FFID: MD321382135500
Size: 72,516 acres
Mission: Develop and test equipment and provide troop training
HRS Score: 31.45 (Michaelsville Landfill); placed on NPL in October 1989
53.57 (Edgewood Area); placed on NPL in February 1990
IAG Status: IAG signed in March 1990
Contaminants: VOCs, SVOCs, metals, PCBs, explosives, petroleum products, pesticides, radiologicals, CWM and their degradation products, UXO, and potential biological warfare material
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $386.2 million
Estimated Cost to Completion (Completion Year): $650.1 million (FY2042)
Final Remedy in Place or Response Complete Date for All Sites: FY2014

Edgewood and Aberdeen, Maryland

Restoration Background

Studies from 1976 to 1983 identified many areas of contamination at the installation, including chemical munitions and manufacturing waste sites. RCRA Facility Assessments identified 319 solid waste management units, which were combined into 13 study areas. There are 234 sites in the Edgewood Area (EA) and 20 sites in the Aberdeen Area. Remedial Investigations (RIs) identified high levels of organic contaminants in most study areas. Lower levels of contamination were detected in a few on-post tributaries of the Chesapeake Bay. Major actions before FY99 include 76 Removal Actions, 4 Remedial Actions (RAs), and 12 Records of Decision (RODs). Removal Actions included removal of soil contaminated with polychlorinated biphenyls (PCBs), petroleum hydrocarbons, trichloroethene, and DDT; removal of underground storage tanks (USTs); removal of unexploded ordnance (UXO) along the EA boundary; closure of Nike missile silos, an adamsite vault, and pilot plant sumps; and cleanup of open dump sites.

In FY93, the Army installed carbon adsorption units for a part of the Harford County Perryman water supply. In FY95, the installation converted its Technical Review Committee to a Restoration Advisory Board (RAB). In FY97, the Army completed a final report on natural attenuation (NA) at the West Branch of Canal Creek (CC).

In FY98, the installation received Nuclear Regulatory Commission release for two radiological Removal Action sites. In the Old O-Field Area, the Army finished installing a permeable infiltration unit at the landfill. At the Nike site, the installation capped a landfill. In the CC study area, Building 503 Burn Site soil remedy construction was completed. The installation completed the 5-year review for the White Phosphorus Underwater Munitions Burial Area, with no further work recommended. Focused Feasibility Studies (FFSs) were completed for the CC East Branch Groundwater Operable Unit (OU) and the Bush River Area and initiated at the Lauderick Creek Area. The Army completed RIs at Carroll Island, Graces Quarters, and the J-Field study area. Feasibility Studies (FSs) began for the Westwood Area. The Army completed an Engineering Evaluation and Cost Analysis for the Lauderick Creek Area and chemical weapons and munitions (CWM) Removal Action. The Proposed Plan (PP) for the CC East Branch Groundwater OU and the Ecological and Human Health Risk Assessments for the J-Field study area also were completed.

FY99 Restoration Progress

The Army completed the design and construction began for the prototype detonation test and destruction facility. In the CC study area, the installation installed a cap on the Building 103 dump. At the Nike site, the installation completed design and construction of a groundwater treatment facility.

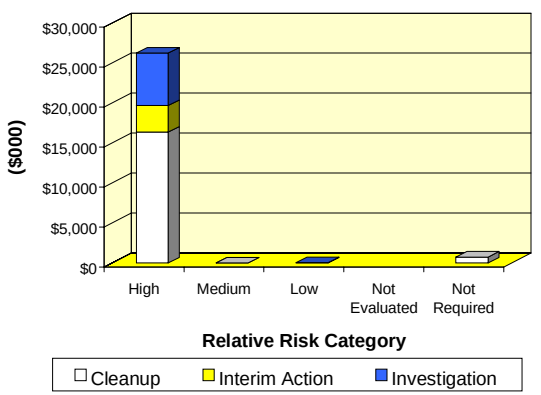
In the Western Boundary study area, the Army completed the FS. The ROD for the CC East Branch Groundwater OU was completed and forwarded for approval at Department of Army headquarters. The CC West Branch NA study and the FFS are ongoing. In the J-Field study area, the Army continued work on the FS for all OUs and installed shoreline erosion control. In the Lauderick Creek Area, the installation completed two RIs and began bench-scale Treatability Studies. In the Bush River Area, the Old Bush River Road dump ROD was signed and capping of the landfill began. At Carroll Island and Graces Quarters, the Army completed sitewide PPs. The New O-Field draft final FS was completed. In the Westwood Area, the RI, a risk assessment, and the FS continued.

Regulatory issues delayed removal of USTs in the CC study area. A revision of the site safety submission delayed the Lauderick Creek UXO removal. CWM encountered in soil delayed the RA for the J-Field Soil OU. The Carroll Island OU-A RA is 95 percent complete, but was delayed because of potential natural resources injury. The Carroll Island OU-B ROD was not completed, due to revisions to the FS.

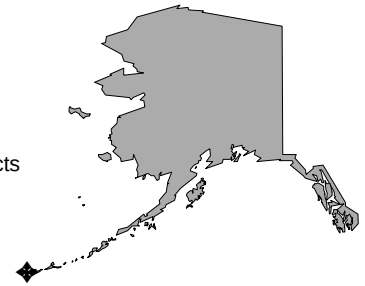
Plan of Action

- Begin Lauderick Creek subsurface UXO/CWM clearance and Removal Action in FY00
- Begin Removal Actions for USTs in the CC study area in FY00
- Complete one RA and two RODs in FY00

FY00 Funding by Phase and Relative Risk



FFID: AK017002432300
Size: 76,800 acres
Mission: Provided services and materials to support aviation activities and operating forces of the Navy
HRS Score: 51.37; placed on NPL in May 1994
IAG Status: Federal Facility Agreement signed in November 1993
Contaminants: UXO, heavy metals, PCBs, VOCs, pesticides, and petroleum products
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $161.0 million
Estimated Cost to Completion (Completion Year): $49.2 million (FY2006)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Adak, Alaska

Restoration Background

In September 1995, the BRAC Commission recommended closure of Adak Naval Air Facility. Operational Naval forces departed the island on April 1, 1997, and command functions were assumed by the Engineering Field Activity Northwest. The installation closed in September 1997.

In FY86, a study identified 32 sites at the installation, including landfills, unexploded ordnance (UXO) areas, and polychlorinated biphenyl (PCB) spill sites that have released contaminants into groundwater, soil, surface water, and sediment. Twenty sites were recommended for further investigation. In FY88, RCRA Facility Assessments identified 76 solid waste management units (SWMUs), 73 of which are managed as CERCLA sites under the Federal Facility Agreement signed in 1993.

From FY90 to FY95, Interim Actions included disposal of PCB-contaminated water and sludge; bioremediation of 4,500 tons of petroleum-contaminated soil; removal of approximately 30 underground and aboveground storage tanks and associated pipelines; and excavation, removal, and disposal of leaking incendiary (napalm) and cluster bombs.

An interim Record of Decision (ROD) was signed in FY95 for two landfills. In FY96, the installation completed fieldwork for the basewide Remedial Investigation and Feasibility Study and final evaluation reports for 10 SWMUs. Removal Actions and Interim Remedial Actions (IRAs) were completed for a number of SWMUs.

In FY97, the installation completed a Tier Assessment to Risk Assessment at petroleum sites and performed petroleum recovery at SWMU 17. Remedial Design (RD) work began for the areas around SWMU 17. SWMUs 19 and 25 were closed, and a Non-Time-Critical Removal Action at SWMUs 16, 16A, and 67 was completed. Corrective actions at abandoned landfill sites were completed.

In FY98, the Navy received letters from EPA confirming that no further action is required at SWMU 4, the South Davis Road Landfill, and at SWMU 27, the Lake Leonne Drum Disposal Area. Additional sampling to determine the volume of contaminated sediment was performed at SWMU 17. Operable Unit (OU) B was formed to address UXO issues. The installation completed clearing a World War II minefield at SWMU 2. Investigations concerning UXO in downtown Adak were completed, while investigations of other potential minefield locations began.

The installation completed a Community Relations Plan in FY90 and revised the plan in FY95. In FY92, it formed a Technical Review Committee, which was converted to a Restoration Advisory Board (RAB) in FY96. During FY97, a Local Redevelopment Authority and a BRAC cleanup team (BCT) were established. In FY98, the BCT developed a Proposed Plan and a draft ROD for OU A.

FY99 Restoration Progress

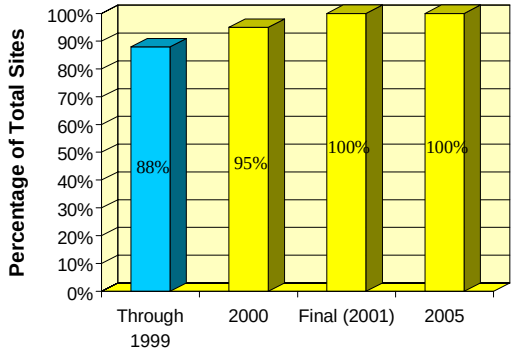
The Navy completed the latest version of its BRAC Cleanup Plan. The RD and Remedial Action (RA) at Sweeper Creek estuary, the RD and RA at SWMU 17, and investigations at potential minefields were completed. The ROD for OU A was approved by the Navy and is awaiting regulatory agency signatures. The Navy began developing the monitoring plan for OU A.

Dispute resolution was initiated for UXO issues (OU B). The Navy has not obtained regulatory (EPA and State of Alaska) approval for DoD's investigative approach to 1999 UXO investigations on Adak, but the Navy and regulators are working together toward that end.

Plan of Action

- Complete and implement a comprehensive monitoring plan for OU A in FY00
- Receive regulatory agency signatures for OU A ROD in FY00
- Obtain regulatory (EPA and State of Alaska) review and approval of DoD's investigative approach to UXO investigations on Adak in FY00
- Initiate UXO investigations for remaining OU B sites in FY00
- Complete RD and RA at OU B sites in FY00
- Close landfill in FY00
- Complete petroleum cleanups in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: GU917002755700
Size: 2,083 acres
Mission: Provided services and material support for transition of aircraft and tenant commands
HRS Score: NA
IAG Status: None
Contaminants: Asbestos, paint, solvents, petroleum/oil/lubricant liquids and sludges, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: $39.2 million
Estimated Cost to Completion (Completion Year): $14.6 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001

Agana, Guam

Restoration Background

In July 1993, the BRAC Commission recommended that the Agana Naval Air Station be closed. The station was closed on March 31, 1995.

In FY84, an Initial Assessment Study (IAS) identified two potentially contaminated sites. In FY93, a Preliminary Assessment identified an additional 13 potentially contaminated sites, later identified as points of interest (POIs). After the Environmental Baseline Survey was completed and updated, additional POIs were identified, bringing the total number of sites identified to 29.

In FY94, the final Site Inspection (SI) report revealed contamination in soil and groundwater at Sites 1 and 2, the two sites identified in the original IAS. An aggressive groundwater investigation was initiated for Site 29. Fast-track actions were also initiated to investigate soil contamination at 17 other sites.

In FY95, one SI was completed for Site 10 and another started for Sites 3 through 9, 11 through 16, and 28. Perimeter fencing was installed at Sites 1 through 5, 7 through 23, and 26, to limit access. As part of the groundwater Remedial Investigation (RI), groundwater monitoring wells, heat pulse flow meters, and pumps were installed. Initial data from the groundwater monitoring wells showed trichloroethene and dichloroethane contamination. An Environmental Condition of Property assessment identified four parcels as suitable for reuse. Findings of Suitability to Lease were completed for three of these parcels with an interim lease and joint use agreement with the Guam International Airport Authority.

In FY96, a Non-Time-Critical Removal Action (NTCRA) was initiated for Sites 1 and 2. RI fieldwork began for Sites 20, 21, and 23. During FY97, an RI for the remaining sites was initiated. The Navy and the regulatory agencies agreed that Sites 3, 5, 6, 8, 9, 11, 20, and 21 required no further action (NFA), but some sites require use restrictions. All aboveground and underground storage tanks were closed and removed.

In FY98, soil RIs were completed at Sites 2, 19, 20, and 23. At Site 29, the installation completed a Time-Critical Removal Action (TCRA), conducted a limited dye trace study, and completed a regional groundwater RI. A groundwater activated-carbon treatment system at an on-site production well began operation. The Navy and regulatory agencies agreed that Sites 2, 10, 12, 13, 14, 15, 25, 27, and 28 require NFA, but some sites require use restrictions.

A BRAC cleanup team (BCT) was established in FY93. The BRAC Cleanup Plan was completed in FY94 and updated in FY98. A Community Relations Plan was published in FY92, and three information repositories were established. The installation formed a Restoration Advisory Board in FY93.

FY99 Restoration Progress

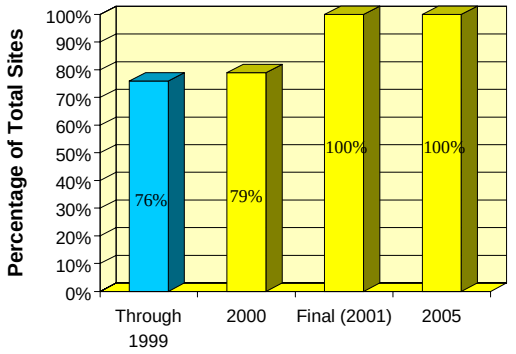
A NTCRA for Site 1 was initiated, and the Removal Site Evaluation was completed. The soil RI for the remaining six sites (Sites 13, 14, 15, 18, 20, and 22) was completed. An expanded Ecological Risk Assessment was continued for Site 7 because of a lack of standing water in the wetland area. A TCRA for Sites 16 and 23 was completed, the regional groundwater RI and Feasibility Study report was initiated, and the Proposed Plan (PP) is under way. The groundwater activated-carbon treatment system is in operation.

The Navy and the regulatory agencies agreed that seven additional sites (Sites 17, 18, 19, 22, 23, 24, and 26) require NFA, but that some sites require use restrictions. Additional samples were taken at Site 29, and the RI/FS was completed. The PP is undergoing public review. A final remedy was proposed but was not selected by the BCT because the public comment period is still ongoing. Site 22 was accepted by the BCT as a No Further Remedial Action site. The Engineering Evaluation and Cost Analysis for Site 22 was not prepared as planned because the site required No Further Remedial Action. Long-term monitoring (LTM) at Site 29 was delayed due to public acceptance of the proposed Remedial Action.

Plan of Action

- Prepare Record of Decision and implement final remedy for Site 29 in FY00
- Conduct NTCRA for landfill using presumptive remedy for Site 1 in FY00
- Select and implement final remedy for the regional groundwater problem at Site 29 in FY00
- Implement LTM at the on-site production well for Site 29 in FY00

Sites Achieving RIP or RC Per Fiscal Year



Air Force Plant No. 4 — Lockheed Martin Tactical Aircraft Systems — NPL

FFID: TX657172460500
Size: 706 acres
Mission: Manufacture aircraft and associated equipment
HRS Score: 39.92; placed on NPL in August 1990
IAG Status: IAG signed in 1990
Contaminants: Solvents, paint residues, spent process chemicals, PCBs, waste oils and fuels, heavy metals, VOCs, and cyanide
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $51.5 million
Estimated Cost to Completion (Completion Year): $31.0 million (FY2013)
Final Remedy in Place or Response Complete Date for All Sites: FY2001

Fort Worth, Texas

Restoration Background

Air Force Plant No. 4 has been a primary manufacturer of military aircraft and associated equipment since 1942. Since FY84, studies have identified 30 sites and confirmed groundwater, surface water, and soil contamination. Trichloroethene (TCE) was detected in groundwater beneath six spill sites and four landfills. Groundwater is the primary drinking water source for the city of White Settlement.

In FY93, two Interim Remedial Actions (IRAs) were implemented at Fuel Saturation Areas 1 and 3 to address contamination from two historical spill sites.

In FY94, the installation completed design and construction of a soil vapor extraction (SVE) system at Building 181, the parts processing plant. In the East Parking Lot and near Carswell Air Force Base (AFB) Landfills 4 and 5, two additional carbon filtration groundwater treatment systems were installed to control the migration of a large TCE plume. The installation began constructing a vacuum-enhanced pumping system to treat groundwater and soil contamination at Landfill No. 3. Additional extraction wells were installed in the East Parking Lot to prevent TCE migration. The SVE pilot plant at Building 181 was expanded to a large-scale, dual-phase SVE system that will treat both groundwater and soil vapors.

In FY95, a Remedial Investigation and Feasibility Study (RI/FS) was completed with the preparation of an Ecological Risk Assessment. During the RI, 28 of the 30 sites were recommended for no further action (NFA).

In FY96, a Record of Decision (ROD) proposed Remedial Actions (RAs) at the remaining two sites. The Air Force decided to integrate the restoration programs for the Carswell Field sites and the Air Force Plant No. 4 groundwater plume. In FY97, the installation completed a long-term monitoring plan and a Remedial Design (RD) work plan for the East Parking Lot plume.

In FY98, an emergency plume containment action and a Focused Feasibility Study (FFS) were initiated at the leading edge of the TCE plume on Carswell Field. Tracer testing was used to identify potential dense nonaqueous phase liquid (DNAPL) areas of source contamination (TCE), a prerequisite for the ROD.

In FY95, Air Force Plant 4 converted its Technical Review Committee to a Restoration Advisory Board (RAB). The RAB was integrated with the Carswell RAB in 1996. RAB meetings are now held quarterly at former Carswell AFB, now the Joint Reserve Base Naval Air Station, Fort Worth.

FY99 Restoration Progress

An RA plan was completed. The installation conducted further characterization at a previous NFA site where DNAPL was found in fractured bedrock. At the request of the Agency for Toxic Substances and Disease Registry, the Air Force, through a contract with the USGS, conducted fish tissue sampling in adjacent Lake Worth.

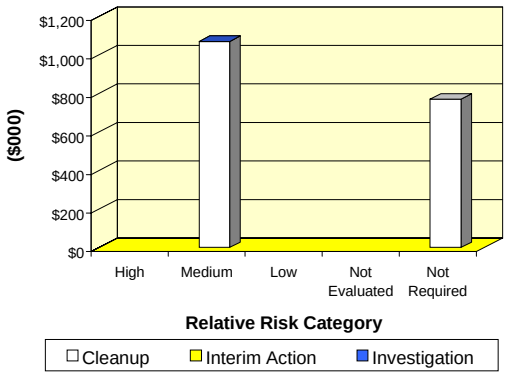
After the unsuccessful use of surfactants and tracer testing, the installation investigated the use of radio frequency heating and six-phase heating to remove DNAPL in the East Parking Lot/ Building 181 area. A phytoremediation project was initiated to dewater the area near Landfill 3. The installation is awaiting final determinations from regulators on the need for an FFS on former Carswell AFB where the plume comingles with other source areas. The RD report for the East Parking Lot was delayed because of additional details, brought to the installation's attention by Lockheed Martin, concerning possible foreign object damage to F-16 aircraft if extraction wells are placed near the aircraft run-up stations, as proposed.

The RAB participated in a tour of the final RA for Building 181, an expanded SVE system.

Plan of Action

- In FY00, address any issues arising from the fish tissue sampling data after the Texas Department of Health has reviewed the data
- Complete the RD for the East Parking Lot and complete construction of the RA in FY00
- Fund future RAs in FY01, depending on the results of the soil heating pilot system in FY00

FY00 Funding by Phase and Relative Risk



Air Force Plant No. 85 — Proposed NPL

FFID: OH557172887000
Size: 420 acres
Mission: Produced aircraft and aircraft missile components
HRS Score: 50.00; proposed for NPL in January 1994
IAG Status: None
Contaminants: PCBs, petroleum hydrocarbons, VOCs, and metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $3.8 million
Estimated Cost to Completion (Completion Year): $0 (FY2000)
Final Remedy in Place or Response Complete Date for All Sites: FY2000

Columbus, Ohio

Restoration Background

Environmental studies since FY86 have identified 11 sites and 1 area of concern (AOC) at Air Force Plant No. 85. Historical operations at the installation involved use of solvents and petroleum products. Contaminants include polychlorinated biphenyls (PCBs), metals, petroleum hydrocarbons, and volatile organic compounds (VOCs), which have affected groundwater, surface water, sediment, and soil. Decision documents have been prepared for 9 of the 11 sites; however, the Air Force has not received concurrence from state regulatory agencies on any of the documents.

In FY94, the installation conducted supplemental investigations of pesticide contamination at the fire training area. In FY95, the installation began to remove soil contaminated with PCBs. In FY96, the AOC was closed under a letter of concurrence from the Ohio EPA, and the installation began a groundwater and surface water investigation. Fieldwork for the investigation was completed in FY97.

In FY97, the Aeronautical Systems Center began using the State of Ohio's Voluntary Action Program rules as applicable or relevant and appropriate requirements for the sites. The restoration of the fire training area was deferred, pending further analysis. The site may be closed after a risk assessment is conducted. Ohio EPA concurred with an Environmental Baseline Survey indicating that all necessary Remedial Action (RA) had taken place at a PCB spill site.

In FY98, a PCB-contaminated soil site was remediated, and regulator concurrence was obtained. Investigations began under Ohio's Voluntary Action Program. Ohio EPA approved closure of a hazardous waste storage site. In addition, Air Force Plant No. 85 property was sold, with sales proceeds to be used for environmental restoration.

In FY95, the installation formed a Restoration Advisory Board (RAB) and began an educational program for RAB members. A public meeting held in FY97 determined that the continuation of the RAB was not necessary. The public and the installation agreed that information will be provided to the community informally, as needed.

FY99 Restoration Progress

The installation used proceeds from the FY98 sale of installation property to investigate eight sites, using Ohio's Voluntary Action Program rules. Investigations resulted in closure of a coal pile site and an acid spill site. Ohio EPA provided preliminary concurrence on these designations. A risk assessment for the fire training area was completed, indicating a need for RA. Additional investigation is needed for the remaining five sites.

The installation continues to use the Defense and State Memorandum of Agreement/Cooperative Agreement process to maintain coordination with Ohio EPA.

Plan of Action

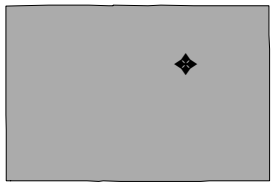
- Perform Feasibility Study (FS) and RA activities for the fire training area and obtain regulatory concurrence in FY00
- Obtain concurrence from regulators on final closure of sites in FY00
- Update community and provide information as needed

FY00 Funding by Phase and Relative Risk

There are no cost data for this installation.

Air Force Plant PJKS — NPL

FFID: CO857172553700
Size: 464 acres
Mission: Research, develop, and assemble missiles and missile components; test engines
HRS Score: 42.93; placed on NPL in November 1989
IAG Status: None
Contaminants: Chlorinated organic solvents, VOCs, nitrate, fuel, and hydrazine
Media Affected: Groundwater and soil
Funding to Date: $21.7 million
Estimated Cost to Completion (Completion Year): $34.6 million (FY2015)
Final Remedy in Place or Response Complete Date for All Sites: FY2004



Waterton, Colorado

Restoration Background

Air Force Plant PJKS supports the military by researching, developing, and assembling missiles, missile components, and engines. Past operations have contaminated groundwater beneath the installation with trichloroethene (TCE), hydrazine, vinyl chloride, benzene, other volatile organic compounds (VOCs), and nitrate. Since FY86, environmental studies have identified 59 sites, which were grouped into six operable units (OUs). There are also six areas of concern. Twelve of 14 underground storage tanks have been removed from the installation.

In FY93, field activities began for a supplemental Remedial Investigation and Feasibility Study (RI/FS) at OU1, OU4, and OU6. RI/FS work plans were completed for supplemental investigations at OU2, OU3, and OU5. In FY94, the installation began using new technologies to improve field methods and data management. The installation also sponsored workshops, which included representatives from EPA and the state, to ensure that all technical and regulatory requirements for the supplemental RI/FS would be met. As a result of the workshops, work plans for supplemental RI/FS activities at OU2, OU3, and OU5 were renewed, approved, and made final. In FY95, all fieldwork, sample collection, and sample analysis for the supplemental basewide RI/FS and construction of the monitoring well network were completed.

In FY96, data validation was completed, and an electronic database was established. Technical work groups were formed with EPA, the State of Colorado, USGS, and the U.S. Army Corps of Engineers to support RI site characterization and risk assessment. Site characterization and a Baseline Risk Assessment began. Negotiations on the Interagency Agreement (IAG) also began.

In FY97, Relative Risk Site Evaluations were reevaluated and revised to reflect data from the RI/FS. The Aeronautical Systems Center and Lockheed Martin Astronautics agreed to sale terms for the installation that include environmental liability and cleanup aspects. In FY98, an Engineering Evaluation/Cost Analysis (EE/CA) was developed for an early action to address groundwater contamination.

The installation formed a Restoration Advisory Board (RAB) in FY96, and in FY97 signed a RAB charter.

FY99 Restoration Progress

A supplemental RI report including all six OUs was submitted to regulators for review. Based on the results of this RI, early actions to address groundwater contamination were deferred. Because regulatory approval of the RI was not yet received, FS work planned for FY99 was not initiated and Record of Decisions (RODs) were not signed.

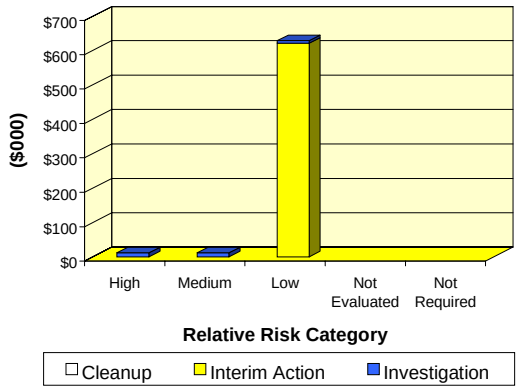
An EE/CA was developed for early action to address soil contamination at two sites. Groundwater monitoring was conducted. Negotiations on the IAG were halted in deference to the signing of a Compliance Order on Consent (COC) between the Air Force and the Colorado Department of Public Health and Environment. Closure plans were developed for regulatory review pursuant to the COC.

The RAB met quarterly to discuss budget and cleanup priorities and progress.

Plan of Action

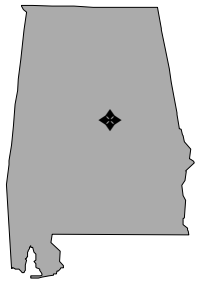
- Obtain regulatory concurrence on supplemental RI report and develop No Action RODs for sites with no potential risk in FY00
- Obtain regulatory concurrence on closure plans for four sites and implement closures in FY00
- Develop and implement work plan for continued groundwater monitoring program in FY00
- Obtain regulatory concurrence on EE/CA for soil contamination at two sites in FY00; implement early action in FY00–FY01
- Develop work plans for FSs in FY00; implement FSs in FY00–FY01

FY00 Funding by Phase and Relative Risk



Alabama Army Ammunition Plant

FFID: AL421382000800
Size: 2,209 acres
Mission: Manufactured explosives
HRS Score: 36.83; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in December 1989
Contaminants: Nitroaromatic compounds, heavy metals, and munitions-related wastes
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $60.3 million
Estimated Cost to Completion (Completion Year): $4.9 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY1983



Childersburg, Alabama

Restoration Background

Studies conducted at this installation since FY83 have identified various sites as potential sources of contaminants. Prominent site types include a former ammunition production and burning ground for explosives; industrial wastewater conveyance systems, ditches, and a red water storage basin; landfills; underground storage tanks; polychlorinated biphenyl (PCB)–containing transformers; and a former coke oven.

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY85. The installation was divided into five operable units (OUs): Area A OUs 1 and 2 and Area B OUs 1, 2, and 3. The RI confirmed that groundwater, surface water, sediment, and soil are contaminated with nitroaromatic compounds, heavy metals, and explosives waste.

In FY88, the Army excavated contaminated soil at the burning grounds at Area A and transported the soil to Area B to await a final decision on treatment or disposal. In FY90, the Army and regulators signed a Record of Decision (ROD) for Area B.

In FY94, the Army initiated an installationwide RI, installing monitoring wells and conducting soil borings; resampling existing monitoring wells; and collecting background samples, soil and sediment samples, surface water samples, and ecological samples. The Army also completed incineration of the Area B stockpiled contaminated soil, as prescribed in the ROD, and formed a BRAC cleanup team (BCT).

In FY95, the Army attempted to establish a Restoration Advisory Board (RAB) but received no applications for RAB membership. The Army and regulators approved the Area A RI/FS.

In FY96, the installation identified an additional OU for Area B (OU4), which includes all remaining lead- and explosives-contaminated soil at the plant. An interim ROD was initiated for OU4, calling for soil removal, incineration of explosives-contaminated soil, and solidification of lead-contaminated soil.

In FY97, the Army and regulators approved the final ROD for Area A and completed the Remedial Action (RA) for Areas 13 and 14. The BCT began delisting procedures for Area A. The Army incinerated explosives-contaminated soil at OU3 and OU4 and constructed an additional disposal cell for the remaining contaminated soil.

In FY98, the installation completed RAs for all lead- and explosives-contaminated soil. All equipment was decontaminated, dismantled, and removed from the site. The installation designed the engineered cap for Landfill 22 and obtained regulatory approval for the cap. The EPA and Alabama Department of Environmental Management approved the closeout report for Area A.

FY99 Restoration Progress

Quarterly groundwater monitoring, surface water and sediment sampling, a dye trace study, and a pump test were completed in Area B. The installation issued a draft final RI/FS for soil, sediment, and surface water for Area B (which is awaiting comments from regulators); closed 35 groundwater monitoring wells; and installed an engineered cap for Area 22. EPA and the State of Alabama approved the closeout report for OU3 and OU4. The installation removed and disposed of PCB-contaminated soil at the transformer area, lead-contaminated soil at the lead hot spot area, and tar and contaminated sediment from the Aniline Sludge Pond. The installation also continued the use of electrical tomography to locate conduits through highly fractured and weathered bedrock.

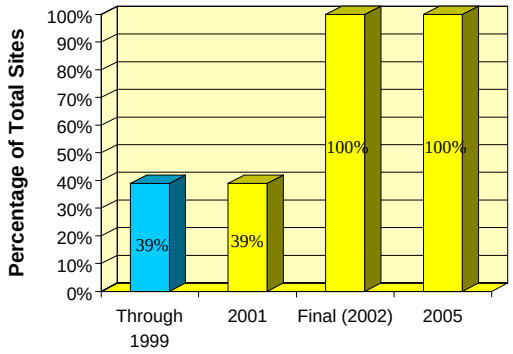
The installation was unable to complete the land use control assurance and implementation plan because of a lack of information on the extent of groundwater contamination. The delisting for Area A was not completed due to regulatory delay.

The installation and its BCT participated in an Independent Technical Review of the risk and groundwater problems at the installation. The outgrowth of this review will help with the plan of action for the next 2 years.

Plan of Action

- Continue the groundwater investigation of Area B to determine the extent of contamination, especially in the area in the south and southeast of the installation, in FY00
- Complete National Priorities List (NPL) delisting for Area A in FY00
- Conduct a soil investigation in Area B to locate possible contamination source areas in FY00
- In FY00, identify and close groundwater monitoring wells that are no longer needed
- Develop land use control and implementation plan as required to support property transfer in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: CA917002323600
Size: 2,675 acres, including about 1,000 offshore acres
Mission: Maintained and operated facilities and provided services and material support for naval aviation activities and operating forces
HRS Score: 50.0; placed on NPL July 22, 1999
IAG Status: Federal Facility Agreement under negotiation
Contaminants: BTEX, chlorinated solvents, radium, heavy metals, herbicides, pesticides, methylene chloride, petroleum hydrocarbons, PAHs, PCBs, VOCs, and SVOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $84.5 million
Estimated Cost to Completion (Completion Year): $148.1 million (FY2012)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003

Alameda, California

Restoration Background

In September 1993, the BRAC Commission recommended closure of Alameda Naval Air Station. The installation was closed in April 1997. Cleanup activities at this installation relate to 25 sites. Prominent site types are landfills, offshore sediment areas, plating and cleaning shops, pesticide control areas, transformer storage areas, and a former oil refinery.

In FY94, the installation removed lead- and acid-contaminated soil from Site 13. In FY95, 4 underground storage tanks (USTs) and associated contaminated soil were removed at Site 7, debris removal began for catch basins at Site 18, and 60 abandoned USTs and associated contaminated soil were removed. The installation completed Phase I of an Environmental Baseline Survey (EBS) for all sites in FY94 and Phase I of an Ecological Risk Assessment (ERA) for all sites in FY95. A community Land Reuse Plan was approved in FY96. The installation began Treatability Studies (TSs) at Sites 1, 2, 3, 5, 13, and 17.

In FY97, the installation began Phase II of the ERA for all sites, completed the EBS for 208 parcels with Environmental Condition of Property (ECP) categories assigned, conducted EBS sampling and risk screening, implemented ECP recategorization, and removed sediment from storm sewer lines at Site 18. TSs were completed for Sites 3 and 13. The installation also completed the final Community Relations Plan and performed early actions at Sites 15, 16, and 18.

In FY98, the installation completed the early removal of polychlorinated biphenyl (PCB)–and lead-contaminated soil at Sites 15 and 16 and began additional TSs at Sites 4, 5, and 13. The Removal Action at Site 18 was completed, and TSs were completed at Sites 1 and 17. A draft and a revised draft Remedial Investigation (RI) for Operable Unit (OU) 1 were completed and issued. The installation also began a project to remove or close 11 miles of abandoned fuel lines; a project to remove contamination from radium paint at Sites 1, 2, 5, and 10; and a project to abate lead-based paint and asbestos.

The installation formed a Technical Review Committee in FY90 and converted it to a Restoration Advisory Board (RAB) in FY93. A BRAC cleanup team was formed in FY93. A BRAC Cleanup Plan was completed in FY94. In FY98, the first Technical Assistance for Public Participation grant in the United States was issued to the RAB to help with the OU1 RI review.

FY99 Restoration Progress

The planned agreement on ECP recategorization of parcels was not completed because of a failure to reach consensus on 209 parcels. All remaining USTs were removed, but one possible UST has been discovered and is being reviewed. Abatement of asbestos in all industrial facilities was completed, and lead-based paint and asbestos were abated in all pre-1960 housing units. The removal of all active and inactive fuel lines was completed. This installation was placed on the NPL on July 22, 1999.

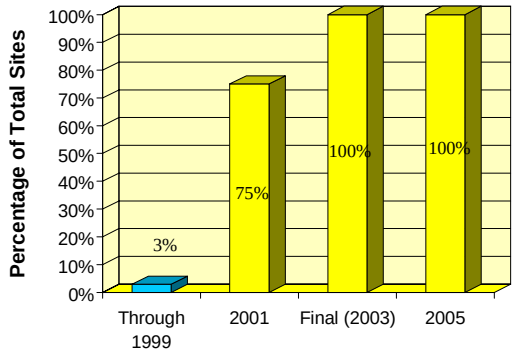
The project to remove radium paint contamination at Sites 1, 2, 5, and 10 has exhausted its funding because the contamination was much more extensive than expected. These sites are being temporarily closed.

Sensitive technologies have delayed TSs at Sites 4, 5, and 13, and the fieldwork at Site 5 was completed for two projects. The final RIs for OU1 and OU3 and the draft Feasibility Study (FS) for OU3 were completed. The final FS for OU1 and the final RI and draft FS for OU2 were delayed because of extensive comments from the RAB and the regulatory community.

Plan of Action

- Obtain agreement from the regulatory agencies on ECP recategorization of parcels in FY00
- Resolve possible UST issue at Building 7 in FY00
- Complete TSs at Sites 4, 5, and 13 in FY00
- Complete removal of radium paint contamination at Site 10 in FY00 and at Sites 1, 2, and 5 in FY01
- Complete final FS and Record of Decision (ROD) at OU1 and complete Remedial Design and Remedial Action (RD/RA) in FY01
- Complete the final RI and the draft and final FS for OU2 in FY01
- Complete the final FS and the ROD for OU3 in FY00; complete RD/RA in FY01
- Complete draft RI for OU4 in FY00; complete final RI and draft FS in FY01

Sites Achieving RIP or RC Per Fiscal Year



Albany Marine Corps Logistics Base NPL

FFID: GA417302369400
Size: 3,579 acres
Mission: Acquire, supply, and dispose of materials needed to sustain combat readiness of Marine Corps forces worldwide; acquire, maintain, repair, rebuild, distribute, and store supplies and equipment; conduct training
HRS Score: 44.65; placed on NPL in December 1989
IAG Status: Federal Facility Agreement signed in July 1991
Contaminants: VOCs, PCBs, heavy metals, pesticides, and PAHs
Media Affected: Groundwater, soil, and sediment
Funding to Date: $26.5 million
Estimated Cost to Completion (Completion Year): $17.3 million (FY2016)
Final Remedy in Place or Response Complete Date for All Sites: FY2002

Albany, Georgia

Restoration Background

Environmental studies identified 23 CERCLA sites and 6 RCRA sites at this base. These sites were grouped in six operable units (OUs), including basewide groundwater (OU6) and a site screening group. Sites include disposal areas, storage areas, and landfills. Contaminants include trichloroethene, polychlorinated biphenyls (PCBs), and heavy metals.

In the 1980s an Initial Assessment Study was completed for eight sites, a confirmation study was completed for nine sites, a groundwater recovery system was installed, and a quarterly groundwater monitoring program began for the Industrial Wastewater Treatment Plant (IWTP) area. The installation completed a RCRA Facility Investigation (RFI) for nine sites, a Corrective Measures Study (CMS) for one site, and an Interim Remedial Action (IRA) for capping the IWTP sludge beds. The installation completed a Preliminary Assessment for one site in FY91 and a Remedial Investigation and Feasibility Study (RI/FS) in FY92. In FY93, Remedial Design (RD) was completed for both sites at OU3; in FY94, OU3 Removal Actions and cleanup were completed.

In FY95, the RI/FS for all four sites at OU1 was submitted to the regulators; an IRA was completed for one site at OU1; the RI/FS for OU2 was submitted; and an Engineering Evaluation and Cost Analysis was completed for one site at OU4. The installation also completed a focused FS, signed an interim Record of Decision (ROD), completed the RD for a site at OU5, and finished RCRA closure of the Domestic Wastewater Treatment Plant sludge beds at Solid Waste Management Unit (SWMU) 3. During FY96, the installation completed a Removal Action for another site at OU1. A final no further action (NFA) ROD was signed for OU2, and the site was closed. An IRA was completed for one site at OU5.

In FY97, the installation completed the RI/Baseline Risk Assessment (RI/BRA) and signed a final ROD for the four sites at OU1 and the two sites at OU3. The potential-sources-of-contamination (PSC) screening technical memorandum was completed for nine sites; seven are listed as no further remedial action planned (NFRAP) in the RCRA permit. The RI/BRA and the NFRAP Proposed Plan for two sites at OU5 were completed. The RFI, the CMS, and corrective measures implementation were finished for two SWMUs. Removal Actions were conducted for two sites listed as NFRAP in the RCRA permit. In FY98, the installation completed a RI/BRA for OU4. A final ROD was signed for two sites at OU5 declaring NFRAP for all soil, surface water, and sediment.

A Technical Review Committee was formed in FY89. In FY92, a Community Relations Plan was completed.

FY99 Restoration Progress

A final ROD was signed for OU4, specifying institutional controls for one site and NFRAP for four sites.

A Land Use Controls Assurance Plan (LUCAP) agreement was finalized between the base and EPA Region 4, and an alternative water supply was provided to 55 residents north of the base whose private wells may have been affected by contamination from the base. The RFI report was submitted to the regulators. Only minimal soil contamination was found in the investigation, and the project team agreed to obtain groundwater samples before determining whether Remedial Action (RA) was required. RAs for PSC 4 will be addressed in the OU6 ROD.

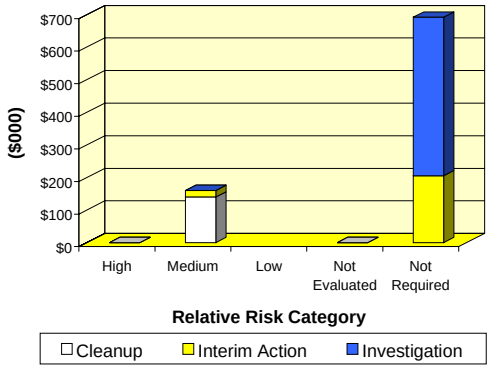
No investigation was performed at PSC 21 because the team considered other sites to have higher priority.

Additional monitoring wells were installed and sampled at OU6. The project team agreed that the results from the additional wells needed to be incorporated into the RI/BRA. The draft FS was submitted to the regulators in August 1999.

Plan of Action

- Initiate pilot studies for enhanced bioremediation in FY00
- Complete final ROD for OU6 in FY00
- Complete RD for OU6 in FY01
- Initiate construction for OU6 in FY01

FY00 Funding by Phase and Relative Risk



Allegany Ballistics Laboratory — NPL

FFID: WV317002369100
Size: 1,628 acres (1,572 acres owned by the Navy)
Mission: Research, develop, and produce solid propellant rocket motors for DoD and NASA
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement signed January 1998
Contaminants: VOCs, RDX, HMX, and silver
Media Affected: Groundwater and soil
Funding to Date: $16.2 million
Estimated Cost to Completion (Completion Year): $59.0 million (FY2024)
Final Remedy in Place or Response Complete Date for All Sites: FY2010

Mineral County, West Virginia

Restoration Background

Environmental studies in FY83 identified 11 sites at this government-owned, contractor-operated installation. A confirmation study recommended further study at eight of these sites. In FY92, Remedial Investigation and Feasibility Study (RI/FS) activities began at six sites. In FY93, 119 solid waste management units (SWMUs) and 12 areas of concern (AOCs) were identified, with 61 recommended for further action. Site 1 consists of six waste disposal units, including ordnance burning grounds, inactive solvent and acid pits, a drum storage area, a former open-burn area, and an ash landfill.

During FY95, the installation began sampling off-site residential wells, completed the focused RI for Site 1, and initiated a Phase I RCRA Facility Investigation (RFI) for SWMUs and AOCs. Baseline Risk Assessments were completed for Sites 1 through 5 and Site 10. During FY96, the installation completed a Focused Feasibility Study (FFS) for groundwater and began an FFS for soil. It also completed an Engineering Evaluation and Cost Analysis (EE/CA) for Site 7, completed a Site Inspection, and began an RI/FS for Site 11.

In FY97, the Record of Decision (ROD) for Site 1 was signed, and the Remedial Design (RD) for a water treatment plant (WTP) was implemented to achieve hydraulic containment. Remedial Action (RA) was initiated for groundwater at Site 1. A ROD was signed, completing the FFS for Site 5, and an RD was implemented for a landfill cap. Negotiation of waste disposal options concluded, and the Removal Action for Site 7 was completed. Eight SWMUs were targeted for cleanup.

In FY98, the installation's Federal Facility Agreement was signed. The RI was implemented for Site 11. For Site 10, an FFS for groundwater was completed, the ROD was signed, the RD was completed, and the RA contract was awarded. The Site 1 WTP was used for hot-spot extraction of groundwater at Site 10.

The installation established a Technical Review Committee in FY89 and converted it to a Restoration Advisory Board (RAB) in FY95. In FY94, an administrative record and two information repositories were established.

FY99 Restoration Progress

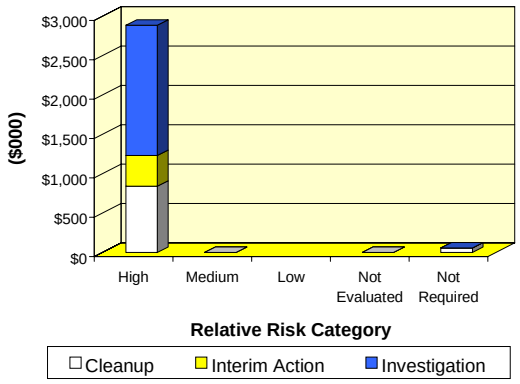
A final decision document for no further action (NFA) was signed for SWMUs 37H, 37K, 37M, 37O, 50, and 51. Closeout packages were submitted for SWMUs 22A, 22B, 22C, 22D, 23, 24B, 32, 37A, 37C, 37D, 37P, and 49. An SWMU/AOC investigation work plan was issued for several locations at the base. The Site 10 RA was completed and an interim long-term monitoring plan was issued. Phase I and II aquifer testing reports were issued for Site 1.

An institutional control plan was issued for Sites 1, 5, and 10. The Site 11 RI was completed with only one round of seasonal monitoring required. A draft Community Relations Plan was issued. The Site 5 natural attenuation assessment project plan was issued and the final deed notation was recorded in the Mineral County Courthouse. The Site 7 NFA plan was submitted. Because of changes in the EPA Region 3 risk-based concentrations, the RODs for Sites 2, 3, 4, and 7 will be moved to FY00, and new risk assessments must be performed on each site. The Site 1 FS for soil is being reevaluated to coincide with a RCRA Subpart X permit action at the facility.

Plan of Action

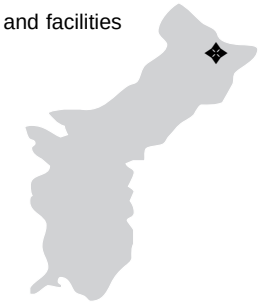
- Complete a focused RI for groundwater and soil investigation at Site 10 in FY00
- Complete natural attenuation study for groundwater at Site 5 in FY00
- Complete RODs for Sites 2, 3, 4, and 7 in FY00
- Complete SWMU/AOC investigation in FY00
- Complete EE/CA for soil at Site 1 in FY00
- Complete Proposed Remedial Action Plan and ROD for Site 11 in FY00

FY00 Funding by Phase and Relative Risk



Andersen Air Force Base NPL

FFID: GU957309951900
Size: 15,400 acres
Mission: Support the Air Force mission in the Pacific by providing troops, equipment, and facilities
HRS Score: 50.00; placed on NPL in October 1992
IAG Status: Federal Facility Agreement signed in March 1993
Contaminants: VOCs, metals, asphalt, dioxins, PCBs, and UXO
Media Affected: Groundwater and soil
Funding to Date: $59.0 million
Estimated Cost to Completion (Completion Year): $31.4 million (FY2003)
Final Remedy in Place or Response Complete Date for All Sites: FY2003



Yigo, Guam

Restoration Background

In FY84 and FY85, Preliminary Assessments identified 50 sites at Andersen Air Force Base, including landfills, waste piles, fire training areas, hazardous waste storage areas, and spill sites. The 50 sites were consolidated into 39 sites and grouped into 6 operable units (OUs). Restoration activities began when low levels of trichloroethene and tetrachloroethene were detected in the sole-source drinking water aquifer.

Andersen Air Force Base is home to several endangered species of plants and animals. Rapid development of non-military lands on the island has made the installation a de facto nature preserve. Extensive ecological inventories are conducted before field activities are performed, to ensure that endangered species will not be affected by restoration work.

Landfill 5 was capped in FY93. To avoid the high cost of importing sterilized soil to Guam, the installation used a synthetic cover material to cap the landfill. The installation's success with this innovative technology prompted other agencies on Guam to use the same synthetic material. Remedial Investigation and Feasibility Study (RI/FS) activities also began in FY93.

In FY96, 25 additional groundwater monitoring wells were installed to facilitate RI sampling and long-term monitoring (LTM) of groundwater in the karst aquifer. In FY97, the base was geographically reorganized into four OUs to accommodate excess-land issues and address groundwater at each site.

In FY98, a Record of Decision (ROD) was completed for the MARBO OU, and remediation began at four of the OU's six sites. More than 4,000 barrels of asphalt from the 1950s was collected from three sites in the Main Base OU and recycled. The recycled asphalt was given to the Government of Guam for road repairs. The installation also began remediation at two sites and seven areas of concern (AOCs) on excess lands in the Harmon OU.

The installation formed a Technical Review Committee (TRC) in FY93 and built a partnership with the Navy to establish a Defense Environmental Restoration Team. The TRC was converted to a Restoration Advisory Board (RAB) in 1995. The base Community Relations Plan was updated in FY98.

FY99 Restoration Progress

The installation began remediation at four sites. Remediation was completed for four sites and seven AOCs on excess property. Investigations were completed at eight sites, four of which require remediation. No Further Remedial Action Planned (NFRAP) documents were prepared for the remaining four sites. Evaluations and Cost Analyses (EE/CAs) for six sites and investigations for eight sites were completed.

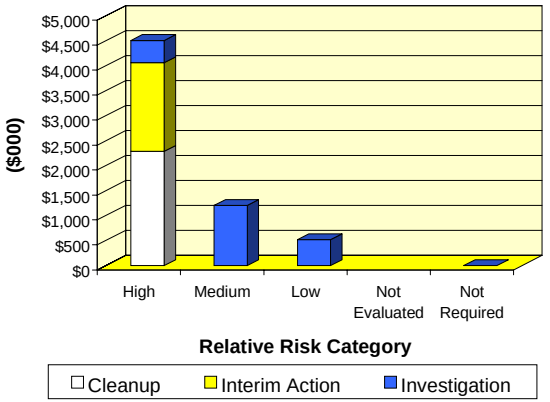
Completion of the Harmon OU ROD was delayed because of remediation delays at two sites. The installation and regulators reached an agreement to halt groundwater monitoring at the Harmon and Northwest Field OUs because concentrations of target analytes did not exceed action levels. LTM began at the MARBO OU in support of the approved ROD.

The installation provided a site tour for the RAB. Partnerships with Guam EPA and EPA Region 9 remedial project managers were fostered by holding quarterly meetings to discuss project activities. Remedial project managers were involved in decisions concerning remediation, per the approved Federal Facility Agreement.

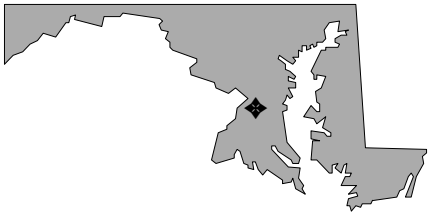
Plan of Action

- Begin EE/CAs for 4 sites and complete EE/CAs or NFRAP documents for 10 sites in FY00
- Complete ROD for three sites in the Harmon OU in FY00
- Continue groundwater investigations at the Main Base OU in FY00–FY01
- Foster continuous partnership with Guam EPA and EPA Region 9 remedial project managers in FY00–FY01
- Continue LTM of MARBO OU groundwater in FY00–FY01
- Begin Interim Remedial Actions at four sites in FY00 and at three sites in FY01

FY00 Funding by Phase and Relative Risk



FFID: MD357182400000
Size: 4,300 acres
Mission: Provide Presidential airlift support
HRS Score: 50.0; placed on NPL in May 1999
IAG Status: NA
Contaminants: Metals, SVOCs, VOCs, PAHs, PCBs, and pesticides
Media Affected: Surface water
Funding to Date: $33.9 million
Estimated Cost to Completion (Completion Year): $9.1 million (FY2011)
Final Remedy in Place or Response Complete Date for All Sites: FY2002



Camp Springs, Maryland

Restoration Background

Operations at this installation have led to surface water contamination with metals (lead, mercury, chromium, and cadmium), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polyaromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and pesticides. Affected areas have been grouped into five source areas. Source 1 (FT02) and Source 2 (FT03) are fire training areas where fuel and waste oil were burned during training exercises. Source 3 (AOC29) is a runway area where waste treatment plant sludge was used to elevate end and intermediate areas. Source 4 (LF05) is a landfill that was used mainly for disposal of general refuse, construction rubble, and fly ash; medical wastes have also been found in this landfill. Source 5 consists of two landfills (LF06 and LF07) used primarily for disposal of construction wastes. Small quantities of refuse, paint, and equipment, and unknown quantities of liquid waste from base shops (waste oils, paint thinner, cleaning solvents) also were disposed of in Source 5.

In FY92, a No Further Remedial Action Planned (NFRAP) document was issued for FT03. In FY95, a Remedial Investigation/Feasibility Study (RI/FS) and a Baseline Risk Assessment were conducted for Source 5.

In FY96, as part of a Preliminary Assessment and Site Inspection (PA/SI), a geophysical survey was conducted for Source 2. Objects that were looked for but not discovered included buried 5-gallon steel gasoline cans, which were believed to have been discarded after the civil rights riots in the 1960s. Test pits also were excavated at this source. At Source 1, investigations, including a PA/SI, have shown concentrations of nickel that were slightly above maximum contaminant levels. Also in FY98, Source 3 underwent a PA/SI, RI/FS fieldwork began at Source 4, and a NFRAP decision document was proposed for Source 5. The installation agreed to a groundwater monitoring plan and a 5-year review process for the Source 5 NFRAP decision.

In FY98, sampling data and the results of the PA/SI showed contaminants at Source 3 to be within acceptable sewage sludge land-application limits. Fieldwork continued at Source 4 to fill data gaps and evaluate remedial alternatives.

FY99 Restoration Progress

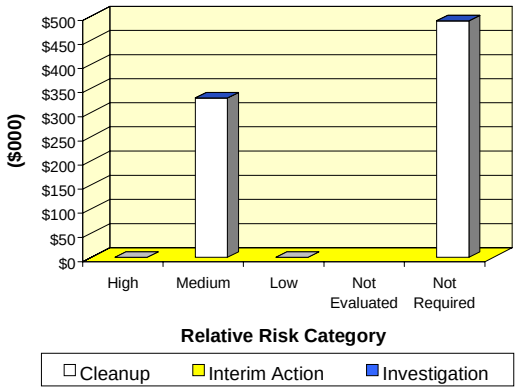
Despite the installation's submittal of rebuttal comments to the proposal to place Andrews Air Force Base on the National Priorities List (NPL), the base was placed on the NPL in May 1999. The RI/FS for LF05 and Source 1 must be revisited because of this NPL placement. The Air Force expects significant changes in the installation's current cost and schedule to complete based on the NPL decision.

The installation began formal partnering with EPA Region 3, the Maryland Department of the Environment, and the Prince Georges County Health Department.

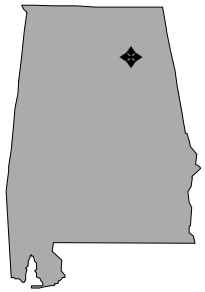
Plan of Action

- Begin RI/FS for Source 1, 2, and 4 in FY00
- Develop new cost and schedules to complete based on NPL decision in FY00
- Continue support of partnering efforts with the regulatory community in FY00

FY00 Funding by Phase and Relative Risk



FFID: AL421382002700
Size: 600 acres
Mission: Maintain combat vehicles
HRS Score: 51.91; placed on NPL in March 1989
IAG Status: IAG signed in June 1990
Contaminants: VOCs, heavy metals, phenols, petroleum products, acids, and caustics
Media Affected: Groundwater and soil
Funding to Date: $40.5 million
Estimated Cost to Completion (Completion Year): $70.8 million (FY2032)
Final Remedy in Place and Response Complete Date for All Sites: FY2008



Anniston, Alabama

Restoration Background

Since 1948, the Army has repaired, rebuilt, and modified combat vehicles and artillery equipment at the Anniston Army Depot Southeast Industrial Area (SIA). Painting, degreasing, and plating operations at the installation generate wastes containing volatile organic compounds (VOCs), phenols, heavy metals, and petroleum distillates. Studies revealed soil and groundwater contamination at 44 sites, most prominently with VOCs, metals, and phenols.

From FY79 to FY89, cleanup activities included pumping waste from an unlined lagoon into a lined lagoon, removing sludge and contaminated soil at RCRA corrective action sites, and installing groundwater interception and treatment systems that use air stripping and carbon adsorption to remove VOCs and phenols. In FY93, the installation removed sludge contaminated with VOCs, metals, and petroleum products from a former industrial wastewater treatment plant.

In FY95, the installation removed two underground storage tanks (USTs) and incorporated the associated contaminated groundwater into the Groundwater Operable Unit (OU). Under an interim Record of Decision (ROD), the installation began a pilot study to address problems with chemical fouling in the groundwater extraction system. The Army developed an Emergency Response Plan to identify further response actions at public water-supply sites and residential wells that might be affected by activities at the installation. The installation addressed community concerns by sampling residential groundwater wells.

In FY96, the Army completed a source delineation at Solid Waste Management Unit (SWMU) 12 and the fieldwork for Phase II of the Remedial Investigation and Feasibility Study (RI/FS).

In FY97, the installation completed dye-tracing work at OU3, the off-post OU. The monitoring well inventory also was completed. A Phase I RI began at the TNT Washout Facility and leaching beds in the Ammunition Storage Area (ASA). A partnership initiative began that involved all members of the restoration process, including federal and state regulators. The installation also held two Technical Review Committee meetings and a public availability meeting.

In FY98, the installation completed the SIA Phase II RI report and submitted the draft SIA Groundwater OU FS. The installation updated its Community Relations Plan. The report on the groundwater dye tracer test, the Building 504 groundwater recovery trench optimization report, and the closure plan for SWMU 2 also were completed. Fieldwork concluded on the ASA RI, the Off-Post Groundwater OU RI Ecological Risk Screening, and the geophysical study along the depot boundary. At SWMU 12, the Army completed soil cleanup using hydrogen peroxide injection for Blocks 1 and 2. Also in FY98, the installation formed a Restoration Advisory Board (RAB).

FY99 Restoration Progress

The installation completed the SIA Groundwater and Soil OU FSs, the 5-year review of the interim ROD for the SIA Groundwater OU, and the Proposed Plan for the SIA Groundwater OU. Fieldwork began on the Off-Post Groundwater OU RI and the hot spot remediation of SWMU 12 groundwater. Fieldwork was completed for the dye tracer study. The Army sampled off-post private drinking water wells as a result of dye hits from the tracer test. The draft ASA RI/FS and the SIA Groundwater OU ROD were completed. The installation designed and implemented an environmental geographic information system. The Army completed 70 percent of the Remedial Design for the SIA Groundwater OU treatment plant; the remainder of the design will be performed during conversion of the existing chromium treatment plant and construction of the facility.

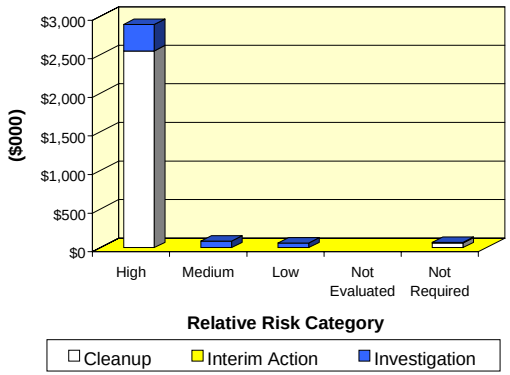
The Army did not complete the SWMU 12 Removal Action because elevated contaminant levels were found in 5 percent of the treated area. Alternative technologies are being evaluated for completing this action.

The RAB meets quarterly and has played an active role in reviewing and discussing installation cleanup activities. Bimonthly partnering meetings among regulators, contractors, and installation personnel have helped accelerate document and fieldwork schedules, resulting in reduced cost for ongoing projects.

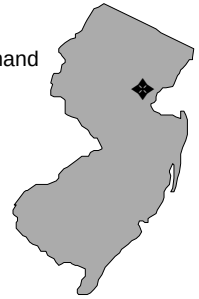
Plan of Action

- Complete Removal Action at SWMU 12 in FY00
- Complete the SIA groundwater and soil RODs and the ASA RI/FS in FY00
- Complete conversion of the chromium treatment plant to an SIA groundwater treatment system in FY00
- Complete the hot spot groundwater treatment at SWMU 12 in FY00
- Conduct an off-post private water well and spring inventory in FY00

FY00 Funding by Phase and Relative Risk



FFID: NJ221382070400
Size: 6,500 acres
Mission: House the Army Armaments Research, Development, and Engineering Command
HRS Score: 42.92; placed on NPL in February 1990
IAG Status: IAG signed in July 1991
Contaminants: VOCs, explosives, PCBs, and heavy metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $72.7 million
Estimated Cost to Completion (Completion Year): $61.5 million (FY2015)
Final Remedy in Place or Response Complete Date for All Sites: FY2010



Rockaway Township, New Jersey

Restoration Background

In 1880, Dover Powder Depot, now known as Picatinny Arsenal, was established to store the gunpowder needed to manufacture ammunition. From 1898 to the early 1970s, the installation manufactured explosives, propellants, and ammunition. It now houses the Army Research, Development, and Engineering Command.

In FY91, the installation identified 156 sites, including a burning ground, landfills, underground storage tanks (USTs), former production areas, and former testing sites. Releases of volatile organic compounds (VOCs), explosives, and heavy metals from these sites have contaminated groundwater, surface water, sediment, and soil.

A Remedial Investigation and Feasibility Study (RI/FS), beginning in FY91, divided the installation into 16 areas and organized the investigation in three phases. The installation conducted an additional RI for the burning ground in FY94. Interim Actions included removing USTs, installing a groundwater extraction and treatment system, and removing drums from a landfill.

In FY95, the installation conducted several Interim Actions, including cleanup of lead-contaminated soil, operation of a groundwater pump-and-treat system for an on-site trichloroethene plume, and installation of a drinking water line to 12 nearby residences. The FS for the burning ground was submitted to the regulatory agencies. In FY96, the commander converted the Technical Review Committee to a Restoration Advisory Board (RAB).

In FY97, the regulators approved the revised Phase I RI report. The Army completed RI fieldwork, the draft Phase II RI report, and relative risk scoring of all sites. The Phase II Ecological Risk Assessment (ERA) work plan was approved by the regulators and implemented by U.S. Army Corps of Engineers contractors. The installation submitted a revised risk assessment for Site 20/24 to the regulators with no Removal Action recommended.

In FY98, the installation completed Relative Risk Site Evaluations at the two remaining sites and completed geological and hydrogeological studies at the Post Farm Landfill. The installation received approval for, and implemented, the Phase III Interim Remedial Action work plan. The Agency for Toxic Substances and Disease Registry provided a draft review of public health consultation based on the revised risk assessment for Site 20/24.

The installation procured a contract through the Technical Assistance for Public Participation (TAPP) program to provide technical support for the RAB in FY98. The TAPP project provided the community members of the RAB with an independent technical review of restoration documents and reports summarized in nontechnical terms so that all RAB members can readily understand the issues.

FY99 Restoration Progress

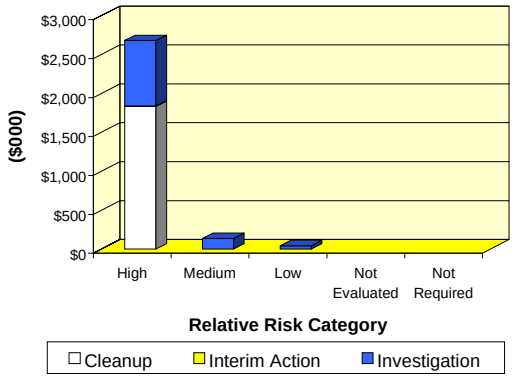
The installation submitted Site Inspection work plans for Sites 3, 31, 192, and 199, which were approved by the State of New Jersey and EPA Region 2. The installation completed a work plan for the Site 20/24 Data Report. The Phase II ERA report and the FSs for Area D Groundwater, Green Pond Brook, and Bear Swamp Brook were completed and are under review by the Army. The Army completed fieldwork for the RI report for Area F and G groundwater, but the report was not completed as planned because of a lengthy review process. The installation began preparing reports for the Area E Groundwater FS and the Phase III 1A RI. The installation submitted the Phase II RI report, an Engineering Evaluation and Cost Analysis (EE/CA) for polychlorinated biphenyl (PCB)–contaminated soil at Site 122, and the FS for Site 20/24 to EPA. The installation has not received regulatory approval for the No Further Action decisions on appropriate sites based on nonresidential cleanup standards.

A dispute between the Army and the State of New Jersey over determining levels of soil contamination was resolved when the parties agreed to a compromise. The Army will, on a case-by-case basis, initiate institutional and/or low-cost engineering controls for soil at sites where levels of contamination are above the state standards but where risk is acceptable per federal National Contingency Plan criteria.

