INSTALLATION ACTION PLAN
for
WATERVLIET ARSENAL

Fiscal Yeal 2001

2001 Installation Action Plan

WATERVLIET ARSENAL

INSTALLATION ACTION PLAN 2001

"A Quality Product, On Time, At the Right Price, Safely."

STATEMENT OF PURPOSE

The purpose of this Installation Action Plan (IAP) is to outline the total multi-year Installation Restoration Program (IRP) for Watervliet Arsenal (WVA). The plan will define all IRP requirements and propose a comprehensive approach including associated costs to conduct future investigations and remedial actions at each IRP site at the installation.

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

All site specific funding and schedule information has been prepared according to projected overall Army funding levels and is therefore subject to change. Under current project funding, all remedial actions will be in place at WVA by the end of 2002. Long term monitoring and remedial action operations will be conducted as long as necessary.

CONTRIBUTORS TO THE INSTALLATION ACTION PLAN

Kathy Hayes	IRP Support
JoAnn Kellogg	Watervliet Arsenal
Katie Watson	IRP Support

APPROVAL

COL John R. Cook
Commanding
Watervliet Arsenal

Joann Kellogg
Installation Restoration Program Manager
Watervliet Arsenal

Robert Whelove
Environmental Restoration Program Manager
Operations Support Command

Ellen Marchese
Legal Advisor
Watervliet Arsenal

Dennis L. Bates
Chief, Environmental Law
United States Army Operations Support Command

APPROVAL

JEWEL SIMMONS
ARMY MATERIEL COMMAND
Environmental Restoration Program Manager,
Office of the Deputy Chief of Staff for Engineering,
Housing, Environmental, and Installation Logistics

INFORMATION SHARING

AMC, as well as MSCs and installations believe that it should make its environmental restoration information available openly. This Installation Action Plan was forwarded to the following people:

RAB Co-chair (document provided to all RAB members)

State Regulator

EPA Regulator

Installation RPM

ACRONYMS & ABBREVIATIONS

ADA	Ammunition Destruction Area
AEC	U.S. Army Environmental Center
ARDC	Armaments Research and Development Center
BRAC	Base Realignment and Closure
CE	Corps of Engineers
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
CRP	Community Relations Plan
DA	Department of Army
DD	Decision Document
DERP	Defense Environmental Restoration Program
DNAPL	Dense Non-Aqueous Phase Liquid
DOD	Department of Defense
DSERTS	Defense Site Environmental Restoration Tracking System
DU	Depleted Uranium
EFF	Effluent
EPA	Environmental Protection Agency
ER,A	Environmental Restoration, Army (formerly DERA)
FFA	Federal Facility Agreement
FORSCOM	U.S. Army Forces Command
FS	Feasibility Study
FY	Fiscal Year
GW	Groundwater
HQ	Headquarters
IAP	Installation Action Plan
IAG	Interagency Agreement
ICM	Interim Corrective Measure
IRA	Interim Remedial Action
IRP	Installation Restoration Program
IWTP	Industrial Wastewater Treatment Plant
LAP	Load, Assemble, Pack
LNAPL	Light Non-Aqueous Phase Liquid
LTM	Long Term Monitoring
LTO	Long Term Operation
MACOM	Major Command
MCL	Maximum Contaminant Level
MMA	Main Manufacturing Area
MW	Monitoring Well
NCP	National Contingency Plan
NFA	No Further Action
NFRAP	No Further Remedial Action Planned
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
O&M	Operations & Maintenance
OB/OD	Open Burning / Open Detonation
OMA	Operations and Maintenance - Army

ACRONYMS & ABBREVIATIONS

OBG	Open Burning Grounds
OU	Operable Unit
PA	Preliminary Assessment
PAH	Poly Aromatic Hydrocarbon
PA/SI	Preliminary Assessment/Site Investigation
PCB	Polychlorinated Biphenyls
PP	Proposed Plan
PPB	Parts Per Billion
PPM	Parts Per Million
POL	Petroleum, Oil, and Lubricants
PY	Prior Year
RA	Remedial Action
RA(C)	Remedial Action - Construction
RA(O)	Remedial Action - Operation
RAB	Restoration Advisory Board
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	Cyclotrimethylenetrinitramine
REARM	Renovation of Armament Manufacturing
REM	Removal
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RIP	Remedy in Place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
S&A	Supervision and Administration
SVOCs	Semi Volatile Organic Compounds
SI	Site Inspection
S&R	Supervision and Review
SPDES	State Pollutant Discharge Elimination System
SSTL	Site Specific Target Cleanup Levels
SWMU	Solid Waste Management Unit
TCE	Trichloroethylene
TRADOC	Training Doctrine Command
TRC	Technical Review Committee
TPH	Total Petroleum Hydrocarbons
TNT	2,3,4 - Trinitrotoluene
USACE	United States Army Corps of Engineers
USACHPPM	United States Army Center for Health Promotion and Preventive Medicine
USAEC	United States Army Environmental Center
USAR	United States Army Reserve
USARC	United States Army Reserve Command
USATHMA	United States Army Toxic and Hazardous Material Agency (replaced by AEC)
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VOCs	Volatile Organic Compounds
WVA	Watervliet Arsenal

SUMMARY

STATUS:	Non-NPL with RCRA Large Generator Status (90-Day Generator).
TOTAL # OF DSERTS SITES:	31
ACTIVE ER,A SITES:	6
RESPONSE COMPLETE (RC) SITES:	25
DIFFERENT SITE TYPES:	Manufacturing Buildings & Labs (14) Outdoor (3) & Indoor (1) Storage Areas Former Vapor Degreasing Sites (2) Spill Sites (3) Underground/Aboveground Waste Oil Storage Tanks (2) Surface Impoundment (1) Landfill (Erie Canal) (1) Industrial Sewers & Sumps (4)
CONTAMINANTS OF CONCERN:	Petroleum/Oils/Lubricants Halogenated Solvents Heavy Metals
MEDIA OF CONCERN:	Groundwater and Soil
COMPLETED REM/IRA/RA:	Surface Impoundment (WVA 26) Soils Removals Oil Spill (WVA 01, 19) Soils Removals Fuel Oil Spill (WVA 03) USTs Removal (WVA 20) Removals of PCB Contaminated-Soils (WVA 07) Contamination Equipment Removal (WVA 11) Industrial Sewers-Removal Portion Soluble Oil Line (WVA 24) Implementation of Permeable Reactive Wall (GW) (WVA-25) Product Recovery Pilot Test- PAHs in GW (WVA-27) Contaminated Soils Removal (WVA 25, 28) Burn Pit soil removal completed July 2000 (Siberia Area)
CURRENT IRP PHASES:	RFI completed CMS at 4 sites LTM at 1 site NFA at 28 sites
PROJECTED IRP PHASES:	CMI at 4 sites LTM at 1 site NFA at 28 sites
IDENTIFIED POSSIBLE REM/IRA/RA:	Capping for Contaminated Soils (WVA-25 Siberia) Soils Bioremediation - Aerobic Process (WVA-25 Siberia - Treatability studies completed) Natural Attenuation for POLs&chlorinated solvents at Siberia and site-wide In-Situ Passive Groundwater Treatment - Reactive Wall (WVA-25 Siberia)-ongoing Soil Removals, Siberia Area (WVA-25) Stabilization for Metals at Siberia Product Recovery at MW-08 between Bldgs. 35&110 - ongoing In-Situ Oxidation Bldg 25, Bldg. 40 In-Situ Reactive Barriers Bldg. 25, Bldg. 40, Bldg. 110
FUNDING:	Prior Year Funding (FY 1987-2000): $ 10,383,600 FY 2001 Funding: $ 1,062,000 Future Requirements (FY 2002-2011): $ 4,047,000 Total Funding (FY 1987-2011): $ 15,492,600
DURATION:	Year of Inception: 1987 Year of Completion Excluding LTM: 2002 Year of Completion Including LTM: 2011

INSTALLATION INFORMATION

LOCALE

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

COMMAND ORGANIZATION

Major Command: Army Materiel Command
Sub-Command: U.S. Army Industrial Operations Command
Installation: Watervliet Arsenal, Installation Services Directorate, Safety, Health & Environmental Division

IRP EXECUTING AGENCIES

IRP Executor: U.S. Army Corps of Engineers, Baltimore District
U.S. Army Corps of Engineers, New York District

REGULATORY PARTICIPATION

Federal: U.S. Environmental Protection Agency, Region II
State: New York State Department of Environmental Conservation (NYSDEC)
New York State Department of Health (NYSDOH)

REGULATORY STATUS

Non-NPL
RCRA Consent Order with NYSDEC, May 1993
RCRA Consent Order with EPA and NYSDEC, September 1993

MAJOR CHANGES TO IAP FROM PREVIOUS YEAR (2000)

Siberia
- Burn pit soil removal
- Landfarming Pilot Treatment System Work Plan completed
- NE Quadrant of Siberia Area
- Long term groundwater monitoring was initiated.

