

**FY2013**

**WATERVLIET ARSENAL**  
**Army Defense Environmental Restoration Program**  
**Installation Action Plan**

Printed 09 September 2013

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## Table of Contents

Statement Of Purpose.....	1
Acronyms.....	2
Installation Information.....	4
5-Year / Periodic Review Summary.....	5
Land Use Control (LUC) Summary.....	6
Cleanup Program Summary.....	7
Installation Restoration Program.....	8
IRP Summary.....	9
IRP Contamination Assessment.....	11
IRP Previous Studies.....	13
Installation Restoration Program Site Descriptions.....	15
WVAA-25 SIBERIA (INCLUDES SWMUS #3 18, 22-24).....	16
WVAA-32 DEGREASERS (B 20/25/40/110/120/130).....	17
Installation Restoration Program Site Closeout (No Further Action) Sites Summary.....	19
Installation Restoration Program Schedule.....	21
Installation Restoration Program Milestones.....	21
IRP Schedule Chart.....	23

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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), Watervliet Arsenal (WVA), the executing agencies, regulatory agencies, and the public, an IAP was completed. The IAP is used to track requirements, schedules, and tentative 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

AEDB-R	Army Environmental Database - Restoration
AMC	Army Materiel Command
AOC	Area of Concern
BLDG	Building
CAP	Corrective Acton Plan
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CMI(C)	Corrective Measures Implementation (Construction)
CMI(O)	Corrective Measures Implementation (Operation)
CMS	Corrective Measures Study
COC	Contaminant of Concern
CRP	Community Relations Plan
CS	Confirmatory Sampling
cy	cubic yard
DD	Decision Document
DES	Design
DOH	Department of Health
DRMO	Defense Reutilization and Marketing Office
EI	Environmental Indicators
FRA	Final Remedial Action
FY	Fiscal Year
GPRA	Government Performance and Results Act
HRC	Hydrogen-Releasing Compound
IAP	Installation Action Plan
ID	Identification
IMP(C)	Implementation (Construction)
IRA	Interim Remedial Action
IRP	Installation Restoration Program
K	thousand
LTM	Long-Term Management
LUC	Land Use Controls
MCL	Maximum Contaminant Level
MMA	Main Manufacturing Area
MMRP	Military Munitions Response Program
MNA	Monitored Natural Attenuation
MW	Monitoring Well
N/A	Not applicable
NFA	No Further Action
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORC	Oxygen-Releasing Compound
OU	Operable Unit
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbons
POL	Petroleum, Oil and Lubricants

## Acronyms

RA	Remedial Action
RA(C)	Remedial Action (Construction)
RAB	Restoration Advisory Board
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facilities Investigation
RIP	Remedy-in-Place
ROD	Record of Decision
SI	Site Inspection
SoB	Statement of Basis
SSDS	Sub Slab Depressurization System
SWMU	Solid Waste Management Unit
TAPP	Technical Assistance for Public Participation
TBD	To Be Determined
TPH	Total Petroleum Hydrocarbons
TRC	Technical Review Committee
USACE	US Army Corps of Engineers
USAEC	US Army Environmental Command
USEPA	US Environmental Protection Agency
UST	Underground Storage Tank
VI	Vapor Intrusion
VOC	Volatile Organic Compound
WVA	Watervliet Arsenal
WVAA	AEDB-R site designation for Watervliet Arsenal

## Installation Information

### Installation Locale

**Installation Size (Acreage):** 140

**City:** Watervliet

**County:** Albany

**State:** New York

### Other Locale Information

The WVA is located on approximately 140 acres of land in the city of Watervliet and in the town of Colonie, in Albany County, New York. The city of Albany is approximately 3.5 miles south of the WVA. To the east, the WVA is separated from the Hudson River by Route 32 (Broadway) and a six-lane highway (I-787). To the west, the WVA extends beyond the city limits of Watervliet into the town of Colonie. Residential areas border the WVA to the south and north.

### Installation Mission

The mission of the WVA is to perform manufacturing (industrial) engineering, procurement, fabrication, and product assurance of assigned material, and to provide administrative and logistical support services to tenant activities. Assigned material includes mortars, recoil-less rifles, cannon for tanks, towed and self-propelled artillery, and components of these items. Also included are: special tools, tool sets, test, measurement and diagnostic equipment, training equipment, devices and simulators relating to assigned material, and other equipment or material as assigned.

### Lead Organization

Army Materiel Command (AMC)

### Lead Executing Agencies for Installation

US Army Corps Engineers (USACE), Baltimore District

USACE, New York District

### Regulator Participation

<b>Federal</b>	US Environmental Protection Agency (USEPA), Region II
<b>State</b>	New York State Department of Environmental Conservation (NYSDEC) New York State Department of Health (NYSDOH)

### National Priorities List (NPL) Status

WATERVLIET ARSENAL is not on the NPL

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

Installation at RIP/RC.