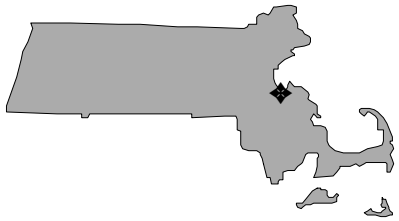
Plan of Action

- Complete eight investigative reports in FY00
- Complete FSs for Post Farm Landfill, Area D Groundwater, Green Pond Brook, Area E, and the burning ground in FY00
- Complete decision documents for institutional controls for 14 sites in FY00
- Complete EE/CA for PCBs at Site 122 and conduct Removal Action in FY00
- Submit FS and Record of Decision for Site 20/24 in FY00
- Submit ecological reports for Phases I and II in FY00
- Complete Area B Groundwater FS in FY01

FY00 Funding by Phase and Relative Risk



FFID: MA121382093900
Size: 48 acres
Mission: Conduct materials research and development
HRS Score: 48.60; placed on NPL in May 1994
IAG Status: Signed July 25, 1995
Contaminants: Radionuclides, heavy metals, petroleum products, solvents, pesticides, and PCBs
Media Affected: Soil and surface water
Funding to Date: $98.1 million
Estimated Cost to Completion (Completion Year): $1.2 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Watertown, Massachusetts

Restoration Background

In December 1988, the BRAC Commission recommended closure of the Army Materials Technology Laboratory (Army Research Laboratory), Watertown. The Army has moved the installation's mission activity to a combined laboratory at Aberdeen Proving Ground, Maryland. The installation closed, as scheduled, on September 30, 1995.

Environmental studies at the installation concluded that most of the soil was contaminated with petroleum products, pesticides, and polychlorinated biphenyls (PCBs). Similar chemical and metal contaminants were present in a number of laboratories and machine shops. The installation divided its Remedial Investigation and Feasibility Study (RI/FS) activities into three areas (indoor, outdoor, and Charles River).

Interim Actions have included asbestos abatement, removal of all known aboveground and underground storage tanks, remediation of petroleum-contaminated soil, decommissioning of the central heavy-oil-fired power plant, retrofitting and disposal of PCB-containing transformers, closing of cooling water discharge sources, and reactor decommissioning.

The installation formed a BRAC cleanup team (BCT) and a Restoration Advisory Board (RAB) in FY94.

In FY96, the installation completed decommissioning of facilities contaminated with radioactive materials. The installation also completed removal and demolition of the tank farm. The Army and regulators signed a Record of Decision (ROD) for the Outdoor Soil and Groundwater Operable Unit (OU). The BCT expedited development of a second ROD for Building 131.

In FY97, the installation initiated soil and indoor remediation and completed cleanup for 11 contaminated soil areas that exceeded acceptable risk levels. The BCT separated the 11-acre River Park Parcel from the 37-acre installation parcel for future resolution, coordinated soil remediation, assessed indoor cleanup criteria, developed the Charles River RI/FS, and finished the Building 60/227 RI/FS.

In FY98, the installation completed remediating the Indoor OU and the soil areas within the 37-acre parcel. A Finding of Suitability to Transfer (FOST) and related transfer documents were signed. The Army implemented land use controls to prevent, through state prohibitions and oversight, future owners from digging in areas contaminated with polyaromatic hydrocarbons unless they dispose of, or remediate, the material properly. The installation accomplished and obtained approval of the Environmental Assessment for the River Park. At the Army's request, EPA began deleting the 37-acre parcel from the National Priorities List (NPL).

FY99 Restoration Progress

The Army published in the *Federal Register* the notice of partial deletion of the 37 acres transferred to Watertown. EPA received no comments. EPA is putting the official notification into the *Federal Register*. The Yacht Club is developing a remediation plan to treat its 1979 oil spill and the related contaminated soil. The proposed new owner of the property (MDC) is working closely with the BCT to review cleanup options and land use controls. The possibility of combining the OUs was also evaluated. The installation designated a 10-foot-wide parcel along the river as the Riverbank; that parcel will be remediated as part of the River OU.

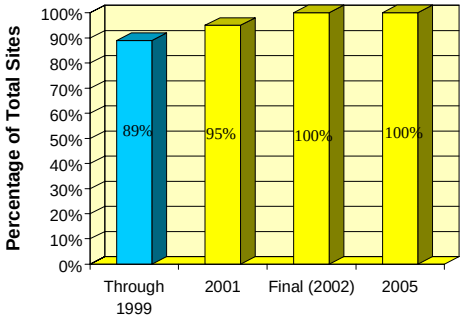
The Charles River RI/FS began and reevaluation of the soil contamination at the 11-acre River Park continued. Neither effort was completed, because the work is being negotiated with the regulators. Alternatives have been presented to the RAB and the River Trustees. Work will include a natural resource component that can be used to offset the installation's past impacts on the river ecology. The MDC draft master plan has been used as a guideline and is expected to become final later in the year.

The RAB continued to meet monthly. It reviewed all documents and provided suggestions and comments. The BCT continued to review land use control amendments and to evaluate the Charles River and River Park options.

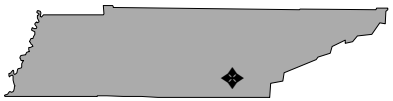
Plan of Action

- Delete the 37-acre parcel from the NPL in FY00
- Complete soil remediation at River Park in FY00
- Complete the Charles River RI/FS in FY00, and the ROD and RA in FY01
- Complete the FOST for River Park in FY01
- Transfer and delete the 11-acre River Park parcel from the NPL in FY02
- Complete BRAC activities in FY02

Sites Achieving RIP or RC Per Fiscal Year



FFID: TN457172404400
Size: 40,000 acres
Mission: Simulate flight conditions
HRS Score: 50.00; proposed for NPL in August 1994
IAG Status: None
Contaminants: VOCs, PCBs, heavy metals, acids, petroleum hydrocarbons, and asbestos-containing material
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $57.6 million
Estimated Cost to Completion (Completion Year): $53.6 million (FY2027)
Final Remedy in Place or Response Complete Date for All Sites: FY2003



Coffee and Franklin Counties, Tennessee

Restoration Background

Arnold Engineering Development Center (AEDC) is an advanced aerospace ground test, evaluation, and simulation facility. AEDC conducts tests, engineering analyses, and technical evaluations for research, system development, and operational programs that simulate operational conditions.

Principal sites at the installation include a landfill, a chemical treatment plant, a main testing area, a leaching pit, a leachate burn area, and a fire training area. The chemical treatment plant, main testing area, and leaching pit contain soil and groundwater contaminated with volatile organic compounds (VOCs).

Between FY88 and FY94, the installation removed 37 underground storage tanks. In FY89, a RCRA Facility Assessment identified 110 solid waste management units (SWMUs). RCRA Facility Investigations (RFIs) were conducted at 13 of these units, and the need for additional sampling was identified for 57. In FY94, the confirmatory sampling and RFI fieldwork were conducted, Preliminary Assessments were completed for all remaining sites, and RCRA closure was approved for four hazardous waste facilities.

In FY95, several Interim Remedial Actions (IRAs), the RFI Phase I Report, and confirmatory sampling for Site 19 were completed. IRAs included low-temperature thermal treatment of soil contaminated with VOCs and installation of a groundwater extraction and treatment system. In FY96, the installation completed Remedial Designs for modified RCRA landfill caps at Sites 1 and 3. The installation also implemented three interim corrective measures to treat contaminated groundwater.

In FY97, the installation constructed 36 wells to monitor groundwater at Site 19. The installation also performed a Corrective Measures Study (CMS) at three other sites and completed the landfill cap at Site 1.

In FY98, the Site LF-3 landfill clay cap was completed as planned. Eight solvent recovery wells were added to the source removal/control system at Site WP-8. Two groundwater source control wells were added to the system at Site WP-6. On the basis of plume movement and geographic information system modeling, the groundwater monitoring program was expanded to include 62 private drinking water wells as potential downgradient receptors. Phase I of a zero valent iron dechlorination (ZVID) pilot study and Phase I data collection for a phytoremediation pilot study were completed. Three CMSs began at Sites 6, 8, and 22. RFI work plans were drafted and submitted to EPA for approval.

In FY91, the installation formed a Technical Review Committee, which was converted to a Restoration Advisory Board (RAB) in FY95.

FY99 Restoration Progress

The installation began installing public water connections for residents downgradient of the Site WP-6 plume. Twenty homes will be connected to the water line. Data collection to evaluate the effectiveness of source containment at Site WP-6 is in progress. Delineation of the Site SS-22 plume migration pathway is under way. The installation successfully completed an emergency response action at Site LF-3. A landfill boundary soil gas collection system was designed, contracted for, and constructed to mitigate an emergency situation involving methane gas migration to a local high school and residences. In addition, 22 SWMUs in Site SS-22 were designated for No Further Action during the year.

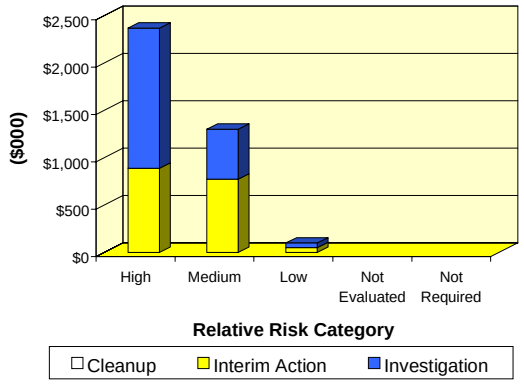
RFI No. 3 fieldwork was completed; however, additional data requirements were identified during the investigation. RFI No. 4 fieldwork was delayed pending regulatory review of the work plan. The ZVID Phase II pilot study is under way. Completion was delayed by construction of a reactor system. CMS efforts for LF-1 and LF-3 are delayed pending final EPA acceptance of RFI reports.

The RAB was converted to a Community Advisory Board.

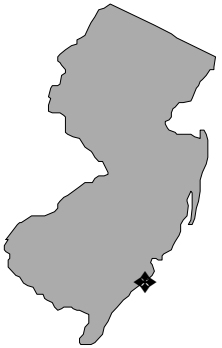
Plan of Action

- Finish the ZVID Phase II pilot study in FY00
- Complete installation of public water connections for residents downgradient of the Site WP-6 plume in FY00
- Complete draft RFI No. 3 report in FY00
- Complete Site WP-6 CMS work plan in FY00 and complete CMS report in FY01
- Complete RFIs for Sites WP-8 and SS-19 in FY01
- Complete the Remedial Investigation for SS-22

FY00 Funding by Phase and Relative Risk



FFID: NJ257282844900
Size: 280 acres
Mission: Provide Air National Guard training
HRS Score: 39.65; placed on NPL in August 1991
IAG Status: Federal Facility Agreement signed in July 1993
Contaminants: VOCs, SVOCs, lead, copper, and pesticides
Media Affected: Groundwater and soil
Funding to Date: $1.5 million
Estimated Cost to Completion (Completion Year): $1.1 million (FY2014)
Final Remedy in Place or Response Complete Date for All Sites: FY2004



Pleasantville, New Jersey

Restoration Background

Atlantic City International Airport is a Federal Aviation Administration (FAA) facility. It was placed on the National Priorities List (NPL) in 1991 because of its proximity to the South Branch of Doughty's Mill Stream, which flows into Upper Atlantic City Reservoir, a source of drinking water for local residents. In addition, a sole-source aquifer underlying the FAA facility contributes 85 to 90 percent of the watershed for the Upper Atlantic City Reservoir. Sites located at the facility are the FAA salvage yard, the FAA jet fuel farm, the FAA fire training facility, and the FAA's old landfill.

The 177th Fighter Wing, New Jersey Air National Guard (ANG), is a tenant at the FAA facility. The installation's mission is to maintain fighter aircraft on continuous peacetime air defense alert to preserve U.S. air sovereignty. During wartime, the mission is to mobilize personnel and equipment for deployment to designated locations and to use air-to-air munitions in strategic defense of the North American continent. The ANG sites were not ranked for the NPL, but the ANG facility is on the NPL because it is a tenant on the FAA property.

A Preliminary Assessment (PA) for the ANG facility, completed in November 1989, identified six sites. The PA recommended Site Inspections (SIs) at all six. Two of the sites (Sites 1 and 4) were already being investigated by the FAA and were referred to FAA for further investigation. None of the ANG sites is suspected of contributing to contamination of groundwater. An SI was completed by HAZWRAP in FY95 at Sites 2, 3, 5, and 6.

A Memorandum of Agreement (MOA) between the FAA and the Air National Guard Readiness Center (ANGRC) was signed in FY95. The MOA stipulates that the FAA will perform any additional studies, and the Remedial Design and Remedial Action if necessary, at ANG sites. ANGRC will provide funding. An SI addendum for additional soil and groundwater sampling at Sites 2, 3, 5, and 6 was performed in FY95. In FY96, the FAA completed fieldwork required under the SI addendum, and the draft SI report.

The SI addendum was completed in FY97. Relative risk evaluations were completed at Sites 2, 3, 5, and 6. A Technical Review Committee meets every 6 weeks. In FY98, several small metal anomalies were discovered at Site 6, but no drums were found.

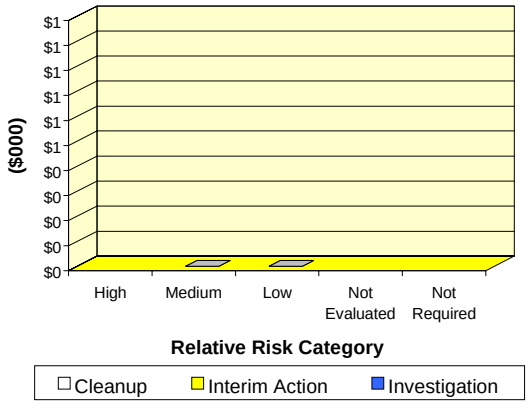
FY99 Restoration Progress

An SI addendum was completed and is under review by the FAA. Based on the results of the SI, the future scope of work at the 177th Fighter Wing is being reevaluated. Cost increases are anticipated.

Plan of Action

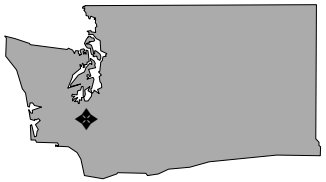
- Initiate Remedial Investigation in FY00

FY00 Funding by Phase and Relative Risk



Bangor Naval Submarine Base NPL

FFID: WA017002729100
Size: 7,001 acres
Mission: Provide support base for Trident submarines
HRS Score: 30.42 (Bangor Ordnance Disposal); placed on NPL in July 1987
55.91 (Bangor Naval Submarine Base); placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in January 1990
Contaminants: Residual TNT, RDX, Otto fuel, dinitrotoluene, benzene, PCBs, pesticides, and chlorinated organic compounds
Media Affected: Groundwater, soil, and sediment
Funding to Date: $74.4 million
Estimated Cost to Completion (Completion Year): $28.0 million (FY2031)
Final Remedy in Place or Response Complete Date for All Sites: FY2001



Silverdale, Washington

Restoration Background

From the early 1940s until it was commissioned as a submarine base in 1977, Bangor Naval Submarine Base was used to store, process, and ship munitions. Past environmental chemical releases at the installation are primarily related to the detonation, demilitarization, and disposal of explosive ordnance and associated activities. The Navy conducted an Initial Assessment Study in FY83 to identify sites requiring further investigation because of suspected soil and groundwater contamination.

In FY90, the Navy, EPA, and the State of Washington signed a Federal Facility Agreement (FFA) for the installation. Investigation of 22 sites was recommended. These sites were grouped into eight operable units (OUs) for the Remedial Investigation and Feasibility Study (RI/FS). A Record of Decision (ROD) was required for each OU. Between FY91 and FY97, seven RODs were completed and five expedited response actions were performed. By the end of FY97, 17 sites required no further action, and groundwater cleanup was initiated at two sites.

The installation removed underground storage tanks (USTs) from four sites and removed drums and reconstructed a bermed area at OU7. In FY95, the installation worked to provide alternate drinking water supplies to nearby residences. In FY96, Remedial Designs (RDs) were completed for OU2 and for soil at OU6. Remedial Actions (RAs) were started at OU2, OU6, and UST 1. An Interim Remedial Action (IRA) at OU8 began, consisting of construction of a pump-and-treat groundwater treatment system. The installation began long-term monitoring at Sites 10 and 26 in OU7, signed a ROD for OU7, and developed an RD for OU7. During FY97, the installation completed the RA for soil and began one for groundwater at OU2. Five-year monitoring was performed at OU3. The RA for soil and groundwater and off-site disposal of soil began at OU7. An investigation was completed and an RA began at UST 4. An RA at OU1 and the RI for OU8 were completed. The pump-and-treat system began operation at OU8.

In FY98, construction completion documents for OUs 1, 2, and 7 were submitted to EPA and Washington State. RAs were completed for OUs 6 and 7. Five-year reviews were prepared for OUs 1, 2, and 3. A Removal Action was completed at Camp Wesley Harris. The RA construction for UST 4 was completed, and the remediation system began operation. Cleanup levels were met for all media at all OUs, except those for groundwater at OUs 1, 2, and 8.

The installation completed a Community Relations Plan in FY91 and updates it biannually. A Technical Review Committee was formed in FY87 and converted to a Restoration Advisory Board (RAB) in FY96.

FY99 Restoration Progress

Compliance and performance monitoring and operation and maintenance continued at OUs 1, 2, 7, and 8 and USTs 1 and 4. Monitored natural attenuation (NA) is under evaluation for OU8. Data gathering and modeling delayed the ROD process for OU8 until FY00. The RA for UST 1 was completed after evaluation against newly promulgated Washington State risk-based interim total petroleum hydrocarbon guidance. The RA for UST 4 will continue to operate through December 1999.

OU1's surface water and groundwater RA objectives were reevaluated, and steps were taken to amend the ROD. The groundwater reevaluation was delayed because of staffing limitations. An explanation of significant differences was completed, allowing closure of the soil leach basin and direct discharge to surface water of the leachate. The leach basin was reconfigured to allow the discharge. The planned 5-year review was not conducted because the OU8 ROD was not signed.

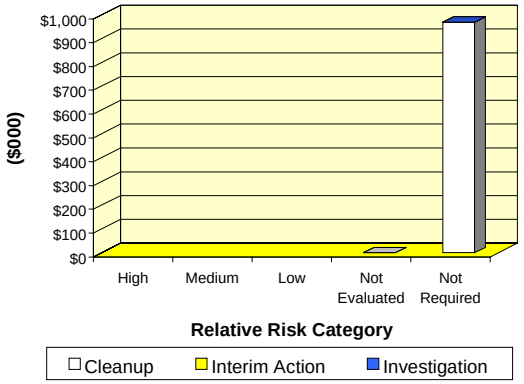
The installation has employed NA monitoring as the remedy at OU8. It also uses three-dimensional fate-and-transport modeling including biological and chemical degradation of the contaminants. The FS and Proposed Plan were drafted and briefed to EPA, with verbal approval of the NA remedy. Progress on OU8 was put on hold at midyear due to staffing limitations. An explanation of significant differences was completed, allowing closure of the soil leach basin and direct discharge to surface water of the leachate. The leach basin was reconfigured to allow the discharge. The planned 5-year review was not conducted because the OU8 ROD was not signed.

The RAB meets monthly.

Plan of Action

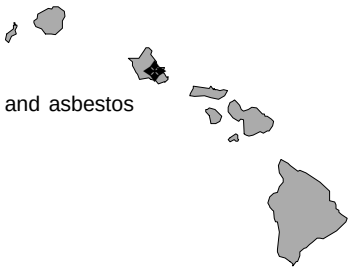
- Sign OU8 and amend OU1 ROD in FY00
- Conduct 5-year review for all OUs except OU3 in FY00
- Complete RA at UST 4 and RD for OU8 in FY00
- Investigate NA of ordnance compounds in FY00
- Complete OU8 construction in FY01
- Amend OU2 ROD in FY01

FY00 Funding by Phase and Relative Risk



Barbers Point Naval Air Station — BRAC 1993

FFID: HI917002432600
Size: 3,816 acres
Mission: Maintain and operate facilities and provide services and material support to aviation activities and units of the operating forces
HRS Score: NA
IAG Status: None
Contaminants: PCBs, heavy metals, petroleum hydrocarbons, pesticides, solvents, and asbestos
Media Affected: Groundwater and soil
Funding to Date: $27.6 million
Estimated Cost to Completion (Completion Year): $18.8 million (FY2012)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY2012



Barbers Point, Hawaii

Restoration Background

In July 1993, the BRAC Commission recommended closure of Barbers Point Naval Air Station. The installation was closed on July 2, 1999.

In the early 1980s, a Preliminary Assessment identified nine sites at the installation. Contamination sources include disposal pits, a pesticide shop, a landfill, and transformer sites. In FY93, an Expanded Site Inspection determined that only one site required further investigation. Primary contaminants include polychlorinated biphenyls (PCBs) and heavy metals.

In FY94, the installation began Remedial Investigation and Feasibility Study (RI/FS) activities for 17 areas identified for further investigation. After an initial site characterization, two groups of underground storage tanks (USTs) were added to the sites already identified. Other USTs had been removed in FY92 and FY93. The installation completed an Environmental Baseline Survey in FY94.

A Restoration Advisory Board and a BRAC cleanup team (BCT) were formed in FY94. The installation also maintains an information repository. A Community Relations Plan was prepared in FY95. The BCT decided to conduct Interim Remedial Actions (IRAs) at all sites requiring cleanup.

During FY96, the installation removed waste from one UST site and completed a Corrective Action Plan (CAP) for another UST site. In FY97, Engineering Evaluations and Cost Analyses (EE/CAs) were started for Sites 1, 2, and 20. A CAP was completed for UST 6. Relative Risk Site Evaluations have been completed at all sites where required. The latest version of the BRAC Cleanup Plan was completed. Regulatory agencies approved 1,700 acres as uncontaminated. A Land Reuse Plan was approved.

During FY98, further investigations were conducted at Sites 1 (groundwater monitoring), 2 (groundwater, surface water, and sediment monitoring), 15 (groundwater sampling), 18 (Removal Site Evaluation [RSE]), and 19 (groundwater monitoring) and at USTs 6 and 7 (groundwater monitoring). UST 2 was closed. The EE/CA for Site 2 and the EE/CA and Remedial Design (RD) for Site 20 were completed. The IRA for Site 20 began. Further investigations at Sites 14 (RI/FS) and 15 (RD), an IRA at Site 1, and an EE/CA for Site 22 began.

FY99 Restoration Progress

An RSE was conducted at Site 18 as part of the RI/FS phase. EE/CAs were prepared for Sites 1 and 18, and RDs were completed for Sites 15 and 18. IRAs were conducted at Sites 1, 15, 18, and 20 and began at Site 22, UST 3, and aboveground storage tank (AST) 4. Sites 5, 8 through 13, and 19 were closed. Records of Decision (RODs) were signed for all of these sites and for Sites 15 and 20. Monitoring continued as part of the RI/FS at Sites 1, 2, and 19. An EE/CA and an IRA were conducted and a ROD was prepared under the RI/FS phase.

Of the 2,650 acres to be transferred, 2,386 were deemed uncontaminated. Findings of Suitability to Transfer were prepared for nine parcels of land, totaling 1,565 acres.

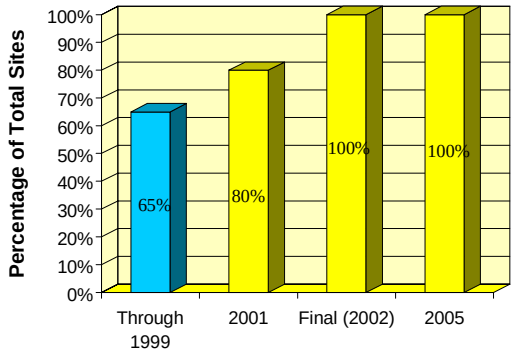
The EE/CA for Site 14 was not conducted, because lack of funds delayed the RI. An IRA at Site 2 was not conducted because no action was necessary. This IRA may be conducted in the future if monitoring results indicate that one is necessary.

Fencing was installed around three of the five firing ranges at the site, and bullet removal began at three of the five ranges. An IRA contract was awarded for soil removal at two of the five ranges.

Plan of Action

- Complete RI and prepare EE/CA for Site 14 in FY00
- Complete RI for Site 2 in FY00
- Continue implementation phase at AST 4 and UST 3 in FY00 and FY01
- Continue long-term monitoring for Site 19 in FY00
- Initiate RD for Site 1 in FY00
- Conduct IRA at Site 18 in FY00
- Award IRA contract at third range in FY01
- Conduct IRA at Sites 1, 2, 14, 15, 18, 20, and 22 in FY01

Sites Achieving RIP or RC Per Fiscal Year



Barstow Marine Corps Logistics Base NPL

FFID: CA917302426100
Size: 5,688 acres
Mission: Maintain, repair, rebuild, store, and distribute supplies and equipment; formerly conducted industrial operations
HRS Score: 37.93; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in October 1990
Contaminants: Heavy metals, PCBs, petroleum hydrocarbons, pesticides, herbicides, and VOCs
Media Affected: Groundwater and soil
Funding to Date: $87.0 million
Estimated Cost to Completion (Completion Year): $54.0 million (FY2029)
Final Remedy in Place or Response Complete Date for All Sites: FY2010

Barstow, California

Restoration Background

Marine Corps Logistics Base Barstow consists of Yermo Annex, Nebo Main Base, and the Rifle Range. Operations that contributed to contamination are vehicle maintenance, repair and maintenance of weapons and missile systems, and storage of petroleum and chemical products. The installation was placed on the National Priorities List (NPL) after high concentrations of trichloroethene were detected in groundwater monitoring wells.

Initial Assessment Studies and other investigations conducted between FY83 and FY90 identified 38 CERCLA sites and 2 underground storage tank (UST) sites. Site types include sludge disposal areas, plating waste disposal areas, low-level radioactive waste storage areas, spill sites, and evaporation ponds. To facilitate cleanup efforts, in accordance with the Federal Facility Agreement, the sites were grouped into seven operable units (OUs). OUs 1 and 2 address groundwater contamination at Yermo Annex and Nebo Main Base, respectively. OUs 3, 4, 5, and 6 address contaminated soil at 36 sites. OU7 was established for new sites.

After an Action Memorandum was completed in FY89, the Navy installed an activated carbon groundwater treatment system to address volatile organic compounds (VOCs) in the Yermo drinking water system. During FY92, the installation removed 41 abandoned USTs from UST Area 1. In FY93, an Interim Remedial Action at OU2 provided potable water to nearby residents. The installation removed industrial waste sludge from the Oil Storage/Spillage and Industrial Wastewater Treatment Plant. The percolation ponds at Site 35 were aerated, and a filter was installed to remove solvents from water before it was discharged into ponds.

In FY94, the installation excavated and disposed of contaminated soil from two sites. Carbon filtration systems were installed in wells at private residences near Yermo Annex. The installation completed an investigation of UST Area 2 and conducted Remedial Investigation and Feasibility Study (RI/FS) activities at all 38 sites.

During FY96, the installation completed construction of the groundwater treatment system at OU1. EPA Region 9 initiated a RCRA Facility Assessment (RFA), and EPA completed the RFA for 61 sites. In FY97, the installation completed the RI/FSs for OUs 5 and 6, signed a Record of Decision (ROD) for OUs 3 and 4, finished a remedial site evaluation and a Removal Action at Site 21, and completed corrective actions at UST Area 2.

In FY98, the installation completed RODs for OUs 1, 2, 5, and 6. Groundwater cleanup (OU 1 and 2, CERCLA Areas of Concern [CAOC] 37 and 38) is estimated to take 30 years. Investigations were completed at three USTs, under UST 2. The RFA report, recommending 15 solid waste management units (SWMUs) for further investigation was finalized. The Remedial Design (RD) and Remedial Action (RA) work plan for the OU1 and OU2 off-base groundwater extraction (GWE) system was started.

In FY91, the installation formed a Technical Review Committee, prepared a Community Relations Plan, and established an information repository and an administrative record.

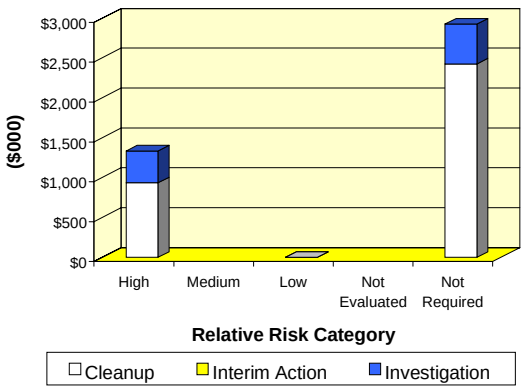
FY99 Restoration Progress

RAs at CAOCs 20 and 23 were completed. RD finalization and RA construction began for the OU1 and OU2 (including CAOCs 37 and 38) off-base GWE systems. The RD is on hold, pending further plume delineation. RA construction started at CAOC 7. RA construction at CAOC 35 is awaiting funding. Thirty UST sites were submitted for closure. An Extended RFA investigation for 15 SWMUs began. Long-term operations and long-term monitoring continued at Yermo and Nebo and are expected to continue for approximately 30 years.

Plan of Action

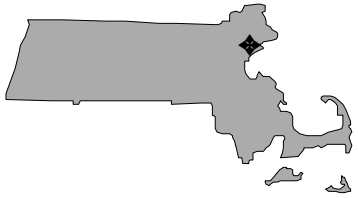
- Finalize OU 1/2 off-base GWE system designs and RA work plans in FY00
- Replace dry monitoring wells and optimize treatment systems at Yermo, OU1, in FY00
- Conduct an FS for Nebo North air-sparging and soil vapor extraction in FY00
- Perform RA at CAOC 35, OU5, in FY00
- Complete RA construction and begin closeout of CAOC 7, OU6, in FY00
- Complete extended RFA report in FY00
- Prepare a Proposed Plan and begin FS for Nebo South source cleanup in FY00
- Close out 26 tanks in UST 2 in FY00
- Complete closeout for CAOCs 7 and 35 in FY01
- Prepare FS for Nebo South, CAOC 39, in FY01

FY00 Funding by Phase and Relative Risk



Bedford Naval Weapons Industrial Reserve Plant NPL

FFID: MA117002357000
Size: 46 acres
Mission: Design, fabricate, and test prototype weapons and equipment
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement signed in September 1999
Contaminants: Acids, BTEX, incinerator ash, industrial wastes, paints, petroleum/oil/lubricants, photographic wastes, solvents, and VOCs
Media Affected: Groundwater and soil
Funding to Date: $12.4 million
Estimated Cost to Completion (Completion Year): $10.8 million (FY2017)
Final Remedy in Place or Response Complete Date for All Sites: FY2002



Bedford, Massachusetts

Restoration Background

This government-owned, contractor-operated plant produces and tests prototype weapons and equipment, such as missile guidance and control systems. Four sites have been identified at the installation: Site 1 (incinerator ash disposal areas), potential soil contamination with ash and heavy metals; Site 2 (components laboratory fuel oil tank), potential soil contamination with low levels of petroleum/oil/lubricants; Site 3 (northwest groundwater plume), groundwater plume contaminated with volatile organic compounds (VOCs); and Site 4 (former fuel pump/tank BTEX area), soil and groundwater contaminated with benzene, toluene, ethylbenzene, and xylene (BTEX). The Navy began to dispose of the plant as excess property in FY97.

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY88, and the Phase II RI began in FY92. RI activities through FY93 and FY94 included further characterization of soil contamination, location of sources of the VOC groundwater plume, and characterization of contaminant migration in groundwater.

In FY95, the draft Phase II RI report was submitted for regulatory review. A fate-and-transport groundwater model was initiated to support the risk assessment. In cooperation with the Massachusetts Department of Environmental Protection (MADEP), the Navy implemented an immediate response action to contain and remediate the VOC groundwater plume. The treatment system is expected to prevent migration of VOCs off site.

During FY96, a baseline Human Health and Ecological Risk Assessment work plan was submitted to EPA for approval, and a fate-and-transport report was completed. The RI Phase II supplemental program was initiated in FY97 for Sites 3 and 4.

The pump-and-treat system at Site 3 began operation in March 1997. Monitoring of the treatment facility and quarterly monitoring of the Site 3 extraction and monitoring wells began in FY97.

In FY98, RI Phase II supplemental work plans for Sites 3 and 4 were completed, and both RI supplemental investigations began. An interim Record of Decision (ROD) was initiated for Site 3.

The installation established a Technical Review Committee in FY89 and converted it to a Restoration Advisory Board (RAB) in FY95. A Community Relations Plan (CRP) was developed in FY89 and updated in FY92. An information repository is maintained at the Town of Bedford Public Library. In FY98, the Technical Assistance for Public Participation (TAPP) program was presented to the RAB.

FY99 Restoration Progress

Federal Facility Agreement negotiations were completed, and the document was signed in September. These negotiations delayed the planned interim ROD for Site 3 until FY00. A Site Management Plan was developed, reviewed, and finalized. The installation also completed the RI Phase II supplemental investigation for Sites 3 and 4, initiated the supplemental reports through the draft document stage, and completed FSs for all four Installation Restoration sites.

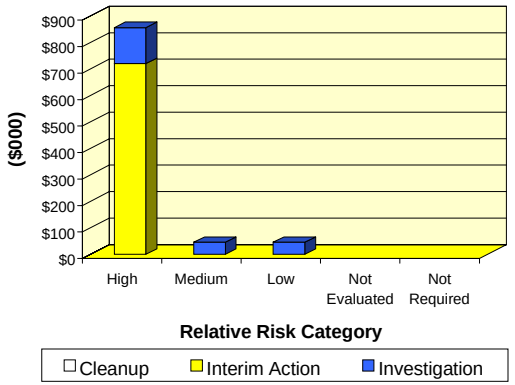
The RI, including Human Health and Ecological Risk Assessments, was not completed because of work required to address the supplemental investigations and the numerous regulatory comments about RI issues. The Installation Restoration Program team agreed that the CRP would be updated in the next fiscal year.

Monthly monitoring at the groundwater treatment facility and quarterly monitoring of the extraction and monitoring wells continued at Site 3. The RAB met four times, and the Navy conducted site tours and continued partnering through FY99.

Plan of Action

- Complete the RI Phase II supplemental reports for Sites 3 and 4 in FY00
- Prepare, review, and implement an accelerated Remedial Action for Site 4 in FY00
- Complete the RI report, including Human Health and Ecological Risk Assessment, for Sites 1 and 2 in FY00
- Continue monthly monitoring of the Site 3 groundwater treatment facility and quarterly monitoring of the extraction and monitoring wells through FY01
- Begin updating the CRP in FY00
- Complete FSs for Sites 1 and 2 in FY00
- Complete the interim ROD for Site 3 in FY00
- Complete No Further Action RODs for Sites 1 and 2 in FY00
- Update the Site Management Plan annually
- Complete the RI report, including Human Health and Ecological Risk Assessment, for Sites 3 and 4 in FY01
- Complete FSs for Sites 3 and 4 in FY01
- Complete RODs for Sites 3 and 4 in FY02
- Begin final RA for Sites 3 and 4 in FY02

FY00 Funding by Phase and Relative Risk



FFID: TX657002418800
Size: 3,216 acres
Mission: Housed the 67th Reconnaissance Wing, 12th Air Force Headquarters, 12th Tactical Intelligence Squadron, 712th Air Support Operations Center, 10th Air Force Reserve, and 924th Fighter Group
HRS Score: NA
IAG Status: None
Contaminants: VOCs, pesticides, petroleum hydrocarbons, metals, and low-level radioactive waste
Media Affected: Groundwater and soil
Funding to Date: $46.2 million
Estimated Cost to Completion (Completion Year): $0 (FY1999)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999

Austin, Texas

Restoration Background

Bergstrom Air Force Base began operations in 1942, maintaining troop carrier units. In July 1991, the BRAC Commission recommended closure of the installation and retirement of the assigned RF-4 aircraft. The installation closed in late FY93, and the Land Reuse Authority (LRA) began to convert the installation to a civilian airport.

Environmental studies since FY83 have identified 30 CERCLA and 452 RCRA sites. Site types include underground storage tanks (USTs), landfills, fuel spill areas, a pesticide evaporation pit, firing ranges, a sludge weathering pit, aboveground storage tanks (ASTs), a fire training area, and a radioactive waste disposal area. Interim Remedial Actions include removal of 106 USTs, removal of contaminated soil and low-level radioactive wastes, and closure of 45 ASTs.

An Environmental Baseline Survey (EBS) was completed in FY93 and updated in FY95. Remedial Actions (RAs) included removal of remaining ASTs, USTs, and oil-water separators. Use of soil vapor extraction and air-sparging systems accelerated cleanup of groundwater plumes at a group of sites.

A BRAC cleanup team and a Restoration Advisory Board (RAB) were formed in FY94. In addition, the Air Force Base Conversion Agency signed a Memorandum of Understanding concerning site management and characterization.

In FY97, the installation completed 37 Removal Actions; cleanup of Installation Restoration Program (IRP) Sites SS-08, SS-10, and SD17; and the latest EBS. The installation also completed the air injection sparging and soil venting project. The RAB was disbanded by the community in FY97 because of the successful remediation efforts at the installation.

In FY98, the installation completed 34 Removal Actions and a Corrective Measures Study (CMS) for the two trichloroethene (TCE) plumes. Construction of landfill caps for the Combined Southeast Landfill (CSLF) Area and improvements on the North and Southfork Drainage Channel were completed. Remediation of soil at the former pistol and rifle ranges was completed. The installation forwarded closure documents recommending no further action (NFA) for 23 of the remaining 60 sites. The installation was established as the Regional Operating Location and took over programs from Carswell AFB, England AFB, and Williams AFB.

FY99 Restoration Progress

The installation completed closure reports and received regulatory approval for the closure of the CSLF Area and several other IRP sites. Long-term monitoring (LTM) of the groundwater associated with the CSLF continued. Remediation of the TCE plumes included completion of a Remedial Design document and installation of treatment system components. Predesign and prestart-up groundwater samples were collected.

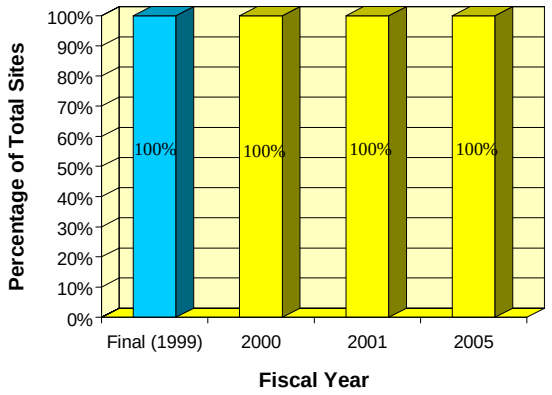
An installation deed transferred 942 acres to the LRA. Of the sites, 439 have been designated for NFA.

RAs, operation of the TCE plume treatment system, and some LTM activities scheduled for completion in FY99 were delayed because of extended Texas Natural Resource Conservation Commission (TNRCC) review and delays in obtaining funding for completion of some projects.

Plan of Action

- Complete remaining RAs in FY00
- In FY00, begin operating the remediation system for the TCE plume that has migrated off base
- Continue LTM of landfills and TCE plumes in FY00
- In FY00, continue to coordinate with the City of Austin, the TNRCC, and EPA on closure of the remaining sites
- Transfer additional acreage to the LRA through the Finding of Suitability to Transfer process in FY00

Sites Achieving RIP or RC Per Fiscal Year



Brandywine Defense Reutilization and Marketing Office — NPL

FFID: MD357182400001
Size: 8 acres
Mission: None (inactive)
HRS Score: 50.15; placed on NPL in May 1999
IAG Status: NA
Contaminants: PCBs and solvents (TCE)
Media Affected: Surface water and groundwater
Funding to Date: $2.8 million
Estimated Cost to Completion (Completion Year): $7.2 million (FY1998)
Final Remedy in Place or Response Complete Date for All Sites: FY2008

Brandywine, Maryland

Restoration Background

The Brandywine facility is an inactive 8-acre former Defense Reutilization and Marketing Office (DRMO) site approximately 8 miles south of Andrews Air Force Base (AFB). Andrews AFB acquired the property from the Navy in 1961, and the Air Force used it to store bulky aircraft parts, aircraft engine fuels and lubricants, paints, chemicals, and other supplies subject to deterioration. No hazardous materials have been stored on site since 1980. The primary contaminants of concern are polychlorinated biphenyls (PCBs) and solvents, including trichloroethene (TCE). The surface water migration pathway for the facility includes wetlands, Timothy Branch, and Mattawoman Creek.

No base personnel or other authorized persons now occupy the site. To prevent access to the property, a chain-link fence with gate locks was constructed around the perimeter of the site. The Air Force has performed three PCB Removal Actions, removing a total of 17,000 cubic yards of contaminated soil; the most recent PCB Removal Action was in 1994. Acceptable PCB concentrations for industrial and unrestricted use of the site were established in 1989 through meetings with regulatory agencies. The Air Force chose to remove PCB-contaminated soil to meet the unrestricted-use standards.

Andrews AFB has installed a groundwater treatment system. The installation has continually monitored the groundwater near the DRMO. The treatment system is operational.

FY99 Restoration Progress

Despite the installation's submittal of rebuttal comments to the proposal to place Brandywine on the National Priorities List (NPL), the base was placed on the NPL in May, 1999. Based on preliminary discussions with EPA Region 3, the Air Force expects significant changes in the installation's current cost and schedule to complete because of the NPL decision.

The Remedial Action (RA) pump-and-treat system for capturing and remediating the TCE groundwater plume began operating.

Plan of Action

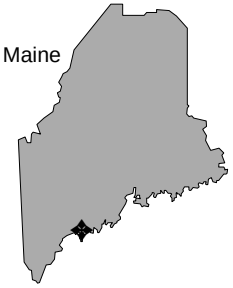
- Begin work on a Remedial Investigation and Feasibility Study in FY00
- Continue operating the RA pump-and-treat system to capture and remediate the TCE groundwater plume in FY00
- Develop new cost and schedules to complete based on NPL decision in FY00
- Continue support of partnering efforts with the regulatory community in FY00

FY00 Funding by Phase and Relative Risk

Cost data are included with Andrews Air Force Base, page A-12.

Brunswick Naval Air Station — NPL

FFID: ME117002201800
Size: 7,259 acres
Mission: Provide facilities, services, materials, and aircraft for submarine warfare
HRS Score: 43.38; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in 1989; revised in 1990 to include the State of Maine
Contaminants: DDT, PCBs, PAHs, VOCs, and metals
Media Affected: Groundwater and soil
Funding to Date: $47.9 million
Estimated Cost to Completion (Completion Year): $12.1 million (FY2016)
Final Remedy in Place or Response Complete Date for All Sites: FY2000



Brunswick, Maine

Restoration Background

Studies conducted since FY83 have identified 19 sites at this installation. Site types include landfills, a groundwater plume contaminated with volatile organic compounds (VOCs), and two underground storage tank (UST) sites. Activities that contributed to contamination included intermediate aircraft maintenance, material support for maintenance, aircraft fueling services, storage and disposal of ordnance, and all-weather air station operations. On-site landfills were used to dispose of wastewater treatment sludge, paints, solvents, medical supplies, pesticides, petroleum products, and photographic and industrial chemicals. The installation was placed on the National Priorities List (NPL) because Sites 1 through 4 and 7 through 9 were used to store or dispose of hazardous waste.

The contaminated groundwater plume associated with Sites 4, 11, and 13 (the Eastern Groundwater Plume) probably originates from a former fire training area; three USTs formerly used to store petroleum products and waste solvents; and a waste pit used to dispose of transformer oils, battery acids, caustics, VOCs, solvents, and paint thinners.

The installation completed Site Inspections for 16 sites from FY85 to FY95. It completed Remedial Investigations and Feasibility Studies for 14 of the 17 active sites, Remedial Design (RD) for 10 sites, and a Remedial Action (RA). A Record of Decision (ROD) was signed in FY92 to address the Eastern Groundwater Plume; this Interim Remedial Action was completed in FY94, and operation and maintenance of the groundwater treatment plant and extraction wells began.

In FY93 and FY94, the installation removed USTs from the Fuel Farm UST site, removed or replaced other USTs, and began full-scale operation of an air-sparging system.

During FY95, the installation completed a Removal Action at the former pesticide shop site where DDT was detected in soil and in unfiltered groundwater samples. Long-term monitoring (LTM) of groundwater is being conducted at the site. In FY96, the installation constructed landfill caps at Sites 1 and 3 and developed final RAs at five sites, three of which were designated as Response Complete. The final ROD for the Eastern Groundwater Plume treatment plant was prepared in FY97. The final ROD for Sites 4, 11, and 13 was signed. The air-sparging system at UST 1 was modified, and the air-sparging system at UST 2 was expanded.

In FY87, the installation established an administrative record and an information repository. In FY88, the Community Relations Plan was completed. A Technical Review Committee was formed in FY88 and converted to a Restoration Advisory Board in FY95.

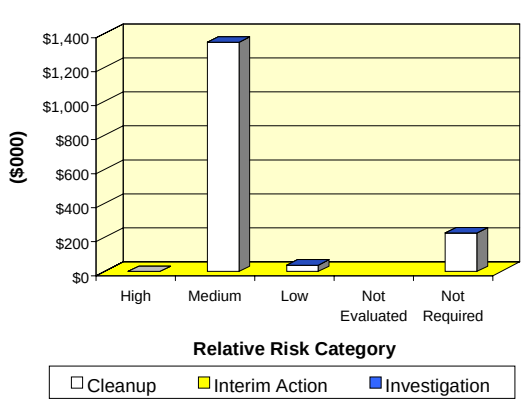
FY99 Restoration Progress

The ROD for LTM with natural attenuation was signed for Site 9. All remaining RODs are expected to recommend No Further Action (NFA). The LTM plans for the majority of Brunswick Naval Air Station were revised, reducing LTM costs. Optimizing of RAs began for Sites 4, 7, 11, and 13, but lengthy planning delayed their completion. An RA was completed at Site 2, and the LTM was initiated. Discovery of buried debris delayed completion of the NFA document for Sites 7, 12, 15, and 16. The statutory 5-year review was initiated. RA operations consisting of air sparging continued at USTs 1 and 2.

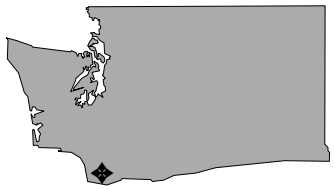
Plan of Action

- Complete 5-year review in FY00
- Investigate RA optimization for USTs 1 and 2 in FY00
- Initiate modification of Eastern Plume treatment plant in FY00 and refine the extraction well system with modifications in FY01
- Complete the NFA document for Sites 7 and 12 in FY00 and Sites 15 and 16 in FY01
- Continue RA for Sites 1, 2, 3, 4, 9, 11, and 13 and USTs 1 and 2 in FY00
- Initiate delisting of Brunswick Naval Air Station from the NPL

FY00 Funding by Phase and Relative Risk



FFID: WA021402011200
Size: 3,020 acres
Mission: Conducted training of active and reserve DoD personnel
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, solvents, and UXO
Media Affected: Soil
Funding to Date: $5.8 million
Estimated Cost to Completion (Completion Year): $43.2 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Vancouver, Washington

Restoration Background

In July 1995, the BRAC Commission recommended closure of Camp Bonneville.

The Army identified 14 areas of concern (AOCs): a leaking underground storage tank (UST) site, three landfills, a burn site, a drum burial site, a paint and solvent burial site, two wash racks, a maintenance pit, grease pits, a pesticide storage facility, and an old sewage lagoon site. The Army initiated site investigation work at the leaking 500-gallon petroleum UST.

In FY96, the Army awarded a contract for the removal of petroleum-contaminated soil at the UST site and completed a survey for lead-based paint and metals in soil.

In FY97, the installation completed an Environmental Baseline Survey and a report on an unexploded ordnance (UXO) archive search. It also began an asbestos survey and characterization of metals in soil and submitted the reports for regulator approval. The installation's Restoration Advisory Board became involved in UXO issues. The latest version of the BRAC Cleanup Plan (BCP) was also completed.

In FY98, the installation completed fieldwork for the Site Inspection (SI) of 13 AOCs. The installation determined that Landfill 1, the gas chamber, and USTs require no further action. The Army discovered a second munitions demolition site (Demo 2) during ordnance and explosives field sampling. Concerns about explosive residue contamination may require hazardous and toxic waste (HTW) investigation.

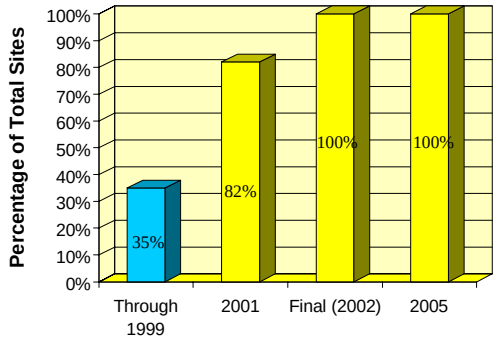
FY99 Restoration Progress

The installation completed two Engineering Evaluations and Cost Analyses (EE/CAs) for UXO management. EPA did not concur with these documents, and the installation is working with regulators and the community to develop a UXO management plan. The installation conducted an independent technical review focusing on UXO issues and submitted responses to recommendations in the draft report. Remedial Action Plans are being developed for the HTW sites. Surface water sampling was completed for all water entering and leaving the property. The Army gathered data for the SI, but additional data will be needed to address explosives contamination in the impact area. The installation completed UXO clearance of 23 acres.

Plan of Action

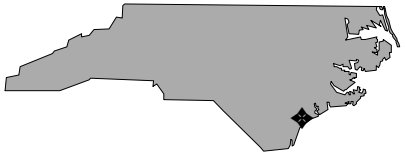
- Complete a Cultural Resources Survey in FY00
- Complete fieldwork for most HTW sites in FY00
- Update the BCP in FY00
- Continue to develop an EE/CA for UXO that all stakeholders can concur with in FY00
- Conduct investigations for explosives contamination in soil and groundwater in FY00

Sites Achieving RIP or RC Per Fiscal Year



Camp Lejeune Marine Corps Base — NPL

FFID: NC417302258000
Size: 151,000 acres
Mission: Provide housing, training facilities, logistical support, and administrative supplies for Fleet Marine Force units and other assigned units; conduct specialized schools and other training as directed
HRS Score: 36.84; placed on NPL in October 1989
IAG Status: Federal Facility Agreement signed in February 1991
Contaminants: Battery acid, fuels and used oils, paints and thinners, PCBs, pesticides, solvents, and metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $76.9 million
Estimated Cost to Completion (Completion Year): $124.3 million (FY2032)
Final Remedy in Place or Response Complete Date for All Sites: FY2004



Jacksonville, North Carolina

Restoration Background

Investigations at Camp Lejeune identified 176 sites, including 86 leaking underground storage tank (UST) sites. Contaminants released from past storage and disposal operations have migrated to a shallow aquifer, several surface water bodies, and a deep aquifer used for drinking water.

In 1991, a Federal Facility Agreement under CERCLA was signed. Since then, 18 operable units (OUs), comprising 42 of the 91 Installation Restoration (IR) sites, have been identified as requiring additional investigation or remediation.

Between FY83 and FY88, the installation completed an initial assessment study for 72 sites and Site Inspections (SIs) for 8 sites, conducted 26 Remedial Investigations and Feasibility Studies (RI/FSs), signed Records of Decision (RODs) for 19 sites, and completed Remedial Design (RD) for 10 sites. Three Interim Remedial Actions at two sites and six Time-Critical Removal Actions (TCRAs) were completed. Remedial Actions (RAs) were completed at four sites. Remediation systems are operating at four sites. Since FY88, the installation's UST program has completed site assessments (SAs) at 76 sites and Corrective Action Plans (CAPs) at 34 sites. Remediation systems were designed and implemented at 23 sites and are operating at 16 sites. The installation has requested closure and no further action (NFA) at 26 sites.

In FY97, Phase I of the RI was completed at 6 sites, RIs were completed at 12 sites, and Treatability Studies (TSs) were completed at 2 sites. Final RODs were signed for four sites. SAs were completed at five UST sites; one was found to require NFA. Designs were completed at four UST sites, and implementation was completed at three others.

In FY98, the installation completed a TCRA for polychlorinated biphenyl (PCB)–contaminated soil at Site 36. It also initiated an Engineering Evaluation and Cost Analysis (EE/CA) for Non-Time-Critical Removal Actions at Sites 84 and 85. Groundwater monitoring ended at Site 24 after it was demonstrated that no contaminants of concern remained on site. Monitoring began at Sites 3, 35, and 69. Remediation was completed at UST Sites 27, 38, 43, and 78. Use of natural attenuation (NA) continues at 14 UST sites. Construction began at UST Sites 9, 50, and 62. Final RODs were prepared for Sites 36, 43, 44, 54, and 86.

The installation formed a Technical Review Committee in FY88 and converted it to a Restoration Advisory Board (RAB) in FY95. A Community Relations Plan was completed in FY90.

FY99 Restoration Progress

Negotiations with state and federal regulators concerning the land use control assurance and implementation plans were concluded with the signing of a Memorandum of Agreement on May 24, 1999. Resolution of land use control issues allowed the signing of the Site 3 amended ROD. The 5-year review was completed.

The ROD for OU6 (Sites 36, 43, 44, 54, and 86) is on hold, pending resolution of site-specific land use controls at Site 36. Fieldwork for the surfactant-enhanced aquifer remediation TS at Site 88 was completed. An EE/CA was completed at Site 85 for a Removal Action that is to be completed in FY00. An RI/FS was initiated at Site 84, but the EE/CA was discontinued when contamination at the site could not be adequately addressed by the planned Removal Action.

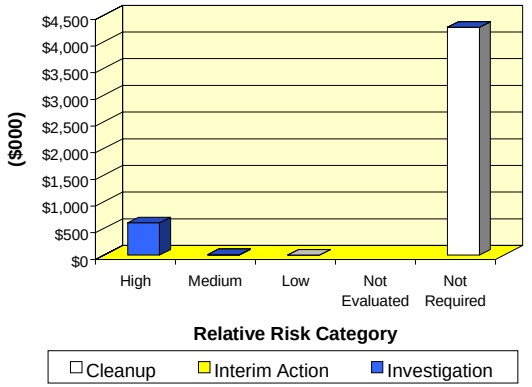
The conversion of records to CD-ROM was not completed because of the large volume of records and the unexpectedly long time it took to load the database. Optimization studies were conducted for the site monitoring program and RA operations. Site characterization studies were implemented at the NA UST sites. A limited SA Phase I and request for NFA were conducted for UST Sites 46 and 67. The CAP for UST Site 86 was not completed because chlorinated solvents were found at the site. The site was transferred to the IR section.

Four UST sites attained NFA status, and the remaining sites await state regulator approval. The RA for Site 3 was delayed because high disposal costs require amending of the ROD for different in situ treatment. The RA at UST Site 67 was not required because the site attained NFA status.

Plan of Action

- Implement recommendations from 5-year review in FY00
- Resolve off-site land use control issue at Site 36 and sign final ROD for OU6 in FY00
- Complete RA at Site 3 and Removal Action at Site 85 in FY00
- Finalize No Further Remedial Action Planned documents for Sites 68, 75, 76, and 87 and the ROD for OU17 and Sites 90, 91, and 92 in FY00
- Initiate RI for Site 94 and complete conversion of administrative record to CD-ROM in FY00
- Continue RI/FS at Sites 84, 88, 89, and 93 in FY00–FY01
- Design and implement changes to operations and to the monitoring program according to optimization study recommendations in FY00–FY01

FY00 Funding by Phase and Relative Risk



Camp Pendleton Marine Corps Base NPL

FFID: CA917302353300
Size: 125,000 acres
Mission: Provide housing, training facilities, logistic support, and administrative support to Fleet Marine Force Units
HRS Score: 33.79; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in October 1990
Contaminants: Pesticides, herbicides, heavy metals, PCBs, and VOCs
Media Affected: Groundwater and soil
Funding to Date: $104.9 million
Estimated Cost to Completion (Completion Year): $97.8 million (FY2016)
Final Remedy in Place or Response Complete Date for All Sites: FY2012

Oceanside, California

Restoration Background

Environmental contamination at Camp Pendleton Marine Corps Base resulted from maintenance of vehicles; equipment; and support facilities, such as gas stations, hospitals, laundries, pest control services, and hobby shops. Sites at the installation include landfills, surface impoundments, pesticide storage areas, fire training areas, vehicle maintenance areas, and underground storage tanks (USTs). The installation was placed on the National Priorities List (NPL) after the herbicide 2,4,5-TP (Silvex) was detected in two groundwater wells used for drinking water.

Of the 201 sites identified at the installation, 58 are CERCLA sites, 113 are RCRA sites, and 30 are UST program sites. The installation has completed Remedial Investigations and Feasibility Studies (RI/FSs) for 55 CERCLA sites. RI/FSs for five CERCLA sites are under way. The installation has completed Interim Removal Actions at three sites. Three operable unit (OU) Records of Decision (RODs) have been signed.

In FY96, the installation completed RIs for 21 sites and an FS for 13 sites and signed the final ROD for no further action (NFA) at OU1. All parties to the Federal Facility Agreement (FFA) signed the final ROD. The FFA project team identified five Removal Actions and closed six sites. The installation completed an Engineering Evaluation and Cost Analysis and an Action Memorandum at Site 7. It also initiated Interim Remedial Actions (IRAs) for three sites, completed the initial site characterization of 25 UST sites, and completed the investigation phase and prepared a Corrective Action Plan (CAP) for four UST sites.

In FY97, RIs were completed at 34 sites and a ROD was signed for 13 sites. IRAs were completed at the pest control wash rack and scrap yard sites. The OU2 ROD was signed on September 29, 1997.

In FY98, the installation capped 5 acres of the Box Canyon Landfill. A Phase II RI was completed for four sites, and an FS was completed for six sites. Twenty-five sites were proposed for NFA, and six sites were proposed for Remedial Action (RA). The OU3 ROD was issued and reviewed. The installation received regulatory approval for a CAP for seven program sites, and completed the Remedial Design (RD) and RAs for seven UST sites.

The installation formed a Technical Review Committee and prepared a Community Relations Plan in FY92.

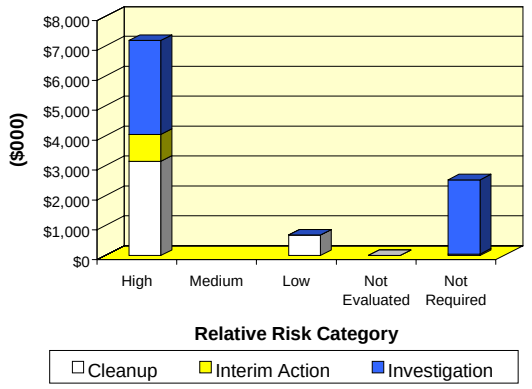
FY99 Restoration Progress

The installation signed the ROD for OU3, calling for the consolidation of wastes from five subsites into the Site 7 Box Canyon landfill under the corrective action management unit designation. RA activities began in June. Site 30, which was originally designated for inclusion in the OU3 ROD, was pulled out because of disagreements about the need to stabilize the high lead levels in the soil. The installation completed CAPs for three program sites, remediated eight sites, installed remediation systems at three sites, and conducted operations and maintenance (O&M) and long-term monitoring (LTM) at an additional seven sites. The RI/FS and Proposed Plans (PPs) for OU4 were not completed because regulatory comments required detailed review and response. A remediation system was installed for USTs 12 and 13 Cleanup and Abatement Order (CAO) 96-49 sites. O&M was not conducted at USTs 12 and 13 because the installation and operation of the remediation system has not reached a point of transition to the O&M phase. At UST 14, evaluation of six sites identified no need for cleanup of soil. Analysis of groundwater revealed the presence of CERCLA constituents not associated with the former USTs. Remediation and the CAP at UST 14 were not completed because the Regional Water Quality Control Board requested a review to determine which regulatory scheme to use. LTM was performed for four UST 24 and two UST 26 sites, and a CAP was completed for one UST 27 and one UST 53 site. A remediation system was installed for UST 43 and 13 UST 100 sites, and O&M for a UST 43 area gas station was performed. Approximately 40 UST 62 sites applied for closure. O&M and LTM for 10 UST 13 sites and 20 UST 22 sites are ongoing.

Plan of Action

- Complete 5-year review of OU1 ROD and CAP implementation and O&M at UST 14 in FY00
- Complete RA at OU3 sites and Removal Action at Site 30 in FY00
- Complete RI/FS and PP, sign ROD, and initiate RD for OU4 in FY00
- Perform O&M and LTM for 10 UST 13 sites and 20 UST 22 sites in FY00
- Apply for closure of approximately 40 UST 62 sites, 4 UST 24 sites, 2 UST 26 sites, 1 UST 27 site, and 1 UST 53 site in FY00
- Perform O&M for UST 12, 13 CAO 96-49 sites, and UST 43 area gas stations in FY00
- Initiate RA for OU4 and LTM for OU3 (Site 7) in FY01
- Continue LTM at OU2 through FY01

FY00 Funding by Phase and Relative Risk



FFID: CA957002455100
Size: 2,777 acres
Mission: Train tanker crews and service KC-135 stratotanker
HRS Score: 27.93; placed on NPL in July 1987
IAG Status: IAG signed in 1989
Contaminants: Spent solvents, PCBs, petroleum/oil/lubricants, pesticides, cyanide, and cadmium
Media Affected: Groundwater and soil
Funding to Date: $124.5 million
Estimated Cost to Completion (Completion Year): $109.9 million (FY2038)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003

Atwater, California

Restoration Background

In July 1991, the BRAC Commission recommended closure of Castle Air Force Base. The installation was closed on September 30, 1995.

Preliminary Assessment and Site Inspection activities identified landfills, underground storage tanks (USTs), discharge areas, chemical disposal pits, fire training areas, fuel spill areas, and six polychlorinated biphenyl (PCB) spill areas at the installation. Interim Actions have included excavating and disposing of contaminated soil from the PCB spill areas; installing potable water supply wells and filtration systems to remove trichloroethene (TCE) from groundwater; and removing 30 USTs. Sites were grouped into three operable units (OUs).

The Record of Decision (ROD) for OU1 was signed in FY91 and the OU2 ROD was signed in December 1994. In FY93, additional areas of concern (AOCs) were identified and incorporated into the Source Control OU (SCOU). The installation also completed Remedial Design (RD) activities at OU1 and began a Remedial Action (RA), abandoning inactive production wells and removing abandoned USTs.

In FY95, the installation began operating soil vapor extraction (SVE) systems at two fuel spill areas. The Environmental Baseline Survey was completed. In FY96, Part 1 of the Remedial Investigation and Feasibility Study (RI/FS) report was completed. The installation removed 69 USTs and 16 oil-water separators. In FY96, the installation completed construction of a pump-and-treat system at OU2.

In FY97, the installation completed construction of two pump-and-treat systems (OU1 Phase 2 and Castle Vista). The BRAC cleanup team (BCT) completed the RD/RA landfill work plan. It also provided the SCOU Proposed Plan for public comment and placed four more sites on Removal Action status. The BCT completed the comprehensive basewide Part I groundwater ROD incorporating OU1, OU2, and Castle Vista.

In FY98, the storm drain cleanup was completed and the sanitary sewer repair designed. Municipal wells' effects on contaminant plumes were determined, control mechanisms were developed, and municipal wells AM-6 and A-16 were evaluated. Castle Vista Landfill A (CV-A), CV-B, and Landfill 2 were excavated and consolidated into Landfill 4. PCB-9 and ETC-10 RAs were completed. RCRA compliance actions included demolition of the Demineralized Water Plant and the Wastewater Treatment Plan. The BRAC Cleanup Plan was updated.

The installation has a Restoration Advisory Board (RAB), which meets every other month.

FY99 Restoration Progress

The work plan and the design for the Phase III groundwater treatment system were approved, and construction is on schedule. Long-term operation (LTO) of four groundwater treatment systems and long-term groundwater sampling continued. One SVE system and two bioventing systems were installed for remediation of petroleum/oil/lubricant intrinsic remediation sites. Two additional SVE systems and three biovent systems were installed. Repairs to the sanitary sewer are complete except for one sewer line segment. The installation completed excavation and consolidation of all landfills into Landfills 4 and 5. Landfills 4 and 5 were capped. The UST site closure project excavated and disposed of petroleum-contaminated soil at five UST and oil-water separator sites.