Main Manufacturing Area
- Initiated interim corrective measure (ICM) for passive recovery of petroleum hydrocarbons in groundwater.
- Long term groundwater monitoring was initiated.
- Exposure Assessment initiated.

INSTALLATION DESCRIPTION

DESCRIPTION

Watervliet Arsenal (WVA) is the nation's only cannon manufacturer facility under the command of the U.S. Army Industrial Operations Command (IOC). The site consists of two primary areas: (1) The Main Manufacturing Area where manufacturing and administrative operations occur, comprising approximately 125 acres, and, (2) The Siberia Area, chiefly utilized for storage, comprising approximately 15 acres. Land use surrounding WVA is primarily residential, with some light to medium industry along the western boundary. WVA currently manufactures tubes and tube assemblies for cannons, cannon components, mortars, and recoilless rifles. Benet Laboratories, a tenant organization at WVA, performs basic and applied research for cannon manufacturing, and provides the U.S. Army with practical engineering research and development for cannon manufacturing applications.

HISTORY

The WVA is a national registered historic landmark 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.

MISSION

The Watervliet Arsenal Mission 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, recoilless 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 materiel; and other equipment or material as assigned.

DSERTS / SWMU CHART

DSERTS to SWMU

WVAA-02	(SWMU #20)
WVAA-04	(SWMU #6)
WVAA-05	(SWMU #4)
WVAA-08	(SWMU#5)
WVAA-14	(SWMU #27)
WVAA-20	(SWMUs #7-17)
WVAA-22	(SWMU #25)
WVAA-24	(SWMU #20)
WVAA-25	(SWMUs #3,18,22,23,24)
WVAA-26	(SWMU #1)
WVAA-29	(SWMU #2)
WVAA-30	(SWMU #19)
WVAA-31	(SWMU #21)
WVAA-33	(SWMU #26)

SWMU TO DSERTS

SWMU #1	WVAA-26
SWMUs #3,18,22,23,24	WVAA-25
SWMU #4	WVAA-05, 06
SWMU #5	WVAA-08
SWMU #6	WVAA-02
SWMU #6	WVAA-04
SWMUs #7-17	WVAA-20
SWMU #21	WVAA-31
SWMU #19	WVAA-30
SWMU #20	WVAA-24
SWMU #25	WVAA-22
SWMU #26	WVAA-9
SWMU #26	WVAA-27
SWMU #27	WVAA-14

CERCLA and RCRA Acronym Conversions

CERCLA		**RCRA**
Preliminary Assessment (PA)	=	RCRA Facility Assessment (RFA)
Site Investigation (SI)	=	Confirmation Study (CS)
Remedial Investigation/ Feasibility Study (RI/FS)	=	RCRA Facility Investigation/Corrective Measures Study (RFI/CMS)
Remedial Design (RD)	=	Design (DES)
Remedial Action (Construction) (RA(C))	=	Corrective Measures Implementation (Construction) (CMI(C))
Remedial Action (Operations) (RA(O))	=	Corrective Measures Implementation (Operation) (CMI(O))

CONTAMINATION ASSESSMENT

OVERVIEW

Contamination at the WVA has been identified in soil, sediment and groundwater. At the Siberia Area metals and chlorinated organic compounds have been detected in soil above guidelines in localized areas. Petroleum hydrocarbons (TPH and PAHs) are present above guidelines in soil throughout Siberia Area. WVA's source of drinking water is city water so there is no immediate threat to human health.

The Northeast Quadrant has a chlorinated VOC groundwater plume. Petroleum hydrocarbons are detected in groundwater throughout 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.

At the Main Manufacturing Area, 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 (LNAPL) and chlorinated organics.

In support of manufacturing and research operations, WVA has a wide and complex variety of active waste streams and air emission sources, each operating in accordance with permits issued by the NYSDEC. While operating the largest electroplating facility in the Northeast, WVA also generates considerable amounts of spent rinsewaters from plating operations that are treated at the on-site industrial waste treatment plant, regulated under a state Clean Water Act permit. The plant also treats cyanide rinse water and soluble oil wastes. Separate industrial sewers convey the wastes to the IWTP, and the treated effluent is discharged to the Hudson River. A variety of petroleum fluids and solvents have been used in the manufacturing operations for the last 186 years.

Detailed documentation on the discovery and/or analysis of contamination at WVA prior to 1986 is not readily available. A RCRA Facility Assessment Report, prepared by NYSDEC in December 1986 and updated December 1987 and March 1992, identified a total of nineteen (19) solid waste management units (SWMUs) at WVA. An additional eight sites have been added, bringing the total to twenty-seven (27) SWMUs (unnumbered SWMUs). In September 1993, USEPA, NYSDEC, and WVA entered into an Administrative Order on Consent Agreement (Docket No.II RCRA-3008-h-93-0210) which requires assessments, investigations, corrective measure studies, and/or corrective measures implementation for the existing, as well as for any future discovered SWMUs. To simplify the investigation and remediation process, WVA has proposed that the IRP be managed as two operable units - "Siberia" and the "Main Manufacturing Area". The distinction also addresses the contamination separately as chlorinated organics and petroleum hydrocarbons. WVA's source of drinking water is city water so there is no immediate threat to human health.

CONTAMINATION ASSESSMENT

OVERVIEW CONTINUED

SIBERIA AREA (DSERTS Site WVA-25)

The area known as Siberia Area is a 15-acre tract that was purchased by the Arsenal in May 1942. Located west of the Main Manufacturing Area, Siberia is used as a staging area for the interim storage of raw and hazardous materials, finished goods and supplies for the WVA. Waste oil, semi-volatiles, chlorinated organics, and heavy metals have been identified as the contaminants in soil and groundwater across the Siberia Area. Sources of the petroleum hydrocarbon 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. All of these practices were considered "acceptable" and "industry-standard" at the time when they were performed. Volatile organic contamination in the Northeast quadrant may have originated from the use of burn pits in this area.

Groundwater sampling performed in the northeast corner of the Siberia Area revealed the presence of hexavalent chromium contamination. The hexavalent chromium contamination in the Siberia Area originates from Perfection Plating; an off post privately owned chrome plating facility, located immediately upgradient of the Siberia Northeast quadrant. NYSDEC is addressing Perfection Plating's contamination under CERCLA as Superfund Site No. 4-01-037. As part of the final remedy, NYSDEC performed extensive soil removals along the northeast boundary fenceline to address the heavy metals soil contamination. In addition, a groundwater-intercepting trench with an onsite treatment facility is being used as the remedial approach for clean up of hexavalent chromium contaminated groundwater. WVA partnered with NYSDEC and played an active role in the cleanup actions of the affected property. A Post Remediation Report was issued on February 1999 by the NYSDEC, Division of Environmental Remediation.

The installation has completed the calculation of the Site Specific Target Cleanup Levels (SSTL's) contained in the Exposure Assessment which will be used to complete a Corrective Measures Study (CMS). This critical step is a precursor of any agreed upon clean-up goals in potential remedial areas. Also, the installation has completed the final phase of a bench-scale biotreatability study for the aerobic and anaerobic bioremediation of PAHs and TPH in soils. Additional treatability studies are being conducted for bioremediation of TPH in groundwater, remediation of chlorinated organics in bedrock through chemical oxidation and stabilization of metals in soil. WVA installed two (2) permeable reactive barrier wall pilot systems to remediate and preclude the off-site migration of chlorinated organics in shallow groundwater. Monitoring wells have been installed in each of the walls as well as upgradient and down gradient of the walls. All of the wells are being monitored for VOCs. Soil removal is part of the remedial approach for the former Burn Pit area at the Northeast Quadrant.

CONTAMINATION ASSESSMENT

OVERVIEW CONTINUED

MAIN MANUFACTURING AREA (DSERTS Sites WVA-01 thru 22, 24, 26-33)

Subsurface contamination has been discovered in several locations in the Main Manufacturing Area. The major contaminants of concern are petroleum, oil, and lubricants (POL's) and chlorinated solvents. POL products have been and are currently used in machining operations. 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 WVA since 1982.

In lieu of separate SWMU assessments, and considering the relatively small size of Watervliet Arsenal, a site wide hydrogeologic RCRA Facility Investigation (RFI) was performed with regulatory approval.

