Road. Aerial photographs from 1943 to 1956 reveal piles of dark material stockpiled in scarred areas along a railroad track. An historical document indicates that space was allocated for storing strategic materials, including manganese ores. VSIs found dark, fine-grained material on the ground surface and a sign: "Pile 5, Manganese, Metallurgical Domestic, MN 48.71 percent, Type 1" in one of the three areas. These three areas include:

- the Storage Area North of RSA-065,
- the OSA South of GCWS Depot Warehouse Area, and
- the Storage Area North of RSA-067.

Rail lines ran across this area to service the former GCWS Depot in the 1940s and RSA depot during that period. The material observed on aerial photographs was originally thought to be coal; however, according to historical reports, arsenal storage space was allocated to the treasury department for storing strategic materials, including bauxite and manganese ores, magnesium scrap, and zinc oxide. Observations in 2004 suggest that this area was used historically as a storage yard for manganese ore. Dark, fine-grained material was observed just below the surface of dead leaves and other vegetation.

A large asphalt parking lot is located in the north-central part of this area that was once used by personnel in former administration/warehouse Building 8027.

In 2005 metals exceeded background values in soil, including manganese in high concentrations in surface soil. Thallium exceeded the MCL in groundwater.

## CLEANUP/EXIT STRATEGY

Additional surface soil, subsurface soil, and groundwater samples will be collected to complete the RFI. After the RFI is finished, it is anticipated that a DES, CMI and LUCs (unrestricted industrial, restricted residential) will be required to address arsenic and manganese contaminated surface soils. It is anticipated that approximately 3,400 cy of soil will require disposal (10% contingency included). Forty confirmation samples will be collected to verify that all soils exceeding the industrial remedial goal (HI = 0.5) for manganese (13,600 mg/kg) for a commercial worker have been removed. Following excavation, the ground surface will be re-graded to approximately the pre-disposal topography.

The CMI(O) phase includes costs for LUC inspections and five-year reviews.

**Site ID: RSA-258**

**Site Name: FORMER PAINT SPRAY BUILDING 7862**

**Alias: TA2**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

**Contaminants of Concern:** Metals

**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200402.....	200405
RFI/CMS.....	200912.....	201311

**RIP Date:** N/A

**RC Date:** 201311

## SITE DESCRIPTION

RSA-258, Building 7862, covers approximately 500 square feet and is situated in the heavily industrialized area in the south-central portion of the RSA approximately 2 miles north of the Tennessee River, within the RSA-154 groundwater unit. The site is the former location of Building 7862, which was used for spray-painting of parts from approximately 1955 to the late-1960's. At that time the building was removed and the site converted to a guard station and visitor waiting area for entry into Test Area 2. It is still utilized for that purpose.

A VSI was conducted in 2004 and an LSA, consisting of a single boring being completed within the drainage swale next to the northwest corner of the guard station pad was performed in 2005. The LSA boring hit bedrock at 6ft and did not yield sufficient groundwater to sample. The data yielded a few metals with concentrations above screening levels in surface and subsurface soils with no significant organics being found.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines. Since the results are from only one location with no viable groundwater data, the LSA effort does not meet the ADEM guidance requirements for an RFI.

## CLEANUP/EXIT STRATEGY

Additional RFI work, consisting of the installation and sampling of new wells and the collection and analysis of soil samples during installation is necessary to complete the investigation. Tasks for this site include completing an RFI; which is expected to indicate minor surficial and shallow (0-2ft) impacts to the drainage swale, completing an IM work plan, conducting the IM (anticipated removal of approximately 53 cy of soil from the drainage swale), and completing the post IM RFI report. A Statement of Basis and Permit Modification will recommend site close-out (RC) with unrestricted land use.

**Site ID: RSA-261**

**Site Name: LANCE MISSILE CONDITIONING FACILITY**

**Alias: TA2**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Other (PRO), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200402.....	200405
RFI/CMS.....	200906.....	201404
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201404	

## SITE DESCRIPTION

Site RSA-261, Building 7847, Lance Missile Conditioning Facility, is located in the south-central portion of the RSA approximately two miles north of the Tennessee River, within the RSA-154 groundwater unit. The building 7847 complex was constructed in 1967 to condition petroleum-based fuel for the Lance missile testing facility. The complex consisted of nine small instrument/conditioning sheds from which 24-inch tubes led to larger conditioning chambers. Each shed/chamber was connected via a buried two-inch stainless steel drain pipe to a vault containing a 55-gallon liquids capture drum. The majority of the structure was covered by earthen berm. The instrument sheds and chambers are now utilized for storage of non-chemical materials.

A VSI was conducted in 2004 and an LSA was conducted in 2005. The LSA consisted of the completion of six borings and temporary wells at locations adjacent to instrument room/chamber areas and the vaults. The LSA results showed there to be no impacts to the surface and subsurface soils from VOCs, and SVOCs above screening levels. There were PRO concentrations in the boring near the vaults, although no associated PAH hits above screening levels were found. Groundwater samples contained trace VOCs, with one, chloroform, slightly above screening levels. There were also PRO detections in several of the wells.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines. The LSA effort does not meet the ADEM guidance requirements for an RFI and failed to evaluate a potential COC, UDMH known to be contained in the fuel for the Lance missile.

## CLEANUP/EXIT STRATEGY

Additional RFI work, consisting of the installation and sampling of new wells and the collection and analysis of soil samples during installation is necessary to complete the investigation. Tasks for this site include completing an RFI; which is expected to lead to an RC decision based upon previous and new data and the inclusion of site groundwater in RSA-154. A Statement of Basis and Permit Modification will recommend site close-out (RC) with unrestricted land use.

**Site ID: RSA-262**

**Site Name: CWS WAREHOUSE AREA BLDGS 8021-8027**

**Alias: GCWD**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals, Other (PRO),  
Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200402.....	200405
CS.....	200405.....	200506
RFI/CMS.....	200909.....	201308
DES.....	201304.....	201407
CMI(C).....	201407.....	201504
CMI(O).....	201504.....	201602
LTM.....	201602.....	204110

**RIP Date:** 201504

**RC Date:** 201602

## SITE DESCRIPTION

Site RSA-262 is an approximately 50-acre site located in the south-central part of RSA within the former GCWD area, just north of Buxton Road. The GCWD warehouses were constructed in 1943 and have been used for storage of inert materials, such as spare parts and shipping crates, and for rehabilitation of unserviceable munitions and equipment. By 1960 the warehouses became general purpose warehouses. Currently, five (8021, 8022, 8023, 8024, and 8026) of the seven warehouses remain and are used primarily for general storage and administrative purposes. Each building had rail and truck loading docks on opposite sides. The primary mission of the GCWS was the segregation, renovation, and preparation for long term storage of chemical munitions manufactured at Huntsville Arsenal and ARFO. Buildings 8025 and 8027 were being demolished during VSI activities conducted in 2004. Approximately 15.2 acres of the site is covered by buildings or a former building slab; the OSA comprises 7.3 acres, a small area of the site being asphalt roadway paved, with the remainder of the site vegetated with maintained grass. PAHs in soil and VOCs (TCE at 30,000 ug/L) in groundwater exceed action levels.

Building 8010, located in the southeastern portion of the area, is an open ended Quonset hut used for equipment storage. Reportedly, heavy equipment is stored within the building, including a large metal shear that has not been operational since the mid 1980s. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

Additional soil and groundwater sampling is needed to complete the RFI. A remediation work plan will be completed once the RFI/CMS is complete. In-situ biodegradation is anticipated to treat TCE contaminated groundwater in the CMI(C) phase. This will be followed by monitored natural attenuation in the CMI(O) phase. Groundwater monitoring, LUC reporting, and five-year reviews are included in the LTM estimate.

**Site ID: RSA-263**

**Site Name: CWS MOTORPOOL(B 8017)/CHANGE HOUSE**

**Alias: POL**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Other (PRO), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200402.....	200405
RFI/CMS.....	200906.....	201311
DES.....	201311.....	201402
CMI(C).....	201311.....	201407
LTM.....	201407.....	204207

**RIP Date:** N/A

**RC Date:** 201407

## SITE DESCRIPTION

Site RSA-263 is the location of the laboratory, motor repair, and storage facility in the south-central area of RSA, north of Buxton Road.

The facility is contained in four buildings: 8015, 8016, 8017, and 8020. Building 8017 and 8020 (which has been demolished) were constructed in 1943. Building 8017 was used as a motor repair shop and Building 8020 was used as a change house for GCWS Depot workers. Building 8020 later became a laboratory and testing building. The foundations of former Buildings 8015 and 8016 lie about 150 ft north of Building 8017. Buildings 8015 and 8016 were built in 1943 and used as a gasoline station and automobile grease and wash stalls.

Building 8017 currently is used by the Recreation Department for dry storage of boats. It is a large metal building constructed on a concrete slab. Two central floor drains were observed which discharge to an open ditch northeast of the building according to a 1942 engineering drawing. There are large rollup doors on the east and west sides of the building.

Building 8020 has been demolished, but the outline of the former building foundation is visible in the exposed soil. A concrete pad or building foundation lies about 20 ft east of Building 8020 and is sloped slightly to the east. Four small concrete foundations 10 ft northwest of the building may have been a transformer base.

The foundations of former Buildings 8015 and 8016 are connected, but the aboveground structures have been removed. There is a two-foot diameter circular sump in the foundation of these buildings, and a depression marks the location of a former UST just east of the foundation. Reportedly, a UST was removed during the 1980s and a strong petroleum odor was noted in the soil. Mounded soils, metal debris, and a 55-gallon drum were observed about 35 ft west of the foundations for Buildings 8015 and 8016.

In 2005, carbon tetrachloride, TCE, and xylene were detected in the groundwater. SVOCs and PRO were detected in soil and groundwater.

## CLEANUP/EXIT STRATEGY

Conduct RFI field investigation with soil and groundwater sampling. Complete an RFI, CMS, DES, CMI (C), CMI (O), and LTM to be consistent with future land uses. The RFI is expected to indicate groundwater is impacted with VOCs but soils are no longer a source for VOC migration to groundwater. The CMS will likely specify natural attenuation monitoring with LUCs. Sampling from six monitoring wells is needed to confirm and track the progress of natural attenuation processes. The Statement of Basis and Permit Modification will document the selection of the final remedy. Annual LUC inspections, five-year reviews, and groundwater monitoring are included in the LTM phase.

**Site ID: RSA-265**  
**Site Name: GASOLINE DRUM STORAGE AREA**  
**Alias: GCWD**

**STATUS**

**Regulatory Driver:** RCRA  
**RRSE:** MEDIUM  
 Contaminants of Concern: Metals, Other (GRO, PRO),  
 Volatiles (VOC)  
 Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200402.....	200405
CS.....	200405.....	201302
RFI/CMS.....	201008.....	201309
DES.....	200906.....	201408
CMI(C).....	200906.....	201508
CMI(O).....	200906.....	201608
LTM.....	201608.....	204208
<b>RIP Date:</b>	201508	
<b>RC Date:</b>	201608	

**SITE DESCRIPTION**

Site RSA-265 is located in the southern portion of RSA, south of Dodd Road and west of Shields Road. The site boundary encompasses approximately 76 acres, of which approximately 42 acres are currently associated with Test Area (TA) 4 activities/support. Current range operations on a portion of RSA-265 began in 1962. Additionally, a small arms firing range is currently active within the site boundary. The site was initially constructed in 1942-1943 for use by the Army in the Gulf Chemical Warfare Depot for bulk storage of gasoline drums. The storage area appears to consist of 23 earthen-bermed areas capable of holding up to 12,000 drums. By 1950, activity associated with gasoline drum storage had apparently ceased; however, two areas identified as open storage for bauxite/aluminum ore are noted at the split of the former railroad spur north of the gasoline drum storage area. VOCs (benzene) detected in groundwater exceed action levels. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

Additional soil and groundwater monitoring are required to complete the RFI/CMS. The MNA sampling will be conducted quarterly for one year under the CMI(C) phase and one year under the CMI(O) phase, with samples collected from five wells and analyzed for VOCs and MNA parameters. Groundwater monitoring, annual LUC inspections, and five-year reviews are included in LTM.

**Site ID: RSA-269**  
**Site Name: FORMER UST, BUILDING 7852**  
**Alias: TA2**

**STATUS**

**Regulatory Driver:** RCRA

**RRSE:** LOW

**Contaminants of Concern:** Other (GRO), Volatiles (VOC)

**Media of Concern:** Groundwater

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200402.....	200405
CS.....	200912.....	201003
<b>RFI/CMS.....</b>	<b>201003.....</b>	<b>201407</b>
DES.....	201407.....	201504
CMI(C).....	201504.....	201510
LTM.....	201610.....	204205
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201610	

**SITE DESCRIPTION**

Site RSA-269 is the location of the Propulsion Systems Facility Pump House, Building 7852, located in Test Area 2, west of Patton Road. Building 7852 was built in 1959 as a pump house in support of operations on Range 2. A 1958 engineering drawing shows a 1,000-gallon UST east of the building. The UST may still be in place. Building 7852 is now labeled as a fuse test facility. It lies approximately 30 ft from the southeast corner of the missile centrifuge test stand at Building 7843. A generator was observed on the southern side of the Building 7852.

A 1958 engineering drawing shows mechanical and electrical specifications for two 1,500 gallons per minute (gpm) electrical-motor pumps and one 3,500-gpm diesel-engine pump used to supply water to test stand C and shows a 1,000-gallon UST east of the building. The tank is labeled as a gasoline tank on the plan view and as a fuel tank in a profile view. Whether or not this UST has been removed is unknown because it is not included on the list of removed USTs provided by the RSA compliance group.

In 2005 gasoline range organics (GRO), benzene and other VOCs were detected in the groundwater.

**CLEANUP/EXIT STRATEGY**

Conduct RFI field investigation with soil and groundwater sampling. Complete an RFI, CMS, DES, CMI (C), and LTM to be consistent with future land uses. The RFI is expected to indicate groundwater is impacted with VOCs but soils are no longer a source for VOC migration to groundwater. The CMS will likely specify natural attenuation monitoring with LUCs. Sampling from six monitoring wells is needed to confirm and track the progress of natural attenuation processes. The Statement of Basis and Permit Modification will document the selection of the final remedy. The LTM will include groundwater monitoring, annual LUC inspections, and five-year reviews.

**Site ID: RSA-271**

**Site Name: FORMER BOILER HOUSE, BUILDING 7729**

**Alias: POL**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Other (PRO), Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Groundwater, Other (Subsurface Soil)

Phases	Start	End
RFA.....	200402.....	200506
CS.....	200912.....	201003
RFI/CMS.....	201003.....	201403

**RIP Date:** N/A

**RC Date:** 201403

## SITE DESCRIPTION

Site RSA-271 includes Building 7729, previously designated B-529, built by the Army in 1942. During ROP operations, the facility was used as a steam heating plant (boiler house). The use remained unchanged following acquisition by Thiokol (circa 1950) until 1982. Subsequent use of the structure was identified to be maintenance storage. The list of UST removals maintained by the RSA Compliance Group indicates that a 2800-gallon steel UST (installation date unknown) was removed in September 1998. During steam house/boiler operations, the UST was used to store fuel oil No. 2.

A visual inspection was performed in 1996 prior to building demolition. At that time, interior floor staining was noted as well as the presence of a small insulated tank with piping intact. All other equipment had been removed. An exterior condensation holding tank was observed on the southeast side of the building. The tank discharged to an open concrete pit (RSA-137O, NFA RCRA SWMU) with weirs and screens that appear to discharge to the sanitary sewer. A VSI conducted in 2004 verified the building is now demolished, and a 1941 engineering drawing shows the previous location of the UST near the east corner of the building, along with a blowoff and hotwell overflow pit near the middle of the southwestern side.

Sampling targeted both the former UST and overflow pit locations. The PRO were detected at high concentrations in both subsurface soil and groundwater in the area of the former UST. Related PAH were also detected well above screening criteria in the groundwater.

The site will be addressed under the ARBCA program.

## CLEANUP/EXIT STRATEGY

Additional RFI work, consisting of the installation and sampling of new wells and the collection and analysis of soil samples during installation is necessary to complete the investigation. Tasks for this site include completing an RFI; which is expected to lead to a Response Complete decision based upon previous and new data and the inclusion of site groundwater in the RSA-146 remedy. A Statement of Basis and Permit Modification will recommend site close-out (RC) with unrestricted land use.

Site ID: RSA-272

Site Name: FORMER UST FOR BOILER UNIT BLD 7650

Alias: POL

### STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Other (PRO), Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Groundwater, Other (Subsurface Soil)

Phases	Start	End
RFA.....	200402.....	200405
CS.....	200912.....	201003
RFI/CMS.....	201003.....	201409
DES.....	201409.....	201504
CMI(C).....	201504.....	201507
LTM.....	201605.....	204205

RIP Date: N/A

RC Date: 201605

### SITE DESCRIPTION

Site RSA-272 includes Building 7650 which was constructed in 1953 as an administration building for Thiokol. A portion of the facility was noted to have housed a natural gas boiler and generator.

During a 1996 visual inspection the boiler was observed in a boiler room on the west side of the basement. The generator was located on the west side at ground level. A 1975 historical document shows that money was budgeted for a tank removal at Building 7650, but documentation of its completion was not found. The VSI performed in 2005 identified a rectangular asphalt patch and flush cut piping in the concrete pavement west of the boiler room which appears to be the location of the excavated UST. Engineering drawings were located that support the hypothesized location of the former UST. Information was also found to indicate that an emergency, diesel-powered generator was also located for a period of time on the noted asphalt pad.

Sampling targeted the presumed location of the former UST. The PROs were detected at high concentrations in both subsurface soil and groundwater in the area of the former UST. Related PAH were also detected above screening criteria in the groundwater.

The site will be addressed under the ARBCA program.

### CLEANUP/EXIT STRATEGY

Conduct RFI field investigation with soil and groundwater sampling. Complete an RFI, CMS, DES, CMI (C), and LTM to be consistent with future land uses. The RFI is expected to indicate groundwater is impacted with SVOC/PAHs but soils are no longer a source for migration to groundwater. The CMS will likely specify natural attenuation monitoring with LUCs. Sampling from six monitoring wells is needed to confirm and track the progress of natural attenuation processes. The Statement of Basis and Permit Modification will document the selection of the final remedy. It is anticipated that five existing wells and one new well will be monitored semiannually for two years and that SVOC/PAHs and MNA parameters will be analyzed. Following the CMI(C) phase, LTM will include groundwater monitoring, LUC inspections, and five-year reviews.

Site ID: RSA-273

Site Name: PROPELLANT CONDITIONING AND MOTOR C

Alias: NP

## STATUS

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Metals, Perchlorate, Volatiles (VOC)

Media of Concern: Groundwater, Other (Subsurface Soil)

Phases	Start	End
RFA.....	200402.....	200405
CS.....	200405.....	200906
RFI/CMS.....	200906.....	201308

RIP Date: N/A

RC Date: 201308

## SITE DESCRIPTION

Site RSA-273 includes Building 7364 built by the Army in 1945 for use as a service magazine and rest house. Following acquisition by Thiokol in 1950, this facility was used for motor cycling and propellant conditioning.

During site visits conducted in 1996 and 2003, a trench drain was observed running along the west side to a surface drain. A temporary storage pad was being used to stage refrigerator units. In the past the pad was used to store class 1.3 propellant wastes. Several curing ovens were present separated by blast walls, an interior pit filled with concrete, and a two ft steel drain line to an open ditch was noted. The following chemicals were listed as having been used in this facility: various propellants, methylene chloride, and 1,1,1-TCA. A 1950 engineering drawing confirmed the presence of a floor drain and trench drains connected to an exterior sump. Although reportedly observed in 1996, this sump was not evident in 2003.

Sampling targeted the former sump, trench drain, interior pits, concrete pad, and two ft pipe discharge. Perchlorate contamination was detected in both subsurface soil and groundwater. High localized groundwater concentration (1600ug/l perchlorate) levels suggest that the former sump, trench drain, and interior pits may be sources of perchlorate and not simply reflective of contamination migrating from surrounding sites. The VOCs were detected in the groundwater, but the data suggest this contamination originates outside the boundary and confines of conducted activities for this site. Metals were also detected in surface and subsurface soils. Aluminum, iron, lead, and magnesium were the only metals believed to be related to site activities (used in rocket propellants or the production thereof).

## CLEANUP/EXIT STRATEGY

The anticipated path is to complete the RFI, demonstrating that unrestricted use is appropriate for this site. The Permit Modification for RSA-273 will identify site closure for unrestricted use for surface media and for the groundwater site to address groundwater contamination. No actions beyond the RFI are anticipated.

**Site ID: RSA-274**

**Site Name: PHYSICS LABORATORY & HIGH EXPLOSIVES**

**Alias: SP**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Perchlorate, Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Other (Subsurface Soil)

Phases	Start	End
RFA.....	200402.....	200405
CS.....	200405.....	200906
RFI/CMS.....	200906.....	201312

**RIP Date:** N/A

**RC Date:** 201312

## SITE DESCRIPTION

Site RSA-274 includes Building 7540 constructed by Rohm & Haas in 1963 to serve as a mixer building to support the operational demands of Building 7597 (RSA-C); however, prior to its use, the program was cancelled. The facility was never used for propellant mixing. From 1970 to 1975, the Army used the facility as a physics laboratory. From 1975 to 1985 it was used for storage. In 1985 the building was transferred to Thiokol, who used it periodically for high explosive (HE) storage until 1992. The building has not been used since 1992.

The VSIs were performed in 1996 and 2005. The area was found to be overgrown. A concrete pad was observed at the northeast side of the building. A grate-covered floor drain was observed extending from the doorway of the building to an uncovered sump south of the building. The sump contained two to three ft of liquid. A rectangular pit located within the bunker had been filled with concrete along with the channel that connected it to the exterior trench drain and sump.

Sampling targeted the downgradient side of the sump, trench drain and doorway of Building 7541 (engineering drawings indicated this is the concrete pad found on the northeast side of the building). Perchlorate was detected in subsurface soil and groundwater at concentrations indicative of the presence of a potential source at this site. Explosives and VOCs were detected in groundwater. A number of SVOCs, specifically PAH, were detected at concentrations exceeding screening levels.

## CLEANUP/EXIT STRATEGY

### Problems Warranting Action

- Existing data identify metals and SVOC exceedances in soil. Perchlorate and explosives detected at elevated concentrations in groundwater, but soil concentrations do not pose risk or potential for sourcing to groundwater.

### Technical Approach

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples and installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the AEIRG.
- Complete an RFI report documenting the remedy of NFA.
- Perform BHHRA/SLERA to show there are no unacceptable human health or ecological risks.
- Demonstrate there is no sourcing threat to groundwater using borehole averaging, and SPLP data as necessary.
- Demonstrate metals are at background levels using calculated background screening levels, geochemical analysis of background, and other weight-of-evidence considerations.
- Prepare a permit modification application following approval of the RFI documenting NFA.

**Site ID: RSA-275**

**Site Name: FORMER FILM PROCESSING LABORATORY**

**Alias: ROP SERVIC**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** MEDIUM

Contaminants of Concern: Metals

Media of Concern: Other (Subsurface Soil)

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200402.....	200405
RFI/CMS.....	200912.....	201311

**RIP Date:** N/A

**RC Date:** 201311

## SITE DESCRIPTION

RSA-275 consists of a grassy area adjacent to an asphalt drive and paved lot. The area was formerly Building S-7173, a photographic laboratory. Included with the site was an area containing an AST stand. It is not known whether the stand is at the historical location of operation or moved to this location at a later time. The AST may be unrelated to the photographic laboratory; however, a boiler was located behind the laboratory. Building S- 7173 operations support the administrative operations of Building 7172, to which the laboratory was attached. Both buildings were built in the 1950s and both were demolished by 1986.

An LSA was conducted in 2005. The LSA consisted of the completion of two borings and one temporary well. The boring/well was placed within the footprint of the former building and the soil boring was located adjacent to the former AST stand. Samples were analyzed for VOCs, SVOCs, Metals, and PRO. Several metals were detected at levels above screening levels in the surface soil sample at Building S-173. No metals were above BSVs in the subsurface sample and no analytes were present in the groundwater sample above screening levels.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines. The LSA effort does not meet the ADEM guidance requirements for an RFI and no compliant groundwater data was collected.

## CLEANUP/EXIT STRATEGY

Additional RFI work, consisting of the installation and sampling of new wells and the collection and analysis of soil samples during installation is necessary to complete the investigation. Tasks for this site include completing an RFI; which is expected to lead to an RC decision based upon previous and new data. A Statement of Basis and Permit Modification will recommend site close-out (RC) and unrestricted land use.

**Site ID: RSA-276**

**Site Name: FORMER BOILER HOUSE, BLDG 7362**

**Alias: POL**

## STATUS

**Regulatory Driver:** RCRA

**RRSE:** LOW

Contaminants of Concern: Other (PRO)

Media of Concern: Groundwater

Phases	Start	End
RFA.....	200402.....	200506
CS.....	200912.....	201003
RFI/CMS.....	201003.....	201409

**RIP Date:** N/A

**RC Date:** 201409

## SITE DESCRIPTION

Site RSA-276 includes Building 7372 built in 1959 as a boiler house to support rocket casting and finishing operations conducted in Building 7360. In the mid-1980s the building became a storage facility for inert materials. The facility has since been demolished.

Two 1958 engineering drawings were found that document the layout of the former building and the location of the former 5000-gallon UST. During steam house/boiler operations, the UST was believed to store fuel oil No. 2.

Sampling targeted the location of the former UST. The PROs were detected in the groundwater, but not of significance in soil. The levels detected in the groundwater and the absence of potential sources in the surrounding areas suggests that the site should be considered a potential source and further investigated as such.

The site will be addressed under the ARBCA program.

## CLEANUP/EXIT STRATEGY

### Problems Warranting Action

- Limited soil data collected at this site did not indicate that petroleum-related SVOCs were present in soil; however, further samples are needed to ensure sampling has been performed at other likely release points.
- In addition, soils have not been assessed for the presence of VOCs.
- Petroleum-related SVOCs were not detected in screening level groundwater data. However, PRO was detected. Definitive groundwater samples are needed from this site.
- Groundwater has not been assessed for the presence of petroleum-related VOCs.

### Technical Approach

- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
- Conduct RFI field investigation including collection of soil and groundwater samples from installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the AEIRG.
- Complete an RFI report documenting the expected remedy of NFA.
- Describe the nature and extent of contamination.
- Perform BHHRA/SLERA to document potential human health or ecological risks.
- Evaluate the potential threat to groundwater from the soil-to-groundwater migration pathway.
- Prepare a permit modification application following approval of the RFI documenting NFA.

**Site ID: RSA-A**

**Site Name: INACTIVE PROPELLANT STORAGE WELLS**

**Alias: SP**

**STATUS**

**Regulatory Driver:** RCRA  
**RRSE:** LOW  
 Contaminants of Concern: Metals, Volatiles (VOC)  
 Media of Concern: Sediment, Soil

Phases	Start	End
RFA.....	198910.....	199009
CS.....	199410.....	200906
RFI/CMS.....	200906.....	201311
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201311	

**SITE DESCRIPTION**

This site is located northwest of former Building 7598 (RSA-B), in the former RARE Facility South Plant. Building 7598 was built during the 1950s and was used for rocket motor propellant R&D. This site consists of approximately 51 steel- cased, four-inch diameter storage wells with capped bottom ends that were used for safe storage of experimental explosives and propellants. Well depths are approximately one to four ft bgs. A concrete-lined sump located on the northeast side of Building 7598 is also being investigated as part of RSA-A. Low levels of metals and chlorinated solvents were detected in the groundwater; low levels of metals were detected in the soil.

In 2004 this site was expanded to 1.1 acres.

**CLEANUP/EXIT STRATEGY**

- Technical Approach
- Based on the AHWMMMA Hazardous Storage Facility/Thermal Treatment/SWMU Corrective Action Permit issued on Sept. 30, 2010, an RFI is required.
  - Conduct RFI field investigation including collection of soil and groundwater samples and installation of new monitoring wells to determine the potential of a release associated with historical site activities in compliance with the AEIRG.
  - Complete an RFI report documenting the remedy of NFA.
  - Perform BHHRA/SLERA to show there are no unacceptable human health or ecological risks.
  - Demonstrate there is no sourcing threat to groundwater using borehole averaging, and SPLP data as necessary.
  - Demonstrate metals are at background levels using calculated background screening levels, geochemical analysis of background, and other weight-of-evidence considerations.
  - Prepare a permit modification application following approval of the RFI documenting NFA.