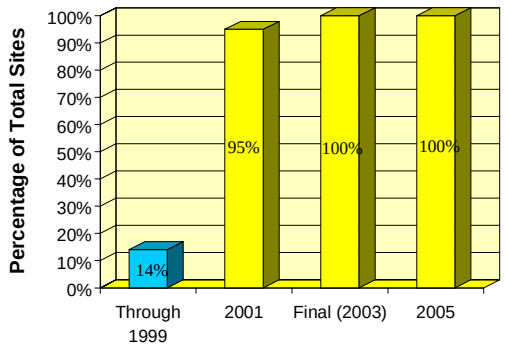
An institutional control (IC) layering strategy worksheet was completed for Parcel A. No land survey is required at this time. The RAB participated in a site tour.

Construction of the well head treatment for AM-6 is awaiting completion of a Memorandum of Agreement (MOA) with the City of Atwater. The SCOU ROD was divided into SCOU ROD I and SCOU ROD II. SCOU ROD I is awaiting IC language approval. SCOU ROD II includes 65 sites that are involved in an informal dispute concerning remediation criteria. The CB Part II RI/FS, Proposed Plan, and ROD, and remediation of the remaining SCOU sites are delayed until the SCOU ROD II is approved.

Plan of Action

- Complete SCOU ROD I in FY00
- Complete MOA with City of Atwater in FY00
- Construct the Phase III groundwater treatment system in FY00
- Continue LTO of five groundwater treatment systems, eight SCOU intrinsic remediation sites, two UST SVE sites, and three UST biovent sites in FY00–FY01
- Complete SCOU ROD II in FY02
- Complete sewer repairs in FY03

Sites Achieving RIP or RC Per Fiscal Year



FFID: FL417002247400
Size: 31,302 acres
Mission: Provide facilities, services, and material support for maintenance of Naval weapons and aircraft
HRS Score: 31.99; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in November 1990
Contaminants: Waste fuel oil, solvents, heavy metals, halogenated aliphatics, phthalate esters, SVOCs, and lead
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $33.4 million
Estimated Cost to Completion (Completion Year): $20.4 million (FY2009)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001

Jacksonville, Florida

Restoration Background

In July 1993, the BRAC Commission recommended the FY99 closure of this installation and relocation of its aircraft, personnel, and equipment to other stations.

Since FY84, investigations have identified 20 CERCLA sites; 7 major underground storage tank (UST) sites; 250 BRAC grey sites; 235 USTs for removal and contamination assessment; and 1 RCRA site. Operations that caused contamination at the installation include equipment maintenance, storage and disposal of fuel and oil, fire training, and training on target ranges. The initial site assessment was completed FY85, and Remedial Investigation and Feasibility Study (RI/FS) activities began in FY93. Fourteen sites have been grouped in nine operable units. Of the six remaining CERCLA sites, one is undergoing investigation and remediation and five are No Further Action (NFA).

Four interim Records of Decision (RODs) were signed and contaminated soil at Site 16 was removed in FY94. In FY95, RODs for four sites were signed and contaminated soil was removed at Sites 11 and 17. During FY96, contaminated soil was removed and a bioslurper installed at the North Fuel Farm (NFF). The ROD for Site 16 was signed.

In FY97, an NFA ROD was signed for Site 10. The RI, Baseline Risk Assessment, and FS documents were completed for Sites 14 and 15. The installation started ROD implementation at Sites 1 and 2. It also completed removal of Day Tank 2 (DT2), Jet Engine Test Cell (JETC) soil, A Avenue soil, Site 18 unexploded ordnance, and 29 miscellaneous tanks. The NFF and DT1 Remedial Action Plans (RAPs) were completed.

In FY98, the installation signed RODs for Sites 3, 11, and 14. The RI/FS for Site 4 was completed, and an NFA document was signed. NFA reports were submitted for Sites 9 and 12. The installation completed soil excavation at Site 5, the NFF, and the JETC. A groundwater remediation system was installed at South Fuel Farm (SFF). The installation completed an FS for Site 11 and RIs for two sites, and began investigating Site 6. It also completed the DT2 contamination assessment report, the RAP, and six designs. Six designs, three Corrective Action Plans for USTs, and four groundwater Remedial Designs also were completed.

In FY94, a BRAC cleanup team was formed, and the Technical Review Committee was converted to a Restoration Advisory Board.

FY99 Restoration Progress

The installation completed Finding of Suitability to Transfer (FOST) documentation for 6,000 acres of flightline-related property and buildings and 640 acres to be transferred to Clay County. The FOST for 7,000 acres in the Yellow Water Weapons Area was not completed because this property will be included in the FOST for the Parks and Recreation (P&R) parcel and the FOST for the economic development conveyance (EDC) parcel, as appropriate.

An air-sparging (AS) system was installed in the Site 3 source area, and natural attenuation (NA) sampling in the downgradient portion of the Site 3 plume continued. An NFA decision document for Sites 18 and 19 was completed, but the planned NFA document for Site 6 was not completed because site conditions required additional delineation and removal of soil. NA monitoring at Sites 5, 8, 16, and 17 and the JETC continued.

The ROD for Site 15 was not submitted due to a significant increase in the size of the site and a need to reevaluate the FS.

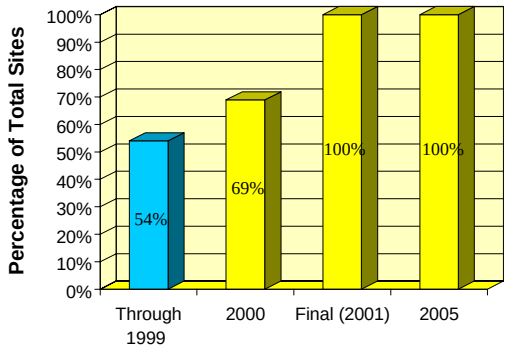
The soil removal design and a work plan for Sites 7 and 8, a groundwater design for Site 11, and an AS and sewer design for Site 16 were submitted. Installation of an AS system and slip-lining of the storm drain at Site 16 were completed. Groundwater sampling began at Site 11. Operation of the AS and soil venting system at SFF continued. A well pilot study at NFF and a radiological survey at Yellow Water Weapons Area bunkers were performed. An investigation of the 103d Street pipeline and removal of asbestos-containing material from six buildings were conducted. Ten other buildings could not be abated because of operational constraints.

Soil removal at Sites 6, 7, and 8, and for seven BRAC grey sites was conducted. Soil removal at three additional sites was not completed because of changed site conditions. Sixteen petroleum tanks were removed.

Plan of Action

- Complete FOST documentation for two parcels in FY00
- Conduct Remedial Actions for Sites 11 and 36/37, DT1, Building 9, Building 46, and A Avenue in FY00
- Complete RI/FS for Site 36/37, revised FS and ROD for Site 15, ROD amendment for Site 5, and NFA for Site 6 in FY00
- Remove asbestos-containing material from 10 buildings and remove 28 tanks in FY00
- Complete soil removals at 20 BRAC grey sites in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: IL557002475700
Size: 2,125 acres
Mission: Served as technical training center
HRS Score: NA
IAG Status: IAG signed in September 1990
Contaminants: Petroleum/oil/lubricants, VOCs, chlorinated solvents, and metals
Media Affected: Groundwater, soil, and sediment
Funding to Date: $56.3 million
Estimated Cost to Completion (Completion Year): $27.9 million (FY2006)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003

Rantoul, Illinois

Restoration Background

Chanute Air Force Base was one of five Air Training Command Technical Training Centers providing specialized training for officers, airmen, and civilian employees of the Air Force and other DoD agencies. In 1988, the installation was recommended for closure. A Record of Decision for reuse of the base was signed in FY91, and closure occurred in September 1993. The majority of the installation has been licensed to the Village of Rantoul for use as an airport.

Environmental studies conducted between FY82 and FY92 identified 69 sites at the facility, including landfills, fire training areas, oil-water separators, a petroleum sludge disposal pit, jet engine test cells, and underground storage tanks (USTs). Interim Actions have included removal of USTs, pipelines, and contaminated soil at all UST sites; removal of sludge and contaminated soil at a sludge pit; and removal of oil-water separators.

The installation formed a BRAC cleanup team (BCT) and a Restoration Advisory Board (RAB) in FY94. In FY95, the installation completed a Treatability Study (TS) and used low-temperature thermal volatilization to treat 60,000 tons of contaminated soil at 14 former UST sites. All remaining sites were ranked according to the Relative Risk Site Evaluation process.

In FY96, a Remedial Investigation (RI) report for 11 sites was submitted to EPA and the State of Illinois EPA (IEPA), but was rejected. The installation also initiated a groundwater extraction and treatment system at Building 700, a former UST site. Several parcels within Operable Unit (OU) 1 were designated as suitable for transfer. Planning began at former UST sites for sampling soil possibly still contaminated with fuel. Bioremediation and intrinsic bioremediation TSs for the Building 952 area spill site determined that petroleum levels were below the State of Illinois cleanup levels for petroleum contamination. Two early actions and site cleanups were completed.

The Village of Rantoul, Illinois, Aviation and Development Group has completed a reuse plan for the facility. As a result of the Local Redevelopment Authority's efforts, an operating civilian airport has been established on former property of the installation.

In FY97, the BCT reviewed and updated the BRAC Cleanup Plan (BCP). In FY98, a field sampling plan was submitted for Landfills 1 through 4 (LF16 through LF19). Area surveys, geophysics and soil gas studies, and cone penetrometer testing were completed for the landfills. The BCP was updated. New areas of concern were discovered in OU1. An Interim Remedial Action (IRA) investigation was initiated at the four landfills in OU2. Planning began for cleanup at Fire Training Area 2 and the Building 932 Sludge Pit.

RAB meetings cover the progress of ongoing RIs and address concerns of community members.

FY99 Restoration Progress

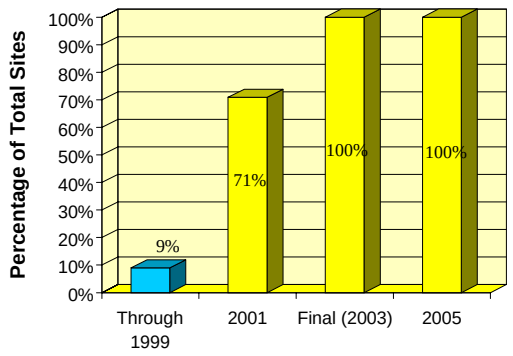
The IRA continued at OU2 Landfills 1 through 4, with completion of the field sampling plan and monitoring well design documents. Monitoring well abandonment Phase I was initiated to close non-productive wells. The installation completed the site characterization and the Engineering Evaluation/Cost Analysis for Fire Training Area 2 and the Building 932 Sludge Pit. The installation prepared to begin Non-Time-Critical Removal Actions (NTCRAs) to accelerate soil cleanup. RIs were initiated for OU1 and the new OU1 areas of concern.

The RAB continued to partner with the Air Force Base Conversion Agency and DA-Chanute. IEPA assigned a new Remedial Project Manager. The BCT conducted bimonthly meetings.

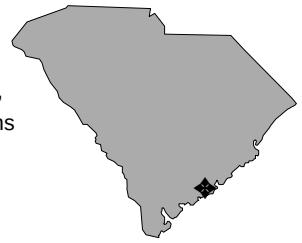
Plan of Action

- Continue NTCRAs at Fire Training Area 2 and the Building 932 Sludge Pit in FY00
- Initiate monitoring well abandonment Phase II in FY00
- Close out leaking UST sites in FY00
- Remove all remaining oil-water separators in FY00
- Initiate RA for Landfills 2 and 3 in FY00 and Landfills 1 and 4 in FY01
- Initiate FS and RA upon completion of RIs for sites in OU1 and new areas of concern in FY00–FY01
- Removed unused aboveground storage tanks in FY00–FY01

Sites Achieving RIP or RC Per Fiscal Year



FFIDs: SC417002434300, SC417002757100, SC417002267000, SC417002425800, and SC417002256000
Size: 2,965 acres
Mission: Repaired, maintained, and overhauled Navy ships
HRS Score: NA
IAG Status: None
Contaminants: Asbestos, cyanide, decontaminating agents, heavy metals, paints, PCBs, pesticides, petroleum/oil/lubricants, solvents, and petroleum hydrocarbons
Media Affected: Groundwater, sediment, and soil
Funding to Date: $25.4 million
Estimated Cost to Completion (Completion Year): $20.1 million (FY2004)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Charleston, South Carolina

Restoration Background

The Charleston Naval Complex housed five major naval commands (the Naval Shipyard [NSY], the Naval Station [NS], the Naval Fleet and Industrial Supply Center [FISC], the Fleet and Mine Warfare Training Center [FMWTC], and the Naval Reserve Center [NRC]), as well as several small organizations. In July 1993, the BRAC Commission recommended closure of the property and the majority of the commands. Operational closure of the complex occurred on April 1, 1996.

The primary sites of concern at the installation are areas that were used as landfills or disposal pits without controls for runoff and leachate. For investigative purposes the complex was divided into 12 zones. As of October 1999, 117 RCRA solid waste management units (SWMUs) or areas of concern (AOCs) and 65 underground storage tanks (USTs) or aboveground storage tanks (ASTs) at the complex required some Remedial Action (RA). Zones J and L, which are in the RCRA Facility Investigation (RFI) stage, contain the waterside areas and the sanitary sewer system, respectively.

All cleanup activities are conducted as RCRA corrective actions. Tank removals are accomplished under the BRAC program and not necessarily under the UST program. The installation has completed initial site characterizations for all UST sites and is nearly finished with the site assessments.

In FY94, a BRAC cleanup team was formed. Two reuse groups were formed, one representing the community and the other, a state agency. A Land Reuse Plan was developed and approved. Transfers of property to other federal agencies and leases to private businesses were completed. The installation converted its Technical Review Committee to a Restoration Advisory Board in FY94. A Community Relations Plan was completed and updated to include all SWMUs.

In FY98, the installation completed RFIs for 70 SWMUs. A Corrective Measures Study (CMS) was initiated for 12 sites; 7 sites were determined to be Response Complete. The asbestos and lead-based paint survey for historical housing was completed. The installation removed all but two petroleum storage tanks. As a result of the tank closures, 61 tank sites must be investigated. Three contamination assessments were completed: one required remediation; the other two resulted in a no further action decision by the state regulator. Other work included cleaning and demolishing a 2.1-million-gallon field-constructed fuel tank at the Chicora Tank Farm.

FY99 Restoration Progress

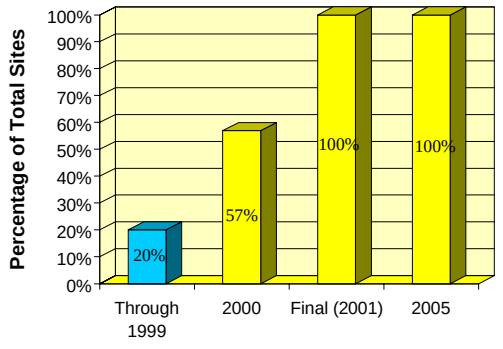
CMS reports for 12 sites have been submitted to the regulatory agencies and are awaiting review. CMSs have been delayed due to the regulatory emphasis on completion of the RFI and associated documentation. Rapid site assessments were completed for the USTs and ASTs requiring additional action. Asbestos and lead-based paint abatement was completed for the majority of the historical housing. The firm fixed price insured environmental contract (FFPIEC) solicitation incorporates the completion of the CMS activities, initiation of remaining RAs and UST program sites, lead-based paint abatement, and survey of buildings for asbestos to facilitate transfer.

The draft economic development conveyance (EDC) Phase I Finding of Suitability to Transfer/Environmental Baseline Survey for Transfer (FOST/EBST) has been prepared and is under review. The EDC Phase II FOST/EBST has been included within the scope of the FFPIEC. Corrective measures implementation (CMI) activities are not expected to begin until FY00 because of delays in completing the CMS.

Plan of Action

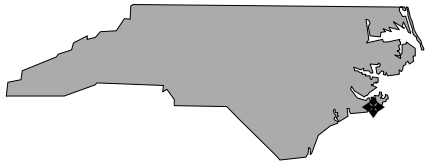
- Complete FOST/EBST for the marina and transfer parcel to the Parks and Recreation Department in FY00
- Complete FOST/EBST for the Chicora Tank Farm and transfer to the Charleston County School District in FY00
- Close out sites associated with EDC Phase II in FY00
- Complete FOST/EBST for EDC Phase II and transfer parcel to the Redevelopment Authority in FY00
- Initiate CMI at the majority of sites in FY00

Sites Achieving RIP or RC Per Fiscal Year



Cherry Point Marine Corps Air Station NPL

FFID: NC417302726100
Size: 27,715 acres
Mission: Maintain and operate support facilities; provide services and materials for marine aircraft
HRS Score: 70.71; placed on NPL in December 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: PCBs, petroleum hydrocarbons, and solvents
Media Affected: Groundwater and soil
Funding to Date: $51.8 million
Estimated Cost to Completion (Completion Year): $70.5 million (FY2020)
Final Remedy in Place or Response Complete Date for All Sites: FY2013



Cherry Point, North Carolina

Restoration Background

The station conducted an Initial Assessment Study in FY83 that identified 32 sites. A RCRA Facility Assessment performed in FY88 identified 114 solid waste management units (SWMUs). The installation and EPA negotiated a Consent Order in FY90 in which the Navy and EPA agreed to perform additional investigations at 32 of the 114 sites.

The installation characterized 22 underground storage tank (UST) sites between FY91 and FY95 and completed Corrective Action Plans (CAPs) for 2 UST sites in FY93 and 1 UST site in FY94. During FY95, a Corrective Measures Study (CMS) was initiated for five sites and completed for one site. The installation completed corrective measures implementation for two sites and a Time-Critical Removal Action (TCRA) for one site. Characterizations were completed for three UST sites, and a CAP was completed for one UST site.

During FY96, the installation completed Remedial Investigations and Feasibility Studies (RI/FSs) for two sites and nine Proposed Remedial Action Plans (PRAPs). CAPs were completed at six UST sites, and designs were completed at three UST sites. A Baseline Risk Assessment is under way for all sites.

In FY97, the RI/FS was initiated for two sites and completed for four additional sites. PRAPs were prepared for two sites and completed at three additional sites. Remedial Action (RA) was initiated for eight sites and completed for four additional sites. An Engineering Evaluation and Cost Analysis was completed for one site. Three Records of Decision (RODs) were completed.

In FY98, a TCRA and a corresponding Action Memorandum were completed for a new site. Interim Remedial Actions were completed for Operable Unit (OU) 1, which contains seven sites, and for Sites 16 and 85. An RI/FS was initiated for OU6, which consists of two sites. Data gap work plans were completed for OUs 2, 4, and 13, which contain a total of eight sites. A comprehensive RI/FS work plan was initiated for OU1, a highly contaminated area consisting of over 100 sites, SWMUs, and areas of concern (AOCs). A CMS was completed for Sites 7 through 9, and negotiations began on a Federal Facility Agreement (FFA).

A Technical Review Committee was established in FY91, and two information repositories were established in FY93. The installation's Restoration Advisory Board was established, and a Community Relations Plan was completed, in FY95.

FY99 Restoration Progress

A ROD for OU2, covering four sites, and a Land Use Control Implementation Plan with the State of North Carolina and EPA were signed. An FFA will be signed by the end of the calendar year. The installation won the Marine Corps Environmental Award for Excellence.

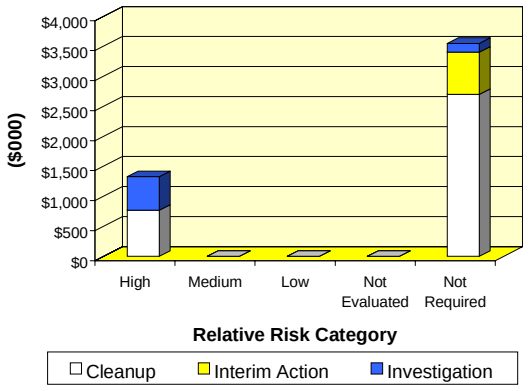
RI work plans were finalized and fieldwork was conducted for OUs 4, 6, and 13, covering five sites. The draft RI for OUs 4, 6, and 13 were not completed as planned because more information was needed to satisfy regulatory interest. RI findings for OU6 (two sites) were presented. The fieldwork for the OU1 RI was delayed due to the complexity of the site. The planned RA for OU3 was delayed because of ROD and construction issues, but RAs for OUs 1 and 2 (seven sites) were completed. An optimization evaluation of four remediation systems covering eight sites was performed, including evaluation of an innovative fuel recovery system, an air-sparging system, a soil vapor extraction system, and a groundwater containment system. An RA operation plan was developed for operations and monitoring of the OUs 1, 2, and 3 treatment systems. Initial construction at an OU1 site was completed. Operations and monitoring for OUs 1, 2, and 3 treatment systems were conducted as planned.

A Treatability Study (TS) using substrate injection to treat a chlorinated solvent groundwater plume was implemented, and an interactive work plan to address a site with over 100 AOCs was created. Modifications of the existing Industrial Wastewater Treatment Plant was completed so that the plant could function as a treatment system for groundwater containment.

Plan of Action

- Sign FFA and ROD for two sites at OU3 in FY00
- Complete RI for five sites at OUs 4, 6, and 13 in FY00
- Complete Ecological Risk Assessment for creek adjacent to OUs 1, 2, and 3 in FY00
- Construct RA system for one site at OU3 in FY00
- Conduct TS for a site at OU1 in FY00
- Complete RA for two sites at OU3 in FY00
- Operate six treatment systems for 10 sites in FY00

FY00 Funding by Phase and Relative Risk



Chicago O'Hare IAP Air Reserve Station — BRAC 1995

FFID: IL557122427200
Size: 359 acres
Mission: Housed 126th Air Refueling Wing (Illinois Air National Guard) and 928th Airlift Wing (Air Force Reserve)
HRS Score: NA
IAG Status: None
Contaminants: VOCs, SVOCs, PNAs, petroleum hydrocarbons, metals, and low-level radioactive waste
Media Affected: Groundwater and soil
Funding to Date: $5.9 million
Estimated Cost to Completion (Completion Year): $10.5 million (FY2000)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000

Chicago, Illinois

Restoration Background

Chicago O'Hare International Airport Air Reserve Station began operations in 1942 as an aircraft assembly plant. The plant was deactivated in 1945, and the Air Force Reserve (AFRES) and the Air National Guard (ANG) began flying activities in 1946 and 1954, respectively.

The 1993 BRAC Commission recommended closure of this station contingent on receipt of funding from the City of Chicago. The BRAC 1995 round modified the decision, and the Air Force and the city began implementing the revised decision. In late 1996, the Air Force and the City of Chicago signed a purchase agreement. The city is paying for replacement facilities at Scott Air Force Base in exchange for the Chicago O'Hare Air Reserve Station land.

Environmental cleanup studies at the station began in 1983. To date, 16 Installation Restoration Program (IRP) sites and 24 areas of concern (AOCs) have been identified. Site types include underground storage tanks (USTs), landfills, fuel spills, aboveground storage tanks (ASTs), a fire training area, and a low-level radioactive waste disposal area. Primary contaminants are petroleum hydrocarbons, metals, PNAs, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs), which have been released into soil and groundwater.

Interim Remedial Actions have included removal of 19 USTs, contaminated soil, and low-level radioactive waste. Eleven ASTs have been closed. Remedial Actions (RAs) include removal of eight ASTs and partial on-site remediation of the south petroleum/oil/lubricant (POL) facility. The IRP sites will be recommended for institutional controls (deed restrictions) once a groundwater classification has been made. One site (LF-001) is planned for long-term monitoring (LTM); another (RW-011) has been closed with no further action needed. A third site (ST-015) had RA (soil removal); and ST-006, the defuel tank leak, was closed under regulations for leaking USTs.

In FY97, a stationwide Phase I Environmental Baseline Survey (EBS) was completed. EBS Phase II supplements are being prepared as investigations and cleanup occur and property transactions are developed.

In FY98, a parcel-specific EBS and a Remedial Investigation (RI) were completed for Parcels 2 and 3A. A Finding of Suitability to Lease (FOSL) was issued. A parcel-specific EBS was completed for Parcel 3. Approximately 50 cubic yards of lead-contaminated soil was removed from AST 1702 and disposed of.

A Restoration Advisory Board (RAB) and a Base Closure and Transition Team (BCTT) were formed in FY97.

FY99 Restoration Progress

An RI was completed for Parcel 3. A FOSL was issued. All remaining in-leases were terminated between the Air Force and the City of Chicago. RIs for Parcels 2, 3A, anf 3, South POL/Storm Drainage and nine IRP sites were completed and are awaiting approval by EPA and Illinois EPA (IEPA). The groundwater investigation project has been expanded.

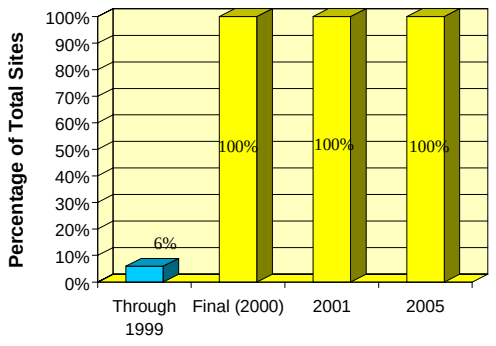
An LTM decision document submitted for LF-001 has been delayed, pending comments from the regulatory agencies. A Finding of Suitability to Transfer (FOST) for Parcel 2, planned for FY99, was delayed pending approval of the RI reports. Closure of IRP sites and RA decision documents were also delayed pending RI report approval. Soil removal at ST-002 and OT-016 was delayed until supporting reports are approved by IEPA. The RAs are under way as Engineering Evaluations and Cost Assessments.

The BCTT meets quarterly.

Plan of Action

- Complete a FOST and deeds for Parcels 2, 3A, and 3 in FY00
- Complete soil removal at ST-002 and OT-016
- Complete groundwater classification for entire facility in FY00
- Close all IRP sites and AOCs in FY00
- Complete two Site Inspections and RIs in FY00
- Complete decision documents for all sites and AOCs in FY00
- Conduct facilitywide Feasibility Study in FY00

Sites Achieving RIP or RC Per Fiscal Year



Concord Naval Weapons Station NPL

FFID: CA917002452800
Size: 13,023 acres
Mission: Ship, receive, inspect, and classify munitions (tidal area); serve as munitions storage and weapons maintenance, inspection, and testing facility (inland area)
HRS Score: 50.00; placed on NPL in December 1994
IAG Status: Federal Facility Site Remediation Agreement signed in September 1992
Contaminants: Heavy metals and petroleum hydrocarbons
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $45.6 million
Estimated Cost to Completion (Completion Year): $14.3 million (FY2009)
Final Remedy in Place or Response Complete Date for All Sites: FY2006

Concord, California

Restoration Background

Since FY83, investigations have identified 58 sites at this installation. Past operations, such as improper disposal of paints and solvents, spent ordnance, treated wood, and household and industrial waste; open burning of munitions; and spills or leaks from fuel storage tanks, have contributed to contamination. The installation was placed on the National Priorities List (NPL) in 1994, primarily because of surface water and sediment contamination at tidal and litigation-area sites. These sites contain sensitive habitat for threatened and endangered species and are interconnected to Suisun Bay.

From FY86 through FY94, the installation completed the Remedial Investigation and Feasibility Study (RI/FS), signed the Record of Decision (ROD), and completed the Remedial Design (RD) for the seven litigation-area sites. By FY94, the installation had completed the Remedial Action (RA) for four of the litigation-area sites. Site Inspections (SIs) were completed and RI began at four tidal area sites and five inland sites; SIs were also performed for six other sites. A RCRA Facility Assessment (RFA) was performed for 49 solid waste management units (SWMUs), 24 of which were proposed for RCRA corrective action. Three tanks were removed from an underground storage tank (UST) site, and initial site characterization was completed for one UST site.

In FY95, three abandoned wells were closed and sealed at one inland site. By FY96, the installation had completed the RA and begun long-term monitoring (LTM) for all litigation-area sites. In FY97, the installation completed corrective actions for 3 of the SWMUs and completed an RFA confirmation study for all SWMUs, recommending 20 for no further action (NFA).

In FY98, the installation completed RIs for five inland sites and a Phase II RI for one of the sites. Four of the inland sites began a no-action Proposed Plan (PP) and ROD, and the fifth inland site was removed from the Installation Restoration Program. An FS for the tidal area landfill site was completed and a PP/ROD was initiated for that site. The installation began an Engineering Evaluation and Cost Analysis (EE/CA) for one tidal area site and an SI for four SWMUs and one inland site (Site 29). A risk-based corrective Removal Action was completed for one inland site.

The installation updated its Community Relations Plan in FY96. An information repository and an administrative record were established in FY89. The installation formed a Technical Review Committee in FY90 and converted it to a Restoration Advisory Board in FY95.

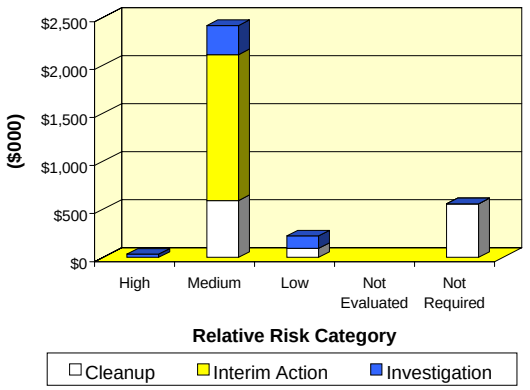
FY99 Restoration Progress

The installation completed an RI for four tidal area sites. The RI demonstrated that NFA was required for three. The planned FS for the three sites and the two planned EE/CAs and Action Memorandums (AMs) for one tidal site were no longer required. An RI/FS was initiated for Site 30 in lieu of the planned Removal Action EE/CA, AM, and design. A ROD for four inland sites was submitted for final regulatory agency review and signature. The Year-4 LTM was completed for the litigation-area sites. The planned EE/CA and AM for one of the sites were canceled because Year-4 LTM results showed no risk at the site warranting a Removal Action. A Preliminary Assessment (PA) for one area of concern (AOC) was completed. The PA results indicated that a Removal Action, not the planned SI, was the next appropriate phase for the AOC (Site 31).

Plan of Action

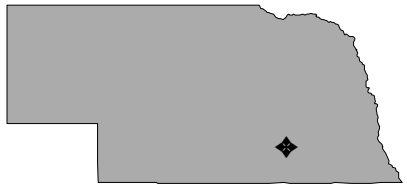
- Complete RODs for four inland sites and the tidal area landfill in FY00
- Initiate the Year-5 LTM and a 5-year periodic review assessment for seven litigation area sites in FY00
- Complete the SI for four SWMUs and inland Site 29 in FY00
- Initiate an RI for the four SWMUs and an FS for inland Site 29 in FY00
- Initiate PP and ROD for three tidal area sites in FY00
- Initiate RD for the tidal area landfill in FY00 and initiate the RA in FY01
- Initiate and complete a removal AM for AOC Site 31 in FY00 and the Removal Action in FY01
- Complete the RI/FS for one tidal area site in FY01
- Initiate a PP and ROD for Site 29 in FY01

FY00 Funding by Phase and Relative Risk



Cornhusker Army Ammunition Plant NPL

FFID: NE721382023400
Size: 11,936 acres
Mission: Manufactured ammunition
HRS Score: 51.13; placed on NPL in July 1987
IAG Status: IAG signed in 1990
Contaminants: Explosives and heavy metals
Media Affected: Groundwater and soil
Funding to Date: $44.9 million
Estimated Cost to Completion (Completion Year): $34.3 million (FY2028)
Final Remedy in Place or Response Complete Date for All Sites: FY2001



Hall County, Nebraska

Restoration Background

Cornhusker Army Ammunition Plant (CHAAP) is a former ammunition manufacturing facility. EPA placed the installation on the National Priorities List (NPL) because of explosive liquid waste contaminants released during the manufacturing process to sumps, cesspools, and leaching pits and disposal of solid waste in landfills and burning areas.

An Initial Assessment Study completed in FY80 identified 65 contaminant sources at the installation. In FY83, the Army identified an explosives-contaminated groundwater plume migrating off site. The off-site contamination affected more than 250 private residences in Grand Island. In FY86, the Army removed and incinerated 40,000 tons of explosives-contaminated soil from sumps and leaching pits. In FY86 and FY95, the Army extended the Grand Island municipal water distribution system to all affected residences. In FY89, the community formed a Local Redevelopment Authority (LRA). In FY94, the Army performed an Interim Remedial Action, removing 5,000 tons of explosives-contaminated soil. The Army also completed an interim Record of Decision (ROD) for remediation of groundwater contamination (Operable Unit [OU] 1).

A Remedial Investigation (RI) in FY96 designated six sites (OU2) as requiring no further action. A site investigation for former underground and aboveground storage tanks was submitted to the state.

In FY97, the U.S. Army Corps of Engineers completed changes in the design of the OU1 ROD phased treatment of on-site source areas, proceeded in accordance with the Interagency Agreement (IAG). This change allows accelerated hot spot removals and moved the discharge location on site.

In FY98, the Army and regulators signed the Proposed Plan and the ROD for OU2. The OU2 ROD requires no action for protection of human health and the environment given future land use requirements. The final Feasibility Study (FS) for OU3 and OU4 was submitted for signature. Due to changes in EPA guidance, final signature by EPA was contingent on the restructuring of institutional controls. Actions at the OU3 and OU4 sites included excavation of explosive contaminants and metals (lead) in soil. Monitoring of the groundwater plume provided initial data on use of the natural attenuation process off site.

In FY96 and FY98, the installation sought to determine whether there was community interest in forming a Restoration Advisory Board (RAB). On both occasions, no interest was expressed.

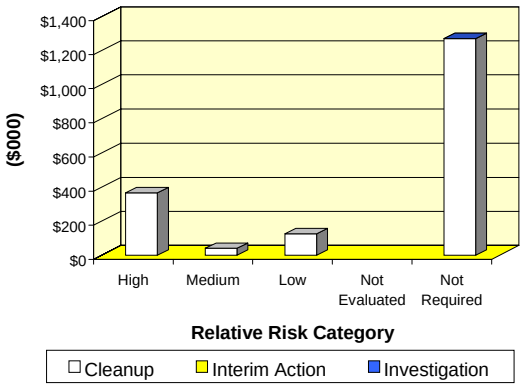
FY99 Restoration Progress

The Army submitted final RODs for OU3 and OU4 to EPA for approval. The groundwater treatment plant (OU1) completed a full year of operation. The Army completed public sales of the southern tier of CHAAP and a farm residence. The Army did not begin Remedial Actions (RAs) for contaminated soil in OU3 and OU4 because of EPA's delay in signing the ROD. The installation began the pump-and-treat operations at the water treatment plant. It also began the RI/FS for remediation of the open burning and open detonation area (OU5).

Plan of Action

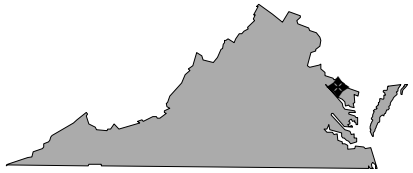
- Sign OU3 and OU4 RODs in FY00
- Begin RA for contaminated soil in OU3 and OU4 in FY00
- Continue pump-and-treat operations for OU1 and add one extraction well at the CHAAP boundary to contain the plume in FY00
- Initiate monitoring of a solvent-contaminated groundwater plume for natural attenuation in FY00
- Continue to remove unexploded ordnance from the OU5 burning grounds in FY00
- Continue long-term monitoring of the contaminated groundwater plume (OU1) to FY01

FY00 Funding by Phase and Relative Risk



Dahlgren Naval Surface Warfare Center — NPL

FFID: VA317002468500
Size: 2,677 acres main site; 1,614 acres experimental explosive area
Mission: Proof and test ordnance
HRS Score: 50.26; placed on NPL in October 1992
IAG Status: Federal Facility Agreement signed in September 1994
Contaminants: Cleaning solvents, explosives residues, heavy metals, low-level radioactive materials, mercury, PCBs, and pesticides
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $25.2 million
Estimated Cost to Completion (Completion Year): $21.5 million (FY2011)
Final Remedy in Place or Response Complete Date for All Sites: FY2011



Dahlgren, Virginia

Restoration Background

Dahlgren Naval Surface Warfare Center was placed on the National Priorities List (NPL) because of potential migration of releases from three contaminated sites that could affect the Potomac River, Gambo Creek, associated wetlands, and local groundwater aquifers used for drinking water. Ordnance testing operations have contributed to the contamination. Site types include former landfills, former ordnance burn and disposal areas, underground storage tanks, operating ordnance ranges, and operating ordnance research and development areas. Seventy-four sites are being addressed under CERCLA.

An Initial Assessment Study identified 36 sites in FY83. In FY86, a confirmation study identified one additional site. In FY92, the installation completed a Removal Action. During FY93, a RCRA Facility Assessment identified more than 100 solid waste management units (SWMUs), and a visual site inspection identified 6 areas of concern (AOCs) and 31 SWMUs that required further action. During FY94, the installation completed several Interim Remedial Actions. In FY95, an Engineering Evaluation and Cost Analysis began at two sites, Site Inspections (SIs) were completed at 10 sites, and a Removal Action was completed at 1 site.

In FY96, the installation completed SIs for 10 sites, initiated SIs for 6 sites, and began Remedial Investigations (RIs) for 7 sites. It completed Phase I of the Ecological Risk Assessment (ERA) of Gambo Creek and Phase I of the Ecological and Human Health Risk Assessments for eight sites. Two SWMUs and two AOCs were closed out.

In FY97, the installation completed Removal Actions for seven sites and began Remedial Actions (RAs) for a landfill site and chemical burn area. RIs for two sites were completed. The installation completed the Feasibility Study (FS) and Remedial Design (RD), and signed two Records of Decision (RODs), for two sites. An SI completed for six sites recommended an RI, Removal Action, further sampling, and a no further action designation.

In FY98, the installation completed the initial testing and confirmed the effectiveness of an air-sparging and soil vapor extraction (AS/SVE) system for groundwater and soil remediation. Two RIs, including Human Health and Ecological Risk Assessments, were completed for Sites 9 and 17. FSs, Proposed Plans (PPs), and RODs also were completed for these two sites. Two RDs were completed for Sites 2 and 12. Ecological data were consolidated into a geographic information system. A bioaccumulation study for Site 25 was submitted for review.

An information repository and an administrative record were established in FY91. A Community Relations Plan was completed in FY92 and updated in FY96. The installation formed a Technical Review Committee in FY92 and converted it to a Restoration Advisory Board in FY95.

FY99 Restoration Progress

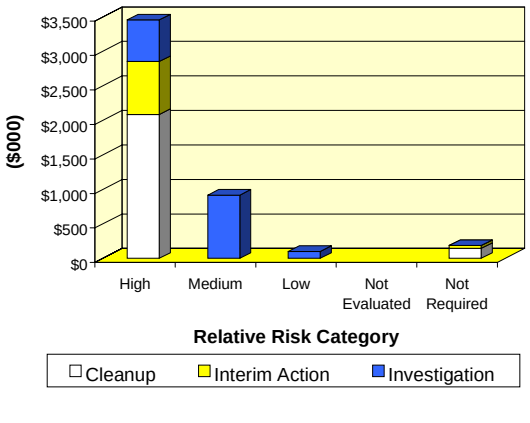
The installation completed Removal Actions for Sites 3 and 44, and Close-out Reports are pending. A landfill cap was completed, the long-term monitoring (LTM) plan was awarded, and a draft plan was submitted for approval at Site 2. Also, the installation completed three RI/FSs, PPs, and RODs for Sites 19, 29, and 25. The AS/SVE system at Site 12 is operating as designed, and sampling results have shown decreases in groundwater and soil contamination. An RD was completed at Site 9, and a 60 percent RD was submitted for Site 17.

Funding cuts in the first quarter of FY99 delayed the awarding of the contract for RD for Site 25. The RA for Site 9, was initiated. The completion date for the Phase II Gambo Creek ERA work plan was shifted to FY00 due to priority and funding changes. Six Appendix B sites were evaluated and closed out with no further action. The administrative record was converted to CD-ROM and placed in a local library. Site 9 landfill cap construction went as scheduled, despite the discovery of ordnance items, a building foundation, and additional contamination.

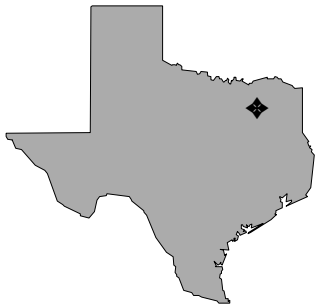
Plan of Action

- Complete two RI/FSs, PPs, and RODs in FY00
- Complete two Remedial Designs and Removal Designs in FY00
- Award one RA contract in FY00
- Complete sampling and Removal Actions for Appendix B sites in FY00
- Finalize the Phase II Gambo Creek study work plan and perform fieldwork in FY00
- Award LTM for one site in FY00

FY00 Funding by Phase and Relative Risk



FFID: TX617002278600
Size: 835 acres
Mission: Served as a pilot training center
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, solvents, heavy metals, and asbestos
Media Affected: Groundwater and soil
Funding to Date: $27.1 million
Estimated Cost to Completion (Completion Year): $21.2 million (FY2003)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Dallas, Texas

Restoration Background

In July 1993, the BRAC Commission recommended closure of the Dallas Naval Air Station (NAS Dallas). Operations were transferred to the Fort Worth Naval Air Station. The installation closed September 30, 1998.

A number of the industrial operations that supported the installation's military mission contributed to contamination. For investigation of environmental conditions, the installation was divided into six areas: Categories A through F. Thirteen sites were identified. The installation completed a confirmation study for six of these sites. Later, it completed a RCRA Facility Assessment, which identified 135 solid waste management units (SWMUs) and 44 areas of concern (AOCs).

During FY94, an Environmental Baseline Survey (EBS) identified 118 additional AOCs. The installation formed a Restoration Advisory Board (RAB), and established an information repository. In addition, a BRAC cleanup team (BCT) was formed, and a BRAC Cleanup Plan (BCP) was completed.

During FY95, the installation initiated fieldwork for Categories B and C, initiated the design for removal of underground storage tanks (USTs), and completed surveys of asbestos and polychlorinated biphenyls (PCBs). A Local Redevelopment Authority (LRA) was established. The LRA has adopted a Land Reuse Plan.

During FY96, the installation completed a Community Relations Plan, finished a draft interim RCRA Facility Investigation (RFI) report for Category B, finished an interim RFI report for Category C, remediated asbestos in all buildings, and completed a background study of soil. Ten SWMUs in Category C were found to require additional sampling.

In FY97, the EBS for transfer and the Finding of Suitability to Transfer for Duncanville housing were approved by EPA, the Texas Natural Resource Conservation Commission, and the BCT. The installation began to delineate a contaminant plume in the Fuel Farm. The BCP was updated.

In FY98, NAS Dallas was operationally closed and transferred to NAVFAC. A caretaker site office was established and manned, but not all tenants had left the station. Fifteen USTs and one oil-water separator were removed, and draft interim RFI reports were completed for Categories A, D, E, and F. The draft final RFI report for Category C was completed. Ninety-eight wells and 210 soil borings were installed across the base. Interim Remedial Action (IRA) work plans were developed and finalized for two SWMUs (the Northern Fuel Farm Area and the PCB Spill Area). Interim source containment measures were implemented at the PCB Spill Area (SWMU 85).

FY99 Restoration Progress

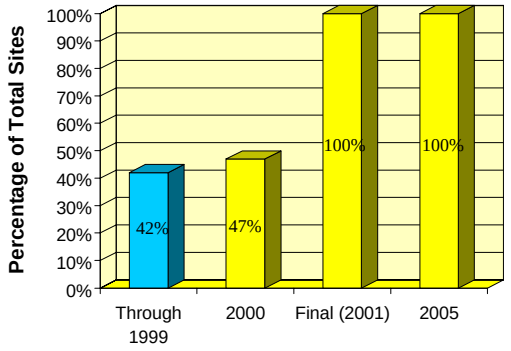
Final draft RFI reports were submitted for Categories A, B, D, E, and F. Comments were negotiated and final RFI reports were submitted for Categories C, E, and F. Final RFI reports for Categories A, B, and D were delayed because of regulatory review. Fourteen oil-water separators and associated contaminated soil were removed, and 12 soil Removal Actions were completed as interim remedial measures. A source Removal Action, consisting of the excavation and off-site disposal of dry-well structures and adjacent soil, was completed at the Fuel Farm to address groundwater impacted by chlorinated solvents. A risk assessment and a Corrective Measures Study (CMS) were completed for the Duncanville Housing site. Property transfer documents were completed, allowing the original landowners to have custody of the property. Twelve sites were earmarked for Interim Action, and Removal Action is under way. All USTs were removed and closure was achieved as planned.

An interim Corrective Action Evaluation Report was completed for the Texas Air National Guard Ponds. The remaining two planned risk assessment/CMS reports were not completed due to ongoing negotiations between the Navy and the City of Dallas about cleanup standards.

Plan of Action

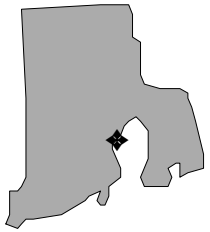
- Complete final RFI reports for Categories A, B, and D in FY00
- In FY00, select remedies for the eight SWMU groups, with emphasis on monitored natural attenuation and off-site migration control
- Complete interim corrective actions to address impacted soil at five sites in FY00
- Complete corrective measures implementation (CMI) at three of eight SWMU groupings in FY00
- Complete CMI at the remaining five SWMU groups in FY01

Sites Achieving RIP or RC Per Fiscal Year



Davisville Naval Construction Battalion Center — NPL/BRAC 1991

FFID: RI117002203600
Size: 1,285 acres
Mission: Provided mobilization support to Naval Construction Forces
HRS Score: 34.52; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in March 1992
Contaminants: Heavy metals, PCBs, pesticides, petroleum hydrocarbons, petroleum/oil/lubricants, and VOCs
Media Affected: Groundwater and soil
Funding to Date: $44.3 million
Estimated Cost to Completion (Completion Year): $9.9 million (FY2017)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Davisville, Rhode Island

Restoration Background

In July 1991, the BRAC Commission recommended closure of this installation. Construction battalion training and mobilization activities were transferred to the Naval Construction Battalion Center, Gulfport, Mississippi, and to Naval Construction Battalion Center, Port Hueneme, California. The installation was closed in April 1994.

Studies conducted since FY84 have identified 25 sites, including landfills, solvent storage and disposal areas, transformer storage areas, spill areas, underground storage tanks (USTs), and fire training areas. Contaminants include solvents, polychlorinated biphenyls (PCBs), petroleum/oil/lubricants, and pesticides.

In FY91, the installation completed Interim Remedial Actions (IRAs) for two PCB spill sites. In FY92, it completed a Phase I Remedial Investigation and Feasibility Study (RI/FS) for 10 sites. In FY93, it completed an IRA and an RI/FS and signed a Record of Decision (ROD) for two sites. In FY94, a Site Inspection, a Phase II RI/FS, Remedial Design, and an Ecological Risk Assessment were accomplished.

Fifty-six USTs were removed from seven sites, and an initial site characterization was completed. A Land Reuse Plan was completed in FY94. In FY95, the installation completed a Corrective Action Plan for 7 UST sites, removed 27 USTs, signed a no further action (NFA) ROD for two sites, and began one Removal Action and completed another. The installation also completed five UST corrective actions (CAs) and closed out one site. The installation updated risk assessments and prepared Proposed Remedial Action Plans for a number of sites.

During FY97, cleanup of two sites was completed. The Navy performed Environmental Baseline Survey (EBS) Phase II CAs and had regulatory agencies approve the results.

In FY98, a risk assessment was completed for Sites 6, 11, and 13. NFA RODs were signed for five sites, and an NFA decision document was issued for one site. The installation initiated a Remedial Action (RA) at Allen Harbor Landfill. The installation also completed CAs, receiving regulator approval on 90 previously identified EBS review items. Fieldwork for five new review items was completed. Long-term monitoring (LTM) was completed at three remaining former UST areas.

The installation's Technical Review Committee, formed in FY88, was converted to a Restoration Advisory Board (RAB) in FY94. The installation established an administrative record and an information repository in FY89. In FY94, a BRAC cleanup team (BCT) was formed, and in FY95, the BRAC Cleanup Plan was completed. In FY96 and FY97, respectively, the BCT prepared BRAC Business Plans and its Community Relations Plan.

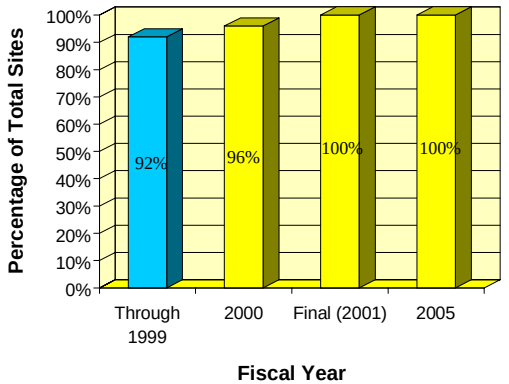
FY99 Restoration Progress

The ROD for LTM was signed for Site 7, and the RA at Allen Harbor Landfill, Site 9 was completed. The remaining EBS review items were completed, with one exception, EBS 21. Petroleum contamination was found and will require remediation. Federal Facility Agreement (FFA) schedule modifications were negotiated for Sites 3 and 16. Site 3 will require further investigation due to off-site contamination from a formerly used defense site. Site 16 progressed from a screening evaluation to RI. Four Findings of Suitability to Transfer (FOSTs) remain. The Parcel 9 FOST, which will be transferred as a public benefit conveyance, and the signing of the Site 7 ROD were delayed because of a Applicable or Relevant and Appropriate Requirement issue. The Parcel 10 FOST was delayed, pending the completion of the RA and an EPA determination that the remedy is operating properly and successfully. The Parcel 7 FOST was delayed pending renegotiation of the FFA schedule for Sites 3 and 16.

Plan of Action

- Issue draft RI for Site 16 and RI amendment for Site 3 in FY00
- Begin LTM fieldwork for Site 7 in FY00
- Continue Remedial Action-Operations at Site 9 in FY00
- Complete remediation of remaining EBS review item under State of Rhode Island regulations in FY00
- Issue ROD for Site 3 in FY01 and ROD for Site 16 in FY02

Sites Achieving RIP or RC Per Fiscal Year



FFID: TN497152057000
Size: 642 acres
Mission: Store and distribute clothing, food, medical supplies, electronic equipment, petroleum products, and industrial chemicals
HRS Score: 58.06; placed on NPL in October 1992
IAG Status: Federal Facility Agreement signed in March 1995
Contaminants: Pentachlorophenol, PCBs, chlorinated solvents, petroleum/oil/lubricants, pesticides, heavy metals, and chemical warfare agents
Media Affected: Groundwater and soil
Funding to Date: $30.0 million
Estimated Cost to Completion (Completion Year): $7.0 million (FY2008)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2004

Memphis, Tennessee

Restoration Background

In September 1995, the BRAC Commission recommended closure of Defense Distribution Depot Memphis. The installation closed in FY97.

Site studies beginning in FY81 have identified more than 120 sites at the installation. Between FY86 and FY89, underground storage tanks (USTs) were removed from the installation. In FY90, Remedial Investigation and Feasibility Study (RI/FS) activities were accomplished for 40 sites. Upon placement of the installation on the National Priorities List (NPL) in 1992, all CERCLA and the remaining UST sites were divided into four operable units (OUs). In FY95, the installation completed additional RI/FS work plans for all four OUs.

In FY85, an Interim Remedial Action (IRA) was completed to remove a pentachlorophenol (PCP) wood preservative treatment vat, a UST used for PCP storage, and contaminated soil in the area. By 1999, all of the remaining USTs had been removed or closed in place.

In FY94, groundwater monitoring was performed. In FY95, the interim Record of Decision (ROD) for groundwater contamination at Dunn Field was completed. In FY97, initial RI/FS fieldwork was completed and monitoring wells were installed at Dunn Field. An Environmental Baseline Survey, version 1 of the BRAC Cleanup Plan, and the local reuse authority's redevelopment plan were also completed.

In FY98, fieldwork in support of an Engineering Evaluation and Cost Analysis (EE/CA) for the removal of suspected chemical warfare material sites at Dunn Field was accomplished. Removal Actions were performed in three areas of the main installation. Dieldrin-contaminated soil was removed from housing (Site 73), polychlorinated biphenyl (PCB)–contaminated soil was removed from around the cafeteria (Site 48), and two remaining USTs were removed from Site 57.

Also in FY98, a groundwater IRA began operation at Dunn Field to prevent off-site migration and achieve product recovery. The city of Memphis sewer system is treating the effluent water. A preliminary risk evaluation (PRE) was finalized, recommending up to 16 sites for no further action (NFA). A Parcel 3–specific risk assessment was developed. All RI work from the main installation was reviewed by the BRAC cleanup team, and each of the approximately 150 BRAC property parcels was assigned an appropriate CERFA Environmental Condition of Property designation.

Community relations activities, starting in FY94, have included development of a Community Relations Plan and establishment of a Restoration Advisory Board. A bimonthly informational publication was started in FY98. All members of the Depot Restoration Team were given risk communication training.

FY99 Restoration Progress

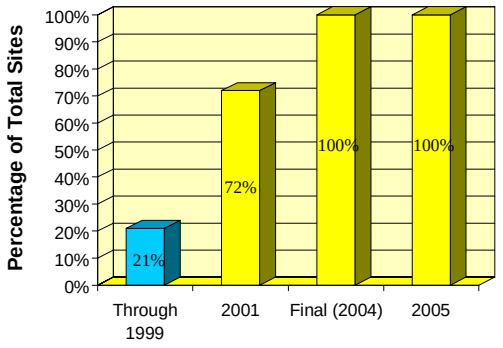
The EE/CA for removal of chemical warfare material at Dunn Field was completed. The contractor's work and safety plans are being reviewed. The EE/CA for early removal at Sites 29 and 31 (the paint shops and sand blast areas) was completed. The erosion control, dust prevention, and revegetation project at Site 64, the former Bauxite piles, was completed. An NFA document for the 16 sites recommended for NFA in the PRE, and for other sites recommended for NFA (solid waste management units addressed in RCRA Facility Assessment) was prepared and forwarded to regulators. The risk assessment was completed and a draft final RI was submitted for the main installation. Fieldwork for the Dunn Field RI/FS was performed. The internal draft RI for Dunn Field was prepared and distributed. The use of bioremediation for dieldrin-contaminated soil on the golf course was evaluated and determined to be a viable alternative if remediation is required. All Finding of Suitability to Lease documents for the main installation were completed.

The Removal Action for Sites 29 and 31 was not completed because of contract delays and an extension of the public comment period for the EE/CA. The Removal Action for Site 38 was not completed due to lack of EPA support. EPA has deferred any Remedial Action at this site until the ROD is finalized. The FS was not completed because of contractor delays.

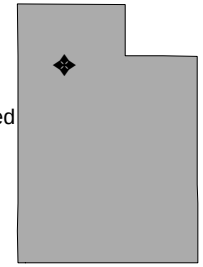
Plan of Action

- Perform removals at Sites 29 and 31, the former paint shop and sand blast areas, in FY00
- Perform removal at two chemical warfare material suspect sites at Dunn Field in FY00
- Finalize RIs for the main installation and Dunn Field in FY00
- Prepare FSs, Proposed Plans, and RODs for the main installation and Dunn Field in FY00
- Develop Remedial Designs for the main installation and Dunn Field in FY00 and FY01
- Sign RODs for the main installation and Dunn Field in FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: UT897154985500
Size: 1,129 acres
Mission: Store and distribute DoD commodities, including electronic equipment and textiles; package petroleum and industrial and commercial chemicals
HRS Score: 45.10; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in November 1989
Contaminants: Solvents, paint and paint residues, petroleum/oil/lubricants, insecticides, chemical warfare agents, methyl bromide, metal-plating wastes and sludge, PCB-contaminated transformer oils, degreasers, acids and bases, and sand-blast residues
Media Affected: Groundwater and soil
Funding to Date: $57.0 million
Estimated Cost to Completion (Completion Year): $10.4 million (FY2015)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003



Ogden, Utah

Restoration Background

In September 1995, the BRAC Commission recommended closure of Defense Distribution Depot Ogden (DDOU) except for minimal essential land and facilities for a Reserve Component area. The depot closed in September 1997.

A Preliminary Assessment in FY80 identified 44 potentially contaminated sites at the installation; 22 sites required further action. Site types include oil-burning pits, disposal pits, a french drain system, and burial sites, which have contaminated groundwater and soil.

In FY90, a Federal Facility Agreement divided the sites into four operable units (OUs). From FY92 through FY95, the installation conducted Remedial Actions at all OUs, including excavating and disposing of contaminated soil and debris and installing wells and piping for groundwater extraction and treatment systems. More than 130 groundwater monitoring wells and more than 100 extraction or injection wells have been installed. The use of advanced technology helped the installation identify the contents of glass bottles excavated at OU3 and remove white phosphorus from the soil at OU4.

In FY95, groundwater treatment facilities began operating at OUs 1, 2, and 4; a RCRA Facility Investigation (RFI) began; and low-level contamination screening sites and leaking aboveground storage tanks (ASTs) were investigated. The installation established a BRAC cleanup team, and the Technical Review Committee was converted to a Restoration Advisory Board (RAB). During FY96, a Local Redevelopment Authority (LRA) was established, and an installationwide Environmental Baseline Survey and a BRAC Cleanup Plan (BCP) were completed.

In FY97, the installation implemented corrective measures for ASTs and received agreement from regulatory agencies concerning the designation of 779 acres as CERFA-uncontaminated. The BCP and Land Reuse Plan was updated, and Phase I of the RFI was completed. Six sites were approved for no further action (NFA), leaving six sites for evaluation and cleanup.

In FY98, DDOU completed investigation and cleanup of polychlorinated biphenyl (PCB) contamination at 135 transformer sites. Phase II of the AST and underground storage tank investigation, Phase II of the RFI, and investigation of the gasoline release at Building 321 also were completed. The installation prepared a Corrective Action Plan (CAP) for Building 321. The Cooperative Agreement with Ogden LRA for depot management was extended to September 1999, and the DDOU RAB received Technical Assistance for Public Participation training. The installation finished an Environmental Assessment for disposal of excess property and completed investigation of identified BRAC sites. Leases were approved for 16 tenants, leasing 1.6 million square feet of building space and creating 663 new jobs.

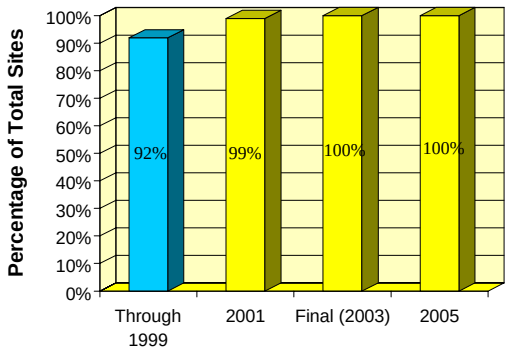
FY99 Restoration Progress

The cleanup of three BRAC sites, Plain City Canal, Building 246, and Building 339R was completed. Phase III of the RFI was completed. Two solid waste management units (SWMUs) were eliminated from further work. The remediation of SWMU 11 was completed. An interim corrective measure, consisting of soil removal, was implemented at SWMU 1. The source area at OU4 was remediated and a second pump-and-treat system for groundwater was installed. Cleanup was completed at Building 321. The investigation of the former skeet range also was completed, and the range was granted NFA status by the State and EPA. The CAP was implemented for Tank 19 and Site 5C/6D. Version 3 of the BCP was completed. The second source of contamination for OU2 was delineated, and a study was conducted for enhanced natural attenuation. Two Findings of Suitability to Transfer (FOSTs) were completed for 544 acres of property. An asbestos operation and maintenance program was developed as part of the Cooperative Agreement. A Lease in Furtherance of Conveyance was signed. A Memorandum of Agreement with the Utah State Historical Preservation Office and the Advisory Council on Historic Preservation was completed.

Plan of Action

- Complete the remediation of SWMUs 1 and 13 in FY00
- Implement cleanup at the Western Boundary and the Pistol Range in FY00
- Complete the implementation of CAP for Building 358 in FY00
- Complete soil cleanup at the Parade Ground Area source for OU2 in FY00
- Implement monitored natural attenuation at BRAC Site 51 in FY00
- Complete one FOST in FY00
- Complete version 4 of the BCP in FY00

Sites Achieving RIP or RC Per Fiscal Year



Defense Distribution Depot San Joaquin, Sharpe Facility

Formerly Sharpe Army Depot **NPL**

FFID: CA997152083200
Size: 724 acres
Mission: Receive, store, and distribute supplies, materials, and equipment
HRS Score: 42.24; placed on NPL in July 1987
IAG Status: IAG signed in March 1989
Contaminants: VOCs, heavy metals, petroleum/oil/lubricants, and pesticides
Media Affected: Groundwater and soil
Funding to Date: $49.0 million
Estimated Cost to Completion (Completion Year): $45.7 million (FY2015)
Final Remedy in Place or Response Complete Date for All Sites: FY2001

Lathrop, California

Restoration Background

This facility began operation in 1941 as a supply and maintenance center. Activities at the installation have included overhauls, repairs, painting, paint stripping, metal finishing, and degreasing of aircraft and heavy equipment. Investigations have identified 152 sites: 8 groundwater plumes and 144 contaminated or potentially contaminated soil or building sites.

A Remedial Investigation and Feasibility Study (RI/FS) for groundwater was completed in FY91, and a Record of Decision (ROD) was signed in FY93. Per ROD requirements, the two interim groundwater extraction and treatment (air-stripping) systems were upgraded to treat and control the migration of trichloroethene (TCE) plumes. A third system using air stripping and carbon adsorption went into operation in FY95 to capture the depot's central area plume.

Between FY85 and FY98, 71 underground storage tanks (USTs) and sumps underwent removal and corrective actions and 57 sites were closed. Approximately 10,000 cubic yards of contaminated soil was removed and disposed of during this period.

In 1995–1996, approximately 500 cubic yards of pesticide-contaminated soil was removed from the former pesticide mixing area. An installationwide RI/FS and a risk assessment were completed, and the Proposed Plan was prepared. The final ROD for Operable Unit (OU) 2, the sitewide remedy, was signed.

During FY97, the installation completed a Removal Action for lead- and chromium-contaminated soil at Sharpe's former industrial waste treatment plant pond and submitted the final closure report. Long-term monitoring and operations and maintenance at the sitewide groundwater treatment systems continued. The design of the lead and chromium soil Removal Action stipulated in the OU2 ROD was completed. Four USTs were removed and two were closed. Two other sites required further action. A study was initiated to determine the best in situ technologies for remediating UST sites where soil contamination had migrated beneath a building or other structure. The installation completed design of the in situ vapor extraction remedy for TCE-contaminated soil.

During FY98, a pilot in situ bioventing project was completed at UST Site 17, and a natural attenuation study began. Lead- and chromium-contaminated soil was removed from Sites S-3 and S-26. Analysis of Sites S-30, S-36, and S-33/29 showed that Remedial Action (RA) was not required. Installation of in situ soil vapor extraction (SVE) systems was also completed, and the SVE systems began operation at TCE and volatile organic compound (VOC) Sites P-1A, P-1B, P-1C, P-1E, and P-6A. Analysis of 10 TCE/VOC sites showed that RA was not required per ROD criteria. Setup of the Sharpe 3-D groundwater model began. A dense nonaqueous phase liquid (DNAPL) study, completed at Site P-6A, indicated no locatable DNAPL pools and recommended installation of an additional groundwater extraction well.

FY99 Restoration Progress

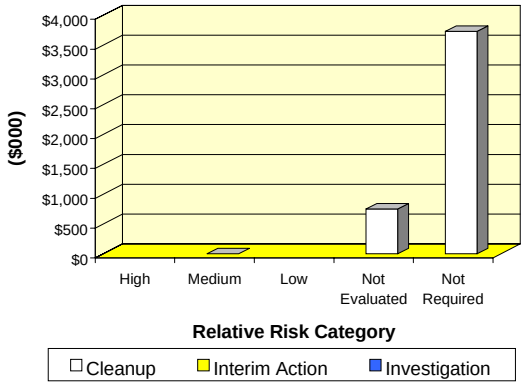
Operation of the SVE system continued at the five TCE/VOC-contaminated soil sites. Preparation of RA reports recommending no further action (NFA) began at the 3 metals sites and 10 TCE/VOC sites. Preparation of an RA report for Sites S-3 and S-26 also began. Finalization of the RA reports was delayed by a regulator request for additional information. The addition of the extraction well was delayed so that the well could be included in the groundwater modeling scenarios. Setup of the Sharpe 3-D groundwater model was completed despite delays in obtaining regulatory agency approval. The Water Management Plan was finalized. The in situ oxygen release compound pilot study at Site 147 began. Nine USTs were removed at the installation's fuel station. Groundwater treatment and monitoring programs continued. The updating of the environmental Web site began.