The following is a description of the most noteworthy findings.

a) **Groundwater** The results of the analytical data indicate that pesticides, metals, and semi-volatile organics are not contaminants of concern for the Main Manufacturing Area. Free-phase petroleum-derived product has been identified on the groundwater and within the bedrock fractures. Based on results of water level measurements, it appears that the source may be located upgradient of Bldg. 35, possibly associated with old spill events and leaking machining equipment foundations.
b) **Soils** Analytical data indicates that the soils in the Main Manufacturing Area have not been contaminated with pesticides or volatile organics (i.e. solvents) above current guidance values. Chromium was found around Bldg. 36 in the area of a reported chromium sludge spill and lead was found in the former Erie Canal in front of Bldg. 25. Petroleum-derived product has been detected in the soils of the former Erie Canal in front of Bldgs 20 and 25. The area is covered with asphalt and therefore the contamination is not considered an immediate threat to human health and the environment.

Proposed Plan: In lieu of separate SWMU assessments, and considering the relatively small size of Watervliet Arsenal, a site-wide hydrogeologic Corrective Measures Study (CMS) is being performed. This will group all SWMUs at the Main Manufacturing Area into two operable units; chlorinated organic contamination and petroleum hydrocarbons. This will enable better IRP management, speed up the investigation and remediation, and therefore, reduce the overall IRP costs at Watervliet Arsenal. Both state and federal regulatory personnel have agreed to this approach. In a similar fashion as with the Siberia restoration process, the installation has submitted to the Regulating Agencies the exposure scenarios and potential pathways document which will be used to aid in calculating the site specific target levels (SSTL's). The main focus of the CMS is to propose one remedial approach for the chlorinated organics contamination in groundwater and one remedial alternative for the petroleum hydrocarbons contamination, also in groundwater. The installation will not pursue restoration for soils in the Main Manufacturing Area. The calculation of action levels for soils should support this negotiable item.

CONTAMINATION ASSESSMENT

PREVIOUS STUDIES

1. Subsurface Investigation Report RCRA Surface Impoundment, Structure 39, Bed 1, C.T. Male Associates, P.C., Revised January 7, 1992. Refer to WVA No. 26.

2. Phase I RCRA Facility Investigation Report, Siberia Area, Environmental Science and Engineering Inc., Gainsville, FL, December 1991. Refer to WVA No. 25.

3. Phase I Subsurface Contamination Investigation of the Chrome and Shrink Pit Areas In Buildings 35 and 135, Clough Harbour and Associates, January 1991. Refer to WVA No. 27.

4. Subsurface Investigation (Pole Barn Vicinity), Groundwater Technology Inc., July 2, 1987. Refer to WVA No. 25.

5. Environmental Site Assessment Report, Perfection Plating, C.T. Male Associates, P.C., November 15, 1988. (Off Site Facility).

6. Preliminary Site Investigation, Siberia Area, C.T. Male Associates P.C., December 1986. Refer to WVA No. 25.

7. Groundwater Monitoring Well Installations, Vicinity of Buildings 25 and 36, Empire Soils Investigations Inc., August 1986.

8. Subsurface Investigation Report for Former Vapor Degreaser Unit, Building 25, C.T. Male Associates, P.C., October 1990. Refer to WVA No. 8.

9. Chromic Acid Line Repair, Huntingdon Empire Soils Inc., June 1992. Refer to WVA No. 24.

10. Soil Characterization Study, Proposed Chip Handling Facility, Huntingdon Empire Soils Inc., March 1994.

11. Natural Gas Transmission Line Installation, Huntingdon Empire Soils, September 1994.

12. RFI, Draft Report, Siberia Area, Malcolm Pirnie, Inc., January 1996.

13. RFI, Draft Final, Siberia Area, Malcolm Pirnie Inc., August 1996.

14. RFI, Preliminary Draft, Main Manufacturing Area, Malcolm Pirnie Inc., December 1996.

15. RFI, Draft, Main Manufacturing Area, February 1997.

16. RFI, Final, Siberia Area, Malcolm Pirnie Inc., December 1997.

17. Bench-scale Aerobic Bioremediation Final Report, March 1999.

18. RFI Draft Final, Siberia Area, Macolm Pirnie Inc., August 1999.

19. Final Approval on the RFI for Siberia Area, Malcolm Pirnie Inc., September 2000.

20. Burn Pit soil removal July 2000.

21. Landfarming Pilot Treatment System started in July 2000.

BUILDING 121 OIL SPILL (1975), WVAA-01

SITE DESCRIPTION

In 1982, oil was observed on the surface soils north of Building 121 which is downgradient from a POL storage area. It is possible that the spill had its source in the POL storage yard. Soil removals were performed and a French drain collection system was installed and operated for a few years. Stormwater at this location flows to a drain that is regularly monitored. No visual evidence of oil contamination has been observed since the early 90's. Subsequent activities will be conducted under WVAA-027.

PROPOSED PLAN

This site was made Response Complete in DSERTS in Spring 2000. Groundwater is being addressed under WVAA-27.

IRP STATUS

RRSE RATING: High
CONTAMINANTS: PAHs
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: RFA, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 36 CHROMIC ACID SPILL, WVAA-02

SITE DESCRIPTION

In May 1993, during preventive maintenance, a number of potential leaking points were detected on the chrome acid rinsewater line that conveys the waste to the onsite treatment plant (Bldg. 36). The spill was reported to NYSDEC, which resulted in the issuance of a consent order. Extensive line repair, soils removal and groundwater extraction and monitoring was performed at this site. At the present time, there are still several active groundwater monitoring wells located at this site and groundwater extraction has been ceased. No contamination has been found in the wells.

PROPOSED PLAN

No further action under the IRP.

IRP STATUS

RRSE RATING: Medium

CONTAMINANTS:
Heavy Metals

MEDIA OF CONCERN:
Groundwater

COMPLETED IRP PHASE:
RFA, RFI

CURRENT IRP PHASE: RC

FUTURE IRP PHASE: RC

BUILDING 136 OIL SPILL (1976), WVAA-03

SITE DESCRIPTION

Stained soil was observed while performing excavation work around the Boiler House area (mid-80's). Later analysis revealed that the contaminant was Fuel Oil #6. A leaking underground transfer line, which is believed to be the source of the spill, was re-routed above ground. Removal of the abandoned underground storage tanks and lines was completed in 1990 and extensive soil removals occurred. No evidence of remaining contamination was discovered. Groundwater monitoring wells were installed at this site in 1987. These wells are sampled and analyzed on a yearly basis as part of the Oil and Petroleum Storage License. No contamination has been detected in the wells.

PROPOSED PLAN

No further action is required under IRP.

IRP STATUS

RRSE RATING: Low
CONTAMINANTS:
Fuel Oil #6
MEDIA OF CONCERN: Soil
COMPLETED IRP PHASE:
RFA, IRA
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 36 INDUSTRIAL WASTEWATER TREATMENT PLANT, WVAA-04 (SWMU #6)

SITE DESCRIPTION

An on-site treatment facility treats mainly acid rinsewaters and soluble waste oil. In February 1995, there was evidence of a leak from the single-walled transfer line to the sludge beds. Remedial actions included soils removals. The plant is under an extensive groundwater monitoring program.

PROPOSED PLAN

No further action under IRP.

IRP STATUS

RRSE RATING: Medium

CONTAMINANTS:
Heavy Metals

MEDIA OF CONCERN:
Groundwater

COMPLETED IRP PHASE:
RFA, RFI

CURRENT IRP PHASE: RC

FUTURE IRP PHASE: RC

BUILDING 110A CYANIDE TREATMENT PLANT, WVAA-05 (SWMU #4)

SITE DESCRIPTION

This facility was demolished in 1981 during the Renovation of Armament Manufacturing (REARM) project. All treatment tanks and waste transfer lines were above ground.

PROPOSED PLAN

No further action is anticipated.

IRP STATUS

RRSE RATING: Low
CONTAMINANTS:
Heavy Metals
MEDIA OF CONCERN:
Groundwater
COMPLETED IRP PHASE:
RFA, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 14 METAL PROCESSING, WVAA-06

SITE DESCRIPTION

This facility was demolished in 1981 during the REARM project. A present contamination problem has not been substantiated through the use of monitoring wells and soil borings in the area.

PROPOSED PLAN

No further action is required.