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
MSFC-002	INACTIVE ABANDONED DRUM DISPOSAL SITE	200709	A Non-Time Critical Removal Action was performed in 2007. A ROD for NFA was submitted to the regulatory agencies and signed in July 2008.
MSFC-003	INACTIVE OLD BONE YARD DISPOSAL SITE	200109	
MSFC-055	DISMANTLED STAUFFER CHEM.MFG. PLANT SITE	199909	Responsibility assumed by NASA under MOA
MSFC-060	INACTIVE DELUGE WATER DRAINAGE SYS.	199909	Closure DD signed by USEPA Region IV and ADEM agreeing to NFA 1999 Sept 15
MSFC-065	FORMER PESTICIDE STORAGE SURFACE DRAIN	199909	Responsibility assumed by NASA under MOA
MSFC-074	INACTIVE DISPOSAL SITE	200604	The site was closed with an administrative letter from USEPA and ADEM in April 2006.
MSFC-077	INACTIVE OPEN BURNING/DISPOSAL PITS	200809	An expanded SI report recommended no action for the site. The regulatory agencies concurred in August 2008.
MSFC-082	INACTIVE CHEM.MUNTS.DEMIL/DISP. TRENCHES	200409	Combined with MSFC-003
MSFC-D	FORMER FUEL OIL STORAGE CONTAINMENT BERM	200409	Responsibility assumed by NASA under MOA
RSA-001	FOX ARMY COMMUNITY HOSPITAL INCINERATOR	199102	NFA under RCRA permit
RSA-002	IN-GROUND OIL/WATER SEPARATOR, BLDG.3338	199102	NFA under RCRA permit
RSA-003	IN-GROUND OIL/WATER SEPARATOR, BLDG.3617	199102	Now compliance response site CCSWMU-003
RSA-004	IN-GROUND OIL/WATER SEPARATOR & WASHRACK	199102	NFA approved by ADEM in Oct 2006
RSA-006	PAINT SHOP & SUMPS BLDG 3634 MOTOR POOL	199102	NFA received from ADEM on Oct 04
RSA-007	HAZARDOUS WASTE STORAGE AREA, BLDG. 3775	199102	NFA under RCRA permit
RSA-008	INACTIVE SEWAGE TREATMENT PLANT 4	200212	Now compliance response site CCSWMU-008
RSA-009	INACTIVE SEWAGE TREATMENT PLANT NO. 3	200212	Now compliance response site CCSWMU-009
RSA-010	CLOSED UNLINED SANITARY LANDFILL	201208	Operational landfill will be captured under installation C&D landfill
RSA-011	INACTIVE SEWAGE TREATMENT PLANT NO. 1	200709	No Action ROD signed in September 2007.
RSA-012	ACTIVE OPEN BURN PANS	199102	Site is an active site regulated under subpart 'X' of the RCRA permit.
RSA-015	HAZARDOUS WASTE STORAGE IGLOO, NO. 1	199102	Site is an active storage unit and not eligible for ER,A program
RSA-016	HAZARDOUS WASTE STORAGE IGLOO, NO. 2	199102	Site is an active storage unit and not eligible for ER,A program
RSA-017	HAZARDOUS WASTE STORAGE IGLOO, NO. 3	199102	Site is an active storage unit and not eligible for ER,A program
RSA-018	HAZARDOUS WASTE STORAGE IGLOO, NO. 4	199102	Site is an active storage unit and not eligible for ER,A program
RSA-019	HAZARDOUS WASTE STORAGE IGLOO, NO. 5	199102	Site is an active storage unit and not eligible for ER,A program
RSA-020	HAZARDOUS WASTE STORAGE IGLOO, NO. 6	199102	Site is an active storage unit and not eligible for ER,A program
RSA-021	HAZARDOUS WASTE STORAGE IGLOO, NO. 7	199102	Site is an active storage unit and not eligible for ER,A program

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
RSA-022	HAZARDOUS WASTE STORAGE IGLOO, NO. 8	199102	Site is an active storage unit and not eligible for ER,A program
RSA-023	HAZARDOUS WASTE STORAGE IGLOO, NO. 9	199102	Site is an active storage unit and not eligible for ER,A program
RSA-024	HAZ. WASTE VACANT STORAGE IGLOO, NO. 10	199102	On RCRA Permit as NFA
RSA-025	HAZ. WASTE VACANT STORAGE IGLOO, NO. 11	199102	On RCRA Permit as NFA
RSA-026	HAZ. WASTE VACANT STORAGE IGLOO, NO. 12	199102	On RCRA Permit as NFA
RSA-027	HAZ. WASTE VACANT STORAGE IGLOO, NO. 13	199102	On RCRA Permit as NFA
RSA-028	IN-GROUND OIL/WATER SEPARATOR, 5693 AREA	199102	Now compliance response site CCSWMU-028
RSA-029	REDSTONE ARSENAL SANITARY SEWER SYSTEM	199102	This site is being tracked under our RCRA program. It is on the NFA list of sites in the Hazardous Waste Permit. No further action is planned for this site. It is an operating sewer system, so it is not eligible for IRP funding.
RSA-030	CENTRAL OIL/WATER SEPARATOR	199102	On RCRA Permit as NFA
RSA-031	CENTRAL OIL/WATER SEPARATOR STORAGE TANK	199102	On RCRA Permit as NFA
RSA-033	PLATING ROOM FLOOR DRAINS, BLDG. 5432	199102	RSA-033 was transferred to the RCRA program and is listed as NFA in the RCRA permit. ADEM concurred with NFA on 26 Nov 2002.
RSA-034	WASTE AVIATION FUEL TEMP. STORAGE AREA	199102	RSA-034 was transferred to the RCRA program and is listed as NFA in the RCRA permit. ADEM concurred with NFA on 6 Dec 2004.
RSA-035	IN-GROUND OIL/WATER SEPARATOR, BLDG.4812	199102	On RCRA Permit as NFA
RSA-036	IN-GROUND OIL/WATER SEPARATOR, BLDG.4832	199102	RSA-036 was transferred to the RCRA program and is listed as NFA in the RCRA permit. ADEM concurred with NFA on 22 Jun 2005.
RSA-037	REMOVED USED OIL UST SITE, TANK #7846	199102	Site will be remediated under the CC Program
RSA-038	REMOVED USED OIL UST SITE, TANK #3240D	199606	DD signed by ADEM Jun 30 1996 for clean closure after underground used oil tank and piping were removed and the former tank vault was backfilled with clean soil.
RSA-039	REMOVED #2 FUEL OIL UST SITE, TANK #3338	199308	NFA under RCRA permit
RSA-040	REMOVED USED OIL UST SITE, TANK #3617	199603	DD signed by ADEM Mar 31 1996 for clean closure after underground used oil storage tank and piping were removed and the former tank vault was backfilled with clean soil.
RSA-041	REMOVED USED OIL UST SITE, TANK #3636	199207	NFA under RCRA permit
RSA-042	REMOVED O.W. SEP.STORAGE TANK #4812 SITE	199102	Site will be remediated under the CC Program
RSA-043	REMOVED USED OIL UST SITE, TANK #3665	199307	NFA under RCRA permit
RSA-044	REMOVED USED OIL UST SITE, TANK #5435B	199102	Site will be remediated under the CC

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
			Program
RSA-046	INACTIVE CHEMICAL MUNITION & DEMIL SITE	200409	RSA-046 is a former range operation on an operational range and is not eligible for either IRP or CC funding. A list in the Hazardous Waste Permit is being prepared to address sites located on ranges at such time as the range goes out of operation. The disposal trenches for this operation are being addressed under site RSA-281.
RSA-047	FORMER CHEMICAL TRAINING OPERATIONS	200709	RSA-047 had a No Action ROD signed in September 2007.
RSA-051	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA	201203	
RSA-052	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA	201203	
RSA-055	INACTIVE SANITARY & INDUSTRIAL LANDFILL	200202	
RSA-061	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA	201203	
RSA-062	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA	200202	RSA-62 and RSA-061 are one disposal area. RSA-062 is now RC and all work for the combined RSA-061/062 site is covered under RSA-061.
RSA-063	INACTIVE CHEMICAL MUNITION STORAGE AREA	201203	
RSA-064	INACTIVE MUNITION DEMIL & DISPOSAL AREA	201203	
RSA-066	INACTIVE ASH DISPOSAL SITE & DEMIL AREA	201203	
RSA-068	INACTIVE TOXIC CHEMICAL DISPOSAL AREA	201203	
RSA-070	FORMER CHEMICAL DRUM STORAGE AREA	200202	RSA-070 has been combined with RSA-069 as these adjacent sites were used for the same purposes.
RSA-071	HIGH EXPLOSIVE DROP TEST SITE AREA	199102	RSA-071 is in the RCRA program and is not eligible for either IRP or CC funding. A list in the Hazardous Waste Permit is being prepared to address sites located on ranges at such time as the range goes out of operation.
RSA-072	MORTAR SHELL TEST SITE AREA	199102	RSA-072 is in the RCRA program and is not eligible for either IRP or CC funding. A list in the Hazardous Waste Permit is being prepared to address sites located on ranges at such time as the range goes out of operation.
RSA-073	HIGH EXPLOSIVE IMPACT TEST SITE (WEST)	199102	RSA-073 is in the RCRA program and is not eligible for either IRP or CC funding. A list in the Hazardous Waste Permit is being prepared to address sites located on ranges at such time as the range goes out of operation.
RSA-074	HIGH EXPLOSIVE IMPACT TEST SITE (EAST)	199102	RSA-074 is in the RCRA program and is not eligible for either IRP or CC funding. A list in the Hazardous Waste Permit is being prepared to address sites located on ranges at such time as the range goes out of operation.

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
RSA-075	INACTIVE SOLID WASTE INCINERATOR	199102	NFA under RCRA permit
RSA-076	REMOVED RDX/HMX FILTRATION UNIT 1, NORTH	199102	NFA under RCRA permit
RSA-077	REMOVED RDX/HMX FILTRATION UNIT 2, SOUTH	199102	NFA under RCRA permit
RSA-078	FORMER RDX/HMX FILTER UNIT 1 SUMP, NORTH	199102	NFA under RCRA permit
RSA-079	FORMER RDX/HMX FILTER UNIT 2 SUMP, SOUTH	199102	NFA under RCRA permit
RSA-080	FORMER RDX/HMX SUSPEN.TRANSFER PAD/SUMP	199102	NFA under RCRA permit
RSA-081	REMOVED RDX/HMX CHARCOAL COLUMN DOLLY	199102	NFA under RCRA permit
RSA-082	FORMER SPARGE UNIT SITE, BLDG. 7595	200212	Combined with RSA-C
RSA-084	INACTIVE PROPELLANT WASTES STORAGE PAD	199708	Closure DD signed by USEPA and ADEM 1997 Oct 10
RSA-085	INACTIVE PROPELLANT WASTES STORAGE PAD	199102	RSA-085 was investigated under the RCRA program and received a NFA on the surface media. The site is to transfer to the CERCLA program for addressing the groundwater. This site is co-located with and will be combined with RSA-198.
RSA-086	INACTIVE PROPELLANT WASTES STORAGE PAD	199102	RSA-086 received an NFA from ADEM in Nov 2003 under the RCRA program.
RSA-089	INACTIVE PROPELLANT WASTES STORAGE PAD	200509	The groundwater contamination will be addressed as part of the remedial activities for RSA-97. The cost for perchlorate remediation at this site is included in the estimate for RSA-97.
RSA-090	INACTIVE PROPELLANT WASTES STORAGE PAD	199102	Based on the RFA report, soil and groundwater samples were not recommended to be collected.
RSA-091	INACTIVE PROPELLANT WASTES STORAGE PAD	199102	Based on the RFA report, soil and groundwater samples were not recommended to be collected.
RSA-092	INACTIVE PROPELLANT WASTES STORAGE PAD	199102	Based on the RFA report, soil and groundwater samples were not recommended to be collected.
RSA-093	FORMER RECLAIMED EMPTY DRUM STORAGE AREA	199102	Based on the RFA report, soil and groundwater samples were not recommended to be collected.
RSA-094	CHLORINATED-SOLVENT DISTILLATION UNIT 1	200909	PP and ROD were completed in 2009. A No Action remedy was approved, provided the building stays in place.
RSA-097	CHLORINATED-SOLVENT DISTILLATION UNIT 4	201209	
RSA-098	CHLORINATED-SOLVENT DISTILLATION UNIT 5	200509	Site determined to be not ER,A eligible. Being addressed under RSA-196.
RSA-099	ABANDONED PLATING SHOP TANKS & SUMPS	200409	RSA-099 received a No Action ROD signed by USEPA in Sept 2004. ADEM has allowed this site to be moved to the NFA table in the permit.
RSA-100	REMOVED ABOVE GROUND USED OIL TANK	199102	RSA-100 was transferred to the RCRA program and is listed in the NFA table in the permit.
RSA-101	ENCAPSULATED PESTICIDE CONTAM. SED. AREA	198803	Based on the RFA report, soil and groundwater samples were not recommended to be collected.

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
RSA-102	DISMANTLED PESTICIDE MFG. PLANT SITE	198803	Based on the RFA report, soil and groundwater samples were not recommended to be collected.
RSA-103	CAPPED PESTICIDE SETTLING LAGOON	198803	Based on the RFA report, soil and groundwater samples were not recommended to be collected.
RSA-104	ABANDONED ISP WASTE DISCHARGE LINE	200509	Combined into RSA-117
RSA-105	INACTIVE CLOSED DDT DRAINAGE DITCHES	198803	OLIN DDT
RSA-106	EARTHEN RETENTION DAMS FOR DDT MIGRATION	198803	Based on the RFA report, soil and groundwater samples were not recommended to be collected.
RSA-107	CLOSED DDT CONTAM.SOILS/DEBRIS LANDFILL	198303	Permit NFA
RSA-108	TEST RANGE 4 MISSILE IMPACT SITE	199708	Closure DD signed by USEPA and ADEM 1997 Oct 10
RSA-110	FORMER CHEMICAL DRUM STORAGE AREA	201203	
RSA-111	CONSTRUCTION DEBRIS	199102	Based on the RFA report, soil and groundwater samples were not recommended to be collected.
RSA-116	FORMER OPERATIONS AT SO. SIDE LAGOON	200212	Based upon the ongoing facility use, the site is not considered DERP eligible. A request has been forwarded to EPA/ADEM to remove this site from the CERCLA program. Approval from ADEM was granted on 4 Feb 03. The site is now being tracked as compliance response site CCSWMU-116
RSA-118	INACTIVE IND. DITCH & DISCHARGE LAGOON	200409	Response complete. This site has been included in RSA-117.
RSA-119	ISP INTERNATIONAL MANUFACTURING PLANT	199102	Tenant has own RCRA Permit
RSA-120	MATTHEWS CAVE AND RAVINE	199102	Permit NFA
RSA-121	PAINT SHOP/PAINT WASHOUT BOOTH, BLDG.4762	199102	Permit NFA
RSA-123	INACTIVE CEMENT PLANT SUMP	199102	Based on the RFA report, soil and groundwater samples were not recommended to be collected.
RSA-124	DISMANTLED CALGON WTP PROCESS EQUIPMENT	199102	Permit NFA
RSA-125	WASTE ACCUMULATION AREA, BLDG. 5477	199102	Permit NFA
RSA-127	PHOTO LAB WASTEWATER SUMP, BLDG. 5451	199102	Permit NFA
RSA-128	INACTIVE MUSTARD GAS DEMIL AREA	200202	Combined with RSA-112
RSA-129	FORMER BURN PAD & CAPPED WASHOUT PIT	200509	ORAP
RSA-130	INACTIVE PHOTOLAB SEPTIC TANK-BLDG.7345	199710	Removal action taken - NFA
RSA-131	ACTIVE OPEN DETONATION AREA	199102	RCRA Subpart X Permit
RSA-132	DISMANTLED & REMOVED POPPING FURNACE	200202	Combined into RSA-013
RSA-133	INACTIVE ROCKET WASHOUT RACK & SUMP	200202	Combined into RSA-013
RSA-141	4.2 INCH MORTAR DISPOSAL SITE, BLDG 4656	200803	Transferred to MMRP (RSA-141-R-01)
RSA-144	CHLORINATED-SOLVENT DISTILLATION UNIT 6	201209	
RSA-188	NORTHERN BURIAL AREA / BURNING GROU	201203	

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
RSA-189	MOTOR/OXIDIZER PREP FACILITIES	201203	
RSA-190	DISPOSAL/DRAINAGE AREA WEST OF ROP	201110	
RSA-196	TEST STAND AND CLEANING BUILDING	200909	The final ROD recommending No Action was signed in September 2008.
RSA-197	ROCKET MOTOR TEST STAND	201009	NFA anticipated by September 30, 2010
RSA-202	GRADED AREA NW OF ROP STORAGE	201209	
RSA-214	ROP LINE 6 AREA OPS FACILITY	201111	
RSA-223	CENTRAL RAILROAD CLASSIFICATION YD	200709	RSA-223 received concurrence letters from USEPA and ADEM on the Preliminary Risk Evaluation document and recommendation for NFA for this site.
RSA-224	CONTAINER STORAGE AREA	200809	Received concurrence letters from EPA and ADEM on the recommendation for NFA presented in the Expanded SI report.
RSA-229	FORMER PX SERVICE STATION	200810	Received concurrence for No Action based upon ARBCA submittals.
RSA-232	SMF #1 SERVICE STATION	200709	RSA-232 received concurrence for No Action based upon ARBCA submittals.
RSA-234	WASTE DISPOSAL PIT	200807	Transferred to MMRP (RSA-234-R-01)
RSA-235	BULK FUEL STORAGE FACILITY	200709	RSA-235 received concurrence for No Action based upon ARBCA submittals.
RSA-236	GRENADE PACKING AND ASSEMBLY	200809	Received concurrence letters from EPA and ADEM on the recommendation for NFA presented in the Expanded SI report.
RSA-249	INACTIVE OLD BONEYARD DISPOSAL SITE	200901	Transferred to MMRP (RSA-249-R-01)
RSA-281	DISPOSAL TRENCHES AT RSA-046 RANGE	201203	
RSA-B	ABANDONED ARMY PROPELLANT MFG.BLDG 7598	199708	Closure DD signed by USEPA and ADEM 1997 Oct 10
RSA-C	ABANDONED ARMY PROPELLANT MIXER BLDG.	201203	
RSA-D	FORMER CYANIDE-BASE PAINTING OPERATION	200809	Received concurrence letters from EPA and ADEM on the recommendation for NFA presented in the Expanded SI report.
RSA-E	FUEL OIL SPILL FROM TANK #5693	200212	Based upon the ongoing facility use, the site is not considered DERP eligible. A request has been forwarded to EPA/ADEM to remove this site from the CERCLA program. Approval from ADEM was granted on 4 Feb 03. The site is now being tracked as compliance response site CCSWMU-E.
RSA-F	FORMER OPERATIONS AT OPEN STORAGE YARD	200212	Based upon the ongoing facility use, the site is not considered DERP eligible. A request has been forwarded to EPA/ADEM to remove this site from the CERCLA program. Approval from ADEM was granted on 4 Feb 03. USEPA has unofficially concurred and formal confirmation is forthcoming. The site is now being tracked as compliance response site CCSWMU-F.

# IRP Schedule

Date of IRP Inception: 197710

## Past Phase Completion Milestones

### 1978

RFA (RSA-101 - ENCAPSULATED PESTICIDE CONTAM. SED. AREA, RSA-102 - DISMANTLED PESTICIDE MFG. PLANT SITE, RSA-103 - CAPPED PESTICIDE SETTLING LAGOON, RSA-105 - INACTIVE CLOSED DDT DRAINAGE DITCHES, RSA-106 - EARTHEN RETENTION DAMS FOR DDT MIGRATION)

### 1979

CS (RSA-102 - DISMANTLED PESTICIDE MFG. PLANT SITE, RSA-103 - CAPPED PESTICIDE SETTLING LAGOON, RSA-105 - INACTIVE CLOSED DDT DRAINAGE DITCHES, RSA-106 - EARTHEN RETENTION DAMS FOR DDT MIGRATION)

### 1981

RFA (RSA-107 - CLOSED DDT CONTAM.SOILS/DEBRIS LANDFILL)

### 1982

CMI(C) (RSA-107 - CLOSED DDT CONTAM.SOILS/DEBRIS LANDFILL)

### 1987

CMI(C) (RSA-101 - ENCAPSULATED PESTICIDE CONTAM. SED. AREA, RSA-102 - DISMANTLED PESTICIDE MFG. PLANT SITE, RSA-103 - CAPPED PESTICIDE SETTLING LAGOON, RSA-105 - INACTIVE CLOSED DDT DRAINAGE DITCHES, RSA-106 - EARTHEN RETENTION DAMS FOR DDT MIGRATION)

### 1989

RFA (RSA-005 - INACTIVE WASTE ACCUMULATION AREA, RSA-083 - INACTIVE SPRAY PAINT BOOTH SUMP, RSA-109 - FORMER CHEMICAL MUNITIONS STAGING AREA, RSA-114 - INACTIVE MADKIN MOUNTAIN ROCK QUARRY, RSA-117 - FORMER LIQUID CAUSTIC MFG. PLANT SITE, RSA-122 - DISMANTLED LEWISITE MFG. PLANTS SITE, RSA-134 - INACTIVE DISPOSAL TRENCH & BURN PIT, RSA-139 - CAPPED ARSENIC WASTE POND-NORTH)  
PA (RSA-129 - FORMER BURN PAD & CAPPED WASHOUT PIT)

### 1990

RFA (MSFC-027 - INACTIVE WASTE ACCUMULATION AREA, MSFC-034 - FORMER CHEMICAL PRODUCTION AREA, MSFC-035 - INACTIVE SUMP/TILED DRAIN FIELD-EAST TA, MSFC-053 - FORMER PROPELLANT STORAGE AREA, MSFC-055 - DISMANTLED STAUFFER CHEM.MFG. PLANT SITE, RSA-001 - FOX ARMY COMMUNITY HOSPITAL INCINERATOR, RSA-002 - IN-GROUND OIL/WATER SEPARATOR, BLDG.3338, RSA-003 - IN-GROUND OIL/WATER SEPARATOR, BLDG.3617, RSA-004 - IN-GROUND OIL/WATER SEPARATOR & WASHRACK, RSA-006 - PAINT SHOP & SUMPS BLDG 3634 MOTOR POOL, RSA-007 - HAZARDOUS WASTE STORAGE AREA, BLDG. 3775, RSA-010 - CLOSED UNLINED SANITARY LANDFILL, RSA-012 - ACTIVE OPEN BURN PANS, RSA-013 - UNLINED INACTIVE OPEN BURN PADS, RSA-014 - UNLINED INACTIVE BURN TRENCHES, RSA-015 - HAZARDOUS WASTE STORAGE IGLOO, NO. 1, RSA-016 - HAZARDOUS WASTE STORAGE IGLOO, NO. 2, RSA-017 - HAZARDOUS WASTE STORAGE IGLOO, NO. 3, RSA-018 - HAZARDOUS WASTE STORAGE IGLOO, NO. 4, RSA-019 - HAZARDOUS WASTE STORAGE IGLOO, NO. 5, RSA-020 - HAZARDOUS WASTE STORAGE IGLOO, NO. 6, RSA-021 - HAZARDOUS WASTE STORAGE IGLOO, NO. 7, RSA-022 - HAZARDOUS WASTE STORAGE IGLOO, NO. 8, RSA-023 - HAZARDOUS WASTE STORAGE IGLOO, NO. 9, RSA-024 - HAZ. WASTE VACANT STORAGE IGLOO, NO. 10, RSA-025 - HAZ. WASTE VACANT STORAGE IGLOO, NO. 11, RSA-026 - HAZ. WASTE VACANT STORAGE IGLOO, NO. 12, RSA-027 - HAZ. WASTE VACANT STORAGE IGLOO, NO. 13, RSA-028 - IN-GROUND OIL/WATER SEPARATOR, 5693 AREA, RSA-029 - REDSTONE ARSENAL SANITARY SEWER SYSTEM, RSA-030 - CENTRAL OIL/WATER SEPARATOR, RSA-031 - CENTRAL OIL/WATER SEPARATOR STORAGE TANK, RSA-032 - INACTIVE SCRAP METAL STORAGE AREA, RSA-033 - PLATING ROOM FLOOR DRAINS, BLDG. 5432, RSA-034 - WASTE AVIATION FUEL TEMP. STORAGE AREA, RSA-035 - IN-GROUND OIL/WATER SEPARATOR, BLDG.4812, RSA-036 - IN-GROUND OIL/WATER SEPARATOR, BLDG.4832, RSA-042 - REMOVED O.W. SEP.STORAGE TANK #4812 SITE, RSA-044 - REMOVED USED OIL UST SITE, TANK #5435B, RSA-045 - SMOKE MUNITIONS PLANT 3, RSA-048 - INACTIVE CLOSED SANITARY LANDFILL, RSA-049 - CAPPED ARSENIC WASTE LAGOONS-WEST, RSA-050 - INACTIVE MUNITIONS DEMIL & DISPOSAL AREA, RSA-051 - INACTIVE MUNITIONS DEMIL & DISPOSAL AREA, RSA-052 - INACTIVE MUNITIONS DEMIL & DISPOSAL AREA, RSA-053 - INACTIVE SANITARY & INDUSTRIAL LANDFILL, RSA-054 - INACTIVE SANITARY & INDUSTRIAL LANDFILL, RSA-056 - CAPPED ARSENIC WASTE PONDS-SOUTH, RSA-057 - INACTIVE ARSENIC WASTE LAGOON-EAST,

RSA-058 - INACTIVE CLOSED RUBBLE FILL & WASTE PILE, RSA-059 - INACTIVE CLOSED CONSTRUCTION RUBBLE FILL, RSA-060 - INACTIVE SANITARY & INDUSTRIAL LANDFILL, RSA-061 - INACTIVE MUNITIONS DEMIL & DISPOSAL AREA, RSA-062 - INACTIVE MUNITIONS DEMIL & DISPOSAL AREA, RSA-063 - INACTIVE CHEMICAL MUNITION STORAGE AREA, RSA-064 - INACTIVE MUNITION DEMIL & DISPOSAL AREA, RSA-065 - FORMER CHEMICAL DRUM STORAGE AREA, RSA-066 - INACTIVE ASH DISPOSAL SITE & DEMIL AREA, RSA-067 - FORMER CHEMICAL DRUM STORAGE AREA, RSA-068 - INACTIVE TOXIC CHEMICAL DISPOSAL AREA, RSA-069 - FORMER CHEMICAL DRUM STORAGE AREA, RSA-070 - FORMER CHEMICAL DRUM STORAGE AREA, RSA-071 - HIGH EXPLOSIVE DROP TEST SITE AREA, RSA-072 - MORTAR SHELL TEST SITE AREA, RSA-073 - HIGH EXPLOSIVE IMPACT TEST SITE (WEST), RSA-074 - HIGH EXPLOSIVE IMPACT TEST SITE (EAST), RSA-075 - INACTIVE SOLID WASTE INCINERATOR, RSA-076 - REMOVED RDX/HMX FILTRATION UNIT 1, NORTH, RSA-077 - REMOVED RDX/HMX FILTRATION UNIT 2, SOUTH, RSA-078 - FORMER RDX/HMX FILTER UNIT 1 SUMP, NORTH, RSA-079 - FORMER RDX/HMX FILTER UNIT 2 SUMP, SOUTH, RSA-080 - FORMER RDX/HMX SUSPEN.TRANSFER PAD/SUMP, RSA-081 - REMOVED RDX/HMX CHARCOAL COLUMN DOLLY, RSA-085 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-086 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-087 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-088 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-090 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-091 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-092 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-093 - FORMER RECLAIMED EMPTY DRUM STORAGE AREA, RSA-095 - CHLORINATED-SOLVENT DISTILLATION UNIT 2, RSA-096 - CHLORINATED-SOLVENT DISTILLATION UNIT 3, RSA-097 - CHLORINATED-SOLVENT DISTILLATION UNIT 4, RSA-100 - REMOVED ABOVE GROUND USED OIL TANK, RSA-110 - FORMER CHEMICAL DRUM STORAGE AREA, RSA-111 - CONSTRUCTION DEBRIS, RSA-112 - FORMER DEMILITARIZATION & DISPOSAL SITE, RSA-113 - INACTIVE DISPOSAL TRENCHES & BURN PITS, RSA-115 - INACTIVE EAST SIDE BLOWDOWN LAGOON, RSA-119 - ISP INTERNATIONAL MANUFACTURING PLANT, RSA-120 - MATTHEWS CAVE AND RAVINE, RSA-121 - PAINT SHOP/PAINT WASHOUT BOOTH, BLD.4762, RSA-123 - INACTIVE CEMENT PLANT SUMP, RSA-124 - DISMANTLED CALGON WTP PROCESS EQUIPMENT, RSA-125 - WASTE ACCUMULATION AREA, BLDG. 5477, RSA-126 - INACTIVE OPEN BURN TRENCH, RSA-127 - PHOTO LAB WASTEWATER SUMP, BLDG. 5451, RSA-135H - INACTIVE SUMP FOR 1.1 PROPELLANT WASTES, RSA-138M - INACTIVE TEMPORARY STORAGE AREA, RSA-183 - FORMER LEWISITE PRODUCTION FACILITY, RSA-A - INACTIVE PROPELLANT STORAGE WELLS, RSA-C - ABANDONED ARMY PROPELLANT MIXER BLDG.)