### Installation Program Summaries

#### IRP

**Primary Contaminants of Concern:** Metals, Petroleum, Oil and Lubricants (POL), Polycyclic Aromatic Hydrocarbons (PAH), Volatiles (VOC)

**Affected Media of Concern:** Groundwater, Other (Soil Vapor and Indoor Air), Soil

## 5-Year / Periodic Review Summary

### 5-Year / Periodic Review Summary

Status	Start Date	End Date	End FY
Complete	201003	201009	2010
Planned	201503	201509	2015

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

Associated ROD/DD Name	Sites
WVA-25 Siberia(includes SWMU#3,18,22-24)	WVAA-25

**Results** The 5 year review was completed by the Baltimore corp of Engineers.

**Actions** No findings in this review.

**Plans** Continue to do monitoring in the Siberia Area.

### Recommendations and Implementation Plans:

The five year review was completed for both sites WVA-25 and WVA-32 (Main Manufacturing Area). Watervliet has completed a site-wide vapor intrusion survey back in 2007 which resulted in installing sub-slab ventilation systems in seven buildings in the Main Manufacturing Area. These Sub Slab Depressurization Systems (SSDS) are monitored daily and monthly reports are kept. We send a report to NYSDOH annually. This will be kept up until the State sees progress in the reports. The next five year review will be in fiscal year (FY)15 at which time we will be evaluating the effectiveness of these systems.

## Land Use Control (LUC) Summary

**LUC Title:** Monitor Air and water

**Site(s):** WVAA-32

**ROD/DD Title:** Statement of Basis for WVAA-32

**Location of LUC**

Site WVAA-32 Will continue to do air monitoring and well sampling-sending reports to the NYSDEC

**Land Use Restriction:** None specified

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

**Types of Institutional Controls:** None

**Date in Place:** 201210

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** State

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

**Documentation Date:** 201210

**LUC Enforcement:** Annual Inspections

**Contaminants:** INORGANICS, ORGANICS, PAH, PETROLEUM HYDROCARBON, VOC

**Additional Information**

N/A

**LUC Title:** Restricted Use

**Site(s):** WVAA-25

**ROD/DD Title:** STATEMENT OF BASIS/STATE for WVAA-25

**Location of LUC**

Siberia Area-WaterVliet Arsenal

**Land Use Restriction:** 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, Guards

**Types of Institutional Controls:** Restrictions on land use

**Date in Place:** 200809

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** State

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

**Documentation Date:** 200809

**LUC Enforcement:** Annual Inspections

**Contaminants:** PAH, PETROLEUM HYDROCARBON, VOC

**Additional Information**

N/A



# Cleanup Program Summary

## Installation Historic Activity

The WVA, a nationally registered historic landmark, was established in 1813 with the purchase of 12 acres of land. The principal mission during the early years of operation included the production of small arms ammunition, gun carriages, and leather goods. Since 1883 the facility has been producing cannons. Peak production periods were reached during World Wars I and II and the Korean and Vietnam Wars.

The area known as the Siberia area is a 15-acre tract that was purchased by the arsenal in May 1942. Located west of the Main Manufacturing Area (MMA), Siberia is used as a staging area for the interim storage of raw and hazardous materials, finished goods, and supplies for the WVA.

## Installation Program Cleanup Progress

### IRP

- Prior Year Progress:** WVA completed the long-term management (LTM) monitoring report for Siberia and MMA for FY11. NYSDEC reviewed and approved the report. Sub-slab ventilation systems were installed in MMA buildings. All systems are up and running. A statement of basis (SoB) was completed in October 2012 for the MMA site WVAA-32.
- Future Plan of Action:** Progress for the next two years is to complete LTM in the Siberia area and MMA. Also, sub-slab ventilation systems will be monitored daily with a report to the state at the end of each year. Systems are up and running.

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

# IRP Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 31/29

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

- 1 Contaminated Ground Water  
(WVAA-32)
- 1 Maintenance Yard  
(WVAA-25)

## Most Widespread Contaminants of Concern

Metals, Petroleum, Oil and Lubricants (POL), Polycyclic Aromatic Hydrocarbons (PAH), Volatiles (VOC)