Sharpe's Technical Review Committee met quarterly during FY99.

Plan of Action

- Complete RA report for 3 metals NFA sites and for 10 TCE/VOC NFA sites in FY00
- Complete RA reports for metals Sites S-3 and S-26 and for Sites P-1A, P-1B, P-1C, P-6A, and P-1E in FY00
- Implement in situ technology or natural attenuation at remaining UST sites in FY00
- Continue operation of three groundwater extraction, treatment (air-stripping), and disposal systems in FY00
- Run optimizing scenarios on 3-D groundwater model and implement optimizing recommendations by FY01
- Complete in situ SVE at six TCE/VOC-contaminated soil sites by FY01
- Complete OU1 interim groundwater RA report in FY01
- Complete OU2 installation wide preliminary closeout report in FY02
- Complete 5-year review in FY03

FY00 Funding by Phase and Relative Risk



Defense Distribution Depot San Joaquin, Tracy Facility — NPL

FFID: CA997150682700
Size: 908 acres
Mission: Store and distribute medical, textile, food, electronic, industrial, construction, chemical, and other supplies and equipment
HRS Score: 37.16; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in 1991
Contaminants: Chlorinated solvents, heavy metals, pesticides, petroleum/oil/lubricants, and VOCs
Media Affected: Groundwater and soil
Funding to Date: $75.3 million
Estimated Cost to Completion (Completion Year): $33.5 million (FY2040)
Final Remedy in Place or Response Complete Date for All Sites: FY2002

Tracy, California

Restoration Background

Studies have identified 65 sites at this installation, including burn and disposal pits, underground storage tanks (USTs), hazardous waste storage sites, and other areas of contamination. Contamination has been identified in on-site soil and in on-site and off-site groundwater.

In FY86, a Remedial Investigation and Feasibility Study (RI/FS) was initiated to address the groundwater and soil contamination. Between FY88 and FY91, 32 USTs were removed, along with 1,060 cubic yards of contaminated soil. In FY92, bottled drinking water was supplied to two nearby farm residences where wells were threatened by the groundwater plume. The depot also installed a pump-and-treat system consisting of an air-stripping plant with carbon absorption, five extraction wells, and three injection wells.

A Record of Decision (ROD) for the remedy of groundwater contamination was signed in early FY93 and modified in FY95 to allow natural attenuation of a portion of the contaminant plume outside the installation.

In FY95, an environmental geographic information system (GIS) was established, which facilitates RI/FS and Remedial Design and Remedial Action (RD/RA) work. The installation removed more than 1,000 cubic yards of contaminated soil at the child-care facility. The installationwide risk assessment was completed, and the Proposed Plan was prepared and provided to the public for comment.

In FY96, an Engineering Evaluation and Cost Analysis and an Action Memorandum for removal of pesticide-contaminated soil from the former industrial pond and pipeline sites were concurred in by the regulatory agencies. Design work for this Removal Action and installation of extraction wells and infiltration galleries for the Operable Unit (OU) 1 groundwater air-stripping pump-and-treat system began.

In FY97, the industrial pond soil Removal Action design was completed and the implementation contract awarded. A Removal Action for pesticide-contaminated soil began. The final sitewide RI/FS was completed. Contaminated-soil Removal Actions were performed at five former UST sites, and approximately 376 cubic yards of contaminated soil was removed. Construction of the new OU1 air stripper, extraction wells, and installation galleries began.

During FY98, a sitewide comprehensive ROD was signed, the Removal Action for industrial pond soil was completed, the RD for the remaining sites was prepared, and the contract for cleanup of the remaining sites was awarded. The full-scale, low-flow groundwater-sampling system was installed and put into operation.

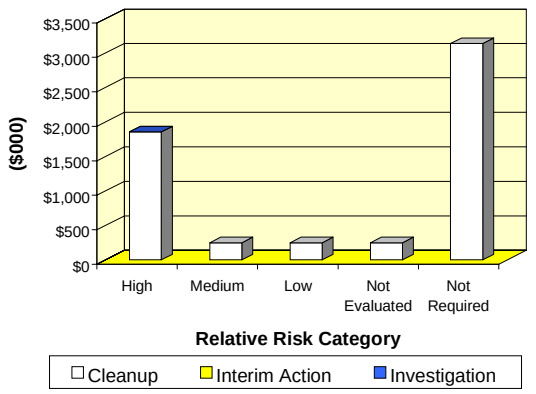
FY99 Restoration Progress

Construction of the OU1 groundwater extraction and treatment (air-stripping) system (Treatment Plant [TP] 2) was completed, and the system was put into operation. Operation of TP-1 and the associated well-monitoring program continued. Modifications of TP-1 and TP-2 were started to provide additional disposal capacity. The design of the OU2 trichloroethene (TCE) and volatile organic compound (VOC) soil vapor extraction (SVE) systems was completed, as were removals of pesticide-contaminated soil at Sites 6, 20, and 27. Institutional controls were implemented at several OU2 sites, and RD was completed for the rest of the sites. Installation of wet-season controls at the stormwater pond also was completed. A groundwater model was developed for the Tracy Site to allow system optimization and future 5-year review. The RA for part of the OU2 soil-removal sites was delayed because of lack of sufficient funds. Implementation of bioventing and other in situ technologies at UST sites also was delayed because of lack of funds and the sites' low relative risk.

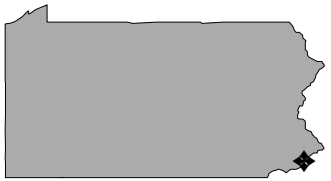
Plan of Action

- Complete modification of groundwater treatment systems at TP-1 and TP-2 in FY00
- Continue operation of TP-1 and TP-2 in FY00
- Perform SVE at TCE- and VOC-contaminated soil sites in FY00
- Implement soil removals, per OU2 ROD, at metals and pesticide sites in FY00
- Complete implementation of institutional controls, per OU2 ROD requirement in FY00
- Implement in situ technology (bioventing, oxygen release compound) or natural attenuation at UST sites in FY00 and FY01
- Prepare RA reports for OU2 RA sites in FY01
- Prepare interim groundwater RA report in FY02
- Prepare installationwide closeout report in FY03
- Complete 5-year review in FY04

FY00 Funding by Phase and Relative Risk



FFID: PA397154266500
Size: 87 acres
Mission: Procure and distribute food, clothing and textiles, medical supplies and equipment, and general and industrial items in support of the DoD military services, federal and civil agencies, and foreign countries and to ensure military readiness
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, PCBs, pesticides, and asbestos
Media Affected: Groundwater and soil
Funding to Date: $15.3 million
Estimated Cost to Completion (Completion Year): $2.5 million (FY2010)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Philadelphia, Pennsylvania

Restoration Background

In July 1993, the BRAC Commission recommended closure of the Defense Personnel Support Center, now known as the Defense Supply Center Philadelphia (DSCP), and relocation of its mission to the Aviation Supply Office in North Philadelphia, Pennsylvania. The BRAC Commission also recommended closure of the Defense Clothing Factory and the Defense Contract Management District Mid-Atlantic.

Environmental studies identified underground storage tanks (USTs), aboveground storage tanks, pesticide management areas, hazardous waste management areas, polychlorinated biphenyl (PCB)–containing transformers, asbestos-contaminated areas, and former railroad track areas. A plume, primarily JP-4 jet fuel, underlies large portions of the installation. Studies indicate that the plume originated off site and migrated onto DSCP.

The installation completed cleanup of a PCB-contaminated sewer site in 1991 before the BRAC Commission's recommendation of closure. Remedial Investigation and Feasibility Study (RI/FS) and Remedial Action (RA) activities began at the clothing factory in FY94 in preparation for interim leasing to the City of Philadelphia. RA activities included cleanup of DDT in two buildings and removal of two USTs and contaminated soil associated with the use of DDT. A hazardous waste management area was closed, and asbestos remediation was completed in one building of the clothing factory. RI activities to determine the extent and source of petroleum contamination underlying the installation are complete.

The BRAC cleanup team (BCT), formed in FY94, provided information to the Base Transition Office and the Local Redevelopment Authority to support reuse plans for the installation. The final Environmental Baseline Survey and the BRAC Cleanup Plan were completed, and an Environmental Assessment was prepared to evaluate alternatives for reuse of the clothing factory. In FY95, a Restoration Advisory Board (RAB) was established.

During FY95–FY96, RAs were completed at all known UST sites, nine USTs were removed, and one UST was closed in place. All 10 PCB-containing transformers were removed. Phase I of the basewide Expanded Site Inspection (ESI), previously known as the RI/FS, was completed. Baildown and recovery tests were completed for 12 on-site wells, and removal of free product from the surface of the groundwater began. A Consent Decree was signed between the installation, the Pennsylvania Department of Environmental Protection (PA DEP), and Sun Oil (a neighboring refinery), allowing the parties to collaborate on defining the extent of the plume and to develop a remediation plan.

In FY97, the Finding of Suitability to Lease for Building 13, portions of Building 9, and an adjacent parking area was completed, and the lease for these parcels was signed. A conceptual plan and a risk assessment plan for the installation were completed and approved by PA DEP. Nineteen Federal Facilities Compliance Act (FFCA) sites were identified, and two have been remediated and certified as closed by the BCT.

In FY98, the RAB applied for and received a Technical Assistance for Public Participation grant. Phase II of the ESI was completed. Skimming operations at DSCP produced 153,500 gallons of free product through FY98. Installation Restoration Program (IRP) Site 29, the PCB-containing transformers, was officially closed. All FFCA sites were remediated and certified as closed.

FY99 Restoration Progress

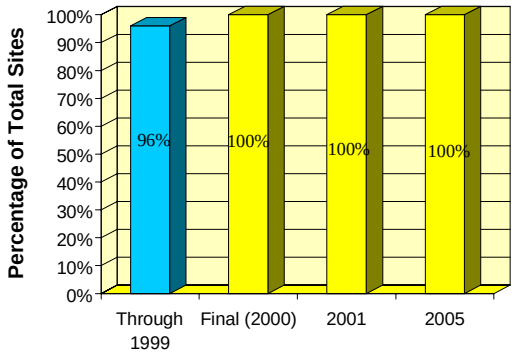
In FY99, DSCP generated a draft Human Health Risk Assessment (HHRA). DSCP participated in the RAB and the PA DEP plume forums and public information exchanges. It continued to share in the cost of Phase I plume remediation and turned over the management of the HHRA to Sunoco. Phase III of the ESI was completed. Thirty-five remediated IRP sites have been administratively closed by the BCT; 10 IRP sites remain.

The Finding of Suitability to Transfer (FOST) for Building 13 was completed and signed in January 1999. The transfer deed for Building 13 was completed but is still under review by the stakeholders. FOSTs for Building 9 (air rights only) and the parking lot have been completed and are being reviewed by regulators. The draft FOST for the balance of the property has been completed and is under review by all stakeholders. Negotiations began with the city to undertake a Cooperative Agreement to operate and maintain the former DSCP site until transfer. The demolition of four World War I-era warehouses also was completed.

Plan of Action

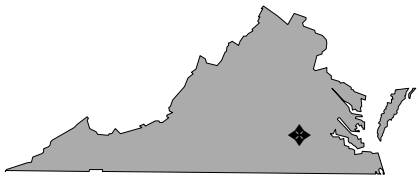
- Transfer property to the City of Philadelphia in FY00
- Relocate DSCP environmental and site management personnel in FY00
- Facilitate DLA completion of the HHRA in FY00

Sites Achieving RIP or RC Per Fiscal Year



Defense Supply Center Richmond — NPL

FFID: VA397152075100
Size: 565 acres
Mission: Manage general supplies for the Armed Services
HRS Score: 33.85; placed on NPL in July 1987
IAG Status: IAG signed in 1991
Contaminants: Phenols, solvents, paints and paint residues, corrosives, pesticides, refrigerants, antifreeze, photographic chemicals, and oils
Media Affected: Groundwater and soil
Funding to Date: $28.8 million
Estimated Cost to Completion (Completion Year): $18.4 million (FY2010)
Final Remedy in Place or Response Complete Date for All Sites: FY2003



Richmond, Virginia

Restoration Background

Preliminary Assessments and Site Inspections identified 31 sites at this installation. In FY91, sites were grouped into eight operable units (OUs). In FY92, a ninth OU was listed as an Interim Action site. Seven of the sites were considered to pose no hazard to the environment; four sites are not covered by CERCLA.

In FY89, an underground storage tank (UST) program was implemented. Through FY95, 30 tanks were replaced and 20 tanks were eliminated.

Two Records of Decision (RODs) were signed in FY92, designating institutional controls (ICs) for contaminated soil at OU1 and a vapor vacuum extraction system as the Remedial Action (RA) for contaminated soil at OU5. Operations at a pilot plant indicated that contamination in the OU5 soil had decreased to undetectable levels, prompting OU5 closeout. In FY93, a ROD was signed requiring installation of an extraction and treatment system to remove volatile organic compounds from the groundwater at OU9. The system was implemented in FY96.

In FY95, a fourth ROD was signed, requiring a two-phase RA for soil at the National Guard Area. ICs and excavation and disposal of 150 cubic yards of contaminated soil were implemented. Six Expanded Site Inspections were completed. Three areas proceeded to the Remedial Investigation and Feasibility Study (RI/FS) phase and were designated OUs 10, 11, and 12. Another area was combined with OU4; the remaining two areas require no further action. During the RI/FS for OU7, another site (OU13) was identified. Exploratory trenching of soil at OU2 was conducted.

During FY96, investigations were completed at one UST site, the investigation was closed at an indoor pistol range, and an air-stripping system was implemented. The RIs for the fire training area (OU4 and OU7), the acid neutralization pits (OU8), and the fire training pit (OU7) were completed. A computer model of the contamination plume for the PX gas station was completed, and the Corrective Action Plan was modified.

In FY97, a recovery system for the gasoline phase on groundwater at the PX gas station was implemented. The remediation of soil at OU3 and the final FS for OU4 were completed. A work plan for removal of contaminated soil from OU2 and a draft Proposed Plan (PP) for OU4 were completed. A Treatability Study for groundwater at OU8 was started.

In FY98, a 5-year review of OU1; the FS; and drafts of the Action Memorandum, the PP, and the ROD for OU2 were completed. A draft PP and a ROD supporting dual-phase extraction were prepared for OU8. Draft PPs and RODs for OUs 10 and 11 were completed. Draft final RIs for OUs 12 and 13 and a draft FS for OU12 were issued. One UST project was completed.

FY99 Restoration Progress

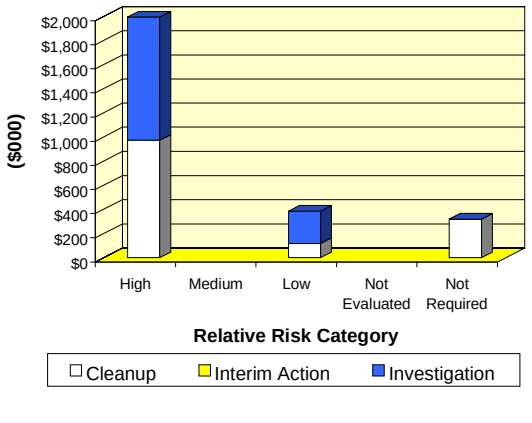
A draft deletion document was issued for OU1. For OU2, a final FS and delineation of hydrocarbon-contaminated soil were completed, and the Remedial Design was initiated. The final PP was issued for OU4 and the ROD was signed. The Phase I pilot test of dual-phase technology was completed for OU6. A density-driven convection pilot test and a draft basewide creek sampling work plan for OU7 also were completed, and a draft FS addendum was issued. The draft FS, PP, and ROD were issued for OUs 10 and 11. The final RI was issued and the FS was completed for OU12. The final RI for OU13 was issued.

The final PP for OU2 was not issued as planned because EPA delayed the decision on whether to abandon or repair an existing sewer line. Final PPs were not issued for OU6 or OU8 because additional technologies were evaluated. Additional contamination was found at OU8. Final PPs were not issued as planned at OU10 and OU11 because of a change in EPA guidance.

Plan of Action

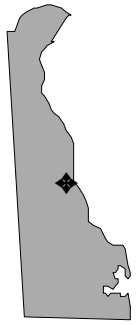
- Issue a residential risk assessment and a draft explanation of significant differences (ESD) to either delete construction sampling requirements for OU1 or permit delisting of the site in FY00
- Issue final PP, hold a public meeting, sign the ROD, and complete design for OU2 in FY00
- Issue ESD to allow site deletion to proceed for OU3 in FY00
- Complete Phase II of pilot test, natural attenuation studies, and FS and complete the draft PP and draft ROD for OU6 in FY00
- Complete additional site studies and a pilot test of in situ treatment technology; complete FS addendum; complete FS; and issue a revised draft PP and ROD for OU7 in FY00
- Complete additional performance evaluation and issue a revised final FS and a final PP for OU8 in FY00
- In FY00, issue final FS and PP and hold a public meeting for OUs 10, 11, and 12; sign ROD and initiate design for OU12
- Complete FS and issue draft PP and draft ROD for OU13 in FY00

FY00 Funding by Phase and Relative Risk



Dover Air Force Base NPL

FFID: DE357182401000
Size: 3,730 acres
Mission: Provide airlift support for troops, cargo, and equipment
HRS Score: 35.89; placed on NPL in March 1989
IAG Status: Federal Facility Agreement signed in August 1989
Contaminants: Solvents, paints, petroleum products, VOCs, heavy metals, and plating wastes
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $44.5 million
Estimated Cost to Completion (Completion Year): $51.2 million (FY2016)
Final Remedy in Place or Response Complete Date for All Sites: FY2004



Dover, Delaware

Restoration Background

Since 1942, this base has provided airlift assistance for troops, cargo, and equipment. Former waste management practices contaminated the shallow groundwater aquifer with petroleum products, volatile organic compounds (VOCs), and heavy metals. The principal site types at the installation are underground storage tanks (USTs), oil-water separators, fire training areas, landfills, fuel spills and leaks, and a fuel hydrant system.

A Preliminary Assessment was completed in 1983, and a Site Inspection was completed in 1989. Fifty-nine restoration sites have been identified to date. Basewide Remedial Investigation and Feasibility Study (RI/FS) fieldwork was completed in FY94.

In FY95, three Records of Decision (RODs) were signed, which incorporated innovative treatment technologies into Remedial Actions (RAs). The installation also completed an RA at a former waste oil tank site, removed USTs from one site, and completed a Focused FS.

In FY96, the installation conducted a natural attenuation project at four sites contaminated with chlorinated solvents. Corrective Action Plans (CAPs) were completed for six petroleum exclusion sites. An Engineering Evaluation and Cost Analysis (EE/CA) was completed for excavation of a waste oil–contaminated soil source.

In FY97, basewide RIs were approved by state and federal regulators. Three RODs were signed for natural attenuation at four sites. A former fire training area was characterized by magnetic scanning and ground-penetrating radar. An EE/CA was completed for soil removal and emplacement of an asphalt cap at a pesticide source.

In FY98, the installation completed construction of a free-product recovery system to extract spilled JP-4 jet fuel. The pesticide source area was excavated and capped. The installation completed a drum removal action at the former fire training area and began monitoring of natural attenuation at three petroleum exclusion sites. At the golf course, the installation excavated 1,935 tons of waste oil–contaminated soil, which was shipped to a treatment and disposal facility. An anaerobic bioremediation and bioaugmentation pilot project was successful in degrading chlorinated solvent contamination. The installation generated a ROD for excavation of two industrial waste basins.

FY99 Restoration Progress

The installation completed construction of a second free-product recovery skimming system. Long-term operations (LTO) at the free-product recovery site have recovered approximately 4,800 gallons of fuel. The installation excavated two concrete industrial waste basins and 753 tons of contaminated soil. Monitoring of natural attenuation was implemented at two sites. Based on the success of the pilot project, the installation generated a full-scale Remedial Design for an innovative accelerated anaerobic bioremediation system for treatment of a chlorinated solvent source area.

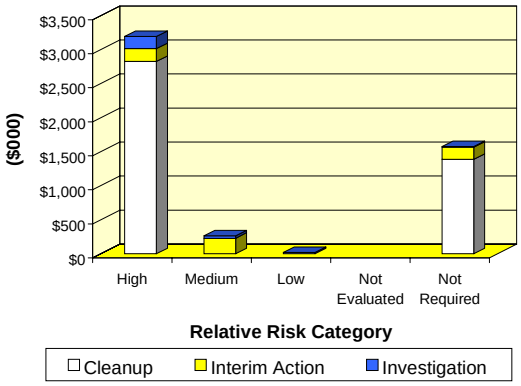
FSs were drafted for active sites, and the No Further Action (NFA) ROD for closing out 20 sites was drafted. Both the FSs and the ROD are on hold pending regulator approval of the basewide Ecological Risk Assessment.

The installation solicited information on community interest in forming a Restoration Advisory Board (RAB) and found that the level of interest was insufficient to justify forming a RAB. The installation meets monthly with state and federal regulators to discuss cleanup issues.

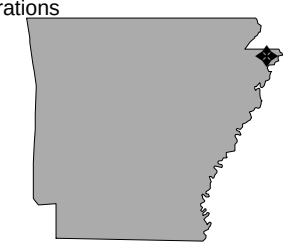
Plan of Action

- Complete FSs for active sites in FY00
- Complete ROD for NFA at 20 sites in FY00
- Implement LTO at a second free-product recovery site in FY00
- Complete a site investigation for a suspected pesticide-contaminated soil source in FY00
- Continue semiannual natural attenuation monitoring at two source areas in FY00
- Develop a CAP for a free-product source area in FY00

FY00 Funding by Phase and Relative Risk



FFID: AR657002447300
Size: 3,286 acres
Mission: Supported B-52 strategic bombers and KC-97 and 135 stratotanker operations
HRS Score: NA
IAG Status: None
Contaminants: Petroleum hydrocarbons, VOCs, and metals
Media Affected: Groundwater and soil
Funding to Date: $29.4 million
Estimated Cost to Completion (Completion Year): $2.9 million (FY2015)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Blytheville, Arkansas

Restoration Background

In July 1991, the BRAC Commission recommended closure of Eaker Air Force Base, which formerly supported aircraft and tanker operations. The installation was closed on December 15, 1992.

Environmental studies conducted between FY85 and FY90 identified 12 sites at Eaker. In FY90, a RCRA Facility Assessment identified 21 solid waste management units and 9 areas of concern. Prominent site types include underground storage tanks (USTs), aboveground storage tanks, oil-water separators, petroleum/oil/lubricant (POL) spill sites, and landfills. Other sites include a fire training area, storage areas, an explosive ordnance disposal (EOD) range, a small-arms firing range, a trap and skeet range, a JP-4 jet fuel hydrant system, and a bulk fuel storage tank farm. Remedial Investigation and Feasibility Study fieldwork began for the first 12 sites. Later, an Administrative Consent Order was signed indicating that 30 sites (including the initial 12) are subject to RCRA corrective action and will be addressed under a RCRA Facility Investigation (RFI). The installation also completed an Environmental Baseline Survey (EBS).

Interim Actions at the installation include removal of 125 USTs and 31 oil-water separators, remediation of contaminated soil at UST sites and at the JP-4 fuel hydrant system, and provision of an interim soil cover and native vegetation for Landfill 4.

The installation formed a BRAC cleanup team and a Restoration Advisory Board in FY94 and completed a Community Relations Plan in FY95. In FY95, fieldwork began for the RFI.

In FY96, the installation submitted an RFI report to the regulatory agencies. Human Health and Ecological Risk Assessments were performed at contaminated sites. The installation completed clearance of unexploded ordnance at the EOD range. The installation also completed sampling at the Defense Reutilization and Marketing Office (DRMO) storage facility under an approved closure plan.

In FY97, several Interim Removal Actions occurred: removal of pesticide-contaminated soil, removal of one UST, and removal of free product by bioslurper at the base service station. The latest version of the BRAC Cleanup Plan and several Supplemental EBSs (SEBSs) also were prepared.

In FY98, the RFI was approved by the Arkansas Department of Environmental Quality (ADEQ) and EPA. A Corrective Measures Study (CMS) was submitted to regulators for review and comment. ADEQ approved use of risk-based closure at the EOD range and DRMO facilities. Interim Remedial Actions were performed at the roads and grounds maintenance facility and the entomology shop. A Finding of Suitability to Lease and a SEBS were completed, resulting in the leasing of the potable water system and the wastewater system and placing all Eaker property under lease. A Finding of Suitability to Transfer (FOST) and another SEBS also were completed, resulting in the transfer by deed of the nonappropriated housing and the Capehart housing to the private sector.

FY99 Restoration Progress

The installation received approval for the CMS. Selected remedies were reviewed by ADEQ in the Remedial Action (RA) decision document. No public comments were received.

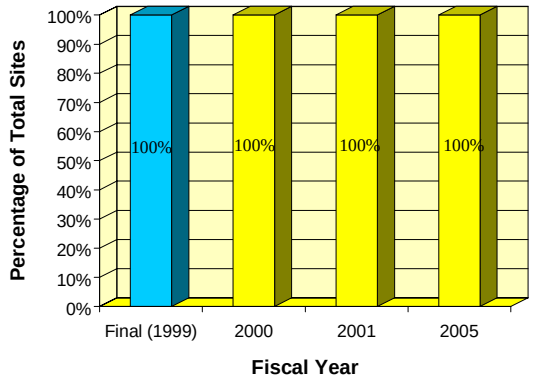
The last remedy in place was completed for all Installation Restoration Program sites. Remedial Action Operations and long-term monitoring are the only actions remaining at these sites.

A FOST and a SEBS for the golf course, the potable water system, and approximately 100 acres of commercial property were completed and submitted to the regulators for review.

Plan of Action

- Complete lead removal at the small-arms firing range in FY00
- Operate RA systems and monitor sites as necessary in FY00
- Complete FOST and SEBS for all farmland, archaeological sites, and remaining commercial property in FY00

Sites Achieving RIP or RC Per Fiscal Year



Earle Naval Weapons Station NPL

FFID: NJ217002217200
Size: 11,134 acres: 706 acres shoreside; 10,428 acres inland
Mission: Handle, store, renovate, and ship munitions
HRS Score: 37.21; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in December 1990
Contaminants: VOCs, SVOCs, heavy metals, hydrocarbons, and petroleum products
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $16.8 million
Estimated Cost to Completion (Completion Year): $20.7 million (FY2030)
Final Remedy in Place or Response Complete Date for All Sites: FY2008

Colts Neck, New Jersey

Restoration Background

Preliminary Assessments (PAs) completed in FY83 identified 29 sites of concern at this installation, 4 of which required further investigation. The sites include landfills, production areas, storage areas, maintenance areas, and disposal areas. Sixty-seven sites (48 CERCLA and 19 underground storage tank [UST] sites) have been identified. Releases of volatile organic compounds (VOCs) and heavy metals from landfills and production areas have contaminated groundwater and soil at the installation.

In FY87, a Site Inspection (SI) identified 11 contaminated sites. An SI in 1992 examined 16 additional sites. No further action (NFA) was recommended for two sites.

In FY91, the installation began Remedial Investigation and Feasibility Study (RI/FS) activities. An interim draft RI report for the first 11 sites was submitted in FY92, recommending cleanup of all sites, including capping, removal, and long-term monitoring. The first round of the RI/FS was completed in late FY93. Additional data were obtained during the second RI/FS round in FY94.

One UST site was investigated in FY91 and closed in FY92. At several UST sites, soil was excavated and disposed of in FY93. In FY94, the installation completed a work plan, an Action Memorandum, and an Engineering Evaluation and Cost Analysis for a Removal Action at Site 20. The installation also prepared a Corrective Action Plan for UST 8. USTs were removed, and some leaking USTs were identified. In FY95, the installation completed RI fieldwork at 21 sites and removed and recycled soil from Site 20. NFA was recommended for six UST sites.

In FY96, the installation completed the RI for 27 sites, initiated Removal Actions at 5 sites, and began FS activities at 4 sites. During FY97, the installation completed Remedial Actions (RAs) at five sites and an FS at four sites. Remedial Design (RD) began for two landfill caps, surface soil remediation, and four UST sites.

In FY98, landfill caps were designed and built for Sites 4 and 5. RD, removal of contaminated soil, and site restoration were completed at Site 19. The Record of Decision (ROD) was signed for Site 26 and a source area removal was completed. Two additional sites, a former pesticide shop and a battery disposal area, were identified. UST corrective actions were initiated. Monitored natural attenuation was selected as the remedy for two sites. Removal Actions were completed at Sites 13 and 26 and expanded at Site 16F. Lead removal was completed at Site 5.

In FY90, the installation formed a Technical Review Committee (TRC), completed a Community Relations Plan (CRP), and established an information repository containing a copy of the administrative record. In FY95, the TRC was converted to a Restoration Advisory Board. The CRP was updated in FY98.

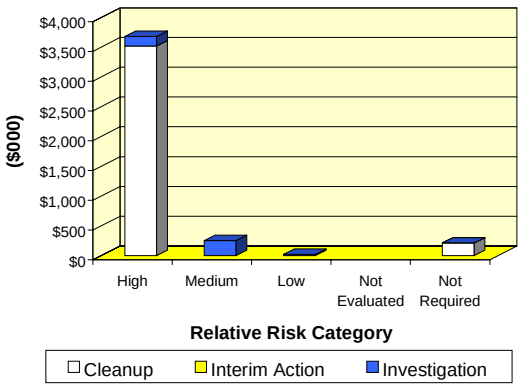
FY99 Restoration Progress

An NFA ROD was signed for eight sites, and a pilot study and RD were completed for an air-sparging system at Site 26. The PA/SI for Sites 47 and 48 was deferred while a removal was completed at Site 47. A removal also was initiated at Site 12. Bank stabilization began at Sites 6 and 17. RD and RA at Sites 3, 10, and 13 were delayed for resolution of regulatory comments on the FS. Natural attenuation started at UST Site 7. RA began for Site 26.

Plan of Action

- Initiate full-scale air sparging at Site 26 in FY00
- Begin RDs for Sites 3, 10, and 13 in FY00
- Begin RAs at Sites 3 and 10 in FY00
- Initiate PA/SI at Sites 47 and 48 in FY00
- Initiate FSs at Sites 1, 7, and 9 in FY00
- Begin RA at Site 13 in FY01

FY00 Funding by Phase and Relative Risk



Edwards Air Force Base NPL

FFID: CA957172450400
Size: 301,000 acres
Mission: Research and develop aircraft
HRS Score: 33.62; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in 1990
Contaminants: Waste oils, solvents, VOCs, petroleum hydrocarbons, petroleum/oil/lubricants, rocket fuel, and heavy metals
Media Affected: Surface water, sediment, groundwater, and soil
Funding to Date: $144.6 million
Estimated Cost to Completion (Completion Year): $248.7 million (FY2015)
Final Remedy in Place or Response Complete Date for All Sites: FY2005

Kern County, California

Restoration Background

In FY93, an Expanded Source Investigation and a RCRA Facility Assessment identified solid waste management units and the following site types: underground storage tanks (USTs), fuel pipelines, landfills, hazardous waste disposal areas, and wastewater and surface water runoff collection areas.

Interim Remedial Actions (IRAs) have included installation of four groundwater extraction and treatment systems to remove JP-4 jet fuel and solvents; removal of over 300 USTs; removal of numerous drums of hazardous waste; stabilization of soil to immobilize dioxin and heavy metals; replacement of leaking jet fuel pipelines; capping of the fire training facility; implementation of bioventing at three sites; implementation of two soil vapor extraction (SVE) and treatment systems; installation of a fence at a landfill; and implementation of in-well vapor stripping at a solvent disposal area. Removal Actions were conducted at 12 sites.

In FY96, using bioventing, the installation cleaned and closed a former UST site ahead of schedule. IRAs began at Operable Unit (OU) 1 with construction of two dual-phase extraction systems to remediate petroleum hydrocarbon and volatile organic compound (VOC) contamination in groundwater and soil. At OU2, IRAs were conducted to activate a bioventing system and to begin construction of a dual-phase extraction system. Decision documents (DDs) were signed for 40 areas of concern (AOCs) in OUs 1 and 2.

In FY97, 24 early actions and 15 site cleanups occurred. The Sampling Technology, Assessment and Remediation (STAR) program, and the Base Environmental Analysis Laboratory, an on-base laboratory, were used to accelerate fieldwork. All three dual-phase extraction systems constructed in FY96 began operating in FY97.

In FY98, five Engineering Evaluations and Cost Analyses and three Treatability Study work plans were approved by regulatory agencies. Eight sites at OU2 were cleaned up, and bioventing units were installed at five sites. No Further Investigation (NFI) letters were signed for 27 sites and AOCs. Mobile free-product recovery systems recovered 2,865 gallons of fuel (in-well skimmers removed an additional 281 gallons of fuel) from the groundwater aquifer for a total of 19,214 gallons to date. A two-phase treatment system at Site 45 reduced contaminants to below regulatory action levels. The catalytic oxidizer was moved to the newly constructed SVE system at Site 11.

The installation's Restoration Advisory Board has provided input since January 1995 and distributes a monthly newsletter to more than 5,000 stakeholders.

FY99 Restoration Progress

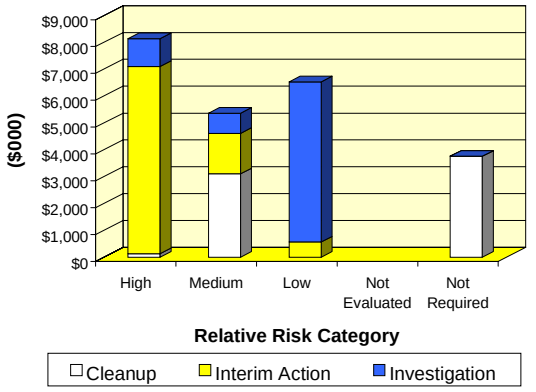
The Edwards AFB Environmental Restoration Program currently contains 461 sites and AOCs. Of these, 162 sites and AOCs are being investigated, 2 are in long-term monitoring (LTM), and 32 are in cleanup, operations, construction, Record of Decision, or DD status. NFI letters were signed for 29 sites and AOCs during FY99.

The STAR program for investigating AOCs and sites was completed. A pump-and-treat system was installed at Site 37. The system at Site 133 will be installed next year because of cleanup priorities. The biotrickling filter technology at Site 17 was tested and put into operation. The four technologies to be tested at Site 85 have been reduced to two technologies based on site conditions. These two technologies are free-product skimming combined with pulsed SVE and air sparging (AS). The basewide Ecological Risk Assessment (ERA) and validation studies were initiated at Sites 25, 31, 37, and 133. LTM, groundwater studies, and remediation continued.

Plan of Action

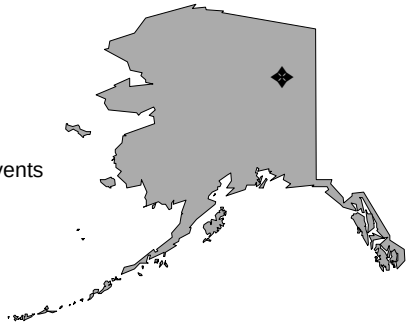
- Continue LTM, groundwater studies, and remediation in FY00
- Conduct initial investigation and screening of sites and AOCs as needed in FY00
- Continue testing of free-product skimming and SVE/AS at Site 85 in FY00
- Continue biotrickling filter testing in FY00
- Continue ERA and validation studies covering all Installation Restoration Program sites through FY02

FY00 Funding by Phase and Relative Risk



Eielson Air Force Base NPL

FFID: AK057302864600
Size: 19,790 acres
Mission: Provide tactical air support to Pacific Air Forces
HRS Score: 48.14; placed on NPL in November 1989
IAG Status: IAG signed in May 1991
Contaminants: Heavy metals, petroleum/oil/lubricants, VOCs, PCBs, and solvents
Media Affected: Groundwater and soil
Funding to Date: $51.6 million
Estimated Cost to Completion (Completion Year): $9.7 million (FY2011)
Final Remedy in Place or Response Complete Date for All Sites: FY1998



Fairbanks, North Star Borough, Alaska

Restoration Background

Environmental studies at Eielson Air Force Base (AFB) began in FY82. By FY93, the installation had identified 64 sites. Thirty-one of the sites were grouped into six operable units (OUs); 24 sites were investigated and determined to require no further action (NFA).

Sites include fire training areas, landfills, spill sites, aboveground storage tanks, underground storage tanks (USTs), and disposal pits. Primary contaminants affecting groundwater and soil are petroleum/oil/lubricants (POLs), benzene, and chlorinated solvents.

Interim Actions in FY90 and FY91 included removal of four USTs and removal and incineration of POL-contaminated soil. Bioventing was implemented at two POL sites, and land treatment was used to remediate the POL-contaminated soil excavated during Remedial Investigation (RI) and Removal Actions. In FY94, a mobile wastewater treatment system was set up to treat monitoring-well purge water.

In FY95, the installation received regulatory approval for use of bioventing and natural attenuation as cleanup alternatives and began Remedial Design (RD) at OUs 1 and 2. The installation also began fate-and-transport modeling for lead-contaminated sites at OU2. A Remedial Action (RA) contract for landfill capping, bioventing, natural attenuation, soil vapor extraction (SVE), and remediation of lead contamination began at OUs 3, 4, and 5. Also in FY95, the installation converted its Technical Review Committee to a Restoration Advisory Board (RAB).

In FY96, RD was conducted for polychlorinated biphenyl (PCB) contamination at SS-067. Bioventing and SVE began at OUs 1 and 2. The installation also completed Removal Actions for lead and POL soil contamination at OU2. A cesspool and a dry well were removed.

In FY97, remedial efforts were completed at all 66 Federal Facility Agreement sites except Site SS-067. All Records of Decision (RODs) for the base's Installation Restoration Program (IRP) have been signed. Limited field investigations (LFIs) and response actions were completed at 44 areas of concern (AOCs); more than 3,000 drums were removed and disposed of and over 218,000 pounds of lead-contaminated sand was removed from a firing range.

In FY98, the installation reached the Construction Complete phase of the CERCLA process, and the preliminary closeout report received EPA signature. Cleanup efforts at the Chena River Site were completed. In addition, the Eielson IRP underwent its first 5-year ROD review, and the installation obtained EPA signature on the OU2 and OU3, OU4, and OU5 ROD amendments. Remediation at Site SS-067 was completed. Approximately 645,000 pounds of PCB-contaminated soil has been disposed of at a Toxic Substances Control Act receiving facility. A total of 245 drums were removed during an AOC LFI/response action project.

FY99 Restoration Progress

The installation completed LFI and response actions at three of the four remaining AOCs. An investigation is under way at the fourth site to determine the nature and extent of groundwater contamination. A total of 250 drums were removed from AOC 003, which was originally estimated to contain approximately 800 drums. Building 500 was demolished under the Clean Sweep program. Asbestos and building debris were removed and disposed of.

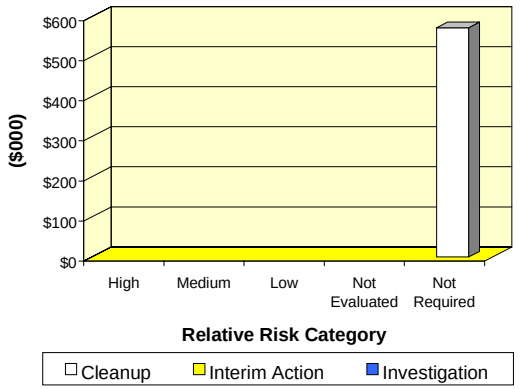
Long-term operations (LTO) and long-term monitoring (LTM) continued at all active IRP sites. Significant groundwater contamination was discovered at Site OT-008 during a delineation effort. Characterization of the contaminant plume is under way to determine whether the plume contains additional constituents. This site is expected to be converted to an IRP site for future RA. The installation has been awaiting Alaska Department of Environmental Conservation signature on the Eielson Air Force Base ROD amendments for OUs 2, 3, 4, and 5 since August 1998.

The RAB met biannually, and the Air Force Center for Environmental Excellence (AFCEE) Regional Coordinators and EPA Regions 9 and 10 participated in a partnering meeting. An institutional control plan was established in the Base General Plan. Enforcement of institutional controls is ongoing.

Plan of Action

- Characterize AOC 029 contamination and possibly convert AOC to an IRP site in FY00
- Initiate AFCEE RPO project to assist in the closure of up to 30 NFA sites in FY00
- Continue LTO/LTM at active sites in FY00
- Continue biannual RAB meetings in FY00
- Continue enforcing institutional controls in FY00
- Complete contaminant characterization at Site OT-008 in FY00, for possible FY02 RA

FY00 Funding by Phase and Relative Risk



FFID: CA917302320800
Size: 4,811 acres
Mission: Serve as the primary Marine Corps jet fighter facility on the West Coast; provide materials and support for Marine Corps aviation activities; provide housing for Marine Corps personnel
HRS Score: 40.83; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in October 1990
Contaminants: TCE and other VOCs, petroleum hydrocarbons, PCBs, pesticides, and herbicides
Media Affected: Groundwater and soil
Funding to Date: $65.5 million
Estimated Cost to Completion (Completion Year): $16.2 million (FY2033)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2007

Irvine, California

Restoration Background

In July 1993, the BRAC Commission recommended that this installation be closed and that its aircraft, personnel, equipment, and support be transferred to Miramar Naval Air Station and Camp Pendleton Marine Corps Base. The installation was placed on the National Priorities List (NPL) in February 1990.

Studies conducted at the Station since FY86 have identified 24 CERCLA sites, 455 areas of concern, and 400 underground storage tanks (USTs). Sites include inactive landfills, storage tanks, oil-water separators, temporary accumulation areas, aerial photograph anomaly sites, and spill sites at which solvents and petroleum hydrocarbons were released into soil and groundwater. The 24 CERCLA sites were grouped into three operable units (OUs): volatile organic compound (VOC)–contaminated regional groundwater (OU1), sites contributing to groundwater contamination (OU2), and all remaining CERCLA sites (OU3). In FY89, a groundwater treatment system was installed. A RCRA Facility Assessment (RFA) and a Phase I Remedial Investigation and Feasibility Study (RI/FS) were completed in FY93.

From FY94 to FY97, the installation began remediation at two landfills. Forty-one inactive USTs were removed in FY95. An Environmental Baseline Survey indicated that approximately 63 percent of the installation property was eligible for designation as uncontaminated under CERFA and approximately 85 percent of the installation property was eligible for transfer by deed.

In FY96, the Local Redevelopment Authority (LRA) approved proposals to convert the installation to a commercial airport. The installation completed the RI for OU1 and OU2. Soil vapor extraction (SVE) systems began operating in two UST areas. During FY97, a No Action Record of Decision (ROD) was signed for 11 OU3 sites and an interim ROD was completed for the VOC Source Area vadose zone. The FS for OU2 and three early actions, two at OU2 and one at OU3, were completed.

In FY98, regulatory closure letters were received for 285 USTs. The RI/FS for OU3 was completed, and a draft Proposed Plan (PP) was submitted for regulatory agency review. The FS for OU2A gained regulatory concurrence. The FS and the PP for the OU2B and OU2C landfill sites were completed. The CERCLA long-term groundwater monitoring plan was sent to regulatory agencies for review.

The installation's Technical Review Committee, formed in FY90, was converted to a Restoration Advisory Board (RAB) in FY94. In FY94, a BRAC cleanup team was formed and the first BRAC Cleanup Plan (BCP) was developed. The BCP has been updated annually since FY95. In FY96, the installation updated its Community Relations Plan.

FY99 Restoration Progress

The Remedial Design (RD) and construction of the SVE system at Site 24 were completed. The PP and the ROD for Sites 18 and 24 were delayed because of negotiations with the Orange County Water District; the settlement agreement with the two water districts (Orange County and Irvine Ranch) and the Department of Justice is still under negotiation. The draft and the final ROD for Sites 2 and 17 were released, but the ROD was not finalized because additional time was needed for review. The PP for Sites 8, 11, and 12 was issued, and the final ROD for Site 11 was completed. The ROD for Sites 8 and 12 was delayed and CERCLA issues for Sites 3 and 5 were not resolved because of the historical radiological assessment and radiological survey. The draft ROD for Sites 3 and 5 was issued and submitted. The RI fieldwork for Sites 7 and 14 was delayed because of difficult field conditions. Routine groundwater monitoring was conducted, and an investigation of perchlorates in groundwater began at Site 1. The RI fieldwork for Site 1 was delayed due to Explosive Ordnance Disposal operations.

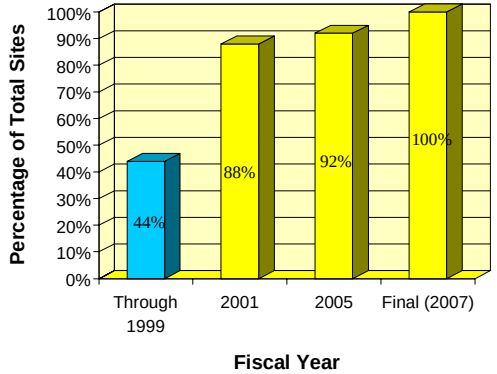
RAB meetings were conducted bimonthly.

All USTs were taken out of service for station closure. Regulatory closure letters have been received for 307 USTs. Thirty-two inactive USTs were removed, and 10 UST sites were investigated. Most oil-water separators were removed.

Plan of Action

- Issue final RODs for Sites 3 and 5 and Sites 2 and 17 in FY00
- Initiate RD for Sites 2 and 17 in FY00
- Continue remediation of the vadose zone at Site 24 in FY00
- Complete the RI for Sites 7, 14, and 16 in FY00
- Remove or close 24 inactive USTs in FY00
- Close the JP-5 pipeline in FY00
- Conduct field sampling for 20 RFA sites in FY00

Sites Achieving RIP or RC Per Fiscal Year



Ellsworth Air Force Base NPL

FFID: SD857212464400
Size: 4,858 acres
Mission: Maintain a combat-ready force capable of executing long-range bombardment operations
HRS Score: 33.62; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in January 1992
Contaminants: Solvents, petroleum/oil/lubricants, lead, and low-level radioactive waste
Media Affected: Groundwater and soil
Funding to Date: $58.3 million
Estimated Cost to Completion (Completion Year): $34.5 million (FY2018)
Final Remedy in Place or Response Complete Date for All Sites: FY2002

Rapid City, South Dakota

Restoration Background

Environmental studies conducted from FY85 to FY87 identified 20 sites at Ellsworth Air Force Base. Site types include landfills, underground storage tanks (USTs), maintenance areas, a fire training area, and a low-level radioactive waste burial site. Groundwater and soil contamination resulted from releases of trichloroethene (TCE) and petroleum/oil/lubricants (POL) at these sites. Sites at the installation were grouped into 12 operable units (OUs).

In FY91, the installation removed 72 USTs and constructed a pilot-scale groundwater treatment plant for TCE and POL contamination. In FY93, 160 UST sites were evaluated and 31 USTs were removed, including 5 USTs from the low-level radioactive waste burial site.

In FY94, Remedial Design began for OUs 1, 2, 4, and 9 through 12. An Interim Action extended the installation's water supply line to three private homes near the southwest part of the base. An additional 100 USTs were investigated and closed. A Restoration Advisory Board (RAB) was formed. In FY95, the installation completed the final Feasibility Study (FS) for OUs 1, 2, 4, 9, 10, and 12 and began Interim Remedial Actions, including groundwater extraction and treatment and soil vapor extraction. The drinking water program was extended to 12 additional off-base residences with contaminated drinking water wells. Twelve USTs and 4,000 cubic yards of contaminated soil were removed, completing the UST investigation and removal program.

During FY96, a final FS report and a Proposed Plan (PP) for OUs 3, 5, 7, and 8 were completed along with the Remedial Investigation (RI)/FS report and the PP for OU11. Remedial Actions (RAs) started for OUs 1 through 5, 7 through 10, and 12. Construction of a groundwater extraction and treatment system began for OU11, and RA construction was completed at OU6. Interim Records of Decision (RODs) were signed for OUs 1 and 4, and final RODs were signed for OUs 1 through 10 and OU12.

In FY97, the ROD for OU11 was signed, and the RA began. RAs were completed for OUs 1 through 5, 8, and 12. Long-term monitoring (LTM) started for OUs 3, 5, 6, 7, 8, and 12 and WP-22. Remedial Action–Operations (RA-O) started for OUs 1, 2, 4, and 11 and non–National Priorities List (NPL) sites SS-8, ST-10, and ST-14. The installation also removed unexploded ordnance from Site OT-18 (former Badlands Bombing Range) using non-DERA funds prior to starting the Environmental Restoration Program investigation.

In FY98, RA at OU11 continued, and the drinking water program extended the water line 26,640 feet on the eastern part of the base. After ordnance removal, a Preliminary Assessment and Site Inspection (PA/SI) began at OT-18. A PA/SI at Site ST-26 (non-NPL) began.

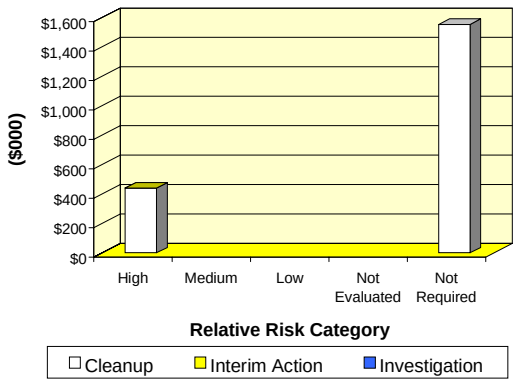
FY99 Restoration Progress

The RA at OU11 continued. The PA/SI for OT-18 was completed, and the PA/SI for Site ST-26 was completed. The RI for Site ST-26 was started and the RI/FS for OT-18 planned for FY99 was deferred due to a lack of funding. Basewide LTM and RA-O activities continued. LTM for WP-22 was completed.

Plan of Action

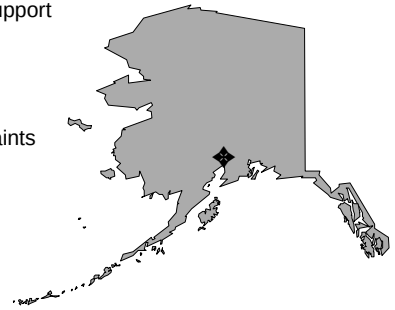
- Continue RA at OU11
- Continue LTM and RA-O at selected sites
- Complete RI and begin monitoring at Site ST-26
- Begin RI/FS for Site OT-18

FY00 Funding by Phase and Relative Risk



Elmendorf Air Force Base NPL

FFID: AK057302864900
Size: 13,130 acres
Mission: Headquarters Alaskan Command, 11th Air Force and host unit, 3rd Wing; also hosts Alaskan NORAD Region, Rescue Coordination Center, and 632nd Air Mobility Support Squadron
HRS Score: 45.91; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in 1991
Contaminants: VOCs, heavy metals, petroleum/oil/lubricants, solvents, and paints
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $64.9 million
Estimated Cost to Completion (Completion Year): $26.4 million (FY2028)
Final Remedy in Place or Response Complete Date for All Sites: FY2005



Anchorage, Alaska

Restoration Background

Environmental studies completed between FY83 and FY98 identified 84 sites at this installation. Sites include old construction landfills, petroleum spill sites, and underground storage tanks (USTs). Thirty-seven sites, which are grouped into six operable units (OUs), are covered by the Federal Facility Agreement. An additional 39 sites are covered by the State-Elmendorf Environmental Restoration Agreement with the State of Alaska.

In FY92, asphalt recovery was completed at SS10 in OU4. In FY93, the installation completed construction of a long-term groundwater treatment system at OU2. In FY94, the installation removed polychlorinated biphenyl (PCB)–contaminated sediment from a stormwater ditch at OU3. Also in FY94, bioventing Treatability Studies (TSs) were completed at three sites, an intrinsic remedial TS was completed for OU4, and a Record of Decision (ROD) was signed for OU1.

In FY95, the installation continued Remedial Investigation and Feasibility Study (RI/FS) work at OU6 and completed RODs for OU2, OU4, and OU5. It also completed Remedial Designs (RDs) for cleaning up PCBs in OU3. Removal Actions were conducted at a pesticide storage facility in OU7 and at an asphalt seep area at OU1. The installation also put in place, and began operating, bioventing systems at eight UST sites and began long-term monitoring (LTM) of groundwater. Also in FY95, the installation formed a Restoration Advisory Board (RAB).

In FY96, the installation prepared RDs for OU6. In addition, the installation closed the four 1-million-gallon USTs and removed associated pipeline at OU2, conducted a PCB TS for OU3, installed the bioventing systems at OU4, and began constructing an engineered wetland at OU5.

In FY97, RODs were signed for OUs 3 and 6. RDs were completed for remediation of PCBs at OU3 and for removal of the North Jet Pipeline. The installation began TSs for a two-phase high-vacuum extraction (HVE) system at SD15 in OU6. The installation closed one bioventing system and removed 13,800 feet of pipeline at ST32. The RAB charter was rewritten to focus on all environmental activities, beginning the transition to a Community Advisory Board. Also in FY97, Elmendorf's RAB received the Pentagon Crystal Award.

In FY98, limited field investigations began at nine areas of concern. A 5-year remedy review was conducted, and Remedial Action (RA) completion reports were completed for OUs 1, 2, 4, 5, and 6. Removal of 11,000 feet of North Jet pipeline was completed. The annual beach sweep at LF04 removed more than 30,000 pounds of general refuse and 21,000 pounds of recyclable metals.

FY99 Restoration Progress

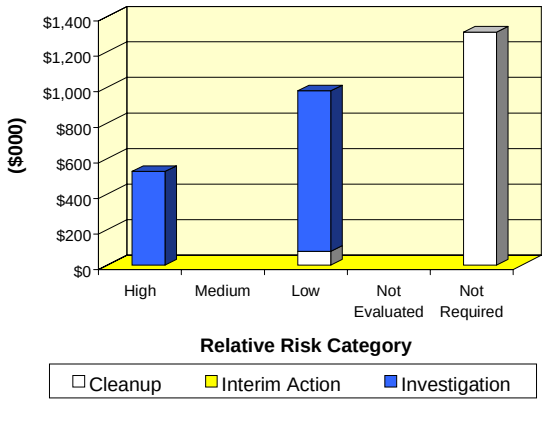
PCB removal and the RA completion report for OU3 were completed; no further work is needed for this OU. Shutdown of the groundwater treatment system at OU2 was completed. The annual beach sweep at LF04 removed 67,000 pounds of debris. Long-term operations (LTO) continued at the OU5 engineered wetland system and the HVE system at SD15. LTO of 22 bioventing systems at 10 sites and LTM of basewide groundwater and surface water also continued.

The installation developed a comprehensive orientation manual for the RAB. Elmendorf received the General Thomas D. White Restoration Award for the third year in a row.

Plan of Action

- Complete groundwater model for OU2 in FY00
- Close one bioventing system in FY00
- Continue LTO of 21 bioventing systems, the engineered wetland system at OU5, and the HVE system at SD15 in FY00
- Conduct the annual beach sweep in FY00
- Revise the Community Relations Plan in FY00
- Remove soil at SS80 in FY00
- Begin Engineering Evaluation and Cost Analysis at two newly discovered sites (SS83 and DP98) in FY00

FY00 Funding by Phase and Relative Risk



FFID: LA657002445200
Size: 2,282 acres
Mission: Used as a tactical fighter wing
HRS Score: NA
IAG Status: None
Contaminants: Industrial waste, spent solvents, fuels, waste oil, paints, pesticides, alkali, low-level radioactive waste, chlorine gas, PCBs, TCE, and medical waste
Media Affected: Groundwater and soil
Funding to Date: $31.8 million
Estimated Cost to Completion (Completion Year): $12.4 million (FY2030)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001

Alexandria, Louisiana

Restoration Background

In July 1991, the BRAC Commission recommended closure of England Air Force Base. The installation closed in December 1992.

Since FY82, studies have identified 42 sites at the installation, including landfills, underground storage tanks, aboveground storage tanks (ASTs), fire training areas, oil-water separators, a sewage treatment pond, a low-level radiation site, and gas training kit burial sites. In FY92, a RCRA Facility Assessment identified 59 solid waste management units (SWMUs) and 5 areas of concern. In FY93, a BRAC cleanup team was formed.

In FY94, the installation formed a Restoration Advisory Board (RAB) and completed the Phase I RCRA Facility Investigation (RFI) and the Environmental Baseline Survey (EBS).

In FY95, the installation updated its BRAC Cleanup Plan and completed a basewide lease. The installation also completed comprehensive field investigations to establish background soil concentration levels, began fieldwork for a Phase II EBS, completed a lead-based paint survey of houses and schools, and completed an AST cleaning project. The installation began Interim Actions (IAs) at several sites and completed closure of an aircraft refueling and hydrant system and cleanup of a chlorine gas sterilizer and the medical waste incinerator.

In FY96, the installation replaced the fire station oil-water separator and completed cleanup at the civil engineering drainage ditch, the low-level radiation site, the hospital polychlorinated biphenyl (PCB) site, and the jet engine shop. Delineation of a trichloroethene (TCE) groundwater plume began.

In FY97, the installation completed a Corrective Measures Study (CMS) for RFI sites and completed the IA at the Fire Training Site and three other contaminated-soil sites. SWMU 41 was closed and capped.

In FY98, a Phase I Ecological Survey was completed for some sites, and a flow meter borehole study was completed. The installation obtained concurrence from EPA and the Louisiana Department of Environmental Quality (LDEQ) on Human Health Risk Assessment and Ecological Risk Assessment Consensus Statements and a final Comprehensive Background Study report. Fourteen sites were closed and officially transferred to the local reuse authority, and an additional 141 sites were closed.

FY99 Restoration Progress

Characterization of the TCE plume was delayed, pending receipt of comments on the SS-45 facility investigation report and the focused CMS for groundwater. Site investigations at restoration sites were delayed, pending the completion of the CMS at WP-36. Fieldwork was completed at the Chemical Burial Mound. Remedial Action (RA) and soil removal for the POL area were not completed as planned because of delays in delineating the area to be remediated. The installation completed a Removal Action for Sites SS-39 and OTH-2505. Contaminated sludge was removed and septic tanks were cleaned at Buildings 1631 and 2607. Contaminated soil was removed at Building 2614. Nineteen additional sites were closed.

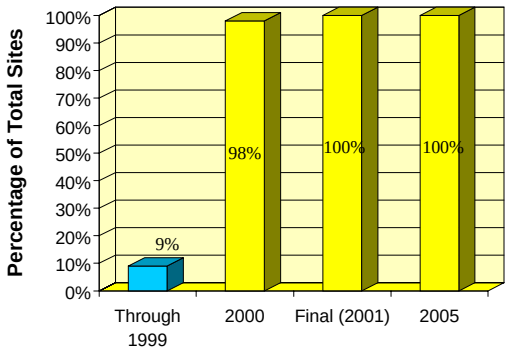
The planned modification of the Hazardous and Solid Waste Amendments (HSWA) permit may not be necessary because the Air Force Base Conversion Agency is planning to enter into a compliance agreement that allows LDEQ to regulate sites included in the HSWA permit. This permit would be allowed to expire in 2001.

Three RAB meetings were held in FY99.

Plan of Action

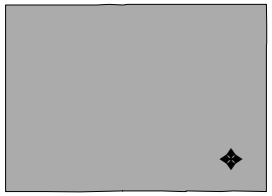
- Characterize the TCE plume in FY00
- Complete site investigations at restoration sites in FY00
- Begin quarterly well sampling at SWMU 41 in FY00
- Complete an Interim Removal Action for lead and chromium beneath the water tower in FY00
- Complete RA for the POL area and remove additional soil along underground fuel lines in FY00
- Complete delineation of contamination at two oil-water separators in FY00
- Complete a CMS for the 50-acre wastewater lagoon in FY00

Sites Achieving RIP or RC Per Fiscal Year



F.E. Warren Air Force Base NPL

FFID: WY857212417900
Size: 5,866 acres
Mission: Provide operational and security support for intercontinental ballistic missiles and perform aerospace rescue operations
HRS Score: 39.23; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in September 1991; Modification 11 signed in July 1998
Contaminants: Oil, solvents, metals, acids, petroleum, and explosives residues
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $66.8 million
Estimated Cost to Completion (Completion Year): $54.8 million (FY2012)
Final Remedy in Place or Response Complete Date for All Sites: FY2007



Cheyenne, Wyoming

Restoration Background

The Air Force began restoration activities at F.E. Warren Air Force Base in FY84. A Preliminary Assessment and a Site Inspection were performed for the installation between 1984 and 1989. In FY84, source removal of trichloroethene (TCE)–contaminated soil was completed at Spill Site 4. In FY87, soil removal at the acid dry well site was completed. Source and soil Removal Actions at Spill Sites 1 and 7 were completed.

In FY90, the base was placed on the National Priorities List (NPL) because of TCE-contaminated groundwater. An in situ bioventing system to reduce soil hydrocarbon concentrations was installed at Spill Site 1. A basewide Remedial Investigation (RI) completed in FY91 confirmed the presence of contamination at 20 sites, which were subsequently grouped into 10 operable units. The RI also identified five plumes of TCE-contaminated groundwater. In FY92, the installation signed a No Further Remedial Action Planned Record of Decision (ROD) for soil on the acid dry well site.

In FY95, a No Action ROD for soil was signed for Spill Sites 1 through 7 and for Fire Protection Training Area (FPTA) 2. Also in FY95, a packed-tower air stripper was installed as part of a Treatability Study for TCE-contaminated groundwater at Spill Site 7, an Interim Remedial Action (IRA) ROD was signed for a RCRA C cover at Landfill 6, and bioventing of petroleum hydrocarbon–contaminated soil began at FPTA 1. A Restoration Advisory Board (RAB) was formed. In FY96, the Landfill 2C Time-Critical Removal Action design was reevaluated and a Non-Time-Critical Removal Action design was initiated.

In FY97, an Engineering Evaluation and Cost Analysis, an Action Memorandum, and a Removal Action design for excavating Landfill 2C waste and removing it to an off-site disposal area were completed. IRA RODs were signed for the construction of a RCRA D cap at Landfill 5A, and a passive reactive (iron filings) wall was constructed to address contaminated groundwater at Spill Site 7. Construction was completed on an IRA to provide city drinking water to residents of Nob Hill near the installation. The innovative technology Landfill 6 evapotranspiration cover design was modified to an impermeable geosynthetic clay liner (GCL) cover.

In FY98, the installation completed comprehensive program revitalization and restructuring, and received approval for realignment under the Wing Commander until completion of the cleanup project. Designs for the Landfill 6 RCRA C cover, the Landfill 5A RCRA D cover, and the Spill Site 7 iron filings wall were completed. Construction of the Landfill 5A cover and the Landfill 2C excavation and waste Removal Actions were completed ahead of Federal Facility Agreement (FFA) requirements. Additionally, the base adopted an investigation strategy that divided the area into seven zones of potential contamination.

FY99 Restoration Progress

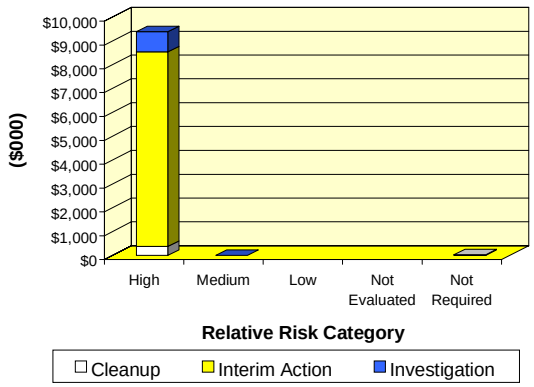
The iron filings wall at Spill Site 7 was installed ahead of work plan requirements. The GCL cover for Landfill 6 was completed ahead of FFA Dispute Resolution Committee requirements. Comprehensive RI efforts began in Zones A, B, and C. The basewide Type Ia 5-year review was completed, indicating that all Remedial Actions (RAs) continue to be protective of human health and the environment. The installation continued exploring early Removal Actions and innovative technologies for expediting cleanup in a cost-effective manner.