PA (MSFC-002 - INACTIVE ABANDONED DRUM DISPOSAL SITE, MSFC-003 - INACTIVE OLD BONE YARD DISPOSAL SITE, MSFC-060 - INACTIVE DELUGE WATER DRAINAGE SYS., MSFC-065 - FORMER PESTICIDE STORAGE SURFACE DRAIN, MSFC-074 - INACTIVE DISPOSAL SITE, MSFC-077 - INACTIVE OPEN BURNING/DISPOSAL PITS, MSFC-082 - INACTIVE CHEM.MUNTS.DEMIL/DISP. TRENCHES, MSFC-D - FORMER FUEL OIL STORAGE CONTAINMENT BERM, RSA-008 - INACTIVE SEWAGE TREATMENT PLANT 4, RSA-009 - INACTIVE SEWAGE TREATMENT PLANT NO. 3, RSA-011 - INACTIVE SEWAGE TREATMENT PLANT NO. 1, RSA-046 - INACTIVE CHEMICAL MUNITION & DEMIL SITE, RSA-047 - FORMER CHEMICAL TRAINING OPERATIONS, RSA-055 - INACTIVE SANITARY & INDUSTRIAL LANDFILL, RSA-082 - FORMER SPARGE UNIT SITE, BLDG. 7595, RSA-084 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-089 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-094 - CHLORINATED-SOLVENT DISTILLATION UNIT 1, RSA-098 - CHLORINATED-SOLVENT DISTILLATION UNIT 5, RSA-099 - ABANDONED PLATING SHOP TANKS & SUMPS, RSA-104 - ABANDONED ISP WASTE DISCHARGE LINE, RSA-108 - TEST RANGE 4 MISSILE IMPACT SITE, RSA-116 - FORMER OPERATIONS AT SO. SIDE LAGOON, RSA-118 - INACTIVE IND. DITCH & DISCHARGE LAGOON, RSA-128 - INACTIVE MUSTARD GAS DEMIL AREA, RSA-130 - INACTIVE PHOTOLAB SEPTIC TANK-BLDG.7345, RSA-131 - ACTIVE OPEN DETONATION AREA, RSA-132 - DISMANTLED & REMOVED POPPING FURNACE, RSA-133 - INACTIVE ROCKET WASHOUT RACK & SUMP, RSA-B - ABANDONED ARMY PROPELLANT MFG.BLDG 7598, RSA-D - FORMER CYANIDE-BASE PAINTING OPERATION, RSA-E - FUEL OIL SPILL FROM TANK #5693, RSA-F - FORMER OPERATIONS AT OPEN STORAGE YARD)

CS (RSA-050 - INACTIVE MUNITIONS DEMIL & DISPOSAL AREA, RSA-052 - INACTIVE MUNITIONS DEMIL & DISPOSAL AREA, RSA-061 - INACTIVE MUNITIONS DEMIL & DISPOSAL AREA, RSA-062 - INACTIVE

## IRP Schedule

	MUNITIONS DEMIL & DISPOSAL AREA, RSA-063 - INACTIVE CHEMICAL MUNITION STORAGE AREA, RSA-117 - FORMER LIQUID CAUSTIC MFG. PLANT SITE, RSA-134 - INACTIVE DISPOSAL TRENCH & BURN PIT)
ISC	(RSA-037 - REMOVED USED OIL UST SITE, TANK #7846, RSA-038 - REMOVED USED OIL UST SITE, TANK #3240D, RSA-039 - REMOVED #2 FUEL OIL UST SITE, TANK #3338, RSA-040 - REMOVED USED OIL UST SITE, TANK #3617, RSA-041 - REMOVED USED OIL UST SITE, TANK #3636, RSA-043 - REMOVED USED OIL UST SITE, TANK #3665)
SI	(RSA-129 - FORMER BURN PAD & CAPPED WASHOUT PIT, RSA-132 - DISMANTLED & REMOVED POPPING FURNACE, RSA-133 - INACTIVE ROCKET WASHOUT RACK & SUMP)
<b>1991</b>	
SI	(RSA-116 - FORMER OPERATIONS AT SO. SIDE LAGOON)
CS	(RSA-013 - UNLINED INACTIVE OPEN BURN PADS, RSA-014 - UNLINED INACTIVE BURN TRENCHES, RSA-066 - INACTIVE ASH DISPOSAL SITE & DEMIL AREA, RSA-115 - INACTIVE EAST SIDE BLOWDOWN LAGOON)
RFA	(RSA-145 - GROUNDWATER UNIT GW-01, RSA-146 - GROUNDWATER UNIT GW-02, RSA-147 - GROUNDWATER UNIT GW-03, RSA-148 - GROUNDWATER UNIT GW-04, RSA-149 - GROUNDWATER UNIT GW-05, RSA-151 - GROUNDWATER UNIT GW-07, RSA-152 - GROUNDWATER UNIT GW-08, RSA-156 - GROUNDWATER UNIT GW-12)
<b>1992</b>	
PA	(RSA-140 - INACTIVE DISPOSAL AREA , RSA-141 - 4.2 INCH MORTAR DISPOSAL SITE, BLDG 4656)
RFA	(RSA-142 - CHLORINATED-SOLVENT SPILL AREA)
IMP(C)	(RSA-041 - REMOVED USED OIL UST SITE, TANK #3636)
<b>1993</b>	
SI	(RSA-055 - INACTIVE SANITARY & INDUSTRIAL LANDFILL, RSA-140 - INACTIVE DISPOSAL AREA )
CS	(RSA-010 - CLOSED UNLINED SANITARY LANDFILL, RSA-053 - INACTIVE SANITARY & INDUSTRIAL LANDFILL, RSA-054 - INACTIVE SANITARY & INDUSTRIAL LANDFILL, RSA-056 - CAPPED ARSENIC WASTE PONDS-SOUTH, RSA-059 - INACTIVE CLOSED CONSTRUCTION RUBBLE FILL, RSA-060 - INACTIVE SANITARY & INDUSTRIAL LANDFILL, RSA-068 - INACTIVE TOXIC CHEMICAL DISPOSAL AREA, RSA-122 - DISMANTLED LEWISITE MFG. PLANTS SITE, RSA-139 - CAPPED ARSENIC WASTE POND-NORTH)
IMP(C)	(RSA-039 - REMOVED #2 FUEL OIL UST SITE, TANK #3338, RSA-043 - REMOVED USED OIL UST SITE, TANK #3665)
<b>1994</b>	
ISC	(RSA-143 - UNDERGROUND STORAGE TANK SPILL SITE)
CS	(RSA-058 - INACTIVE CLOSED RUBBLE FILL & WASTE PILE)
<b>1995</b>	
SI	(RSA-130 - INACTIVE PHOTOLAB SEPTIC TANK-BLDG.7345)
CS	(RSA-048 - INACTIVE CLOSED SANITARY LANDFILL, RSA-057 - INACTIVE ARSENIC WASTE LAGOON-EAST, RSA-067 - FORMER CHEMICAL DRUM STORAGE AREA, RSA-113 - INACTIVE DISPOSAL TRENCHES & BURN PITS, RSA-142 - CHLORINATED-SOLVENT SPILL AREA)
<b>1996</b>	
IMP(C)	(RSA-038 - REMOVED USED OIL UST SITE, TANK #3240D, RSA-040 - REMOVED USED OIL UST SITE, TANK #3617)
RFA	(RSA-144 - CHLORINATED-SOLVENT DISTILLATION UNIT 6)
INV	(RSA-143 - UNDERGROUND STORAGE TANK SPILL SITE)
SI	(RSA-047 - FORMER CHEMICAL TRAINING OPERATIONS, RSA-094 - CHLORINATED-SOLVENT DISTILLATION UNIT 1, RSA-098 - CHLORINATED-SOLVENT DISTILLATION UNIT 5, RSA-118 - INACTIVE IND. DITCH & DISCHARGE LAGOON, RSA-128 - INACTIVE MUSTARD GAS DEMIL AREA, RSA-D - FORMER CYANIDE-BASE PAINTING OPERATION)

## IRP Schedule

CS	(RSA-005 - INACTIVE WASTE ACCUMULATION AREA, RSA-049 - CAPPED ARSENIC WASTE LAGOONS-WEST, RSA-051 - INACTIVE MUNITIONS DEMIL & DISPOSAL AREA, RSA-095 - CHLORINATED-SOLVENT DISTILLATION UNIT 2, RSA-096 - CHLORINATED-SOLVENT DISTILLATION UNIT 3, RSA-097 - CHLORINATED-SOLVENT DISTILLATION UNIT 4, RSA-112 - FORMER DEMILITARIZATION & DISPOSAL SITE, RSA-114 - INACTIVE MADKIN MOUNTAIN ROCK QUARRY, RSA-126 - INACTIVE OPEN BURN TRENCH, RSA-183 - FORMER LEWISITE PRODUCTION FACILITY)
<b>1997</b>	
SI	(RSA-046 - INACTIVE CHEMICAL MUNITION & DEMIL SITE, RSA-084 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-104 - ABANDONED ISP WASTE DISCHARGE LINE, RSA-108 - TEST RANGE 4 MISSILE IMPACT SITE, RSA-141 - 4.2 INCH MORTAR DISPOSAL SITE, BLDG 4656, RSA-B - ABANDONED ARMY PROPELLANT MFG.BLDG 7598)
RI/FS	(RSA-130 - INACTIVE PHOTOLAB SEPTIC TANK-BLDG.7345)
CS	(RSA-032 - INACTIVE SCRAP METAL STORAGE AREA, RSA-065 - FORMER CHEMICAL DRUM STORAGE AREA, RSA-144 - CHLORINATED-SOLVENT DISTILLATION UNIT 6, RSA-145 - GROUNDWATER UNIT GW-01, RSA-146 - GROUNDWATER UNIT GW-02, RSA-147 - GROUNDWATER UNIT GW-03, RSA-148 - GROUNDWATER UNIT GW-04, RSA-149 - GROUNDWATER UNIT GW-05, RSA-151 - GROUNDWATER UNIT GW-07, RSA-152 - GROUNDWATER UNIT GW-08, RSA-156 - GROUNDWATER UNIT GW-12)
<b>1998</b>	
CS	(MSFC-027 - INACTIVE WASTE ACCUMULATION AREA, RSA-064 - INACTIVE MUNITION DEMIL & DISPOSAL AREA, RSA-069 - FORMER CHEMICAL DRUM STORAGE AREA, RSA-070 - FORMER CHEMICAL DRUM STORAGE AREA, RSA-110 - FORMER CHEMICAL DRUM STORAGE AREA)
RA(C)	(RSA-130 - INACTIVE PHOTOLAB SEPTIC TANK-BLDG.7345)
SI	(RSA-008 - INACTIVE SEWAGE TREATMENT PLANT 4, RSA-009 - INACTIVE SEWAGE TREATMENT PLANT NO. 3)
RD	(RSA-130 - INACTIVE PHOTOLAB SEPTIC TANK-BLDG.7345)
<b>1999</b>	
CS	(MSFC-034 - FORMER CHEMICAL PRODUCTION AREA, MSFC-053 - FORMER PROPELLANT STORAGE AREA, MSFC-055 - DISMANTLED STAUFFER CHEM.MFG. PLANT SITE, RSA-045 - SMOKE MUNITIONS PLANT 3, RSA-087 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-088 - INACTIVE PROPELLANT WASTES STORAGE PAD)
SI	(MSFC-002 - INACTIVE ABANDONED DRUM DISPOSAL SITE, MSFC-060 - INACTIVE DELUGE WATER DRAINAGE SYS., MSFC-065 - FORMER PESTICIDE STORAGE SURFACE DRAIN, MSFC-074 - INACTIVE DISPOSAL SITE, RSA-089 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-099 - ABANDONED PLATING SHOP TANKS & SUMPS, RSA-E - FUEL OIL SPILL FROM TANK #5693, RSA-F - FORMER OPERATIONS AT OPEN STORAGE YARD)
<b>2000</b>	
SI	(MSFC-077 - INACTIVE OPEN BURNING/DISPOSAL PITS, RSA-011 - INACTIVE SEWAGE TREATMENT PLANT NO. 1, RSA-082 - FORMER SPARGE UNIT SITE, BLDG. 7595)
<b>2001</b>	
CS	(RSA-138M - INACTIVE TEMPORARY STORAGE AREA)
SI	(MSFC-003 - INACTIVE OLD BONE YARD DISPOSAL SITE , MSFC-082 - INACTIVE CHEM.MUNTS.DEMIL/DISP. TRENCHES, MSFC-D - FORMER FUEL OIL STORAGE CONTAINMENT BERM)
<b>2002</b>	
RFI/CMS	(RSA-062 - INACTIVE MUNITIONS DEMIL & DISPOSAL AREA, RSA-070 - FORMER CHEMICAL DRUM STORAGE AREA)
RI/FS	(RSA-055 - INACTIVE SANITARY & INDUSTRIAL LANDFILL, RSA-128 - INACTIVE MUSTARD GAS DEMIL AREA, RSA-132 - DISMANTLED & REMOVED POPPING FURNACE, RSA-133 - INACTIVE ROCKET WASHOUT RACK & SUMP)
<b>2003</b>	
RI/FS	(RSA-008 - INACTIVE SEWAGE TREATMENT PLANT 4, RSA-009 - INACTIVE SEWAGE TREATMENT PLANT NO. 3, RSA-116 - FORMER OPERATIONS AT SO. SIDE LAGOON, RSA-E - FUEL OIL SPILL FROM

## IRP Schedule

TANK #5693, RSA-F - FORMER OPERATIONS AT OPEN STORAGE YARD)

### 2004

PA (RSA-223 - CENTRAL RAILROAD CLASSIFICATION YD, RSA-224 - CONTAINER STORAGE AREA, RSA-234 - WASTE DISPOSAL PIT, RSA-236 - GRENADE PACKING AND ASSEMBLY)

CAP (RSA-143 - UNDERGROUND STORAGE TANK SPILL SITE)

IMP(C) (RSA-143 - UNDERGROUND STORAGE TANK SPILL SITE)

RFA (RSA-150 - GROUNDWATER UNIT 06, RSA-153 - GROUNDWATER UNIT 09, RSA-154 - GROUNDWATER UNIT 10, RSA-155 - GROUNDWATER UNIT 11, RSA-157 - GROUNDWATER UNIT 13, RSA-187 - NORTHERN THIOKOL MIXING FACILITY, RSA-188 - NORTHERN BURIAL AREA / BURNING GROU, RSA-189 - MOTOR/OXIDIZER PREP FACILITIES, RSA-190 - DISPOSAL/DRAINAGE AREA WEST OF ROP , RSA-191 - ROP LINE 1 SERVICE FACILITIES, RSA-192 - TETRYL AND IGNITER PROCESSING (ROP , RSA-193 - THIOKOL IGNITER PREPARATION FACILIT, RSA-194 - PHYSICAL TEST LABORATORY & STORAGE, RSA-195 - THIOKOL PROPELLANT MIX FACILITY #1, RSA-196 - TEST STAND AND CLEANING BUILDING, RSA-197 - ROCKET MOTOR TEST STAND, RSA-198 - THIOKOL EQUIPMENT/TOOL CLEANING FAC, RSA-199 - THIOKOL PROPELLANT MIX FACILITY #2, RSA-200 - ROP LINE 5 AREA OPERATIONS FACILITY, RSA-201 - THIOKOL RESEARCH LABORATORY, RSA-202 - GRADED AREA NW OF ROP STORAGE, RSA-203 - IGLOO AREA LOADING DOCK, RSA-204 - THIOKOL OXIDIZER FACILITY, RSA-205 - PHOTO LAB & MOTOR SERVICE FACILITY, RSA-206 - PROPELLANT MIXING FACILITY #2 & C, RSA-207 - ROHM & HAAS GORGAS LABORATORY, RSA-208 - SOUTH PLANT TESTING FACILITIES, RSA-209 - PROPELLANT CRUSHING/GRINDING & FUZE, RSA-210 - NITROGLYCERINE WASH HOUSE, RSA-211 - SOUTH PLANT STORAGE MAGAZINES, RSA-212 - PROPELLANT DRY HOUSES, RSA-213 - ROP LINE 4 AREA OPS FACILITY, RSA-214 - ROP LINE 6 AREA OPS FACILITY, RSA-215 - RSA-146 HISTORIC SERVICE FACILITIES, RSA-217 - INERT STORAGE WAREHOUSE FACILITIES, RSA-218 - DRMO OPEN STORAGE AREA, RSA-219 - CHEMICAL STORAGE AREA IN SALVAGE YD, RSA-220 - CONSTRUCTION MATERIAL STORAGE YARD, RSA-225 - FUSE MODIFICATION LINE 7, RSA-226 - OPEN STORAGE 54-2, RSA-227 - INACTIVE WASHRACK, RSA-228 - SEWAGE TREATMENT PLANT 2, RSA-230 - ABANDONED RUBBLE PILE, RSA-231 - SMF #1 MIXING & PREP FACILITIES, RSA-233 - SMF#2 MIXING AND PREPARATION FACILI, RSA-237 - PROPELLANT CUTTING AND DRYING, RSA-238 - HVA PLANT #2 MUSTARD LINES 5 & 6, RSA-239 - LINE # 1 BOILER HOUSE, RSA-249 - INACTIVE OLD BONEYARD DISPOSAL SITE, RSA-250 - FORMER STORAGE WAREHOUSE BLDG 778, RSA-252 - INCENDIARY BOMB FACILITY PLANT 2 , RSA-255 - MANGANESE ORE STORAGE AREA N. of RS, RSA-258 - FORMER PAINT SPRAY BUILDING 7862, RSA-261 - LANCE MISSILE CONDITIONING FACILITY, RSA-262 - CWS WAREHOUSE AREA BLDGS 8021-8027, RSA-263 - CWS MOTORPOOL(B 8017)/CHANGE HOUSE, RSA-265 - GASOLINE DRUM STORAGE AREA, RSA-269 - FORMER UST, BUILDING 7852, RSA-272 - FORMER UST FOR BOILER UNIT BLD 7650, RSA-273 - PROPELLANT CONDITIONING AND MOTOR C, RSA-274 - PHYSICS LABORATORY & HIGH EXPLOSIVES, RSA-275 - FORMER FILM PROCESSING LABORATORY , RSA-281 - DISPOSAL TRENCHES AT RSA-046 RANGE)

RI/FS (MSFC-082 - INACTIVE CHEM.MUNTS.DEMIL/DISP. TRENCHES, MSFC-D - FORMER FUEL OIL STORAGE CONTAINMENT BERM, RSA-046 - INACTIVE CHEMICAL MUNITION & DEMIL SITE, RSA-099 - ABANDONED PLATING SHOP TANKS & SUMPS, RSA-118 - INACTIVE IND. DITCH & DISCHARGE LAGOON)

ISC (RSA-232 - SMF #1 SERVICE STATION, RSA-235 - BULK FUEL STORAGE FACILITY)

### 2005

RI/FS (RSA-089 - INACTIVE PROPELLANT WASTES STORAGE PAD, RSA-098 - CHLORINATED-SOLVENT DISTILLATION UNIT 5, RSA-104 - ABANDONED ISP WASTE DISCHARGE LINE, RSA-129 - FORMER BURN PAD & CAPPED WASHOUT PIT)

CS (RSA-188 - NORTHERN BURIAL AREA / BURNING GROU, RSA-194 - PHYSICAL TEST LABORATORY & STORAGE, RSA-195 - THIOKOL PROPELLANT MIX FACILITY #1, RSA-196 - TEST STAND AND CLEANING BUILDING, RSA-198 - THIOKOL EQUIPMENT/TOOL CLEANING FAC, RSA-200 - ROP LINE 5 AREA OPERATIONS FACILITY, RSA-226 - OPEN STORAGE 54-2, RSA-227 - INACTIVE WASHRACK, RSA-230 - ABANDONED RUBBLE PILE, RSA-231 - SMF #1 MIXING & PREP FACILITIES, RSA-238 - HVA PLANT #2 MUSTARD LINES 5 & 6, RSA-252 - INCENDIARY BOMB FACILITY PLANT 2 , RSA-262 - CWS

## IRP Schedule

RFA	WAREHOUSE AREA BLDGS 8021-8027, RSA-281 - DISPOSAL TRENCHES AT RSA-046 RANGE) (PBCatRedstone - FY05 PBC, RSA-271 - FORMER BOILER HOUSE, BUILDING 7729, RSA-276 - FORMER BOILER HOUSE, BLDG 7362)
ISC	(RSA-229 - FORMER PX SERVICE STATION, RSA-253 - UTILITY/FLAMMABLE MATERIALS STORAGE)
<b>2006</b>	
RI/FS	(MSFC-074 - INACTIVE DISPOSAL SITE)
<b>2007</b>	
RI/FS	(MSFC-002 - INACTIVE ABANDONED DRUM DISPOSAL SITE, RSA-011 - INACTIVE SEWAGE TREATMENT PLANT NO. 1, RSA-047 - FORMER CHEMICAL TRAINING OPERATIONS)
CAP	(RSA-229 - FORMER PX SERVICE STATION)
CS	(RSA-150 - GROUNDWATER UNIT 06, RSA-153 - GROUNDWATER UNIT 09, RSA-154 - GROUNDWATER UNIT 10, RSA-155 - GROUNDWATER UNIT 11)
RFI/CMS	(RSA-049 - CAPPED ARSENIC WASTE LAGOONS-WEST, RSA-057 - INACTIVE ARSENIC WASTE LAGOON-EAST)
INV	(RSA-229 - FORMER PX SERVICE STATION, RSA-232 - SMF #1 SERVICE STATION, RSA-235 - BULK FUEL STORAGE FACILITY)
SI	(RSA-223 - CENTRAL RAILROAD CLASSIFICATION YD)
IRA	(MSFC-002 - INACTIVE ABANDONED DRUM DISPOSAL SITE)
<b>2008</b>	
IMP(C)	(RSA-229 - FORMER PX SERVICE STATION)
SI	(RSA-224 - CONTAINER STORAGE AREA, RSA-234 - WASTE DISPOSAL PIT, RSA-236 - GRENADE PACKING AND ASSEMBLY)
IRA	(RSA-252 - INCENDIARY BOMB FACILITY PLANT 2 )
CMI(C)	(RSA-049 - CAPPED ARSENIC WASTE LAGOONS-WEST, RSA-057 - INACTIVE ARSENIC WASTE LAGOON-EAST)
CS	(RSA-157 - GROUNDWATER UNIT 13)
RI/FS	(MSFC-077 - INACTIVE OPEN BURNING/DISPOSAL PITS, RSA-141 - 4.2 INCH MORTAR DISPOSAL SITE, BLDG 4656, RSA-D - FORMER CYANIDE-BASE PAINTING OPERATION)
<b>2009</b>	
RFI/CMS	(RSA-056 - CAPPED ARSENIC WASTE PONDS-SOUTH, RSA-122 - DISMANTLED LEWISITE MFG. PLANTS SITE, RSA-139 - CAPPED ARSENIC WASTE POND-NORTH, RSA-183 - FORMER LEWISITE PRODUCTION FACILITY, RSA-196 - TEST STAND AND CLEANING BUILDING, RSA-200 - ROP LINE 5 AREA OPERATIONS FACILITY)
IMP(O)	(RSA-229 - FORMER PX SERVICE STATION)
CMI(C)	(RSA-056 - CAPPED ARSENIC WASTE PONDS-SOUTH, RSA-139 - CAPPED ARSENIC WASTE POND-NORTH)
CS	(RSA-187 - NORTHERN THIOKOL MIXING FACILITY, RSA-189 - MOTOR/OXIDIZER PREP FACILITIES, RSA-190 - DISPOSAL/DRAINAGE AREA WEST OF ROP , RSA-191 - ROP LINE 1 SERVICE FACILITIES, RSA-192 - TETRYL AND IGNITER PROCESSING (ROP , RSA-193 - THIOKOL IGNITER PREPARATION FACILIT, RSA-199 - THIOKOL PROPELLANT MIX FACILITY #2, RSA-201 - THIOKOL RESEARCH LABORATORY, RSA-202 - GRADED AREA NW OF ROP STORAGE, RSA-203 - IGLOO AREA LOADING DOCK, RSA-204 - THIOKOL OXIDIZER FACILITY, RSA-205 - PHOTO LAB & MOTOR SERVICE FACILITY, RSA-206 - PROPELLANT MIXING FACILITY #2 & C, RSA-207 - ROHM & HAAS GORGAS LABORATORY, RSA-208 - SOUTH PLANT TESTING FACILITIES, RSA-209 - PROPELLANT CRUSHING/GRINDING & FUZE, RSA-210 - NITROGLYCERINE WASH HOUSE, RSA-211 - SOUTH PLANT STORAGE MAGAZINES, RSA-212 - PROPELLANT DRY HOUSES, RSA-213 - ROP LINE 4 AREA OPS FACILITY, RSA-215 - RSA-146 HISTORIC SERVICE FACILITIES, RSA-233 - SMF#2 MIXING AND PREPARATION FACILI, RSA-237 - PROPELLANT CUTTING AND DRYING, RSA-239 - LINE # 1 BOILER HOUSE, RSA-249 - INACTIVE OLD BONEYARD DISPOSAL SITE, RSA-255 - MANGANESE ORE STORAGE AREA N. of RS, RSA-273 - PROPELLANT CONDITIONING AND MOTOR C, RSA-274 - PHYSICS LABORATORY &HIGH EXPLOSIVES,

RSA-A - INACTIVE PROPELLANT STORAGE WELLS, RSA-C - ABANDONED ARMY PROPELLANT MIXER BLDG.)  
 RI/FS (RSA-094 - CHLORINATED-SOLVENT DISTILLATION UNIT 1)  
**2010**  
 CS (RSA-197 - ROCKET MOTOR TEST STAND, RSA-269 - FORMER UST, BUILDING 7852, RSA-271 - FORMER BOILER HOUSE, BUILDING 7729, RSA-272 - FORMER UST FOR BOILER UNIT BLD 7650, RSA-276 - FORMER BOILER HOUSE, BLDG 7362)  
**2011**  
 CS (RSA-083 - INACTIVE SPRAY PAINT BOOTH SUMP)  
 DES (RSA-122 - DISMANTLED LEWISITE MFG. PLANTS SITE)  
 CMI(C) (RSA-122 - DISMANTLED LEWISITE MFG. PLANTS SITE)  
 RFA (CCRSA-315 - Abandoned Drum Area , MSFC-033A - Surface Soils East of Bldg 4816 )  
 RFI/CMS (RSA-053 - INACTIVE SANITARY & INDUSTRIAL LANDFILL, RSA-058 - INACTIVE CLOSED RUBBLE FILL & WASTE PILE, RSA-095 - CHLORINATED-SOLVENT DISTILLATION UNIT 2, RSA-096 - CHLORINATED-SOLVENT DISTILLATION UNIT 3, RSA-142 - CHLORINATED-SOLVENT SPILL AREA)

**Projected Phase Completion Milestones**

See attached schedule

**Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates**

Site ID	Site Name	ROD/DD Title	ROD/DD Date
RSA-253	UTILITY/FLAMMABLE MATERIALS STORAGE	DECISION DOCUMENT FOR RSA-253	20130130
MSFC-053	FORMER PROPELLANT STORAGE AREA	RECORD OF DECISION FOR MSFC-053	20130830
RSA-146	GROUNDWATER UNIT GW-02	RECORD OF DECISION FOR RSA-146	20121130
RSA-151	GROUNDWATER UNIT GW-07	RECORD OF DECISION FOR RSA-151	20130415
RSA-200	ROP LINE 5 AREA OPERATIONS FACILITY	RECORD OF DECISION FOR RSA-200	20130228
RSA-206	PROPELLANT MIXING FACILITY #2 & C	DECISION DOCUMENT FOR RSA-206	20130228
RSA-261	LANCE MISSILE CONDITIONING FACILITY	Permit Modification FOR RSA-261	20140430
RSA-069	FORMER CHEMICAL DRUM STORAGE AREA	Permit Modification for RSA-069	20140228
RSA-087	INACTIVE PROPELLANT WASTES STORAGE PAD	RECORD OF DECISION FOR RSA-087	20130228
RSA-148	GROUNDWATER UNIT GW-04	Permit Modification FOR RSA-148	20140130
RSA-149	GROUNDWATER UNIT GW-05	RECORD OF DECISION FOR RSA-149	20140115
RSA-152	GROUNDWATER UNIT GW-08	RECORD OF DECISION FOR RSA-152	20130419
RSA-191	ROP LINE 1 SERVICE FACILITIES	DECISION DOCUMENT FOR RSA-191	20121130
RSA-192	TETRYL AND IGNITER PROCESSING (ROP)	DECISION DOCUMENT FOR RSA-192	20130930
RSA-205	PHOTO LAB & MOTOR SERVICE FACILITY	DECISION DOCUMENT FOR RSA-205	20121130
RSA-208	SOUTH PLANT TESTING FACILITIES	DECISION DOCUMENT FOR RSA-208	20130530

## IRP Schedule

RSA-213	ROP LINE 4 AREA OPS FACILITY	DECISION DOCUMENT FOR RSA-213	20130815
RSA-233	SMF#2 MIXING AND PREPARATION FACILI	Permit Modification FOR RSA-233	20140228
RSA-237	PROPELLANT CUTTING AND DRYING	DECISION DOCUMENT FOR RSA-237	20130530
RSA-065	FORMER CHEMICAL DRUM STORAGE AREA	RECORD OF DECISION FOR RSA-065	20121028
RSA-150	GROUNDWATER UNIT 06	RECORD OF DECISION FOR RSA-150	20130330
RSA-203	IGLOO AREA LOADING DOCK	DECISION DOCUMENT FOR RSA-203	20130830
RSA-209	PROPELLANT CRUSHING/GRINDING & FUZE	DECISION DOCUMENT FOR RSA-209	20130930
RSA-212	PROPELLANT DRY HOUSES	DECISION DOCUMENT FOR RSA-212	20130530
RSA-219	CHEMICAL STORAGE AREA IN SALVAGE YD	DECISION DOCUMENT FOR RSA-219	20130130
RSA-228	SEWAGE TREATMENT PLANT 2	Permit Modification FOR RSA-228	20130930
RSA-273	PROPELLANT CONDITIONING AND MOTOR C	DECISION DOCUMENT FOR RSA-273	20130827
RSA-276	FORMER BOILER HOUSE, BLDG 7362	DECISION DOCUMENT FOR RSA-276	20130630
MSFC-034	FORMER CHEMICAL PRODUCTION AREA	RECORD OF DECISION FOR MSFC-034	20130830
RSA-058	INACTIVE CLOSED RUBBLE FILL & WASTE PILE	Permit Modification FOR RSA-058	20121030
RSA-060	INACTIVE SANITARY & INDUSTRIAL LANDFILL	Permit Modification FOR RSA-060	20130130
RSA-067	FORMER CHEMICAL DRUM STORAGE AREA	Permit Modification FOR RSA-067	20140228
RSA-138M	INACTIVE TEMPORARY STORAGE AREA	Permit Modification for RSA-138M	20121230
RSA-145	GROUNDWATER UNIT GW-01	RECORD OF DECISION FOR RSA-145	20130630
RSA-155	GROUNDWATER UNIT 11	RECORD OF DECISION FOR RSA-155	20130430
RSA-195	THIOKOL PROPELLANT MIX FACILITY #1	Permit Modification for RSA-195	20121130
RSA-198	THIOKOL EQUIPMENT/TOOL CLEANING FAC	Permit Modification for RSA-198	20130730
RSA-210	NITROGLYCERINE WASH HOUSE	DECISION DOCUMENT FOR RSA-210	20130530
RSA-227	INACTIVE WASHRACK	Permit Modification FOR RSA-227	20141130
RSA-269	FORMER UST, BUILDING 7852	DECISION DOCUMENT FOR RSA-269	20130530
RSA-045	SMOKE MUNITIONS PLANT 3	Permit Modification FOR RSA-045	20130130
RSA-083	INACTIVE SPRAY PAINT BOOTH SUMP	RECORD OF DECISION FOR RSA-083	20130830
RSA-088	INACTIVE PROPELLANT WASTES STORAGE PAD	RECORD OF DECISION FOR RSA-088	20130228
RSA-117	FORMER LIQUID CAUSTIC MFG. PLANT SITE	Permit Modification FOR RSA-117	20141030
RSA-126	INACTIVE OPEN BURN TRENCH	Permit Modification for RSA-126	20130330

## IRP Schedule

RSA-135H	INACTIVE SUMP FOR 1.1 PROPELLANT WASTES	Permit Modification for RSA-135H	20130530
RSA-157	GROUNDWATER UNIT 13	Permit Modification FOR RSA-157	20140630
RSA-193	THIOKOL IGNITER PREPARATION FACILIT	DECISION DOCUMENT FOR RSA-193	20130830
RSA-226	OPEN STORAGE 54-2	Permit Modification FOR RSA-226	20131130
RSA-271	FORMER BOILER HOUSE, BUILDING 7729	DECISION DOCUMENT FOR RSA-271	20130130
RSA-272	FORMER UST FOR BOILER UNIT BLD 7650	DECISION DOCUMENT FOR RSA-272	20130630
RSA-189	MOTOR/OXIDIZER PREP FACILITIES	No Further Action ROD for several sites	20121130
RSA-190	DISPOSAL/DRAINAGE AREA WEST OF ROP	No Further Action ROD for several sites	20121130
RSA-202	GRADED AREA NW OF ROP STORAGE	No Further Action ROD for several sites	20121130
RSA-214	ROP LINE 6 AREA OPS FACILITY	No Further Action ROD for several sites	20121130
RSA-144	CHLORINATED-SOLVENT DISTILLATION UNIT 6	No Further Action ROD for several sites	20121130
RSA-197	ROCKET MOTOR TEST STAND	No Further Action ROD for several sites	20121130
MSFC-027	INACTIVE WASTE ACCUMULATION AREA	RECORD OF DECISION FOR MSFC-027	20130830
RSA-005	INACTIVE WASTE ACCUMULATION AREA	RECORD OF DECISION FOR RSA-005	20140630
RSA-153	GROUNDWATER UNIT 09	RECORD OF DECISION FOR RSA-153	20130330
RSA-201	THIOKOL RESEARCH LABORATORY	DECISION DOCUMENT FOR RSA-201	20130830
RSA-217	INERT STORAGE WAREHOUSE FACILITIES	DECISION DOCUMENT FOR RSA-217	20130228
RSA-220	CONSTRUCTION MATERIAL STORAGE YARD	DECISION DOCUMENT FOR RSA-220	20130630
RSA-225	FUSE MODIFICATION LINE 7	DECISION DOCUMENT FOR RSA-225	20130330
RSA-231	SMF #1 MIXING & PREP FACILITIES	Permit Modification for RSA-231	20131030
RSA-238	HVA PLANT #2 MUSTARD LINES 5 & 6	Permit Modification for RSA-238	20130530
RSA-252	INCENDIARY BOMB FACILITY PLANT 2	Permit Modification for RSA-252	20130430
RSA-263	CWS MOTORPOOL(B 8017)/CHANGE HOUSE	DECISION DOCUMENT FOR RSA-263	20130630
RSA-275	FORMER FILM PROCESSING LABORATORY	DECISION DOCUMENT FOR RSA-275	20130630
RSA-A	INACTIVE PROPELLANT STORAGE WELLS	DECISION DOCUMENT FOR RSA-A	20130830
RSA-013	UNLINED INACTIVE OPEN BURN PADS	RECORD OF DECISION FOR RSA-013	20130119
RSA-014	UNLINED INACTIVE BURN TRENCHES	RECORD OF DECISION FOR RSA-014	20130201
RSA-032	INACTIVE SCRAP METAL STORAGE AREA	Permit Modification FOR RSA-032	20131030