## Media of Concern

Groundwater, Other (Soil Vapor and Indoor Air), Soil

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

Site ID	Site Name	Action	Remedy	FY
WVAA-03	BLDG136 (1976 SPILL DURING TRANS OPS)	IRA	WASTE REMOVAL - SOILS	1990
WVAA-03	BLDG136 (1976 SPILL DURING TRANS OPS)	IRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1990
WVAA-26	BLDG 36 SURFACE IMPOUNDMENT CLOSURE	FRA	WASTE REMOVAL - SOILS	1994
WVAA-23	SIBERIA AREA	FRA	FENCE OR OTHER SITE ACCESS CONTROL MEASURES	1997
WVAA-29	RCRA CONTAINER STORAGE FACILITY BLDG 145	FRA	OTHER	1997
WVAA-20	UST LOCATIONS	FRA	WASTE REMOVAL - SOILS	1998
WVAA-24	INDUSTRIAL WASTE SEWER LINES	IRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1999
WVAA-25	SIBERIA (INCLUDES SWMUS #3 18, 22-24)	IRA	DEHALOGENATION	1999
WVAA-09	BUILDING 35 MEDIUM CALIBER GUN SHOP	IRA	FREE PRODUCT RECOVERY	2000
WVAA-10	BUILDING 110 BIG GUN SHOP	IRA	FREE PRODUCT RECOVERY	2000
WVAA-27	INVESTIGATE OIL CONTAMINATION IN MFG ARS	IRA	FREE PRODUCT RECOVERY	2001
WVAA-27	INVESTIGATE OIL CONTAMINATION IN MFG ARS	IRA	FREE PRODUCT RECOVERY	2001
WVAA-25	SIBERIA (INCLUDES SWMUS #3 18, 22-24)	FRA	FENCE OR OTHER SITE ACCESS CONTROL MEASURES	2002
WVAA-25	SIBERIA (INCLUDES SWMUS #3 18, 22-24)	FRA	WASTE REMOVAL - SOILS	2003
WVAA-25	SIBERIA (INCLUDES SWMUS #3 18, 22-24)	FRA	BIOREMEDIATION - IN SITU GROUNDWATER	2004
WVAA-25	SIBERIA (INCLUDES SWMUS #3 18, 22-24)	FRA	SLURRY-PHASE BIOREMEDIATION	2004
WVAA-32	DEGREASERS (B 20/25/40/110/120/130)	FRA	DEHALOGENATION	2004
WVAA-32	DEGREASERS (B 20/25/40/110/120/130)	IRA	CHEMICAL REDUCTION/OXIDATION	2004

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## IRP Summary

### Duration of IRP

**Date of IRP Inception:** 197612

**Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC):** 200509/204309

**Date of IRP completion including Long Term Management (LTM):** 204309

# IRP Contamination Assessment

## Contamination Assessment Overview

Contamination at the WVA has been identified in the soil, sediment and groundwater. To simplify the investigation and remediation process, the WVA has proposed that the Installation Restoration Program (IRP) be managed as two operable units (OUs) the Siberia area [Army Environmental Database - Restoration (AEDB-R) site WVA-25] and the MMA (AEDB-R sites WVA-01 through WVA-22, WVA-24, and WVA-26 through WVA-33). The distinction also addresses the contamination separately as chlorinated organics and petroleum hydrocarbons.

At the Siberia area metals and chlorinated organic compounds have been detected in the soil above guidelines in localized areas. Petroleum hydrocarbons [total petroleum hydrocarbons (TPH)] and PAHs are present above guidelines in the soil throughout the Siberia area. Sources of the TPH contamination are the result of past practices such as handling waste metal chips saturated with cutting oil, spreading spent oil on the ground surface for dust control, and the use of burn pits. The northeast quadrant has a chlorinated VOC groundwater plume. VOC contamination in the northeast quadrant may have originated from the use of burn pits in this area. TPH are detected in the groundwater throughout the Siberia area. Hexavalent chromium-contaminated groundwater is limited to a portion of the northeast quadrant. This contamination is attributable to Perfection Plating, an adjacent facility. The WVA source of drinking water is city water, so there is no immediate threat to human health.

At the MMA contaminated soil above guidelines was not detected except for a limited area in the former Erie Canal (lead and PAHs). Groundwater in the MMA is contaminated with petroleum hydrocarbons (light non-aqueous phase liquids) and chlorinated organics. The POL products have been and are currently used in machining operations. The WVA also stores POL products for future use and stores waste oils for removal. Chlorinated solvents have been used in vapor degreasing and cleaning operations but have not been used for this purpose at the WVA since 1982.

In lieu of separate solid waste management unit (SWMU) assessments, and considering the relatively small size of the WVA, a site-wide hydrogeologic RCRA facility investigation (RFI) was performed with regulatory approval.

The following is a description of the most noteworthy findings for groundwater and soils.

### GROUNDWATER

With regard to the groundwater, the results of the analytical data indicate that pesticides, metals, and semi-volatile organics (SVOC) are not contaminants of concern (COCs) for the MMA. Free-phase petroleum-derived product has been identified in the groundwater and within the bedrock fractures. Based on the results of water level measurements, the source appears to be located upgradient of Building 35, possibly associated with old spill events and leaking machining equipment foundations. Chlorinated VOCs have been detected in bedrock groundwater, and the contaminant assessment indicates that most chlorinated VOCs are present in the bedrock matrix.

### SOILS

With regard to the soils, analytical data indicates that the soils in the MMA have not been contaminated with pesticides or VOCs (i.e., solvents) above current guidance values. Chromium was found around Building 36 in the area of a reported chromium sludge spill, and lead was found in the former Erie Canal in front of Building 25. Petroleum-derived product has been detected in the soils of the former Erie Canal in front of Buildings 20 and 25. The area is covered with asphalt and, therefore, the contamination is not considered an immediate threat to human health or the environment.

The Government Performance and Results Act (GPRA) established interim goals for the RCRA and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) programs. The GPRA goals are called environmental indicators (EIs). In RCRA, the GPRA goals are called CA 725, Human Exposures Controlled and CA 750, Groundwater Migration Controlled. A positive CA 725 and CA 750 have been achieved.