The base provided recurring training at monthly RAB meetings. A quarterly newsletter is published and distributed to over 1,500 neighbors. The installation conducted several tours to demonstrate RI and RA projects in various stages of completion.

Plan of Action

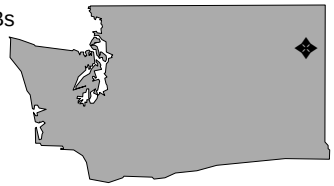
- Complete Removal Actions and on-base consolidation of Landfills 2A, 2B, 3, and 5B in FY00
- Complete RI efforts for Zones A, B, and C in FY00
- Begin Feasibility Study (FS) for Zones B and C and complete FS for Zone A in FY00
- Complete basewide surface water risk assessment in FY00
- Continue long-term monitoring of Landfills 5A and 6, Spill Site 7, and acid dry wells in FY00–FY01
- Begin comprehensive RI work for Zones D1, D2, and E in FY01

FY00 Funding by Phase and Relative Risk



Fairchild Air Force Base NPL

FFID: WA057212464700
Size: 4,300 acres
Mission: Provide aerial refueling and airlift services
HRS Score: 31.98; placed on NPL in March 1989
IAG Status: IAG signed in 1990
Contaminants: Solvents, fuels, electroplating chemicals, cleaning solutions, corrosives, photographic chemicals, paints, thinners, pesticide residues, and PCBs
Media Affected: Groundwater and soil
Funding to Date: $36.2 million
Estimated Cost to Completion (Completion Year): $33.1 million (FY2026)
Final Remedy in Place or Response Complete Date for All Sites: FY2006



Spokane County, Washington

Restoration Background

Environmental studies since FY85 have identified 37 sites at the installation, including contaminated fire training areas, landfills, radioactive waste sites, spill sites, waste pits, disposal pits, and ditches.

In FY92, Interim Actions included removal of 1,600 cubic yards of soil contaminated with fuels and oils. Drinking water was provided to members of the local community to replace drinking water contaminated by trichloroethene (TCE) leaching from a landfill (Craig Road Landfill). By FY93, the installation had identified 30 sites and completed Remedial Investigation and Feasibility Study (RI/FS) activities at 8 sites. The Air Force signed two Records of Decision (RODs). Two sites required no further action, two required long-term monitoring (LTM) or institutional controls, and four required cleanup.

In FY94, the installation completed Remedial Designs (RDs) for two sites, began RD at a third site, and started construction on a Remedial Action (RA) at a base landfill.

In FY95, the installation formed a Restoration Advisory Board (RAB). It also completed construction of a landfill cap and expansion of an extraction and treatment system to contain a TCE-contaminated groundwater plume at the Craig Road Landfill. The installation also began a Preliminary Assessment and Site Inspection (PA/SI) for nine areas of concern (AOCs) and the two remaining original sites.

The installation completed an RI/FS for 20 sites in FY96, and the Air Force signed a ROD for the sites. Because of contamination identified during the PA/SI, seven AOCs were transferred to the Installation Restoration Program. In FY97, groundwater air-sparging and soil bioventing systems were implemented at the former fire training area. The final Public Health Assessment report was released, validating the base's cleanup program.

In FY98, the installation began a 5-year review of all active remedial sites. Data gathering began for TCE groundwater plumes to support natural attenuation of chlorinated solvents. Construction and Interim Removal Actions were completed at the wastewater lagoons (TCE-contaminated plume), a petroleum/oil/lubricants bulk storage area, a waste storage area, waste fuel operations, a fuel transfer facility, arsenic ditches and culverts, and the former fire training area.

FY99 Restoration Progress

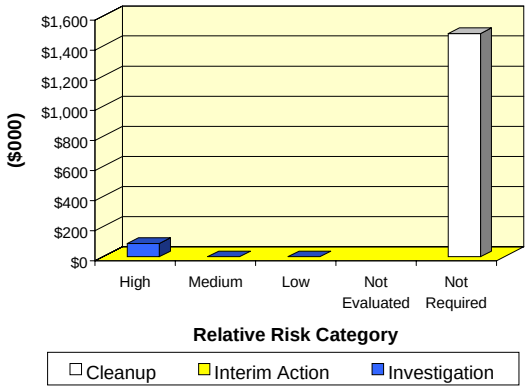
The installation, in cooperation with EPA and the state, began a 5-year review to ensure that selected remedies protect human health and the environment. LTM and operations and maintenance (O&M) data are being evaluated. Interim Removal Actions were completed at the waste storage area, waste fuel operations, a fuel transfer facility, and arsenic ditches and culverts. These four sites will be included in the Priorities 3 ROD, which is under way and covers eight sites and one AOC.

The RI/FS for the TCE plumes has been delayed, and the installation will not begin investigations until further funds become available. The RI/FS for the basewide oil-water separators began but requires additional funding for completion. Both projects will require additional funding to address the last two sites at the base.

Plan of Action

- Secure funds for RI/FS studies for the TCE orphan plumes and the oil-water separator site in FY00
- Continue LTM and O&M for groundwater treatment plants, groundwater air sparging, soil bioventing systems, and basewide groundwater sampling in FY00
- In FY00, complete the 5-year review to ensure that in-place remedies are protecting human health and the environment

FY00 Funding by Phase and Relative Risk



FFID: WV39799F789200
Size: 12 acres of former 16,000-acre government plant
Mission: Manufacture smokeless powder (private party operated a batch chemical plant)
HRS Score: 36.3; placed on NPL in September 1983
IAG Status: None
Contaminants: Dioxin, organic and inorganic chemicals, and metals
Media Affected: Groundwater and soil
Funding to Date: $0.6 million
Estimated Cost to Completion (Completion Year): $0.8 million (FY2008)
Final Remedy In Place or Response Complete Date for All Sites: FY2008

Nitro, West Virginia

Restoration Background

Environmental restoration sites at Fike-Artel Chemical have been grouped into five operable units (OUs): disposal of storage tank and drum contents (OU1); decontamination and disposal of storage tanks, surface drums, and aboveground structures (OU2); removal of buried drums (OU3); Remedial Investigation and Feasibility Study (RI/FS) of groundwater and soil (OU4); and RI of the cooperative sewage treatment plant (OU5). Private-sector potentially responsible parties (PRPs) and EPA are leading all environmental restoration activities.

In FY93, an RI was completed for OU1. In FY94, RI activities began at OU2. Twenty PRPs signed an agreement with EPA to remove 7,000 to 16,000 buried containers from OU3.

In FY95, an Interim Action was conducted to remove underground storage tanks (USTs) and aboveground storage containers (OUs 1, 2, and 3). RI activities were completed for OU2 and started for OU5, and RI/FS activities began for OU4.

In FY96, USTs and building OUs were demolished and removed. Final allocation of liability was achieved and a principal agreement was signed. The Consent Decree for OU4 was filed in court and protested by a nonsigning party. The RI work plan was submitted to EPA for approval. EPA and the PRPs and were negotiating a Consent Decree.

In FY97, the PRPs and EPA established a Consent Decree. The PRPs (private and government) revised the RI/FS work plan for OU4, and the plan was submitted to EPA for review and concurrence. In addition, the PRPs completed a UST Removal Action for OU5.

In FY98, The PRPs received EPA approval on the Phase I RI/FS work plan and began soil and groundwater sampling.

FY99 Restoration Progress

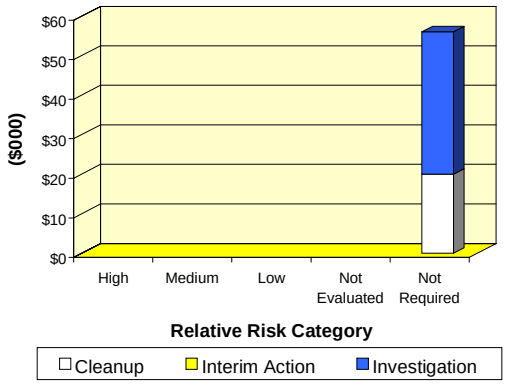
Implementation of Phase I of the RI/FS work plan was completed. The Phase II work plan was developed in conjunction with EPA and the West Virginia Department of Environmental Protection. The Prospective Purchaser Agreement was executed by EPA, the Department of Justice, and the Nitro Redevelopment Authority to allow industrial redevelopment of the site.

The stormwater treatment system was operated in compliance with permit requirements. The Y2K compliance plan was executed. The RI/FS report was not submitted as planned because, at the request of EPA, the PRPs agreed to conduct Phase II sampling.

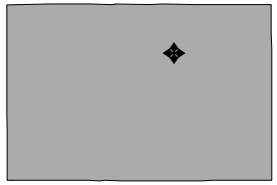
Plan of Action

- Secure access and implement Phase II RI/FS work plan in FY00
- Issue RI/FS report for PRP and EPA review and approval in FY00
- Conduct RA, prepare FS, and support EPA efforts for Record of Decision preparations in FY00
- Continue operating stormwater treatment system in FY00

FY00 Funding by Phase and Relative Risk



FFID: CO821162033300
Size: 577 acres
Mission: Provided medical services, training, and research
HRS Score: NA
IAG Status: None
Contaminants: Petroleum hydrocarbons, asbestos, lead-based paint, and radioactive waste
Media Affected: Groundwater and soil
Funding to Date: $15.4 million
Estimated Cost to Completion (Completion Year): $12.6 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Aurora, Colorado

Restoration Background

In July 1995, the BRAC Commission recommended closure of all facilities at Fitzsimons Army Medical Center except for the Edgar J. McWhethy Army Reserve Center. Tenants will be relocated to other installations. The Army will transfer ownership of excess property to public and private entities by FY03.

Environmental studies at the installation identified several sites posing environmental concerns. Sites include aboveground storage tanks (ASTs), underground storage tanks (USTs), landfills, clinical areas, pesticide and herbicide facilities, a wastewater treatment plant, and maintenance areas.

A BRAC cleanup team (BCT) was formed to investigate and ensure cleanup of all areas of concern to facilitate property transfer to the Fitzsimons Redevelopment Authority (FRA). The BCT meets biweekly. Alternate meetings include the FRA as well as local agencies involved in the redevelopment of Fitzsimons. EPA and the state regulatory agency reviewed the scope of work for the Environmental Baseline Survey and the BRAC Cleanup Plan in FY95.

Community awareness measures are extensive. The commander formed a Restoration Advisory Board (RAB) in FY96. The installation also completed a Community Relations Plan. Before beginning excavation at a low-level radioactive waste landfill (Landfill 5), the installation held a media day to address community concerns. No radioactivity was detected.

The installation removed tanks and associated contaminated soil from the UST area for the former heating plant and received formal approval of closure documents from the Colorado Department of Public Health and Environment.

In FY97, the installation initiated groundwater and Site Inspection (SI) studies for all sites. Accelerated fieldwork techniques (hydropunch, geoprobe, and cone penetrometer) were employed. In addition, a Total Environmental Restoration Contract was used at the installation.

In FY98, the installation completed studies at four landfills that had been closed before 1972: the golf course, pesticide and herbicide facilities, the optical fabrication laboratory, and clinical and maintenance facilities. Nuclear Regulatory Commission (NRC) decommissioning was completed, and a license termination request was forwarded to the NRC. Remediation began at the Army and Air Force Exchange Service (AAFES) service station and at other AST and UST locations. The BCT reviewed and approved four Findings of Suitability to Transfer (FOSTs) and four Findings of Suitability to Lease (FOSLs).

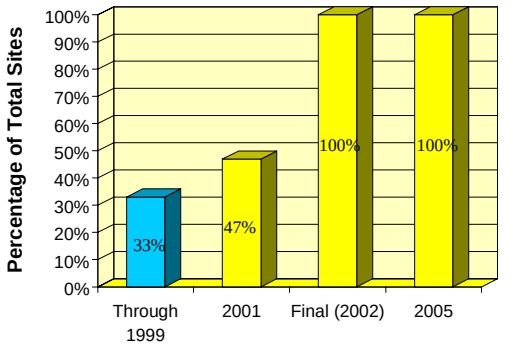
FY99 Restoration Progress

The installation completed final SI reports for the Directorate of Public Works and Directorate of Logistics (DPW/DOL) maintenance areas and the Directorate of Clinical Investigations (DCI) clinical areas. The Army completed investigation of the maintenance areas and the Optical Fabrication Laboratory, but the state required additional data. An independent technical review concurred with the approach used by Fitzsimons for the salvage yard, the wastewater treatment plant (WWTP), and the landfills. The installation and the state negotiated landfill closure requirements. The Local Redevelopment Authority requested that the installation provide a cost analysis for additional landfill closure options, which delayed the Remedial Design. The NRC did not require the planned confirmatory survey for the NRC license termination; therefore, it was not performed. The Army drafted a risk assessment for the golf course/pesticide/herbicide storage facilities, but additional data are required for some sites to complete the final risk assessment. The installation completed a draft work plan for the closure of the WWTP. A historical/operational review of the Perinatal Research Center is in preparation. The Army completed cleanup of the salvage yard and an interim Removal Action at the former AAFES service station.

Plan of Action

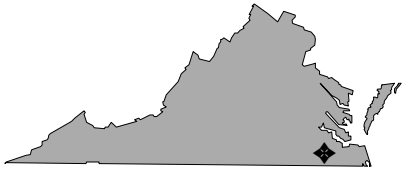
- Complete the additional fieldwork and risk assessment for the golf course/pesticide/herbicide storage facilites in FY00
- Determine and perform required additional work for the DPW/DOL maintenance and DCI clinical facilities and the Optical Fabrication Laboratory in FY00
- Complete work plan and remedial work for closure of the WWTP in FY00
- Operate remedial systems for Buildings 821 (Reserve Center) and 135 (AAFES service station) in FY00
- Close out remaining UST and AST sites in FY00
- Complete site closeout for the Perinatal Research Facility in FY00
- Complete closure options analysis and begin landfill design in FY00

Sites Achieving RIP or RC Per Fiscal Year



Former Nansemond Ordnance Depot NPL

FFID: VA39799F156700
Size: 975 acres
Mission: Served as ordnance depot
HRS Score: 70.0; placed on NPL in July 1999
IAG Status: Under negotiation
Contaminants: TNT and pesticides
Media Affected: Soil, groundwater, and sediment
Funding to Date: $6.2 million
Estimated Cost to Completion (Completion Year): $38.8 million (FY2015)
Final Remedy in Place or Response Complete Date for All Sites: FY2015



Suffolk, Virginia

Restoration Background

The Former Nansemond Ordnance Depot consists of approximately 975 acres on the James River, at the mouth of Nansemond River. The property was acquired by the Army between 1917 and 1929. The Army used the depot from World War I until November 1950. The Army leased the site to the Navy from 1950 to 1960. In 1960, the property was excessed and conveyed to Beaszley Foundation, Inc. Tidewater Community College; the General Electric Company; Dominion Lands, Inc.; and Interstate 664 now occupy the majority of the site.

In FY97, the site's first Restoration Advisory Board (RAB) meeting was held at Tidewater Community College. The RAB has 18 members, including representatives of corporations, EPA, and the Virginia Department of Environmental Quality (VDEQ); property owners; civic leagues; and minority interests. The RAB meets bimonthly.

In FY98, the U.S. Army Corps of Engineers (USACE), EPA Region 3, the Biological Technical Assistance Group, and VDEQ began partnering efforts. New work at the burning ground area, the horseshoe-shaped pond, and the background study area was discussed. These studies moved from the Site Inspection (SI) phase to the Remedial Investigation (RI) stage. Also in FY98, a draft SI for the James River beachfront was provided to EPA Region 3 and VDEQ for review.

FY99 Restoration Progress

Former Nansemond Ordnance Depot was listed on the National Priorities List (NPL) in July, 1999. A Removal Action took place to remove impregnite kits from Dominion Lands, Inc., property; 850 tons of impregnite kits and associated soil was removed. Because of this removal, this site was not included in the final listing package. Soil sampling at the TNT removal area indicated that additional monitoring wells needed to be installed. A contract for an Engineering Evaluation and Cost Analysis to determine what Remedial Action should be performed at the James River beachfront area of concern (AOC) was awarded. USACE conducted a geophysical investigation and took samples to determine whether any additional disposal activities took place at the James River AOC. Fieldwork was completed at the James River beachfront source area.

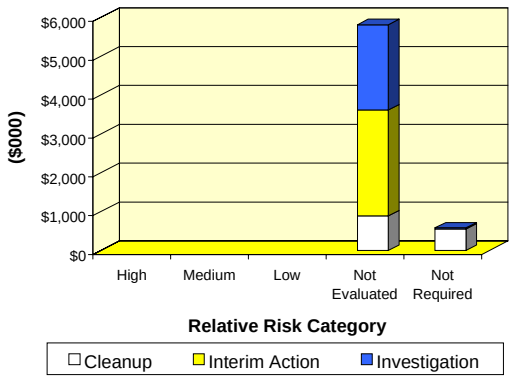
Navy divers investigated two piers associated with the former depot. The investigation did not discover any ordnance around the pier areas in the water.

EPA and USACE completed approximately 85 percent of an interagency agreement related to an anomaly investigation at AOC 5 on Tidewater Community College property. Work began on the anomaly investigation.

Plan of Action

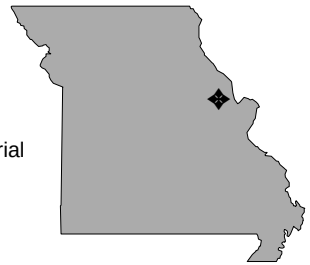
- Complete ordnance and explosives removal and anomaly investigation at main burning ground area in FY00
- Complete an RI and Feasibility Study (FS) and a background study for the main burning ground area and the horseshoe-shaped pond in FY00
- Begin addressing 18 AOCs by implementing an agreed Site Screening Process to determine whether RI/FS or Removal Actions will be required in FY00 and FY01
- Perform Removal Actions at the James River beachfront, the Track K dump, the TNT removal area, the pesticide drum area, and the Nansemond River AOC in FY00 and FY01

FY00 Funding by Phase and Relative Risk



Former Weldon Spring Ordnance Works — NPL

FFID: MO79799F037400
Size: 17,232 acres
Mission: Manufactured TNT and DNT during World War II
HRS Score: 30.26; placed on NPL in February 1990
IAG Status: IAG signed in 1990; amended in August 1991
Contaminants: TNT, DNT, lead, asbestos, PCBs, PAHs, and low-level radioactive material
Media Affected: Groundwater and soil
Funding to Date: $189.5 million
Estimated Cost to Completion (Completion Year): $59.9 million (FY2005)
Final Remedy in Place or Response Complete Date for All Sites: FY2005



St. Charles County, Missouri

Restoration Background

From 1941 to 1944, the Weldon Spring Ordnance Works produced explosives for the Armed Services. The Army currently occupies the 1,655-acre Weldon Spring Training Area. The majority of the remaining property is owned by the state and is maintained as a wildlife area and an agricultural research facility of the University of Missouri. A parcel covering approximately 200 acres was acquired by the Atomic Energy Commission in the early 1950s and used for a uranium ore feed material plant. This site, the Chemical Plant Area of the Weldon Spring site, is being investigated and remediated by DOE as a separate National Priorities List (NPL) site and is not part of the Weldon Spring Ordnance Works project, beyond DoD's providing partial funding for the cleanup through DoD potentially responsible party (PRP) payments.

Two operable units (OUs) exist at the Weldon Spring Ordnance Works: OU1, Soils and Pipeline (lagoons, landfills, burning grounds, TNT/DNT-contaminated soil, and underground wastewater pipelines); and OU2, Groundwater. Contaminants subject to OU1 cleanup are TNT, DNT, lead, polychlorinated biphenyls (PCBs), and polyaromatic hydrocarbons (PAHs). Non-NPL projects include building demolition and debris removals (BD/DR).

The U.S. Army Corps of Engineers (USACE) conducted several studies that relate to remediation efforts at the site: a biodegradation research study (FY92); a historical survey of activities (FY94); and a study of genetic effects on organisms. Remedial Investigation (RI) of OU2 began in FY91.

In FY94, USACE initiated the Remedial Design (RD) for OU1. RD was completed in FY95. USACE also worked with DOE to prepare final joint RI and Feasibility Study (FS) work plans for OU2 and to complete two rounds of jointly collected quarterly groundwater monitoring.

In FY96, USACE completed the RD and the Record of Decision (ROD) for OU1. The OU1 Remedial Action (RA) contract was awarded in May 1997. The joint RI/FS and Proposed Plan (PP) for OU2 were also submitted in FY97. A Restoration Advisory Board (RAB) was established in January 1997, replacing the previous Technical Review Committee. Quarterly meetings of the RAB began in April 1997.

In FY98, OU1 RA fieldwork began. The Missouri Department of Natural Resources (MDNR) found DOE and USACE joint preparation of the OU2 FS and PP to be unacceptable. Due to technical differences between the DoD and DOE sites, the agencies agreed to proceed independently with each FS and PP for OU2. The RD and construction phase of the BD/DR for Water Treatment Plant No. 2 also was completed.

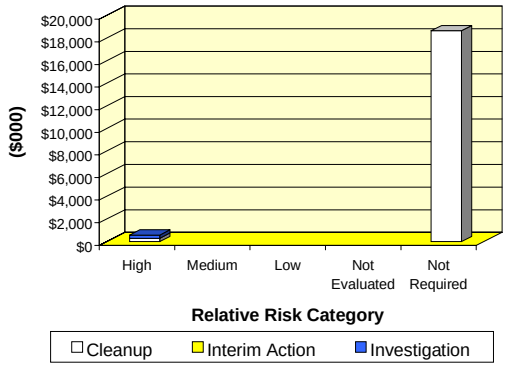
FY99 Restoration Progress

Soil and pipeline incineration activities at OU1 were completed. In conjunction with MDNR and EPA, the installation decided to postpone completion of the OU2 FS, PP, and ROD to allow collection of groundwater data for the next 36 months. These data would allow the installation to assess whether contaminant concentrations were decreasing due to completion of the OU1 RA. Long-term monitoring of groundwater was initiated. The RD and demolition of Power Plant No 2 was deferred due to funding constraints.

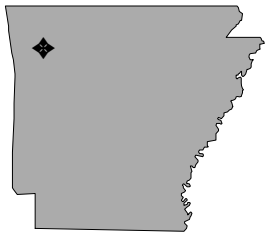
Plan of Action

- Complete OU1 RA construction in FY00
- Close out the OU1 project in FY00
- Continue discussions with EPA and MDNR about the OU2 FS and PP in FY00
- Continue OU2 groundwater monitoring in FY00 and FY01
- Continue PRP payments to DOE in FY00 and FY01

FY00 Funding by Phase and Relative Risk



FFID: AR621372018700
Size: 71,359 acres
Mission: Light infantry and mobilization
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, DDT, and solvents
Media Affected: Groundwater and soil
Funding to Date: $25.3 million
Estimated Cost to Completion (Completion Year): $17.2 million (FY2000)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Fort Chaffee, Arkansas

Restoration Background

In July 1995, the BRAC Commission recommended closure of Fort Chaffee, except for the minimum essential buildings and ranges for a Reserve Component training enclave. The BRAC parcel available for transfer is approximately 7,012 acres. The installation closed at the end of FY97.

Primary site types include underground storage tanks (USTs), a fire training area, landfills, and hazardous waste and hazardous material storage areas. Primary contaminants of concern include petroleum/oil/lubricants in groundwater and soil, solvents in groundwater, and pesticides in soil. Interim Removal Actions at the installation have included removal of USTs and soil remediation at all abandoned UST locations.

The community formed a Local Redevelopment Authority in FY95. In FY96, the installation formed a BRAC cleanup team (BCT) and a Restoration Advisory Board. The installation also completed a RCRA Facility Investigation initiated in FY95. The draft final Environmental Baseline Survey report was submitted to the regulatory agencies. The Army began investigations at the North POW Landfill.

In FY97, the installation removed USTs from the BRAC parcel. The BCT completed and implemented the open burning and open detonation unit-closure work plan. It also completed work plans for closing the Hazardous Waste Storage Facility and the Air National Guard Burn Pit. Phase I of the Site Inspection began, as did work on removing postwide USTs, oil-water separators, wash racks, and fuel fill stands. Version 2 of the BRAC Cleanup Plan (BCP) was completed in late 1997.

In FY98, the installation conducted Removal Actions at Building 5830 and Buildings 402/403 UST sites. The installation also removed all USTs and oil-water separators, and the west area fuel fill stands and transmission lines. It completed Relative Risk Site Evaluations for all sites except Sites 2 and 45. The installation completed an unexploded ordnance (UXO) archive search and a site visit for BRAC property. It also completed the RCRA closure evaluation of the Hazardous Waste Storage Facility.

FY99 Restoration Progress

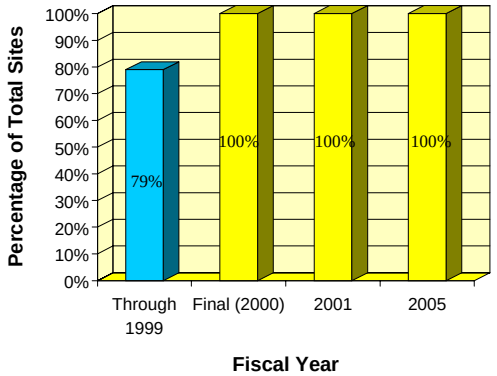
The installation completed all previously funded work on the enclave site, passing full responsibility for the sites to the National Guard. The BCT agreed to prioritize all environmental sites and address them in five No Further Action (NFA) Records of Decision (RODs). RODs I, II, and III were completed, clearing 37 sites from the enclave and BRAC excess property. The Army completed a Finding of Suitability of Transfer (FOST) for 4,617 acres of CERFA-uncontaminated acreage, which EPA and the state are reviewing. The Engineering Evaluation and Cost Analysis (EE/CA) for Site 32 was completed and is awaiting regulatory comments. The installation removed all fuel fill stands and completed the initial investigation at Site 45.

The EE/CA for Site 1 was not completed as planned because of scheduling conflicts and a lengthy regulatory review process. The initial investigation of Site 2 was delayed because of scheduling and resource conflicts.

Plan of Action

- Complete EE/CA for landfill Sites 1 and 32 and begin remedial fieldwork in FY00
- Complete ROD IV and FOSTs II and III, including Sites 22 and 46 in FY00
- Implement remediation at the Site 1 and 32 landfills in FY00, with completion in FY01
- Close out all sites and propose final NFA round in FY01, with final FOST at end of FY01

Sites Achieving RIP or RC Per Fiscal Year



Fort Crowder - Pools Prairie NPL

FFID: MO79799F034700
Size: 42,786 acres
Mission: Served as World War II Signal Corps training facility; Korean Conflict Era reception station; disciplinary barracks; Atlas missile rocket engine manufacture and testing facility; jet engine and component manufacture and repair facility
HRS Score: 50.00; placed on NPL in October 1999
IAG Status: None
Contaminants: VOCs, including TCE and carbon tetrachloride
Media Affected: Groundwater and soil
Funding to Date: $0.6 million
Estimated Cost to Completion (Completion Year): $1.2 million (FY2013)
Final Remedy in Place or Response Complete Date for All Sites: FY2003

Newton County, Missouri

Restoration Background

The former Fort Crowder is located near the city of Neosho, in southwestern Missouri. The Army used the site during World War II as a signal corps training center and again during the Korean conflict as a reception station. In 1956, approximately 3,650 acres was transferred to the Air Force for the establishment of Air Force Plant 65. Approximately 4,358 acres was leased to the Missouri National Guard (MNG) for a training facility, known as Camp Crowder. The remainder of the property reverted to ownership by private parties and local municipalities and now is used for farming, light industry, an airport, a landfill, and a community college.

Air Force Plant 65 operated until 1968 as an Atlas missile manufacturing and testing facility, and later, until 1980, as a jet engine overhaul and testing facility. Plant 65 was a government-owned, contractor- operated facility. The operating contractors were the Rocketdyne Division of North American Aviation (now Boeing) and Continental Aviation (now Teledyne Industries).

The U.S. Army Corps of Engineers (USACE), Kansas City District, began investigating the property as a Formerly Used Defense Site (FUDS) project in 1991. A site investigation was completed in 1993, and a Remedial Investigation (RI) began in 1995.

Trichloroethene (TCE) was discovered in private wells near the property in 1995. USACE, Kansas City District, provided bottled water to residents with affected wells, discontinued the RI, and initiated a potentially responsible party (PRP) project to determine the extent of DoD's liability. The Missouri Department of Natural Resources and EPA Region 7 conducted further investigations on the property and tested additional wells on adjacent property.

EPA named Boeing, Teledyne, DoD, Saberliner, and MNG as PRPs in 1997. The Department of Justice (DOJ) is leading negotiations for the United States, supported by USACE, Kansas City District. The PRPs negotiated an Administrative Order on Consent for a Removal Action in 1998. The Pools Prairie Site was placed on the National Priorities List (NPL) on October 18, 1999. A portion of Air Force Plant 65 is located on the federally owned Camp Crowder. The National Guard Bureau is directing a Removal Action on this site and is planning an RI and a Feasibility Study.

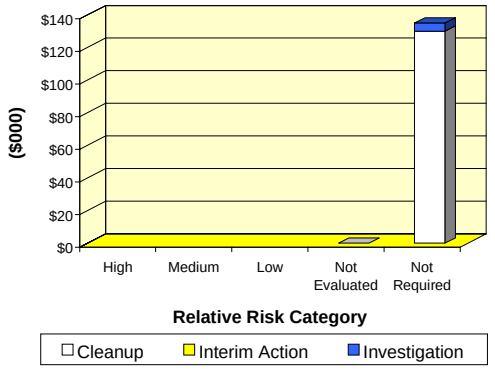
FY99 Restoration Progress

USACE, Kansas City District, negotiated and signed two Administrative Orders on Consent for Removal Actions. A private PRP's execution of a Removal Action to connect approximately 225 residents to city water was monitored. A second Removal Action by a private PRP to conduct further studies at a source area was planned and monitored. DoD's interim contribution for these actions has been paid by the Judgment Fund. A document-sharing agreement was negotiated. Negotiation began on plans for an Alternative Dispute Resolution (ADR) process for allocating liability to PRPs.

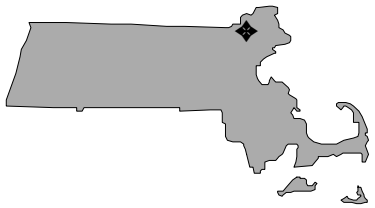
Plan of Action

- Finalize plan for and begin ADR process in FY00
- Provide technical and legal support to DOJ in FY00
- Negotiate Administrative Order on Consent for an additional Removal Action in FY00
- Monitor execution of Administrative Orders on Consent by private PRPs in FY00 and FY01
- Conclude ADR process in FY01

FY00 Funding by Phase and Relative Risk



FFID: MA121402027000
Size: 9,219 acres
Mission: Support Reserve Component training
HRS Score: 42.24; placed on NPL in November 1989
IAG Status: IAG signed in November 1991
Contaminants: VOCs, heavy metals, petroleum products, PCBs, pesticides, herbicides, and explosive compounds
Media Affected: Groundwater and soil
Funding to Date: $89.1 million
Estimated Cost to Completion (Completion Year): $33.6 million (FY2004)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003



Fort Devens, Massachusetts

Restoration Background

In July 1991, the BRAC Commission recommended that Fort Devens close and establish a reserve enclave. In FY96, the Army closed Fort Devens, replacing it with the Devens Reserve Forces Training Area, which assumed the remaining Army mission.

Environmental investigations since FY89 identified 84 sites with 324 BRAC areas of concern (AOCs), including landfills, vehicle and equipment maintenance and storage yards, the Defense Reutilization and Marketing Office (DRMO) scrap yard, motor pools, and underground storage tanks (USTs). Investigations revealed soil and groundwater contamination.

In FY94, the commander formed a Restoration Advisory Board (RAB) and a BRAC cleanup team. In FY95, the installation began several Interim Actions, including removal of USTs and installation of a soil vapor extraction system. The installation also completed two Records of Decision (RODs) for the Shepley's Hill Landfill Operable Unit (OU) and the Barnum Road Maintenance Yards OU. An Environmental Impact Study was completed, and an enhanced Preliminary Assessment identified 10 areas requiring evaluation.

In FY96, the Army and regulators signed a ROD for the South Post Impact Area. The installation completed radiological surveys for 98 percent of affected buildings on the property and began a Feasibility Study (FS) for landfill consolidation.

In FY97, the Army and EPA approved a No Further Action (NFA) ROD for AOC 63AX. The installation completed the Remedial Investigation (RI) and FS and the Proposed Plan (PP) for AOCs 32 and 43A. It also completed the explosive ordnance survey.

In FY98, the installation issued a PP addressing landfill consolidation and remediation at seven sites. The Army and EPA approved a ROD for AOCs 32 and 43A. Supplemental RIs began at AOC 50 and AOC 57. The installation completed an Interim Removal Action at AOC 69W.

FY99 Restoration Progress

The installation signed two RODs for eight sites. The Army transferred an 836-acre parcel to the U.S. Fish and Wildlife Service and issued a revised PP for AOC 69W. The Army also conducted Removal Actions at AOCs 32, 43A, and 57 and installed microwells for long-term monitoring at Shepley's Hill Landfill. An NFA decision document was signed for the former maintenance shop.

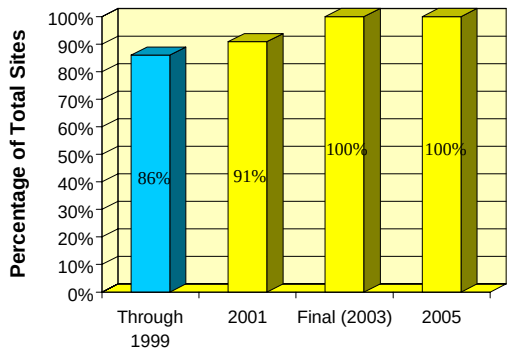
Final RI/FSs for AOCs 50 and 57 were initiated, but completion was impeded by regulatory delays. The Army was unable to complete the planned Remedial Actions (RAs) for landfill consolidation and remediation at seven sites because of a disagreement regarding on-site or off-site disposal.

The RAB met regularly. The installation continued partnering efforts with regulators to resolve institutional controls issues.

Plan of Action

- Complete RI/FSs for AOCs 50 and 57 in FY00
- Complete a 5-year review for all ROD sites in FY00
- Initiate RAs for the landfill consolidation and remediation project in FY00–FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: NJ221042027500
Size: 30,997 acres
Mission: Provide training and reserve support
HRS Score: 37.40; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in September 1991
Contaminants: Heavy metals, petroleum/oil/lubricants, chlorinated solvents, and PCBs
Media Affected: Groundwater, surface water, sediment, and surface and subsurface soil
Funding to Date: $6.3 million
Estimated Cost to Completion (Completion Year): $95.6 million (FY2039)
Final Remedy in Place or Response Complete Date for All Sites: FY2013

Pemberton Township, New Jersey

Restoration Background

Remedial Investigation (RI) of the Fort Dix Sanitary Landfill began in FY79, leading to the installation of groundwater monitoring wells around the perimeter. EPA placed the landfill on the National Priorities List (NPL) in FY87. The Army and regulators signed a Record of Decision (ROD) for the landfill in FY91. The Remedial Design was developed in FY92. In FY93, the installation performed site characterization and field screening at 16 other sites, including storage areas, underground storage tanks (USTs), landfills, lagoons, impact areas, and an incinerator with suspected heavy metals, petroleum/oil/lubricants, and chlorinated solvents. USTs and associated contaminated soil were removed from seven sites.

In FY94 and FY95, the installation built a multilayer cap over the sanitary landfill and began long-term monitoring (LTM) of groundwater, surface water, and sediment. In FY95, the BRAC Commission recommended realignment of Fort Dix, allowing it to retain ranges, facilities, and training areas for Reserve Component training. In FY96, the Fort Dix Commander formed a Restoration Advisory Board to replace the Technical Review Committee.

In FY97, the installation completed an RI at the MAG-1 Area. In FY98, the installation completed an Environmental Investigation and an Alternatives Analysis of 19 sites and began RI activities at nine other Environmental Restoration sites. Interim Remedial Actions (IRAs) were completed at three sites. The installation completed a groundwater flow model. The Army completed an RI and Feasibility Study (FS) and a natural attenuation addendum for golf course sites, and the FS for the MAG-1 site. The installation removed 80 abandoned USTs and began evaluations of the contaminated sites. It also started an RI/FS for the New Egypt Armory Site.

FY99 Restoration Progress

The Army completed statistical analyses of the Fort Dix Sanitary Landfill monitoring data, which showed decreasing levels of contaminants in groundwater and surface water. It negotiated a reduction in the number of monitoring wells from 39 to 31, saving $30,000 in monitoring costs. The cost of long-term maintenance was reduced by $37,000 from FY98 levels and will continue to decline. An RI/FS began for the Range Landfill, the ANC-2 Landfill, and leaking UST sites with residual contamination. The installation reached the Proposed Plan (PP) stage at eight investigation sites. The Army Environmental Center conducted an Independent Technical Review of five Environmental Restoration sites. The review resulted in improved technical investigations of these sites. EPA Region 2 approved adding the Fort Dix Sanitary Landfill to the EPA Construction Complete List and completed the Preliminary Remedial Action Closeout report and the 5-Year Review report for the landfill.

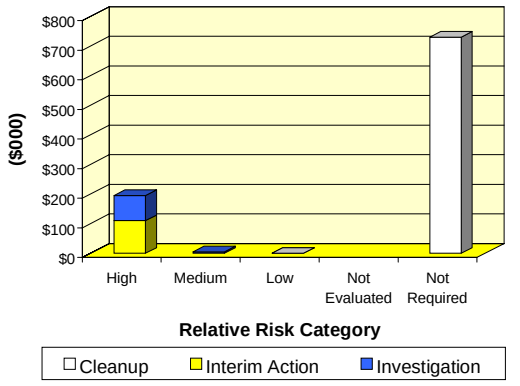
The Army conducted a pilot test of a chemical oxidation remediation technology on a trichloroethene plume in the 4400 Area, and evaluated monitored natural attenuation for another plume in this area. The installation continued removing abandoned USTs and incorporated the groundwater flow model into the Installation Restoration Program investigations.

The RI/FS for the Boiler Blowdown site was delayed by regulatory requirements, but the RI/FS for Landfill ANC-9 was completed. The installation delayed the PPs for MAG-1, golf course sites, and 19 other sites to change the approved remedy.

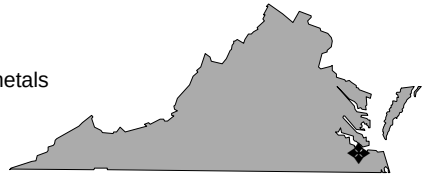
Plan of Action

- Continue removing abandoned USTs and investigating UST sites with residual contamination through FY00
- Continue LTM and long-term maintenance of the Fort Dix Sanitary Landfill, request reductions in the monitoring program, and continue to press for removal from the NPL in FY00
- Continue the RI/FS for the Boiler Blowdown, Fire Training Tank, Armament Research and Development Center, New Egypt Armory, Barnes Building, Range Landfill, and ANC-2 Landfill sites in FY00
- Complete the PP and the ROD for ANC-9 Landfill, Golf Course Pesticide Area, EPIC-8 Landfill, Bivouac 5 Washrack, Hazardous Waste Storage Area, Paint Shop, Range Impact Area, and MAG-1 and MAG-2 Area in FY00

FY00 Funding by Phase and Relative Risk



FFID: VA321372032100
Size: 8,228 acres
Mission: House the Army Transportation Training Center; provide training in rail, marine, and all other modes of transportation involved in amphibious operations
HRS Score: 50.00; placed on NPL in December 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Petroleum products, PCBs, VOCs, pesticides, and heavy metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $43.8 million
Estimated Cost to Completion (Completion Year): $5.0 million (FY2013)
Final Remedy in Place or Response Complete Date for All Sites: FY2004



Newport News, Virginia

Restoration Background

Fort Eustis is home to the Army Transportation Center, where officers and enlisted soldiers receive education and training in all modes of transportation, aviation maintenance, logistics and deployment doctrine, and research.

Investigations have identified 27 sites at the installation, including landfills, underground storage tanks (USTs), pesticide storage areas, range and impact areas, and surface impoundments. The migration of contaminants from some sites to creeks and estuaries and the potential migration through surface water and the upper water table to the James River are of greatest concern at the installation. Analysis of samples indicated the presence of polychlorinated biphenyls (PCBs), pesticides, polyaromatic hydrocarbons, and lead in surface water and sediment.

In FY90, a Remedial Investigation (RI) began for four sites near estuaries at the installation. In FY92, the Army completed a Preliminary Assessment and a Site Inspection at eight more sites where suspected soil contaminants included fuel and oils, pesticides, and volatile organic compounds (VOCs).

In FY94, the installation completed Interim Remedial Actions (IRAs) for removal of contaminated soil at the Felker Airfield Tank Farm and a waste-oil storage tank site. It also completed cleanup at the two landfills. In the following year, the state approved a Corrective Action Plan (CAP) involving installation of pneumatic pumps and passive skimmers to recover petroleum products from groundwater at the Helicopter Maintenance Area UST site.

In FY96, the installation established an administrative record and set up information repositories at three local libraries. The state regulatory agency approved another CAP for installation of a free-product recovery system at the Gas Station UST site. The Agency for Toxic Substances and Disease Registry published a final Public Health Assessment that indicated that the Fort Eustis National Priorities List (NPL) site poses no apparent risk to public health. In FY97, a draft Feasibility Study (FS) and an Engineering Evaluation and Cost Analysis for two areas of contaminated sediment were submitted to the regulators for review. Fort Eustis capped a pesticide storage yard with asphalt, limiting exposure to contaminated soil.

In FY98, the Army constructed a methane soil vapor extraction system at one closed landfill and installed a methane collection trench at another closed landfill. EPA reviewed three RI reports for four estuary sites, a fire training area, a buried sludge site, and a pesticide storage area. The installation completed investigation and field efforts at Eustis Lake and the pesticide storage area and submitted the reports to EPA and the state.

FY99 Restoration Progress

The installation continued operating free-product recovery systems at two UST sites. It also continued long-term monitoring (LTM) at a closed landfill and operation of a methane vapor extraction system at another closed landfill. The installation completed the capping of contaminated sediment at the 3-acre lake, which was restocked with bass, catfish, and blue gill. Two aerators were installed in the lake to enhance the water quality by increasing dissolved oxygen levels. The installation awarded an IRA contract for the removal of PCB-contaminated sediment in Bailey Creek and awarded another contract for updating the Community Relations Plan (CRP).

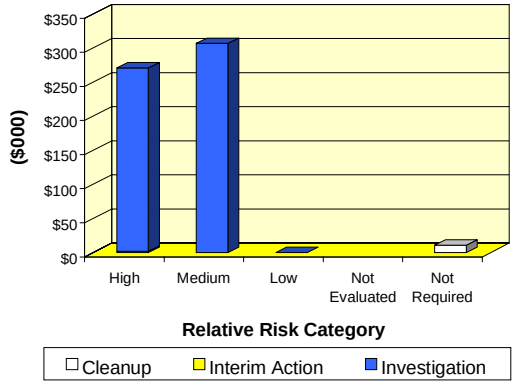
The installation met with the regulatory community to resolve comments on RI reports and is still addressing the regulator comments. The installation concluded that FS reports would be necessary at several sites.

In March 1999, the installation placed advertisements in two local newspapers to determine interest in the formation of a Restoration Advisory Board (RAB). Very limited interest was generated and the installation determined that a RAB was not necessary.

Plan of Action

- Continue operating the free-product recovery system at two UST sites in FY00
- Continue LTM of groundwater and surface water at one closed landfill and operation of a methane vapor extraction system at another closed landfill in FY00
- Complete the IRA for removal of PCB-contaminated sediment in Bailey Creek in FY00
- Complete update of the CRP by performing interviews with local residents, government officials, and potential stakeholders in FY00
- Begin developing work plans for additional sampling and monitoring for the FSs at the fire training area and Bailey Creek in FY00

FY00 Funding by Phase and Relative Risk



FFID: MD321022056700
Size: 13,680 acres
Mission: Serve as administrative post to various DoD tenants
HRS Score: 52.0; placed on NPL in July 1998
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Heavy metals, petroleum hydrocarbons, VOCs, and UXO
Media Affected: Groundwater and soil
Funding to Date: $62.1 million
Estimated Cost to Completion (Completion Year): $7.1 million (FY2004)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY2004

Fort Meade, Maryland

Restoration Background

In December 1988, the BRAC Commission recommended closing the Fort Meade range and training areas and realigning Fort Meade from an active Army post to an administrative center. The National Security Agency is now the primary tenant. In July 1995, the commission recommended additional realignment, reducing Kimbrough Army Community Hospital to a clinic.

In November 1980, Fort Meade began investigating its sanitary landfill. In 1996, the Army officially closed the landfill; the remaining cells were capped.

Investigations beginning in FY88 identified several areas of concern, including landfills, petroleum and hazardous waste storage areas, aboveground storage tanks (ASTs) and underground storage tanks, asbestos-containing material in structures, and unexploded ordnance (UXO).

In FY90, the installation removed contaminated soil and determined the extent of groundwater contamination at the former post laundry. In FY91, Fort Meade removed a leaking AST and established a pump-and-treat system. The Army shut down the system in 1997.

In FY92, groundwater contamination from a leaching acid neutralization pit at a former battery shop was discovered. The installation removed the building and pit and has monitored groundwater since the removals. In FY94, approximately 120 drums containing petroleum products were removed from a former storage and salvage yard.

The installation conducted UXO surveys in FY94 and FY95 and completed a risk assessment for UXO. The installation formed a BRAC cleanup team in FY94 and a Restoration Advisory Board in FY95.

In FY96, a Preliminary Assessment led to the discovery of groundwater contaminated by fuel oil and substances from former spill areas. The Army transferred the 100-acre site to the Architect of the Capitol. Fort Meade also began an installationwide Ecological Risk Assessment (ERA).

In FY97, the installation removed and disposed of soil from the neutralization pit and the fire training area and completed a UXO project at Tipton Airfield. It also completed an Environmental Baseline Survey, a Finding of Suitability to Lease, and cleanup at the medical waste site.

In FY98, a Site Inspection led to discovery of a former incinerator site. The installation completed a cap for Cell 2 of the sanitary landfill. Fort Meade was placed on the National Priorities List (NPL) in July 1998. The installation issued a final Remedial Investigation (RI) report for four sites and a draft RI for two sites.

FY99 Restoration Progress

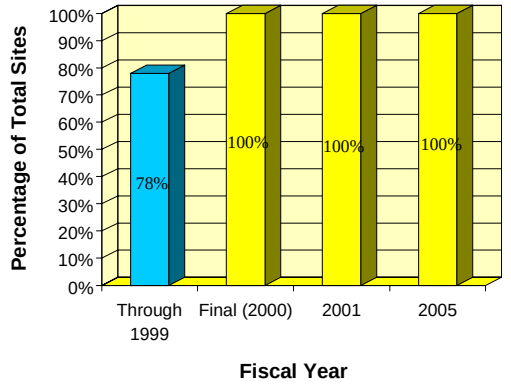
Fort Meade began a quarterly monitoring program at the post laundry and awarded a contract for additional RI work. The troop boiler plant Remedial Action (RA) continued. The RI and Feasibility Study (FS) at the Defense Reutilization and Marketing Office (DRMO) drum site continued. The installation completed capping of the active sanitary landfill and plans to conduct long-term monitoring. Fort Meade also completed RI/FSs at the trap and skeet range and at the incinerator site. No further action (NFA) is planned at the incinerator site. The installation awarded contracts for RI/FS activities at the Architect of the Capitol site, the battery shop, the post laundry, the Granite Nike Control Site, the Phoenix Nike Control Site, and other solid waste management units (SWMUs). The installation completed the Proposed Plan (PP), a final RI report for two sites, and two NFA Records of Decision for Tipton Airfield.

The installation did not complete the planned ERA work at the clean fill dump or RI work at the ordnance demolition area because regulators required additional sampling.

Plan of Action

- Continue RI/FS work at post laundry, battery shop, Architect of the Capitol site, and DRMO in FY00
- Continue RA at the troop boiler plant and examine RA alternatives for the trap and skeet range in FY00
- Continue RI/FS work at the Granite Nike Control Site, the Phoenix Nike Control Site, and other SWMUs in FY00
- Delete the Tipton Airfield parcel from the NPL in FY00
- Complete PP and decision document for the clean fill dump in FY00
- Complete RI/FS, PP, and decision document for the ordnance demolition area in FY00
- Continue partnering efforts with EPA in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: WA021402050600
Size: 86,176 acres
Mission: House I Corps Headquarters; plan and execute Pacific, NATO, or other contingency missions; provide troop training, airfield, medical center, and logistics
HRS Score: 42.78 (Landfill No. 5); placed on NPL in July 1987; deleted from NPL in May 1995
35.48 (Logistics Center); placed on NPL in November 1989
IAG Status: IAG signed in January 1990
Contaminants: VOCs, PCBs, heavy metals, waste oils and fuels, coal liquification wastes, PAHs, solvents, and battery electrolytes
Media Affected: Groundwater and soil
Funding to Date: $45.2 million
Estimated Cost to Completion (Completion Year): $59.0 million (FY2036)
Final Remedy in Place or Response Complete Date for All Sites: FY2007

Fort Lewis, Washington

Restoration Background

Two Fort Lewis sites, Landfill No. 5 and the Logistics Center, were placed on the National Priorities List (NPL) after investigations revealed soil and groundwater contamination. Additional sites include landfills, disposal pits, contaminated buildings, and spill sites. Primary contaminants include organic solvents, heavy metals, and fuels.

The Army and regulators signed a Record of Decision (ROD) for the Logistics Center in FY90. The final remedy, a groundwater extraction and treatment system, became operational in FY95.

In FY92, the Army and regulators signed a ROD specifying No Further Action and long-term monitoring for Landfill No. 5. In FY94, a ROD was signed for Landfill No. 4 and the Solvent Refined Coal Plant. Fort Lewis completed the Remedial Design for contaminated soil at the Solvent Refined Coal Plant in FY95. EPA removed Landfill No. 5 from the NPL in FY95. This was the first federal site, and the first DoD site, to be removed from the NPL.

In FY97, the installation completed the Remedial Action (RA) at the Solvent Refined Coal Plant. RA work began at Landfill No. 4 using air sparging and soil vapor extraction (SVE). Fort Lewis established an Installation Restoration Program Technical Working Group (TWG) to accelerate cleanups. In FY98, EPA approved the use of innovative technologies at the Logistics Center to accelerate cleanups and reduce program life-cycle costs. The installation determined that Landfill No. 1 required additional sampling.

FY99 Restoration Progress

The Army completed the first in a series of tests to evaluate the use of in situ redox manipulation and phytoremediation and began field testing a reductive anaerobic biological in situ treatment technology. Planning began on a treatability test of Six Phase Soil Heating at Landfill No. 2. Groundwater treatment plants continue to operate as designed, removing contaminants from the Logistics Center groundwater. The clay cap at the polychlorinated biphenyl (PCB) dump site was inspected and found serviceable, and a new fence was installed around the area. The installation's contractor completed the old Explosives Ordnance Disposal (EOD) site field investigation and is writing its report. Additional groundwater sampling was conducted at Landfill No. 1. The TWG completed the Logistics Center NPL site master remediation plan and now updates it as needed.

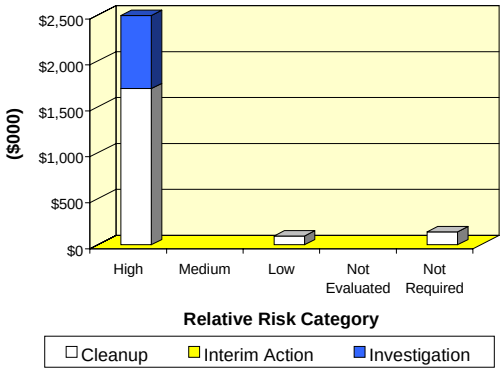
The Army completed site closeout at Vancouver Barracks. The installation is awaiting EPA No Further Action designations for the old fire fighting training pit, the stormwater outfalls, the Logistics Center battery acid pit, and the pesticide rinse area. An initial phytoremediation field test was completed and is awaiting issuance of a final investigative report. The Landfill No. 2 source investigation is in progress. The installation is evaluating the comparative merits of monitored natural attenuation and air sparging with SVE as treatment choices for Landfill No. 4.

The newsletter containing solicitation for a Restoration Advisory Board (RAB) is in progress.

Plan of Action

- Continue groundwater sampling at Landfill No. 1 through FY00
- Complete Landfill No. 2 source investigation in FY00
- Continue Logistics Center trichloroethene (TCE) upper aquifer groundwater treatment in FY00
- Continue innovative technology development for the Logistics Center in FY00
- Complete RAB solicitation in FY00
- Investigate Logistics Center lower aquifer for TCE contamination in FY00–FY01

FY00 Funding by Phase and Relative Risk



FFID: CA957172433700
Size: 3,688 acres
Mission: Provide logistics support for aircraft, missile, space, and electronics programs
HRS Score: 57.93; placed on NPL in July 1987
IAG Status: IAG signed in 1989
Contaminants: Solvents, metal plating wastes, caustic cleaners and degreasers, paints, waste lubricants, photochemicals, phenols, chloroform, spent acids and bases, and PCBs
Media Affected: Groundwater and soil
Funding to Date: $403.5 million
Estimated Cost to Completion (Completion Year): $748.2 million (FY2032)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2015

Sacramento, California

Restoration Background

Environmental contamination at McClellan Air Force Base has resulted from sumps near industrial operations, landfills, leaks near industrial waste lines, surface spills, and underground storage tanks (USTs). A study in FY79 detected groundwater contamination, leading to the closure of two on-base and three off-base drinking water wells. In addition to 373 acres of contaminated soil in the vadose zone, three large plumes of contaminated groundwater have been identified over 660 acres.

Sites at the installation were grouped into 11 operable units (OUs), including an installationwide Groundwater OU. Preliminary Assessments and Site Inspections for all OUs, and the Remedial Investigation (RI) for five OUs, have been completed. A streamlining effort resulted in the development of a basewide Engineering Evaluation and Cost Analysis (EE/CA) for implementing soil vapor extraction (SVE) at the base.

In FY93, the installation converted its Technical Review Committee to a Restoration Advisory Board (RAB). More than 800,000 pounds of contaminants has been removed from the soil and groundwater. An interim Record of Decision (ROD) was signed to address polychlorinated biphenyl (PCB) contamination at OU B1.

In FY95, the Groundwater OU interim ROD was signed. The installation has implemented 213 Interim Remedial Actions, including a landfill cap, construction of a groundwater treatment plant, and demolition of an electroplating facility. The UST program has removed or abandoned in place 210 USTs.

In FY97, a dual-phase extraction system was installed to treat volatile organic compound (VOC)–contaminated soil and groundwater. Thirty-six on- and off-base groundwater wells were decommissioned, eliminating possible conduits for additional soil and groundwater contamination. Thirteen USTs were removed, and 33,000 feet of linear piping associated with the industrial waste line was inspected and 4,000 feet repaired.

In FY98, the Phase II groundwater action design was completed and construction started. Three EE/CAs for SVE systems were completed, and fieldwork for an additional 10 EE/CAs began. RIs were completed for five OUs, and a Phase I RI was completed for all 11 OUs.

FY99 Restoration Progress

Installation of the Phase II groundwater system was completed. Three SVE systems were installed, SVE well installations at another 12 sites were completed but require additional work for implementation. Twelve SVE EE/CAs were completed. EPA-stipulated penalties were paid as planned. Six innovative technology demonstrations were completed.

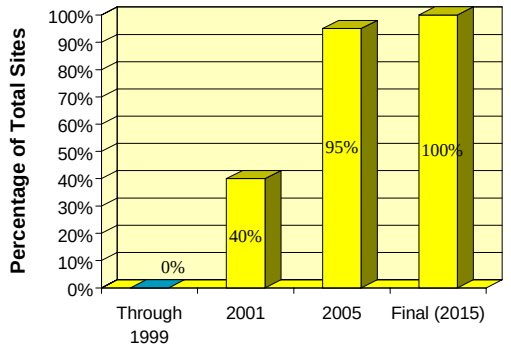
Phase I and Phase II of the RI effort are complete, but data gaps were identified that require additional fieldwork. Planned completion of the ROD for remediating VOCs, which allows final actions for soil before the completion of the installationwide ROD, did not conform to the installation schedule and therefore was not accomplished.

The RAB participated in training activities and document reviews. The installation continues to work with federal, state, and local agencies.

Plan of Action

- Install five SVE systems and connect seven SVE sites to existing systems in FY00
- Complete the VOC ROD in FY00
- The BRAC cleanup team will continue to prepare Environmental Baseline Surveys and Finding of Suitability to Lease documents in FY00
- Complete the final basewide RI in FY01
- Design and install Phase III of the groundwater actions by the end of FY02

Sites Achieving RIP or RC Per Fiscal Year



FFID: NJ221382059700
Size: 727 acres
Mission: House the Headquarters of the Army Communications and Electronics Command
HRS Score: NA
IAG Status: None
Contaminants: Petroleum hydrocarbons, VOCs, SVOCs, PCBs, heavy metals, radionuclides, asbestos, and lead paint
Media Affected: Groundwater and soil
Funding to Date: $16.0 million
Estimated Cost to Completion (Completion Year): $7.4 million (FY2006)
Final Remedy in Place and Response Complete Date for BRAC Sites: FY2000
Final Remedy in Place and Response Complete Date for Non-BRAC Sites: FY2003

Monmouth County, New Jersey

Restoration Background

In July 1993, the BRAC Commission recommended realignment and partial closure of Fort Monmouth, involving closure of the Evans Area, transfer of part of the Charles Wood Area to the Navy, and relocation of personnel from the Evans Area and Vint Hill Farms Station to the Main Post and Charles Wood Area. To speed transfer, Fort Monmouth BRAC property was divided into three parcels: the Charles Wood Housing Area and two parcels at the Evans Area.

Studies identified 37 sites in three areas. In FY94, an enhanced Preliminary Assessment (PA) of the BRAC parcels identified 32 sites at the Evans Area and 8 sites at the Olmstead Housing Area. Prominent sites are landfills, underground storage tanks (USTs), hazardous waste storage areas, polychlorinated biphenyl (PCB) spill areas, asbestos areas, and radiological storage and spill areas. Contaminants in groundwater and soil include chlorinated solvents, volatile organic compounds (VOCs), and heavy metals.

In FY94, the installation formed a BRAC cleanup team and completed version 1 of the BRAC Cleanup Plan. In FY95, the Army determined that one site at the Evans Area and two sites at the Olmstead Housing Area required no further action.

In FY96, the installation completed Site Inspections (SIs), the final SI report for all sites, and a radiological site characterization work plan. The installation's Land Reuse Plan and the survey for asbestos-containing material were also completed. The installation formed a Restoration Advisory Board.

In FY97, the Army developed remediation plans for nine sites. Radiological decommissioning fieldwork continued in the vacant parcels. A draft Finding of Suitability to Transfer (FOST) and a draft updated Environmental Baseline Survey (EBS) report were prepared for the early conveyance of land north of Laurel Gully Brook.

In FY98, the Army prepared a draft second supplemental Environmental Assessment (EA) and a finding of no significant impact (FNSI). A Supplemental Site Inspection report was completed. Removal Actions began at the PCB spill sites, the metal plating facility, and 36 USTs. The installation completed soil sample analysis at the antenna field in Parcel E and prepared updated draft EBS reports for Parcels A and B.

FY99 Restoration Progress

The installation completed cleanup of the sewage treatment plant site and removed underground neutralization tanks. All USTs have been removed, but petroleum soil contamination was identified during radiation remediation and the metal plating facility project. Construction of a new facility to replace the "Shield" is in progress.

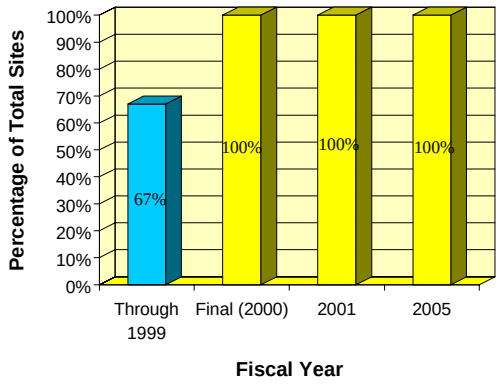
The Army began reviewing the EBS and the draft FOST for Parcel E. The State Historic Preservation Office required an additional archaeological field investigation for Parcels A, B, and D. This investigation has uncovered some human remains, which are believed to be Native American in origin. Initial contact has been made with the federally recognized tribes in accordance with the Native American Graves Protection and Repatriation Act.

Completion of the second phase of the radiological surveys was delayed because of the discovery of additional radiation and mercury contamination in Area 4A. The area is being remediated. The final supplemental EA, a FNSI, and a Removal Action for soil at the metal plating facility and the PCB spill sites were delayed because of an increase in the work needed to complete radiation and UST remediation. The installation did not complete the final updated EBS and FOST for Parcels A and B or transfer the property because of mercury contamination in the sanitary system.

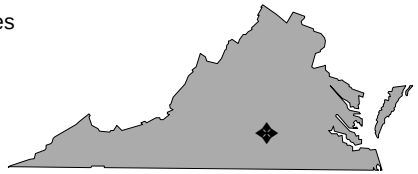
Plan of Action

- Complete second phase of radiological surveys and remediation and disposal actions in FY00
- Complete Removal Action for soil at metal plating facility and PCB spill sites in FY00
- Complete cleanup activities at all UST sites in FY00
- Complete mercury remediation activities for the sewer system and Buildings 9045 and 9401 in FY00
- Complete the final updated EBS and FOST for Parcels E, A, and B and transfer property in FY00
- Complete Feasibility Study for the groundwater in Parcel C in FY00
- Complete the updated EBS and FOST for Parcels C and D and transfer propety in FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: VA321402070500
Size: 45,160 acres
Mission: Provide training support for Active and Reserve Component Units of all Services
HRS Score: NA
IAG Status: None
Contaminants: Petroleum hydrocarbons, metals, propellants, and explosives
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $6.7 million
Estimated Cost to Completion (Completion Year): $6.2 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Blackstone, Virginia

Restoration Background

In July 1995, the BRAC Commission recommended closure of Fort Pickett except for essential training areas and facilities used for Reserve Components. The installation closed on September 30, 1997. Training and maneuver areas and part of the cantonment area were transferred to the National Guard (41,744 acres). The remaining area (3,416 acres) has been designated as excess BRAC property.

Site types include underground storage tanks (USTs), petroleum spills, old salvage yards, and firefighter training areas. Petroleum hydrocarbons are the primary contaminants affecting groundwater, surface water, sediment, and soil. Interim Actions at the installation include UST upgrades, asbestos surveys, and removal of polychlorinated biphenyl (PCB)–containing transformers.

During FY95, the installation formed a Local Reuse Authority. In FY96, the Army formed a BRAC cleanup team and a Restoration Advisory Board (RAB). The Local Reuse Authority developed a Local Reuse Plan. The installation performed an Environmental Baseline Survey (EBS).

Also in FY96, the Army performed an Environmental Assessment (EA) and a Remedial Investigation (RI) of the 5-mile gasoline pipeline. The installation began a survey of all radioactive materials stored on the installation to support closeout of the license and conducted an archive search for unexploded ordnance (UXO) on the property.

In FY97, the installation completed an asbestos survey for buildings in the excess area and the removal, replacement, and disposal of PCB-containing transformers. It also completed the UXO Archive Search Report. Fort Pickett initiated a multisite Preliminary Assessment and Site Inspection (PA/SI) for the BRAC excess property.

In FY98, the installation completed a draft version of the Zone 1 PA/SI and an RI for the gasoline pipeline. The installation also initiated an RI and a Feasibility Study (FS) at the former firefighter training area, an RI/FS at the former service station, a Time-Critical Removal Action (TCRA) at the former salvage yard site, and a project to drain residual fuel from the underground gasoline pipeline. The Army completed Findings of Suitability to Lease for Blackstone Army Airfield and support facilities and for eight buildings and the surrounding property. Abatement of friable asbestos was completed in all buildings in the excess area.