## IRP Schedule

RSA-053	INACTIVE SANITARY & INDUSTRIAL LANDFILL	Permit Modification FOR RSA-053	20130130
RSA-194	PHYSICAL TEST LABORATORY & STORAGE	Permit Modification for RSA-194	20130228
RSA-215	RSA-146 HISTORIC SERVICE FACILITIES	DECISION DOCUMENT FOR RSA-215	20130830
RSA-239	LINE # 1 BOILER HOUSE	DECISION DOCUMENT FOR RSA-239	20130830
RSA-250	FORMER STORAGE WAREHOUSE BLDG 778	DECISION DOCUMENT FOR RSA-250	20121015
RSA-255	MANGANESE ORE STORAGE AREA N. of RS	DECISION DOCUMENT FOR RSA-255	20130430
RSA-258	FORMER PAINT SPRAY BUILDING 7862	Permit Modification FOR RSA-258	20131030
RSA-262	CWS WAREHOUSE AREA BLDGS 8021-8027	Permit Modification for RSA-262	20130430
RSA-265	GASOLINE DRUM STORAGE AREA	DECISION DOCUMENT FOR RSA-265	20130930
RSA-274	PHYSICS LABORATORY & HIGH EXPLOSIVES	DECISION DOCUMENT FOR RSA-274	20130530
RSA-117	FORMER LIQUID CAUSTIC MFG. PLANT SITE	RECORD OF DECISION FOR RSA-109	20140228
RSA-109	FORMER CHEMICAL MUNITIONS STAGING AREA	RECORD OF DECISION FOR RSA-109	20140228
RSA-134	INACTIVE DISPOSAL TRENCH & BURN PIT	Permit Modification for RSA-134	20130228
RSA-140	INACTIVE DISPOSAL AREA	Permit Modification for RSA-140	20130730
RSA-147	GROUNDWATER UNIT GW-03	Permit Modification FOR RSA-147	20140130
RSA-154	GROUNDWATER UNIT 10	RECORD OF DECISION FOR RSA-154	20130430
RSA-156	GROUNDWATER UNIT GW-12	RECORD OF DECISION FOR RSA-156	20130430
RSA-187	NORTHERN THIOKOL MIXING FACILITY	DECISION DOCUMENT FOR RSA-187	20130830
RSA-199	THIOKOL PROPELLANT MIX FACILITY #2	DECISION DOCUMENT FOR RSA-199	20130930
RSA-204	THIOKOL OXIDIZER FACILITY	DECISION DOCUMENT FOR RSA-204	20130830
RSA-207	ROHM & HAAS GORGAS LABORATORY	DECISION DOCUMENT FOR RSA-207	20130330
RSA-211	SOUTH PLANT STORAGE MAGAZINES	DECISION DOCUMENT FOR RSA-211	20130530
RSA-218	DRMO OPEN STORAGE AREA	DECISION DOCUMENT FOR RSA-218	20130630
RSA-230	ABANDONED RUBBLE PILE	Permit Modification for RSA-230	20130730

**Final RA(C) Completion Date:** 201701

**Schedule for Next Five-Year Review:** N/A

**Estimated Completion Date of IRP at Installation (including LTM phase):** 204212

## REDSTONE ARSENAL IRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCRSA-315	Abandoned Drum Area	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
MSFC-027	INACTIVE WASTE ACCUMULATION AREA	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
MSFC-033A	Surface Soils East of Bldg 4816	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
MSFC-034	FORMER CHEMICAL PRODUCTION AREA	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
MSFC-035	INACTIVE SUMP/TILED DRAIN FIELD-EAST TA	RFI/CMS						
		IRA						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
MSFC-053	FORMER PROPELLANT STORAGE AREA	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
PBCatRedstone	FY05 PBC	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-005	INACTIVE WASTE ACCUMULATION AREA	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-013	UNLINED INACTIVE OPEN BURN PADS	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-014	UNLINED INACTIVE BURN TRENCHES	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						

## REDSTONE ARSENAL IRP Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-032	INACTIVE SCRAP METAL STORAGE AREA	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-045	SMOKE MUNITIONS PLANT 3	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-048	INACTIVE CLOSED SANITARY LANDFILL	DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-049	CAPPED ARSENIC WASTE LAGOONS-WEST	LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-050	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-053	INACTIVE SANITARY & INDUSTRIAL LANDFILL	DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-054	INACTIVE SANITARY & INDUSTRIAL LANDFILL	CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-056	CAPPED ARSENIC WASTE PONDS-SOUTH	CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-057	INACTIVE ARSENIC WASTE LAGOON-EAST	CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-058	INACTIVE CLOSED RUBBLE FILL & WASTE PILE	DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-059	INACTIVE CLOSED CONSTRUCTION RUBBLE FILL	CMI(C)						
		LTM						

## REDSTONE ARSENAL IRP Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-060	INACTIVE SANITARY & INDUSTRIAL LANDFILL	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-065	FORMER CHEMICAL DRUM STORAGE AREA	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-067	FORMER CHEMICAL DRUM STORAGE AREA	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-069	FORMER CHEMICAL DRUM STORAGE AREA	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-083	INACTIVE SPRAY PAINT BOOTH SUMP	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-087	INACTIVE PROPELLANT WASTES STORAGE PAD	DES						
		CMI(C)						
		CMI(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-088	INACTIVE PROPELLANT WASTES STORAGE PAD	DES						
		CMI(C)						
		CMI(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-095	CHLORINATED-SOLVENT DISTILLATION UNIT 2	DES						
		CMI(C)						
		CMI(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-096	CHLORINATED-SOLVENT DISTILLATION UNIT 3	CMI(C)						
		CMI(O)						

## REDSTONE ARSENAL IRP Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-109	FORMER CHEMICAL MUNITIONS STAGING AREA	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-112	FORMER DEMILITARIZATION & DISPOSAL SITE	RFI/CMS						
		IRA						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-113	INACTIVE DISPOSAL TRENCHES & BURN PITS	RFI/CMS						
		IRA						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-114	INACTIVE MADKIN MOUNTAIN ROCK QUARRY	RFI/CMS						
		IRA						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-115	INACTIVE EAST SIDE BLOWDOWN LAGOON	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-117	FORMER LIQUID CAUSTIC MFG. PLANT SITE	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-122	DISMANTLED LEWISITE MFG. PLANTS SITE	CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-126	INACTIVE OPEN BURN TRENCH	RFI/CMS						
		IRA						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-134	INACTIVE DISPOSAL TRENCH & BURN PIT	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-135H	INACTIVE SUMP FOR 1.1 PROPELLANT WASTES	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-138M	INACTIVE TEMPORARY STORAGE AREA	RFI/CMS						
		IRA						

## REDSTONE ARSENAL IRP Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-139	CAPPED ARSENIC WASTE POND-NORTH	CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-140	INACTIVE DISPOSAL AREA	RI/FS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-142	CHLORINATED-SOLVENT SPILL AREA	DES						
		CMI(C)						
		CMI(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-143	UNDERGROUND STORAGE TANK SPILL SITE	IMP(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-145	GROUNDWATER UNIT GW-01	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-146	GROUNDWATER UNIT GW-02	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-147	GROUNDWATER UNIT GW-03	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-148	GROUNDWATER UNIT GW-04	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						

## REDSTONE ARSENAL IRP Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-149	GROUNDWATER UNIT GW-05	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-150	GROUNDWATER UNIT 06	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-151	GROUNDWATER UNIT GW-07	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-152	GROUNDWATER UNIT GW-08	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-153	GROUNDWATER UNIT 09	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-154	GROUNDWATER UNIT 10	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						

## REDSTONE ARSENAL IRP Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-155	GROUNDWATER UNIT 11	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-156	GROUNDWATER UNIT GW-12	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-157	GROUNDWATER UNIT 13	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-183	FORMER LEWISITE PRODUCTION FACILITY	CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-187	NORTHERN THIOKOL MIXING FACILITY	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-191	ROP LINE 1 SERVICE FACILITIES	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-192	TETRYL AND IGNITER PROCESSING (ROP)	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-193	THIOKOL IGNITER PREPARATION FACILIT	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-194	PHYSICAL TEST LABORATORY & STORAGE	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-195	THIOKOL PROPELLANT MIX FACILITY #1	RFI/CMS						
		DES						
		CMI(C)						

## REDSTONE ARSENAL IRP Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-198	THIOKOL EQUIPMENT/TOOL CLEANING FAC	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-199	THIOKOL PROPELLANT MIX FACILITY #2	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-200	ROP LINE 5 AREA OPERATIONS FACILITY	DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-201	THIOKOL RESEARCH LABORATORY	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-203	IGLOO AREA LOADING DOCK	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-204	THIOKOL OXIDIZER FACILITY	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-205	PHOTO LAB & MOTOR SERVICE FACILITY	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-206	PROPELLANT MIXING FACILITY #2 & C	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-207	ROHM & HAAS GORGAS LABORATORY	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-208	SOUTH PLANT TESTING FACILITIES	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-209	PROPELLANT CRUSHING/GRINDING & FUZE	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-210	NITROGLYCERINE WASH HOUSE	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-211	SOUTH PLANT STORAGE MAGAZINES	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-212	PROPELLANT DRY HOUSES	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-213	ROP LINE 4 AREA OPS FACILITY	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-215	RSA-146 HISTORIC SERVICE FACILITIES	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-217	INERT STORAGE WAREHOUSE FACILITIES	RFI/CMS						

## REDSTONE ARSENAL IRP Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-218	DRMO OPEN STORAGE AREA	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-219	CHEMICAL STORAGE AREA IN SALVAGE YD	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-220	CONSTRUCTION MATERIAL STORAGE YARD	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-225	FUSE MODIFICATION LINE 7	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-226	OPEN STORAGE 54-2	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-227	INACTIVE WASHRACK	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-228	SEWAGE TREATMENT PLANT 2	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-230	ABANDONED RUBBLE PILE	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-231	SMF #1 MIXING & PREP FACILITIES	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-233	SMF#2 MIXING AND PREPARATION FACILI	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-237	PROPELLANT CUTTING AND DRYING	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-238	HVA PLANT #2 MUSTARD LINES 5 & 6	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-239	LINE # 1 BOILER HOUSE	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-250	FORMER STORAGE WAREHOUSE BLDG 778	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-252	INCENDIARY BOMB FACILITY PLANT 2	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						

## REDSTONE ARSENAL IRP Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-253	UTILITY/FLAMMABLE MATERIALS STORAGE	INV						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-255	MANGANESE ORE STORAGE AREA N. of RS	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-258	FORMER PAINT SPRAY BUILDING 7862	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-261	LANCE MISSILE CONDITIONING FACILITY	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-262	CWS WAREHOUSE AREA BLDGS 8021-8027	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-263	CWS MOTORPOOL(B 8017)/CHANGE HOUSE	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-265	GASOLINE DRUM STORAGE AREA	CS						
		RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-269	FORMER UST, BUILDING 7852	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-271	FORMER BOILER HOUSE, BUILDING 7729	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-272	FORMER UST FOR BOILER UNIT BLD 7650	RFI/CMS						
		DES						
		CMI(C)						
		LTM						

## REDSTONE ARSENAL IRP Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-273	PROPELLANT CONDITIONING AND MOTOR C	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-274	PHYSICS LABORATORY & HIGH EXPLOSIVES	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-275	FORMER FILM PROCESSING LABORATORY	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-276	FORMER BOILER HOUSE, BLDG 7362	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-A	INACTIVE PROPELLANT STORAGE WELLS	RFI/CMS						

**REDSTONE ARSENAL**  
**Army Defense Environmental Restoration Program**  
**Military Munitions Response Program**

# MMRP Summary

**Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count:** 34/21

## Installation Site Types with Future and/or Underway Phases

- 2 Burn Area  
(PBA@MR Redston, RSA-234-R-01)
- 2 Chemical Disposal  
(MSFC-003-R-01, RSA-141-R-01)
- 1 Explosive Ordnance Disposal Area  
(RSA-221-R-01)
- 1 Small Arms Range  
(RSA-280-R-01)
- 1 Storage Area  
(RSA-249-R-01)
- 1 Training and Maneuver Area  
(RSA-294-R-01)
- 5 Unexploded Munitions/Ordnance  
(RSA-072-R-01, RSA-278-R-01, RSA-285-R-01, RSA-312-R-01, RSA-313-R-01)

## Most Widespread Contaminants of Concern

Munitions and explosives of concern (MEC)

## Media of Concern

Soil

## Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
RSA-072-R-01	Former Mortar Test Site (NOT in Ran	IRA	UXO CLEARANCE	2009

## Duration of MMRP

**Date of MMRP Inception** 200201

**Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC):** 202409/202409

**Date of MMRP completion including Long Term Management (LTM):** 204701

# MMRP Contamination Assessment

## Contamination Assessment Overview

The National Defense Authorization Act (NDAA) for FY02 (Public Law 107-107) amended the Defense Environmental Restoration Program (DERP) by establishing a new program element for the cleanup of property known or suspected to contain UXO, discarded military munitions (DMM) and/or munitions constituents (MC). It requires the Army to develop and maintain an inventory of sites [referred to as munitions response sites (MRS)] that are known or suspected to contain UXO, DMM, and/or MC for sites that are not located on operational ranges, operating manufacturing or storage facilities, or permitted demilitarization facilities. This program element is called the MMRP and is funded separately from the DERP; however, because the Army had previously conducted responses on-sites known or suspected to contain UXO, DMM, and/or MC, munitions response action can occur under the IRP category or the MMRP category. Under the MMRP category, the Army may conduct munitions response activities when the release is at a site that is not a formerly used defense site (FUDS), an operational range, an active munitions demilitarization facility, or an active waste military munitions (WMM) treatment or disposal unit and the site's MMRP costs were not identified or included in the DERP IRP database prior to Sept. 30, 2002.

The Army was required to initiate an inventory of defense sites or MRS with UXO, DMM, and/or MC by May 31, 2003, and to update the inventory annually until complete. The data collected during this inventory on defense sites provides the MRS that will be addressed as MMRP category sites. The range inventory consisted of three phases. Phase I, advance range survey (ARS), was completed between September and December 2000. The ARS was followed by Phase II, the active/inactive (A/I) range inventory, with data being collected from October 2000 through January 2003. The final phase, Phase III, was the closed, transferred or transferring (CTT) range inventory which was completed between October 2001 and December 2003. These three phases were completed specifically for RSA during the following time periods:

Phase I ARS was completed December 2000

Phase II A/I range inventory was completed July 2001

Phase III CTT range inventory was completed September 2002

There are some off-site issues associated with MMRP sites at Redstone. Site RSA-278-R-01 is a 110-acre portion of RSA that was transferred to the state of Alabama for the construction of Highway 565. The Army disclosed to the state the possible presence of UXO on this parcel and performed a visual sweep for UXO and ordnance-related residue prior to construction. No complete subsurface survey has been conducted. The extent of UXO or related materials (if any) found during construction is not known.

There is high regulatory interest in the MEC on RSA. There has been a great deal of confusion in regard to the division of responsibility between the IRP and MMRP for sites on the arsenal. Many of the issues causing the confusion are being worked out at the Army level and we have begun discussions with the regulators to sort through and alleviate the confusion.

As yet, there is little to no public interest in the MMRP sites. Most are located within the boundaries of RSA and the MSFC. Landowners within the site located off of the installation's property have been notified of the MMRP by letters sent in May 2009.

Work on the RFIs has begun on several of the MMRP sites under the PMC awarded in 2009. Several new MMRP sites have been identified due to range boundary adjustments to support mission activities. These new sites will be included in a forthcoming task under the PMC.

## Cleanup Exit Strategy

The MMRP SI was completed in FY08 for all but one site. An extended SI was determined to be warranted for RSA249-R-01. Three new MMRP sites, RSA-285-R-01, RSA-312-R-01, and RSA-313-R-01 were added in FY11. Sites will be addressed in priority order based upon the Munitions Response Site Prioritization Protocol (MRSP) and program funding availability.

## MMRP Previous Studies

2008

Title	Author	Date
Final Historical Range Report for RSA.	Shaw	JUN-2008
Final Site Investigation Report United States Army Garrison Redstone Arsenal	Malcolm Pirnie, Inc.	SEP-2008

**REDSTONE ARSENAL**  
**Military Munitions Response Program**  
**Site Descriptions**

**Site ID: MSFC-003-R-01**  
**Site Name: Inactive Old Bone Yard Disposal Sit**  
**Alias: MSFC-003**

**STATUS**

**Regulatory Driver:** RCRA  
**MRSPP Score:** 03  
 Contaminants of Concern: Chemical weapon munitions (CWM)/Chemical agent, Munitions and explosives of concern (MEC)  
 Media of Concern: Soil

Phases	Start	End
RFA.....	200201.....	200305
CS.....	200602.....	200809
RFI/CMS.....	200911.....	202409
IRA.....	201103.....	202209
LTM.....	202509.....	204209
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	202409	

**SITE DESCRIPTION**

Site MSFC-003-R-01 is located southwest of the historic Redstone Rocket Test Stand, on both sides of Dodd Road and east of Lem Road. MSFC-003-R-01 is an inactive disposal site of approximately 63 acres. Site MSFC-003-R-01 was used to dispose of and/or treat chemical munitions, toxic materials, chemical wastes, and phosphorous-filled munitions. Portions were formerly known as the "old bone yard".

A 1.5-acre area labeled on earlier maps as the "permanent toxic storage area" and several burn pits lies within MSFC-003-R-01. MSFC-003-R-01 has been expanded to the south and southwest to include MSFC-082-R-01 (IRP site MSFC-082) where chemical artillery shells were demilitarized and disposed of in trenches. Several rounds have been discovered in fill material from this area.

NASA has active, buried utility lines going through this site. In 2000, 52 empty, chemically configured 4.2-inch mortar rounds were uncovered during the repair of a water main. Information gathered during historical reviews concluded that construction and miscellaneous debris from the original boundary of this site was relocated to the east across Dodd Road during construction of water reservoirs for the Saturn test stand. This activity expanded the original boundary to create two noncontiguous sites (separated by Dodd Road) which together represent the current MSFC-003-R-01 boundary.

This site is entirely located within the MSFC boundary. Therefore, enforcement of LUC by the Army is questionable.

The shape file that was provided with the CTT range inventory document shows that this site is the original area associated with the IRP site MSFC-3. Since this area is MMRP eligible, the IRP site has been made RC and the area will be addressed under the MMRP. The CWM probability assessment for the installation shows that there is an occasional probability of encountering CWM at this site.

In 2005 RSA-002-R-01 was combined with this site.

When MMRP sites were first being identified on RSA, the MMRP inadvertently divided the MSFC-003-R munitions response area (MRA) into two MRSs, MSFC-003-R-01 and MSFC-003-R-02. Later, the two MRSs were discovered to be equivalent to the outline of the IRP site MSFC-003. Site MSFC-003-R-01 represented the area west of Dodd Road and MSFC-003-R-02 represented the area east of Dodd Road. In 2007, MSFC-003-R-02 was combined with MSFC-003-R-01, therefore increasing site acreage to a total of 55.23 acres, which matched the IRP site boundary. These changes were made at the direction of the 2006 IAP meeting. In February 2007, due to AEDB-R administrative conflicts, MSFC-003-R-02 was deleted from AEDB-R. The SI for this site was completed in 2008.

The ADEM issued the RCRA Hazardous Waste Facility Permit #AL7 210 020 742, on Sept. 30, 2010 to the Army. This RCRA permit governs the storage, treatment, and disposal of hazardous waste, as well as corrective measures for multiple SWMUs and AOCs in accordance with RCRA. Part VI of the RCRA permit requires that IM and/or source removal be completed at this suspect CWM site.

**Site ID: MSFC-003-R-01**  
**Site Name: Inactive Old Bone Yard Disposal Sit**  
**Alias: MSFC-003**

## **CLEANUP/EXIT STRATEGY**

The ADEM issued the RCRA Hazardous Waste Facility Permit #AL7 210 020 742, on Sept. 30, 2010 to the Army. This RCRA Permit governs the storage, treatment, and disposal of hazardous waste, as well as corrective measures for multiple SWMUs and AOCs in accordance with RCRA. Part VI of the RCRA Permit requires that IM and/or source removal be completed at this suspect CWM site.

A Phase 1 and 2 IRA, RFI, and LTM are expected.

**Site ID: PBA@MR Redston**  
**Site Name: PBA@MR Redstone**  
**Alias: None**

## STATUS

**Regulatory Driver:** RCRA  
**MRSPP Score:** Evaluation pending

Phases	Start	End
RFA.....	200211.....	200305
RFI/CMS.....	200912.....	201409
DES.....	200912.....	201412
CMI(C).....	200912.....	201507
CMI(O).....	200912.....	201604

**RIP Date:** 201507

**RC Date:** 201604

## SITE DESCRIPTION

PBA for sites: RSA-072-R-01, RSA-141-R-01, RSA-234-R-01, RSA-278-R-01. All contract line item numbers (CLINs) required for phase completion have been funded.

## CLEANUP/EXIT STRATEGY

See cleanup strategy for the individual MR sites.

**Site ID: RSA-072-R-01**  
**Site Name: Former Mortar Test Site (NOT in Ran**  
**Alias: RSA-282**

**STATUS**

**Regulatory Driver:** RCRA  
**MRSPP Score:** 03  
 Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)  
 Media of Concern: Soil

Phases	Start	End
RFA.....	200201.....	200305
CS.....	200602.....	200809
RFI/CMS.....	200909.....	201409
DES.....	201307.....	201503
IRA.....	200709.....	200810
CMI(C).....	201407.....	201510
CMI(O).....	201502.....	201607
LTM.....	201607.....	204312
<b>RIP Date:</b>	201510	
<b>RC Date:</b>	201607	

**SITE DESCRIPTION**

Site RSA-072-R-01 (RSA-282) is a 117-acre portion of RSA-072 that is located outside of the RSA operational range boundaries. The location of RSA-072-R-01 corresponds to the impact area of RSA-072. Construction activities supporting the Software Engineering Directorate (SED) of the Aviation and Missile Research, Development, and Engineering Center in the RSA-072-R-01 area have indicated that a continuing UXO hazard still exists at this site. Construction of the initial phases of the SED complex approximately 15 years ago unearthed some 4.2-inch mortar ordnance and explosives (OE) scrap but no munitions items presenting a UXO hazard. An EM-61 survey of the area was done in 2005 and a number of geophysical anomalies were noted. Construction on the more recent SED expansions resulted in a number of 4.2-inch mortar projectiles, both fuzed and non-fuzed. To date, these projectiles have been found to be filled with sand, cholorsulfonic acid (FS), or WP. Nothing found in the historical record or on-site indicates that CWM (mustard or lewisite)-filled projectiles were fired at the former proofing range. When the fuzed projectiles were found in April 2007, work was suspended on the construction activities and the site was nominated for cleanup under the MMRP. A time critical removal action (TCRA) was performed to remove the 4.2-inch mortar projectiles. The TCRA report stated that 3,610 anomalies were investigated and 1,135 pounds of cultural debris, 4 MD items, and 17 MEC items were recovered. The cultural debris was assessed and recycled. The MD items were transferred to the OB/OD operations at Redstone Arsenal for final disposition. The MEC items were 4.2-inch mortars that were recovered, packaged, and transported by the 22nd Chemical Battalion (Technical Escort) personnel to the Redstone Arsenal storage area. Further testing by 22nd Chemical Battalion (Technical Escort) personnel determined that all MEC items recovered were FS smoke filled mortars. The TCRA clearance operations covered a total of 37.88 acres of the 117 acre MRS. The work was performed in phases to meet site construction requirements. The Phase I area, site of the storm water retention pond construction was 5.5 acres in size. Clearance for the Phase II Area A covered 15.88 acres for mag and dig surface sweep in the western half of Area A and a digital geophysical mapping (DGM) survey in the eastern half of Area A. Clearance was also performed for the following areas: approximately one acre for the Area E, three-ft wide by 1,500-ft long sewer line construction; for 0.5 acre for Area B, the additional parking lot; and 15 acres for the Area F, Rotary Wing Facility area.

Additional site information is from the Draft Historical Records Review (May 2007, excerpt attached), the Final Site Inspection Report (September, 2008) and the Inventory of BCM Sites on Active Army Installations conducted in 2004. Site data including site size and type are from this report unless superseded by Site-specific Instructions from the Data Gathering Sessions.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**Site ID: RSA-072-R-01**  
**Site Name: Former Mortar Test Site (NOT in Ran**  
**Alias: RSA-282**

## **CLEANUP/EXIT STRATEGY**

Additional RFI work, which will include an intrusive investigation, is needed to further delineate the 117-acre RSA-072-R-01 MRS. A CMS and Statement of Basis/Permit Modification will be performed after the RFI. Additional post-2009 PBA actions for this site will consist of completing the DES and CMI. Land Use Controls will include administration of the Site Access Control program. In addition, five-year reviews are estimated for planning purposes. LTM is also anticipated for groundwater.

Additional RFI and CMI-C tasks include: Collection and analysis of approximately 18 soil samples and five groundwater samples from soil borings and monitoring wells, Collection and analysis of three additional surface water and sediment samples, Collection and analysis of one soil vapor sample from a soil boring, Conduct a DGM (MEC) survey over approximately 6.2 acres, Perform anomaly reacquisition and investigation (digs) for approximately 1,240 items. Soil and groundwater sampling for munitions constituents will be performed in the areas of the anomalies. Removal and disposal of anomalies determined to MPPHE during reacquisition

**Site ID: RSA-141-R-01**  
**Site Name: 4.2 Inch Mortar Disposal Site, Bldg**  
**Alias: RSA-141**

**STATUS**

**Regulatory Driver:** RCRA  
**MRSPP Score:** 03  
 Contaminants of Concern: Munitions and explosives of concern (MEC)  
 Media of Concern: Soil

Phases	Start	End
RFA.....	200201.....	200305
CS.....	200602.....	200809
RFI/CMS.....	200906.....	201306
DES.....	201301.....	201405
CMI(C).....	201401.....	201412
CMI(O).....	201407.....	201509
LTM.....	201509.....	204409
<b>RIP Date:</b>	201412	
<b>RC Date:</b>	201509	

**SITE DESCRIPTION**

This site is a 14.5 acre former mustard shell disposal area. A burial pit was used to dispose of unused 4.2-inch mortar shells after WWII. 4.2-inch mortars and a single 3.5-inch rocket part were documented at the site. The site is undeveloped. MRS information available indicates Army test results were negative for CWM monitoring during previous site investigation intrusive activities in 1999; no CWM surety material was detected in the recovered 4.2-inch mortars, and the mortars were not CWM configured. All previous site information indicates the 4.2-inch mortars were empty when recovered and were buried at RSA-141-R-01 after WWII. The finding of parts from 3.5-inch rockets, Korean war-vintage weapons, suggests the MEC was buried after the early-1950s. The MEC recovered at RSA-141-R-01 was configured as unfuzed liquid-filled rounds that did not contain burster tubes, which were common in munitions readied for transport after filling at the Huntsville Arsenal. The location of the burial pits suggests the 4.2-inch mortars were buried in shallow pits and were not related to a postulated WWII-era release from a train transportation incident at the RSA-141-R-01 site. Therefore, it is thought the MEC was directly buried, because the 4.2-inch mortars were not filled with CWM and the mortars were not demilitarized by burning or decontamination before burial. The TCE groundwater contamination belongs to MSFC, NASA and explosives have not been detected in the groundwater. NASA would like to build on this area as soon as possible. Historical photographs show that the site was used as a coal storage area during the 1950s and that it was oriented in a north-south elongated pile in the western part of the site located between two parallel, north-south-oriented railroad tracks. Hazardous, toxic and radioactive waste (HTRW) constituents in the coal storage pile may have impacted the site soil in the vicinity of the coal storage pile.

Additional site information is from the Draft Historical Records Review (May 2007, excerpt attached), the Final Site Inspection Report (September 2008) and the Inventory of BCM Sites on Active Army Installations conducted in 2004. Site data including site size and type are from this report unless superseded by Site-specific Instructions from the Data Gathering Sessions.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

Additional RFI work, including an intrusive investigation, is needed to further delineate the 14.5-acre RSA-141-R-01 MRS. A CMS and Statement of Basis/Permit Modification will be performed after the RFI. Additional actions for this site will consist of completing the DES and CMI. Land Use Controls will include administration of the Site Access Control program. In addition, five-year reviews are estimated for planning purposes. LTM is also anticipated for groundwater.

**Site ID: RSA-221-R-01**  
**Site Name: FuseStorage&Munitions Disposal Area**  
**Alias: RSA-221**

**STATUS**

**Regulatory Driver:** RCRA  
**MRSPP Score:** 05  
 Contaminants of Concern: Munitions and explosives of concern (MEC)  
 Media of Concern: Soil, Surface Water

Phases	Start	End
RFA.....	200201.....	200305
CS.....	200602.....	200809
RFI/CMS.....	200910.....	201503
DES.....	201501.....	201511
CMI(C).....	201506.....	201611
LTM.....	201611.....	202611
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201611	

**SITE DESCRIPTION**

The 13.4-acre Fuze Storage and Munitions Disposal Area contains six fuze and ammunition storage buildings constructed in 1943 and an adjacent drainage ditch. The relationship between the buildings and the drainage ditch is unclear. During a site visit in 2001, a UXO specialist identified projectile components, empty canisters, and empty shells. A site inspection in 2003 noted that two areas were found to contain MD, and a site visit in April 2006 noted that several of the buildings were in a state of disrepair. It was discussed during the TPP meetings that the buildings were not currently in use. Previous analytical data confirmed NC and elevated metals in the groundwater and pentaerythritol tetranitrate, NG, NC, nitroguanidine, thiodiglycol, and metals in the on-site ditch soil. TDG was identified in one soil sample; however, it is not clear why TDG was tested for because there is no indication CWM was used at this site. Potential MEC include 155mm projectiles and other debris, and potential MC include explosives.

Additional site information is from the Draft Historical Records Review (May 2007), the FY08 SI, and the Inventory of BCM Sites on Active Army Installations conducted in 2004. Site data including site size and type are from this report unless superseded by Site-specific Instructions from the Data Gathering Sessions. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

Proposed actions at this site include RFI, MEC SC&RA, CMS, Statement of Basis, Permit Modification, community relations/public involvement support and admin record support. Components of MEC site characterization and removal assessment (SC&RA) include survey, vegetation removal, MEC reconnaissance, geophysical mapping, reacquisition and removal action. Actions following Statement of Basis and Permit Modification will depend on whether the RFI confirms the presence of MEC on-site. The MEC institutional controls are anticipated to be established in the CMI(C) phase. The MEC monitoring and annual reviews are assumed in the LTM phase.