STATUS

RRSE RATING: Low
CONTAMINANTS: Heavy Metals
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: RFA, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 20 MAJOR COMPONENT, WVAA-07

SITE DESCRIPTION

During the excavation for the installation of a new machine foundation in February 1990, oil was observed in the soil. A limited soil removal action was conducted as part of construction activities. Investigatory work performed in 1995 showed levels above standards for trichloroethylene (TCE) in monitoring wells MW-35 & MW- 36. A former vapor degreaser station on the northeast corner of the building appears to have been the most likely source of contamination.

PROPOSED PLAN

Future activities will be performed under site WVAA-032, which addresses vapor degreasers.

STATUS

RRSE RATING: Medium
CONTAMINANTS:
POLs, Chlorinated Solvents
MEDIA OF CONCERN: Soil, Groundwater
COMPLETED IRP PHASE: RFA, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 25 MINOR COMPONENT, WVAA-08 (SWMU #5)

SITE DESCRIPTION

Vapor degreasing operations located on the southeast corner of this building terminated in 1982. Chlorinated volatile organic contaminants were discovered in a downgradient groundwater monitoring well in 1986 and also in recent RFI monitoring.

PROPOSED PLAN

Groundwater will be addressed under WVAA-032.

STATUS

RRSE RATING: High
CONTAMINANTS:
Chlorinated organics
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: RFA, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 35 MEDIUM CALIBER GUN SHOP, WVAA-09

SITE DESCRIPTION

Machining, electroplating, grinding, drilling, cutting, etc., has been performed in this building since the early 1900's. Most of these operations involve chemicals such as plating solutions, acids, caustics, cutting oils, hydraulic fluids and coolants. Plating operations are performed in the eastern and southern portions of the building. Oil contamination has been observed migrating into one of four deep processing pits located in the south end of the building. The processing pits are approximately 40 feet in depth, and extend below the groundwater table.

PROPOSED PLAN

POL contamination on this site will be addressed under WVAA- 27.

STATUS

RRSE RATING: Medium
CONTAMINANTS: POLs
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: RFA, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 110 BIG GUN SHOP, WVAA-10

SITE DESCRIPTION

Oil contamination has been observed migrating into a deep pit known as the Autofrettage pit located in the south end of the building. Refer to WVAA-027 for additional information. An additional SWMU, Oil Collection Trench, identified on March 1996, is located in this building.

PROPOSED PLAN

Groundwater will be addressed under WVAA-027 and 032.

IRP STATUS

RRSE RATING: High
CONTAMINANTS:
POLs, Chlorinated Organics
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: RFA, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 110 ANNEX, WVAA-11

SITE DESCRIPTION

This site is a duplicate of WVAA-05. It has been deleted from the DSERTS database.

IRP STATUS

RRSE RATING: Not Evaluated
CONTAMINANTS:
Heavy Metals
MEDIA OF CONCERN:
Groundwater
COMPLETED IRP PHASE:
PA/SI
CURRENT IRP PHASE: RFI
FUTURE IRP PHASE: CMS

BUILDING 123 PAINT SHOP, WVAA-12

SITE DESCRIPTION

Spray painting and paint stripping of minor components are conducted here. There are no documented cases of leaking tanks or spills from any operations. Soil and groundwater sampling results did not indicate the presence of contamination. A vapor degreasing unit was excessed on the spot in the late 1970's. The dimensions of the unit was 30'L x 4'H x 4'W.

PROPOSED PLAN

No further action is required under the IRP.

STATUS

RRSE RATING: Low
CONTAMINANTS:
POLs, Chlorinated Solvents
MEDIA OF CONCERN:
Groundwater
COMPLETED IRP PHASE:
PA/SI, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 125, WVAA-13

SITE DESCRIPTION

This building is being used for machining, grinding and welding. Soil and groundwater sampling results did not indicate the presence of contamination.

PROPOSED PLAN

No further action is required under the IRP.

STATUS

RRSE RATING: Low
CONTAMINANTS: POLs
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: PA/SI, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 135 PROCESS PIT, WVAA-14 (SWMU #27)

SITE DESCRIPTION

Extensive machining, drilling, grinding, etc., occurs in this building. Oil has been observed migrating into this facility at the south end in a deep pit (100 ft) referred to as the Blue Lagoon. The Blue Lagoon is acting as a collection point for LNAPL. Oil skimming is serving as an ICM.

IRP STATUS

RRSE RATING: Low
CONTAMINANTS: POLS
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: PA/SI, RFI, ICM
CURRENT IRP PHASE: LTM
FUTURE IRP PHASE: LTM

PROPOSED PLAN

LTM will continue. ICM operations, currently being funded with operational funds, will continue. If operations at the facility cease, then the ICM will be funded by ER,A.

This site is included under the CMS being performed for the Main Manufacturing Area (see Contamination Assessment section for full description of CMS efforts).

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS							
IRA							
RD							
RA							
LTO							
LTM	10	5	5	5	3	3	6

PROJECTED TOTAL: $ 37,000

BUILDING 114 BENET LABS PILOT SCALE PLATING, WVAA-15

SITE DESCRIPTION

Coating technology research is performed at this location. Groundwater and soil sampling results did not indicate the presence of significant contamination.

PROPOSED PLAN

No further action is required.

STATUS

RRSE RATING: Medium
CONTAMINANTS: Heavy Metals
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: PA/SI, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 115 BENET RESEARCH LABS, WVAA-16

SITE DESCRIPTION

Various research projects are conducted at this location. Most research is conducted in laboratory hoods with beaker amounts of hazardous materials. Groundwater and soil sampling results did not indicate the presence of contamination.

PROPOSED PLAN

No further action is required.

STATUS

RRSE RATING:
Not Evaluated
CONTAMINANTS: Heavy Metals
MEDIA OF CONCERN:
Soil and Groundwater
COMPLETED IRP PHASE: PA/SI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 119 DU MACHINING, WVAA-17

SITE DESCRIPTION

This site is a duplicate of WVAA-16 (DU Machining performed on BLDG 115).
It is currently Response Complete in DSERTS.

STATUS

RRSE RATING: Not Evaluated
CONTAMINANT: DU
MEDIA OF CONCERN:
Soil and Groundwater
COMPLETED IRP PHASE: PA/SI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 120 BENET RESEARCH LABS, WVAA-18

SITE DESCRIPTION

Research operations conducted in this building are similar to those conducted in Building 115, prototype chrome plating. Groundwater and soil sampling results did not indicate the presence of contamination.

PROPOSED PLAN

No further action is required.

STATUS

RRSE RATING: Low
CONTAMINANTS: Heavy Metals
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: PA/SI, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

BUILDING 121 BENET LABS MATERIAL TESTING, WVAA-19

SITE DESCRIPTION

This site was a duplicate of WVA-01. It has been removed from the DSERTS database.

NUMEROUS UNDERGROUND STORAGE TANKS (USTs), WVAA-20 (SWMUs #7-17)

SITE DESCRIPTION

The arsenal has removed and/or replaced several USTs over the last several years. Two of these tanks (waste oil storage tanks) leaked. The leaking tanks were located in the vicinity of buildings 44 and 110. Both tanks have been replaced.

PROPOSED PLAN

No further action is required.

STATUS

RRSE RATING: Low
CONTAMINANT: POLs
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: IRA (tank removal)
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

NUMEROUS ABOVE GROUND STORAGE TANKS (ASTs), WVAA-21

SITE DESCRIPTION

A number of above ground storage fuel oil tanks are registered on the current oil storage license. Groundwater monitoring wells were installed in October 1987 as a requirement of the license. These wells are sampled and analyzed on a yearly basis as part of the Oil and Petroleum Storage License. Groundwater and soil sampling results did not indicate the presence of contamination.

PROPOSED PLAN

No further action is required.

STATUS

RRSE RATING: Not Evaluated
CONTAMINANT: Waste Oil
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: IRA
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

ERIE CANAL SITE, WVAA-22
(SWMU #25)

SITE DESCRIPTION

The Erie Canal passed through the eastern portion of WVA, flowing in a north/south direction. In the 1920's, the canal was filled in with unknown materials. Soil borings were completed in the former canal in the 1990 and 1997 hydrogeological investigations of the MMA. Analysis of the soil samples revealed the presence of petroleum and lead contamination above guidance values.

PROPOSED PLAN

The CMS for this site was funded under WVAA-027. The exposure assessment is expected to show minimal risk of exposure.