These GPRA goals are only an interim step; they do not represent the end of the corrective action process. Rather, EIs are a measure of near-term success with the ultimate goal being to achieve a completed RCRA cleanup.

Progress on these findings is as follows:

- In FY06, corrective measures (permeable iron reactive walls) for groundwater reached RC at the Siberia area. Corrective measures for soil have been implemented and include landfarming, excavation and disposal, and asphalt capping. The site was made RC in FY07. The LTM will continue. A SoB was publicized in August 2008 and was finalized in September 2008.

## IRP Contamination Assessment

### Contamination Assessment Overview

- At the MMA, corrective measures consisting of periodic sodium permanganate injections were implemented at Building 40. In FY07, the third year of a five-year injection plan was completed. An indoor air remediation consisting of indoor air-filtration through carbon was also implemented at Building 40 and was completed in FY07. System operation and indoor air monitoring will continue.
- At Building 25, the hydrogen-releasing compound (HRC) groundwater remedy is completed.
- The LTM of the monitored natural attenuation (MNA) remedy will continue.
- One Military Munitions Response Program (MMRP) site was identified at the WVA in May 2003. Site WVA-001-R-01, the Musket Testing Range, was listed as RC in May 2003.

### Cleanup Exit Strategy

The remedy at Building No. 40 (Degreasers Site) will be completed and LTM will be conducted.

At the Siberia Area, LTM will continue and LUCs will be completed.

## IRP Previous Studies

Year	Title	Author	Date
1986	Groundwater Monitoring Well Installations, Vicinity of Buildings 25 and 36	Empire Soils Investigations Inc.	AUG-1986
	Preliminary Site Investigation, Siberia Area	C.T. Male Associates P.C.	DEC-1986
1987	Subsurface Investigation (Pole Barn Vicinity)	Groundwater Technology Inc.	JUL-1987
1988	Environmental Site Assessment Report, Perfection Plating	C.T. Male Associates, P.C.	NOV-1988
1990	Subsurface Investigation Report for Former Vapor Degreaser Unit, Building 25	C.T. Male Associates, P.C.	JAN-1990
1991	Phase I Subsurface Contamination Investigation of the Chrome and Shrink Pit Areas In Buildings 35 and 135	Clough Harbour and Associates	JAN-1991
	Phase I RCRA Facility Investigation Report, Siberia Area	Environmental Science and Engineering Inc., Gainesville, FL	DEC-1991
1992	Subsurface Investigation Report RCRA Surface Impoundment, Structure 39, Bed 1	C.T. Male Associates, P.C.	JAN-1992
	Chromic Acid Line Repair	Huntingdon Empire Soils, Inc.	JUN-1992
1994	Soil Characterization Study, Proposed Chip Handling Facility	Huntingdon Empire Soils, Inc.	MAR-1994
	Natural Gas Transmission Line Installation	Huntingdon Empire Soils, Inc.	SEP-1994
1997	RFI, Final, Siberia Area	Malcolm Pirnie, Inc.	DEC-1997
2000	Final Approval on the RFI for MMA	Malcolm Pirnie, Inc.	NOV-2000
2003	Siberia CMS Approved		OCT-2003
	Building #40 Corrective Measures	Malcolm Pirnie, Inc.	OCT-2003
2004	Building #25 Main Manufacturing Corrective Measures//Approved as final remedy by NYSDEC in 2007	Malcolm Pirnie, Inc.	AUG-2004
2006	Corrective Measures Installation and Startup Report for Building 340 Groundwater	Malcolm Pirnie, Inc.	JUN-2006
2007	Vapor Intrusion Evaluation Work Plan, Main Manufacturing Areas	Malcolm Pirnie	AUG-2007
	Siberia Construction Report Completed and Approved by NYSDEC/DOH/EPA	Malcolm Pirnie, Inc.	AUG-2007

## IRP Previous Studies

	<b>Title</b>	<b>Author</b>	<b>Date</b>
<b>2008</b>	Vapor Intrusion Evaluation Work Plan Addendum	Malcolm Pirnie	FEB-2008
	Vapor Intrusion Investigation Main Manufacturing Area Watervliet Arsenal, Watervliet New York	Malcolm Pirnie, Inc.	AUG-2008
	Statement of Basis Watervliet Arsenal Siberia Area, Watervliet New York	New York State Department of Environmental Conservation and United States Environmental Protection Agency Region-2	SEP-2008
<b>2009</b>	Vapor Intrusion Interim Corrective Measures Work Plan	Malcolm Pirnie	MAY-2009
<b>2011</b>	Focused Corrective Measures Study for the Main Manufacturing Area	Malcolm Pirnie	JAN-2011
<b>2012</b>	Statement of Basis for Main Manufacturing Area	New York State Department of Conservation	OCT-2012



**WATERVLIET ARSENAL**  
**Installation Restoration Program**  
**Site Descriptions**

Site Name: SIBERIA (INCLUDES SWMUS #3 18, 22-24)