**Site ID: RSA-234-R-01**  
**Site Name: WASTE DISPOSAL PIT**  
**Alias: RSA-234**

**STATUS**

**Regulatory Driver:** RCRA

**MRSPP Score:** 05

Contaminants of Concern: Munitions and explosives of concern (MEC)

Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200311.....	200405
RFI/CMS.....	200906.....	201409
DES.....	200906.....	201501
CMI(C).....	200906.....	201508
CMI(O).....	200906.....	201606
LTM.....	201606.....	204604

**RIP Date:** 201508

**RC Date:** 201606

**SITE DESCRIPTION**

RSA-234-R-01 is an approximately one-acre site located in the northeast part of RSA. The site is the location of former Building 642. Building 642 was constructed in 1942, initially as an incendiary bomb filling plant and grenade filling plant warehouse. It was converted in March 1942 to a M-54 incendiary bomb loading plant. In April 1942, the entire building and approximately four tons of thermate were destroyed in a fire and the remaining structure was razed. The RSA historical records and site aerial photographs indicate that the remaining slab was then used as a waste disposal area to burn and dispose of various waste smoke mixes and rejected 105-millimeter canisters. These operations continued until sometime before 1975. Currently, the former building concrete slab is deteriorated in many areas and the area surrounding the slab is heavily wooded.

A LSA was completed in 2004. This LSA consisted of placement of five borings and temporary wells. Locations selected included holes and cracks within the slab where it appeared past burning activities had occurred and from within the former rail road loading dock footprints. Soil data yielded a few metals with concentrations above screening levels in surface and subsurface soils, and sporadic VOCs and explosives all at levels below screening limits. In groundwater chlorinated VOCs were present at levels above screening limits. However, due to low yields in the temporary wells very limited groundwater analyses were completed. The LSA effort does not meet the ADEM guidance requirements for a RFI and additional sampling to conduct an ADEM compliant RFI is necessary. In addition, since the site was previously used to burn MEC, a DGM survey and potential anomaly removal will be required before the projected RIP/RC can be achieved.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

This site was formerly IRP site RSA-234.

**CLEANUP/EXIT STRATEGY**

Additional RFI work, consisting of the installation and sampling of new wells and the collection and analysis of soil samples during installation is necessary to complete the investigation. Since the site is a MMRP site, a DGM survey will be performed based upon the visual evaluation of the site and its past use, it is expected to result in additional investigation and removal of several anomalies. Tasks for this site include completing an RFI; under MEC avoidance procedures, and a DGM survey, which is expected to lead to the further investigation and removal of several anomalies. The RFI is expected to result in there being no need for soil remediation. The CMS will likely specify natural attenuation monitoring with LUCs. Sampling from six monitoring wells is needed to confirm and track the progress of natural attenuation processes. The Statement of Basis and Permit Modification will document the selection of the final remedy.

**Site ID: RSA-249-R-01**

**Site Name: INACTIVE OLD BONEYARD DISPOSAL SITE**

**Alias: RSA-249**

**STATUS**

**Regulatory Driver:** RCRA  
**MRSPP Score:** 06  
 Contaminants of Concern: Explosives, Metals, Pesticides, Semi-volatiles (SVOC), Volatiles (VOC)  
 Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200311.....	200405
CS.....	200602.....	201111
RFI/CMS.....	201010.....	201504
DES.....	201501.....	201511
CMI(C).....	201509.....	201611
LTM.....	201611.....	202211
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201611	

**SITE DESCRIPTION**

RSA-249-R-01, the former Salvage Yard, was located on the northwest corner of Martin and Mills Roads and includes an area of about 22 acres. The yard was started in May 1942 and operations were probably discontinued in the early-1960s. A collection of empty munitions boxes, drums, barrels, wire and numerous other items were handled here. It was serviced by former Railroad No. 1 from the former North Carolina, Chattanooga and St. Louis Railroad Classification Yard. Aerial photographs from 1943, 1950, 1956, and 1959 show continuous activity.

In late-1944 the Salvage Division, which managed the former Salvage Yard, became active in the redistribution and disposition of various surplus materials which included disposal of reject chemical munitions to other components of the armed services for training purposes and the manufacture of equipment of miscellaneous and specialized nature to other government projects; however, there was no evidence that any surplus items processed at the salvage yard contained CWM.

The general area of the former salvage yard is predominantly wooded with utility transmission rights-of-way through the eastern and western portions of the area. Ground vegetation was quite heavy in the northern portion of the area with metal debris observed scattered on the ground on the western boundary. Ridges or mounds were observed in the southwest portion of the area, but no debris was observed. Material identified as slag was also observed in a bare area in the northwestern portion of the area. Another bare area with exposed surface soil containing metal debris was observed along the eastern edge of the transmission line right-of-way on the western portion of the area. A 16 ft by 35 ft concrete pad with a short ramp on one end was observed on the east side of the area.

VOC, SVOC, and pesticide contamination was observed in the surface and subsurface soil. Metal contamination was observed in surface soil. The groundwater is contaminated with VOCs, SVOCs, manganese, and PROs.

This site was formerly RSA-249 under the IRP and has been transferred to the MMRP. Additional site information is from the Draft Historical Records Review (May 2007) and the Inventory of BCM Sites on Active Army Installations conducted in 2004. Site data including site size and type are from this report unless superseded by Site-specific Instructions from the Data Gathering Sessions. This site has been categorized as a Multi-Use Range of moderate complexity. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

Actions at this site include RFI, MEC SC&RA, CMS, Statement of Basis, Permit Modification, community relations/public involvement support and admin record support. Components of MEC SC&RA include survey, vegetation removal, MEC reconnaissance, geophysical mapping, reacquisition and removal action. Actions following Permit Modification include a CMI (C) and LTM phase for implementing and maintaining land use controls for MEC. The CMI (C) phase includes costs for planning and

**Site ID: RSA-249-R-01**  
**Site Name: INACTIVE OLD BONEYARD DISPOSAL SITE**  
**Alias: RSA-249**

implementing MEC institutional controls, engineering controls, initial and follow-up training, and quality support visits. The LTM includes LUC inspections and five 5-year reviews.

**Site ID: RSA-278-R-01**  
**Site Name: Highway 565 Area**  
**Alias: RSA-278**

**STATUS**

**Regulatory Driver:** RCRA  
**MRSPP Score:** 04  
 Contaminants of Concern: Munitions and explosives of concern (MEC)  
 Media of Concern: Soil

Phases	Start	End
RFA.....	200201.....	200305
CS.....	200602.....	200809
RFI/CMS.....	200912.....	201412
DES.....	200912.....	201506
CMI(C).....	200912.....	201601
CMI(O).....	200912.....	201610
LTM.....	201610.....	202604
<b>RIP Date:</b>	201601	
<b>RC Date:</b>	201610	

**SITE DESCRIPTION**

This site replaces site RSA-001-R-01. This change was made in January 2007 based on guidance received from the December 2006 IAP meeting to correspond to RSA environmental site naming conventions.

The RSA-278-R-01 site is the portion of RSA that was transferred from the northwest corner of the installation in the mid-1980s to the state of Alabama for the construction of Highway 565. The site is at the north end of three former ranges: "North Bombing Range," "4.2-Inch Mortar Range", and "High Explosives Drop Test Site, Area A." This MRS is approximately 110 acres and includes a portion of Interstate-565 (I-565) (i.e., "Highway 565 Area"), several developed parcels, and approximately 44 acres of undeveloped land. In addition to the Alabama Department of Transportation (ALDOT), there are eight other property owners. Prior to construction of the highway, the Army visually swept the area for UXO and ordnance related residue. The Army also agreed to provide safety training to highway workers and explosive ordnance disposal (EOD) support during the intrusive construction phase of the project. A complete subsurface survey was not conducted on the area prior to, during, or after the construction. In response to a Nov. 16, 1984 memo to the Army from ALDOT during construction, the Army determined "that the possibility exists that unexpended ordnance (live ammunition) may exist on all right-of-way on the project which was formerly RSA property." The extent of UXO or related materials remaining (if any) on the site is unknown. No portion of this MRS is currently owned or controlled by the DoD, as all property was officially transferred to ALDOT via quitclaim deed in 1991. However in 2008, this MRS was added to the list of Military Munitions Response Program (MMRP) sites requiring investigation and potential additional actions based upon historical information. A historical review has been performed and is summarized in the Final Site Inspection Report, US Army Garrison, Redstone Arsenal, Huntsville, Alabama (Malcolm Pirnie, Inc., 2008). No other work or investigations been conducted at this MRS since the property was transferred. Additional site information is from the Draft Historical Records Review (May 2007) and the Inventory of BCM Sites on Active Army Installations conducted in 2004.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

Additional RFI work, including a DGM (MEC) survey, is needed to delineate the site. A CMS and Statement of Basis/Permit Modification will be performed after the RFI. Additional actions for this site will consist of completing the DES and CMI. Land Use Controls only are anticipated, without active remediation, based on potential for MEC. The LUCs include administration of the Site Access Control program, fencing, and signage, intrusive activity restrictions, and coordination with adjacent landowners. In addition, two five-year reviews are estimated for planning purposes. The LUC monitoring and enforcement for MEC and five-year reviews are included in LTM.

**Site ID: RSA-280-R-01**  
**Site Name: Skunk Hollow Small Arms Range**  
**Alias: RSA-280**

**STATUS**

**Regulatory Driver:** RCRA  
**MRSPP Score:** 07  
**Contaminants of Concern:** Metals, Munitions constituents (MC)  
**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200201.....	200305
CS.....	200602.....	200809
RFI/CMS.....	201211.....	201501
DES.....	201501.....	201504
CMI(C).....	201506.....	201704
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201704	

**SITE DESCRIPTION**

The Skunk Hollow Small Arms Range is a 0.8-acre site north of Madkin Mountain and operational range. The range was used for small arms firing, including M16 rifles and 40mm practice grenades.

Built in 1991, this 0.8-acre 25-meter M16 rifle and pistol range was used until approximately 2001-2002 when it was closed due to the potential for small arms to ricochet. It is believed that the range had two years of limited use. The range site plans include details of drains below and within the face of the impact berm. The design drawings depict that the drains were to be constructed of perforated pipe and exit the range on the east side into a drainage ditch.

MC related to small arms ammunition is suspected in the backstop. Based on the activities that occurred at the former small arms range, debris associated with small arms ammunition includes spent projectiles, fragments, and shell casings. Fragments from M781 40mm projectiles were also found in the backstop here. This projectile contains only an orange dye powder which is dispersed on impact without an explosive charge. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

Additional soil and groundwater sampling is required to complete the RFI. A CMI(C) is anticipated to excavate the small arms range backstop, which contains lead contamination. The soil will be transported and disposed off-site.

**Site ID: RSA-285-R-01**  
**Site Name: Former WP Grenade Test Area**  
**Alias: RSA-285**

**STATUS**

**Regulatory Driver:** RCRA

**MRSPP Score:** 04

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

Phases	Start	End
RFA.....	200802.....	201009
RFI/CMS.....	201206.....	201503
DES.....	201503.....	201511
CMI(C).....	201511.....	201608
LTM.....	201608.....	204701

**RIP Date:** N/A

**RC Date:** 201608

**SITE DESCRIPTION**

RSA-285-R-01 is approximately 3.6 acres, located west of Rideout Road between Neal Road and Pogo Road, adjacent to the west side of George C. Marshall Space Flight Center. Available historical information indicates that this location was essentially undeveloped prior to 1941. The Army began developing the area in mid-1941 with the development of RSA during WWII. Historical documents suggest that RSA-285-R-01 was used for explosive testing of items produced at RSA during WWII. Utilization of the area for explosive testing ceased by Aug. 17, 1945. There have been no known additional uses of the area for explosive testing after 1945. There are no known structures constructed or associated with the site. A SWMU Assessment Report was submitted for RSA-285 in accordance with Part IV.B.3 of Modification No. 3 of Redstone Arsenal's AHWMMMA/Hazardous Waste Storage/SWMU Correction Action/Subpart X Permit dated Sept. 20, 2007. The recommendation for RSA-285 was to move the site from Table IV.4 to IV.3 as a SWMU requiring no further action. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

The RFI/CMS will include a UXO survey and soil and groundwater sampling for explosives, metals, and white phosphorus. Land use controls will be implemented in the CMI(C) phase. The LUC monitoring and five-year reviews are included in LTM.

**Site ID: RSA-294-R-01**  
**Site Name: Field Training Exercise Area E**  
**Alias: RSA-294**

**STATUS**

**Regulatory Driver:** RCRA

**MRSPP Score:** 06

Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC)

Media of Concern: Groundwater, Sediment, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	201103.....	201108
RFI/CMS.....	201308.....	201410

**RIP Date:** N/A

**RC Date:** 201410

**SITE DESCRIPTION**

The FTX Area E is located south of Martin Road and north of Creek Road. The part of Area E located south of Martin Road was PSA 145-PS-07A. MMRP is recommended because this PSA is not on a range and there is a munitions potential. Field training activities in this PSA began during the 1960s. This area is shown on a 1970 reservation map of Missile and Munitions Center and School training areas and a 1973 historical map. Training aids may have included smoke grenades, blank ammunition, and flares. Features and materials observed during the VSI include soil piles and a couple of discarded drums. Most of the PSA is swampy and densely vegetated. Little evidence of historical training activities was observed. Soil and groundwater samples collected at one of the drums were analyzed for TLC VOCs, TCL SVOCs, PRO, and TAL metals (soil only). No analytes exceed screening criteria in soil, and TCE was detected at a concentration (64 µg/L) consistent with the plume associated with RSA-113. No TCE was detected in soil.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

An RFI report will be prepared. Sampling will include soil, sediment, and groundwater sampling for explosives and metals.

**Site ID: RSA-312-R-01**  
**Site Name: Former Range Area Gate 7 Expansion**  
**Alias: RSA-312**

**STATUS**

**Regulatory Driver:** RCRA  
**MRSPP Score:** 04  
 Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC)  
 Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	201012.....	201103
RFI/CMS.....	201205.....	201505
DES.....	201505.....	201511
CMI(C).....	201511.....	201605
LTM.....	201605.....	204605
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201605	

**SITE DESCRIPTION**

RSA-312-R-01, Former Range Area for Gate 7 Expansion, was identified as the result of the removal of parcels of land from the Redstone Arsenal Range Inventory for the expansion of Gate 7 and the construction of a new access control facility. RSA-312-R-01 covers approximately 60 acres of land, consisting of pasture and wooded areas and is located in the northwest portion of RSA, west of Anderson Road extending almost to the western arsenal boundary and is adjacent to the recently identified SWMU RSA-313-R-01 which is located along Zierdt Road. Portions of the site extend north and south of Martin Road. Available historical information indicates that this location was largely undeveloped or was farm land prior to 1941. In mid-1941 with the development of RSA as a result of WWII, the Army began developing the area. Numerous range areas were developed in support of testing activities for ordnance manufactured at RSA during WWII. According to available historical information, the majority of the areas within the site were not used as impact or explosive testing areas.

RSA-312-R-01 also encompasses most of an existing SWMU, RSA-073. RSA-073 is identified as the HE Impact Test Site, Area C. This site was used for explosive training/munitions testing during the 1940s and 1950s. The five-acre site consists of wooded and open field areas. The unit was identified by the USEPA as an area of concern in 1989 and further characterized as an SWMU in RSA's RCRA permit. RSA-073 was surface cleared of unexploded ordnance in the 1940s and 1950s. Construction areas adjacent to RSA-073 were also surface cleared in 1989.

A Site/Activity-Specific Probability Assessment Support Work Plan for the Martin Road Expansion/Gate 7 Access Control Point Construction and Zierdt Road Expansion Activities was submitted in August 2010. A SWMU Assessment Report was submitted for RSA-312-R-01 in September 2010. The available historical information indicated that the vast majority of the areas within the site were not used for waste management activities and that most of the site likely served as a buffer area between the arsenal's western boundary and the test areas known to be present within the northern portions of RSA. The general lack of construction activities and permanent structures make it unlikely that waste management or disposal occurred within RSA-312-R-01. The recommendation for RSA-312-R-01 was to conduct a UXO survey and if UXO are discovered, the UXO will be addressed as required under the Military Munitions Response Program and applicable RCRA requirements. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

An RFI will be prepared. Geophysical mapping will be conducted on impacted areas. The MEC anomalies will be removed. Soil and groundwater will be sampled for metals and explosives. Land use controls will be implemented in the CMI(C) phase. The LTM includes LUC inspections and five-year reviews.

**Site ID: RSA-313-R-01**  
**Site Name: W side Former High explosive Area A**  
**Alias: RSA-313**

**STATUS**

**Regulatory Driver:** RCRA

**MRSPP Score:** 04

Contaminants of Concern: Munitions and explosives of concern (MEC)

Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	201012.....	201103
RFI/CMS.....	201210.....	201505
DES.....	201505.....	201606
CMI(C).....	201606.....	201702
LTM.....	201709.....	204209

**RIP Date:** N/A

**RC Date:** 201702

**SITE DESCRIPTION**

RSA-313-R-01, Western Side of Former High Explosive Drop Area A, is located in the northwestern portion of RSA, west of Anderson Road along the western boundary of the Arsenal and occupies approximately 96.5 acres of land. There are no known structures associated with the site. The site extends from Interstate 565 along the western arsenal boundary to a point south of Martin Road and consists mostly of wooded and limited pasture areas. Areas outside of the RSA boundary to the west include numerous agricultural, residential and commercial areas.

A Site/Activity-Specific Probability Assessment Support Work Plan for the Martin Road Expansion/Gate 7 Access Control Point Construction and Zierdt Road Expansion Activities was submitted in August 2010. A SWMU Assessment Report was submitted for RSA-313-R-01 in September 2010. The available historical information indicates that the areas within the site were not used for waste management activities and that the site likely served as a buffer area between the arsenal's western boundary and the test areas known to be present within the northern portions of RSA. However, concerns over the possible presence of MEC still exist for the site. The recommendation for RSA-313-R-01 was to conduct a UXO survey and if UXO are discovered, the UXO will be addressed as required under the Military Munitions Response Program and applicable RCRA requirements. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA requiring an RFI for this site.

**CLEANUP/EXIT STRATEGY**

An RFI will be prepared. Geophysical mapping will be conducted on impacted areas. The MEC anomalies will be removed to an approximate depth of three ft. Soil and groundwater will be sampled for metals and explosives. Land use controls will be implemented in the CMI(C) phase. The LTM includes LUC inspections and five-year reviews.

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
MSFC-077-R-01	MSFC-77	200809	DD received
MSFC-082-R-01	MSFC-82	200406	Combined with MSFC-003-R-02 due to possibility of CWM
RSA-001-R-01	HIGHWAY 565 AREA	200701	
RSA-002-R-01	MSFC-3E	200305	Combined with MSFC-003-R-01
RSA-003-R-01	RIFLE RANGE	200503	This is an operational range (R0506), therefore not eligible for MMRP
RSA-004-R-01	SMOKE GRENADE AREA	200701	
RSA-013-R-01	RSA-13	200406	
RSA-014-R-01	RSA-14	200406	
RSA-046-R-01	RSA-46	200406	This is an operational range (R0505 and R0506), therefore not eligible for MMRP
RSA-065-R-01	RSA-65	200406	
RSA-066-R-01	RSA-66	200406	This is an operational range (R0701), therefore not eligible for MMRP
RSA-067-R-01	RSA-67	200406	This is an operational range (R0701), therefore not eligible for MMRP
RSA-068-R-01	RSA-68	200406	This is an operational range (R0701), therefore not eligible for MMRP
RSA-069-R-01	RSA-69	200406	This is an operational range (R0701), therefore not eligible for MMRP
RSA-070-R-01	RSA-70	200406	This is an operational range (R0701), therefore no eligible for MMRP
RSA-071-R-01	RSA-71	200503	This is an operational range (Range R1101/1102/1103/1104/1105/1107), therefore no eligible for MMRP
RSA-073-R-01	RSA-73	200503	This is an operational range ( R1104 /1105/1106/1107), therefore not eligible for MMRP
RSA-074-R-01	RSA-74	200503	This is an operational range (R1000 and R1107), therefore not eligible for MMRP
RSA-110-R-01	RSA-110	200406	This is an operational range (0701), therefore not eligible for MMRP
RSA-132-R-01	RSA-132	200406	This is an operational range (R0702), therefore not eligible for MMRP
RSA-279-R-01	Smoke Grenade Area	200809	

# MMRP Schedule

Date of MMRP Inception 200201

## Past Phase Completion Milestones

### 2003

RFA (MSFC-003-R-01 - Inactive Old Bone Yard Disposal Sit, PBA@MR Redston - PBA@MR Redstone, RSA-072-R-01 - Former Mortar Test Site (NOT in Ran, RSA-141-R-01 - 4.2 Inch Mortar Disposal Site, Bldg, RSA-221-R-01 - FuseStorage&Munitions Disposal Area, RSA-278-R-01 - Highway 565 Area, RSA-279-R-01 - Smoke Grenade Area, RSA-280-R-01 - Skunk Hollow Small Arms Range)

PA (MSFC-077-R-01 - MSFC-77, MSFC-082-R-01 - MSFC-82, RSA-001-R-01 - HIGHWAY 565 AREA, RSA-002-R-01 - MSFC-3E, RSA-003-R-01 - RIFLE RANGE, RSA-004-R-01 - SMOKE GRENADE AREA, RSA-013-R-01 - RSA-13, RSA-014-R-01 - RSA-14, RSA-046-R-01 - RSA-46, RSA-065-R-01 - RSA-65, RSA-066-R-01 - RSA-66, RSA-067-R-01 - RSA-67, RSA-068-R-01 - RSA-68, RSA-069-R-01 - RSA-69, RSA-070-R-01 - RSA-70, RSA-071-R-01 - RSA-71, RSA-073-R-01 - RSA-73, RSA-074-R-01 - RSA-74, RSA-110-R-01 - RSA-110, RSA-132-R-01 - RSA-132)

### 2004

RFA (RSA-234-R-01 - WASTE DISPOSAL PIT, RSA-249-R-01 - INACTIVE OLD BONEYARD DISPOSAL SITE)

### 2008

CS (MSFC-003-R-01 - Inactive Old Bone Yard Disposal Sit, RSA-072-R-01 - Former Mortar Test Site (NOT in Ran, RSA-141-R-01 - 4.2 Inch Mortar Disposal Site, Bldg, RSA-221-R-01 - FuseStorage&Munitions Disposal Area, RSA-278-R-01 - Highway 565 Area, RSA-279-R-01 - Smoke Grenade Area, RSA-280-R-01 - Skunk Hollow Small Arms Range)

SI (MSFC-077-R-01 - MSFC-77)

### 2009

IRA (RSA-072-R-01 - Former Mortar Test Site (NOT in Ran)

### 2010

RFA (RSA-285-R-01 - Former WP Grenade Test Area)

### 2011

RFA (RSA-294-R-01 - Field Training Exercise Area E, RSA-312-R-01 - Former Range Area Gate 7 Expansion, RSA-313-R-01 - W side Former High explosive Area A)

## Projected Phase Completion Milestones

See attached schedule

## Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

To Be Determined

Final RA(C) Completion Date: 201704

Schedule for Next Five-Year Review: N/A

Estimated Completion Date of MMRP at Installation (including LTM phase): 204701

## REDSTONE ARSENAL MMRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
MSFC-003-R-01	Inactive Old Bone Yard Disposal Sit	RFI/CMS						
		IRA						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
PBA@MR Redston	PBA@MR Redstone	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-072-R-01	Former Mortar Test Site (NOT in Ran	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-141-R-01	4.2 Inch Mortar Disposal Site, Bldg	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-221-R-01	FuseStorage&Munitions Disposal Area	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-234-R-01	WASTE DISPOSAL PIT	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-249-R-01	INACTIVE OLD BONEYARD DISPOSAL SITE	RFI/CMS						
		DES						
		CMI(C)						
		LTM						

## REDSTONE ARSENAL MMRP Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-278-R-01	Highway 565 Area	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-280-R-01	Skunk Hollow Small Arms Range	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-285-R-01	Former WP Grenade Test Area	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-294-R-01	Field Training Exercise Area E	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-312-R-01	Former Range Area Gate 7 Expansion	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
RSA-313-R-01	W side Former High explosive Area A	RFI/CMS						
		DES						
		CMI(C)						
		LTM						

**REDSTONE ARSENAL**  
**Army Defense Environmental Restoration Program**  
**Compliance Restoration**

# CR Summary

**Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count:** 42/3

## Installation Site Types with Future and/or Underway Phases

- 3 Above Ground Storage Tank  
(CCRSA-314, CCSWMU-031, CCSWMU-E)
- 2 Disposal Pit/Dry Well  
(CCRSA-308, CCRSA-309)
- 2 Maintenance Yard  
(CCSWMU-246, CCSWMU-247)
- 8 Oil Water Separator  
(CCRSA-310, CCSWMU-003, CCSWMU-028, CCSWMU-030, CCSWMU-035, CCSWMU-222, CCSWMU-304, CCSWMU-306)
- 1 POL (Petroleum/Lubricants) Lines  
(CCSWMU-143)
- 3 Sewage Treatment Plant  
(CCSWMU-008, CCSWMU-009, CCSWMU-268)
- 2 Soil Contamination After Tank Removal  
(CCSWMU-291, CCSWMU-293)
- 7 Spill Site Area  
(CCSWMU-240, CCSWMU-245, CCSWMU-248, CCSWMU-283, CCSWMU-284, CCSWMU-286, CCSWMU-287)
- 4 Storage Area  
(CCSWMU-241, CCSWMU-242, CCSWMU-243, CCSWMU-F)
- 1 Surface Disposal Area  
(CCRSA-311)
- 1 Surface Impoundment/Lagoon  
(CCSWMU-116)
- 1 Unexploded Munitions/Ordnance  
(CCRSA-266)
- 1 Washrack  
(CCSWMU-305)
- 3 Waste Treatment Plant  
(CCSWMU-288, CCSWMU-289, CCSWMU-290)

## Most Widespread Contaminants of Concern

Metals, Perchlorate, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

## Media of Concern

Groundwater, Soil

## Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
N/A				

## Duration of CR

**Date of CR Inception:** 198908

**Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC):** 201704/201704

**Date of CR completion including Long Term Management (LTM):** 204209

## CR Contamination Assessment

### Contamination Assessment Overview

Release assessments for RSA-241, RSA-242, RSA-243, RSA-283, RSA-284, RSA-288, RSA-290, RSA-291, RSA-304, and RSA-305 were not accepted by ADEM. These sites will move forward in FY12 as RFIs. Technical review comments were received from ADEM on aging RFI reports for sites RSA-003, RSA-008, RSA-009, RSA-030, and RSA-031. No further action decisions for surface media were received for sites RSA-037, RSA-170, RSA-172, and RSA-174. ADEM concurred with a Land use control decision for site RSA-008.

### Cleanup Exit Strategy

RFIs are planned to be completed at six sites, and will begin at 13 other sites. Sites RSA-116, RSA-222, RSA-240, RSA-246, and RSA-248 may also move forward into an RFI depending upon ADEMs final review comment responses. Corrective Measure Studies are underway and are planned to be completed for sites RSA-003 and RSA-009. RFIs at 11 compliance restoration (CR) sites are planned under the RSA PMC Task Order 4. CR Sites RSA-009, RSA-003, RSA-035 and RSA-268 will move forward into CMI phases under the RSA PMC TO 4.

## CR Previous Studies

**Title**

**Author**

**Date**

There are no Previous Studies

**REDSTONE ARSENAL**  
**Compliance Restoration**  
**Site Descriptions**

**Site ID: CCRSA-266**  
**Site Name: Open Storage area N. of Bldg 8607**  
**Alias: RSA-266**

**STATUS**

**Regulatory Driver:** RCRA  
 Contaminants of Concern: Explosives, Metals, Perchlorate, Semi-volatiles (SVOC), Volatiles (VOC)  
 Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200901.....	201009
RFI/CMS.....	201104.....	201412
DES.....	201412.....	201508
CMI(C).....	201508.....	201602
CMI(O).....	201602.....	201609
<b>RIP Date:</b>	201602	
<b>RC Date:</b>	201609	

**SITE DESCRIPTION**

The site is located along the Tennessee River in the southern portion of RSA within the RSA-157 groundwater unit and is approximately 111 acres. Buildings 8800 through 8855 were constructed in 1942 as storage magazines to support activities at the GCWD. The primary mission of the GCWD was the segregation, renovation, and preparation for long term storage of chemical munitions manufactured at Huntsville Arsenal artillery ammunition returned from overseas (ARFO). Building lists indicates that the primary function of these facilities was storage of general depot materials. However, the 1954 BIM indicates that several of these buildings were assigned to the Ordnance Guided Missile School or contractors such as Rohm & Haas and Thiokol Corporation. Magazines in this area were used for the storage of finished munitions (not raw explosive materials or chemical agents).

A potential source area investigation was conducted with the subsequent PSA report submitted in 2006. Select PAHs and metals were detected in soil at concentrations exceeding evaluation criteria. As part of the PSA report comment resolution meeting held on April 15, 2008, ADEM, the EPA, and the Army reviewed analytical data collected as part of the 2004 PSA effort and determined that CCRSA-266 does not warrant further investigation for HTRW constituents. In a letter dated Jan. 14, 2009, the Army requested a no action decision for HTRW constituents and to defer until range closure the investigation of MEC and MC. Qualified concurrence for no action for HTRW constituents and to defer investigation for MEC and MC until range closure was received from USEPA on Feb. 20, 2009. ADEM concurred that no action was appropriate for HTRW in a letter dated Nov., 10, 2009. A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

Complete the RFI/CMS, Statement of Basis and Permit Modification Request. Based on requirements of the Permit, AEIRG, and ARBCA, additional funding is necessary to complete an RFI. It is anticipated that a DES, CMI (C), CMI (O) will be required to address PAHs and metals in soil. Excavation of 2,500 cy with off-site disposal is the expected remedy.

**Site ID: CCRSA-308**  
**Site Name: Exterior Sump at Bldg 7120**  
**Alias: RSA-308**

**STATUS**

**Regulatory Driver:** RCRA  
**Contaminants of Concern:** Metals, Perchlorate, Volatiles (VOC)  
**Media of Concern:** Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200908.....	200910
RFI/CMS.....	201104.....	201503
DES.....	201503.....	201511
CMI(C).....	201511.....	201605
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201605	

**SITE DESCRIPTION**

Building 7120 was built in 1945 to serve as the Ordnance Missile Laboratories propulsion laboratory and auditorium. It contains offices, an auditorium, a maintenance shop, laboratories, and a 28-bay propellant mixing/testing area. The majority of activities conducted were related to physical tests of rockets and missiles to better understand the flight mechanics and design physics. These activities included propellant mixing, casting, curing, testing, painting, and/or degreasing. Current activities conducted in the test bays include mixing and testing of small batches of propellants. During a site visit completed May 11, 2009, an east side exterior sump was observed. The sump has the potential to receive waste from the test bays and to manage hazardous constituents. It is unknown if any releases of hazardous constituents occurred from the exterior sump. The sump will be investigated further as a SWMU. Historical sample results associated with Building 7120 indicate that there may have been more than one sump in the past and have managed solid and hazardous waste based on lead and solvent concentrations that exceed RCRA limits.