IRP STATUS

RRSE RATING: High
CONTAMINANTS:
POLs, Lead
MEDIA OF CONCERN: SOIL
COMPLETED IRP PHASE:
PA/SI
CURRENT IRP PHASE:
RFI, CMS
FUTURE IRP PHASE: LTM

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS							
IRA							
RD							
RA							
LTO							
LTM		4	4	1	1	3	

PROJECTED TOTAL: $ 13,000

INDOOR RCRA STORAGE AREA BUILDING 145, WVAA-23

SITE DESCRIPTION

This site was an indoor temporary storage area for hazardous waste located in Building 145 at the Siberia Area. The storage area underwent a clean closure. A new storage area in the same building is currently used for under 90 day storage. Conditions of the closure letter requires routine visual inspection of the epoxy coating on the floor and lease restrictions are in place as an institutional control.

PROPOSED PLAN

No further action is required under IRP.

IRP STATUS

RRSE RATING: High

CONTAMINANTS:
POLs, Heavy Metals

MEDIA OF CONCERN:
Groundwater

COMPLETED IRP PHASE:
PA/SI, RFI, CMI

CURRENT IRP PHASE: RC

FUTURE IRP PHASE: RC

INDUSTRIAL WASTE SEWER LINES, WVAA-24 (SWMU #20)

SITE DESCRIPTION

There are three types of waste lines which convey waste material to the on-site treatment plant in separate industrial sewers: acid rinsewater, soluble waste oil, and cyanide rinsewater. The acid and soluble sewers are clay tile and were installed in the late 1970's. The cyanide sewers are constructed of ductile iron pipe and were installed in the late 1970's. The pipes were upgraded in 1993-94. Follow-on RFI activities have been initiated to determine if any leaks occurred in the past.

PROPOSED PLAN

The results of this investigation will be included as addendum to the RFI.

IRP STATUS

RRSE RATING: Medium
CONTAMINANTS:
PAHs, Heavy Metals, Cyanide
MEDIA OF CONCERN:
Groundwater
COMPLETED IRP PHASE:
PA/SI, IRA
CURRENT IRP PHASE: RFI
FUTURE IRP PHASE: RC

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS	50	2	1				
IRA							
RD							
RA							
LTO							
LTM							

PROJECTED TOTAL: $ 53,000

SIBERIA AREA RCRA FACILITY INVESTIGATION, WVAA-25 (SWMUs #3, 18, 22, 23, 24)

SITE DESCRIPTION

The Siberia Area is a 15-acre storage plot, located to the west of the Main Manufacturing Area. The land was purchased in the 1940's. Raw material storage buildings and the DRMO salvage yard are located in this area. In addition, there is an onsite Chip Handling Facility and a Trash/ Dumpster Area. The area is also the location for a newly replaced underground storage tank (1997; SWMU # 7a), an electrical substation and the site of an old Burn Pit (last used in the late 60's). A permeable reactive wall pilot system was installed in the Northeast Quadrant in December 1998 for the dehalogenation of chlorinated solvents in groundwater. The effectiveness of this pilot system is being monitored with an upgradient and downgradient well system. POL contaminated soil was discovered in the Southwest Quadrant during substation upgrade work. Sixty (60) cy of soil was removed in December 1997.

STATUS

RRSE RATING: High
CONTAMINANTS:
POLs, PAHs, Heavy Metals, Chlorinated Solvents
MEDIA OF CONCERN: Soil and Groundwater
COMPLETED IRP PHASE: RFI, ICM
CURRENT IRP PHASE: CMS, ICM
FUTURE IRP PHASE: CMI, RAO

PROPOSED PLAN

The effectiveness of the pilot study (barrier walls) will continue to be monitored. Soil removal will be conducted as part of an ICM for the former Burn Pit. The remedy is expected to include a combination of biotreatment, removal and capping. The estimated volume of the contaminated soil is 30,000 cy. LTM will continue.

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS	10						
IRA							
RD	400						
RAC		2700					
RAO				145	65	130	180
LTM							

PROJECTED TOTAL: $ 3,630,000

BUILDING 36 SURFACE IMPOUNDMENT CLOSURE, WVAA-26 (SWMU #1)

SITE DESCRIPTION

There are five (5) sludge drying beds at the industrial wastewater treatment plant. One of the beds was converted to an emergency holding tank that fits the definition of an impoundment as stated in 40 CFR Part 260.10. Hazardous waste was stored in this bed prior to RCRA and beyond the 90-day storage limitation for a non-storage facility. WVA therefore proceeded with actions necessary to close the bed, and it was formally closed in October 1987. Changes in the closure rules required additional soil removal for clean closure. WVA performed this additional work in Jan 94. The bed has been closed clean. NYSDEC has accepted clean closure in a letter dated 03 May 1994.

PROPOSED PLAN

No further action is required under IRP.

IRP STATUS

RRSE RATING: Low
CONTAMINANTS:
Trace metals and organics
MEDIA OF CONCERN:
Soil and Groundwater
COMPLETED IRP PHASE: IRA
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

OIL CONTAMINATION MANUFACTURING AREAS, WVAA-27

SITE DESCRIPTION

Oil has been observed migrating into three processing pits located in three different manufacturing buildings (Buildings 35, 110, and 135) of the Main Manufacturing Area. The oil contamination has appeared approximately 30 to 40 feet below ground level, which is below the groundwater surface. This DSERTS site will be used to address specifically POL groundwater contamination at the following DSERTS sites: WVAA-01, 09, 10, 27 and 28. Three (3) passive recovery pumps were installed in January 1999 to test the viability of product (POLs) recovery. Product recovery is currently in progress.

STATUS

RRSE RATING: Medium
CONTAMINANT: POLs
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: PA/SI
CURRENT IRP PHASE: RFI, ICM, CMS, LTM
FUTURE IRP PHASE: CMI, LTM

PROPOSED PLAN

Additional groundwater CMI activities will be required. Institutional and engineering controls may be required. Long term monitoring will continue.

This site will be included under the CMS to be performed for the Main Manufacturing Area (see Contamination Assessment section for full description of CMS efforts).

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS	12						
IRA							
RD		10					
RAC		109					
RAO		15	15	15	15	15	
LTM							30

PROJECTED TOTAL: $ 236,000

FORMER CHIP HANDLING AREA, BUILDING 132 SOUTH, WVAA-28

SITE DESCRIPTION

In the 1950's and 1960's, metal chips and scrap metal were stored on the ground south of building 132. The scrap steel, mostly in chip form, would be soaked with machining oils and fluids. Soil sampling results indicated soil contamination below guidance levels.

PROPOSED PLAN

Groundwater will be addressed under WVAA-027.

STATUS

RRSE RATING: Low
CONTAMINANTS:
POL, Solvents
MEDIA OF CONCERN:
Soil and Groundwater
COMPLETED IRP PHASE:
PA/SI, RFA, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

RCRA CONTAINER STORAGE FACILITY BUILDING 145, WVAA-29 (SWMU #2)

SITE DESCRIPTION

This site is a duplicate of WVAA-23. It is Response Complete in DSERTS.

STATUS

RRSE RATING: Not Evaluated
CONTAMINANTS:
POls, Heavy Metals
MEDIA OF CONCERN:
Groundwater
COMPLETED IRP PHASE:
PA/SI, RFI, CMI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

OUTFALL TO HUDSON RIVER (OUTFALL 003), WVAA-30 (SWMU #19)

SITE DESCRIPTION

This is the main outfall to the Hudson River and includes the discharge from outfall 002, which is the industrial wastewater treatment plant (IWTP). This outfall is monitored monthly as part of the SPDES permit.

PROPOSED PLAN

No further action is required under the IRP.

STATUS

RRSE RATING: Low
CONTAMINANT: None
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: PA/SI, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

INCINERATOR (INACTIVE), WVAA-31 (SWMU #21)

SITE DESCRIPTION

The incinerator (Building 132) has not been active since the early 1970s. Groundwater and soil sampling results did not indicate the presence of contamination above guidance levels.

PROPOSED PLAN

No further action is required.

STATUS

RRSE RATING: Low
CONTAMINANT : PAHs
MEDIA OF CONCERN: Soil and Groundwater
COMPLETED IRP PHASE: PA/SI, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

VAPOR DEGREASERS (BLDGS 20, 25, 110, 120, 123, AND 130), WVAA-32

SITE DESCRIPTION

This DSERTS site specifically addresses chlorinated solvent groundwater contamination from all vapor degreasers. Vapor degreasers were used to remove protective oil coatings from 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.

Groundwater sampling results indicated high concentrations of chlorinated VOCs in overburden and fractured bedrock. A DNAPL was detected at the downgradient installation boundary in deep fractured bedrock (MW 51). Soil sampling results did not indicate the presence of chlorinated VOCs above guidance values.