**STATUS**

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Metals, Petroleum, Oil and Lubricants (POL), Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA.....	197906.....	198708
CS.....	199409.....	199509
RFI/CMS.....	200206.....	200305
DES.....	200306.....	200307
IRA.....	199810.....	200312
CMI(C).....	200205.....	200312
CMI(O).....	200303.....	204309

RIP Date: 200312

RC Date: 204309

**SITE DESCRIPTION**

The Siberia area is a 15-acre storage plot located to the west of the MMA. The land was purchased in the 1940s. Raw material storage buildings and the Defense Reutilization Marketing Office (DRMO) salvage yard are located in this area. There also is an on-site chip handling facility and a trash/dumpster area. The area is also the location for a newly replaced underground storage tank [(UST) - 1997; SWMU No.7a], an electrical substation, and the site of an old burn pit (last used in the late-1960s).

During substation upgrade work, POL-contaminated soil was discovered in the southwest quadrant. In December 1997, 60 cubic yards (cy) of soil were removed. Soil from the burn pit was determined to be the source of VOC contamination. In October 1999 approximately 1,600 cy were removed and added to the land farming operation.

In December 1998, a permeable reactive wall full-scale pilot system was installed in the northeast quadrant for the dehalogenation of chlorinated solvents in the groundwater. This system has been effective and is being monitored with an upgradient and downgradient well system. In August 2001 pilot studies for oxygen-releasing compound (ORC) and biosparging were initiated. By November 2001 they had proved ineffective. In August 2000 bioremediation land farming was initiated; 14 of the 16 monitored contaminants are already below the technical and administrative guidance memo. The USEPA and New York State have accepted the bioremediation pilot study results as part of a viable final remedy. Also, agreement was reached on corrective action objectives.

In September 2003 the corrective measure study (CMS) was approved. The study recommends land farming and excavation of soil, a permeable iron reactive wall for groundwater, paving and seeding, and long-term monitoring. In October 2002 the excavation of 18,500 cy of soil was initiated and was completed in April 2003. Capping was completed in July 2005. Land farming was completed in the first quarter of 2005. Grading, geotextile and gravel placement was completed in January 2005. Final confirmation sampling was completed in September 2005. The construction certification report was submitted and approved in 2007 and a SoB was completed in September 2008. Corrective measures implementation (operation) (CMI(O)) for this site is continuing in the Siberia area. LUCs limit this area to industrial use only. On Dec. 28, 2011 NYSDEC deleted Siberia from the New York State Registry of Inactive Hazardous Waste Disposal Site Registry.

**CLEANUP/EXIT STRATEGY**

The LTM will continue on an annual basis.

Site ID: WVAA-32

Site Name: DEGREASERS (B 20/25/40/110/120/130)

STATUS

Regulatory Driver: RCRA

RRSE: HIGH

Contaminants of Concern: Volatiles (VOC)

Media of Concern: Groundwater, Other (Soil Vapor and Indoor Air)

Phases	Start	End
RFA.....	197906.....	198708
CS.....	199409.....	199610
RFI/CMS.....	199610.....	200305
DES.....	200309.....	200312
IRA.....	200209.....	200409
CMI(C).....	200209.....	200409
CMI(O).....	200509.....	204309

RIP Date: 200509

RC Date: 204309

SITE DESCRIPTION

This AEDB-R site-specifically addresses chlorinated solvent groundwater contamination from all vapor degreasers. Vapor degreasers were used to remove protective oil coatings from the surfaces of metal parts. Vapors were exhausted to the outdoors through a vent. These vapor degreasers are no longer part of the manufacturing process and have been removed.

The RFI, accepted in January 2001, defined five distinct and separate sources of groundwater contamination at Building 25, 40, 110, and 121 North and South.

Groundwater sampling results indicated high concentrations of chlorinated VOCs in overburdened and fractured bedrock. A dense non-aqueous phase liquid was detected at the downgradient installation boundary in deep fractured bedrock [monitoring well (MW) 51]. Soil sampling results did not indicate the presence of chlorinated VOCs above guidance values.

The CMS Data Gap Study (June 2001) met the objectives of contaminant distribution, fracture characterization, flow-zone characterization, aquifer parameters, and hydraulic connection.

In 2003 pilot-scale activities for VOCs at Building 40 (chemical oxidation) and Building 25 (enhanced natural attenuation) were completed.

An exposure assessment which included soil, surface water, groundwater and indoor air, was completed to evaluate the plume's risk to human health and the environment. In 2003 the assessment was revised and resubmitted. The exposure assessment concluded that there are no ecological risks. An indoor air exposure pathway at Building 40 was identified and has been mitigated. Concern over vapor intrusion has been raised at several buildings within the MMA. An additional vapor intrusion investigation has been requested by the NYSDEC, the NYSDOH and the USEPA. The WVA has completed additional soil vapor and indoor air sampling in Buildings 20, 22, 25, 115 and 120. Based on the results the state will request the WVA to do additional sampling and, possibly, some sub-slab depressurization in some buildings where the levels of VOCs are over their guidance levels. In February 2008 a full-scale investigation of all buildings and surrounding areas where vapor degreasers were used was initiated.