**CLEANUP/EXIT STRATEGY**

It is expected that an RFI and a risk assessment are required. The results of the RFI are expected to indicate that removal of contaminants is required. All site activities will be documented in a site closure report. The phases included in the project are an RFI, CMS, DES, and CMI-C to address contamination in soil.

**Site ID: CCRSA-309**  
**Site Name: Covered trench & sump at Bldg 7155**  
**Alias: RSA-309**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals, Perchlorate, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200908.....	200910
RFI/CMS.....	201104.....	201503
DES.....	201503.....	201511
CMI(C).....	201511.....	201605

**RIP Date:** N/A

**RC Date:** 201704

**SITE DESCRIPTION**

Building 7155 was built in 1988 and is used as a laboratory. Building activities consist of testing both inert and energetic materials for Ordnance Missile Laboratories studies. There are nine test bays along the north side of the lower level that currently test explosives. All bays have interior floor trench drains along the outside (north wall) that connect to an exterior metal-covered trench that extends approximately 30 yards to a large metal-covered concrete sump. During a site visit completed May 11, 2009, it was noted that activities in the test bays had the potential to discharge through the floor drains to an exterior sump. Given the past and current building activities, the sump likely received spills from building activities. It is unknown if any releases to the sump contained hazardous constituents.

**CLEANUP/EXIT STRATEGY**

It is expected that an RFI and a risk assessment are required. The results of the RFI are expected to indicate that a removal action is required. All site activities will be documented in a site closure report. The phases included in the project are an RFI/CMS, DES, and CMI-C. A limited soil excavation with off-site disposal is expected.

**Site ID: CCRSA-310**  
**Site Name: Former & Suspected OWS at Bldg7289**  
**Alias: RSA-310**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200908.....	200910
RFI/CMS.....	201104.....	201504
DES.....	201504.....	201512
CMI(C).....	201512.....	201606

**RIP Date:** N/A

**RC Date:** 201704

**SITE DESCRIPTION**

Building 7289 was constructed in 1961 as a boiler house to support operations in the adjacent rocket-motor conditioning facility, Building 7288. One 7,200-gallon, steel No. 2-fuel-oil UST was installed in 1961 and removed on May 10, 1996 when the boiler house was converted to natural gas. The boiler house has been inactive for more than 10 years. An OWS was abandoned by removal between June 20, 2001 and June 30, 2002. It is unclear if soil sampling for the removed OWS was performed. During a May 11, 2009, site visit, a second in-place suspected OWS was discovered south of Building 7289.

**CLEANUP/EXIT STRATEGY**

It is expected that the release assessment at CCRSA-310 will indicate that an RFI and a risk assessment are required. The results of the RFI are expected to indicate that a removal action is required for the removal of contaminants. It is expected that the removal action will serve as the final remedial action. All site activities will be documented in a site closure report. The phases included in the project are a release assessment (already funded), RFI/CMS, DES, and CMI-C.

**Site ID: CCRSA-311**  
**Site Name: Sump & Concrete Pits at Bldg 7352**  
**Alias: RSA-311**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Explosives, Metals, Perchlorate, Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA.....	200908.....	200910
RFI/CMS.....	201104.....	201503
DES.....	201503.....	201511
CMI(C).....	201511.....	201605

**RIP Date:** N/A

**RC Date:** 201704

**SITE DESCRIPTION**

Building 7352 was constructed in 1989 as a bowl and wastewater clean-up facility for equipment and tools used in propellant mixing and casting at nearby facilities. Building 7352 is now used to support R&D activities for a missile propellant recycling program. The recycling process uses anhydrous ammonia to dissolve and remove propellant materials from missile housings. During a site visit completed May 11, 2009, three exterior sumps and two interior concrete pits were observed. The three open exterior sumps are connected to interior floor trench drains where the missile propellant recycling study is conducted. The building has two interior concrete pits that were once used for wastewater treatment. The past use of the interior concrete pits for wastewater treatment suggests that the potential exists for releases to the interior concrete pits and exterior sumps. It is unknown if releases of hazardous constituents occurred. The interior concrete pits and the three exterior sumps at Building 7352 will be investigated further as a SWMU.

**CLEANUP/EXIT STRATEGY**

Additional investigation of soil, groundwater, sediment, and surface water is expected. All site activities will be documented in a site closure report. The phases anticipated would be an RFI/CMS, DES, and CMI if a release had occurred. A limited soil excavation with off-site disposal is expected.

**Site ID: CCRSA-314**  
**Site Name: Used Oil AST & Spill site Bldg 3670**  
**Alias: RSA-314**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals, Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	201009.....	201011
RFI/CMS.....	201104.....	201505
DES.....	201505.....	201601
CMI(C).....	201601.....	201607

**RIP Date:** N/A

**RC Date:** 201607

**SITE DESCRIPTION**

RSA-314 consists of the used oil AST and spill site located near Building 3670. Building 3670 is the heavy equipment (e.g., bulldozer and forklift) maintenance facility. The AST was installed in 1992. It has a capacity of 2,000 gallon. Reportedly, less than 25 gallons of used oil was spilled at this location as a result of a failure of the overfill alarm. Due to high levels of petroleum contamination in the soil, this area was identified as a new SWMU. Further investigation is required to determine the full extent of contamination. RSA-314 is located in the eastern portion of RSA, in the motor pool area, west of Patriot Drive and Patton Road.

**CLEANUP/EXIT STRATEGY**

The RFI will consist of additional soil sampling, monitoring well installation and sampling, and the completion of a risk assessment. The RFI will likely indicate that a CMS and a CMI-C are required. The phases included in this project are an RFI, CMS, DES and CMI-C. No corrective actions are expected for groundwater. A limited excavation and off-site disposal is expected for soils.

**Site ID: CCSWMU-003**

**Site Name: IN-GROUND OIL/WATER SEPARATOR BLDG 3617**

**Alias: RSA-003**

## STATUS

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals, Petroleum, Oil and Lubricants (POL), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	198908.....	199109
CS.....	200001.....	200110
RFI/CMS.....	200404.....	201310
DES.....	201307.....	201501
CMI(C).....	201406.....	201512
LTM.....	201610.....	204205

**RIP Date:** N/A

**RC Date:** 201610

## SITE DESCRIPTION

This SWMU was an in-ground OWS located outside Building 3617 that received waste lubricant oils, grease, and detergents from vehicle maintenance activities until 1997. It was replaced by a new in-ground OWS.

The separator was a concrete structure eight-ft wide by eight-ft long by eight-ft deep, designed to hold approximately four-ft of liquid (approximately 2,000-gallons). The unit reportedly received waste lubricant oils, grease, detergents, and solvents from vehicle maintenance activities until 1997 when it was replaced by a new in-ground separator. The data collected during the confirmation sampling indicated the need for additional investigations at CCSWMU-003 due to the release of TPH and lead. The release assessment completed in 2001 identified TPH above 100-ppm and metals (arsenic, lead, chromium, and mercury) above RSA background levels in surface and subsurface soils. Removal actions for TPH contaminated soil were implemented in June and July 2002. The removal actions identified additional TPH impacted soils resulting from an out of service oil drain pit on the south side of Building 3617. The removal action activities at CCSWMU-003 were expanded to include the waste oil drain pit and petroleum impacted soils around the pit. Additional release areas were identified during the removal actions. Groundwater contained TPH, TCE, DCE, DCA, and vinyl chloride above MCLs. The identification of additional potential release areas and the concentrations of contaminants in the groundwater indicated that an RFI was necessary to assess releases at CCSWMU-003.

The RFI began in May 2004. The draft RFI Report recommending a NFA was submitted based on lack of risk to human health and the environment on Sept. 20, 2004. Comments on the RFI Report were received from ADEM Nov. 17, 2005. ADEM requested additional evaluation of groundwater at CCSWMU-003. The evaluation of groundwater at CCSWMU-003 as part of a supplemental RFI began in July 2006 and was completed in 2010. The supplemental RFI and an ARBCA human health risk evaluation identified six VOC COC in groundwater (1,1,1-Trichloroethane, 1,1-Dichloroethene, cis-1,2-Dichloroethene, Methylene Chloride, Trichloroethene, Vinyl Chloride). Multiple sampling rounds indicate there is a steady decline in TCE concentrations at the site.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

The path forward will consist of MNA study followed by LTM. Documentation of all site investigation activities and the completion of a closure report for CCSWMU-003 are included in the cleanup strategy. The phase included in the project is long term monitoring of groundwater annually for a period of 10 years. Two five-year reviews will be included in the LTM program.

**Site ID: CCSWMU-008**  
**Site Name: SEWAGE TREATMENT PLANT #4**  
**Alias: RSA-008**

**STATUS**

**Regulatory Driver:** RCRA  
**Contaminants of Concern:** Metals, Volatiles (VOC)  
**Media of Concern:** Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198908.....	199109
RFI/CMS.....	200409.....	201307
CMI(C).....	201307.....	201401
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201503	

**SITE DESCRIPTION**

STP No. 4 (CCSWMU-008) is located in the northeastern section of RSA north of Martin Road, east of Patton Road, south of Hansen Road, and west of McDonald Creek. The in-ground concrete facility was constructed in 1959 and removed from active service in 1992. However, it is still used on an as needed basis. The plant was used for treatment of sewage and wastewater generated in the northern portion of RSA. CCSWMU-008 also received floor wash water from some of the research labs and motor pools, as well as water separated by the oil/water separators located in the area.

RSA requested the movement of SWMU-008 from the CERCLA program to the RCRA program under an NFA recommendation on Oct. 7, 2002. Limited investigations of CCSWMU-008 were completed under the CERCLA program. More thorough investigations are required under RCRA to evaluate the site. The ADEM requested an RFI for the site on Feb. 4, 2003. The RFI began in June of 2004. A courtesy copy of the RFI WP was submitted to the ADEM on June 14, 2004. The RFI was completed in October 2004. The CCSWMU-008 RFI Report was submitted to the ADEM on Oct. 5, 2005 for review. Comments on the CCSWMU-008 RFI report were received from the ADEM on Oct. 23, 2007. A response to the ADEM comments was issued on Dec. 20, 2007 requesting an NFA for CCSWMU-008. As of March 2011, no response had been received from the ADEM.

**CLEANUP/EXIT STRATEGY**

It is possible that a removal action will be required to allow unrestricted use of the site. Therefore, a CMS, and a CMI will be required for CCSWMU-008. The CMI will consist of removing contaminated soil from the sludge drying beds. The cleanup strategy assumes that the documentation of all site investigation activities will be included in the closure report for CCSWMU-008. Phases included in this site are CMS and CMI.

**Site ID: CCSWMU-009**

**Site Name: INACTIVE SEWAGE TREATMENT PLANT #3**

**Alias: RSA-009**

## STATUS

**Regulatory Driver:** RCRA

**Contaminants of Concern:** Polychlorinated Biphenyls (PCB)

**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198908.....	199109
RFI/CMS.....	200702.....	201401
DES.....	201306.....	201504
CMI(C).....	201406.....	201601

**RIP Date:** N/A

**RC Date:** 201611

## SITE DESCRIPTION

Inactive Sewage Treatment Plant #3 located in the northeastern portion of RSA north of Martin Road. The treatment plant was originally constructed in 1942. The plant was operated under a NPDES permit allowing a monthly flow of 2.0 million gallons per day (MGD). The treatment plant historically treated sewage generated in the central portion of RSA as well as discharges from the Marshall Space Flight Center. The plant is currently operational and is utilized on an as needed basis. RSA requested the movement of CCSWMU-009 from the CERCLA program to the RCRA program under a NFA recommendation on Oct. 07, 2002. ADEM concurred with the movement of CCSWMU-009 to RCRA but did not concur with the NFA recommendation. ADEM requested an RFI for the site on Feb. 4, 2003. The efforts to complete the RFI were funded and began in 2007. Delays in completing the investigation due to archeological concerns were identified in January 2008. RFI field efforts were completed in 2008. The preliminary data indicated that PCBs were a concern for surface soils at the site. Delineation of the extent of PCBs in surface soils was attempted and data indicated that PCBs were present in soils at concentrations up to 860 ppm. Data from the RFI indicates that PCBs in soils are a concern at CCSWMU-009. Based on the RFI data, a CMS, and a CMI will be required. The CMS was initially funded in FY09. However, because ADEM requested additional sampling at RSA-009 in their Dec. 12, 2011 comments, RSA agreed to the sampling and the efforts proposed for the CMS will be used to revised the RFI. Therefore, a CMS/CMI will be required. CMI will consist of removing contaminated soil from the sludge drying beds. No corrective actions are expected for groundwater. The cleanup strategy assumes that the documentation of all site investigation activities will be included in the closure report for CCSWMU-009.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

The ADEM requested an RFI for the site on Feb. 4, 2003. The efforts to complete the RFI were funded and began in 2007. Delays in completing the investigation due to archeological concerns were identified in January 2008. RFI field efforts were completed in 2008. The preliminary data indicated that PCBs were a concern for surface soils at the site. Delineation of the extent of PCBs in surface soils was attempted and data indicated that PCBs were present in soils at concentrations up to 860-ppm. Data from the RFI indicates that PCBs in soils are a concern at CCSWMU-009. Based on the RFI data, a CMS, and a CMI will be required. The CMS was initially funded in FY09. However, because ADEM requested additional sampling at RSA-009 in their Dec. 12, 2011 comments, RSA agreed to the sampling and the efforts proposed for the CMS will be used to revised the RFI. Therefore, a CMS/CMI will be required. CMI will consist of removing contaminated soil from the sludge drying beds. No corrective actions are expected for groundwater. The cleanup strategy assumes that the documentation of all site investigation activities will be included in the closure report for CCSWMU-009.

**Site ID: CCSWMU-028**  
**Site Name: IN-GROUND OWS 5693 AREA**  
**Alias: RSA-028**

**STATUS**

**Regulatory Driver:** RCRA  
 Contaminants of Concern: Metals, Petroleum, Oil and Lubricants (POL), Volatiles (VOC)  
 Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	198908.....	199109
CS.....	200001.....	200110
RFI/CMS.....	201103.....	201411
DES.....	201411.....	201412
CMI(C).....	201412.....	201506
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201506	

**SITE DESCRIPTION**

CCSWMU-028 consists of four active in-ground oil-water separators located within the confines of the RSA POL storage yard. The separators are designed to capture and separate any spills or leaks that could occur during product transfer operations. The separators are of concrete construction and are about eight-ft wide by six-ft long by eight-ft deep. The separators are designed to hold about four-feet of liquid (approximately 1,000-gallons). The discharge from the separators is routed to the RSA sanitary sewer. The four OWS are referred to as RSA-028 (1), RSA-028 (2), RSA-028 (3), and RSA-028 (4). Visual inspections of three of the OWSs during confirmation sampling determined that the influent pipe seals had deteriorated due to contact with oil, grease, or solvents, and the holes left in the concrete by the form ties used in construction provided potential areas for leaks. Soil sampling indicated that releases occurred from RSA-028 (1). It is unknown if releases occurred from and RSA-028 (4). The release assessment completed in 2001 indicated the presence of barium, chromium, lead, and mercury in the soils around RSA-028 (1) at concentrations that exceeded background levels. TPH was detected in subsurface soils in areas that were upgradient of RSA-028 (1). Similar results were noted in the groundwater samples collected. Upgradient and downgradient groundwater samples reported concentrations of TPH and TCE. The evidence suggests that the TPH detected in soil and groundwater could have potentially come from sources other than the OWS. Numerous sources including ASTs and pipelines used to store and transfer petroleum fuels are located in the immediate area surrounding CCSWMU-028. Any further investigation at CCSWMU-028 will encompass the POL storage yard and surrounding areas and will be completed under the ARBCA program for petroleum releases. Petroleum releases occurred in the areas around CCSWMU-028. Presently, it is unclear if the detected concentrations of petroleum are due to releases from the OWS. The OWSs were replaced in 2002. The cleanup strategy for RSA-028 (1) assumes that the clean-up will incorporate the entire area associated with the RSA POL Fuel Storage Yard into studies and corrective actions. A Secondary Site Assessment plan to collect data for use in the Tier II evaluation will be required to collect data to complete the site-specific risk-screening process. It is likely that the site investigation will consist of soil borings, collection of soil samples, sampling existing wells, and installation and sampling of new wells. Upon completion of the ARBCA evaluation, it is assumed that corrective action will be required for groundwater and soils of RSA-028 (1) and the RSA POL Fuel Storage Yard. The investigation phase and CMS for RSA-028 were funded in 2010 under the RSA PMC contract.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

The cleanup strategy for RSA-028 (1) assumes that the clean-up will incorporate the entire area associated with the RSA POL Fuel Storage Yard into studies and corrective actions. A Secondary Site Assessment plan to collect data for use in the Tier II evaluation will be required to collect data to complete the site-specific risk-screening process. It is likely that the site investigation will consist of soil borings, collection of soil samples, sampling existing wells, and installation and sampling of new wells. Upon completion of the ARBCA evaluation, it is assumed that corrective action will be required for groundwater and soils of RSA-028 (1) and the RSA POL Fuel Storage Yard. The investigation phase and CMS for RSA-028 were funded in 2010 under the RSA PMC contract.

**Site ID: CCSWMU-028**  
**Site Name: IN-GROUND OWS 5693 AREA**  
**Alias: RSA-028**

Corrective action will consist of injecting oxidizer into the groundwater to enhance remediation of contaminants in the groundwater and removal of contaminated soil. Upon completion of corrective action, long-term monitoring will be required. The phases included in the project are two study phases (one named ARBCA and one named Release Assessment), and a CMI, and site close out.

**Site ID: CCSWMU-030**  
**Site Name: CENTRAL OIL WATER SEPARATOR**  
**Alias: RSA-030**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals, Petroleum, Oil and Lubricants (POL), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198908.....	199109
CS.....	200001.....	200110
RFI/CMS.....	200409.....	201303

**RIP Date:** N/A

**RC Date:** 201303

**SITE DESCRIPTION**

This is an inactive facility located near Building 5427 used as the central repository for waste oil generated throughout RSA until it was removed from service in 2004. Recovered oil was discharged to the central OWS storage tanks (RSA-031) located east of the unit.

CCSWMU-030 is an inactive facility located near Building 5427. The unit consists of a metal building, a 2,000-gallon concrete holding sump, & a 1,000-gallon OWS. The unit served as a central repository for waste oil generated throughout RSA until it was removed from service in 2004. It began operation in 1982. Recovered oil was discharged to the central OWS storage tank (CCSWMU-031) located east of the unit. Treated water was discharged to the sanitary sewer system.

The release assessment completed in 2001 indicated that the soils at this site contain arsenic, barium, & cadmium at concentrations exceeding preliminary risk screening levels, & groundwater contains TPH, TCE, acetone, carbon disulfide, & chlorobenzene. It is suspected that these contaminants originated from releases at this site. The RFI to assess the extent of contamination began in October 2004. The RFI included the removal of the existing OWS, completion of additional sampling, & completing a removal action for TPH contaminated soils. The RFI report for CCSWMU-030 requesting NFA was submitted in July 17, 2006. As of March 2011, no response has been received from the ADEM.

**CLEANUP/EXIT STRATEGY**

It is expected that ADEM will require that a CMS and CMI (funded in 2004) be implemented for RSA-030. Additional data collected during the CMS will determine the feasibility of the proposed actions and determine if the cleanup strategy is viable. The CMI will include the excavation of contaminated soils and the construction of a stripper to remove VOCs from groundwater. The phases included in this project are a CMS, a CMI(C), and a CMI(O).

**Site ID: CCSWMU-031**

**Site Name: CENTRAL OIL WATER SEPARATOR STORAGE TANK**

**Alias: RSA-031**

### STATUS

**Regulatory Driver:** RCRA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	198908.....	199109
CS.....	200001.....	200110
RFI/CMS.....	200409.....	201303

**RIP Date:** N/A

**RC Date:** 201303

### SITE DESCRIPTION

This site consisted of three ASTs located near RSA-030 (Bldg 5427) taken out of service in 2004. RSA-031 was active during the release assessment, therefore sampling below the containment liner was not completed. Additional sampling was completed in 2005.

CCSWMU-031 is an inactive facility located near Building 5427. The unit consists of three ASTs with secondary containment. Two of the ASTs are located within a bermed containment area with a synthetic liner. These tanks reportedly have a capacity of 5,000 and 2,000 gallons. The third tank is a 5,000-gallon, double-wall tank located on the east side of CCSWMU-031. The tanks stored the oil recovered from the operations completed in Building 5427. Confirmation sampling completed in 2000 did not indicate that releases occurred from CCSWMU-031. However, surface soil data was not collected during the confirmation sampling. The release assessment completed in 2001 collected surface soil samples from CCSWMU-031 and verified that releases or petroleum products from the ASTs had not impacted surface soils. However, since CCSWMU-031 was active during the release assessment, sampling below the containment liner was not completed because it would compromise the integrity of the liner. The facility was removed from service in 2004 and investigations to assess the extent of contamination began. The clean up strategy funded in 2004 included cleaning and removal of the ASTs located at SWMU-030, removal of associated aboveground pipelines, removal of the berms and synthetic liner, and installing soil borings below the synthetic liner to determine if releases occurred. Based upon sampling conducted in 2005, a release did occur and was cleaned up. The RFI report was submitted to ADEM in July 2006. Review and comments are still pending from ADEM. The CAP assumes that the documentation of all site investigation activities will be included in the closure plan for CCSWMU-031. There are no more activities planned for this site.

### CLEANUP/EXIT STRATEGY

Site close out documentation will be combined with CCSWMU-030 after all actions are completed with that site. No additional funding is required.

**Site ID: CCSWMU-035**

**Site Name: IN-GROUND OIL/WATER SEPARATOR, BLDG 4812**

**Alias: RSA-035**

## STATUS

**Regulatory Driver:** RCRA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	198908.....	199109
CS.....	200001.....	200110
RFI/CMS.....	200807.....	201312
DES.....	201310.....	201503
CMI(C).....	201410.....	201511
LTM.....	201610.....	204209

**RIP Date:** N/A

**RC Date:** 201610

## SITE DESCRIPTION

Site CCSWMU-035 is an inactive in-ground OWS located at the RSA airfield. The OWS received run-off from a fuel truck parking area. The OWS was taken out of service in 1997 when a new separator was installed. The original unit was installed in the 1940s, upgraded in the 1970s, and upgraded in 1985. The OWS consisted of two stages (initial and second). Each stage consisted of a two-ft by three ft by four-ft deep concrete pit. A UST associated with RSA-042 stored the recovered waste oil. The OWS was connected to the RSA-042 UST by an underground pipeline. The waste oil recovered from the unit was routinely transferred to RSA-030. The water discharged from the unit was routed to an adjacent drainage ditch east of the OWS. In 2000, confirmation sampling was completed, and the OWS was removed. Samples were also collected from the pipelines. The data indicated that releases occurred from the OWS prompting the completion of a release assessment. The release assessment completed in 2001 determined that releases from the OWS were related to petroleum products and had impacted surface soil at the point where the OWS overflowed. A removal action completed in 2002 removed surface soils impacted by petroleum releases. Additional areas of TPH impacted soil were identified near the airfield UST. Investigations under the UST program may be necessary to determine future actions at the UST site. The UST was not addressed by any of the previous investigations. Groundwater at CCSWMU-035 occurs at or below the bedrock overburden interface. The limited number of samples obtained from the wells indicated the presence of TCE in groundwater. However, samples were not obtained from upgradient locations to confirm the release point. Since the groundwater occurs in bedrock at CCSWMU-035, the assessment of groundwater was separated from soils and combined with the groundwater investigation for RSA-034. The groundwater investigation completed in August 2003 indicated that releases from CCSWMU-035 did not impact groundwater. The NFA recommendation for the site surface media contained in the closure report submitted to ADEM in June 2004 was not accepted. On Dec. 6, 2004, ADEM provided comments on the closure report and requested additional sampling at CCSWMU-035. A report indicating the need for additional sampling at CCSWMU-035 due to releases detected during the additional investigations was submitted to ADEM in August 2005. A meeting was held with ADEM on Oct. 18, 2005 to discuss the CCSWMU-035 issues. ADEM indicated that at a minimum, a technical memorandum to outline proposed sampling efforts to address releases to soil and groundwater at CCSWMU-035 was required. ADEM also requested a review of the work plan for CCSWMU-035 investigation activities prior to implementation. The technical memorandum was submitted to ADEM recommending that releases in the area of the initial OWS stage be addressed and to determine if the site was a source of TCE in the groundwater. These Additional actions were funded and implemented in 2007. A report documenting the actions completed was submitted to ADEM in January 2009 requesting NFA for soils and acknowledging the need to proceed forward with additional groundwater investigations. Efforts to address the groundwater concerns at CCSWMU-035 are funded and underway. Upon completion of the RFI, it is expected that groundwater contamination associated with CCSWMU-035 will pose a risk and remedial efforts to address may be required. Long term groundwater monitoring for TCE will be required for CCSWMU-035.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**Site ID: CCSWMU-035**

**Site Name: IN-GROUND OIL/WATER SEPARATOR, BLDG 4812**

**Alias: RSA-035**

## **CLEANUP/EXIT STRATEGY**

The path forward will consist of MNA study followed by LTM. Documentation of all site investigation activities and the completion of a closure report for CCSWMU-035 are included in the cleanup strategy. The phase included in the project is long term monitoring of groundwater annually for a period of 10 years. Two five-year reviews will be included in the LTM program.

**Site ID: CCSWMU-116**

**Site Name: SOUTH SIDE BLOWDOWN LAGOON, TEST AREA 5**

**Alias: RSA-116**

## STATUS

**Regulatory Driver:** RCRA

Contaminants of Concern: Perchlorate, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198908.....	199109
RFI/CMS.....	201210.....	201503
DES.....	201507.....	201603
CMI(C).....	201603.....	201612

**RIP Date:** N/A

**RC Date:** 201612

## SITE DESCRIPTION

CCSWMU-116 (RSA-116) is approximately 4.5 acres in size and is located in the southern portion of RSA, south of Buxton and Pershing Roads, on the south side of Test Area 5. The site is active. RSA-116 was originally constructed as a holding basin for spent cooling water discharged during rocket motor test firing at Test Stand 8879. The cooling water was mixed with rocket motor exhaust. The spent cooling water was held in the lagoon and evaporated and/or percolated through the soil. There is a release structure at the base of the lagoon for drainage to the creek. In 1993, the lagoon was upgraded, lined with a synthetic membrane, and an eight-ft chain-link-fence was installed. The site is still used to capture water used during the static testing of rocket motors. The Final RCRA Confirmation Sampling Report South-Side Blowdown Lagoon, Test Area 5, RSA-116 was submitted to ADEM May 08, 2006. The sampling completed at RSA-116 indicated that SVOCs were present in subsurface soils at concentrations that exceeded RBSCs. After the site becomes inactive, further investigation to determine the extent of SVOC contamination is warranted. Additional soil borings installed along the western edge of the dam are needed to confirm and determine the extent of PAH contamination in subsurface soils. Comments on the Final RCRA Confirmation Sampling Report for RSA-116 were received Dec. 13, 2007. The comments from ADEM requested that RSA complete additional monitoring of groundwater at RSA-116. RSA agreed to the additional monitoring efforts in their response to comments submitted on May 19, 2008. The monitoring effort was funded in FY08 and were implemented from 2009 to 2010. The report was issued in January 2012 suggesting annual monitoring until the site is closed. After closure, the site will require a RFI, CMS, DES, and CMI. The cleanup strategy for RSA-116 involves completing a RFI and a corrective measure.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

The comments from ADEM on the final RCRA Confirmation Sampling Report requested that RSA complete additional monitoring of groundwater at RSA-116. RSA agreed to the additional monitoring efforts in their response to comments submitted on May 19, 2008. The monitoring effort was funded in FY08 and implemented from 2009 to 2010. The report was issued in January 2012 suggesting annual monitoring until the site is closed. After closure, the site will require a RFI, CMS, DES, and CMI.

**Site ID: CCSWMU-143**

**Site Name: POL-CONTAM. SOIL, B.3234 SOUTH of B.3240**

**Alias: Bldg 3234**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	198908.....	199109
RFI/CMS.....	201007.....	201310
CMI(C).....	201006.....	201404
CMI(O).....	201404.....	201411

**RIP Date:** 201404

**RC Date:** 201411

**SITE DESCRIPTION**

Site CCSWMU-143 is located at the intersection of Goss Road and Vincent Drive and includes the current installation convenience store (Building 3234), and former Branch Exchange Service Station (Building 3240). Building 3234 currently operates three 12,000-gallon gasoline USTs, which are located to the northwest of the building.

Operations at the former service station at Building 3240 included the use of three gasoline USTs and a waste oil pit from 1967 to 1995. Petroleum contamination was discovered near Building 3240 in 1993 during geotechnical investigations. A preliminary site contaminant assessment performed later that year revealed soil and groundwater contamination. In 1996, the three gasoline USTs and the waste oil pit were closed and removed. Investigations determined that groundwater at Building 3240 contained lead, MTBE, and BTEX. It was discovered in 2001 that overfills and spills from the active USTs at Building 3234 were mixing in groundwater with releases from the contamination at building 3240.

The investigations at CCSWMU-143(RSA-143) had been conducted under the CERCLA program. In 2002, USEPA deferred future characterization and cleanup activities to the ADEM UST program. The ADEM accepted RSA-143 into the UST program in 2002. Corrective measures for the contamination associated with Building 3240 were implemented in August 2004, which included the injection of oxidant material. However, subsequent monitoring revealed the presence of free-product in wells where it was not previously detected. An EE/CA document was prepared in May 2007 to determine the best method of treating the remaining free-product and dissolved-phase groundwater contamination. Excavation by LDAs and installation of an MPE system were the selected technologies. A pilot study for the MPE system was performed in July 2007. A CAP was prepared in October 2007. The LDA excavation and disposal fieldwork was completed in June 2008. Startup activities related to the MPE system began in January 2009.

Operation of the system is expected until site-specific target levels are achieved in groundwater. Additional investigation is also required near the current service station USTs at building 3234. It is expected that future investigations required for the active USTs at 3234 will proceed under the Alabama Risk-Based Corrective Action Program for Petroleum Sites. Completion of an ARBCA evaluation for Building 3234 was funded under the RSA PMC contract. Upon completion of the ARBCA evaluation, limited corrective action measures will be required to achieve compliance at the site boundaries. The limited corrective action funded in 2010 under the RSA PMC contract will consist of injecting oxidizer into the groundwater to enhance remediation of contaminants in the groundwater. Additional phases or injections will be required to achieve site closure.

**CLEANUP/EXIT STRATEGY**

It is expected that future investigations required for the active USTs at 3234 will proceed under the Alabama Risk-Based Corrective Action Program for Petroleum Sites. Completion of an ARBCA evaluation for Building 3234 was funded under the RSA PMC contract. Upon completion of the ARBCA evaluation, limited corrective action measures will be required to achieve compliance at the site boundaries. The limited corrective action funded in 2010 under the RSA PMC contract will consist of injecting oxidizer into the groundwater to enhance remediation of contaminants in the groundwater. Additional phases or injections will be required to achieve site closure.