STATUS

RRSE RATING: High
CONTAMINANT:
Chlorinated Solvents
MEDIA OF CONCERN:
Groundwater
COMPLETED IRP PHASE: PA/SI
CURRENT IRP PHASE:
RFI, ICM, CMS,
FUTURE IRP PHASE: CMI, LTM

PROPOSED PLAN

A bench and pilot scale treatability study (ICM) (chemical oxidation) will be conducted for in-situ remediation of VOCs. The CMS will be completed and a CMI will follow. LTM will be conducted. A matrix diffusion study of the bedrock will be conducted to evaluate natural attenuation. Institutional controls may be required.

This site is included under the CMS being performed for the Main Manufacturing Area (see Contamination Assessment section for full description of CMS efforts).

CONSTRAINED COST TO COMPLETE

PHASE	2001	2002	2003	2004	2005	2006	2007+
RI/FS							
IRA							
RD	50						
RAC	530						
LTO							
LTM		160	160	80	40		120

PROJECTED TOTAL: $ 1,140,000

CHROME PLATING SUMPS (BLDG 35), WVAA-33 (SWMU #26)

SITE DESCRIPTION

This site includes the sump pit areas for tube plating and minor plating in Building 35. Groundwater and soil sampling results did not indicate the presence of contamination above guidance levels.

PROPOSED PLAN

No further action is required.

STATUS

RRSE RATING: Low
CONTAMINANTS: POLs, Heavy Metals
MEDIA OF CONCERN: Groundwater
COMPLETED IRP PHASE: PA/SI, RFI
CURRENT IRP PHASE: RC
FUTURE IRP PHASE: RC

SCHEDULE

The environmental investigations and assessments at WVA have been performed under RCRA. CERCLA terminology was used in several early documents at WVA, therefore RCRA terms are used interchangeably with CERCLA terms. A RCRA 3008(h) order with the New York State Department of Environmental Conservation (NYSDEC) and EPA Region II, became effective on 12 October 1993. The following is a compilation of completed work to date:

PAST MILESTONES

1. Initial Installation Assessment 1979
2. Installation Assessment Update 1986
3. PA/SI WVA 02 Bldg 36 IWTP chromic acid spill mid 1970's, long term monitoring.
4. PA/SI WVA 03 Bldg 136 oil spill, source removed mid 1970's, long term monitoring.
5. RA WVA 05 Bldg 110A Cyanide treatment, process removed 1981, no further action required.
6. RA WVA 06 Bldg 14 metal processing, removed 1981, no further action required.
7. PA/SI WVA 08 Bldg 25 Minor Components, PA/SI conducted in vapor degreaser area in July 1990. Presently in RFI.
8. RA WVA 11 Bldg 110 Annex, Metal Processing, removed in 1981, no further action required.
9. PA/SI WVA 22 Erie Canal Site, preliminary site investigation conducted in July 1990. Further investigation required. Part of site wide PA/SI.
10. PA/SI WVA 24 Acid Waste Disposal Line, site investigation conducted in June 1992. One location, manhole 34D, recovery well and additional monitoring wells installed. Long term monitoring required. Part of site wide PA/SI.
11. RFI WVA 25 Siberia Area RCRA Facility Investigation. Site investigations conducted in December 1986 and July 1987. RFI Phase I & Phase II completed in 1996.
12. REM WVA 26 Bldg 36 Surface Impoundment. Impoundment closed clean in January 1994. NYSDEC letter accepting clean closure May 1994. No further action required.
13. PA/SI WVA 28 Former Chip Handling Area, Bldg 132 South. Partial soil removal for new gas line installation. Site investigation report dated September 1994. Additional investigation (PA/SI) warranted. Part of site wide PA/SI.
14. HW Container Storage Facilities located at Bldg. 145 underwent closure procedures during 1996. A Clean Closure Letter was issued by NYSDEC in April 1997.
15. Final RFI WVA 25 Siberia Area RCRA Facility Investigation completed in December 1997.
16. A Soil Removal Action (Interim Remedial Action) was taken in January 1998. A total of 60 cubic yards of potentially-contaminated soils were taken from the Main Substation Area at Siberia.

SCHEDULE

PAST MILESTONES, continued

17. A bench-scale Aerobic Bioremediation Study for the treatability of PAH's and TPH's was completed in August 1998. A report was submitted to the Regulators and final approval was obtained in January 1999. Part of the CMS.

18. The installation of Reactive Permeable Walls Pilot System for the in-situ passive treatment of chlorinated solvents in the Siberia Area was completed in December 1998. Monitoring of the system to commence on June 1999.

19. The Exposure Assessment Report for the Siberia Area obtained final approval from the regulators. This report details the potential intake scenarios, parameters and possible clean-up concentrations to be used on the Corrective Measures Study (CMS).

20. A RCRA Facility Investigation (RFI) was completed for the Siberia Area in December, 1997. Task was completed on schedule.

21. Additional investigatory work was performed to supplement the Corrective Measures Study for the Siberia Area in August, 1998. Task was completed ahead of schedule.

22. A RCRA Facility Investigation (RFI) was completed for the MMA in December, 1999.

23. Phase II of the RFI (DNAPL investigation) was completed for the MMA in August, 1998.

24. Landfarming Pilot Treatment System started in July 2000.

PROJECTED MILESTONES BY PHASE

SIBERIA AREA

PHASE	ESTIMATE START	ESTIMATE COMPLETION	REMARKS
CMS Bench-Scale Pilot Study (Soils)	Aug-97	Dec-00	Ongoing
CMS Design Reactive Wall Pilot System	Jun-98	Dec-98	Task completed ahead of schedule.
Final CMS Siberia Report	Aug-99	Dec-00	Proposed addtl work for treatability studies.
IRA Soils Removals (Burn Pit)	Jan-00	Jun-00	Proposed IRA, if approved by Regulators.
CMI Soils	Jun-02	Dec-03	Proposed: Bioremediation
CMI Groundwater	Jun-02	Dec-02	Installed Reactive Wall Pilot on Dec 98.
Long Term Monitoring	Jun-99	Dec-07	Well monitoring & Institutional controls are anticipated.

* Estimate includes allotted times for reports revision & final acceptance by Regulators.

SCHEDULE

PROJECTED MILESTONES BY PHASE

MAIN MANUFACTURING AREA

PHASE	ESTIMATE START	ESTIMATE COMPLETION	REMARKS
Draft CMS Main Manufacturing Area Work Plan	Apr-00	Jun-00	
POL's Intermedial Remedial Action	May-98	Aug-99	Passive Pump & Treat Setup in the vicinity of Bldg. 110.
Final CMS Main Manufacturing Area	Jul-00	Jul-01	
Long Term Monitoring of NFA Sites	Jun-99	Dec-07	Well monitoring & Institutional controls are anticipated.
CMI Soils	TBD	TBD	None anticipated
CMI GW	Dec-02	Dec-07	Insitu treatment
NFA Sites	Jun-99	Dec-07	Well monitoring & Institutional controls are anticipated.
Remediated sites	Dec-99	Dec-07	
* Estimate includes allotted times for reports revision & final acceptance by Regulators.			

Watervliet Arsenal IRP Schedule

(Based on current funding constraints)

Completed Phase | Underway Phase | Future Phase

FACILITY	DSERTS #	PHASE	FY87-00	FY01	FY02	FY03	FY04	FY05	FY06	FY07+
WVAA-01	BLDG 121 OIL SPILL	PA/SI								
		RI/FS								
WVAA-02	CHROMIC ACID RINSE WT SPILL NR BLDG 36	PA/SI								
		RI/FS								
WVAA-03	BLDG136 OIL SPILL 1976 DURING TRANS OPS	PA/SI								
		RI/FS								
WVAA-04	INDUSTRIAL WASTE TRT PLANT AREA	PA/SI								
		RI/FS								
WVAA-05	CYANIDE TRT PLANT BUILDING 110	PA/SI								
		RI/FS								
WVAA-06	METAL PLATING SHOP BLDG 14 DEMOLISH.1981	PA/SI								
		RI/FS								
WVAA-07	BUILDING 20 MAJOR COMPONENTS	PA/SI								
		RI/FS								
WVAA-08	BLDG 25 VAPOR DEGREASER (MINOR COMP)	PA/SI								
		RI/FS								
WVAA-09	BUILDING 35 MEDIUM CALIBER GUN SHOP	PA/SI								
		RI/FS								
WVAA-10	BUILDING 110 BIG GUN SHOP	PA/SI								
		RI/FS								
WVAA-11	BUILDING 110 ANNEX	PA/SI								
		RI/FS								
WVAA-12	BUILDING 123 PAINT SHOP	PA/SI								
		RI/FS								
WVAA-13	BUILDING 125	PA/SI								
		RI/FS								
WVAA-14	BUILDING 135 ROTARY FORGE	PA/SI								
		RI/FS								
		IRA								
		LTM								
WVAA-15	BUILDING 114 BENET LABS PILOT SCALE PLAT	PA/SI								
		RI/FS								
WVAA-18	BUILDING 120 BENET RESEARCH LABS	PA/SI								
		RI/FS								