The Building 40 in situ chemical oxidation program with the consent of NYSDEC/NYSDOH/USEPA has been discontinued based on interim results. Plans are for CMI(O) for that site. The WVA is in the final stage of the vapor intrusion work. Ten sub-slab ventilation systems will be installed in the MMA where the levels of VOCs were above NYSDOH guidance. A Statement of Basis from the NYSDEC on this site is expected late in 2011. Site WVAA-32 is in final remedy with the installations of the sub-slab depressurization units in manufacturing buildings where the levels were above NYSDOH guidance. All units are up and running. Watervliet completed the Statement of Basis (Decision Document (DD)) with NYSDEC in October 2012. The elements of the final corrective measures are: no further action (NFA) with continued long-term monitoring of the ongoing natural attenuation for Building 25 groundwater; NFA for Building 40 groundwater, beyond natural attenuation, documented through long-term groundwater monitoring; NFA with continued operation and monitoring of the subsurface depressurization systems for vapor intrusion in Buildings 20, 21, 22, 25, 114, 120, 121, and 130; and site management and LUCs to protect public health and the

**Site ID: WVAA-32**

**Site Name: DEGREASERS (B 20/25/40/110/120/130)**

environment for contamination remaining at the site after the Interim Corrective Measures. The MMA site WVAA-25 is currently in the CMI(O) phase.

### **CLEANUP/EXIT STRATEGY**

The final remedy for this site is the installation of sub-slab depressurization units in the Manufacturing Buildings 20, 21, 22, 25, 114, 120, 121 and Building 130. All of the systems have been installed and are up and running. LTM will continue at WVAA-32 along with Site WVAA-25. Reports will be completed and sent to the state for approval.

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
WVAA-01	BLDG 121 OIL SPILL	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-02	CHROMIC ACID RINSE WT SPILL NR BLDG 36	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-03	BLDG136 (1976 SPILL DURING TRANS OPS)	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-04	INDUSTRIAL WASTE TRT PLANT AREA	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-05	CYANIDE TRT PLANT BUILDING 110	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-06	METAL PLATING SHOP BLDG 14 DEMOLISH.1981	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-07	BUILDING 20 MAJOR COMPONENTS	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-08	BLDG 25 VAPOR DEGREASER (MINOR COMP)	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-09	BUILDING 35 MEDIUM CALIBER GUN SHOP	200109	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-10	BUILDING 110 BIG GUN SHOP	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-12	BUILDING 123 PAINT SHOP	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-13	BUILDING 125	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-14	BUILDING 135 ROTARY FORGE	200209	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-15	BUILDING 114 BENET LABS PILOT SCALE PLAT	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-16	BUILDING 115 BENET RESEARCH LABS	198708	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-17	BUILDING 119	198708	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-18	BUILDING 120 BENET RESEARCH LABS	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-20	UST LOCATIONS	199712	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-21	AST LOCATIONS	198708	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-22	ERIE CANAL SITE	200209	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-23	SIBERIA AREA	199704	Covered under WVAA-25 (duplicate)
WVAA-24	INDUSTRIAL WASTE SEWER LINES	200109	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-26	BLDG 36 SURFACE IMPOUNDMENT CLOSURE	199405	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-27	INVESTIGATE OIL CONTAMINATION IN MFG ARS	200109	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-28	FORMER CHIP HANDLING AREA BLDG 132 SOUTH	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-29	RCRA CONTAINER STORAGE FACILITY BLDG 145	199704	Closure of Hazardous Waste Storage Facility USEPA ID No.NY7213820940 issued by the NYSDEC on March 18, 1997.
WVAA-30	OUTFALL TO HUDSON RIVER (OUTFALL 003)	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
WVAA-31	INCINERATOR (INACTIVE)	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000
WVAA-33	CHROME PLATING SUMPS	200001	Final RCRA Facility Investigation MMA Report (RFI) Nov 2000