**Site ID: CCSWMU-143**  
**Site Name: POL-CONTAM. SOIL, B.3234 SOUTH of B.3240**  
**Alias: Bldg 3234**

The implementation operation IMP(O) phase is the only unfunded phase included in this project.

**Site ID: CCSWMU-222**  
**Site Name: Roads and Grounds Maintenance Shop**  
**Alias: RSA-222**

**STATUS**

Regulatory Driver: RCRA

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200509.....	200610
RFI/CMS.....	201203.....	201412
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201412	

**SITE DESCRIPTION**

This site was identified in 2005 based upon a PSA Investigation (RSA-147) conducted under the CERCLA program. RSA-222 (Roads and Grounds Maintenance Shop) consists of the paint shop, water curtain paint booth, and OWS in Building 5494. The paint shop is located at the east end of Building 5494. The paint booth OWS is located on the southeast side of the building. An additional OWS (Building 5498) is located south of Building 5494. All vehicle washing activities occur at Building 5498 and all discharges from the operations are routed to the Building 5498 OWS. The water curtain system for paint booth is still operational. The sump for the water curtain paint booth and floor drain for the painting areas is connected to the OWS. The OWS discharges to the sanitary sewer. The old OWS that was referred to as the paint trap was replaced in 2001. The old OWS was in poor repair prior to its replacement and it is likely that the discharges from the water curtain paint booth contained hazardous constituents that were released to the old OWS. No sampling was completed during the replacement of the old OWS. The investigations were funded in 2005 and completed in 2006. A Release Assessment/Closure Report recommending a NFA was submitted to ADEM Oct. 23, 2006.

In a letter dated Feb. 24, 2012, ADEM stated that addition investigation of the Oil-Water Separator was required.

**CLEANUP/EXIT STRATEGY**

Additional investigation of the Oil Water Separator is required per the February 2012 response letter from ADEM. Research and evaluation of the structural condition of the sidewalls and associated piping was requested by ADEM. Additional RFI activities may be required based on the results of this investigation.

**Site ID: CCSWMU-240**

**Site Name: FORMER SUBSTATION NO.7, BLDG 5290**

**Alias: RSA-240**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Polychlorinated Biphenyls (PCB)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200412.....	200501
RFI/CMS.....	200603.....	201405
CMI(C).....	201405.....	201412

**RIP Date:** N/A

**RC Date:** 201412

**SITE DESCRIPTION**

Site CCSWMU-240 was identified in 2005 based upon a PSA investigation (PSA RSA-147) conducted under the CERCLA program. This Former Substation No. 7, Building 5290, which operated from 1960-1996 is located just northeast of the Sparkman Center, north of Sparkman Circle, and west of Patton Road. It was replaced by Substation No. 8 located approximately 25 to 50 ft east of CCSWMU-240. The site where Former Substation No. 7 was located is now an open field. Little evidence of the former substation remains at the site. A concrete conduit that spans a drainage ditch south of the former substation's location is the only remaining indication of the substation's presence. Previous sampling completed in 2004 indicated that PCB Aroclor-1260 is present in groundwater at concentrations that exceed the risk based concentration (RBC) and the drinking water MCL. The 2004 data for soil indicated that Aroclor-1260 is present in surface soil at concentrations that exceed the RBC. Release assessment investigations funded in 2005 were completed in 2006. The investigations at CCSWMU-240 determined that the extent of PCBs in soil and groundwater was limited and that the site posed no risk. However, to ensure that the site could be utilized in the future without restrictions, a limited soil removal was implemented to remove all soil with greater than one ppm of PCBs. A release assessment/closure report documenting the activities completed was submitted to the ADEM with an NFA recommendation in October 2007. If the NFA recommendation is not accepted by the ADEM, an RA would be required. No response has been received from the ADEM during this data call.

**CLEANUP/EXIT STRATEGY**

Release assessment investigations funded in 2005 were completed in 2006. The investigations at CCSWMU-240 determined that the extent of PCBs in soil and groundwater was limited and that the site posed no risk. However, to ensure that the site could be utilized in the future without restrictions, a limited surface soil removal was implemented to remove all soil with greater than 1-ppm of PCBs. A Release Assessment/Closure Report documenting the activities completed was submitted to ADEM with an NFA recommendation on Oct. 15, 2007. The recommendation for the NFA was rejected by ADEM in their Sept. 6, 2011 comments. Therefore, a CMS and corrective action could be required for CCSWMU-240. This project includes the CMS and CMI phases.

**Site ID: CCSWMU-241**  
**Site Name: HW STORAGE IGLOO, BLDG 7313**  
**Alias: RSA-241**

**STATUS**

Regulatory Driver: RCRA

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200502.....	200503
RFI/CMS.....	200702.....	201501
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201501	

**SITE DESCRIPTION**

This RCRA SWMU was identified in 2005 based upon a Potential Source Area Investigation (RSA-146) conducted under the CERCLA program. CCSWMU-241 (Bldg. 7313, Storage Igloo), is located on Plover Road, west of Magazine Road and north of Redstone Road in the former RARE Facility area in the southeast portion of RSA (currently within the Test Area 10 boundary). Bldg. 7313 is situated in a field of several igloos and was most recently used by the Thiokol Corporation. Bldg. 7313 is an igloo that was constructed in 1942 and used primarily for storage of high explosives and chemical high explosives in support of operations at the ROP. CCSWMU-241 was used to store hazardous waste until 1996. Sampling completed in 2004 indicated that chromium and mercury are present in surface and subsurface soils at levels that exceed background values. The release assessment for CCSWMU-241 was funded and started in 2007. The initial results from the release assessment indicated the presence of SVOCs in soils above screening levels. A limited removal action to address SVOCs in soils was completed in fiscal year (FY) 09. The data from the removal action indicated that the removal action was not successful and a RCRA facility investigation (RFI) is required for the site. This site has been transferred from the Army Environmental Database-Compliance Cleanup program for further investigation.

**CLEANUP/EXIT STRATEGY**

**Site ID: CCSWMU-242**  
**Site Name: HW STORAGE IGLOO, BLDG 7314**  
**Alias: RSA-242**

**STATUS**

Regulatory Driver: RCRA

Phases	Start	End
RFA.....	200502.....	200503
RFI/CMS.....	201108.....	201412
RIP Date:	N/A	
RC Date:	201412	

**SITE DESCRIPTION**

This RCRA SWMU was identified in 2005 based upon a PSA Investigation (RSA-146) conducted under the CERCLA program. CCSWMU-242 (Building 7314, Storage Igloo), is located on Plover Road, west of Magazine Road and north of Redstone Road in the former RARE Facility area in the southeast portion of RSA (currently within the Test Area 10 boundary). Building 7314 is situated in a field of several igloos and was most recently used by the Thiokol Corporation. Building 7314 is an igloo that was constructed in 1942 and used primarily for storage of high explosives and chemical high explosives in support of operations at the ROP. CCSWMU-242 was used to store hazardous waste until 1996. In 1997, one surface soil sample collected near the front of the igloo was analyzed for explosives, PAHs, metals, and VOCs. Benzo(a)anthracene and benzo(a)pyrene were detected in the sample at concentrations slightly above the RBC value. Sampling completed in 2004 analyzed for perchlorate, VOCs, SVOCs, and explosives. The 2004 sampling confirmed the presence of benzo(a)pyrene above the RBC. Perchlorate was detected in the subsurface soils. Groundwater contained TCE above the RBC.

The release assessment for CCSWMU-242 was funded and started in 2007. The release assessment report confirmed the presence of SVOCs in soils. The ARBCA RM-1 evaluation completed as part of the release assessment report determined that the cumulative cancer risk level for the hypothetical future residential receptors was below the ADEM trigger level of 1E-5, and that the detected concentrations of metals and SVOCs in surface soil pose no unacceptable threat to groundwater or surface water quality. The release assessment report requesting a NFA for CCSWMU-242 was submitted to ADEM on July 31, 2009. However, ADEM did not concur with the NFA recommendation in their comments provided August 22, 2011. RSA agreed to complete additional sampling and/or a RFI.

**CLEANUP/EXIT STRATEGY**

**Site ID: CCSWMU-243**  
**Site Name: PROPELLANT STORAGE, BLDG 7342**  
**Alias: RSA-243**

**STATUS**

Regulatory Driver: RCRA

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200502.....	200503
RFI/CMS.....	201108.....	201503
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201503	

**SITE DESCRIPTION**

RSA-243 is located on Plover Road, west of Magazine Road and north of Redstone Road in the former Redstone Arsenal Rocket Engine (RARE) Facility area in the southeast portion of RSA (currently within the Test Area 10 boundary). Building 7342 is situated in a field of several igloos and was most recently used by the Thiokol Corporation. Building 7342 is an igloo that was constructed in 1942 and used primarily for storage of high explosives and chemical high explosives in support of operations at the Redstone Ordnance Plant. After 1950, the igloo was used by Thiokol Corporation to store chemicals and munitions until the company's departure from RSA in 1996. Sampling completed in 1997 indicated that SVOCs were present in surface and subsurface soils at levels that exceed RBSCs. A release assessment was completed to determine the extent of the hazardous constituents released from RSA-243. The release assessment for RSA-243 was funded and started in 2007. The initial results from the release assessment indicated the presence of SVOCs in soils above screening levels but not at levels that posed a risk. The February 2009 Release Assessment Report for RSA-243 requested a NFA for RSA-243. However, ADEM did not concur with the NFA recommendation in their comments provided August 30, 2011. RSA agreed to complete additional sampling and/or a RFI.

**CLEANUP/EXIT STRATEGY**

**Site ID: CCSWMU-245**  
**Site Name: STEAM HEATING PLANT, BLDG 7579**  
**Alias: RSA-245**

**STATUS**

Regulatory Driver: RCRA

Phases	Start	End
RFA.....	200502.....	200503
RFI/CMS.....	200702.....	201406
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201406	

**SITE DESCRIPTION**

RSA-245 was identified in 2005 based upon a Potential Source Area Investigation (PSA RSA-146) conducted under the CERCLA program. RSA-245 is located south of Redstone Road and east of Line Road in the northern portion of the former Redstone Arsenal Rocket Engine (RARE) South Plant area in the southeast portion of RSA. RSA-245 was constructed in 1942 as the primary steam heating plant (boiler house) for the Redstone Ordnance Plant (ROP) Lines 3 and 4. It was transferred from RSA to Rohm and Haas Company in 1950, reverted back to RSA in 1971, and then transferred to the Thiokol Corporation in 1985. Thiokol used the facility as a boiler house from 1985 until 1996. In 1997, soil samples were collected and analyzed for explosives, polyaromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), and metals. Lead was detected in surface soil above background levels. Benzo(a)pyrene was detected in surface soil above the RBC. TPH was also detected in the samples analyzed. Additional investigations are required to determine the extent of the release of hazardous constituents from RSA-245. The release assessment for RSA-245 was funded in 2007 and implemented in 2008. The results of the release assessment indicate that SVOCs in soil are a concern for RSA-245. The release assessment report noted that an RFI is required for RSA-245.

The RFI will consist of additional soil sampling, monitoring well installation and sampling, and the completion of a risk assessment. The RFI will indicate that a CMS and a CMI are required. The RFI and CMS were funded in 2010 under the RSA PMC contract. The phase included in this project is a study phase is the CMI and site close out.

**CLEANUP/EXIT STRATEGY**

**Site ID: CCSWMU-246**

**Site Name: SEWER EJECTOR & MOTOR POOL, BLDG 7630**

**Alias: RSA-246**

## STATUS

**Regulatory Driver:** RCRA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200502.....	200503
RFI/CMS.....	200609.....	201405
DES.....	201405.....	201501
CMI(C).....	201501.....	201507

**RIP Date:** N/A

**RC Date:** 201507

## SITE DESCRIPTION

CCSWMU-246 was identified in 2005 based upon a PSA investigation (RSA-146) conducted under the CERCLA program. Site CCSWMU-246 (Building 7630, Sewer Ejector/Motor Pool) is located on Pheasant Road at Oriole Circle, in the central portion of the former RARE North Plant area in the southeast portion of RSA. Site CCSWMU-246 was originally constructed in 1959 and was used as a sewer ejector station. The original building was demolished. The existing Building 7630 was constructed in 1983 and used by the Thiokol Corporation as a motor pool and painting facility until 1996.

A 1,000-gallon fuel oil UST and a pump were located in an equipment yard north of the building. Oil stains were visible on the ground near the pump. An exterior two-chambered baffled OWS, which had an outlet to the sewer line, was located next to the equipment wash bay. Gray water leaving the OWS suggested paint-wash discharge may have entered the OWS. A former gasoline UST (approximately 2,000 gallons) was reportedly removed from the west end of the building in 1983 or 1984. In 1997 soil and groundwater samples were collected near the building and analyzed for explosives, PAHs, metals, PCBs, and SVOCs. Benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, and PCB-1254 were detected above RBCs. Groundwater contained metals, VOCs and explosives above screening criteria. A release assessment investigation to determine the extent of the release of hazardous constituents from this site began in 2006 and was completed in 2007. On June 26, 2007, a release assessment/closure report was submitted to the ADEM requesting an NFA for this site.

## CLEANUP/EXIT STRATEGY

A release assessment investigation at RSA-246 began in 2006 and was completed in 2007. On June 26, 2007, a Release Assessment/Closure Report for RSA-246 requesting NFA was submitted to ADEM. The February 2009 Release Assessment Report for RSA-246 requested a NFA for RSA-246. However, ADEM did not concur with the NFA recommendation in their comments provided September 29, 2011 and requested a RFI for RSA-246. The phases included in this project are the RFI Phase, CMS, DES, CMI (C), and CMI (O). A limited excavation and off-site disposal is the expected remedy.

**Site ID: CCSWMU-247**

**Site Name: STEEL FABRICATION/MAINTENANCE FAC. B7644**

**Alias: RSA-247**

## STATUS

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200502.....	200503
RFI/CMS.....	200605.....	201412

**RIP Date:** N/A

**RC Date:** 201412

## SITE DESCRIPTION

Additional investigation in the form of an RFI is required to determine the extent of hazardous constituents in soil at CCSWMU-247. The site will be closed based on the results of the risk assessment.

Site CCSWMU-247 was identified in 2005 based upon a PSA investigation (PSA RSA-146) conducted under the CERCLA program. Site CCSWMU-247 is located in the northeast corner of Pheasant Road and Blue Bird Road, in the central portion of the former RARE North Plant area in the southeast portion of the RSA. Site CCSWMU-247 was originally constructed in 1956 and used until 1996 by the Thiokol Corporation as a steel fabrication and maintenance shop. Legal opinion was that it would be too costly and timely to pursue Thiokol for reimbursement of cleanup costs. The 2000 building list indicates that the facility was most recently operated as a maintenance shop. The building was demolished. In 1997 soil samples were analyzed for explosives, PAHs, metals, and SVOCs. Arsenic, cadmium, and chromium detected above background levels and RBCs. Additional investigations are required to determine the extent hazardous constituents in soil at CCSWMU-247. Funding for the CCSWMU-247 release assessment was obtained in 2006 and was completed in 2007. Based on the findings of the release assessment an RFI is required for CCSWMU-247. Notification of the intent to proceed with the RFI was provided to the ADEM on Oct. 31, 2007. The RFI was funded in FY08 and will be implemented in the next year.

## CLEANUP/EXIT STRATEGY

An RFI report requesting NFA was submitted to ADEM.

**Site ID: CCSWMU-248**

**Site Name: BATTERY MAINTENANCE SHOP, BLDG 3633**

**Alias: RSA-248**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200502.....	200503
RFI/CMS.....	200609.....	201401

**RIP Date:** N/A

**RC Date:** 201501

**SITE DESCRIPTION**

Site CCSWMU-248 (Building 3333) was identified in 2005 based upon a PSA investigation (RSA-145) conducted under the CERCLA program. It is located west of Patriot Drive, north of Neal Road, and south of Roland Road and is currently operational. It occupies 12,360 sf and was constructed in 1943 as a warehouse for the SMF plant. The northern half of Building 3633 is used as a forklift maintenance area and the southern half is used for battery maintenance. The battery maintenance portion of Building 3633 consists of a storage area for incoming batteries, a battery filling and charging area, and a wash down area. The battery maintenance activities in Building 3633 began with the development of the Nike missile system that occurred in the mid-1950s. During this era, lead acid and nickel-cadmium batteries were serviced. The battery maintenance activities included the complete rebuilding of batteries, draining of battery electrolyte, and replacing lead plates. These historical activities as well as current activities have resulted in the release of hazardous waste or hazardous constituents through floor drains, piping to the sanitary sewer, and to the surface by spills and routine operations. The release assessment indicated that an RFI may not be required for CCSWMU-248. The closure report requesting an NFA for CCSWMU-248 was submitted to the ADEM on Oct. 16, 2007.

**CLEANUP/EXIT STRATEGY**

The release assessment indicated that an RFI may not be required for CCSWMU-248. The closure report requesting an NFA for CCSWMU-248 was submitted to ADEM on Oct. 16, 2007. In ADEM comments received Aug. 29, 2011, ADEM requested an RFI for CCSWMU-248. The RFI will consist of additional soil sampling, monitoring well installation and sampling, and the completion of a risk assessment. The only phase included in this project is a study phase named RFI.

**Site ID: CCSWMU-268**

**Site Name: SEWAGE TREATMENT PLANT, BLDG 8018**

**Alias: RSA-268**

## STATUS

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200501.....	200607
RFI/CMS.....	200609.....	201405

**RIP Date:** N/A

**RC Date:** 201405

## SITE DESCRIPTION

CCSWMU-268 is located in the southwestern portion of RSA north of Buxton Road along the northern end of Shields Road. CCSWMU-268 is a former sewage treatment plant (Building 8018) that was constructed in 1943 to provide limited wastewater treatment services for the Gulf Chemical Warfare Depot. Building 8018 was removed from service in 1992 when the Imhoff tank, dosing chamber, and other structures were filled with gravel. Limited investigations at CCSWMU-268 were completed under the CERCLA program in 2005. Metals were detected in surface or subsurface soils at concentrations that exceeded background and/or RBCs. Arsenic, chromium, and mercury were detected in surface or subsurface soils at concentrations that exceeded background. One groundwater grab sample contained SVOCs (benzo (a)anthracene, benzo(b)fluoranthene, and benzo(k)fluoranthene) at concentrations exceeding their respective RBCs. Additional investigations to confirm and determine the extent of the releases at CCSWMU-268 were funded and completed in 2007. The release assessment indicated the presence of metals in groundwater samples collected from piezometers. A single well was installed to collect data to confirm the presence of metals in groundwater. The release assessment report requesting an NFA for CCSWMU-268 was submitted in April 2008. Comments on the release assessment report were received from ADEM on June 9, 2009. Existing sampling at the site was not fully compliant with ADEM's AEIRG and ADEM did not provide concurrence with the NFA recommendation. ADEM requested further investigation of soil and groundwater at CCSWMU-268.

The path forward for this site is to conduct additional characterization to become compliant with ADEM's AEIRG and produce an RFI in anticipation that no further action (NFA) can be achieved at the site. Existing data indicate that no release has occurred at the site. The RFI for CCSWMU-268 was funded in 2009 and an RFI work plan was produced in March of 2011.

## CLEANUP/EXIT STRATEGY

The path forward for this site is to conduct additional characterization to become compliant with ADEM's AEIRG and produce an RFI in anticipation that NFA can be achieved at the site. Existing data indicate that no release has occurred at the site. The RFI for CCSWMU-268 was funded in 2009 and an RFI work plan was produced in March of 2011.

**Site ID: CCSWMU-283**

**Site Name: FORMER PRIMARY SUBSTATION NO.2, BLDG3796**

**Alias: RSA-283**

## STATUS

**Regulatory Driver:** RCRA

Contaminants of Concern: Polychlorinated Biphenyls (PCB)

Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200705.....	200706
RFI/CMS.....	201211.....	201503

**RIP Date:** N/A

**RC Date:** 201503

## SITE DESCRIPTION

Site CCSWMU-283 is a former primary substation that was reportedly established in the 1940s. The substation is currently inactive. Substation No. 2 was taken out of service between 1994 and 1996. Available engineering drawings indicate that the primary substation existed as early as 1943 and originally consisted of three 161 kilovolt (kV) transformers used to reduce the 161 kV voltage to 44 kV to allow distribution to substations within RSA. The 23 transformers of varying sizes, voltages, and vintages located at CCSWMU-283 have been removed and disposed in accordance with applicable regulations. In May 2007 sampling of all 23 transformers indicated that two of the transformers located at CCSWMU-283 (transformers 19 and 20) contain PCBs at concentrations above 50 parts per million (ppm). The nine surface soil samples collected from suspected release areas indicated that PCBs were released from the transformers to soil. The concentrations of PCBs detected in the soil were low, with concentrations ranging from 0.24 mg/kg (equivalent to ppm) to 6.8 mg/kg. However, all of the detections of PCBs exceed RBCs based on the USEPA Region 9 PRG for residential soil (0.11 mg/kg). This data indicates the need for additional investigation to determine the nature and extent of the releases. Notification of CCSWMU-283 as a new SWMU was provided to the ADEM on June 11, 2007. The additional investigations in the form of a release assessment began in 2008. The release assessment determined the extent of PCB contaminated soils. The concentrations of PCBs detected in surface soil confirmed that releases of PCB-containing transformer oil occurred at CCSWMU-283. The data from the release assessment indicates that PCBs are present in soils above the residential risk-based screening concentrations but are below the industrial levels. While it is unlikely that the area will be returned to residential use, a removal action was implemented to remove concentrations of PCBs above residential levels. The release assessment report containing the removal action will be completed noting the findings and requesting NFA for CCSWMU-283.

## CLEANUP/EXIT STRATEGY

The concentrations of PCBs detected in surface soil confirmed that releases of PCB-containing transformer oil occurred at CCSWMU-283. The data from the release assessment indicates that PCBs are present in soils above the residential risk-based screening concentrations but are below the industrial levels. While it is unlikely that the area will be returned to residential use, a removal action was implemented to remove concentrations of PCBs above residential levels. The release assessment report containing the removal action and requesting NFA for CCSWMU-283 was submitted to ADEM July 28, 2011. The comments provided by ADEM on Sept. 21, 2011 indicated an RFI is required for the site. It is expected that upon completion of the RFI/risk assessment it will be determined that the site poses no future risks.

**Site ID: CCSWMU-284**  
**Site Name: FIRE TRAINING AREA (FTA)**  
**Alias: RSA-284**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200705.....	200706
CS.....	201012.....	201012
RFI/CMS.....	201205.....	201501

**RIP Date:** N/A

**RC Date:** 201501

**SITE DESCRIPTION**

CCSWMU-284 is Fire Training Area (FTA) that covers an area of approximately 900 feet by 400 feet (8.3 Acres). The FTA contains a burn pit, a diesel fuel aboveground storage tank, a drafting pit (used for extended testing of water pumping apparatus), propane AST, and a structural training tower with a burn room. Discharges from the burn pit are routed to an OWS. The OWS discharges directly to surface drainage. According to available information, the initial construction of the burn pit consisted of a concrete curb lined with firebrick and a sand bottom with a high density polyethylene liner. The initial construction of the burn pit did not include a method to remove the fuel and water from the pit. During heavy rains the burn pit would fill up with rain water resulting in overflows that contained residual petroleum products that remained in the pit and sand layer. Additionally, it was also noted during the exercises that diesel fuel would splash over the curb resulting in a release of petroleum to the surrounding soil. Since that time, the site was upgraded to fix problems that resulted in past releases of water contaminated with diesel fuel from the burn pit. The burn pit was first rebuilt in the 1990s to change its construction to concrete. However, deficiencies in the type of concrete selected were noted in the form of cracks in the concrete that occurred due to the high heat that occurs during the training exercises. The burn pit was rebuilt in the late-1990s with refractory concrete and a 14 ft wide catch apron with drains. The catch apron was routed to an OWS that discharges to a drainage feature east of the site.

During a site visit completed in May of 2007, it was determined that at least two documented releases of diesel fuel occurred at the FTA in 2002 and 2007. While the releases were properly responded to and cleaned up, the frequency indicates a need for further evaluation of past usage and evaluation of past releases on soil and groundwater. Notification of CCSWMU-284 as a new SWMU was provided to ADEM on June 26, 2007. The release assessment to determine the nature and extent of releases at CCSWMU-284 was funded in 2007 and was completed in 2008. The release assessment indicated that surface and subsurface soils at CCSWMU-284 did not pose an unacceptable risk to human health in a residential use scenario, nor do they pose an unacceptable threat to groundwater quality from leaching. Because groundwater samples could not be collected from three of the six wells installed during the release assessment, a significant data gap exists in the western half of CCSWMU-284. TCE exceeded the MCL in groundwater, indicating a possible release to groundwater. However, it is not clear that the TCE originated from CCSWMU-284. Further investigation of the groundwater at CCSWMU-284 is being completed as part of the RSA-035 groundwater RFI that will be completed in 2011. The Release Assessment Report requesting an NFA was submitted to ADEM Oct. 26, 2010. However, it is possible that ADEM may not concur with the inclusion of the CCSWMU-284 groundwater investigation as part of the RSA-035 and they will require an RFI and continued monitoring.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

Further investigation of the groundwater at CCSWMU-284 is being completed as part of the RSA-035 groundwater RFI that will be completed in 2011. The Release Assessment Report requesting an NFA was submitted to ADEM Oct. 26, 2010. However, it is possible that ADEM may not concur with the inclusion of the CCSWMU-284 groundwater investigation as part of the RSA-035 and they will require an RFI and continued monitoring at CCSWMU-284. The phases included in this project are a confirmatory sampling (CS) phase and an RFI.

**Site ID: CCSWMU-286**  
**Site Name: BOILER/STEAM PLANT, BLDG 3624**  
**Alias: RSA-286**

**STATUS**

Regulatory Driver: RCRA

Phases	Start	End
RFA.....	200401.....	200801
RFI/CMS.....	200809.....	201505
RIP Date:	N/A	
RC Date:	201505	

**SITE DESCRIPTION**

RSA-286 is located in the eastern portion of RSA east of Ajax Road and south Gray Road. RSA-286 is 8,253 sq. ft and was a constructed as boiler house in 1943. Building 3624 was constructed with four water-tube, sectional-header boilers. The boiler was replaced in 1960 with four new water-tube boilers. The boiler was then fueled with natural gas and fuel oil as standby. Due to the long history of use of the building as a boiler, releases of boiler chemicals and POL from AST pipelines and operational activities occurred during past operations. Additional investigations in the form of a release assessment are required to determine the extent of releases from RSA-286. RSA-286 was identified as 145-PS-02F-03 in the Potential Source Area Investigation for RSA-145 conducted under the CERCLA program. Based on the potential for releases, RSA-286 was identified as a new SWMU in notification provided to the Alabama Department of Environmental Management (ADEM) on January 17, 2008.

The release assessment for RSA-286 was implemented in 2010. The release assessment for RSA-286 indicated that releases occurred at RSA-286 and that an RFI is required. The release assessment investigations indicated that a limited removal action, RFI, and risk assessment are required to determine the extent of releases at RSA-286 and ensure that there are no risks are associated with any remaining concentrations of contaminants at RSA-286.

**CLEANUP/EXIT STRATEGY**

**Site ID: CCSWMU-287**

**Site Name: COMPONENT STORAGE WAREHOUSE, BLDG 3634**

**Alias: RSA-287**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals, Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200701.....	200801
RFI/CMS.....	200809.....	201507
DES.....	201507.....	201603
CMI(C).....	201603.....	201610

**RIP Date:** N/A

**RC Date:** 201610

**SITE DESCRIPTION**

CCSWMU-287 is located in the eastern portion of RSA west of Patriot Drive, north of Neal Road, and south of Roland Road. Building 3634 built in 1943 is a 12,780 sq. ft. storage warehouse for components in the Smoke Munitions Filling Area 2. In 1954, the building was used by the transportation organization as a shop for vehicle maintenance. Historical documents noted potential releases during vehicle oil changes and lubrications. CCSWMU-287 was identified as 145-PS-03A-04 in 2007 in the Potential Source Area Investigation for RSA-145 conducted under the CERCLA program. Additional investigations in the form of a release assessment were implemented in 2010 to confirm the releases at CCSWMU-287. The release assessment investigations indicated that a limited removal action, RFI, and risk assessment are required to determine the extent of releases at CCSWMU-287 and ensure that there are no risks associated with any remaining concentrations of contaminants at CCSWMU-287.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

Additional investigations in the form of a release assessment were implemented in 2010 to confirm the releases at CCSWMU-287. The release assessment investigations indicated that a limited removal action, RFI, and risk assessment are required to determine the extent of releases at CCSWMU-287 and ensure that there are no risks associated with any remaining concentrations of contaminants at CCSWMU-287. The phases included in this project are RFI, DES, and CMI(C). Two excavations totaling approximately 4370 cy are expected.

**Site ID: CCSWMU-288**

**Site Name: WTP#1, SLUDGE THICKENER & DRYING BEDS**

**Alias: RSA-288**

## STATUS

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200404.....	200801
RFI/CMS.....	200903.....	201505
DES.....	201409.....	201505
CMI(C).....	201505.....	201512

**RIP Date:** N/A

**RC Date:** 201610

## SITE DESCRIPTION

CCSWMU-288 is located in the southern portion of RSA off of Shields Road on the northern banks of the Tennessee River. CCSWMU-288 was built in 1942 as the primary water treatment facility for RSA. It treated water from the Tennessee River for use at the arsenal. The treatment of water drawn from the Tennessee River generated solid waste that was managed in the sludge thickener and sludge drying beds. It is unknown if the solid waste contained any hazardous constituents or if any releases from the sludge beds or other features occurred. CCSWMU-288 was identified as 145-PS-02F-03 in the Potential Source Area Investigation for RSA-145 conducted under the CERCLA program.

The release assessment completed in 2010 indicated that no further action was required for CCSWMU-288. However, it is possible that ADEM will not concur and an RFI and a risk assessment will be required. The results of the RFI are expected to indicate that a removal action is required and it will be implemented as an interim removal action for the removal of contaminants from the sludge beds. It is expected that the interim removal action will serve as the final remedial action and no CMS will be required. All site activities will be documented in a site closure report.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

Additional investigations are required at CCSWMU-288. The release assessment completed in 2010 indicated that no further action was required for CCSWMU-288. However, it is possible that ADEM will not concur and a RFI and a risk assessment will be required. The results of the RFI are expected to indicate that a removal action is required and it will be implemented as an interim removal action for the removal of contaminants from the sludge beds. It is expected that the interim removal action will serve as the final remedial action and no CMS will be required. All site activities will be documented in a site closure report. The phases included in the project are an RFI, Design and CMI-C. A limited excavation with off-site disposal is the expected remedy.