Watervliet Arsenal IRP Schedule

(Based on current funding constraints)

Completed Phase | Underway Phase | Future Phase

FACILITY	DSERTS #	PHASE	FY87-00	FY01	FY02	FY03	FY04	FY05	FY06	FY07+
WVAA-22	ERIE CANAL SITE	PA/SI								
		RI/FS								
		LTM								
WVAA-24	INDUSTRIAL WASTE SEWER LINES	PA/SI								
		RI/FS								
		IRA								
WVAA-25	SIBERIA (INCLUDES SWMU'S #3 18, 22-24)	PA/SI								
		RI/FS								
		IRA								
		RD								
		RA(C)								
		RA(O)								
WVAA-26	BLDG 36 SURFACE IMPOUNDMENT CLOSURE	PA/SI								
		IRA								
WVAA-27	INVESTIGATE OIL CONTAMINATION IN MFG ARS	PA/SI								
		RI/FS								
		RD								
		RA(C)								
		RA(O)								
		LTM								
WVAA-28	FORMER CHIP HANDLING AREA BLDG 132 SOUTH	PA/SI								
		RI/FS								
WVAA-30	OUTFALL TO HUDSON RIVER (OUTFALL 003)	PA/SI								
		RI/FS								
WVAA-32	VAPOR DEGREASERS (BLDGS 20,110,120, 130)	PA/SI								
		RI/FS								
		IRA								
		RD								
		RA(C)								
		LTM								
WVAA-33	CHROME PLATING SUMPS (BLDGS 35 AND 110)	PA/SI								
		RI/FS								

DEFENSE SITE ENVIRONMENTAL RESTORATION TRACKING SYSTEM

Site, 4. Installation Phase Summary Report 1/19/01

Installation: WATERVLIET ARSENAL

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

Subprograms: Compliance, Restoration, UXO

Installation count for Programs: 1

NPL Options: Delisted, No, Proposed, Yes

Installations count for Programs and NPI 1

Site count for Programs and NPL: 31

				Phase / Status / Sites						
		PA						**SI**		
	C	**U**	**F**	**RC**		**C**	**U**	**F**	**RC**	
	31	0	0	2		27	0	0	2	
		RI / FS						**RD**		
	C	**U**	**F**	**RC**		**C**	**U**	**F**		
	18	6	0	17		0	1	2		
		RA(C)						**RA(O)**		
	C	**U**	**F**	**RC**		**C**	**U**	**F**	**RC**	
	4	0	3	4		0	0	2	0	
					LTM					
				C	**U**	**F**	**N**			
				1	2	3	23			
				Remedy / Status / Sites (Actions)						
					IRA					
		C			**U**			**F**		
	6	(7)		1	(1)			0	(0)	
					FRA					
	C				**U**			**F**		
	4	(4)		0	(0)			3	(8)	
RIP Total:		0								
RC Total:		25								
							Reporting Period End Date:			03/31/2001

DEFENSE SITE ENVIRONMENTAL RESTORATION TRACKING SYSTEM

Site, 9. RISK INSTALLATION ACTION PLAN REPORT 01/19/2001

Installation: WATERVLIET ARSENAL
Major Command: AMC

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

Subprogram Options: Compliance, Restoration, UXO

			Media	Phase (s)	Phase (s)	Phase (s)	#IRA	#IRA	#IRA	LTM	RIP	RC
Site		RRSE	Evaluated	Completed	Underway	Future	Completed	Underway	Future	Status	Date	Date
WVAA-01		1A	GW	PA			1			N		200001
			SL	RI								
				SI								
WVAA-02		2A	GW	PA						N		200001
				RI								
				SI								
WVAA-03		3A	GW	PA			2			C		199610
				SI								
WVAA-04		2A	GW	PA						N		200001
				RI								
				SI								
WVAA-05		3A	GW	PA						N		200001
				RI								
				SI								
WVAA-06		3A	GW	PA						N		200001
				RI								
				SI								

			Media	Phase (s)	Phase (s)	Phase (s)	#IRA	#IRA	#IRA	LTM	RIP	RC
Site		**RRSE**	**Evaluated**	**Completed**	**Underway**	**Future**	**Completed**	**Underway**	**Future**	**Status**	**Date**	**Date**
WVAA-07		2A	GW	PA						N		200001
				RI								
				SI								
WVAA-08		1A	GW	PA						N		200001
				RI								
				SI								
WVAA-09		2A	GW	PA	RI		1			N		200105
				SI								
WVAA-10		1A	GW	PA			1			N		200001
				RI								
				SI								
WVAA-12		3A	GW	PA						N		200001
				RI								
				SI								
WVAA-13		3A	GW	PA						N		200001
				RI								
				SI								
WVAA-14		3A	GW	PA						U		200001
				RI								
				SI								
WVAA-15		2A	GW	PA						N		200001
				RI								
				SI								
WVAA-16		NE		PA						N		198708
WVAA-17		NE		PA						N		198708
WVAA-18		3A	GW	PA						N		200001
			SL	RI								
				SI								

			Media	Phase (s)	Phase (s)	Phase (s)	#IRA	#IRA	#IRA	LTM	RIP	RC
Site		**RRSE**	**Evaluated**	**Completed**	**Underway**	**Future**	**Completed**	**Underway**	**Future**	**Status**	**Date**	**Date**
WVAA-20		3A	SL	PA						N		199712
				RAC								
				RI								
				SI								
WVAA-21		NE		PA						N		198708
				SI								
WVAA-22		1A	GW	PA	RI					F		200104
			SL	SI								
WVAA-23		1A	GW	PA						N		199704
			SL	RAC								
WVAA-24		2A	GW	PA	RI		1					200304
				SI								
WVAA-25		1A	GW	PA	RD	RAC	1				200210	201109
			SL	SI	RI	RAO						
WVAA-26		3A	GW	PA						U		199405
			SL	RAC								
				SI								
WVAA-27		2A	GW	PA	RI	RAC		1		F	200201	200701
			SL	SI		RAO						
						RD						
WVAA-28		3A	GW	PA						N		200001
				RI								
				SI								
WVAA-29		NE		PA						N		199704
				RAC								

			Media	Phase (s)	Phase (s)	Phase (s)	#IRA	#IRA	#IRA	LTM	RIP	RC
Site		**RRSE**	**Evaluated**	**Completed**	**Underway**	**Future**	**Completed**	**Underway**	**Future**	**Status**	**Date**	**Date**
WVAA-30		1A	GW	PA						N		200001
			SL	RI								
			WEF	SI								
WVAA-31		3A	GW	PA						N		200001
			SL	RI								
				SI								
WVAA-32		1A	GW	PA	RI	RAC				F		200110
				SI		RD						
WVAA-33		3A	GW	PA						N		200001
			SL	RI								
				SI								
RRSE - Relative Risk Site Evaluation; Risk Category - 1=High, 2=Medium, 3=Low;												
Legal Agreement - A = with agreement, B = without agreement; C = Complete, U = Underway, F = Future, N = Not Applicable												
									Reporting Period End Date:		03/31/2001	

REMEDIATION ACTIVITIES

PAST REM/IRA/RA

*WVA 01, Building 121 Oil spill (1975), contaminated soil removal approximately 1975; collection system installed approximately 1977.

* WVA 02, Building 36 Chromic Acid Spill, contaminated soil removal, long term monitoring since removal.

*WVA 03, Building 136 Oil Spill (1976), USTs and soil removal, long term monitoring since 1987, no POL ground water contamination observed.

* WVA 05, Building A Cyanide Treatment Plant, contaminated equipment removal in 1981.

* WVA 06, Building 14 Metal Processing, contaminated equipment, concrete removals in 1981.

* WVA 07, Building 20 Major Components, limited contaminated soil removal Feb 1990.

* WVA 11, Building 110 Annex, contaminated equipment, concrete removals 1981.

* WVA 20, Numerous Underground Storage Tanks, selected tank removals.

*WVA 24, Acid Waste Disposal Line, contaminated soil and broken piping removal, monitoring wells installed, one groundwater recovery well installed Feb-Jun 1992.

*WVA 26, Building 36 Surface Impoundment Closure contaminated soil removal completed in January 1994. NYSDEC Clean Closure Letter issued on May 1994.