# IRP Schedule

Date of IRP Inception: 197612

## Past Phase Completion Milestones

### 1987

ISC (WVAA-20 - UST LOCATIONS)  
SI (WVAA-21 - AST LOCATIONS)  
PA (WVAA-21 - AST LOCATIONS)  
RFA (WVAA-01 - BLDG 121 OIL SPILL, WVAA-02 - CHROMIC ACID RINSE WT SPILL NR BLDG 36, WVAA-03 - BLDG136 (1976 SPILL DURING TRANS OPS), WVAA-04 - INDUSTRIAL WASTE TRT PLANT AREA, WVAA-05 - CYANIDE TRT PLANT BUILDING 110, WVAA-06 - METAL PLATING SHOP BLDG 14 DEMOLISH.1981, WVAA-07 - BUILDING 20 MAJOR COMPONENTS, WVAA-08 - BLDG 25 VAPOR DEGREASER (MINOR COMP), WVAA-09 - BUILDING 35 MEDIUM CALIBER GUN SHOP, WVAA-10 - BUILDING 110 BIG GUN SHOP, WVAA-12 - BUILDING 123 PAINT SHOP, WVAA-13 - BUILDING 125, WVAA-14 - BUILDING 135 ROTARY FORGE, WVAA-15 - BUILDING 114 BENET LABS PILOT SCALE PLAT, WVAA-16 - BUILDING 115 BENET RESEARCH LABS, WVAA-17 - BUILDING 119, WVAA-18 - BUILDING 120 BENET RESEARCH LABS, WVAA-22 - ERIE CANAL SITE, WVAA-25 - SIBERIA (INCLUDES SWMUS #3 18, 22-24), WVAA-26 - BLDG 36 SURFACE IMPOUNDMENT CLOSURE, WVAA-27 - INVESTIGATE OIL CONTAMINATION IN MFG ARS, WVAA-28 - FORMER CHIP HANDLING AREA BLDG 132 SOUTH, WVAA-30 - OUTFALL TO HUDSON RIVER (OUTFALL 003), WVAA-31 - INCINERATOR (INACTIVE), WVAA-32 - DEGREASERS (B 20/25/40/110/120/130), WVAA-33 - CHROME PLATING SUMPS )

### 1989

CS (WVAA-26 - BLDG 36 SURFACE IMPOUNDMENT CLOSURE)

### 1990

IRA (WVAA-03 - BLDG136 (1976 SPILL DURING TRANS OPS))

### 1992

RFA (WVAA-24 - INDUSTRIAL WASTE SEWER LINES)

### 1994

CMI(C) (WVAA-26 - BLDG 36 SURFACE IMPOUNDMENT CLOSURE)

RFA (WVAA-23 - SIBERIA AREA , WVAA-29 - RCRA CONTAINER STORAGE FACILITY BLDG 145)

### 1995

CS (WVAA-25 - SIBERIA (INCLUDES SWMUS #3 18, 22-24))

### 1996

CS (WVAA-01 - BLDG 121 OIL SPILL, WVAA-02 - CHROMIC ACID RINSE WT SPILL NR BLDG 36)

### 1997

CS (WVAA-03 - BLDG136 (1976 SPILL DURING TRANS OPS), WVAA-04 - INDUSTRIAL WASTE TRT PLANT AREA, WVAA-05 - CYANIDE TRT PLANT BUILDING 110, WVAA-06 - METAL PLATING SHOP BLDG 14 DEMOLISH.1981, WVAA-07 - BUILDING 20 MAJOR COMPONENTS, WVAA-08 - BLDG 25 VAPOR DEGREASER (MINOR COMP), WVAA-09 - BUILDING 35 MEDIUM CALIBER GUN SHOP, WVAA-10 - BUILDING 110 BIG GUN SHOP, WVAA-12 - BUILDING 123 PAINT SHOP, WVAA-13 - BUILDING 125, WVAA-14 - BUILDING 135 ROTARY FORGE, WVAA-15 - BUILDING 114 BENET LABS PILOT SCALE PLAT, WVAA-18 - BUILDING 120 BENET RESEARCH LABS, WVAA-22 - ERIE CANAL SITE, WVAA-24 - INDUSTRIAL WASTE SEWER LINES, WVAA-27 - INVESTIGATE OIL CONTAMINATION IN MFG ARS, WVAA-28 - FORMER CHIP HANDLING AREA BLDG 132 SOUTH, WVAA-30 - OUTFALL TO HUDSON RIVER (OUTFALL 003), WVAA-31 - INCINERATOR (INACTIVE), WVAA-32 - DEGREASERS (B 20/25/40/110/120/130), WVAA-33 - CHROME PLATING SUMPS )  
CMI(C) (WVAA-23 - SIBERIA AREA , WVAA-29 - RCRA CONTAINER STORAGE FACILITY BLDG 145)

### 1998

IMP(C) (WVAA-20 - UST LOCATIONS)

CAP (WVAA-20 - UST LOCATIONS)

INV (WVAA-20 - UST LOCATIONS)

### 1999

IRA (WVAA-24 - INDUSTRIAL WASTE SEWER LINES)

# IRP Schedule

**2000**

IRA (WVAA-01 - BLDG 121 OIL SPILL, WVAA-09 - BUILDING 35 MEDIUM CALIBER GUN SHOP, WVAA-10 - BUILDING 110 BIG GUN SHOP)  
 LTM (WVAA-03 - BLDG136 (1976 SPILL DURING TRANS OPS))  
 RFI/CMS (WVAA-01 - BLDG 121 OIL SPILL, WVAA-02 - CHROMIC ACID RINSE WT SPILL NR BLDG 36, WVAA-04 - INDUSTRIAL WASTE TRT PLANT AREA, WVAA-05 - CYANIDE TRT PLANT BUILDING 110, WVAA-06 - METAL PLATING SHOP BLDG 14 DEMOLISH.1981, WVAA-07 - BUILDING 20 MAJOR COMPONENTS, WVAA-08 - BLDG 25 VAPOR DEGREASER (MINOR COMP), WVAA-10 - BUILDING 110 BIG GUN SHOP, WVAA-12 - BUILDING 123 PAINT SHOP, WVAA-13 - BUILDING 125, WVAA-14 - BUILDING 135 ROTARY FORGE, WVAA-15 - BUILDING 114 BENET LABS PILOT SCALE PLAT, WVAA-18 - BUILDING 120 BENET RESEARCH LABS, WVAA-28 - FORMER CHIP HANDLING AREA BLDG 132 SOUTH, WVAA-30 - OUTFALL TO HUDSON RIVER (OUTFALL 003), WVAA-31 - INCINERATOR (INACTIVE), WVAA-33 - CHROME PLATING SUMPS )