FY99 Restoration Progress

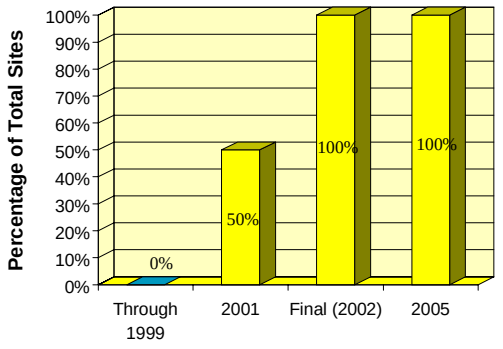
The Zone 1 and Zone 2 PA/SI documents are in draft form and near completion. A change in the sampling protocol for the PA/SIs, which was required by regulators, delayed the completion of these documents. However, the changes will provide more definitive data for decision-making purposes. The BRAC environmental office finished draining the underground gasoline pipeline and the TCRA at the former salvage yard. More than 8,000 expended shell casings were removed from the salvage yard site. No live rounds were found on site. The Army conducted seven small Removal Actions for CERCLA-regulated wastes, effectively serving as final Remedial Actions at these locations. RIs are under way at the firefighter training area and the former service station. The Army awarded RI contracts and initiated field activities at the former salvage yard (EBS-13) and the storage compound (EBS-79).

The RAB remains active in the restoration process and is discussing a project for Technical Assistance for Public Participation funding.

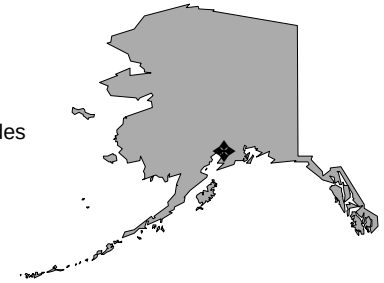
Plan of Action

- Complete Finding of Suitability to Transfer and EBS for excess parcel in FY00
- Complete RI for firefighter training area and former service station in FY00
- Award RI contract and begin field activities at the motor pools (EBS-115 and EBS-124) in FY00
- Obtain closure letter from Virginia Department of Environmental Quality for the underground gasoline pipeline in FY00
- Complete Site Assessment Reports for identified petroleum release sites adjacent to pipeline in FY00
- Complete RI for former salvage yard and storage compound in FY01
- Complete BRAC cleanup work in FY02

Sites Achieving RIP or RC Per Fiscal Year



FFID: AK021452215700
Size: 64,470 acres
Mission: Support and sustain forces assigned to U.S. Army Alaska
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement signed in December 1994
Contaminants: White phosphorus, PCBs, heavy metals, petroleum/oil/lubricants, solvents, dioxins, chemical agents, UXO, explosives, and pesticides
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $64.6 million
Estimated Cost to Completion (Completion Year): $23.7 million (FY2020)
Final Remedy in Place or Response Complete Date for All Sites: FY2009



Anchorage, Alaska

Restoration Background

Since World War II, Fort Richardson has supported combat unit training and operations. These activities contaminated soil, surface water, sediment, and groundwater with petroleum/oil/lubricants (POL), solvents, and polychlorinated biphenyls (PCBs). Parts of a 2,500-acre wetland serving as an ordnance impact area are contaminated with white phosphorus.

Preliminary Assessments and Site Inspections completed in FY83 identified 38 contaminated sites. Removal Actions have addressed PCB contamination in soil, underground storage tank sites, two drum burial sites, and more than 4,000 cubic yards of soil contaminated with volatile organic compounds and chemical agents. The Army treated 20,000 cubic yards of POL-contaminated soil by thermal desorption.

In FY95, the installation conducted Remedial Investigations (RIs) for Operable Unit (OU) A, to address three potential source areas, and for OU B, a former disposal site for chemical agent identification sets and other small munitions. The Army installed groundwater monitoring wells in the disposal area after a geophysical survey identified potential subsurface anomalies. The installation conducted a focused Treatability Study (TS) for dredging white phosphorus contamination at OU C, the Eagle River Flats Area, and completed a preliminary source evaluation in OU D at nine potential source areas.

During FY96, the Army completed groundwater sampling at OU B and OU A and submitted draft RIs and Feasibility Studies (FSs) to EPA. The installation initiated a pond draining and pumping TS for OU C. Evaluations of petroleum sites were completed. More than 20 sites required no further action with negotiated alternate cleanup levels.

In FY97, the installation completed a TS for heat-enhanced soil vapor extraction (SVE) at OU B. It completed the RI/FS for OU C and the RI for OU D. Records of Decision (RODs) were signed for OUs A and B.

In FY98, the installation completed a postwide risk assessment and incorporated the results into the OU D RI/FS report. It also drained six ponds at Eagle River Flats, thereby reducing white phosphorus levels. The installation signed a ROD for OU C. A six-phase soil heating (SPSH) system was used to remove chlorinated solvents from soil at the Poleline Road Disposal Area. The Army remediated two stockpiles of solvent-contaminated soil excavated from the same area in 1993 and 1994 using heat-enhanced SVE. The installation installed SVE systems to remove POL contamination at Ruff Road and the Building 986 POL Laboratory dry well.

The installation established a Restoration Advisory Board (RAB) in FY98.

FY99 Restoration Progress

A design verification study for OU B was completed. This study revealed that SPSH coupled with high-vacuum extraction (HVE) remediated soil and groundwater at the site more effectively than HVE alone. Six ponds at OU C were drained, allowing continued remediation of white phosphorus in pond sediment at the OU. The installation completed remediation at the two former OU A sites undergoing SVE treatment of POL-contaminated soil. Confirmation sampling was conducted at the Building 986 SVE system. The test results revealed that the site would benefit from an additional year of passive bioventing. SVE operations at Ruff Road were also completed.

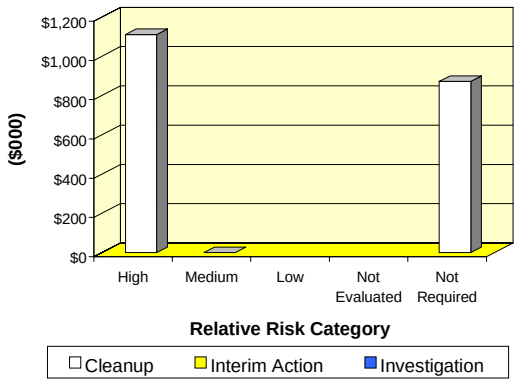
The Army Environmental Center raised significant concerns with the OU D ROD. Therefore, the installation was unable to complete and sign the ROD. The installation was delayed in designing and installing of the OU B dual-phase vacuum extraction system because system evaluation and the design verification study resulted in modifications of the six-phase soil dual-phase extraction system.

Quarterly RAB meetings occurred, including a tour of Fort Richardson's contaminated sites.

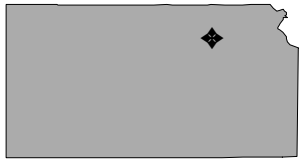
Plan of Action

- Complete and sign the OU D ROD in FY00
- Complete final design for, and install, OU B remediation system in FY00
- Design selected Remedial Actions for OU D in FY00
- Complete bioventing at former OU A POL sites in FY00
- Conduct quarterly RAB meetings and another site tour in FY00
- Continue draining and pumping of ponds at OU C in FY00 and FY01

FY00 Funding by Phase and Relative Risk



FFID: KS721402075600
Size: 100,671 acres
Mission: Provide training, readiness, and deployability for three component combat brigades; mobilize and deploy active and reserve component units
HRS Score: 33.79; placed on NPL in August 1990
IAG Status: IAG effective June 1991
Contaminants: VOCs, pesticides, and lead
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $50.0 million
Estimated Cost to Completion (Completion Year): $34.4 million (FY2020)
Final Remedy in Place or Response Complete Date for All Sites: FY2007



Junction City, Kansas

Restoration Background

Environmental studies from FY74 through FY86 identified a former pesticide storage facility, a dry cleaning facility and a closed landfill. Additional sites include a former firing range, two former landfill areas, an open burn/open detonation range (OB/OD), and a former fire training area.

The installation has identified five operable units (OUs): the Southwest Funston Landfill (OU1), the Pesticide Storage Facility (OU2), the Dry Cleaning Facility (OU3), the former Fire Training Area (OU4), and the 354 Area Solvent Detection Site (OU5). Groundwater contamination from OU4 was detected off post.

Remedial Investigation and Feasibility Studies (RI/FSs) began at OU1 and OU2 in FY91, and at OU3 in FY92. In FY94 to FY95, the installation stabilized the riverbank at OU1, conducted Removal Actions at OU2 and a former range site, and performed soil vapor extraction pilot tests at OU3 and OU4.

In FY96, the installation conducted soil investigations at OU4. In FY97, the Army obtained signatures on the final Records of Decision (RODs) for OU1 and OU2, which call for institutional controls. The installation performed initial field investigations at OU5. Remediation of fuel oil–contaminated utility trenches in the 6200 Family Housing Area was completed. EPA and state regulators participated in developing the Installation Action Plan.

In FY98, the Army submitted the draft Proposed Plan (PP) for OU3 to the regulators. The Army also completed an exposure control Engineering Evaluation and Cost Analysis (EE/CA) for OU4 that was followed by a public comment period and signing of the Action Memorandum (AM). An EE/CA for a groundwater early action at OU4 also was drafted. The installation completed decision memorandums for many No Action and No Further Action sites. It also completed an EE/CA, drafted an AM, and initiated the design for riverbank stabilization at the Forsyth Landfill Area. The installation drafted an EE/CA for hot-spot ash and soil removal at the Old Southeast Funston Landfill Incinerator and for cover repairs at the Old Southeast Funston Landfill.

FY99 Restoration Progress

The installation submitted the groundwater modeling report for the Camp Funston Groundwater Evaluation project and completed the RI/FS work plan for OU5. The Phase I RI field investigations for OU5 were expanded because groundwater screening showed an additional source area upgradient of the planned study area. The installation completed the AM for Forsyth Landfill Area 2, but increased project costs and scheduling considerations (including protection of bald eagle habitat) delayed construction of the riverbank stabilization project. The installation completed an EE/CA and began construction of hot-spot ash and soil removal at the Old Southeast Funston Landfill Incinerator. It also began cover repairs at the Old Southeast Funston Landfill.

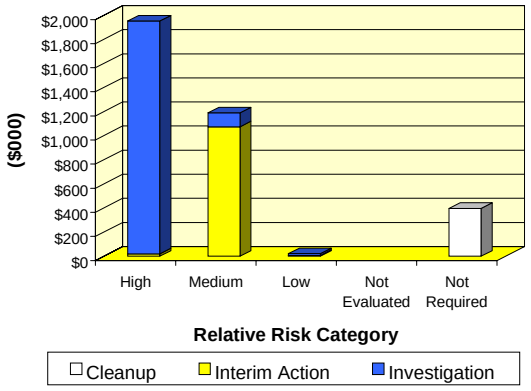
The installation did not complete the PP and the draft ROD for OU3 because of a need to further characterize the downgradient extent of alluvial groundwater contamination. The exposure control action and the early groundwater action EE/CA at OU4 were not completed because landowner permission was not given and because monitoring data showed a marked decrease in the contaminant levels, apparently due to the success of FY94–FY95 source removal and natural attenuation.

The Restoration Advisory Board reviewed and provided advice on proposed Removal Actions for the Funston Landfill and Incinerator and Forsyth Landfill Area 2 riverbank stabilization projects.

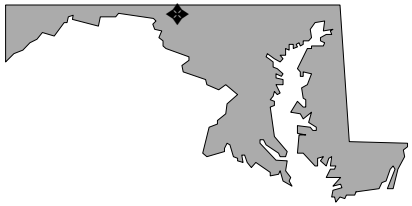
Plan of Action

- Complete OU4 RI in FY00
- Prepare decision document for 6200 Area fuel line site in FY00
- Complete Southeast Funston Landfill and Incinerator Removal Action construction in FY00
- Perform Forsyth Landfill Area 2 riverbank stabilization in FY00
- Perform RI surface water monitoring at OB/OD in FY00–FY05
- Complete PP and draft ROD for OU3 in FY01
- Complete OU4 FS and draft PP in FY01
- Complete OU5 RI and draft FS in FY01
- Develop Removal Action for OU5 in FY01

FY00 Funding by Phase and Relative Risk



FFID: MD321022075800
Size: 1,374 acres
Mission: Supported Site R underground facility
HRS Score: NA
IAG Status: None
Contaminants: UXO, heavy metals, and asbestos
Media Affected: Groundwater and soil
Funding to Date: $3.4 million
Estimated Cost to Completion (Completion Year): $5.9 million (NA)
Final Remedy in Place or Response Complete Date for BRAC Sites: NA



Fort Ritchie, Maryland

Restoration Background

In July 1995, the BRAC Commission recommended that Fort Ritchie be closed. The installation closed on September 30, 1998.

Environmental contamination at Fort Ritchie resulted from underground storage tanks (USTs), a mortar firing range, and a skeet range. The closed mortar range may contain unexploded ordnance (UXO). Housing units and administrative buildings contain asbestos and lead-based paint.

Interim Actions have included removal or replacement of USTs, relining of sewer lines with plastic, removal of falling lead paint and high-hazard friable asbestos, and closure of an incinerator. The Army also cleaned up a gasoline spill in FY92.

Measures to improve the decision-making process and communication at the installation include forming a planning group, conducting meetings at the town hall, conducting quarterly in-progress reviews, establishing hot lines to answer employee questions, and relaying installation updates to the local news media.

In FY96, the Army formed a BRAC cleanup team (BCT) to investigate and ensure cleanup of all areas of concern and allow transfer of all BRAC parcels. The commander also formed a Restoration Advisory Board (RAB). The Environmental Baseline Survey was completed. The installation's supporting U.S. Army Corps of Engineers (USACE) district negotiated a Total Environmental Restoration Contract for all restoration work. Work began on an Environmental Impact Statement (EIS).

In FY97, the installation completed the UXO archive search with the help of USACE, St. Louis District. The installation initiated hazardous, toxic, and radioactive waste (HTRW) sampling.

In FY98, the installation completed a revised draft Site Inspection report and BRAC Cleanup Plan version 2. It also completed UXO sampling, the UXO interim characterization report, and additional HTRW sampling. In addition, the installation signed a programmatic agreement for historic district preservation and completed the EIS and a Record of Decision. The installation completed a Finding of Suitability to Lease for all non-UXO property.

FY99 Restoration Progress

The installation completed Feasibility Studies for the Auto Craft Shop, the Administrative Area, the former Hospital Area, and the Wise Road Disposal Area. A groundwater monitoring report was completed for the former gas station. The Army completed Removal Actions at 19 UST sites, the incinerator, and the Reservoir Road area to expedite cleanup. An Engineering Evaluation and Cost Analysis (EE/CA) was completed for the Directorate of Public Works maintenance area and the incinerator area, and a final EE/CA was published for the ordnance and explosives impact area. The installation developed work plans and sampling and analysis plans for the golf shop, lakes, and the motor pool.

The Army made more than 300 acres (all non-UXO property) available for lease, but there were no transfers in FY99 because of ongoing environmental evaluation. The Local Redevelopment Authority wishes to have all property issues resolved before it takes ownership of any property.

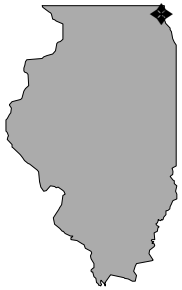
Plan of Action

- Continue sampling at the golf shop and the motor pool in FY00
- Initiate ordnance and explosives removal in FY00
- Complete a Finding of Suitability for Early Transfer in FY00

Sites Achieving RIP or RC Per Fiscal Year

Fort Ritchie has no environmental restoration activities. Funding shown is for compliance and UXO clearance activities. All environmental compliance activities are scheduled for completion by FY02. All UXO activities are scheduled for completion by FY03.

FFID: IL521402083800
Size: 712 acres
Mission: Provided administrative and logistical support; nonexcess property currently used as Army Reserve installation and Navy Housing Area
HRS Score: NA
IAG Status: None
Contaminants: Fuel hydrocarbons, PAHs, metals, and UXO
Media Affected: Groundwater and soil
Funding to Date: $35.8 million
Estimated Cost to Completion (Completion Year): $21.1 million (FY2033)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003



Fort Sheridan, Illinois

Restoration Background

In December 1988, the BRAC Commission recommended the closure of Fort Sheridan. The Fort's missions have included cavalry and infantry training, NIKE systems maintenance, and administrative and logistical support. Currently, the Army uses 104 acres for an Army Reserve installation.

Sites include landfills, pesticide storage areas, hazardous material storage areas, underground storage tanks (USTs), polychlorinated biphenyl (PCB)–containing transformers, and unexploded ordnance (UXO) areas. Petroleum hydrocarbons, volatile organic compounds (VOCs), and polyaromatic hydrocarbons (PAHs) affect groundwater and soil. Early actions have included removal of USTs and contaminated soil.

Remedial Investigation and Feasibility Study (RI/FS) activities, beginning in FY90, identified groundwater and soil contamination at two gas stations, seven landfills, and the coal storage areas.

In FY94, an installation survey identified UXO at the former artillery range at the north end of the Fort. The installation completed an Environmental Baseline Survey (EBS), and the commander formed a BRAC cleanup team, which completed the version 1 BRAC Cleanup Plan (BCP).

FY95 actions included removal of contaminated soil from Building 208. The installation also began an Interim Action to close Landfills 6 and 7. The Army approved a Land Reuse Plan prepared by the Local Redevelopment Authority. The installation formed a Restoration Advisory Board (RAB).

In FY96, the Army completed a Time-Critical Removal Action involving removal of contaminated sediment from Buildings 43 and 368. The installation completed Phase II and Phase III RI fieldwork at the excess property, performed a UXO clearance, and completed version 2 of the BCP. The Army removed several USTs on excess property and conducted asbestos abatement for excess-area buildings. The Army also completed a radiological closeout survey.

In FY97, the Army completed the decision document for the Landfill 6 and 7 Interim Remedial Action (IRA). It began IRA construction and initiated a Non-Time-Critical Removal Action (NTCRA) for the coal storage areas and a blacksmith shop on excess property. In addition, the installation prepared an RI, a Proposed Plan (PP), and a No Action decision document for Landfills 3 and 4. The Army conducted lead-based paint hazard abatement for excess property. RI reports were prepared for the remaining excess property. The Army completed a site-specific EBS for property transfers and leases, and Phase II RI fieldwork on nonsurplus property.

In FY98, the installation prepared two RI reports for the remainder of the excess property and an RI report for nonsurplus property. It also completed a No Action decision document for portions of the excess property. The installation completed the NTCRA at the coal storage areas and the former blacksmith shop and completed UXO clearance at the former rifle range.

FY99 Restoration Progress

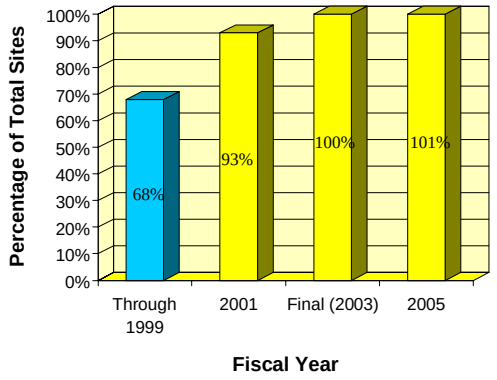
The installation prepared a No Action decision document for the remainder of the excess property and an EBS and Finding of Suitability to Transfer for excess property transfers. An RI, an FS, and No Action PP reports for nonsurplus property were completed. The construction of IRA continued at Landfills 6 and 7, including completion of shoreline erosion protection systems, leachate collection system, and final landfill grading.

The RAB submitted a Technical Assistance for Public Participation application for installation approval.

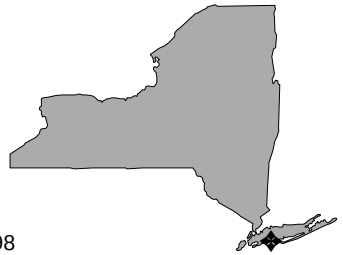
Plan of Action

- Complete Phase III RI for nonsurplus property sites in FY00
- Initiate Remedial Design for nonsurplus property Phase II action sites in FY00
- Continue IRA at Landfills 6 and 7 in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: NY221022089700
Size: 175 acres
Mission: Provided administrative and logistical support and housing; nonexcess property currently used as an Army Reserve enclave.
HRS Score: NA
IAG Status: None
Contaminants: Fuel hydrocarbons and metals
Media Affected: Groundwater and soil
Funding to Date: $0.9 million
Estimated Cost to Completion (Completion Year): $0 (FY1998)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY1998



Bayside, New York

Restoration Background

In 1995, the BRAC Commission recommended closing Fort Totten except for use as an enclave for the U.S. Army Reserve.

In 1989, the installation initiated a broad Installation Restoration Program. The Army conducted several preliminary studies, including groundwater sampling at the former landfill area and soil sampling throughout the installation. The installation completed several Interim Remedial Actions and removals. The actions include removing and replacing polychlorinated biphenyl (PCB)–containing transformers, removing and replacing tanks, and removing petroleum-contaminated soil.

In FY95, the installation initiated an Environmental Baseline Survey (EBS), which identified seven areas on BRAC property that required further evaluation. In FY96, the installation submitted a draft EBS report to the regulatory agencies for review. An unexploded ordnance archive search was performed, along with a limited field survey.

In FY97, the Army completed the EBS and began an Environmental Investigation. The BRAC cleanup team (BCT) was able to expedite document review by implementing a 15-day review process. The BCT coordinated with Restoration Advisory Board (RAB) members in making decisions. The Army identified 100 acres of CERFA-uncontaminated acreage at the installation for transfer. The appropriate regulatory agencies concurred with this designation.

In FY98, the Army completed cleanup of the Old Fort Area. The installation tested four USTs for leaks and determined that removal was not necessary. It also determined that further monitoring of groundwater wells was unnecessary. The installation received regulatory concurrence on the remainder of the CERFA-uncontaminated acreage.

FY99 Restoration Progress

The EBS, which supports a Finding of Suitability to Transfer (FOST), is in its final draft version. The installation will complete it (along with the FOST) after 11 fuel oil underground storage tanks (USTs) are removed to meet the requirements of the reuse plan. This plan calls for demolition of the buildings that these fuel tanks service. Removal of the tanks is also necessary to meet state regulatory requirements for permanent closure of temporarily out-of-service USTs.

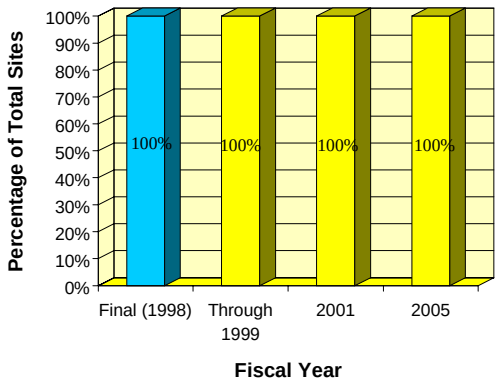
A programmatic agreement to address cultural resource issues was revised to reflect the comments of the State Historic Preservation Office (SHPO), the New York City Landmarks Preservation Commission (LPC), the City of New York, the Department of Education, and the National Park Service. These entities will take part in the Public Benefit Conveyance process in order to transfer the property. The final programmatic agreement was delayed due to disagreements on details about the covenants and on how jurisdiction would be divided between the SHPO and the LPC. When these issues are resolved, the final document will be signed.

The Army completed a final Environmental Assessment (EA) for the disposal and reuse action, as required by the National Environmental Policy Act. The EA resulted in a finding of no significant impact.

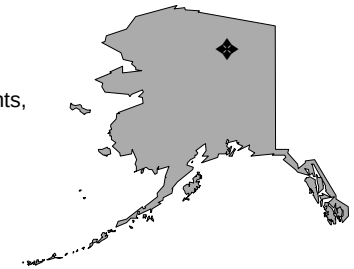
Plan of Action

- Remove 11 fuel oil USTs in FY00
- Complete the FOST and supporting EBS in FY00
- Complete and sign cultural resources programmatic agreement in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: AK021452242600
Size: 917,993 acres
Mission: House the Headquarters of the 6th Light Infantry Division
HRS Score: 50.00; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in November 1991
Contaminants: Petroleum/oil/lubricants, heavy metals, solvents, pesticides, paints, UXO, ordnance compounds, and chemical agents
Media Affected: Groundwater and soil
Funding to Date: $100.4 million
Estimated Cost to Completion (Completion Year): $50.8 million (FY2023)
Final Remedy in Place or Response Complete Date for All Sites: FY2003



Fairbanks, Alaska

Restoration Background

Since World War II, Fort Wainwright has housed light infantry brigades, most recently the 1st Brigade, 6th Infantry Division (Light).

Studies at the installation identified a chemical agent dump, drum burial sites, underground storage tanks, a railroad car off-loading facility, an open burning/open detonation area, a former ordnance disposal site, solvent groundwater plumes, petroleum/oil/lubricant (POL) plumes, and pesticide-contaminated soil. The installation divided sites into five operable units (OUs).

The Army conducted two Interim Actions in FY93 and FY94 to remove drums and contaminated soil. In FY93, the installation completed Site Inspections at 30 sites, 15 of which required no further action. In FY94 and FY95, the installation conducted Remedial Investigation and Feasibility Study (RI/FS) activities, including characterization of POL and solvent groundwater plumes and fieldwork for a former landfill. The chemical agent dump site was addressed separately under an interim Record of Decision (ROD).

In FY96, the Army and regulators signed RODs for groundwater contamination in OU3 and soil and groundwater contamination in OU4. The OU4 remedy specifies natural attenuation of groundwater contamination, capping of the inactive portion of the landfill, and in situ treatment of coal storage yard soil and air sparging (AS) of associated groundwater. Remedial Design (RD) began for all sites addressed under those RODs. The Army completed the fire training pits (OU4) Removal Action and closed the site.

In FY97, the installation completed the FS, Proposed Plan, and ROD for OU1 and initiated RD for OU1 and OU2. The Army and regulators signed the ROD for OU2. The OU4 RD was completed, the inactive portion of the landfill was capped, and the treatment system was installed at the coal storage yard. The installation completed the draft FS and initiated Treatability Studies (TSs), including installation of a horizontal well, at OU5.

In FY98, systems at OU3 were expanded because additional contamination was discovered, and OU4 achieved construction complete status. The installation began additional TSs at OU5. Removal of an old retaining structure at OU5 resulted in removal and treatment of 650 cubic yards of contaminated soil and 1,700 gallons of product.

The installation established a Technical Review Committee in FY90 and a Restoration Advisory Board (RAB) in FY97. The installation sends out quarterly restoration newsletters to keep the public informed of cleanup activities.

FY99 Restoration Progress

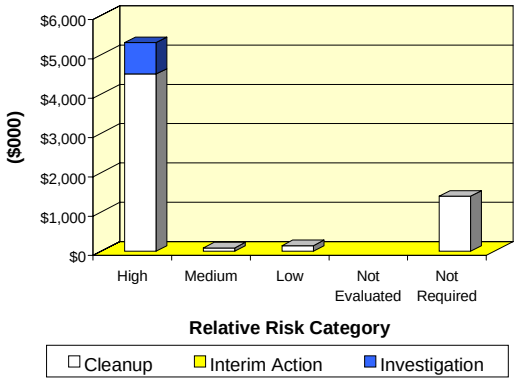
The OU5 ROD was signed, and RD began. The installation continued the Chena River Aquatic Assessment Program on a reduced schedule. Petroleum-contaminated sites continue to be remediated under state agreement. Remediation progressed at OU1; all parties have reviewed the draft Remedial Action Report (RAR). The RAR for OU2 was finalized. Bottled water continued to be provided to neighboring churches.

The horizontal well AS and soil vapor extraction (SVE) augmented system at OU5 and the sparge curtain are considered treatment in place because of their success in removing contamination. Inspection verified the integrity of the landfill cap at OU4 after its first full year in place. The installation continued a design verification study at OU3, which showed a greater area of contamination than previously identified, requiring technology changes and increasing the cost for completing work at the site. An AS curtain was installed at the river to treat potential contamination moving off post. At OU2, treatment continued at the Defense Reutilization and Marketing Office yard to address benzene contamination. At OU1, investigation-derived waste soil containing pesticides is being treated by phytoremediation.

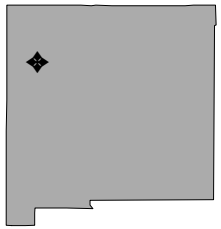
Plan of Action

- Finalize RARs for OU1 in FY00
- Obtain long-term monitoring plan agreements from the state on petroleum-contaminated sites in FY00
- Complete explanation of significant differences for OU3 for extended amount of contamination FY00
- Complete operations and maintenance reports for OU4, OU1, and OU2 in FY00
- Continue Chena River Aquatic Assessment Program in FY00
- Continue remediating petroleum-contaminated sites under state agreement in FY00–FY01
- Continue to provide bottled water to neighboring churches in FY00–FY01
- Complete RD at OU5 in FY00 and attain construction complete status in FY01
- Complete RARs for OU3 and OU5 in FY01

FY00 Funding by Phase and Relative Risk



FFID: NM621382097400
Size: 22,120 acres
Mission Stored, shipped, and received ammunition components and disposed of obsolete or deteriorated explosives and ammunition
HRS Score: NA
IAG Status: None
Contaminants: Explosive compounds, UXO, PCBs, pesticides, heavy metals, asbestos, and lead-based paint
Media Affected: Groundwater and soil
Funding to Date: $28.2 million
Estimated Cost to Completion (Completion Year): $24.1 million (FY2003)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003



Gallup, New Mexico

Restoration Background

From 1949 to 1993, Fort Wingate stored, tested, and demilitarized munitions. Past practices deposited ordnance-related waste on and off the installation. Restoration efforts have focused on land affected by unexploded ordnance (UXO); the Open Burning and Open Detonation (OB/OD) Area; soil at a pistol range; pesticide-contaminated soil at Building 5; explosives-contaminated soil at the former Bomb Washout Plant Lagoons; polychlorinated biphenyl (PCB) contamination in Buildings 501 and 11; demolition of the former Bomb Washout Plant (Building 503); and three unpermitted solid waste landfills.

In FY94, the installation formed a BRAC cleanup team and a Restoration Advisory Board. In FY95, the installation revised the BRAC Cleanup Plan. The Army conducted a Removal Action to clear UXO from Indian tribal lands adjacent to the OB/OD Area. Remedial Designs (RDs) were completed for the pistol range and for Building 5 soil.

In FY96, the installation conducted additional fieldwork for a Remedial Investigation and Feasibility Study (RI/FS) and completed field investigations at the three unpermitted solid waste landfills. Groundwater contamination was detected at the former TNT Washout Plant.

In FY98, the installation completed RDs for the Group C and Central Landfills. The Army remediated PCB-contaminated soil at Buildings 536 and 537 and excavated and disposed of pesticide-contaminated soil from Building 5. The field program confirmed the extent of explosives contamination in groundwater and defined the northern extent of nitrite and nitrate groundwater contamination at the former TNT Washout Plant. The Army installed monitoring wells at the Bomb Washout Plant site and the OB/OD unit. The installation demolished Buildings 501 and 503 and disposed of PCB-contaminated building materials. The process equipment was recycled, and the building materials were disposed of off site. By the end of FY98, all sites outside the OB/OD unit except Building 11 and Functional Test Range 1 (FTR1) had been investigated.

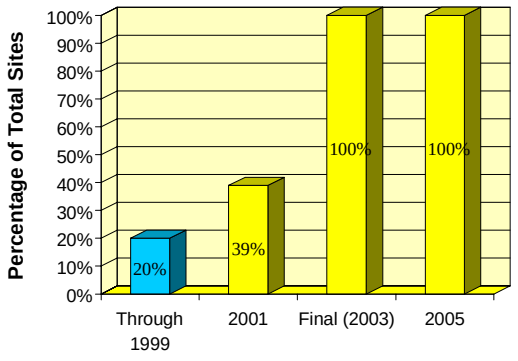
FY99 Restoration Progress

The installation completed asbestos abatement in 8 buildings and an Assessment Survey Report on 29 buildings. The Human Health and Ecological Baseline Risk Assessments are awaiting regulatory approval. The installation completed a design plan for Building 11, and the PCB investigation at the site determined that no PCBs are being released into the environment. The installation completed the investigation at the disposal pits at FTR1 and an installationwide surface water assessment, which was submitted to the regulators for review. The Army submitted a no further action (NFA) petition to the regulators for the suspected petroleum, oil, and lubricants site. The UXO "kickout" clearance was completed for the southeastern and southern side of the OB/OD site. The Army will implement additional land use controls to facilitate transfer of southern area properties at Fort Wingate. The installation developed and submitted a draft application for a post-closure care permit. The Group C and Central Landfills were remediated, contoured, and reseeded. The Western Landfill design was completed. A Remedial Action (RA), consisting of removal of contaminated soil, was completed at the Pistol Range and the Coal Tar Storage Site. A contract was awarded for demolition of Building 29.

Plan of Action

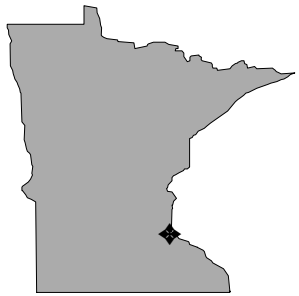
- Conduct Human Health and Ecological Baseline Risk Assessments in FY00
- Petition for NFA at specific sites in FY00
- Develop land use controls to facilitate transfer of installation's southern properties in FY00
- Revise and submit post-closure permit application in FY00
- Conduct soil background study in FY00
- Complete RAs at Group C and Central Landfills in FY00 and at Western Landfill in FY01
- Complete design plan for remediating TNT pits in FY01
- Remediate PCBs in Building 11 in FY01
- Complete investigation of septic tanks in FY01
- Complete RI and RD for Building 537 and RI for Building 9 in FY01

Sites Achieving RIP or RC Per Fiscal Year



Fridley Naval Industrial Reserve Ordnance Plant NPL

FFID: MN517002291400
Size: 82.6 acres
Mission: Design and manufacture advanced weapons systems
HRS Score: 30.83; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in March 1991
Contaminants: Petroleum/oil/lubricants, VOCs, SVOCs, metals, and cyanide
Media Affected: Groundwater and soil
Funding to Date: $31.5 million
Estimated Cost to Completion (Completion Year): $19.7 million (FY2015)
Final Remedy in Place or Response Complete Date for All Sites: FY2006



Fridley, Minnesota

Restoration Background

Investigations conducted at this government-owned, contractor-operated installation between FY83 and FY88 identified trichloroethene (TCE) in groundwater. The facility was placed on the National Priorities List (NPL) in FY90 because of the TCE contamination in the groundwater, which discharges into the Mississippi River upstream from the Minneapolis drinking water plant.

Site types include waste disposal pits and trenches, source areas beneath the main industrial plant, a foundry core butt disposal area, and sitewide groundwater contamination. Wastes and contaminants associated with these site types include petroleum/oil/lubricants, solvents, plating sludge, construction debris, and foundry sands.

Studies in FY83 and FY91 identified five sites at the plant. These were subsequently divided into three operable units (OUs): OU1 (Site 5), sitewide groundwater; OU2 (Sites 1, 2, and 4), source areas outside of the plant buildings; and OU3 (Site 3), source areas under the main industrial plant. Sites 1 and 2 have achieved Response Complete status. OU1 Feasibility Study (FS) activities were completed in FY88, and a Record of Decision (ROD) was signed in FY90. The ROD included a Remedial Action (RA) to provide hydraulic containment and recovery of all future off-site migration of contaminated groundwater. In FY95, the installation initiated a Remedial Design (RD) for the groundwater treatment facility (GWTF). In FY96, it combined OU2 with OU3 to effectively manage cleanup.

In FY97, the installation finished removing drums from Site 4, initiated the Remedial Investigation (RI) work plan for Site 3, began constructing the groundwater treatment plant, and issued a Site Management Plan.

In FY98, the installation issued the draft RI report, including a Human Health Risk Assessment (HHRA), for Site 3. A 5-year review of the groundwater remedy for Site 5 and GWTF construction were completed. The installation conducted a long-term operations and maintenance optimization study of the groundwater remedy. A screening effort for residual groundwater contamination in Anoka County Park was completed, and recommendations were included in the 5-year review of the groundwater remedy.

The installation formed a Technical Review Committee in FY93 and converted it to a Restoration Advisory Board (RAB) in FY95. It prepared its Community Relations Plan in FY91 and updated the plan in 1997. An administrative record was compiled and an information repository established in FY95. In FY98, the RAB was briefed on Technical Assistance for Public Participation grants.

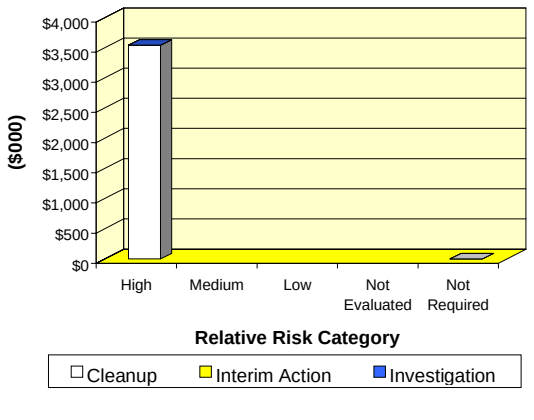
FY99 Restoration Progress

The installation issued the final RI report, including the HHRA for OU2 and Site 3. The installation initiated fieldwork to address data gaps identified in the 5-year review of the groundwater remedy for Site 5. Wells were installed at Anoka City Park and the remedial response will be determined in FY00. The plant began successfully discharging NPDES effluent into the Mississippi River via the GWTF. ATSDR completed a Public Health Assessment in September 1999.

Plan of Action

- Complete RI/FS for OU2 and OU3 in FY00
- Initiate the Proposed Plan, ROD, and RD for OU2 and OU3 in FY00
- Continue evaluation of on-site and residual off-site groundwater contamination and initiate any necessary RAs in FY00
- Continue implementing remedy for discharging NPDES effluent into the Mississippi River from OU1 in FY00

FY00 Funding by Phase and Relative Risk



FFID: OH597152435700
Size: 164 acres
Mission: Provided logistical support to the military services by supplying electrical and electronic material
HRS Score: NA
IAG Status: None
Contaminants: Residual petroleum/oil/lubricants, solvents, coal pile runoff (VOCs and SVOCs), and metals
Media Affected: Groundwater and soil
Funding to Date: $7.5 million
Estimated Cost to Completion (Completion Year): $3.1 million (FY2004)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001

Kettering, Ohio

Restoration Background

In July 1993, the BRAC Commission recommended closure of the Defense Electronics Supply Center (Gentile Air Force Station) and relocation of its mission to the Defense Construction Supply Center in Columbus, Ohio. The installation closed in December 1996. An Environmental Baseline Survey (EBS) completed in FY94 identified 9 sites and 48 areas of concern (AOCs) at the installation. Prominent site types included underground storage tanks (USTs); areas of past industrial operations; and landfills containing construction debris, hardfill, waste oil, solvents, asbestos, low-level radioactive waste, and a subsurface material suspected to be paint thinner. Releases from these sites have contaminated soil and groundwater.

In FY93, the reuse committee helped prepare a market survey of the types of commercial space in high demand in the area. In FY95, the findings were incorporated into an award-winning reuse plan. The BRAC cleanup team (BCT) developed a plan for investigating sites and AOCs. The Local Redevelopment Authority (LRA) has subleased two parcels on the installation.

A Restoration Advisory Board (RAB) was formed in FY94.

In FY95, all but one of the remaining polychlorinated biphenyl (PCB)–containing transformers were removed from the installation. In FY96, the installation completed an Environmental Impact Statement, updated the installationwide EBS, and completed a Record of Decision. Remedial Design and Remedial Action (RA) activities began at the installation. A Memorandum of Agreement (MOA) between the DLA and the Air Force Base Conversion Agency (AFBCA) was signed. Phase I of the Remedial Investigation and Feasibility Study (RI/FS) was completed. In FY97, No Further Remedial Action Planned documents were signed for 23 sites. All USTs were removed and parcels were transferred by the end of FY97.

In FY98, an Engineering Evaluation and Cost Analysis was initiated for Site SD001, Little Beaver Creek. A nonintrusive investigation of Site LF008 began. Parcels A, B, and C were transferred to the LRA. Long-term monitoring (LTM) began at Site WP026 and Parcel B. Sites SS014, SS020, SS028, and SS030 continue to be evaluated in a supplemental RI (SRI). The BRAC Cleanup Plan was updated. The MOA between the DLA and the AFBCA was amended to terminate DLA's involvement in the environmental restoration effort as of September 30, 1998. The BRAC funds held by DLA for the remaining cleanup effort were transferred to the Air Force Center for Environmental Excellence (AFCEE).

FY99 Restoration Progress

A post decision document for site R2 was delayed because of priority changes for parcels yet to be transferred. The BCT determined that an Interim Remedial Action (IRA) was necessary at Parcel B, and no FS was required. The determination of the necessity of an FS for Parcel E was delayed pending the results of additional sampling and an SRI, which was delayed because of development issues with the Gentile Quality Assurance Project Plan.

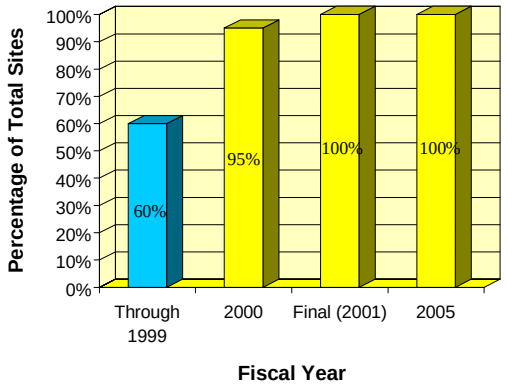
Long-term operations and LTM began at Site R2. The RA for LF008 began. Parcel F (17 acres) was transferred.

The RAB and the LRA participated in reuse activities. The installation continued partnering efforts with Ohio EPA.

Plan of Action

- Implement the IRA for Parcel B groundwater and begin RA in FY00
- Begin Finding of Suitability to Transfer for Parcel B in FY00
- Finalize the SRI for Parcel E in FY00
- Begin RA at Site C1 in FY00
- Begin SRI/FS for Parcel E in FY00

Sites Achieving RIP or RC Per Fiscal Year



George Air Force Base

FFID: CA957002445300
Size: 5,226 acres
Mission: Provided tactical fighter operations support
HRS Score: 33.62; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in October 1990
Contaminants: Petroleum/oil/lubricants, VOCs, and lead
Media Affected: Groundwater and soil
Funding to Date: $73.1 million
Estimated Cost to Completion (Completion Year): $44.3 million (FY2031)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001

Victorville, California

Restoration Background

Environmental studies conducted at George Air Force Base since FY81 have identified the following site types: landfills, petroleum spill sites, underground storage tanks (USTs), waste storage and disposal units, and fire training areas. These sites were grouped into three operable units (OUs).

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY84. The installation has completed Relative Risk Site Evaluation at all sites. In FY91, the installation implemented an Interim Remedial Action at OU1. Other Interim Actions at the installation have included removal of more than 80 USTs and contaminated soil, and cleanup and closure of a hazardous waste storage yard. In FY91, a RCRA Facility Assessment identified 113 solid waste management units. In FY92, the installation prepared an Engineering Evaluation and Cost Analysis and installed a pumping system at OU2. A BRAC cleanup team (BCT) was formed in FY92, and the installation's Technical Review Committee was converted to a Restoration Advisory Board in FY94. The installation closed on December 15, 1992. The BCT continues to meet monthly.

In FY93, the installation completed a final draft FS and a Proposed Plan for OU1 and began an Environmental Baseline Survey. In FY94, the Air Force and regulatory agencies signed a final Record of Decision (ROD) for OU1.

In FY95, the installation removed 30 oil-water separators and associated contaminated soil, began operation of bioventing systems at seven fuel-contaminated sites, and removed and disposed of soil from a low-level radioactive waste disposal site. All basewide RI/FS fieldwork was completed, and a draft report was issued.

In FY96, mobile recovery units were developed to remove JP-4 jet fuel from contaminated groundwater at OU2. Removal of the liquid fuel distribution system and of all USTs was completed. The installation also began cleanup by bioventing at six fuel spill sites.

In FY97, the installation completed all landfill closures and landfill-surface rehabilitation projects and the Phase II construction of the OU1 treatment system.

In FY98, the remedial project managers signed the ROD for OU3. The base began a study on the effectiveness of the pump-and-treat system. A basewide sampling and analysis plan also was completed.

FY99 Restoration Progress

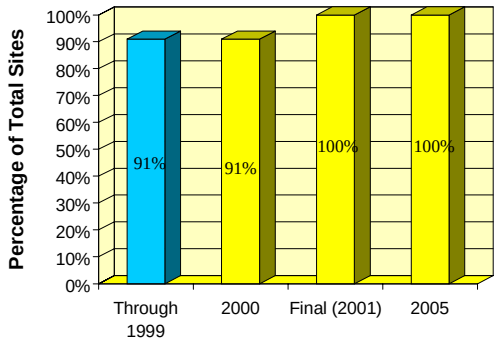
Approximately 20,000 gallons of free product was removed at OU2. A Remedial Action was implemented at OT-51, and a basewide groundwater monitoring project was approved, with funding scheduled for FY00. Long-term operations and monitoring continued at OU1 and OU2. All remaining UST locations were identified.

The OU2 FS was not submitted for review as planned because the soil vapor extraction (SVE) pilot system was still being constructed. This system was not completed because of a lack of funds. Closeout of bioventing sites, which was also planned for FY99, did not occur because work plans were not approved by the remedial project managers. Lead was not removed from the indoor firing range as planned because it was determined that for the planned reuse of this area it does not pose a health hazard.

Plan of Action

- Complete construction of the SVE pilot system for OU2 and begin operation in FY00
- Initiate a CERCLA-mandated 5-year review of the overall cleanup program in FY00
- Complete closeout of remaining biovent sites in FY00
- Continue to submit all work plans to the BCT for approval in FY00
- Initiate sampling at identified UST sites in FY00
- Continue removal of free product at OU2 in FY01
- Continue long-term operations and monitoring at OU1 and OU2 through FY31

Sites Achieving RIP or RC Per Fiscal Year



Glenview Naval Air Station and Libertyville Training Site — BRAC 1993

FFIDs: IL517002293000 and IL517009999900
Size: 1,285 acres (1,121 acres at Glenview; 164 acres at Libertyville)
Mission: Provided accommodations for aircraft, conducted flight and general training, and served as a NIKE missile location (Libertyville site)
HRS Score: NA
IAG Status: None
Contaminants: Petroleum hydrocarbons, heavy metals, PCBs, solvents, asbestos, and waste activated sludge
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $25.6 million
Estimated Cost to Completion (Completion Year): $0.2 million (FY2000)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY1997

Glenview, Illinois

Restoration Background

Glenview was established in 1937 to provide accommodations for Service aircraft. In World War II, the station was used for flight training. In 1946, it became a Reserve Command training facility. Libertyville was a flight training site and a NIKE missile air defense location. In July 1993, the BRAC Commission recommended closure of Glenview Naval Air Station, except for 93 acres of housing property, and the Libertyville Training Site. Closure occurred in FY95.

Forty-three sites were identified at the two bases: 33 CERCLA sites and 2 underground storage tank (UST) sites at Glenview; 7 CERCLA sites and 1 UST site at Libertyville. The sites that present the greatest risk are fire fighter training areas, landfills, fuel storage areas, and areas where waste was disposed of on the land surface.

Between FY88 and FY92, nine potentially contaminated sites were identified at Glenview. Between FY92 and FY94, the installation completed an Interim Removal Action for five of seven CERCLA sites at Libertyville. An Environmental Baseline Survey was completed for the two bases.

During FY95, a Site Inspection (SI) was completed at Glenview Site 8. The installation initiated SI activities at 16 sites and Remedial Investigation and Feasibility Study (RI/FS) activities at 4 sites. In FY96, it initiated SIs at three sites, and replaced contaminated soil with clean fill in parts of the airfield.

During FY97, the installation began an SI at 7 Libertyville sites, began an RI and conducted an Interim Remedial Action (IRA) at 7 Glenview sites, and completed an SI at 20 Glenview sites and UST removals at 1 Glenview site. Some sites were found to require no further action (NFA). The Navy transferred a parcel of land at the former Glenview Airfield to the Local Redevelopment Authority (LRA) in FY97.

In FY98, Glenview completed an SI at two sites, an RI at one site, and an IRA at one site. Eight sites at Glenview were designated for NFA. At Libertyville, restoration activities included SIs at five sites, an IRA at one site, and UST removal at another site. Three sites at Libertyville were designated for NFA. The Navy transferred Parcels 2, 3, 4, and the Golf Course Parcel to the Village of Glenview LRA.

Two Restoration Advisory Boards (RABs) were formed. The Navy prepared the Libertyville Community Relations Plan (CRP) in FY93 and the Glenview CRP in FY95. The BRAC cleanup team (BCT), which formed in FY93, works closely with two LRAs. A BRAC Cleanup Plan was completed in FY94, and a Land Reuse Plan was completed in FY95.

FY99 Restoration Progress

The Navy transferred ownership of one parcel at Libertyville for FAA reuse and transferred two segments of Parcel 5 at Glenview for LRA reuse. IRAs at five sites and an Engineering Evaluation and Cost Analysis (EE/CA) for nine sites at Glenview and one site at Libertyville were completed. RIs at 3 Glenview sites and IRAs at 11 Glenview sites and 1 Libertyville site were completed. All fieldwork at Glenview was completed. Documentation for five sites was completed and transferred to the LRA. Documentation for the other sites is in the regulatory review and comment process.

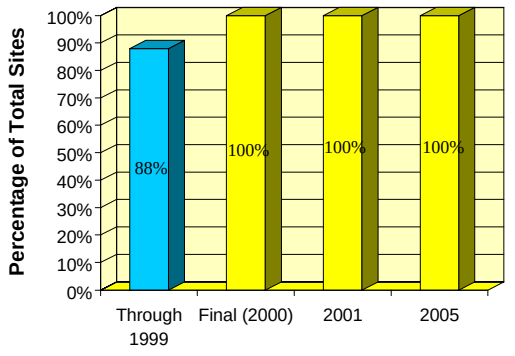
All USTs have been removed from Glenview and Libertyville. Only two UST closure reports remain to be finalized out of 43 UST removals. SIs at six Glenview sites were completed, and an SI at Libertyville is nearing completion. A planned IRA at one Libertyville site was not initiated because this work was not funded in FY99.

Findings of Suitability to Transfer (FOSTs) for Parcels 5A, 5B, 2 (at Libertyville), and portions of 5C were completed. Parcel 5C once contained all remaining acreage at Glenview. Discussions with the LRA continue on proposed land use controls for two remaining sites. Libertyville Parcel 1 depends on completion of the SI, which was not completed in FY99 because of continuing discussions about the groundwater.

Plan of Action

- Complete IRA for seven Glenview sites in FY00
- Complete SI and IRA at one Libertyville site in FY00
- Complete Remedial Action (RA) at one Libertyville site in FY00
- Complete IRA at Parcel 3 in FY00
- Transfer documentation for remaining Glenview sites to LRA in FY00
- Complete two closure reports on USTs in FY00
- Remove two sites from Parcel 5C and complete separate FOSTs in FY01
- Complete RA at two Glenview sites in FY01
- Complete RA at two Libertyville sites in FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: NY257002445100
Size: 3,638 acres
Mission: Operate air refueling and long-range bombardment facility
HRS Score: 34.20; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in June 1990
Contaminants: VOCs, heavy metals, PCBs, grease, degreasers, caustic cleaners, dyes, penetrants, pesticides, and solvents
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $101.4 million
Estimated Cost to Completion (Completion Year): $43.9 million (FY2033)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003

Rome, New York

Restoration Background

In FY81, a Preliminary Assessment and a Site Inspection (SI) identified 54 sites at Griffiss Air Force Base. Site types include landfills, underground storage tanks (USTs), fire training areas, disposal pits, and spill areas. Possible off-site groundwater contamination was identified.

Interim Actions conducted at the facility between FY86 and FY91 included modification of a landfill cap and removal of contaminated soil and USTs from a tank farm, various disposal pits, and the area adjacent to an aircraft nosedock. During FY91 and FY92, an $8 million alternative water distribution system was constructed to serve community residents outside of the installation. Remedial Investigations (RIs) of the areas of concern (AOCs) began in FY93.

In FY95, work began on numerous UST closures and contaminated-soil removals. The installation also completed an Environmental Baseline Survey (EBS). A final reuse plan was submitted. A BRAC cleanup team (BCT) and a Restoration Advisory Board (RAB) were formed. A Local Redevelopment Authority was formed to address socioeconomic issues related to closure of the installation. A BRAC Cleanup Plan was completed.

In 1996, the installation completed an Environmental Impact Statement and issued a final reuse Record of Decision (ROD) for the BRAC III realignment. In FY96, 96 of the 210 UST sites and hydrant fuel systems were closed. The installation also began Feasibility Study (FS) activities. Design work began for an Interim Remedial Action (IRA) at seven AOCs.

In FY97, the final RI report for 31 AOCs (Federal Facility Agreement sites) was completed. Thirteen draft Proposed Plans (PPs) for no further action (NFA) were submitted. The FS process began with submission of the draft Remedial Alternative Development and Screening Report.

In FY98, IRAs were completed on three of the seven IRA sites. The final supplemental investigation report was completed for the 31 AOCs. Five RODs were submitted. A landfill consolidation program began. Draft PPs were submitted for Landfills 1, 2/3, 5, 6, and 7. The final Remedial Designs for the landfills began. The close spill sites program began with submission of the draft Phase I work plan. A RCRA closure report was submitted for 76 areas. Concurrence has been received on 16 areas.

FY99 Restoration Progress

The installation completed IRAs for five sites, and closure documents are being prepared and reviewed. The landfill consolidation program was completed. The AOC Expanded Site Inspection (ESI) was completed. An ESI addendum is under review by regulators. The PP was completed for Landfill 1. Other landfill PPs, RODs, and closure designs were delayed because of the Woodstock 99 event. The planned landfill remediation was delayed for completion of the PPs and RODs. The BCT decided to conduct additional creek sampling before finalizing the planned FS.

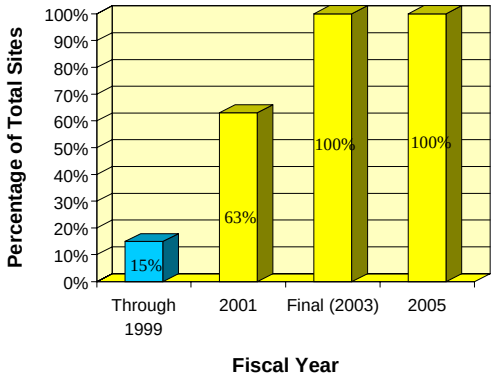
A total of 54,030 tons of polyclorinated biphenyl (PCB)–contaminated soil and 11,785 tons of lead-contaminated soil were removed. Of the 368 identified USTs, 330 have been removed, and 36,000 tons of petroleum-contaminated soil was remediated using the land-farming process.

Technical Assistance for Public Participation assistance has been provided for review of the final PPs for CERCLA sites. The BCT established an NFA, land use restriction, and institutional control policy.

Plan of Action

- Complete PPs and RODs for landfills in FY00
- Begin closure of Landfill 1 in FY00, and closure of remaining landfills in FY01
- Complete the AOC ESI in FY00 and begin the FS in FY01
- Complete the FS for installation creeks in FY00 and initiate the PP and ROD in FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: IN557212447200
Size: 2,722 acres
Mission: House a refueling wing; formerly housed a bombardment wing
HRS Score: NA
IAG Status: None
Contaminants: Household and industrial waste, spent solvents, fuels, waste oil, pesticides, lead, munitions, asbestos, potential radiation contamination, PCBs, and lead-based paint
Media Affected: Groundwater and soil
Funding to Date: $12.1 million
Estimated Cost to Completion (Completion Year): $6.9 million (FY2010)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY2001

Peru, Indiana

Restoration Background

In July 1991, the BRAC Commission recommended realignment of Grissom Air Force Base. When the installation was realigned in September 1994, the Air Force retained approximately 1,400 acres for military activities, and 1,300 acres was returned to the community for redevelopment. Grissom is a joint-use base, which uses both BRAC and Environmental Restoration Account funds to reach cleanup goals.

Remedial Investigation and Feasibility Study (FS) activities began in FY91. The installation has completed clean closure at underground storage tank (UST) removal sites and finalized No Further Action (NFA) documents for 22 BRAC areas of concern (AOCs).

In FY94, the installation formed a BRAC cleanup team (BCT) and prepared a BRAC Cleanup Plan (BCP). The basewide Environmental Baseline Survey (EBS) was completed. The installation also completed Supplemental EBSs on specific parcels.

In FY95, the installation began use of ex situ bioremediation, natural attenuation (NA), and geoprobe technology. Site characterization and Corrective Action Plans began at UST sites in the former Military Family Housing Area and at the BX gas station. The installation formed a Restoration Advisory Board (RAB).

In FY96, the installation developed a Focused FS (FFS) and completed an asbestos survey of BRAC buildings. An economic development conveyance was signed in May 1996. In FY97, investigation of 9 AOC sites and 40 oil-water separators and removal of USTs were completed. The installation completed the first Finding of Suitability for Early Transfer.

In FY98, an unexploded ordnance (UXO) statement of clearance was issued for the munitions burn and burial area, and the Environmental Investigation was completed. Projects at Oil-Water Separator 896, the interim hazardous waste storage site, and former leaking UST sites were initiated. The BCT reached consensus on closure, with NFA, of the firing-in butt. The BCP abstract was updated.

FY99 Restoration Progress

Monitored NA began to address groundwater contamination at the BX and flightline gas stations. The BCT resolved to conduct subsurface investigations at the B-58 aircraft burial site. The munitions burn and burial area report was finalized with a No Further Remedial Action Planned (NFRAP) decision document (DD). A methane gas study was completed. Nine NFRAP documents were signed to close out AOCs, and 10 Findings of Suitability to Transfer were signed. The Military Family Housing UST sites were closed, with NFA required.

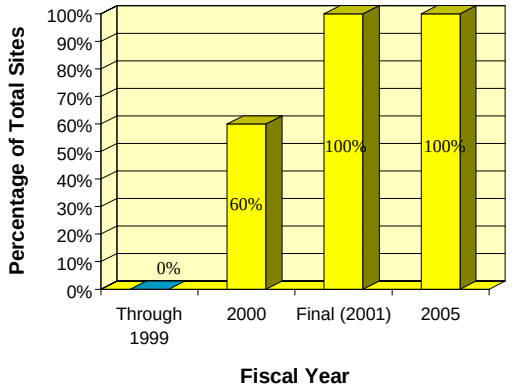
The planned finalization of the FFS and signing of the Remedial Action (RA) DD for the fire protection training areas were delayed because of lack of funding. A need for additional funding also delayed execution of the UXO survey for the firing-in butt and the grenade training range and RA at the outdoor small-arms firing range (SAFR) and the indoor SAFR. Because of CERCLA liabilities, the installation decided not to sign a DD establishing institutional controls as the remedy for metals in the groundwater.

The RAB met quarterly, and the BCP abstract was updated.

Plan of Action

- Finalize the FFS, sign the RA DD, and begin monitored NA at the fire protection training areas in FY00
- Sign RA DDs for Landfills 1 and 2 in FY00
- Complete soil removal and closure of the abandoned UST site in FY00
- Obtain a certificate of clearance for the firing-in butt and the grenade training range in FY00
- Investigate and close out the interim RCRA hazardous waste storage area in FY00
- Complete the sale and transfer of Parcels K and L to the City of Belton, and transfer Parcels F and G in FY00
- Conduct investigation and cleanup at the B-58 aircraft site in FY00–FY01
- Execute RA at the outdoor SAFR and the indoor SAFR in FY00 and sign an NFA DD in FY01
- Submit the RA DD for groundwater contamination at the BX and flightline gas stations in FY01

Sites Achieving RIP or RC Per Fiscal Year



FFIDs: GU917002753200, GU917002758300, GU917002758500, and GU917002757600
Size: 2,981 acres
Mission: Maintained and operated facilities, provided services and materials, and stored and issued weapons and ordnance in support of the operating forces of the Navy and shore activities; provided dry-dock facilities, repair services, and related services for Guam Naval Activities
HRS Score: NA
IAG Status: IAG signed in 1993
Contaminants: PCBs, petroleum/oil/lubricants, solvents, pesticides, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: $92.1 million
Estimated Cost to Completion (Completion Year): $50.3 million (FY2016)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY2013

Apra Harbor, Guam

Restoration Background

This facility consists of Navy commands in the Apra Harbor area and the former Naval Magazine (NAVMAG) area southeast of the harbor. Four of the commands [Guam Naval Activities (NAVACTS), Naval Fleet and Industrial Supply Center (FISC), Naval Ship Repair Facility (NSRF), and Public Works Center (PWC)] were recommended for realignment or closure by the BRAC Commission in July 1995. The Naval Ship Repair facility ceased operations in September 1997.

Operations that contributed to contamination were support, photographic and printing shops, a dry cleaning plant, power plants and boilers, pest control operations, and chemical and medical laboratories. Wastes were stored and disposed of in landfills and wastewater treatment plants.

The four commands have 29 CERCLA sites in the Installation Restoration Program, 21 RCRA sites, and 3 BRAC sites. Of the CERCLA sites, 13 are Response Complete (RC), 3 are in the study phase of a Remedial Investigation and Feasibility Study (RI/FS), 1 is in the cleanup phase of Interim Remedial Action (IRA), 1 is in the design phase of IRA, and 1 is in the study phase of IRA. Eight Removal Actions have been completed for CERCLA sites. Of the RCRA sites, 13 are in the RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) phase. Two Removal Actions have been completed and six are in progress. A Human Health Risk Assessment and an Ecological Risk Assessment (ERA) have been prepared for the four commands. One BRAC site is RC and the the other two are in the Removal Action phase.

The complex completed a joint Community Relations Plan in FY92. A local information repository was established in FY94. The complex converted its Technical Review Committee (formed in FY89) to a Restoration Advisory Board in FY95. During FY96, the BRAC cleanup team completed an Environmental Baseline Survey and a BRAC Cleanup Plan. In FY97, regulators and the Navy created a Memorandum of Understanding.

FY99 Restoration Progress

At NAVACTS, corrective measures implementation (CMI) is under way at two sites. The Engineering Evaluation and Cost Analysis (EE/CA) and design for the seawall to stabilize the cliff were completed for Site 1. Construction of the seawall began. A decision document (DD) for no further action (NFA) was signed for Site 14, and the site was determined to be RC. Investigations were completed for Areas of Concerns (AOCs) 2 and 21. EE/CA and RA at AOC 2 were not initiated because lead was found. No further action may be required. Hot spots were discovered at AOC 1 and are being characterized. Completion of RI and beginning of RD at New Apra Heights Disposal Area in AOC 1 are awaiting the results of additional characterization. Additional disposal areas were found during investigations at AOC 3, delaying other planned activities. The Guam Environmental Protection Agency (GEPA) is reviewing the Site 28 RFI recommendation that no further Remedial Action (RA) is necessary. CMI for Site 26 was delayed because of Remedial Design (RD) revisions requested by GEPA. CMI at Sites 16 and 17 was completed, and requests for NFA were submitted.

At FISC, the investigation at Site 33 was completed and no further action was required. At Site 19, RD and Removal Action were not initiated as planned because of a reevaluation of the ERA. GEPA has accepted the closure report for Solid Waste Management Unit (SWMU) 12, the Defense Reutilization and Marketing Office salvage yard, but further cleanup in nearby areas is needed.

At NSRF, the Removal Action at Site 25 was completed. Groundwater sampling and analysis are under way at AOC 1. No Removal Action is required at this time. The EE/CA, RD, and RA for soil were completed at AOC 1.

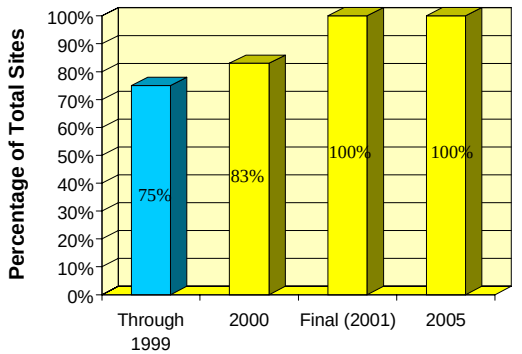
At PWC, the IRA for Site 16 was completed. Corrective Measures Design was completed at SWMUs 1 and 11. Investigations at AOC 1 were completed, and the EE/CA and RD were delayed until evaluation is complete. The CMI for SWMU 1 was completed and a closure report is being prepared. A Screening Ecological Risk Assessment (SRA) for SWMU 11 is being prepared.