*WVA 28, Former Chip Handling Area, Building 132, limited soil removal Feb 94.

*WVA 25, Siberia Area RCRA Facility Investigation, limited soil removal (60 cubic yards) at the Main Substation area, January 1998.

* WVA 27 - Oil Contamination in Manufacturing Areas, Interim Removal Action, Petroleum on Groundwater Table (Passive Skimming).

*WVA 25 - Siberia Area, Soil Removal (IRA) at Substation Areas.

*WVA 25 Reactive Walls (ICM).

*Burn Pit Soil Removal completed July 2000 (Siberia Area).

CURRENT REM/IRA/RA

*WVA 20, USTs Locations, Long Term Monitoring

*WVA 21, ASTs Locations, Long Term Monitoring

*WVA 23, Siberia Area RCRA Storage Facility, Long Term Monitoring

*WVA 25, Siberia Area, Northeast Quadrant, In-situ treatment Permeable Walls

*WVA 26, Building 36 Surface Impoundment Closure, Long Term Monitoring

*WVA 27, Main Manufacturing Area, Passive NAPL Recovery Test

*WVA 29, Siberia Area RCRA Storage Facility, Long Term Monitoring

* Land Farming Pilot Treatment System started. The pilot test will encompass two adjacent test plots, one treating approximately 3,200 cubic yards of soil, and the other approximately 200 cubic yards of soil. Each pilot will undergo periods of active treatment (landfarming) alternated with periods of monitored natural attenuation (NMA).

REMEDIATION ACTIVITIES

FUTURE REM/IRA/RA

* WVA 28, Former Chip Handling Area, Building 132, additional soil removal, groundwater pump and treatment (Oil/Water Separation followed by Carbon Adsorption).

*WVA 25 - Siberia Area, IRA Interim Removal Actions (Pilot Studies on Bioremediation and Reactive Walls, Soil Removals)

*WVA 30 Outfall to Hudson River (Outfall 003) Interim Remedial Action (IRA) Insitu Chemical Oxidation

*LTM Long Term Monitoring (Multiple DSERT sites in the Main Manufacturing Area)

COST ESTIMATES

PRIOR YEAR FUNDS

FISCAL YEAR	PHASE DESCRIPTION	PHASE AMOUNTS (IN THOUSANDS)	TOTAL (IN THOUSANDS)
1992	RFI Siberia	$1,092	
	RFA Vapor Degreaser	$291	
	RFA Oil Contamination	$80	
	Manufacturing Areas		
	RFA Acid Waste Line	$53	$1,516
1993	S&A RFI Siberia		
	SI Degreaser		
	Oil Contamination	$80	
	Manufacturing Areas		
	IRA Former Chip handling Area, Building 132	$15	
	RA Surface Impoundment Closure	$30	$125
1994	S&A RFI Siberia	$160	
	SI Vapor Degreaser	$817	
	RFI Phase II Siberia	$268	
	RFA Oil Contamination Mfg. Areas	$653	
	RFA Base Hydrogeologic Study		$2,274
1995	Soluble Oil Removal	$182	
	RFA Site Wide	$115	
	S&A RFI Siberia		
	Oil Contamination Manufacturing Areas	$274	$571
1996	S&R RFI Siberia	$44	
	S&R RFA Site Wide	$77	
	RFI Siberia	$99	
	RFI Site Wide	$440	
	CMS Siberia	$264	
	IRA Oil Contamination Mfg. Area	$174	$1,098

COST ESTIMATES

PRIOR YEAR FUNDS

FISCAL YEAR	PHASE DESCRIPTION	PHASE AMOUNTS (IN THOUSANDS)	TOTAL (IN THOUSANDS)
1997	RFI Siberia	$40	
	IRA MW-08	$68	
	CMS Siberia (included additional data collection)	$44	
	Aerobic Bioremediation Bench-Scale Study	$75	
	CMS Design Reactive Wall	$100	
	RFI Site Wide (includes DNAPL Geo Study)		
	Community Relations Plan	$115	
	S&R for RFI Site Wide, Siberia	$22	
	CMS Siberia	$156	$620
1998	RFI Main Mfg Area (includes DNAPL Associated Work)	$360.703	
	CMS Bench Scale Bioremediation Treatment Studies	$59	
	CMS Design Siberia (WP React Walls)	$95.287	
	CMS Const. Siberia Pilot Study React Walls	$415	
	ICMI Soils Removals Siberia	$70	
	S&R RFI, CMS Design, CMI ICMI		
1999	Total S&A for Siberia Area (WVA-25)	$59.55	
	Total Project Funding for Siberia Area (WVA-25)	$637.59	
	Total S&A for Main Manufacturing Area (WVA-27)	$98.20	
	Total Project Funding for Main Manufacturing Area (WVA-27)	$707.76	
	S&A for BLDG 121 Bedrock Well (WVA-01)	$2	$1,505.10

COST ESTIMATES

PRIOR YEAR FUNDS

FISCAL YEAR	PHASE DESCRIPTION	PHASE AMOUNTS (IN THOUSANDS)	TOTAL (IN THOUSANDS)
2000			$1,586,500.00

GRAND TOTAL (1987-2000): $10,383,600

WATERVLIET ARSENAL - 2001 PROGRAMMED COST TO COMPLETE

DSERTS #	SITE DESCRIPTION	RRSE	PHASE	2001	2002	2003	2004	2005	2006	2007+	SITE TOTAL
WVAA-14	BUILDING 135 ROTARY FORGE	LOW	LTM	10	5	5	5	3	3	6	**37**
WVAA-22	ERIE CANAL SITE	HIGH	LTM		4	4	1	1	3		**13**
WVAA-24	INDUSTRIAL WASTE SEWER LINES	MED	RI	50	2	1					**53**
WVAA-25	SIBERIA (INCLUDES SWMU'S #3 18, 22-24)	HIGH	RI	10							
			RD	400							
			RAC		2700						
			RAO				145	65	130	180	**3630**
WVAA-27	INVESTIGATE OIL CONTAMINATION IN MFG ARS	MED	RI	12							
			RD		10						
			RAC		109						
			RAO		15	15	15	15	15		
			LTM							30	**236**
WVAA-32	VAPOR DEGREASERS (BLDGS 20/110/120/130)	HIGH	RD	50							
			RAC	530							
			LTM		160	160	80	40		120	**1140**
TOTAL IN THOUSANDS OF DOLLARS				**$1,062**	**$3,005**	**$185**	**$246**	**$124**	**$151**	**$336**	**$5,109**

COMMUNITY INVOLVEMENT

RESTORATION ADVISORY BOARD (RAB) STATUS

The Army strongly encourages local community involvement during investigations and cleanup actions at all Army sites. In the past, Watervliet Arsenal (WVA) has conducted interviews with Watervliet citizens and local officials to integrate community issues and concerns to ongoing site investigations, engineering designs, and proposed construction activities. As a result of an interview process conducted in August 1992, it was determined that there was no community interest in formal involvement in restoration activities. The result of this interview process was documented in the WVA Community Relations Plan (CRP), dated 19 October 1992.

Since then, the following are the community outreach activities performed by the Watervliet Arsenal in their attempt to gather feedback from the community in regard to their restoration efforts.

In April 1998, Watervliet Arsenal submitted an update to the 1992 Community Relations Plan to the Regulators. The CRP was updated with the following objectives:

- to meet the requirements set forth in the Administrative Order on Consent Docket No. II RCRA-3008(h)-93-0210,

- to include chronological summaries of environmental investigations conducted at the Arsenal since 1990,

- to integrate community issues and concerns from Watervliet citizens and local officials,

- and to prepare a site-specific program to establish communication and information exchange regarding restoration efforts between Army staff, the civilian workforce, community agencies, and the public.

Any interest from the local community and officials has been addressed and properly documented by the WVA Public Affairs Office (Attn: Mr. John Swantek, (518) 266-5418), e-mail address swantek@wva.army.mil).

DEFENSE SITE ENVIRONMENTAL RESTORATION TRACKING SYSTEM

Installation, 7. RAB REPORT 01/19/2001

Command: AMC **SubComma** OSC
Installation: WATERVLIET ARSENAL

RAB Established Date:

Reason RAB Not Establish: The community has expressed no sufficient, sustained interest in a RAB.

RAB Adjourned Date:

Reason RAB Adjourned:

TRC Date:

RAB Community Members:

Total RAB Community Members:

RAB Government Members:

Total RAB Government Members:

RAB Activities:

RAB Advice

TAPP Application Approval Date:
TAPP Project Title: 03/31/2001
TAPP Project Description:

Award Number	Purchase Order Award Date	Completion Date