**2001**

RFI/CMS (WVAA-09 - BUILDING 35 MEDIUM CALIBER GUN SHOP, WVAA-22 - ERIE CANAL SITE, WVAA-24 - INDUSTRIAL WASTE SEWER LINES, WVAA-27 - INVESTIGATE OIL CONTAMINATION IN MFG ARS)  
 LTM (WVAA-24 - INDUSTRIAL WASTE SEWER LINES)  
 IRA (WVAA-27 - INVESTIGATE OIL CONTAMINATION IN MFG ARS)

**2002**

LTM (WVAA-14 - BUILDING 135 ROTARY FORGE, WVAA-22 - ERIE CANAL SITE)

**2003**

RFI/CMS (WVAA-25 - SIBERIA (INCLUDES SWMUS #3 18, 22-24), WVAA-32 - DEGREASERS (B 20/25/40/110/120/130))  
 DES (WVAA-25 - SIBERIA (INCLUDES SWMUS #3 18, 22-24))

**2004**

IRA (WVAA-25 - SIBERIA (INCLUDES SWMUS #3 18, 22-24), WVAA-32 - DEGREASERS (B 20/25/40/110/120/130))  
 CMI(C) (WVAA-25 - SIBERIA (INCLUDES SWMUS #3 18, 22-24), WVAA-32 - DEGREASERS (B 20/25/40/110/120/130))  
 DES (WVAA-32 - DEGREASERS (B 20/25/40/110/120/130))

**Additional Past Phase Completion Milestones**

2007-WVAA-32-Building #40 Corrective Measures has been discontinued with the approval of NYSDEC, NYSDOH, EPA and AEC based on technical infeasibility. LTM will be conducted.

2007-NYSDEC has mandated that we do additional Vapor Intrusion investigations throughout the Arsenal. WVA completed investigations at several buildings which showed that a much larger-scale investigation will be needed.

**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
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**Final RA(C) Completion Date:** 200409

**Schedule for Next Five-Year Review:** 2015

**Estimated Completion Date of IRP at Installation (including LTM phase):** 204309



## WATERVLIET ARSENAL IRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
WVAA-25	SIBERIA (INCLUDES SWMUS #3 18, 22-24)	CMI(O)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
WVAA-32	DEGREASERS (B 20/25/40/110/120/130)	CMI(O)						

## Community Involvement

**Technical Review Committee (TRC):** None

**Community Involvement Plan (Date Published):** 199804

**Restoration Advisory Board (RAB):** No

**Reason Not Established:** Installation at RIP/RC.

### Additional Community Involvement Information

The Army strongly encourages local community involvement during investigations and cleanup actions at all Army sites. In the past, the WVA has conducted interviews with Watervliet citizens and local officials to integrate community issues and concerns with ongoing site investigations, engineering designs, and proposed construction activities. An interview process conducted in August 1992 indicated that there was no community interest in formal involvement in restoration activities. This result was documented in the WVA community relations plan (CRP) dated Oct. 19, 1992.

Since then the WVA has performed community outreach activities in an attempt to gather feedback from the community with regard to their restoration efforts.

In April 1998, the WVA submitted an update to the 1992 CRP to the regulators. The CRP was updated with the following objectives:

1. Meet the requirements set forth in the Administrative Order on Consent Docket No. II RCRA-3008(h)-93-0210.
2. Include chronological summaries of environmental investigations conducted at the arsenal since 1990.
3. Integrate community issues and concerns from Watervliet citizens and local officials.
4. Prepare a site-specific program to establish communication and information exchange regarding restoration efforts between Army staff, the civilian work force, community agencies, and the public.

An SoB was provided for public comment and was completed in September 2008.

An second SoB was completed in FY12 for the Main Manufacturing Area. A notice went out for public comment at that time. The public has been notified when any work was done at the arsenal. Thus far there has been no interest in having a RAB at WVA.

### Administrative Record is located at

Watervliet Arsenal  
1 Buffington Street  
Building No. 1-2nd Floor/Environmental Office  
Watervliet, New York 12189-4000

### Information Repository is located at

Environmental Office/Public Works Division  
1 Buffington Street  
Watervliet, New York 12189-4000

**Current Technical Assistance for Public Participation (TAPP):**N/A

**TAPP Title:** N/A

**Potential TAPP:** N/A