**Site ID: CCSWMU-289**

**Site Name: WTP#2, SLUDGE THICKENER & DRYING BEDS**

**Alias: RSA-289**

## STATUS

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200404.....	200801
RFI/CMS.....	200904.....	201505
DES.....	201409.....	201505
CMI(C).....	201505.....	201512

**RIP Date:** N/A

**RC Date:** 201704

## SITE DESCRIPTION

CCSWMU-289 is located in the southeastern portion of RSA off of the southeastern corner of the Railford Road loop, on the northern banks of the Tennessee River. CCSWMU-289 was built in 1943 and served as Water Treatment Plant 2 for the secondary treatment of water used in industrial processes. The treatment of water drawn from the Tennessee River generated solid waste that was managed in the sludge thickener and sludge drying beds. It is unknown if the solid waste contained any hazardous constituents or if any releases from the sludge beds or other features occurred. CCSWMU-289 was identified as 157-PS-01B in the Potential Source Area Investigation for RSA-157 conducted under the CERCLA program. Additional investigations are required at CCSWMU-289 in the form of a release assessment. It should be noted that CCSWMU-289 has an archaeological site (1MA0720) on the southeast portion of the site. The state historical preservation office (SHPO) has determined that the archaeological site is eligible for inclusion on the national register.

Additional investigations in the form of a release assessment were completed at CCSWMU-289 in 2010. The release assessment indicated that no further action is required for CCSWMU-289. However, it is possible that ADEM will not concur and they will require an RFI and a risk assessment. The results of the RFI are expected to indicate that a removal action is required and it will be implemented as an interim removal action for the removal of contaminants from the sludge beds. It is expected that the interim removal action will serve as the final remedial action and no CMS will be required. All site activities will be documented in a site closure report.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

Additional investigations in the form of a release assessment were completed at CCSWMU-289 in 2010. The release assessment indicated that no further action is required for CCSWMU-289. However, it is possible that ADEM will not concur and they will require an RFI and a risk assessment. The results of the RFI are expected to indicate that a removal action is required and it will be implemented as an interim removal action for the removal of contaminants from the sludge beds. It is expected that the interim removal action will serve as the final remedial action and no CMS will be required. All site activities will be documented in a site closure report. The phases included in the project are an RFI, DES and a CMI(C) phase. A limited excavation with off-site disposal is the expected remedy.

**Site ID: CCSWMU-290**

**Site Name: WTP#3, SLUDGE THICKENER & DRYING BE**

**Alias: RSA-290**

## STATUS

Regulatory Driver: RCRA

Phases	Start	End
RFA.....	200404.....	200801
RFI/CMS.....	200809.....	201501

RIP Date: N/A

RC Date: 201501

## SITE DESCRIPTION

RSA-290 is located in the south-central portion of RSA south of Martin Rd., east of Patton Rd. and north of Mills Rd. behind Building 5428. Buildings 5431(Former Sludge Thickener) and 5433 (Former Sludge Drying Beds) were demolished in the 1990s. Water Treatment Plant #3 (WTP #3) was built in 1959 as a potable water treatment facility for RSA. WTP #3 was never used to treat wastes of any kind. WTP #3 treated the industrial water produced by WTPs #1 and #2. In 1970, WTP #3 was estimated to have the capacity to produce 6.0 million gallons of potable water per day. There were seven drying beds at RSA-290 before they were demolished in the 1990s. Each bed was 61 feet, 4 inches long and 24 feet wide (including the retaining wall for both dimensions). The drying-bed retaining walls were made of 8-inch-thick concrete and extended to a maximum depth of 8 feet. Based on available engineering drawings, the sludge thickener and drying beds cover approximately 0.25 acre.

Every six weeks, the settling/mixing basins were drained and the sediment removed.

Sediment/sludge was pumped from the settling/mixing basins to the thickener. From the thickener, the sediment/sludge was pumped into the drying beds. The sediment removed from the filter beds is the only waste assumed to be associated with the WTP process. The areas associated with the treatment of the sediment/sludge (sludge thickener and drying beds) outline the areas of concern with this SWMU. During the early years of operation, the drying beds were backwashed to surface drainage; however, notes on the 1991 piping diagrams state that sludge from the drying beds was discarded at the RSA landfill. It is unknown if the solid waste contained any hazardous constituents or if any releases from the sludge beds or other features occurred.

Additional investigations in the form of a release assessment were completed at RSA-290 in 2010. The release assessment indicated that no further action is required for RSA-290. However, it is possible that ADEM will not concur and they will require an RFI and a risk assessment. The results of the RFI are expected to indicate that a removal action is required and it will be implemented as an interim removal action for the removal of contaminants from the sludge beds. It is expected that the interim removal action will serve as the final remedial action and no CMS will be required. All site activities will be documented in a site closure report.

## CLEANUP/EXIT STRATEGY

**Site ID: CCSWMU-291**

**Site Name: UST AT FORMER BLDG T-3162 (STEAM PLANT)**

**Alias: RSA-291**

## STATUS

**Regulatory Driver:** RCRA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200704.....	200801
RFI/CMS.....	201205.....	201503

**RIP Date:** N/A

**RC Date:** 201503

## SITE DESCRIPTION

CCSWMU-291 is located in the northeastern portion of RSA south of Bob Wallace Ave. and west of Patton Road. Building T-3162 was built in 1942 as a boiler house. It continued as a steam plant through 1976 and was demolished by 1983. Records documenting the removal of USTs at T-3162 are not available. Soil and groundwater samples collected in 2005 indicated the presence of petroleum products in soil and groundwater. It is unknown if the USTs were removed or if any investigations into potential releases from the USTs were completed. Additional investigation under the ADEM UST program is required to confirm releases occurred from the USTs at CCSWMU-291. CCSWMU-291 was identified as 145-PS-01C-03 in the Potential Source Area Investigation for RSA-145 conducted under the CERCLA program. Additional investigations are required at CCSWMU-291. The release assessment was funded in FY08 and implemented in 2009. The release assessment identified VOCs and PAH compounds in soil below evaluation criteria, except methylene chloride. Definitive level soil and groundwater data are not available.

The path forward is to conduct a RFI field investigation in accordance with AEIRG to include collection of surface and subsurface soil samples using direct-push technology (DPT) to confirm existing data and investigate areas currently not evaluated.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

## CLEANUP/EXIT STRATEGY

The path forward is to conduct a RFI field investigation in accordance with AEIRG to include collection of surface and subsurface soil samples using DPT to confirm existing data and investigate areas currently not evaluated.

The ARBCA risk assessment is expected to indicate that no corrective action is required.

**Site ID: CCSWMU-293**  
**Site Name: FORMER USTs AT BLDG 3639**  
**Alias: RSA-293**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200401.....	200801
RFI/CMS.....	200908.....	201305
DES.....	201305.....	201401
CMI(C).....	201401.....	201407
CMI(O).....	201407.....	201502
LTM.....	201502.....	201902
<b>RIP Date:</b>	201407	
<b>RC Date:</b>	201502	

**SITE DESCRIPTION**

Site CCSWMU-293 is located in the eastern portion of RSA east of Patriot Drive, West of Patton Road and North of Overlook Road. Building 369 was used as a screening and proportioning building for various mix components (105 mm M-1 white and M-2 colored smoke canisters) in the 1940s. In the 1950s, Building 3639 was converted to a gasoline/diesel fueling station. Five USTs were removed from CCSWMU-293 in 1996. During limited sampling completed in 2005 benzene and carbon tetrachloride were detected in soil and/or groundwater at concentration above the MCL indicating potential releases from the USTs. Additional investigation under the ADEM UST program is required to determine if releases occurred from CCSWMU-293. CCSWMU-293 was identified as 145-PS-03C-01 in the Potential Source Area Investigation for RSA-145 conducted under the CERCLA program.

Additional investigation under the ADEM Corrective action program is required to confirm releases from CCSWMU-293. The release assessment was funded in FY08. The release assessment (essentially a secondary investigation under the UST program) completed in 2010 confirmed releases to soil and groundwater and that an ARBCA investigation for a petroleum site is required. Benzene is a concern for groundwater. The ARBCA investigation for CCSWMU-293 was funded under the PMC in 2010 and will be complete by 2014. The ARBCA risk assessment is expected to indicate that corrective action is required. The corrective action will consist of injecting oxidizer into groundwater to enhance remediation of contaminants and the construction of an air stripper and activated carbon treatment system.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA. Table VI.2 of the Permit stipulates that this site achieve an approved RFI in accordance with AEIRG and ARBCA guidelines.

**CLEANUP/EXIT STRATEGY**

Additional investigation under the ADEM UST program is required to determine if releases occurred from CCSWMU-293. CCSWMU-293 was identified as 145-PS-03C-01 in the Potential Source Area Investigation for RSA-145 conducted under the CERCLA program. Additional investigation under the ADEM UST program is required to confirm releases from CCSWMU-293. The release assessment was funded in FY08. The release assessment (essentially a secondary investigation under the UST program) completed in 2010 confirmed releases to soil and groundwater and that an ARBCA investigation for a petroleum site is required. Benzene is a concern for groundwater. The ARBCA investigation for CCSWMU-293 was funded under the PMC in 2010 and will be complete by 2014. The ARBCA risk assessment is expected to indicate that corrective action is required. The corrective action will consist of injecting oxidizer into groundwater to enhance remediation of contaminants and the construction of an air stripper and activated carbon treatment system. All site activities will be documented in a site ARBCA closure report. The Phases included in the project are the design phase, DES, the remedial action, CMI(C), Operations and Maintenance CMI(O), and LTM to address contamination in soil and groundwater.

**Site ID: CCSWMU-304**

**Site Name: OWS,WASHRACK&SUMP ADJACENT TO BLDG 5498**

**Alias: RSA-304**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200803.....	200805
RFI/CMS.....	200907.....	201503
DES.....	201010.....	201602
CMI(C).....	201010.....	201608

**RIP Date:** N/A

**RC Date:** 201608

**SITE DESCRIPTION**

The original washrack and OWS at Building 5498 were constructed around 1979. Available information indicates that the washrack was historically used for washing vehicles and equipment associated with maintenance activities completed at RSA. The original OWS was replaced with a 3,000-gallon, double-walled, fiberglass, enhanced coalescing OWS in 2002.

Site CCSWMU-304 (Building 5498) is located in the eastern portion of RSA, east of Miles Road and north of Stewart Road. The original washrack and OWS at Building 5498 were constructed around 1979. Available information indicates that the washrack was historically used for washing vehicles and equipment associated with maintenance activities completed at RSA. The SWMU consists of the concrete washing area, settling basins, and OWS. The original OWS was replaced with a 3,000-gallon, double-walled, fiberglass, enhanced coalescing OWS in 2002. Due to the potential for release of POL from the washrack, it was identified as a new SWMU in notification provided to the ADEM on May 5, 2008. Additional investigations are required at this site in the form of a release assessment. The release assessment for this site was funded in FY08. An ARBCA has been assumed to be required following the release assessment.

**CLEANUP/EXIT STRATEGY**

Additional investigations are required at RSA-304. It is expected that a release assessment will be completed and indicate that no additional investigation is required. All site activities will be documented in a site closure report.

**Site ID: CCSWMU-305**

**Site Name: DISPATCHER OFC WITH WASHRACK,BLDG 3664**

**Alias: RSA-305**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals, Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	200803.....	200805
RFI/CMS.....	201006.....	201502

**RIP Date:** N/A

**RC Date:** 201502

**SITE DESCRIPTION**

Site CCSWMU-305 (Bldg 3664) is located in the northeastern portion of RSA west of Patriot Drive near Vista Road. It was constructed in 1952 as a dispatcher's office in support of the motor pool area. The washrack was constructed prior to 1977 and the OWS was added after 1977. Available information indicates that the washrack was historically used for washing the exterior of vehicles maintained in the motor pool. The original concrete OWS at Building 3664 was replaced in 2002 with a 3,000-gallon, double-walled, fiberglass, enhanced coalescing OWS. The SWMU consists of the concrete washing area and OWS. Due to the potential for release of POL from the washrack, it was identified as a new SWMU in notification provided to the ADEM on May 5, 2008. Additional investigations are required at this site in the form of a release assessment. The additional investigation was funded in FY08 and was implemented in 2009. The release assessment/closure report for CCSWMU-305 was submitted to ADEM in June 2010 with an NFA recommendation.

**CLEANUP/EXIT STRATEGY**

Additional investigations are required at CCSWMU-305 in the form of a release assessment. The release assessment for CCSWMU-305 was funded in FY08 and was implemented in 2009. The Release Assessment/Closure report for CCSWMU-305 was submitted to ADEM in June 2010 with an NFA recommendation. Comments received from ADEM on Dec. 29, 2011 indicated that ADEM may require an RFI for RSA-305. The RFI will consist of additional soil sampling, monitoring well installation and sampling, and the completion of a risk assessment.

**Site ID: CCSWMU-306**  
**Site Name: STEAM HEATING PLANT, BLDG 7291**  
**Alias: RSA-306**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	200803.....	200805
RFI/CMS.....	200907.....	201502

**RIP Date:** N/A

**RC Date:** 201502

**SITE DESCRIPTION**

Site CCSWMU-306 (Building 7291), is located south of Redstone Road and east of Line Road in the northern portion of the former RARE South Plant area in the southeast portion of RSA. The site includes Building 7291, a concrete sump, OWS, and a water conditioning vault. Building 7291 is a 1,200 sf building constructed in 1960 as a steam heating plant/boiler house. It was constructed with two 15,000 - gallon, steel No. 2 - fuel oil USTs on the east side of the building. The USTs were removed in February 1996 and replaced with one 10,000-gallon AST. In 2004 an SI noted a stained soil and stressed vegetation near the OWS/sump. It is possible that POL was released from the OWS/sump. Based on the long history of use of the building as a boiler and the visual indications of potential releases of POL it was identified as a new SWMU in notification provided to the ADEM on May 5, 2008. Additional investigations are required at this site in the form of a release assessment. The additional investigation was funded in FY08.

**CLEANUP/EXIT STRATEGY**

The path forward is to conduct an RFI field investigation in accordance with AEIRG to include collection of surface and subsurface soil samples using DPT to confirm existing data and investigate areas currently not evaluated.

**Site ID: CCSWMU-E**

**Site Name: #2 FUEL OIL SPILL TANK #5693, FUEL FARM**

**Alias: RSA-E**

**STATUS**

**Regulatory Driver:** RCRA  
 Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC)  
 Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	198908.....	199109
CS.....	200401.....	200409
RFI/CMS.....	201009.....	201408
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201408	

**SITE DESCRIPTION**

CCSWMU-E resulted from the release of approximately 58,584 gallons of No. 2 fuel oil from AST 5693 in 1985. Immediately recovery efforts were implemented in the form of a recovery trench. Within eight days 36,000 gallons were recovered. Recovery efforts continued for a period of six months. However, at the end of the effort an estimated 30,000 gallons of oil had seeped into the ground. In 1998, monitoring wells & soil borings were installed to determine the extent of the release. Soil samples collected were only analyzed for TPH DRO, oil, and grease. The results of the investigation indicated that area of contamination was likely localized south of AST 5693. However, in view of the limited analytical suite performed & the limited number of samples collected, additional investigation was recommended to determine if the nearby fuel farm contributed to the contaminants detected at CCSWMU-E.

Additional investigation is necessary to characterize the release and its impact on soil & groundwater contamination in the surrounding areas. A request was made Oct. 7, 2002 to USEPA to transfer CCSWMU-E from the CERCLA program to the RCRA program since the site is currently active. ADEM accepted transfer of CCSWMU-E into the RCRA program in February but RSA has not received official concurrence from EPA. The investigation of CCSWMU-E should be completed under the ARBCA program. The additional site investigation was funded in 2010 under the PMC contract. It should be noted that CCSWMU-E has an archaeological site (1MA0262) on the southwest portion of the site. No determination as to the eligibility for inclusion on the national register was made. Upon completion of the ARBCA evaluation, it is likely that remediation by natural attenuation will be the corrective action selected for CCSWMU-E.

A Hazardous Waste Facility Permit was issued Sept. 30, 2010 pursuant to AHWMMMA requiring an RFI for this site.

**CLEANUP/EXIT STRATEGY**

Additional investigation is necessary to characterize the release and its impact on soil & groundwater contamination in the surrounding areas. A request was made Oct. 7, 2002 to USEPA to transfer CCSWMU-E from the CERCLA program to the RCRA program since the site is currently active. The ADEM accepted transfer of CCSWMU-E into the RCRA program in February, but RSA has not received official concurrence from USEPA. The investigation of CCSWMU-E should be completed under the ARBCA program. The additional site investigation was funded in 2010 under the PMC contract. It should be noted that CCSWMU-E has an archaeological site (1MA0262) on the southwest portion of the site. No determination as to the eligibility for inclusion on the national register was made. Upon completion of the ARBCA evaluation, it is likely that remediation by natural attenuation will be the corrective action selected for CCSWMU-E. The phases are a corrective action phase, CMI(C) and an Operations and Maintenance phase, CMI(O).

**Site ID: CCSWMU-F**

**Site Name: FENCED OPEN STORAGE/LAYDOWN YARD**

**Alias: RSA-F**

**STATUS**

**Regulatory Driver:** RCRA

Contaminants of Concern: Metals, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
RFA.....	198908.....	199109
RFI/CMS.....	201110.....	201504
DES.....	201504.....	201512
CMI(C).....	201512.....	201606

**RIP Date:** N/A

**RC Date:** 201606

**SITE DESCRIPTION**

This site is an active, gravel covered, open storage used to store transformers, empty drums, POL products & scrap metals. Only a portion of the yard was used in relation to RCRA activities. The RSA requested this site be transferred from the CERCLA program to the RCRA program in October 2002. In February 2003, the ADEM stated they did not agree that this site should fall exclusively under RCRA and stated that CERCLA authority still applied.

Site CCSWMU-F is an active, gravel covered, OSA located northwest of the intersection of Mills and Jungerman roads in the central portion of the RSA. CCSWMU-F covers approximately 1.5 acres. The gravel site was used to store a variety of materials including transformers, empty drums, POL products, and scrap metal. However, only a portion of the area (half an acre) was used in relation to RCRA activities. The area located in the southern portion of CCSWMU-F was used as an overflow area for 90-day storage of hazardous waste and to store empty drums. There are no known releases from the hazardous waste storage area or the drum storage area. A request was made by the RSA on Oct. 7, 2002 to transfer CCSWMU-F from the CERCLA program to the RCRA program. In reply to the request, on Feb. 4, 2003 the ADEM stated that they did not agree that CCSWMU-F should fall exclusively under RCRA and acknowledged that CERCLA authority still applies. Soil staining was reported in the northern portion due to past operations at CCSWMU-F and a possible release of PCBs was also reported. Previous site investigations under the CERCLA program detected PAHs and metals in the soils at CCSWMU-F. These previously identified releases are commonly accepted to be associated with CERCLA activities. Further investigation in these areas could be required under the CERCLA program.

**CLEANUP/EXIT STRATEGY**

Further investigation in these areas could be required under the CERCLA program. Since CCSWMU-F is an active facility and other possible regulatory concerns are associated with the site (CERCLA and TSCA), it is suggested that any RFI investigations be deferred until the site becomes inactive. The RFI will require a complete characterization of the 1.5-acre site and the installation of additional soil borings, collection of soil samples, and sampling of existing wells. The RFI likely will indicate that limited removal actions for nonhazardous (TPH) contaminated soils are needed and that a site-specific risk assessment is necessary for site closure. This project contains the following phases - RFI, CMS, DES and a CMI(C). Two limited soil excavations are expected.

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
CCRSA-257	Rock Pond	201203	
CCRSA-264	RR spring	201203	
CCSWMU-277	B5487 WW MAINT SHOP ACID BATH WASHDOWN	201208	

# CR Schedule

**Date of CR Inception:** 198908

## Past Phase Completion Milestones

**1991**

RFA (CCSWMU-003 - IN-GROUND OIL/WATER SEPARATOR BLDG 3617 , CCSWMU-008 - SEWAGE TREATMENT PLANT #4, CCSWMU-009 - INACTIVE SEWAGE TREATMENT PLANT #3, CCSWMU-028 - IN-GROUND OWS 5693 AREA, CCSWMU-030 - CENTRAL OIL WATER SEPARATOR, CCSWMU-031 - CENTRAL OIL WATER SEPARATOR STORAGE TANK, CCSWMU-035 - IN-GROUND OIL/WATER SEPARATOR, BLDG 4812, CCSWMU-116 - SOUTH SIDE BLOWDOWN LAGOON, TEST AREA 5, CCSWMU-143 - POL-CONTAM. SOIL, B.3234 SOUTH of B.3240, CCSWMU-E - #2 FUEL OIL SPILL TANK #5693, FUEL FARM, CCSWMU-F - FENCED OPEN STORAGE/LAYDOWN YARD )

**2002**

CS (CCSWMU-003 - IN-GROUND OIL/WATER SEPARATOR BLDG 3617 , CCSWMU-028 - IN-GROUND OWS 5693 AREA, CCSWMU-030 - CENTRAL OIL WATER SEPARATOR, CCSWMU-031 - CENTRAL OIL WATER SEPARATOR STORAGE TANK, CCSWMU-035 - IN-GROUND OIL/WATER SEPARATOR, BLDG 4812)

**2004**

CS (CCSWMU-E - #2 FUEL OIL SPILL TANK #5693, FUEL FARM)

**2005**

RFA (CCSWMU-240 - FORMER SUBSTATION NO.7, BLDG 5290, CCSWMU-241 - HW STORAGE IGLOO, BLDG 7313, CCSWMU-242 - HW STORAGE IGLOO, BLDG 7314, CCSWMU-243 - PROPELLANT STORAGE, BLDG 7342, CCSWMU-245 - STEAM HEATING PLANT, BLDG 7579, CCSWMU-246 - SEWER EJECTOR & MOTOR POOL, BLDG 7630, CCSWMU-247 - STEEL FABRICATION/MAINTENANCE FAC. B7644, CCSWMU-248 - BATTERY MAINTENANCE SHOP, BLDG 3633)

**2006**

RFA (CCSWMU-268 - SEWAGE TREATMENT PLANT, BLDG 8018, CCSWMU-277 - B5487 WW MAINT SHOP ACID BATH WASHDOWN )

**2007**

RFA (CCSWMU-222 - Roads and Grounds Maintenance Shop, CCSWMU-283 - FORMER PRIMARY SUBSTATION NO.2, BLDG3796, CCSWMU-284 - FIRE TRAINING AREA (FTA))

**2008**

RFA (CCSWMU-286 - BOILER/STEAM PLANT, BLDG 3624, CCSWMU-287 - COMPONENT STORAGE WAREHOUSE, BLDG 3634, CCSWMU-288 - WTP#1, SLUDGE THICKENER & DRYING BEDS , CCSWMU-289 - WTP#2, SLUDGE THICKENER & DRYING BEDS, CCSWMU-290 - WTP#3, SLUDGE THICKENER & DRYING BE, CCSWMU-291 - UST AT FORMER BLDG T-3162 (STEAM PLANT), CCSWMU-293 - FORMER USTs AT BLDG 3639, CCSWMU-304 - OWS,WASHRACK&SUMP ADJACENT TO BLDG 5498, CCSWMU-305 - DISPATCHER OFC WITH WASHRACK,BLDG 3664, CCSWMU-306 - STEAM HEATING PLANT, BLDG 7291)

**2010**

RFA (CCRSA-257 - Rock Pond, CCRSA-264 - RR spring, CCRSA-266 - Open Storage area N. of Bldg 8607, CCRSA-308 - Exterior Sump at Bldg 7120, CCRSA-309 - Covered trench & sump at Bldg 7155, CCRSA-310 - Former & Suspected OWS at Bldg7289 , CCRSA-311 - Sump & Concrete Pits at Bldg 7352)

**2011**

CS (CCSWMU-284 - FIRE TRAINING AREA (FTA))

RFA (CCRSA-314 - Used Oil AST & Spill site Bldg 3670)

## Projected Phase Completion Milestones

See attached schedule

## Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

To Be Determined

## CR Schedule

**Final RA(C) Completion Date:** 201612

**Schedule for Next Five-Year Review:** N/A

**Estimated Completion Date of CR at Installation (including LTM phase):** 204209

## REDSTONE ARSENAL CR Schedule

  = phase underway

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCRSA-266	Open Storage area N. of Bldg 8607	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
CCRSA-308	Exterior Sump at Bldg 7120	RFI/CMS						
		DES						
		CMI(C)						
CCRSA-309	Covered trench & sump at Bldg 7155	RFI/CMS						
		DES						
		CMI(C)						
CCRSA-310	Former & Suspected OWS at Bldg7289	RFI/CMS						
		DES						
		CMI(C)						
CCRSA-311	Sump & Concrete Pits at Bldg 7352	RFI/CMS						
		DES						
		CMI(C)						
CCRSA-314	Used Oil AST & Spill site Bldg 3670	RFI/CMS						
		DES						
		CMI(C)						
CCSWMU-003	IN-GROUND OIL/WATER SEPARATOR BLDG 3617	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
CCSWMU-008	SEWAGE TREATMENT PLANT #4	RFI/CMS						
		CMI(C)						
CCSWMU-009	INACTIVE SEWAGE TREATMENT PLANT #3	RFI/CMS						
		DES						
		CMI(C)						
CCSWMU-028	IN-GROUND OWS 5693 AREA	RFI/CMS						
		DES						
		CMI(C)						
CCSWMU-030	CENTRAL OIL WATER SEPARATOR	RFI/CMS						

## REDSTONE ARSENAL CR Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-031	CENTRAL OIL WATER SEPARATOR STORAGE TANK	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-035	IN-GROUND OIL/WATER SEPARATOR, BLDG 4812	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-116	SOUTH SIDE BLOWDOWN LAGOON, TEST AREA 5	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-143	POL-CONTAM. SOIL, B.3234 SOUTH of B.3240	RFI/CMS						
		CMI(C)						
		CMI(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-222	Roads and Grounds Maintenance Shop	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-240	FORMER SUBSTATION NO.7, BLDG 5290	RFI/CMS						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-241	HW STORAGE IGLOO, BLDG 7313	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-242	HW STORAGE IGLOO, BLDG 7314	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-243	PROPELLANT STORAGE, BLDG 7342	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-245	STEAM HEATING PLANT, BLDG 7579	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-246	SEWER EJECTOR & MOTOR POOL, BLDG 7630	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-247	STEEL FABRICATION/MAINTENANCE FAC. B7644	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-248	BATTERY MAINTENANCE SHOP, BLDG 3633	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-268	SEWAGE TREATMENT PLANT, BLDG 8018	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-283	FORMER PRIMARY SUBSTATION NO.2, BLDG3796	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-284	FIRE TRAINING AREA (FTA)	RFI/CMS						

## REDSTONE ARSENAL CR Schedule

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-286	BOILER/STEAM PLANT, BLDG 3624	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-287	COMPONENT STORAGE WAREHOUSE, BLDG 3634	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-288	WTP#1, SLUDGE THICKENER & DRYING BEDS	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-289	WTP#2, SLUDGE THICKENER & DRYING BEDS	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-290	WTP#3, SLUDGE THICKENER & DRYING BE	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-291	UST AT FORMER BLDG T-3162 (STEAM PLANT)	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-293	FORMER USTs AT BLDG 3639	RFI/CMS						
		DES						
		CMI(C)						
		CMI(O)						
		LTM						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-304	OWS,WASHRACK&SUMP ADJACENT TO BLDG 5498	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-305	DISPATCHER OFC WITH WASHRACK,BLDG 3664	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-306	STEAM HEATING PLANT, BLDG 7291	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-E	#2 FUEL OIL SPILL TANK #5693, FUEL FARM	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
CCSWMU-F	FENCED OPEN STORAGE/LAYDOWN YARD	RFI/CMS						
		DES						
		CMI(C)						

## Community Involvement

**Technical Review Committee (TRC):** 199406

**Community Involvement Plan (Date Published):** 200603

**Restoration Advisory Board (RAB):** No

**Reason Not Established:** The community has expressed no sufficient, sustained interest in a RAB.

**Community Interest Solicited on:** 200911

### Efforts Taken to Determine Interest

In 1994, RSA established a TRC to provide a forum for interested parties to discuss and provide input into restoration activities. This was in accordance with requirements outlined by 10 U.S.C. 27(c), Executive Order 12580, Superfund Implementation and Army Regulation 200-1.

The RSA has conducted TRC meetings along with public availability sessions, environmental open houses, and public meetings to generate interest in the environmental program. A community involvement plan was also developed. The community involvement plan documents the chronology of historical events that the RSA has conducted to solicit community involvement regarding environmental restoration efforts.

During these community involvement efforts, RSA solicited potential interest in forming a RAB. Some of the tools used to solicit interest included RAB booths at public meetings, fact sheets, RAB sign-up sheets, comment cards and RAB applications.

Public meetings were held in October 2003, October 2005, and November 2007. At these meetings, the public was solicited for interest in a RAB using a RAB booth, fact sheets, a RAB sign-up sheet, comment cards, RAB applications, and an oral presentation on RABs. In November 2009, advertisements were published in the "Huntsville Times," "Speakin' Out News", and the "Redstone Rocket" newspapers soliciting public interest in forming a RAB.

### Results

Six citizens responded to the advertisements with interest in forming a RAB; however, this was less than the minimum of 50 individuals indicating interest in forming a RAB. A minimal number of responses have resulted from each of the public meetings held in previous years.

### Follow-up Procedures

Although there is not enough sustainable community interest to establish a RAB at present, interest will continue to be solicited on a biennial basis. The next effort to solicit interest in a RAB is planned for October or November 2011.

### Additional Community Involvement Information

Document repositories for RSA's IRP are established at both the Triana and Huntsville public libraries for public review and reference. The Triana library repository is now located at 640 6th Street, Triana, AL. The repository for the Huntsville library is located in the main library in the Genealogical and Historical Resources Section (Heritage Room, third floor), 915 Monroe Street Huntsville, AL. The attendant at each library is available to direct interested parties to the exact location of the computer.

The entire IRP document repository has been loaded electronically onto a dedicated, interactive computer at each library. Documents can be accessed and read at each station or copied to flash storage drives, but cannot be edited. Currently at the Huntsville library, because of electronic storage capacity, the first 399 documents are available on CDs that can be accessed through the dedicated CD reader. All other documents are loaded directly onto the dedicated computer for public retrieval, review, and reference. Both computers contain an electronic listing of the entire repository to assist with locating those documents of interest. The attendant at the library can direct interested parties to the exact location of the computer. The RSA is in the process of adding additional storage capacity to the Huntsville Library computer so that all documents are accessible without loading individual CDs. In addition, Redstone staff are also investigating and programming a static, but enhanced, interactive log-on for the public to utilize in retrieving documents. It is the installation's intent to enhance the interactive log-on with mapping so that the public can investigate a specific AOC without knowing the site name or document of interest.

**Administrative Record is located at**

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## Community Involvement

Redstone Arsenal, Environmental Management Division  
Electronic copies are housed in Building 4488, Martin Road, Room A327.  
Hard copies are in Building 7741, Redstone Arsenal. Contact: 256-842-0314

**Information Repository is located at**

Triana library - 640 6th Street, Triana, AL. Huntsville library - Genealogical and Historical Resources Section (Heritage Room, third floor), 915 Monroe Street Huntsville, AL.

**Current Technical Assistance for Public Participation (TAPP):**N/A

**TAPP Title:** N/A

**Potential TAPP:** N/A