Investigations were delayed at Barrigada Disposal Areas because two additional disposal areas were found during the fieldwork. These two sites were added to field investigation.

Plan of Action

- Complete SRA for PWC SWMU 11 and CMI for NAVACTS SWMU 26 in FY00
- Complete investigations at Barrigada Disposal Areas and RA at NAVACTS AOC 2 in FY00
- Begin EE/CA at NAVACTS AOC 3, RA at PWC AOC 1, and IRA at NAVACTS Site 4 in FY00
- Complete construction of the seawall at NAVACTS Site 1 and RD at FISC Site 19 in FY00
- Draft NFA DD for PWC Site 17 in FY01
- Complete closure reports for NAVACTS SWMUs 16 and 17, FISC SWMU 12, and PWC SWMU 1 in FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: CA921402303800
Size: 669 acres
Mission: Conducted reserve training
HRS Score: NA
IAG Status: None
Contaminants: Metals, VOCs, SVOCs, fuel hydrocarbons, PCBs, PAHs, and pesticides
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $25.3 million
Estimated Cost to Completion (Completion Year): $2.2 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002

Novato, California

Restoration Background

In December 1988, the BRAC Commission recommended closure of about 700 acres at Hamilton Army Airfield, as well as relocation of the airfield's mission. There are eight areas at the installation: a former petroleum/oil/lubricant (POL) hill area; a hospital complex; five "Out Parcels" (A-2, A-3, A-4, A-5, and A-6); and the main airfield parcel. Out Parcels A-2, A-3, A-5, and A-6 were transferred to the City of Novato, California, in 1996.

Investigations at the main airfield parcel addressed tidal wetlands, a perimeter drainage ditch, underground storage tanks (USTs), burn pits, aboveground storage tanks, onshore and offshore fuel lines, a former sewage treatment plant, a pump station, an aircraft maintenance and storage facility, the east levee construction debris disposal site, a POL area, and a revetment area. Metals, petroleum hydrocarbons, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyls (PCBs) are the main contaminants of concern.

In FY94, the installation formed a BRAC cleanup team (BCT) and a Restoration Advisory Board. To facilitate cleanup, the BCT conducted a bottom-up review of the installation's restoration program.

During FY95, the installation completed a draft Environmental Impact Statement. Additional Remedial Investigation (RI) work continued at five sites. Installation cleanup actions included removal of USTs and soil contaminated with petroleum constituents and PCBs.

In FY96, the Army continued RI and Feasibility Study (FS) activities on the main airfield BRAC parcel. In addition, the local reuse authority selected a wetlands reuse scenario for the BRAC airfield parcel. In FY97, the Army removed two USTs.

In FY98, the comprehensive RI report was submitted to the regulatory agencies for review. An Interim Removal Action work plan was prepared, and fieldwork was initiated for several sites that were identified in the RI report. The Army completed the design for the onshore fuel line remedy and removed the fuel line. The offshore fuel line was flushed, sealed, and abandoned in place.

FY99 Restoration Progress

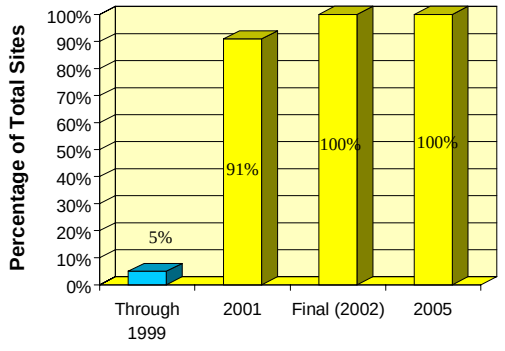
The installation completed a fate-and-transport study to justify leaving some remaining onshore fuel line contamination in place. The offshore fuel line closure report was approved by the regulators, and no further action is required on this site.

The Army initiated Removal Actions for several sites inside of the perimeter levee but did not complete them due to the endangered species breeding season, scheduling of other work, and the discovery of additional contamination during removals. The installation was unable to complete the planned risk assessment because of a lengthy regulatory review and comment resolution process. Completion of the planned Focused Feasibility Study (FFS) is awaiting completion of the risk assessment. Minor remaining contamination delayed the Parcel A-4 closure report, which the installation addressed in a Risk-Based Corrective Action report. The POL hill closure report was submitted to the regulators, who requested additional sampling. The Army submitted the closure report for the hospital area to the regulators, but it did not complete it, because of a lengthy regulatory review process.

Plan of Action

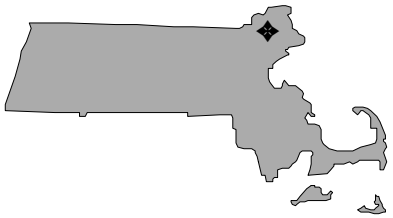
- Complete Interim Removal Actions for airfield sites in FY00
- Issue a Record of Decision (ROD) for airfield sites in FY00 and conduct long-term monitoring (LTM) if required
- In FY00, complete BRAC activities, except for LTM, for airfield sites
- Complete the risk assessment, the FFS, and fate-and-transport study documentation for airfield sites in FY00
- Complete closure reports for Parcel A-4, the POL hill, and the hospital area in FY00
- Prepare a sampling plan for coastal salt marsh sites in FY00
- Prepare an FFS and a ROD for coastal salt marsh sites in FY01

Sites Achieving RIP or RC Per Fiscal Year



Hanscom Air Force Base NPL

FFID: MA157172442400
Size: 826 acres
Mission: Support Electronic System Center
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: None
Contaminants: VOCs, chlorinated solvents, gasoline, jet fuel, tetraethyl lead, PCBs, and mercury
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $29.7 million
Estimated Cost to Completion (Completion Year): $15.4 million (FY2020)
Final Remedy in Place or Response Complete Date for All Sites: FY2000



Bedford, Massachusetts

Restoration Background

Historical operations at Hanscom Air Force Base involved generation, use, and disposal of numerous hazardous substances. Possible sources of contamination include a former industrial wastewater treatment system, a former filter-bed/landfill area, a jet fuel residue and tank sludge area, two landfills, three former fire training areas, a paint waste disposal area, a mercury spill area, the former aviation fuel handling and storage facilities, underground storage tanks (USTs), and various fuel spill areas.

Studies completed from the mid-1980s to the early 1990s identified 22 sites. For 14 of these sites, remedies are in place or response has been completed and no further response is planned. No Further Remedial Action Planned (NFRAP) decision documents are pending for two additional sites. Remedial Investigations and Feasibility Studies (RIs/FSs) are under way at the remaining six sites, and Interim Remedial Actions (IRAs) have been completed or are under way at five of the six.

In FY88, the final Remedial Action (RA) was completed at the closed municipal waste landfill, and IRAs were completed at three high-risk sites in Operable Unit (OU) 1. In FY89, the final RA was completed for the mercury release site. In FY90, Interim Actions included removing nonoperating tanks and petroleum-contaminated soil at UST sites. In FY91, the installation began operating an OU1 groundwater collection and treatment system to remove volatile organic compounds (VOCs) from groundwater and completed an IRA at the Army and Air Force Exchange Service (AAFES) service station UST site.

In FY94, the installation removed more than 1,300 tons of contaminated soil from a former UST site. In FY95, the installation began an IRA involving a dual-phase groundwater extraction and soil vapor extraction system at the former aviation fuel handling and storage area for remediation of petroleum releases. The installation's Technical Review Committee was converted to a Restoration Advisory Board (RAB).

In FY97, the installation automated the groundwater recovery and treatment system at OU1 and added two recovery wells to the collection system. Human Health and Ecological Risk Assessments were completed for the capped municipal waste landfill, and Massachusetts Contingency Plan (MCP) documentation was filed to establish natural attenuation as the final remedy for the AAFES service station UST site.

In FY98, the installation completed Site Inspections (SIs) at two UST sites, an RI at the former filter-bed/landfill site, and groundwater monitoring at OU1 and the AAFES service station site. Tufts University completed an environmental technology initiative at OU1, which EPA has publicized as a success story.

FY99 Restoration Progress

The installation completed the Human Health and Ecological Risk Assessments for the former filter-bed/landfill site, however, technical problems delayed these activities at the former aviation fuel site. The installation completed the Ecological Risk Assessment for OU1 and groundwater monitoring at several sites. The installation hosted an Air Force Technology Transfer Project to demonstrate vacuum-enhanced recovery of chlorinated hydrocarbons from groundwater at Site FT01 in OU1. MCP documentation was filed to establish natural attenuation as the final remedy for the Base Motor Pool UST site.

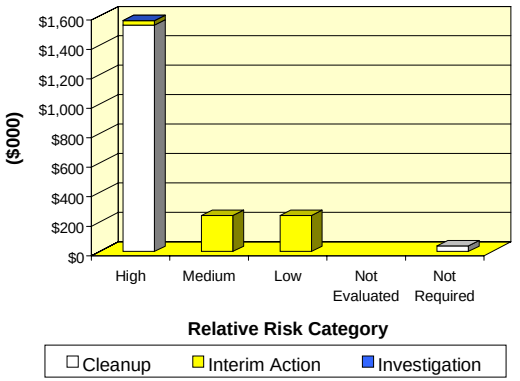
The FS and ROD process for OU1 and OU3 continued. Operation of the groundwater recovery and treatment system at OU1 and the dual-phase recovery and treatment system at the former aviation fuel handling and storage area also continued. Long-term monitoring (LTM) at the AAFES service station site and long-term maintenance at the capped municipal waste landfill continued. Completion of No Further Action decision documents for two UST sites was delayed because manpower was diverted to the more time-sensitive OMB Circular A-76 requirements.

The RAB met twice in FY99.

Plan of Action

- Complete the Human Health and Ecological Risk Assessments and the RI for the former aviation fuel site in FY00
- Complete NFRAP decision documents for two UST sites in FY00
- Complete the FS and the ROD process for OU1 and OU3 in FY00
- Convert the OU1 IRA to final remedy and begin design and construction of the final remedy for the former filter-bed/landfill site in FY00
- Continue operating IRAs at OU1 and the former aviation fuel site in FY00
- Continue LTM of natural attenuation at the AAFES service station and Base Motor Pool sites, and long-term maintenance of the capped municipal waste landfill in FY00

FY00 Funding by Phase and Relative Risk

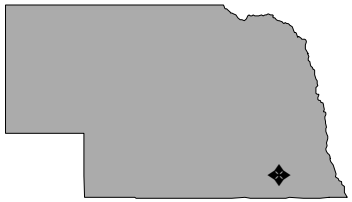


Hastings Groundwater Contamination Site

Formerly Blaine Naval Ammunition Depot

NPL

FFID: NE79799F041100
Size: 48,753 acres
Mission: Produce, load, and store ammunition
HRS Score: 42.24; placed on NPL in June 1986
IAG Status: IAG under negotiation
Contaminants: Explosive compounds, UXO, VOCs, PAHs, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: $60.6 million
Estimated Cost to Completion (Completion Year): $76.1 million (FY2031)
Final Remedy In Place or Response Complete Date for All Sites: FY2018



Hastings, Nebraska

Restoration Background

Operations at the Blaine Naval Ammunition Depot (NAD) Subsite contributed to groundwater and soil contamination at the Hastings Groundwater Contamination Site. The U.S. Army Corps of Engineers (USACE) designated five operable units (OUs) at the site: three OUs for the 2,900-acre Hastings East Industrial Park (HEIP) area (OU4, soil; OU8, vadose zone; and OU14, groundwater); one OU for the former Naval Yard Dump, the Explosives Disposal Area, and the Bomb and Mine Complex Production Facility (OU16); and one OU for a 44,500-acre area whose contamination status is unknown (OU15).

Soil sampling, installation of monitoring wells, and geophysical surveys were conducted for the Remedial Investigation (RI) of the HEIP area. EPA signed a Record of Decision (ROD) to remove surface soil. In FY95, EPA signed an amendment to the ROD for removal of soil from the HEIP area.

RI, Feasibility Study (FS), and Remedial Design (RD) activities were conducted for two OUs. A Time-Critical Removal Action (TCRA) was conducted to remove utility accesses and piping that had been identified as a source of groundwater contamination. Engineering Evaluations and Cost Analyses (EE/CAs) were performed to assess alternatives for environmental restoration in several areas. USACE also completed a preliminary study for the remaining 44,500 acres at the former depot.

In FY96, the RD for soil vapor extraction (SVE) and remediation of surface soil at the HEIP area was completed. Phase II of the RD for SVE began at three source areas in OU8. USACE completed an air-sparging pilot study as part of the RI/FS for OU14 and began the TCRA for the air-sparging facility. A comprehensive RI began for OU5. A TCRA for subsurface soil and drums was conducted at the Naval Yard Dump. In addition, a Remedial Action (RA) for surface soil and a Removal Action were initiated at the HEIP.

In FY97, a sitewide groundwater Baseline Risk Assessment began. USACE used shallow and deep soil gas sampling and testing. The property's Restoration Advisory Board (RAB) received risk assessment training.

During FY98, the OU4 RA was completed. EPA completed an RA report on the OU4 soil repository, and operations and maintenance for the repository began. In situ bioremediation and in-well stripping were pilot tested. The OU8 Phase I systems produced significant reductions in contamination. The ordnance and explosives (OE) EE/CA began. RAB members participated in groundwater hydrogeologic training. The Army signed a Federal Facility Agreement, which was later approved.

FY99 Restoration Progress

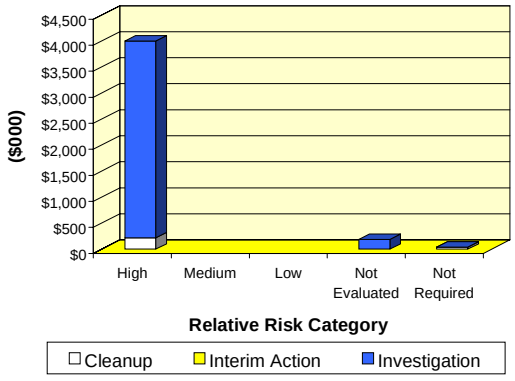
The RAB received Technical Assistance for Public Participation (TAPP) training. The OE EE/CA was completed on time and under budget. The EE/CA found that no further action was necessary for the OE Removal Action. The public availability session for the EE/CA was held. A draft technical memorandum to address carcinogenic polyaromatic hydrocarbons (cPAHs) at OU4 was completed and submitted for review. The OU14 Environmental Risk Assessment (ERA) was completed.

The OU14 groundwater model is in its final stages. Data gaps were identified during groundwater modeling preparation, and additional investigation provided information that allowed work on the model to continue. Annual groundwater monitoring continued to help track the extent and concentrations of the plumes. Design of the OU8 Phase II SVE systems was completed, and construction began. A final draft report for the OU15 ERA was submitted to regulators. The OU16 final draft Explosives Disposal Area Removal Action report and the draft final EE/CA for OU16 were submitted. Field sampling at OUs 15 and 16 was completed. The sitewide plan also was completed. Initial and follow-on partnering sessions were held.

Plan of Action

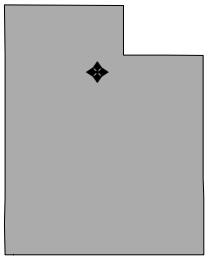
- Conduct TAPP training for RAB in FY00
- Complete OU4 technical memorandum to address cPAHs in FY00
- Complete OU4 Proposed Plan in FY00
- Complete OU14 groundwater model in FY00
- Complete construction of OU8 Phase II SVE systems in FY00
- Complete OU14 FS, OU15 ERA and EE/CA, and OU16 EE/CA in FY00

FY00 Funding by Phase and Relative Risk



Hill Air Force Base NPL

FFID: UT857172435000
Size: 6,666 acres
Mission: Provide logistics support for weapons systems
HRS Score: 49.94; placed on NPL in July 1987
IAG Status: IAG signed in April 1991
Contaminants: Solvents, sulfuric acid, chromic acid, metals, and petroleum wastes
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $124.0 million
Estimated Cost to Completion (Completion Year): $227.2 million (FY2049)
Final Remedy in Place or Response Complete Date for All Sites: FY2006



Ogden, Utah

Restoration Background

Between FY82 and FY87, Preliminary Assessment and Site Inspection activities were completed at Hill Air Force Base. Since FY87, 105 sites have been identified. Forty of these sites have been grouped into nine operable units (OUs). Site types include disposal pits, landfills, surface impoundments, underground storage tanks (USTs), fire training areas, firing ranges, discharge and wastewater ponds, a contaminated building, a munitions dump, and spill sites.

The base installed 10 systems to treat groundwater contaminated with trichloroethene (TCE) at 11 separate plumes, capped 3 landfills, capped 1 of the discharge and wastewater ponds at OU3, and installed 4 treatment systems to treat springs contaminated with TCE. The installation also completed decision documents for 63 sites, signed Records of Decision (RODs) for 6 OUs, and signed 3 interim RODs.

In FY95, the installation began work on the Remedial Investigation and Feasibility Study (RI/FS) for OUs 5 and 6 and implemented Phase I of the Interim Remedial Action at OU8. In FY96, a ROD was signed for Chemical Pit 3 (OU2), and construction of a containment system began. Four UST sites were closed, and five decision documents and the ROD for OU2 were completed. The installation also completed Remedial Design and Remedial Action (RD/RA) activities at OU7 and completed the design and implemented the RA for upgrading the horizontal drain system at Landfill 1.

In FY97, a ROD was signed for OU6, and the RD phase began. More than 200 areas of concern in OU9 were investigated and closed, requiring no further action. In FY98, a hydraulic barrier was constructed and began operating at OU2; over 42,000 gallons of solvent has been removed, with a 98 percent removal efficiency. An innovative asphalt cap was designed and constructed for OU3. At off-base areas with groundwater contamination, a natural attenuation cleanup strategy was employed, and an innovative aeration curtain was used to prevent contamination from moving into the local community. A ROD was signed for six sites in OU1.

The installation formed a Restoration Advisory Board (RAB) in FY94.

FY99 Restoration Progress

A groundwater collection trench and a spring collection and treatment system were installed at OU2. A groundwater pump-and-treat system and a natural attenuation and monitoring system were installed at OU6. At OU8, a groundwater pump-and-treat system was installed. Construction design was completed for six sites in OU1. Three sites were closed.

Additional site closures were delayed, pending regulatory concurrence. Signing of an innovative cleanup agreement for the Utah Test and Training Range (UTTR) was delayed, pending Air Force review. The test demonstration of an innovative technology using co-metabolic cleanup of TCE was delayed because of technical issues.

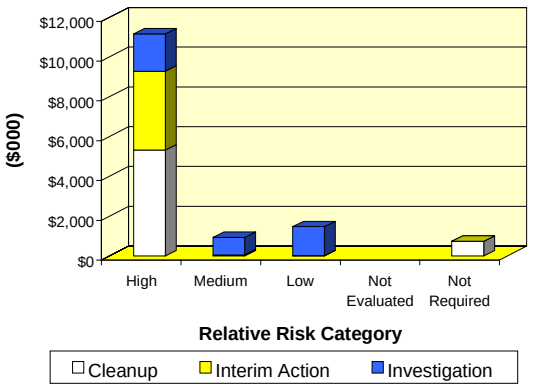
A basewide approach to groundwater sampling at post-ROD sites resulted in a reduction in the amount of needed sampling and a cost avoidance of $750,000. Consolidation of the management and operation of groundwater treatment systems has produced a $700,000 cost avoidance.

The RAB participated in four training sessions and three site tours. RAB attendance increased.

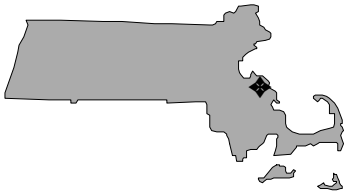
Plan of Action

- Initiate construction of groundwater collection and treatment systems at six sites in FY00
- Sign innovative cleanup agreement for the UTTR in FY00
- Implement natural attenuation off base at OU1 in FY00
- Close seven sites in FY00 and three sites in FY01
- Continue partnering with regulatory agencies and fostering RAB involvement in FY00–FY01
- Complete construction of RA at six sites in FY01

FY00 Funding by Phase and Relative Risk



FFID: MA121402280500
Size: 125 acres
Mission: Served as a Naval Ammunition Depot and Army Reserve Center
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, heavy metals, VOCs, PCBs, and asbestos
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $1.3 million
Estimated Cost to Completion (Completion Year): $0.2 million (FY2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Hingham, Massachusetts

Restoration Background

In July 1995, the BRAC Commission recommended closure of Hingham Annex, a subinstallation of Devens Reserve Forces Training Area. The Annex is now inactive. Studies have identified the following site types at the Annex: underground storage tanks (USTs), aboveground storage tanks (ASTs), spill sites, waste disposal areas, sewage filter beds, storage areas for polychlorinated biphenyl (PCB)–containing transformers, and areas with asbestos-containing materials (ACM). Investigations have determined that groundwater and soil are contaminated with volatile organic compounds (VOCs) and heavy metals.

Interim Actions at the installation include removal of USTs; ASTs; an oil-water separator; contaminated soil, including contaminated soil from an area that held PCB-containing electrical transformers; and ACM (building insulation and roofing tiles). The Army also used an innovative technology, asphalt batching, to remediate contaminated soil.

In FY93, the Army formed a BRAC cleanup team (BCT). During FY95, a Phase II Screening Site Inspection (SSI) was completed. The state regulatory agency allowed the installation to proceed with removal of soil contaminated with petroleum/oil/lubricants (POL), pending revision of the Human Health and Ecological Risk Assessments. In FY96, the installation removed the POL-contaminated soil. The installation conducted an Environmental Baseline Survey and received comments on the draft report. The BCT completed the BRAC Cleanup Plan (BCP). Public interest has been insufficient to support formation of a Restoration Advisory Board.

The Army completed the final BCP in FY97. Seven early actions were completed for asbestos at the Building 25 AST, the Building 25 Transformer Area, the Waste Disposal Area, the Building 54 Transformer Area, the Building 90 AST, and the Building 90 PCB Transformer. The installation conducted an unexploded ordnance archives search to support a recommendation of no further action and prepared a report on the results. It also performed release abatement measures while conducting a Phase II Comprehensive Site Assessment (CSA) and an SSI.

In FY98, the installation submitted the Human Health Risk Assessment to state regulators for review. A toxicity study was completed at two sites to address potential risks identified in an Ecological Risk Assessment. The installation also removed contaminated soil from seven sites. The installation removed soil contaminated with petroleum at three sites. A NEPA survey and a Cultural Resources Investigation were completed.

FY99 Restoration Progress

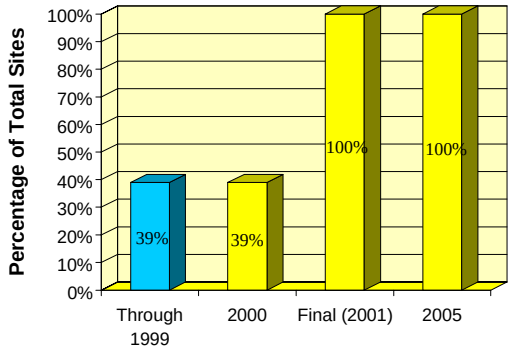
The installation completed a Removal Action at one POL-contaminated site, release abatement measures, and the final Phase II SSI, and is now attempting to resolve asbestos and solid waste issues with state regulators. The proposed CERFA-uncontaminated acreage has not yet received concurrence from regulatory agencies. The installation also completed topographical surveys and asbestos abatement.

The BCT worked on the CSA, provided oversight for the Asbestos Abatement Program, and worked with the local reuse authority to facilitate building demolition efforts.

Plan of Action

- Resolve asbestos and solid waste issues with state regulators in FY00
- Propose acreage as CERFA-uncontaminated and receive concurrence from appropriate regulatory agencies in FY00
- Complete additional groundwater characterization with installation of additional monitoring wells (Sites SA2, SA3, SA4/7, SA10, SA11, SA12, SA18, SA22) in FY00
- Complete additional work to identify source(s) of benzene contamination at SA22 in FY00
- Begin Removal Action at SA25 in FY00
- Complete Phase II CSA under the Massachusetts Contingency Plan in FY00
- Prepare a Finding of Suitability to Transfer for CERFA-uncontaminated acreage in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: CA917002278400
Size: 936 acres, including 493 acres on land and 443 acres submerged
Mission: Repaired and maintained ships
HRS Score: 48.77; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in September 1990 and revised in January 1992
Contaminants: Heavy metals, PCBs, petroleum hydrocarbons, VOCs, and SVOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $152.2 million
Estimated Cost to Completion (Completion Year): $263.6 million (FY2009)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2009

San Francisco, California

Restoration Background

In July 1991, the BRAC Commission recommended closure of this installation. The station ceased operations on April 1, 1994. It is now in caretaker status and is the responsibility of the Naval Facilities Engineering Command's Engineering Field Activity West. Parts of the installation have been leased to private parties.

The installation divided the property into six geographic areas, Parcels A through F, to facilitate studies, cleanup, and transfer of the property. Environmental studies identified 78 CERCLA sites. Site types include landfills and land disposal areas containing primarily heavy metals and volatile organic compounds (VOCs).

In FY91 and FY93, 36 underground storage tanks were removed, and 10 were closed in place. The installation demonstrated an innovative technology for recycling sand-blasting grit generated by ship-cleaning operations, which contains low levels of copper and lead. A full-scale demonstration was completed in FY93, allowing the Navy to use the technology at other installations.

In FY96, the installation completed a basewide Environmental Baseline Survey. A Record of Decision (ROD) for no further action was signed for Parcel A. The installation has completed nine Interim Removal Actions at sites throughout the shipyard.

In FY98, the installation signed a ROD, completed a Remedial Design (RD), and began a Remedial Action (RA) for Parcel B. Interim Removal Actions were completed for Parcels B, C, D, and E. The installation also completed draft Feasibility Studies for all parcels.

A BRAC cleanup team, formed in FY94, has expedited cleanup. The installation prepared its BRAC Cleanup Plan in FY94 and updates it regularly. The installation also prepared a Community Relations Plan in FY89 and revised it in FY97. The Technical Review Committee was converted to a Restoration Advisory Board in FY94.

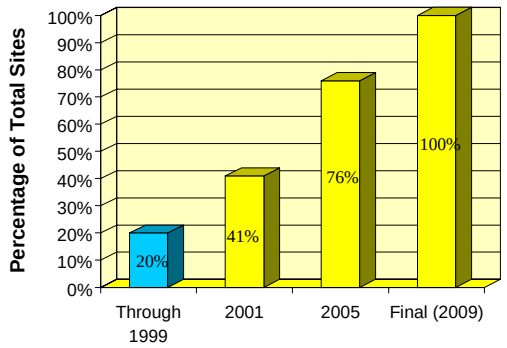
FY99 Restoration Progress

The installation initiated a risk management (RM) analysis at Parcels B through E to evaluate the impact of new EPA risk assessment guidance to the RD/RA for each parcel. The RM analysis at Parcel B enabled the Navy to propose a revised technical approach that would expedite the completion of the RA. The RODs for Parcels C, D, and E will be signed upon completion of the RM analyses. Parcel F is being investigated under a regional approach in which offshore sediments are assessed at multiple Naval facilities on San Francisco Bay. A final agreement with the City of San Francisco to transfer Parcels A and B and execute the lease in furtherance of conveyance (LIFOC) was not completed because of extensive public comment on the joint NEPA/California Environmental Quality Act (CEQA) document.

Plan of Action

- Complete NEPA/CEQA process in FY00
- Transfer Parcel A and part of Parcel B and execute the LIFOC in FY00
- Sign the ROD and start RD for Parcels C, D, and E in FY01
- Prepare the draft ROD for Parcel F in FY01

Sites Achieving RIP or RC Per Fiscal Year



Indian Head Naval Surface Warfare Center NPL

FFID: MD317002410900
Size: 3,423 acres (923 acres at Stump Neck Annex)
Mission: Conduct research, development, and production of rocket and torpedo propellants and explosives
HRS Score: 50.00; placed on NPL in February 1995
IAG Status: None
Contaminants: Waste propellants, explosives, acids, paints, solvents, heavy metals, low-level radioactive material, TCE, and industrial wastewater
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $9.0 million
Estimated Cost to Completion (Completion Year): $57.4 million (FY2013)
Final Remedy in Place or Response Complete Date for All Sites: FY2013

Indian Head, Maryland

Restoration Background

The Center provides services in energetics for all warfare centers through engineering, fleet and operational support, manufacturing technology, limited production, and industrial base support. It produces and handles complex chemicals to accomplish this mission. Lead, silver, and mercury are the primary contaminants of concern.

In FY83, a Preliminary Assessment (PA) identified 29 potential CERCLA sites. Silver-contaminated soil was removed at the X-Ray Building at Site 5 in FY91. In FY92, a supplemental PA identified 17 additional sites, 2 of which were recommended for no further study. Soil was remediated in one downgradient swale at Site 5, and a Site Inspection (SI) was completed at Site 42.

In FY93, a Site Characterization Report for mercury-contaminated soil was completed at Site 8 for Building 766. An Engineering Evaluation and Cost Analysis for the Removal Action was completed, and a weir was installed at the discharge point to prevent migration of mercury farther downstream. A study of mercury levels in fish from Mattawoman Creek, which receives runoff from a large part of the facility, concluded that the concentration of mercury in fish at the installation was comparable to typical concentrations found in fish throughout Maryland. In FY94, an SI was completed at 14 sites, and 2 more sites were identified.

In FY95, the installation remediated another downgradient swale at Site 5 and published the Removal Action report. Another Removal Action for excavation of the mercury-contaminated soil at Building 766 was completed. Biomonitoring indicated that the mercury from the site had no adverse effect on fish. The installation began removing trichloroethene (TCE)-contaminated soil from Site 57 (Building 292).

In FY96, the installation initiated Remedial Investigation and Feasibility Study (RI/FS) activities at 14 sites, completed fieldwork for removal of lead-contaminated soil, and initiated project closeout reports at Site 56. In FY97, pilot studies indicated that site conditions would inhibit the application of soil vapor extraction for soil at Site 57. A Removal Action was planned to address an immediate threat of groundwater contamination, while an RI/FS was conducted at the site to further evaluate site conditions and means of final Remedial Action (RA).

In FY98, a draft RI report was completed for Sites 12, 39, 41, 42, and 44, and a Removal Action to line and restore several hundred feet of sewer piping was initiated at Site 57. An RI for Site 57 was initiated, and work plans for RIs at Sites 47 and 53 were completed. The administrative record was converted to electronic format.

A Technical Review Committee was formed in FY93 and converted to a Restoration Advisory Board (RAB) in FY95. The installation prepared a Community Relations Plan and established an information repository.

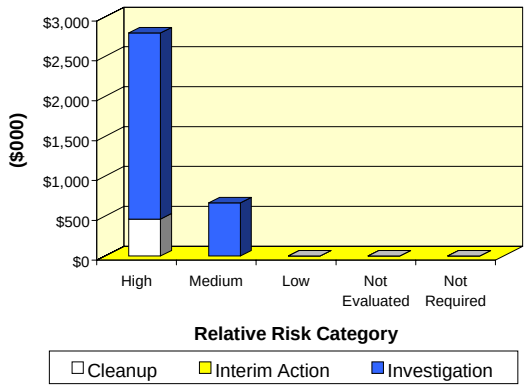
FY99 Restoration Progress

The final RI report for Sites 12, 41, 42, and 44 was completed, and an FS was initiated to evaluate alternatives for final remediation of Sites 12, 41, and 42. A No Further Action Record of Decision (ROD) will be pursued for Site 44. The planned draft RI report for Site 39 was not finalized because further investigation is required. The Removal Action was completed at Site 57. The project used an alternative means of pipe rehabilitation to cut costs. RI fieldwork was completed at Site 47. Severe funding constraints delayed RIs at Sites 11, 21, 49, and 53. Funding constraints will also delay RAs at Sites 39 and 41 and FSs for Sites 49 and 53, orginally scheduled for FY00. Official partnering efforts were initiated with EPA and the Maryland Department of the Environment.

Plan of Action

- Initiate RI fieldwork and report for Sites 15, 16, 49, and 53 in FY00
- Initiate RI at Sites 11, 17, 21, and 25 in FY00
- Initiate ROD and develop Remedial Designs for Sites 12, 41, 42, and 44 in FY00
- Initiate additional investigation at Site 39 in FY00
- Initiate FS for Site 57 in FY00
- Initiate RA at Sites 12 and 42 in FY01

FY00 Funding by Phase and Relative Risk



FFID: IN517002349900
Size: 185 acres
Mission: Conduct research, development, engineering, and limited manufacturing of aviation electronics and of missile, space-borne, undersea, and surface weapons systems, and related equipment
HRS Score: NA
IAG Status: None
Contaminants: Solvents, degreasers, alcohol, chemical laboratory waste, pesticides, wastewater, heavy metals, acids, petroleum/oil/lubricants, PCBs, and VOCs
Media Affected: Groundwater and soil
Funding to Date: $1.6 million
Estimated Cost to Completion (Completion Year): $0.2 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001

Indianapolis, Indiana

Restoration Background

Indianapolis Naval Air Warfare Center, Aircraft Division (NAWCAD) was commissioned in 1942 as a naval ordnance plant. Its mission was redefined to add space, undersea, and surface weapons. Typical operations conducted at the facility in support of this mission included machining; electroplating; degreasing of metal parts; carpentry; painting; operation of photographic laboratories; testing and evaluation; destruction of documents; and storage of supplies, materials, and fuels. In July 1995, the BRAC Commission recommended closure of NAWCAD. Various functions, along with personnel, equipment, and related support, were to be relocated.

The installation completed a Preliminary Assessment in FY88. In FY90, two underground storage tank (UST) sites were identified. Site assessments for the sites were completed in FY92, and the sites were designated Response Complete. In FY96, the installation delineated Site 1 and began a Remedial Investigation and Feasibility Study (RI/FS). Eighteen areas of concern (AOCs) were identified, and sampling began.

In FY95, the installation initiated an Environmental Baseline Survey (EBS); it completed the fieldwork for the EBS in FY96. Thirty-eight AOCs were found to require further investigation; these were consolidated into 18 AOCs and 16 UST sites. The NAWC Indianapolis Reuse Planning Authority formed and completed a preliminary privatizing business plan. In FY97, the installation completed closure of the hazardous waste transfer facility. Draft baseline Human Health and Ecological Risk Assessments were completed.

In FY98, the Navy prepared an Environmental Baseline Survey for Transfer and a Finding of Suitability to Transfer (FOST) and submitted the documents for public comment. A Finding of No Significant Impact was executed in FY98 to satisfy National Environmental Policy Act requirements after completion of the Environmental Assessment for Disposal and Reuse of the Naval Air Warfare Center, Indianapolis, Indiana. The Navy also completed five process closures in accordance with state requirements. A closure letter from the state was received for 30 UST sites. Decision documents were prepared for eight AOCs, recommending no further action or use of institutional controls.

A Restoration Advisory Board (RAB) and a BRAC cleanup team were formed in FY96. The installation established an information repository and worked with the RAB to complete a Community Relations Plan. A BRAC Cleanup Plan (BCP) was completed in FY97.

FY99 Restoration Progress

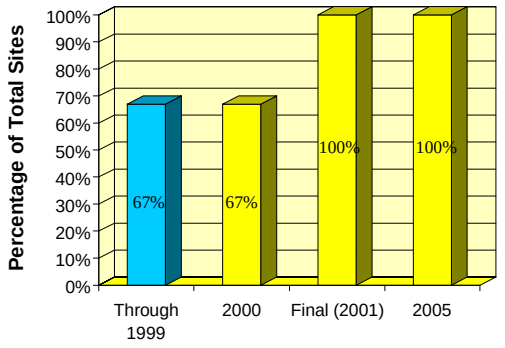
Polychlorinated biphenyls (PCBs), found in construction materials at Building 1000, were in violation of new Toxic Substances Control Act (TSCA) regulations. This is the remaining issue involved in the FOST for Parcel 1B. The FOST for Parcel 1A was finalized and is ready for signature once the timing of institutional controls is resolved. Initial transfer of the property was delayed, pending approval of the economic development conveyance. Remediation began on Site 1, a government radioactive materials survey was conducted, and a draft Remedial Action (RA) report is under review by the regulators for Parcel 2.

The planned revision of the BCP was delayed so that the installation could focus on higher priority projects. The Environmental Assessment was completed. The Engineering Evaluation and Cost Analysis (EE/CA) was completed and the Interim Remedial Action is nearing completion. Decision documents for Group 1 were finalized and an RI report was finalized as planned.

Plan of Action

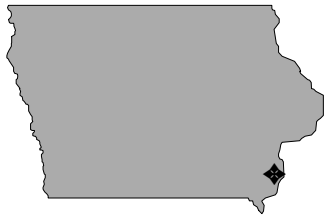
- Prepare EE/CA Action Memorandum in FY00
- Prepare Final Phase II RI report in FY00
- Prepare FOST (Parcel 1A) in FY00
- Conduct Site 1 RA in FY00
- Conduct final FS and prepare Proposed Plan in FY00
- Revise BCP in FY00
- Complete initial transfer of property in FY00

Sites Achieving RIP or RC Per Fiscal Year



Iowa Army Ammunition Plant — NPL

FFID: IA721382044500
Size: 19,024 acres
Mission: Load, assemble, and pack munitions
HRS Score: 29.73; placed on NPL in August 1990
IAG Status: IAG signed in December 1990
Contaminants: Explosives, heavy metals, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $50.4 million
Estimated Cost to Completion (Completion Year): $55.4 million (FY2035)
Final Remedy in Place or Response Complete Date for All Sites: FY2014



Middletown, Iowa

Restoration Background

In 1941, the Army constructed the Iowa Army Ammunition Plant to load, assemble, and pack various conventional ammunition and fusing systems. During operations, industrial process wastewaters and by-products were disposed of at the installation. Site types include surface impoundments, production areas, landfills, and a fire training pit. Soil and groundwater contamination resulted primarily from disposal of explosives and heavy metal–containing wastes directly on soil. The installation also identified small amounts of contamination by volatile organic compounds (VOCs).

Environmental studies have identified 45 restoration sites. Of those sites, 40 require further action. In FY92, Remedial Investigation and Feasibility Study (RI/FS) activities began. In FY96, the installation completed its RI; however, supplemental RI efforts have since been initiated. Restoration activities through FY96 included closing one cell in the inert landfill, removing aboveground treatment tanks, removing lead-contaminated soil from a production line, and cleaning up an abandoned coal storage yard. The installation funded a project connecting local residences to a public water supply because of off-post environmental impacts. Other restoration activities involved excavation and off-site incineration of pesticide-contaminated soil and excavation of explosives-contaminated sumps. The installation has three operable units (OUs): a soil OU (OU1), a groundwater OU (OU3), and an overall OU (OU4).

In FY97, the Army removed more than 80,000 cubic yards of contaminated soil from the former Line 1 impoundment area and the Line 800 lagoon. It also created wetlands and began phytoremediation to clean up residual contamination.

In FY98, the Army completed two studies for removal of explosives contamination from soil. The U.S. Army Environmental Center completed the bioslurry demonstration, and the U.S. Army Corps of Engineers completed humic polymer testing. Soil removal at the former Line 1 impoundment area and the Line 800 lagoon was completed. The installation capped five landfill cells. Soil removal also was completed at the North Burn Pads. The installation initiated an off-post groundwater study and supplemental RI groundwater activities around the Line 800 lagoon. It also completed an interim soil Record of Decision (ROD) and a ROD addressing soil remediation.

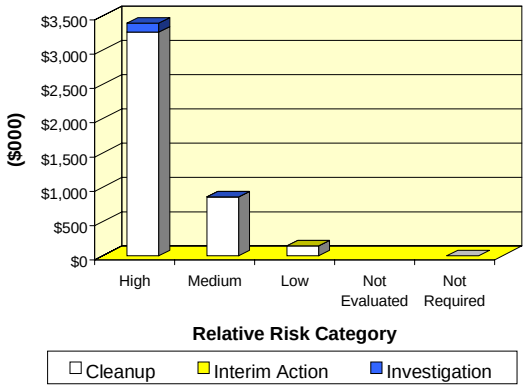
FY99 Restoration Progress

The installation completed soil removal at the East Burn Pads, the North Burn Pads Landfill, and the fire training pit. It completed treatment of soil from the fire training pit through use of low-temperature thermal desorption. The installation also continued the off-post groundwater study and the supplemental RI activities around the Line 800 pink water lagoon. The OU3 ROD will be delayed until these investigations are complete. Phytoremediation monitoring continues; data show that the contaminant level in the area undergoing this treatment is decreasing. An additional restoration site was designated to better manage the site and cleanup activities.

Plan of Action

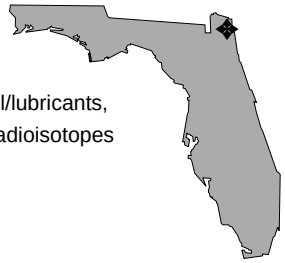
- Complete cap extension at the Inert Disposal Area in FY00
- Complete soil removal at Lines 5A/5B in FY00
- Complete soil removals at the West Burn Pads in FY00
- Perform off-post groundwater study and RI activities for the Line 800 pink water lagoon

FY00 Funding by Phase and Relative Risk



Jacksonville Naval Air Station NPL

FFID: FL417002441200
Size: 3,820 acres
Mission: Maintain and operate facilities; provide services and materials to support aviation activities and aircraft overhaul operations
HRS Score: 31.02; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in October 1989
Contaminants: Waste solvents, acids and caustics, cyanide, heavy metals, petroleum/oil/lubricants, low-level radioactive wastes, oil, paint, PCBs, pesticides, phenols, and radioisotopes
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $62.5 million
Estimated Cost to Completion (Completion Year): $53.6 million (FY2014)
Final Remedy in Place or Response Complete Date for All Sites: FY2014



Jacksonville, Florida

Restoration Background

Jacksonville Naval Air Station (NAS) includes the following site types: fire fighting training areas, waste storage and disposal areas, transformer storage areas, radioactive-waste disposal areas, and other miscellaneous support and maintenance areas. Typical operations have generated solvents, sludge (from on-site treatment plants), and low-level radioactive waste, which have migrated into nearby soil and local groundwater supplies.

The installation contains 47 CERCLA sites, 20 underground storage tank (UST) sites, and 3 RCRA solid waste management units (SWMUs). As of FY97, the installation had completed Preliminary Assessments (PAs) for 40 sites and Site Inspections (SIs) for 42 sites. Fifteen sites have proceeded to the Remedial Investigation and Feasibility Study (RI/FS) phase. To expedite cleanup, three operable units (OUs) were defined: OU1, two disposal pits; OU2, the Wastewater Treatment Plant area; and OU3, the Industrial Area.

During three Interim Remedial Actions (IRAs) in FY94, the installation erected fences at five sites and removed soil from one. A Record of Decision (ROD) was signed for two sites. An interim ROD was signed for one site in FY95.

During FY96, the installation continued RI/FS activities at six sites. It completed two IRAs, PA/SIs for three sites, RI/FSs for two sites, and Engineering Evaluations and Cost Analyses (EE/CAs) for six sites. A site assessment, two closure action plans, and an IRA were completed for UST sites. For two UST sites, monitoring-only plans were approved, and corrective measures implementation (CMI) was completed at one SWMU. Five IRAs were initiated.

In FY97, the installation completed the Remedial Design (RD) and Remedial Action for OU1, completed the corrective action and IRA for UST 1, and implemented a monitoring-only plan at UST 10. The installation finished IRAs for Site 18 and SWMU 2 and began long-term monitoring (LTM) for SWMU 2.

In FY98, the installation conducted a Baseline Risk Assessment and completed six RI/FS activities for OU2. The installation completed two PA/SIs for potential sources of contamination (PSCs), one IRA to remove spreading groundwater contamination, one Corrective Action Plan and corrective action, and the CMI and IRA for SWMU 1. UST 13 and Area A at UST 17 received No Further Action designations. LTM was conducted at UST 16. Seven monitoring wells were installed at SWMU 1 and the T-56 Wash Area.

The installation's Technical Review Committee, which formed in FY88, was converted to a Restoration Advisory Board in FY95. In FY91, the installation completed its Community Relations Plan and established an administrative record and an information repository.

FY99 Restoration Progress

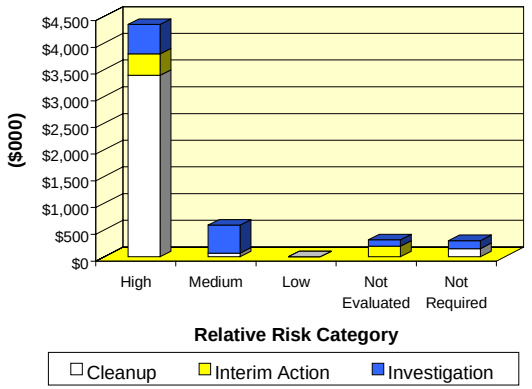
A full Ecological Risk Assessment (ERA) was conducted in response to the results of a screening level ERA. The RI/FS for PSC 51 and Hangar 1000 was started, but the RI/FS for PSC 47 was delayed for performance of an IRA. Six RI/FS activities continued at OU3. The results of the IRA are needed before the RI/FS can be implemented. The completion of the RI/FS for PSC 21 was delayed because of ecological concerns. The ROD for OU2 was signed.

Contracts for a Site Assessment Report (SAR) Addendum and a Remedial Action Plan (RAP) were awarded for UST 4. A SAR and a RAP were approved for UST 15. LTM continued at UST 16, and long-term operations (LTO) continued at USTs 1 and 7.

Plan of Action

- Continue RI/FS and IRA for Hangar 1000 in FY00
- Begin RI/FS for PSCs 46 and 47 and RD for three sites in FY00
- Complete RI/FS for OU3, PSC 16, PSC 21, and PSC 51 in FY00
- Continue to pursue RCRA Closure Permit for Hangar 1000 and T-56 wash area and monitoring at T-56 in FY00
- Implement remedial system at UST 4 in FY00
- Begin SAR/RAP at UST 14 in FY00
- Continue monitoring at the plating shop (Building 101) and seven monitoring wells at SWMU 1 in FY00 and FY01
- Continue O&M at UST 1 and UST 15 in FY00 and FY01
- Continue LTO at Tank Site 119 (UST 7) and UST 16 in FY00 and FY01
- Continue RI/FS for Hangar 1000 in FY01
- Begin operation's and maintenance (O&M) of the UST 4 remedial system in FY01

FY00 Funding by Phase and Relative Risk



FFID: IN521382045400
Size: 55,270 acres
Mission: Performed production acceptance testing of ammunition, weapons, and their components
HRS Score: NA
IAG Status: None
Contaminants: Solvents, petroleum products, VOCs, PCBs, heavy metals, depleted uranium, and UXO
Media Affected: Groundwater and soil
Funding to Date: $23.3 million
Estimated Cost to Completion (Completion Year): $16.9 million (FY2006)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2004

Madison, Indiana

Restoration Background

In December 1988, the BRAC Commission recommended closure of the Jefferson Proving Ground in Madison, Indiana, and relocation of the installation's mission to Yuma Proving Ground in Arizona. The installation was closed on September 30, 1995.

Sites identified during environmental studies included landfill and disposal areas, hazardous waste storage areas, fire training areas, underground storage tanks (USTs), and buildings with asbestos-containing materials. Contaminants at the installation include depleted uranium, heavy metals, unexploded ordnance (UXO), solvents, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), and petroleum hydrocarbons. Interim Actions include installation of a landfill cap, removal of USTs, and excavation of contaminated soil.

In FY94, the installation formed a BRAC cleanup team (BCT) and a Restoration Advisory Board (RAB). The installation submitted the draft Phase I Remedial Investigation (RI) report for sites south of the firing line. In FY95, the installation removed 18 USTs, treated contaminated soil in Bioremediation Cell No. 1, and constructed a landfill cap at Gate No. 19. The installation also surveyed and decontaminated depleted uranium support facilities.

In FY96, the installation submitted Interim Remedial Action (IRA) work plans for 10 sites to the regulatory agencies and began cleanup activities. The installation also initiated UXO removal operations and long-term monitoring of the landfill at Gate No. 19. The Army completed Finding of Suitability to Transfer (FOST) and Finding of Suitability to Lease reports for parts of the installation, in conjunction with the Record of Decision. The installation issued an updated Community Relations Plan. Phase II RI data collection began in FY96 and continued into FY97.

In FY98, the installation completed the Phase II RI report and submitted it for regulatory review. The installation also completed field studies for an Ecological Risk Assessment. Relative Risk Site Evaluations are under way for the remaining 10 sites.

FY99 Restoration Progress

The installation implemented the open burning (OB) unit clean closure plan with the installation of additional groundwater monitoring wells and the acquisition of groundwater samples and soil samples. The planned closure of the OB unit is awaiting regulatory concurrence. A UXO statement of clearance was signed for the airfield area, and the UXO clearance fieldwork for the eastern parcel was completed. Phase II of the Engineering Evaluation and Cost Analysis (EE/CA) for UXO clearance on the western parcel was completed. The Army completed a FOST for approximately 1,200 acres and submitted two additional FOSTs for public review.

Changes in state program managers and lack of response from federal regulators have delayed the signature of decision documents supporting RI and Feasibility Study (FS) requirements.

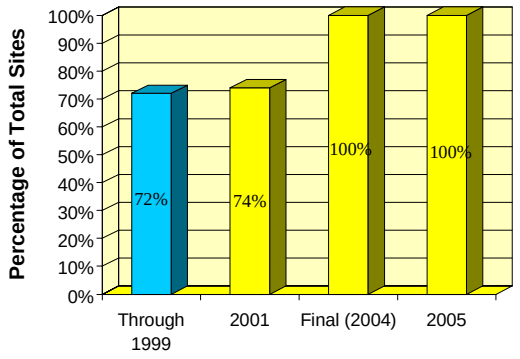
While the BCT awaits regulatory concurrence on Phase II RI data and the open burning unit closure plan, the installation has decided to continue with the fieldwork. The installation is providing new FOSTs as property becomes available and will issue an EE/CA for public comment concerning UXO clearance of the western parcel of the installation.

The installation commander approved the RAB's Technical Assistance for Public Participation (TAPP) application. The TAPP contract will provide RAB community members with technical review and training services concerning the RI. The TAPP contractor provided a report on the Phase II RI to the RAB.

Plan of Action

- Obtain regulatory concurrence on Phase II RI data in FY00
- Sign decision document(s) to eliminate site(s) from the RI in FY00
- Complete FS for solvent sites in FY00
- Obtain regulatory concurrence for closure of open burning unit in FY00
- Continue to prepare technical memorandums through FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: CA99799F546700
Size: 176 acres
Mission: Conduct research and develop aeronautics, rocketry, and space exploration technology
HRS Score: 50.00; placed on NPL in October 1992
IAG Status: IAG between NASA and EPA signed in 1992
Contaminants: VOCs and various inorganic chemicals
Media Affected: Groundwater
Funding to Date: $0.6 million
Estimated Cost to Completion (Completion Year): $0.2 million (FY2001)
Final Remedy in Place or Response Complete Date for All Sites: FY2001

Pasadena, California

Restoration Background

In 1980, samples from drinking water wells of the city of Pasadena were found to be contaminated with volatile organic compounds (VOCs), including trichloroethane (TCA), trichloroethene (TCE), and tetrachloroethene (PCE). NASA and the California Institute of Technology Jet Propulsion Laboratory initiated a study to determine whether the Jet Propulsion Laboratory was a source of the contaminants. A Preliminary Assessment and a Site Inspection were conducted, and an Expanded Site Inspection was completed in FY90.

In October 1993, the Omaha District of the U.S. Army Corps of Engineers (USACE) proposed an Interim Settlement Agreement to NASA and the California Institute of Technology Jet Propulsion Laboratory for DoD participation in funding of environmental restoration activities.

The laboratory site was divided into three operable units (OUs): on-site groundwater contamination (OU1), on-site contamination sources (OU2), and off-site groundwater contamination (OU3). The installation also identified eight waste disposal areas. NASA prepared and submitted a Remedial Investigation and Feasibility Study (RI/FS) work plan to EPA for approval.

In FY94, RI/FS activities began with the installation of groundwater monitoring wells at OU1. RI fieldwork was initiated at OU3. RI/FS activities continued in FY95 with a second sampling round for on-site soil vapor extraction wells. Also in FY95, an Interim Remedial Action was implemented, involving installation of a groundwater treatment system for contaminated municipal wells. Five off-site groundwater monitoring wells were installed, and one round of groundwater samples was collected.

In FY96, NASA conducted a second round of groundwater sampling at five off-site monitoring wells. Three additional monitoring wells were installed to determine the direction of groundwater migration beneath the installation. Four soil-gas probes were installed to determine the extent of vertical migration of contamination.

In FY97, NASA conducted quarterly off-site well sampling and monitoring, and a risk assessment analysis was developed. NASA also completed the on-site RI and began the FS. Pilot treatment plants for VOCs and perchlorates (a previously undetected contaminant of concern) were implemented.

During FY98 the draft RI for OUs 1 and 3 were completed by NASA and the Jet Propulsion Laboratory. An FS perchlorate pilot study using ion-exchange resins and a cathodic system began.

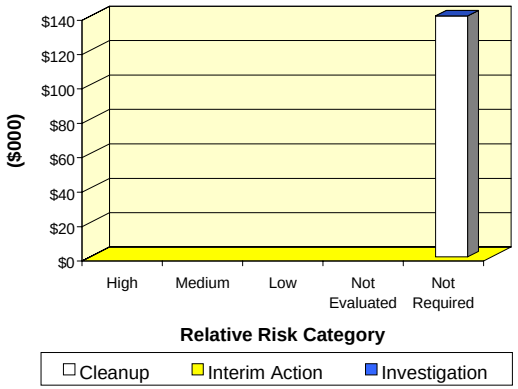
FY99 Restoration Progress

The groundwater hydrology modeling of Raymond Basin was completed. Cost sharing negotiations between USACE, NASA, and the California Institute of Technology began. In addition, NASA and the Jet Propulsion Laboratory completed the final RIs for OU1, OU2 and OU3. The draft FS perchlorate pilot study using ion-exchange resins and a cathodic system was completed.

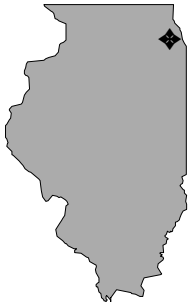
Plan of Action

- Continue cost sharing negotiations in FY00
- Complete the final FS perchlorate pilot study in FY00
- Complete a Record of Decision for OU1, OU2 and OU3 by FY01

FY00 Funding by Phase and Relative Risk



FFID: IL521382046000
Size: 23,544 acres
Mission: Manufacture, load, assemble, and pack munitions and explosives
HRS Score: 35.23 (Loading, Assembling, and Packing Area); placed on NPL in March 1989
32.08 (Manufacturing Area); placed on NPL in July 1987
IAG Status: IAG signed in June 1989
Contaminants: Explosives, heavy metals, VOCs, and PCBs
Media Affected: Groundwater and soil
Funding to Date: $39.0 million
Estimated Cost to Completion (Completion Year): $121.5 million (FY2010)
Final Remedy in Place or Response Complete Date for All Sites: FY2009



Wilmington, Illinois

Restoration Background

The Army constructed Joliet Army Ammunition Plant (JOAAP) in the early 1940s. It was one of the largest munitions and explosives manufacturers in the Midwest. Installation operations included manufacturing of explosives and loading, assembling, and packing (LAP) of munitions for shipment. The 14,385-acre LAP Area and the 9,159-acre Manufacturing Area have been placed on the National Priorities List (NPL).

Environmental studies conducted between FY78 and FY88 identified 53 sites. Prominent site types in the LAP and Manufacturing Areas include ash piles, landfills, open burning and open detonation areas, and surface impoundments. The installation consolidated all sites into two operable units, one that addresses groundwater contamination and another for contamination of soil.

During a FY85 Interim Remedial Action (IRA), the Army removed more than 7 million gallons of explosives-contaminated water from the Red Water Lagoon. After disposing of the water off site, the Army dredged the lagoon, removed the sludge and liner, and covered the entire area with a clay cap. IRA activities in FY93 included capping two ash piles.

Phase II Remedial Investigations (RIs) were completed for the Manufacturing Area (FY94) and for the LAP Area (FY95) and approved by the regulatory agencies. In FY94, the Joliet Arsenal Citizen Planning Commission developed and approved a future land use plan for the installation. In FY95, the installation formed a Restoration Advisory Board (RAB).

In FY96, more than 1,000 exterior-mounted, oil-filled electrical switches that contained polychlorinated biphenyls (PCBs) and 3 oil pits from the explosives burning ground were removed from the installation. The installation also removed petroleum- and PCB-contaminated soil from Site L6.

In FY97, the Army completed Feasibility Studies at all active study sites at the installation. The installation transferred more than 15,000 acres of land to the Forest Service, and 982 acres to the Department of Veterans Affairs. The installation partnered with EPA and U.S. Army Corps of Engineers Waterways Experiment Station (USAWES) on a groundwater natural attentuation and phytoremediation study, including state and federal remedial project managers in the review of internal draft reports. In FY98, the installation released an installationwide Proposed Plan and held a public presentation and comment period. It also began Remedial Design (RD) for soil and groundwater remediation.

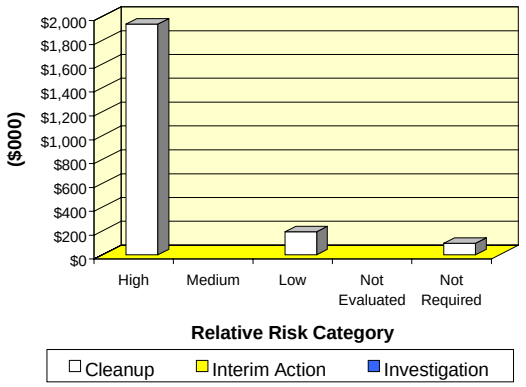
FY99 Restoration Progress

Joliet completed the installationwide Record of Decision (ROD), and approved the associated RD and Remedial Action work plans. The installation completed remediation of all but one PCB-contaminated site, finished excavation of the Trinitrophenylmethylnitramine (TETRYL) Production Area, and initiated a groundwater remedy. Excavation of the TNT Production Area is 50 percent complete. The installation chose bioremediation as the cleanup technology after completing the field demonstrations. The transfer of land to the State of Illinois was delayed because of continuing negotiations, but 2,000 acres was offered for industrial park reuse. Progress continued on the land transfer to Will County.

Plan of Action

- Complete excavation of the TNT Production Area, the Redwater Treatment Area, Group 4, and Test Site in FY00
- Initiate treatment of stockpiled, explosives-contaminated soil in FY00
- Conduct unexploded ordnance sweeps in FY00
- Continue groundwater remedy in FY00
- Convey 455 acres to Will County for reuse as a landfill in FY00
- Finalize interim components of ROD in FY01
- Convey additional land to State of Illinois in FY01

FY00 Funding by Phase and Relative Risk



FFID: MI557002476000
Size: 5,215 acres
Mission: Conducted long-range bombardment and air refueling operations
HRS Score: NA
IAG Status: None
Contaminants: Petroleum, pesticides, heavy metals, and solvents
Media Affected: Groundwater and soil
Funding to Date: $41.3 million
Estimated Cost to Completion (Completion Year): $31.9 million (FY2012)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002

Gwinn, Michigan

Restoration Background

In July 1993, the BRAC Commission recommended closure of K.I. Sawyer Air Force Base, inactivation of the 410th Wing, and transfer of the base's mission. In September 1995, the installation officially closed.

Environmental studies have been in progress at the installation since FY84. Twenty-five sites were identified as requiring additional investigation. Sites include landfills, fire training areas, underground storage tanks (USTs), aboveground storage tank (AST) spill sites, drainage pits, and a drainage pond. Petroleum hydrocarbons, trichloroethene (TCE), tetrachloroethene, vinyl chloride, 4-methyl phenol, and heavy metals are the primary contaminants affecting soil and groundwater.

Interim Remedial Actions include removal of USTs; removal and cleanup of contaminated soil; installation of 14 groundwater extraction wells; construction and operation of a groundwater treatment plant; removal of fuel from groundwater at the former petroleum/oil/lubricant (POL) storage area; and installation of pilot-scale bioventing systems. A downgradient fuel recovery trench is also being used to capture contaminants at the leading edge of the POL Area fuel plume. No Further Action closure documents are complete for five sites. An impermeable membrane cap has been installed at Landfills 3 and 4.

RCRA closure plans have been developed for the Explosive Ordnance Disposal (EOD) Range. The installation received regulatory concurrence on its Environmental Baseline Survey in FY94. A Restoration Advisory Board (RAB) was formed in FY94. In FY95, the Local Redevelopment Authority submitted a reuse plan.

Seven large aboveground fuel storage tanks and the aircraft hydrant refueling system were removed. RCRA corrective measures were completed at two interim status hazardous waste storage facilities. Remedial Action (RA) at the small-arms firing range was completed, and additional testing indicated no migration of lead into groundwater. Closeout was achieved for approximately 200 areas of concern (AOCs).

In FY98, RIs were completed at FT-06, LF-01, LF-04, and ST-04. Investigations were completed, and several AOCs were closed out. An emergency interceptor trench was installed downgradient of ST-04. Five regulated USTs were removed. Four Remedial Action Plans (RAPs) were completed. The abstract for the BRAC Cleanup Plan was updated.

FY99 Restoration Progress

RAs completed at the EOD Range included installation of a permeable membrane liner, clean cover material, topsoil, and vegetation. An upgraded contaminant capture system was installed at the leading edge of the ST-04 contaminant plume.

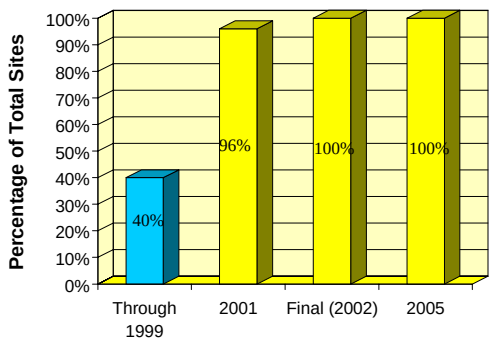
The RAP for FT-06 was delayed pending results from the pilot-scale soil vapor extraction (SVE) system. RAPs were completed for LF-01 and ST-04. RA was completed at LF-01 and began at ST-04. The pump-and-treat system at DP-02 and the bioventing system at ST-04 continued operating as planned.

The RAB met quarterly. Technical Assistance for Public Participation (TAPP) funding was obtained and used for technical review of documents for Sites ST-04, FT-06, and LF-01.

Plan of Action

- Finalize RAP for FT-06 in FY00
- Install full-scale SVE system at FT-06 in FY00
- Continue long-term operations of the DP-02 pump-and-treat system in FY00
- Initiate long-term monitoring of landfill caps in FY00
- Complete demolition and removal of ASTs for the Wells Terminal in FY00
- Complete RAP and RA for Wells Terminal in FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: TX657172433300
Size: 3,997 acres
Mission: Provide depot-level aircraft and engine repair
HRS Score: NA
IAG Status: None
Contaminants: Metals, VOCs, and SVOCs
Media Affected: Groundwater and soil
Funding to Date: $146.8 million
Estimated Cost to Completion (Completion Year): $193.0 million (FY2025)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY2004

San Antonio, Texas

Restoration Background

In July 1995, the BRAC Commission recommended closure and realignment of Kelly Air Force Base (AFB). The Defense Distribution Depot, San Antonio, will be closed, and the airfield and all associated support activities will be realigned to Lackland Air Force Base in Texas.

Investigations have identified 52 sites and several areas of interest on base, including landfills, spill sites, former fire training areas, low-level radioactive waste sites, underground storage tanks, aircraft maintenance areas, sludge lagoons, and sludge-spreading beds. Two former range sites were added to the program in FY98. Sites are separated into five zones: Zone 1, properties west of Leon Creek (to be realigned to Lackland AFB); Zone 2, south and west of the runway; Zone 3, industrial operations area; Zone 4, an area known as east Kelly; and Zone 5, flightline, warehouses, and administrative support operations (portions of which are to be realigned to Lackland AFB). Since 1996, Kelly has used both BRAC and Environmental Restoration Account funds to reach cleanup goals.

A basewide groundwater and surface water monitoring program began in FY94. By the end of FY95, final reports had been prepared for Remedial Investigation and Feasibility Study (RI/FS) phases for 41 sites in Zones 1, 2, and 3.

A BRAC cleanup team formed in FY96, and the first BRAC Cleanup Plan was issued. In FY97, a Zone 4 site was remediated, and the property leased. A source area was discovered in Zone 3 at Site MP. The final Zone 5 RI report and the Zone 3 groundwater decision document were submitted for regulatory review. Monitoring for natural attenuation parameters was completed.

In FY98, a state groundwater permit and compliance plan were issued. An effluent polishing facility was added to the existing groundwater treatment plant. Long-term operations and long-term monitoring optimization studies began for existing remedial systems. Arsenic-contaminated soil was removed from Site S-7 in east Kelly. A Removal Action began at a newly discovered source area, a spill site at the former metal plating shop. More than 1,000 gallons of dense nonaqueous phase liquid was removed. Investigations concluded at the Site MP source area. A Technical Assistance for Public Participation (TAPP) application was developed, and contracts were awarded.

FY99 Restoration Progress

Stormwater reroutes were completed for cross connections within the base. Delineation and characterization were completed for Zone 3. Sampling was conducted in the off-base area. The Remedial Actions (RAs) for Zones 2 and 3 are under way. A slurry wall was installed for the former metal plating shop. A project was initiated to remove radioactive sources at RD-1. Bioaugmentation was implemented at a chlorinated solvent spill site in the industrial area of the base.

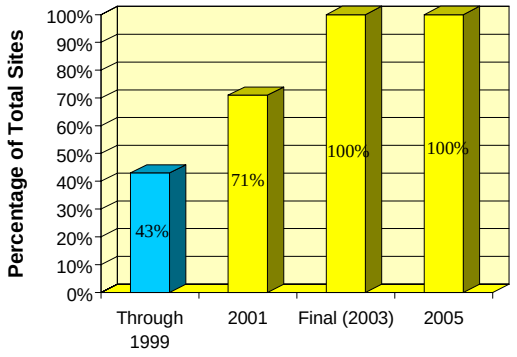
The on- and off-base RI, and construction of the Interim Remedial Action (IRA) for groundwater, began for Zone 4. Completion of these projects was delayed because regulator comments prompted additional sampling. Additional groundwater modeling also is required to support some of the recommended alternatives in the FS for Zone 5. The Quintana Road Culvert project began. Additional IRAs, planned for groundwater in Zone 1, were delayed until a soil Corrective Measures Study (CMS) is completed. A combined soil and groundwater corrective measures implementation work plan (CMIWP) will provide the design for the system.

A TAPP grant allowed the base's Restoration Advisory Board to review the basewide groundwater assessment and the Agency for Toxic Substances and Disease Registry Public Health Assessment.

Plan of Action

- Complete the Zone 1 soil CMS; the Zone 2, 3, and 5 CMSs; and the Zone 2 CMIWP in FY00
- Complete the Zone 4 soil RI and the off-base RI addendum in FY00
- Complete the IRA for Site S-1 in FY00
- Continue the bioaugmentation project in FY00
- Complete construction of a hydraulic barrier to control contaminated groundwater flow in FY00

Sites Achieving RIP or RC Per Fiscal Year



Keyport Naval Undersea Warfare Center NPL

FFID: WA017002341900
Size: 340 acres
Mission: Test, prove, overhaul, and issue torpedoes
HRS Score: 32.61; placed on NPL in October 1989
IAG Status: Federal Facility Agreement signed in 1990
Contaminants: VOCs, heavy metals, petroleum hydrocarbons, herbicides, fuel, PCBs, and pesticides
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $28.3 million
Estimated Cost to Completion (Completion Year): $18.5 million (FY2016)
Final Remedy in Place or Response Complete Date for All Sites: FY1999

Keyport, Washington

Restoration Background

In September 1995, the BRAC Commission recommended realignment of this installation. The center's responsibility for maintaining combat system consoles and its general industrial workload were moved to Puget Sound Naval Shipyard.

Operations at the installation, including plating, torpedo refurbishing, and disposal, contributed to contamination at the property. Since FY84, environmental investigations at the installation have identified sites such as underground storage tanks, sumps, spill sites, a landfill, and an underground trench. Environmental investigations conducted under CERCLA have identified 12 sites.

In FY92, an underground trench and several sumps were excavated, and chromium-contaminated soil was removed and replaced with clean fill at a chromate spill site.

In FY93, the Navy completed Remedial Investigation and Feasibility Study (RI/FS) activities for Operable Unit (OU) 2. Additional RI activities were initiated at Site 1 (OU1) because of public concern. In FY94, a Record of Decision (ROD) was signed for OU2. In FY95, the Navy began additional groundwater sampling at OU1 and conducted a Phase I Removal Action at Site 8 (OU2). The Navy conducted interim corrective measures and performed a corrective action consisting of removal and closure-in-place for hazardous waste storage tanks and sumps for Site 23.

During FY96, the Navy conducted additional groundwater, sediment, and tissue sampling and analysis at OU1 and began long-term monitoring (LTM) at Sites 2 and 8 (OU2). The Navy completed the confirmational groundwater sampling at Site 5 and sediment sampling at Site 9, making them No Further Action sites. Work plans for Phase II soil removal were initiated at Site 8. Corrective measures, including removal of tanks and soil and in situ remediation of contaminated soil, were conducted at Site 23. In FY98, the Navy completed a Focused Feasibility Study (FFS), a Proposed Plan (PP), and a ROD for OU1. The Navy also began the Phase II removal of metals-contaminated soil at Area 8 (OU2).

A Technical Review Committee was formed in FY89 and converted to a Restoration Advisory Board (RAB) in FY95. A Community Relations Plan (CRP) was completed in late FY90. The CRP was updated in FY96.

FY99 Restoration Progress

The Navy completed Remedial Design for phytoremediation, sediment removal, and the tide gate upgrade for OU1. The planting for phytoremediation was initiated during a dedication ceremony on Earth Day, April 22, 1999. The Navy, regulators, the RAB, and community members participated. The Navy completed Remedial Action (RA) for sediment removal and started the tide gate upgrade for OU1. The work plans for LTM at OU1 began. The draft Institutional Control Plan (ICP) for OU1 and OU2 was completed.

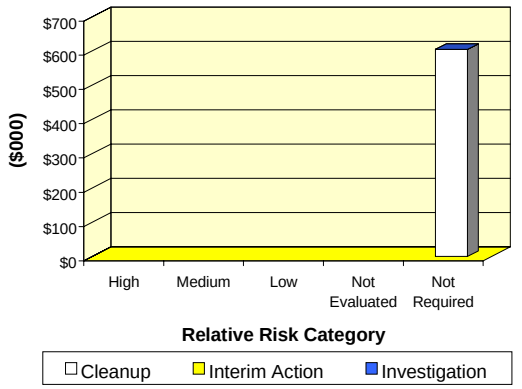
Metals-contamination removal and site restoration began at Site 8 (OU2). An independent cleanup of total petroleum hydrocarbon (TPH)–contaminated soil was completed at Site 8, and LTM of groundwater was completed at Sites 2 and 8 (OU2).

The Navy began implementation of a Time-Critical Removal Action (TCRA) at Building 21 in Site 23 to remove buried drums and associated contaminated soil. The Navy hosted a site visit to a thermal desorption facility for regulators, the RAB, and community members. The TPH-contaminated soil from Site 8 was treated at this facility and then made available for reuse in highway maintenance projects.

Plan of Action

- Finalize ICP and initiate implementation at OU1 and OU2 in FY00
- Finalize work plans and begin LTM at OU1 in FY00
- Conduct 5-year review in FY00
- Complete RA at Site 8 in FY00
- Complete TCRA at Site 23 in FY00
- Continue operations and maintenance at OU1 in FY00 and FY01
- Continue LTM at OU2 in FY00 and FY01

FY00 Funding by Phase and Relative Risk



FFID: MO721382048900
Size: 3,935 acres
Mission: Manufacture, store, and test small-arms munitions
HRS Score: 33.62; placed on NPL in July 1987
IAG Status: IAG signed in September 1989
Contaminants: Explosives, heavy metals, solvents, and petroleum/oil/lubricants
Media Affected: Groundwater and soil
Funding to Date: $56.1 million
Estimated Cost to Completion (Completion Year): $83.4 million (FY2028)
Final Remedy in Place or Response Complete Date for All Sites: FY2011

Independence, Missouri

Restoration Background

Operations at the Lake City Army Ammunition Plant, a government-owned, contractor-operated facility, include the manufacture, storage, and testing of small-arms munitions. Principal site types at the installation include abandoned disposal pits, sumps, firing ranges, old lagoons, old dumps, and closed RCRA lagoons and burning grounds. Environmental studies identified 73 sites, which were consolidated into 35 sites for further investigation.

Sampling at seven representative areas identified groundwater contaminated with volatile organic compounds, explosives, and heavy metals. After the plant was placed on the National Priorities List (NPL), it conducted a Remedial Investigation and Feasibility Study (RI/FS) focusing on four operable units (OUs), the Northeast Corner OU, the Area 18 OU, the Area 8 OU, and an installationwide OU. Area 8 was subsequently incorporated into the installationwide OU.

In FY93, the installation drafted RI/FS reports for the Area 18 OU and the Northeast Corner OU. In FY94, the installation completed the draft RI report for the Area 8 and installationwide OUs and finished Relative Risk Site Evaluations. The installation completed an Engineering Evaluation and Cost Analysis (EE/CA), an Action Memorandum (AM), and design documents in FY95.

In FY96, the installation began revising its Community Relations Plan. It also initiated a Removal Action at the Area 18 OU, with concurrent development of the final Record of Decision (ROD). The Army completed the FS report for the Area 18 OU and submitted the Proposed Plan to the regulatory agencies. Also, in FY96, the installation initiated Removal Actions for sumps, installationwide groundwater containment, and the capping and leachate collection system for the abandoned landfill in Area 16. The installation submitted a draft final FS for the Northeast Corner OU.

In FY97, the installation completed a pump-and-treat system for Area 18. It developed an EE/CA and an AM for the leachate collection trench and a cap for the abandoned landfill in the Area 16/Northeast Corner OU. The Army proceeded with an interim ROD to install a permeable reactive barrier in the Northeast Corner OU. The commander formed a Restoration Advisory Board.

In FY98, the installation completed the final ROD for the Northeast Corner OU Interim Action. It also installed an extraction well at the northern boundary to prevent off-post migration of a contaminated groundwater plume. Installationwide characterization of groundwater was completed. Cleanup of depleted uranium on the firing range began under a Nuclear Regulatory Commission decommissioning plan.

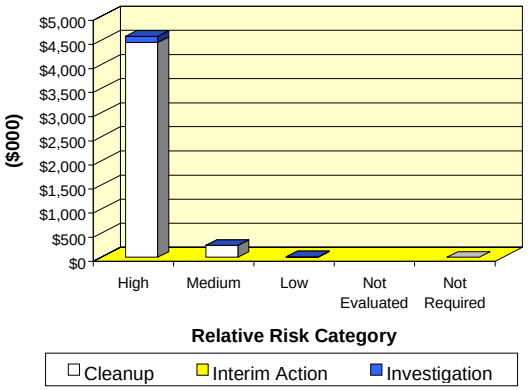
FY99 Restoration Progress

The installation completed the ROD and continued Remedial Design (RD) activities for Area 18. RD activities for the Interim Action in the Northeast Corner OU also continued. The installation initiated an Interim Remedial Action for noncontroversial metals-contaminated soil sites and completed sampling of sump contents.

Plan of Action

- Complete final FS, Proposed Plan, and ROD for the entire Northeast Corner OU in FY00
- Complete the final risk-based screening criteria document and installationwide FS in FY00
- Complete RA construction of the Northeast Corner OU Interim Action in FY00
- Complete RD for Area 18 in FY00 and initiate Remedial Action (RA) construction in FY01
- Complete Northeast Corner OU final action FS in FY00 and ROD in FY01
- Complete installationwide Interim Action Proposed Plan in FY00 and ROD in FY01
- Complete AM for installationwide groundwater Removal Action in FY01
- Complete sump removal in FY01

FY00 Funding by Phase and Relative Risk



Lakehurst Naval Air Engineering Station NPL

FFID: NJ217002727400
Size: 7,382 acres
Mission: Perform technology development and engineering
HRS Score: 50.53; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in October 1989
Contaminants: Fuels; PCBs; solvents, including TCE; and waste oils
Media Affected: Groundwater and soil
Funding to Date: $40.1 million
Estimated Cost to Completion (Completion Year): $51.5 million (FY2025)
Final Remedy in Place or Response Complete Date for All Sites: FY2000

Lakehurst, New Jersey

Restoration Background

Historical operations at this installation involved handling, storage, and on-site disposal of hazardous substances. Forty-five potentially contaminated sites were identified. Investigations began in FY83 and the Remedial Investigation and Feasibility Study (RI/FS) was completed by the end of FY95.

Contaminated soil, drums, tanks, and debris were removed at 23 sites. Innovative technologies have been implemented, including soil washing, asphalt batching, and solar-powered spray irrigation and sparge treatment systems. In FY93, the installation developed groundwater modeling, which supported, and built consensus for, the use of natural restoration as the selected action for a large trichloroethene (TCE) plume.

A 3-year pilot project for natural restoration at Areas I and J began in FY96. Also in FY96, Remedial Designs were completed for upgrades of the installation's four pump-and-treat systems, and Records of Decisions (RODs) were completed for continued treatment of groundwater and soil in Areas C and H. FSs for Areas A/B, E, and K also were completed. A soil vapor extraction (SVE) system began operating at Site 13, and soil bioventing and vapor extraction systems began operating at Sites 16 and 17.

During FY97, RODs for Areas A/B, E, and K were completed. The installation created an aeration system and a surface water reservoir to treat groundwater and irrigate the station's golf course. In FY98, the groundwater recovery systems at Areas A, C, E, and H were modified to optimize system performance and improve the recovery of contaminated groundwater for treatment. An SVE and groundwater sparge system was installed in Area E, a groundwater sparge wall was installed in Area A, and a free-product recovery trench was installed in Area C to accelerate groundwater remediation. The installation implemented solar-powered spray irrigation systems in Areas A and D to treat groundwater.

FY99 Restoration Progress

A 3-year pilot project for natural restoration in Areas I and J was completed. Natural restoration and co-metabolism were selected to treat groundwater in this area. A co-metabolic treatment system was installed to treat the high area of groundwater contamination. The final ROD for Area I and J groundwater was signed by EPA on September 27. The installation has final RODs for all sites and is ready to begin the delisting process.

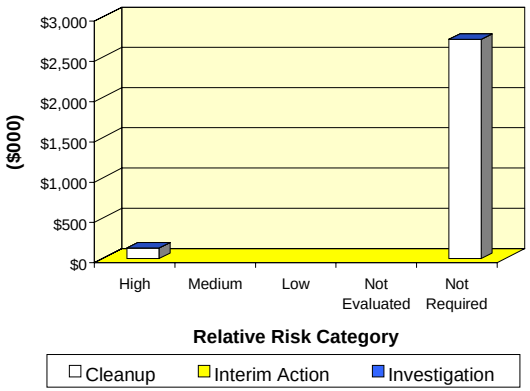
The vapor treatment system blowers at Sites 17 and 29 were upgraded to improve system performance, and contaminated soil at Site 42 was excavated and removed for off-site recycling. Operation and maintenance of four groundwater pump-and-treat systems, six vapor extraction/bioventing/sparging systems, and six spray irrigation systems continued as planned.

The station's Restoration Advisory Board (RAB) met every other month to present the status of the facility's environmental program and address any related questions from the public. The station is located upgradient of Toms River, a community identified with a child cancer cluster. Congress appropriated funding to study the occurrences of cancer in this area. The RAB was an excellent forum for community discussion of this issue. The Lakehurst Environmental Branch assisted the Naval Air Warfare Center, Trenton, with many Installation Restoration projects, including sampling, Remedial Actions, and report preparation.

Plan of Action

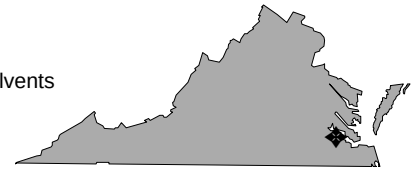
- In FY00, prove that remedy for Area I and J groundwater is operating properly and successfully
- Start National Priorities List (NPL) delisting process in FY00
- Complete monitoring at Site 1 in FY00
- Complete removal of free-product and contaminated soil at Site 42 in FY00
- In FY00, continue operations and maintenance, monitoring, data interpretation, and reporting for four pump-and-treat systems (Sites 16, 28, 29, and 32), five SVE/bioventing/sparge systems (Sites 13, 14, 16, 17, and 28), six spray irrigation systems (Sites 4 and 31), and one co-metabolic treatment system with natural restoration (Site 6)

FY00 Funding by Phase and Relative Risk



Langley Air Force Base — Including NASA Langley Research Center — NPL

FFID: VA357212447700
Size: 3,152 acres
Mission: Air Combat Command Headquarters, 1st Fighter Wing, 74th Tactical Control Facility, 480th Reconnaissance Technical Group, and NASA Langley Research Center
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Petroleum products, chlordane, PCBs, heavy metals, and solvents
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $46.3 million
Estimated Cost to Completion (Completion Year): $29.0 million (FY2006)
Final Remedy in Place or Response Complete Date for All Sites: FY2005



Hampton, Virginia

Restoration Background

Langley Air Force Base has been an airfield and an aeronautical research center since 1917 and is the home base of the 1st Fighter Wing and Headquarters Air Combat Command.

In FY81, a Preliminary Assessment, a Site Inspection (SI), and additional studies identified 45 sites at the installation, including landfills, underground storage tanks (USTs), a bulk fuel distribution system, and storm sewers. Investigations have determined that contaminants are migrating into Tabb Creek, the Back River, and ultimately the Chesapeake Bay.

In FY85, the installation discovered additional fuel contamination and free-product plumes. Subsequently, the installation replaced the fuel distribution system, investigated contaminated sediment in the storm sewers, and conducted Removal Actions to address free product at eight sites. Corrective Action Plans for the eight petroleum-contaminated sites were completed, and USTs at those sites were removed. Removal Actions to remediate soil and groundwater contamination began at three other sites. Additional actions at the sites included removal of abandoned USTs and free product, and installation of a treatment plant to remove emulsified fuel from groundwater.

In FY93, the installation began SIs at 33 sites and Remedial Action (RA) construction at six sites. In FY95, the installation completed construction of a second groundwater extraction and treatment system for petroleum-contaminated groundwater at two sites. A soil vapor extraction system also was implemented to remediate petroleum-contaminated soil near the BX Gas Station. The installation's Restoration Advisory Board participated in the Streamlined Oversight Initiative, which involved formation of the Langley Partnership to improve communication and to set cleanup priorities. In FY96, Remedial Investigations (RIs) began at 13 sites, and the installation completed SI activities at 33 sites and Removal Actions at 2 sites. In FY97, the installation implemented Removal Actions at three sites.

In FY98, the installation completed Interim Remedial Actions for two sites, signed decision documents (DDs) designating No Further Remedial Action Planned (NFRAP) for three sites, and completed Proposed Plans (PPs) for two sites. Three areas of concern were established that later became Environmental Restoration Program sites, for a total of 48 sites. Nine USTs were removed from three sites, a recovery system and monitoring wells were upgraded at three sites, and one petroleum/oil/lubricants (POL) site was closed with a NFRAP designation approved by the state. A former wastewater treatment plant was removed to eliminate a pathway to the Back River.

FY99 Restoration Progress

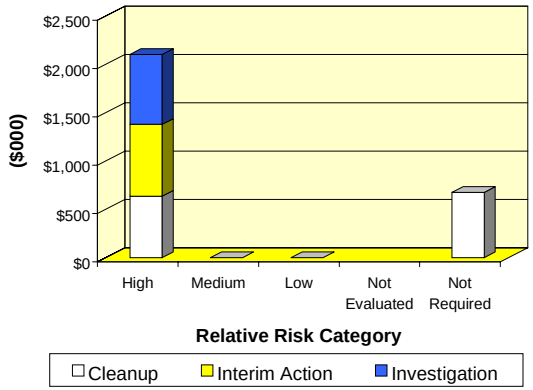
Three Records of Decision (RODs), six DDs, and two No Further Action letters were signed. The installation closed out eight sites. One Removal Action was completed, resulting in the closure of 85 monitoring wells. Free-product removal was conducted at 13 POL sites. The installation completed an interim groundwater approach, including RODs, for two sites. Three additional POL sites were closed. The installation developed an Ecological Summary Report for all sites.

The installation continued to use streamlined oversight tools and the Langley Partnership. The Finding of Fact for the Federal Facility Agreement (FFA) was revised, and a draft Site Management Plan was developed. The FFA is under negotiation.

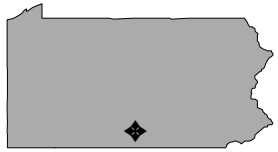
Plan of Action

- Continue to use streamlined oversight tools and the Langley Partnership in FY00
- Sign three RODs in FY00
- Complete RIs for six sites in FY00
- Complete the PP for 10 sites in FY00

FY00 Funding by Phase and Relative Risk



FFID: PA321382050300
Size: 19,243 acres
Mission: Store, maintain, and decommission ammunition; rebuild and store tracked and wheeled vehicles; rebuild, store, and maintain missiles; provide warehousing and bulk storage
HRS Score: 34.21 (Southeastern Area); placed on NPL in July 1987
37.51 (Property Disposal Office); placed on NPL in March 1989
IAG Status: IAG signed in February 1989
Contaminants: VOCs, petroleum/oil/lubricants, PCBs, heavy metals, explosives, and asbestos
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $95.1 million
Estimated Cost to Completion (Completion Year): $47.4 million (FY2042)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2004
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY2003



Franklin County, Pennsylvania

Restoration Background

Letterkenny Army Depot contains various contaminated sites, including disposal lagoons and trenches, oil burn pits, an open burning and open detonation area, an explosives washout plant, two scrap yards, landfills, industrial wastewater treatment plant lagoons, and industrial wastewater sewer lines. The National Priorities List (NPL) sites are in the south part of the installation.

The installation has concentrated its remedial efforts on source removal, including excavation, low-temperature thermal treatment, backfilling, and capping of soil in the industrial wastewater treatment plant lagoons and the three K-Areas; emergency repairs to leaking industrial wastewater sewers; removal of the Property Disposal Office (PDO) fire training pit; and emergency removal of playground soil at the PDO Area and of sediment contaminated with polychlorinated biphenyls (PCBs) in the Rocky Spring springhouse. In FY91, the installation signed a Record of Decision (ROD) for no further action for PDO Operable Unit (OU) 1. Remedial Investigations and Feasibility Studies (RI/FSs) were expanded to 10 OUs in the Southeastern Area and 6 OUs in the PDO Area.

In FY94, the Army completed the RI/FS for contaminated groundwater at PDO OU2 and began RI fieldwork at the Mercury Detections in Rocky Spring Lake and at five OUs in the Southeastern Area. In FY95, the Army upgraded the groundwater extraction and treatment system. The installation completed a Remedial Action (RA) in the K-Area part of the Disposal Area, treating volatile organic compound (VOC)–contaminated soil. A draft final ROD was prepared for PDO OU2.

In FY96, the installation began removing contaminated sediment from the Rowe Run and Southeast drainage sites, delineation and removal at the old PDO Oil Burn Pit, and delineation of contaminated soil at the spill area in Area A of Southeastern Area OU5. It also completed Phase I of an Environmental Baseline Survey (EBS).

In FY97, the installation completed three Removal Actions at the spill site in Area A, the industrial wastewater sewers, and the Open Truck Storage Area. A Removal Action was initiated at the former PDO Oil Burn Pit for in situ treatment of chlorinated solvent–contaminated soil.

In FY98, the installation prepared draft RI reports for Southeastern Area OUs 2, 4, and 5. The Army signed a ROD for the Phase I parcel and prepared a Proposed Plan. A Finding of No Significant Impact Environmental Assessment was signed.

The Army established a BRAC cleanup team, the community formed a Local Redevelopment Authority, and the installation established a Restoration Advisory Board in FY96.

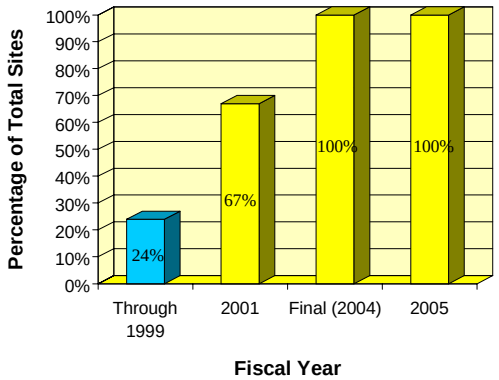
FY99 Restoration Progress

Completion of pilot studies for the Southeastern Area OU3 postponed a planned Focused Feasibility Study (FFS) report. The first phase of the investigation for PDO OU6 and Southeastern Area OU8 was delayed for completion of technical investigation plans. The construction of a treatment plant at Rowe Spring was delayed because additional time was needed to negotiate an access easement. The installation began PCB removal at the Defense Reutilization and Marketing Office (DRMO) scrap yard, but the removal was halted while a tear gas cannister issue was resolved. Long-term monitoring began at PDO OUs 2, 4A, and 4B. The installation also completed a Finding of Suitability to Transfer for Phase I BRAC parcels. The in situ treatment at the former PDO Oil Burn Pit is 90 percent complete.

Plan of Action

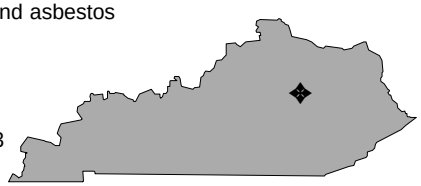
- Complete first phase RI/FS and RA reports for PDO OU6 and Southeastern Area OU8 sites in FY00
- Complete draft FFS report for Southeastern Area OUs 3 and 10 in FY00
- Complete PCB removal at DRMO scrap yard in FY00
- Complete RI and risk assessment for Southeastern Area OUs 2, 4, 5, and 6 in FY00
- Complete RI/FS and RA for soil at the former PDO Oil Burn Pit and PDO OU1 in FY00
- Conduct soil Removal Action at the Open Vehicle Storage Area and the Lead Ingot Storage Area in FY00–FY01

Sites Achieving RIP or RC Per Fiscal Year



Lexington Facility, Lexington-Bluegrass Army Depot

FFID: KY421382050900
Size: 780 acres
Mission: Conducted light industrial operations, including paint stripping, metal plating, etching, and anodizing
HRS Score: NA
IAG Status: None
Contaminants: VOCs, SVOCs, heavy metals, PCBs, pesticides, herbicides, and asbestos
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $26.7 million
Estimated Cost to Completion (Completion Year): $9.3 million (FY2030)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003



Lexington, Kentucky

Restoration Background

In December 1988, the BRAC Commission recommended closure of the Lexington Facility, Lexington-Bluegrass Army Depot (LBAD). The installation closed as scheduled in FY95.

In FY90, studies identified 67 sites requiring further investigation. A RCRA Facility Assessment identified 30 solid waste management units (SWMUs) and two areas of concern (AOCs).

The Army began fieldwork for a RCRA Facility Investigation (RFI) and a Corrective Measures Study (CMS) in FY90. Sampling data from the initial phase of the RFI showed contaminated groundwater, soil, and sediment at 29 sites. The major AOCs were three landfills (new, old, and industrial and sanitary waste disposal), industrial waste lagoons, industrial wastewater treatment plants (IWTPs), the Industrial Sludge and Sewage Waste Disposal Site (Area A), Area B, the north end of Building 135, and groundwater. The Phase I RFI and groundwater investigation demonstrated the need for soil cleanup.

In FY94, the installation formed a BRAC cleanup team and completed an Environmental Baseline Survey and a BRAC Cleanup Plan (BCP).

In FY95, the installation submitted the final Phase I RFI, the CMS, and groundwater investigation documents to regulatory agencies for approval. It also removed the last underground storage tanks, contaminated soil, polychlorinated biphenyl (PCB)–containing transformers, and asbestos.

In FY96, the installation completed Interim Remedial Actions (IRAs) at Area A, Area B, the Coal Pile Run-Off Area, and other locations. In FY97, it completed removal of contaminated soil and sludge from the industrial waste lagoons. Early actions took place at the sump and sand filter at Building 139 and at the oil-water separator at Buildings 8, 10, 19, and 43.

In FY97, the Kentucky Department of Environmental Protection (KDEP) issued a Corrective Action Order to the Army. The Army signed an interim lease with the Commonwealth of Kentucky for the entire depot. EPA and KDEP concurred with the Phase I RFI and CMS documents. A Phase II installationwide groundwater investigation (RFI/CMS) began. Interim measure work plans for a number of SWMUs were forwarded to KDEP and EPA for approval. The Army completed the cap on the three landfills; excavated contaminated soil from the lagoons, Area A, Area B, and IWTP; and conducted Remedial Actions at other AOCs.

In FY98, the Army issued the draft Phase II RFI (soil) and provided a draft RCRA Statement of Basis (SOB) to KDEP and EPA on the three landfill sites and the Group II sites. LBAD established a Restoration Advisory Board.

FY99 Restoration Progress

KDEP and EPA approved the transfer of the structures listed in the Phase IIB Finding of Suitability of Transfer (FOST) and sent the FOST to the Army Materiel Command for signature. The installation completed the Phase II RFI soil investigation. The Phase II installationwide groundwater investigation also was completed, but the draft report was delayed by regulatory issues.

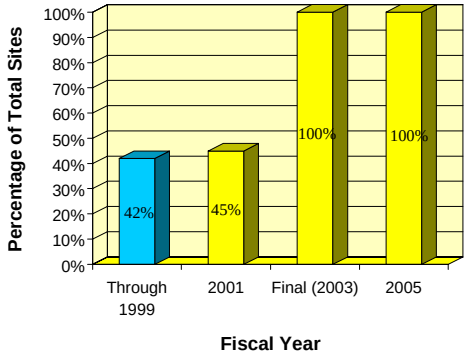
The Army provided an SOB to KDEP and EPA concerning institutional control sites (Buildings 3, 9, 42, and 46), Buildings 19 and 43, the Golf Course Ponds, and the Industrial Sludge and Sewage Waste Disposal Site (Area A). The installation completed IRAs at Buildings 63, 130, 135, and 154; the New Wastewater Treatment Plant; and the Old Wastewater Treatment Plant. The installation completed version 3 of the BCP.

The installation issued a revised SOB for the landfills and 13 No Further Action sites, and is awaiting KDEP and EPA review.

Plan of Action

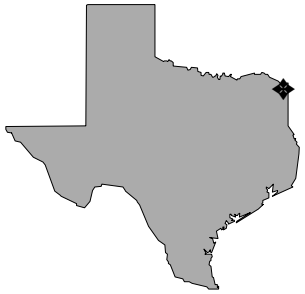
- Transfer the structures listed in the Phase IIB FOST to the Commonwealth of Kentucky in FY00
- Develop a FOST for the public benefit conveyance parcel in FY00
- Develop a FOST for the recreational area of the economic development conveyance parcel in FY00
- Develop and issue SOBs for Building 303, the former lagoon, and several other sites in FY00
- Complete the Phase II RFI/CMS for soil and groundwater in FY00
- Resolve with KDEP the lead cleanup standards for affected sites in FY00
- Draft and complete Phase II CMS in FY00–FY01

Sites Achieving RIP or RC Per Fiscal Year



Lone Star Army Ammunition Plant NPL

FFID: TX621382183100
Size: 15,546 acres
Mission: Load, assemble, and pack ammunition
HRS Score: 31.85; placed on NPL in July 1987
IAG Status: IAG signed in September 1990
Contaminants: VOCs, petroleum, heavy metals, and explosives
Media Affected: Groundwater and soil
Funding to Date: $17.4 million
Estimated Cost to Completion (Completion Year): $17.8 million (FY2003)
Final Remedy in Place or Response Complete Date for All Sites: FY2003



Texarkana, Texas

Restoration Background

Lone Star Army Ammunition Plant loads and packs munitions. From 1943 to 1944, the Old Demolition Area (ODA) was used to destroy faulty or nonstandard explosives. Environmental studies revealed explosives and metal contamination in the ODA. EPA therefore placed that area on the National Priorities List (NPL) in July 1987. The ODA is the only CERCLA site at the installation.

RCRA sites investigated include surface impoundments, landfills, fuel storage areas, and load lines. Investigations revealed soil contamination with solvents, metals, and explosives at some sites. At one site, groundwater is contaminated.

Interim Actions undertaken by the installation include closing two surface impoundments, installing industrial wastewater treatment facilities, and removing the bulk fuel storage area and the service station. In FY92, the installation began a RCRA Facility Investigation (RFI) for RCRA corrective action sites and completed a corrective action at one underground storage tank site.

In FY95, the installation conducted soil boring and installed monitoring wells, accompanied by analytical sampling, for the ODA Phase IV Remedial Investigation (RI). It also obtained regulatory approval for and began sampling of biota at the ODA. The installation conducted groundwater investigations under RCRA at the two closed surface impoundments and performed soil and groundwater investigations at the bulk fuel storage area.

In FY96, the Army collected samples of groundwater and surface soil at the ODA. RI activities in the area were completed. The installation took soil borings and established groundwater wells for the RFI. In FY97, the state approved a background survey report on ambient concentrations of contaminants for the installation.

In FY98, the installation submitted a draft Record of Decision (ROD) to EPA. A Focused Feasibility Study and a Proposed Plan were also submitted for the ODA. The Army decontaminated and removed cisterns and prepared closure reports. Contaminated soil at Paint Filter Site and RDX Pit K 2 was excavated. The installation also completed soil removal and decontamination activities at nine sites and completed two Relative Risk Site Evaluations. The installation solicited interest in forming a Restoration Advisory Board (RAB), but the interest was insufficient.

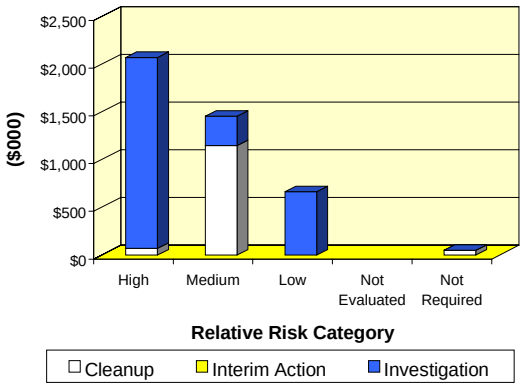
FY99 Restoration Progress

All parties (EPA, the state, and the Army) signed the ROD for the ODA. Removal of ordnance debris and construction of soil cover and erosion control berms can now proceed. Phase I of RFI activities was completed, and RFI activities began at the G and O ponds. (Items in the FY98 Plan of Action indicating that all RFI activities, removal of ordnance debris, and construction of erosion control berms would be completed in FY99 were erroneous. The items should have indicated completion in FY01.) Natural attenuation technologies planned for FY99 will be implemented after the Corrective Measures Study (CMS) for the Western Inactive Sanitary Landfill (WISL) is complete.

Plan of Action

- Begin Phase II RFI activities at nine sites in FY00
- Resolicit interest in establishing a RAB in FY00
- Complete RFI activities at the G and O Ponds in FY01
- Complete CMS for the WISL in FY01
- Implement natural attenuation technologies in FY01

FY00 Funding by Phase and Relative Risk



FFIDs: CA917002727200, CA917002755400, CA917002319000, and CA917002726700
Size: 1,563 acres
Mission: Provide logistics support for assigned ships and service craft; perform authorized work in connection with construction, alteration, dry docking, and outfitting of ships and craft assigned; perform manufacturing, research, development, and test work
HRS Score: NA
IAG Status: None
Contaminants: Chlorinated solvents, solvents, acids, blasting grit, paint, heavy metals, industrial wastewater, and industrial liquid waste
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $49.7 million
Estimated Cost to Completion (Completion Year): $22.3 million (FY2012)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2009

Long Beach, California

Restoration Background

The Long Beach Naval Complex consists of the Long Beach Naval Shipyard (NSY), the Naval Station (NS) Long Beach, and the Long Beach Naval Hospital (NAVHOSP). The BRAC Commission recommended closure of the NAVHOSP, the NS, and associated housing areas in FY91, and closure occurred in FY94. Closure of the NSY and associated housing areas was recommended in July 1993 and occurred in September 1997.

NSY and NS operations that contributed to contamination include ship and vehicle repair and maintenance, utility maintenance and operation, support shops, storage of petroleum products and hazardous materials, laundry and dry cleaning, steam plant operations, and air compressor operations. Portions of housing areas associated with the NSY were used to dispose of ship wastes, drilling mud, and construction debris. The primary sites of concern are disposal pits into which a variety of wastes were deposited.

No action was necessary for industrial use of NS Site 6A. Phases I and II of the Remedial Investigation and Feasibility Study (RI/FS) were combined.

In FY94, the installation formed a BRAC cleanup team (BCT), which completed a BRAC Cleanup Plan (BCP) and the Environmental Baseline Survey (EBS) for NS and NAVHOSP. In FY94, the joint NS and NSY Technical Review Committee was converted to a Restoration Advisory Board (RAB).

In FY96, the installation completed the RI for NS Sites 1 through 6A and the Engineering Evaluation and Cost Analysis (EE/CA) and Action Memorandum (AM) for NS Site 3. Removal of arsenic-contaminated soil from Site 3 also was completed. At the former NS gas station, the installation began operating a soil vapor and liquid extraction and bioremediation system to clean up petroleum contaminants in soil and groundwater.

In FY97, the installation began an Interim Remedial Action (IRA) at Sites 2, 11, and 12 (Palos Verdes housing) and Site 5 (San Pedro housing). The groundwater investigation for Site 6A began, and cleanup of Site 6B NSY was completed. EE/CAs for four sites and an EBS for NSY housing were completed. NSY was closed, and an EBS was written for NS.

In FY98, the installation completed an RI for Sites 8 through 13, an IRA at four sites, a Site Inspection (SI) for Site 14, and the FS for Sites 3 through 6A. The FS for Sites 8, 10, and 11 was drafted. The installation issued a draft Record of Decision (ROD) for Sites 3 through 6A, an EE/CA for Site 14, and a draft FS for Sites 1 and 2. The RI for Site 7 and the Proposed Plan (PP) for Sites 3 through 6A were finalized.

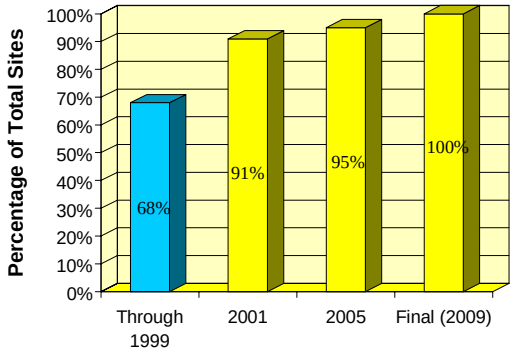
FY99 Restoration Progress

The FS and PP for Sites 1 and 2 were finalized, and the draft ROD was submitted to the regulatory agency for review. The ROD for Sites 3, 4, 5, and 6A was finalized. The draft FS for Site 7 was submitted to the agencies for review. The ROD was not completed, because of regulatory issues on early transfer and regulatory tardiness in review. The FS, PP, and ROD for Sites 8, 10, and 11 were not completed. These sites hold a lower reuse priority than the others, and the regulatory agencies did not have sufficient resources to review documents. Additional fieldwork was also necessary, delaying the previous projects at these sites. The FS and PP planned for the sites are now scheduled for completion in FY00. The AM for Site 14 was not completed as scheduled because of regulatory comments and California Environmental Quality Act issues. The draft FS for Sites 9, 12 and 13 was submitted for review. The PP, ROD, and Remedial Design (RD) for Sites 9, 12, and 13 have been delayed because the BCT is considering the use of the Local Redevelopment Authority.

Plan of Action

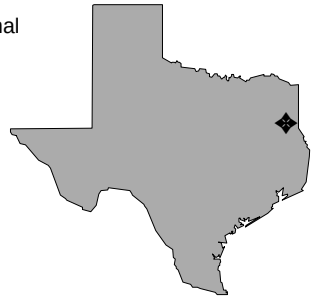
- Finalize Site 1 and 2 ROD and initiate Site 1 and 2 RD and Remedial Action (RA)
- Finalize Site 7 FS and prepare Site 7 draft PP
- Finalize Site 8, 10, and 11 FS and PP in FY00
- Finalize Site 9, 12, and 13 FS and prepare draft and final PP for the sites in FY00
- Finalize the Site 14 AM and Non-Time-Critical Removal Action in FY00
- Initiate IRA for Site 14 in FY00
- Finalize Site 7 PP and ROD in FY00–FY01
- Finalize Site 9, 12, and 13 ROD, RD, and RA in FY01–FY02

Sites Achieving RIP or RC Per Fiscal Year



Longhorn Army Ammunition Plant NPL

FFID: TX621382052900
Size: 8,493 acres
Mission: Loaded, assembled, and packed pyrotechnic and illuminating signal munitions
HRS Score: 39.83; placed on NPL in August 1990
IAG Status: IAG signed in October 1991
Contaminants: Explosives, heavy metals, VOCs, and perchlorate
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $66.5 million
Estimated Cost to Completion (Completion Year): $55.5 million (FY2005)
Final Remedy in Place or Response Complete Date for All Sites: FY2005



Karnack, Texas

Restoration Background

Longhorn Army Ammunition Plant (LHAAP) manufactured pyrotechnic and illuminating signal munitions and solid-propellant rocket motors. Environmental studies identified 50 sites, including storage areas, landfills, open burning grounds, industrial areas, burial pits, sumps, and wastewater treatment plants. Eighteen of these sites are eligible for the Installation Restoration Program (IRP). The installation divided the sites into five groups.

A FY84 Remedial Action (RA) included design and construction of a landfill cap for an unlined evaporation pond formerly known as the Rocket Motor Washout Pond. In FY91, the installation began a Remedial Investigation and Feasibility Study (RI/FS) at 13 sites. Phase I of the RI was completed in FY93. The Army completed Phase II investigations at 11 sites that required additional fieldwork in FY95.

In FY94, the Army completed a pilot-scale study for groundwater extraction and treatment to remove trichloroethene (TCE) and methylene chloride at Burning Ground No. 3, which includes the capped, unlined evaporation pond. During FY95, the installation completed three Records of Decision (RODs), one for Burning Ground No. 3, another for two landfills, and a third for two sites at which no further action was necessary.

In FY96, construction began on the Burning Ground Treatment Facility and the caps for Landfills 12 and 16. The installation completed the Phase II RI. It also began evaluating alternatives for pumping and treating the groundwater at Site 16. An RA began for 84 wastewater sumps.

In FY97, the installation compiled data to complete the Group 1 RI and initiated Phase III of the RI for Groups 2 and 4. It also completed construction of the Burning Ground Treatment Facility and began treatment of groundwater and soil. A Site Inspection report for Group 5 recommended no further action at two of the four sites. In addition, the Army initiated four Interim Actions and/or Removal Actions.

In FY98, the installation completed a no further action ROD for Group 1 sites (1, 11, 27, and 54) and finished treatment of 30,000 cubic yards of source material. The Army completed the Landfill 12 cap. Field studies were initiated for Groups 2 and 4.

The installation's Technical Review Committee meets quarterly. The commander attempted to form a Restoration Advisory Board, but interest was not sufficient to sustain the effort.

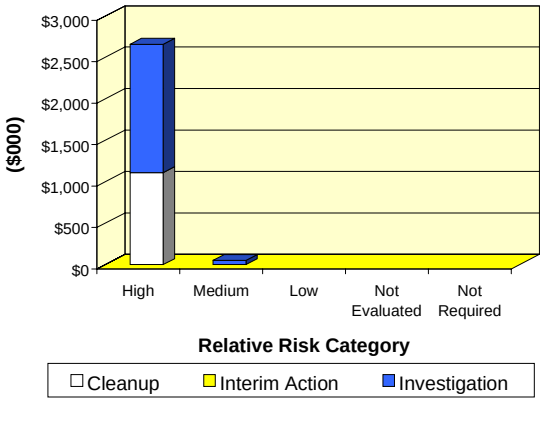
FY99 Restoration Progress

The installation completed the capping of Landfill 16 and the fieldwork for the Group 2 and 4 RI/FSs. The installation continued collection and treatment of groundwater from the Burning Ground. The Army completed the accelerated RI for Site 16, but the FS was delayed because the contractor needed to collect more samples. Perchlorate was detected in groundwater, surface water, soil, and sediment at the installation. The Army awarded a Technical Assistance for Public Participation contract to determine the effects of on-post contamination in surface waters entering Caddo Lake.

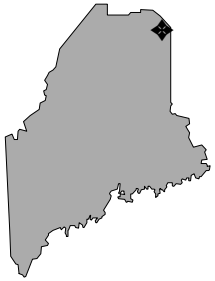
Plan of Action

- Continue collection and treatment of groundwater from the Burning Ground in FY00
- Complete FS for Site 16 in FY00
- Complete Remedial Design for Site 16 in FY02

FY00 Funding by Phase and Relative Risk



FFID: ME157002452200
Size: 9,477 acres
Mission: Support B-52 bombers and KC-135 tankers
HRS Score: 34.49; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in April 1991; revision signed in 1994
Contaminants: VOCs, waste fuels, oils, spent solvents, PCBs, pesticides, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: $117.4 million
Estimated Cost to Completion (Completion Year): $82.3 million (FY2299)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Limestone, Maine

Restoration Background

Loring Air Force Base was established in 1952 to support B-52 bombers and KC-135 tankers. In July 1991, the BRAC Commission recommended closure of the base. The Flightline and Nose Dock Areas, where industrial shops and maintenance hangars were located, are the primary areas at which wastes were released into soil and groundwater.

Environmental studies began at the base in FY84. Sites include spill areas, landfills, fire training areas, underground storage tanks (USTs), aboveground storage tanks, and low-level radioactive waste areas. In FY93, sites were grouped into 13 operable units (OUs). Interim Remedial Actions initiated in FY93 include removal of free product at three sites, source removal at two sites, and Treatability Studies of bioventing at one site and of solvent extraction at another site.

In FY94, Remedial Actions (RAs) were completed for two OUs. An Environmental Baseline Survey (EBS) was completed, and the installation received regulatory concurrence on the designations. A BRAC cleanup team (BCT) and a Restoration Advisory Board (RAB) were formed.

In FY95, Interim Actions were completed at six sites and initiated at another six. In FY96, the installation demonstrated an innovative emission control system using soil vapor extraction at the Base Laundry. Landfill covers were completed at 2 sites, bioventing systems installed at 8 sites, Interim Actions completed at 15 sites, and numerous USTs removed. Polychlorinated biphenyl (PCB) cleanups began at an underground transformer site and for the base drainage system. Four Records of Decision (RODs) were signed for 31 sites. A Corrective Action Plan was submitted to the state regulatory agency to address contamination from numerous fuel tank sites.

In FY97, the installation implemented a decision for remediation of the Surface Drainage OU and initiated the cleanup plan for pipeline from the installation to Searsport. Early Removal Actions took place at OU5 and at two pump houses in OU10.

In FY98, a ROD was completed for eight Installation Restoration Program sites. The BCT determined that the final 10 source control sites would be best handled in a FY99 source control ROD. It also initiated the site closure process and developed a strategy in coordination with the Local Redevelopment Authority for eventual deed transfer of property. The BCT published an updated BRAC Cleanup Plan. The installation completed the RA for basewide surface drainage. A Remedial Investigation and Feasibility Study for the Basewide Groundwater OU was completed. Cleanup of fuel spill sites was completed under Maine regulations. Investigative efforts at the base quarry revealed a buried drum disposal site. The BCT immediately executed a Removal Action, excavating and disposing of over 300 drums, some containing hazardous wastes.

FY99 Restoration Progress

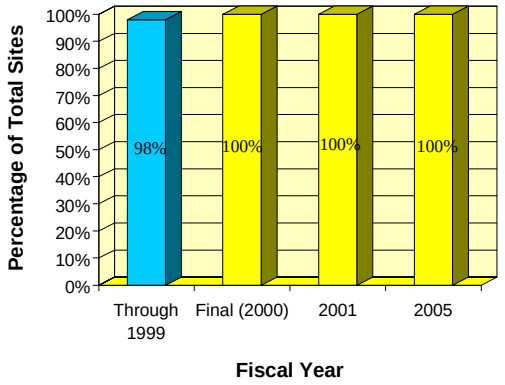
The last two installation RODs for the remaining 10 source control sites and the Basewide Groundwater OU were completed. Construction of the cover at Landfill 3 was nearly completed. A 5-year review was initiated after EPA set an FY00 due date. Characterization of the quarry was completed, and the installation decided not to proceed with a full-scale pilot study. A long-term groundwater monitoring plan was developed and implemented. The wetland mitigation project was constructed. A supplemental EBS and a Finding of Suitability to Transfer (FOST) for 2,000 acres of clean property were drafted. The installation implemented diffusion sampling techniques to identify potential groundwater discharge points in the base drainage. Fuel spill cleanup along the 180-mile pipeline was initiated, but funding prioritization delayed completion.

The RAB met four times and participated in a site tour of construction activities.

Plan of Action

- Complete the 5-year review in FY00
- Complete the FOST for 2,000 acres in FY00
- Complete construction at Landfill 3 for Last Remedial Action in Place in FY00
- Complete the quarry demonstration project in FY00
- Monitor groundwater and operate active soil cleanup systems in FY00

Sites Achieving RIP or RC Per Fiscal Year



Louisiana Army Ammunition Plant NPL

FFID: LA621382053300
Size: 14,974 acres
Mission: Manufacture ammunition metal parts and maintain ammunition production facilities
HRS Score: 30.26; placed on NPL in March 1989
IAG Status: IAG signed in 1989
Contaminants: Oils, grease, degreasers, phosphates, solvents, and metal plating sludges, acids, fly ash, TNT, RDX, and HMX
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $53.1 million
Estimated Cost to Completion (Completion Year): $8.4 million (FY2002)
Final Remedy in Place or Response Complete Date for All Sites: FY2002

Doyline, Louisiana

Restoration Background

Sites identified at the Louisiana Army Ammunition Plant include lagoons, burning grounds, and landfills contaminated with explosives and plating wastes. The Army identified seven sites during a Preliminary Assessment and Site Inspection in FY78 and completed a preliminary Remedial Investigation and Feasibility Study (RI/FS) in FY82. The installation initiated full-scale RI/FS activities at four of the seven sites in FY85. The studies identified no off-site contamination; however, groundwater-monitoring wells at the installation were contaminated with explosive compounds, such as TNT, RDX, and HMX.

The potential for off-site migration of contaminants required groundwater monitoring beyond the northern and southern boundaries of the installation, which still continues.

Between FY89 and FY90, the installation incinerated almost 102,000 tons of explosives-contaminated soil and treated more than 53 million gallons of contaminated water. The lagoons underwent RCRA closure and were revegetated. The installation must monitor the vegetated protective cap and maintain it regularly to ensure its integrity.

The Army identified two additional sites in FY93 and FY94, the Y-Line Etching Facility and the Load-Assemble-Pack Lines. In FY95, the installation began the RI at the Load-Assemble-Pack Lines and completed the RI at the Y-Line Etching Facility. In FY94, the Army completed a 5-year review of the Interim Remedial Action at the Area P lagoons, evaluating the effectiveness of interim measures. The review confirmed that the source of the contamination had been removed. The installation established a partnership with the U.S. Army Corps of Engineers Waterways Experiment Station to study the feasibility of using natural attenuation to treat groundwater contaminated with explosives.

In FY96, the installation received approval from EPA for the Record of Decision (ROD) concerning soil at the first seven sites. A separate operable unit (OU) will address the installationwide groundwater. In addition, the installation completed the first phase of the RI at the Load-Assemble-Pack Lines and began the FS for the Y-Line Etching Facility.

In FY97, the installation completed the RI/FS for the Y-Line Etching Facility. The RI/FS determined that there was no risk from contaminated soil at the site. The groundwater, however, is contaminated with trichloroethene. Remedial options for the contaminated groundwater will be developed under the installationwide groundwater OU.

In FY98, the installation initiated work on the RIs for the Ecological Risk Assessment (ERA) and installationwide groundwater OU. The Proposed Plan for Area Y is complete.

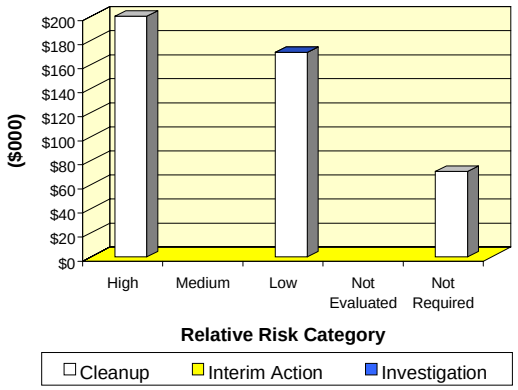
FY99 Restoration Progress

The installation prepared a draft No Further Action ROD for soil at the Y-line Etching Facility. The Army did not complete the RI for the ERA on schedule because of fieldwork delays and a change of scope in the work. The fieldwork for the groundwater OU RI will be finished concurrently with the ERA RI fieldwork. The Army completed a natural attenuation study to aid in completion of the FS for the groundwater OU.

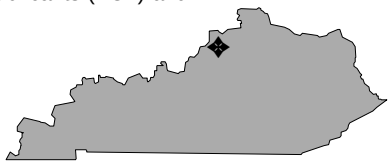
Plan of Action

- Complete the No Action ROD for soil at the Y-Line Etching Facility in FY00
- Complete all fieldwork for the remaining installationwide (groundwater and soil) OUs in FY00
- Complete the ERA and FS for the installationwide groundwater OU in FY00 and the installationwide soil OU in FY01
- Complete the ROD for the installationwide groundwater OU in FY01 and the installationwide soil OU in FY02

FY00 Funding by Phase and Relative Risk



FFID: KY417002417500
Size: 142 acres
Mission: Overhauls, repairs, and manufactures weapon systems and components used on naval vessels
HRS Score: NA
IAG Status: None
Contaminants: Asbestos, chlorinated solvents, chemical agents, heavy metals, industrial liquid waste, industrial sludge, nonchlorinated solvents, paint, pesticides, petroleum/oil/lubricants (POL) and POL sludge, plating waste, PCBs
Media Affected: Groundwater, sediment, and soil
Funding to Date: $7.8 million
Estimated Cost to Completion (Completion Year): $12.1 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Louisville, Kentucky

Restoration Background

In July 1995, the BRAC Commission recommended closure of the Louisville Naval Surface Warfare Center. In August 1996, 85 percent of the property was leased to the Louisville/Jefferson County Redevelopment Authority (LJCRA) as the Navy's first privatize-in-place installation. Raytheon and United Defense Louisville Plant contractors currently work on naval ship weapon systems (5-inch guns and Phalanx) using the same facilities, equipment, and personnel previously employed by the Navy.

Operations contributing to contamination at this installation include machining, welding, draining of lubricating fluids, painting, electroplating, degreasing and cleaning of metals, and paint stripping. Site types include waste storage and disposal areas, manufacturing operations and disposal areas, and other miscellaneous support and maintenance activity areas. Contaminants have migrated into nearby soil, sediment, and groundwater.

The installation's RCRA Part B permit began in FY86. Through pre-BRAC Preliminary Assessment and continuing investigation since FY96, 70 solid waste management units (SWMUs) and 18 areas of concern (AOCs) had been identified. Many of these SWMUs and AOCs have sub-areas, accounting for more than 350 overlapping environmental sites that require investigation within the 144 acres.

A Restoration Advisory Board meets monthly. The restoration program is conducted by a BRAC cleanup team partnering effort with the Navy, EPA Region 4, and the Kentucky Department of Environmental Protection.

FY99 Restoration Progress

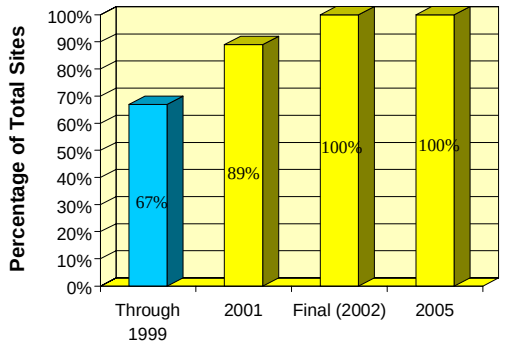
The BRAC program completed asbestos abatement, lead-based paint abatement, operational closure of sumps and pits, sewer system repairs, cleaning of various machines and equipment, removal and repair of oil-water separators, removal and remediation of underground and aboveground tanks, Interim Removal Actions at nine hot spot locations with soil contamination, and field sampling (through Round 2). A RCRA Facility Investigation (RFI) was initiated.

Incomplete actions under BRAC include transfer of property, RFI reports, a Corrective Measures Study (CMS) for SWMUs (which will be initiated after completion of the RFI), and establishment of risk-based cleanup criteria. In response to a request from LJCRA, the Navy began pursuing an early transfer of the property under the CERCLA 120(h) covenant deferral process.

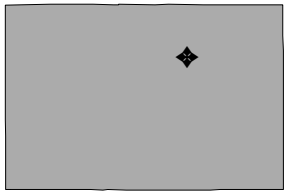
Plan of Action

- Complete final round of sampling in FY00
- Issue draft RFI reports in FY00
- Plan final RFI reports in FY01
- Initiate CMS and corrective measures implementation at several sites in FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: CO857002413000
Size: 1,866 acres
Mission: House the 3400th Technical Training Wing; served as a technical training center
HRS Score: NA
IAG Status: IAG under negotiation
Contaminants: Waste oil, general refuse, fly ash, coal, metals, fuels, VOCs, solvents, and petroleum hydrocarbons
Media Affected: Groundwater and soil
Funding to Date: $45.8 million
Estimated Cost to Completion (Completion Year): $41.3 million (FY2030)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Denver, Colorado

Restoration Background

In 1991, the BRAC Commission recommended closure of all but 108 acres at Lowry. It was recommended that the 1001st Space Systems Squadron, DFAS, and the Air Force Reserve Personnel Center remain at Lowry in cantonment areas. The installation closed in September 1994.

Sites at the installation include fire training areas, landfills, a fly ash disposal area, coal storage yards, and underground storage tanks (USTs). Interim Remedial Actions (IRAs) have included removal of 20 USTs, removal of free product from the water table, closure of off-base wells, operation of an in situ bioventing system, and construction of an aboveground bioremediation land-treatment area. In FY94, the installation began a RCRA Facility Investigation and a basewide groundwater investigation to determine the extent of trichloroethene (TCE) contamination. IRAs have been installed to treat TCE contamination at the source area and at the base boundary to capture the TCE plume before it leaves the base.

In FY95, the installation conducted Phase II site assessments for eight UST sites. The installation also began IRAs involving placing extraction wells at the boundaries of the installation to intercept the TCE groundwater plume and installing bioventing systems at two petroleum-contaminated sites. A Focused Feasibility Study was conducted to characterize a landfill before closure. An Environmental Baseline Survey (EBS) was completed. In addition, the installation's Technical Review Committee was converted to a Restoration Advisory Board (RAB), and a BRAC cleanup team (BCT) was formed.

In FY96, the facility assessment, fieldwork for 18 areas of concern, and Phase I of the basewide groundwater investigation were completed. Actions included initiation of Remedial Investigations (RIs) for five study areas and long-term monitoring and operations and maintenance of bioventing systems at two UST sites. The installation also completed removal of all USTs.

In FY97, a Local Redevelopment Authority (LRA) road project was used to cap part of a former coal storage yard. Second-level site assessments were accomplished. The EBS for the BRAC 95 parcel was completed, and an Environmental Impact Statement was initiated. A hydraulic containment system for the TCE plume began operation, and construction began on an interim response for OU5. Final actions at the fly ash disposal area (OU3) were completed.

In FY98, second-level site assessments began at removed-UST locations. The dual-phase vapor extraction system at the TCE source area began operation. The cleanup of contaminated soil and storage tanks at the Auto Hobby Shop (OU4) was completed. Feasibility Studies (FSs) at three sites and the Landfill Zone were completed. RD for the remainder of the coal storage yard was initiated. Final definition of the groundwater contamination at OU5 was accomplished.

FY99 Restoration Progress

The draft RI for basewide groundwater investigations was completed. Removal actions began for USTs, aboveground storage tanks (ASTs), and oil-water separators. The IRAs planned at OU5 underwent peer review. In addition, long-term operations and maintenance (LTOM) began at the Auto Hobby Shop and for basewide groundwater at the source area reduction and boundary area hydraulic containment system.

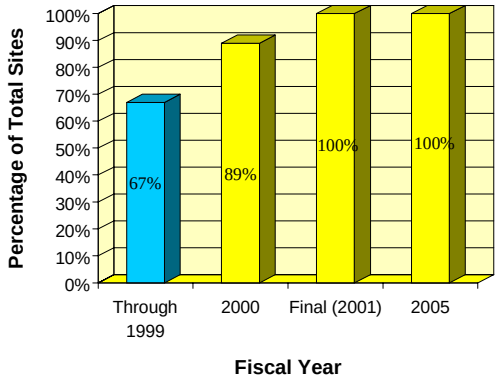
The installation is evaluating the possibility of transferring landfill closure and LTOM to the LRA. It decided not to split OU5 sites into separate FS documents, as originally planned, because doing so would create delays and additional costs. Peer review and project initiation delayed the contract award and the RA for the Firing and Skeet Ranges. RAs at the Coal Storage Zones also have been delayed, pending ROD completion.

The BCT's partnership with the LRA resulted both in the redevelopment authority's receiving clean property immediately and in cost avoidance. A Technical Assistance for Public Participation contract was awarded to the RAB for review of the OU5 documentation.

Plan of Action

- Complete the final RI, the draft final FS, and pilot studies for basewide groundwater in FY00
- Complete LTOM for the Auto Hobby Shop in FY00
- Award contract and initiate RA for the Firing and Skeet Ranges and complete RA at the Coal Storage Zone West in FY00
- Complete UST, AST, and oil-water separator site Removal Actions in FY00
- Complete delineation of soil hot spots at the Fire Training Zone in FY00
- Complete the FS and ROD, and initiate RA, for Coal Storage Zone East in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: CA957212452700
Size: 6,545 acres
Mission: Maintain, repair, and refuel aircraft
HRS Score: 31.94; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in September 1990
Contaminants: VOCs, petroleum/oil/lubricants, and PCBs
Media Affected: Groundwater and soil
Funding to Date: $133.6 million
Estimated Cost to Completion (Completion Year): $27.1 million (FY2021)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY2001

Riverside, California

Restoration Background

In July 1993, the BRAC Commission recommended that March Air Force Base undergo realignment. It was recommended that the installation serve as an Air Reserve Base once realignment was completed. Base realignment occurred in April 1996.

Environmental studies at the installation began in FY84. A Preliminary Assessment and Site Inspection identified 28 sites, including three fire training areas, seven inactive landfills, several underground storage tanks, an engine test cell (Site 18), sludge drying beds at a sewage treatment plant, and various spill sites. March is a joint-use base that uses both BRAC and Environmental Restoration Account funds to reach cleanup goals.

An Engineering Evaluation and Cost Analysis, a Removal Action, and a groundwater extraction and treatment system were completed to prevent off-base migration of contaminated groundwater. The installation also began a Removal Action for the Panero hydrant refueling system and treatment of contaminated soil. In FY91, sites were grouped into three operable units (OUs).

In FY94, generic remedies, including modified RCRA caps and stream modifications, were initiated at some landfill sites. Modified vapor extraction and recovery systems were used to clean up contaminants in soil and groundwater. The Technical Review Committee was converted to a Restoration Advisory Board. The installation also completed an Environmental Baseline Survey.

In FY95, Removal Actions were conducted at five sites, and two landfills were closed. A soil vapor extraction pilot system was installed at Site 31 (Solvent Spill), and an air-sparging system was installed at Site 18. These systems were upgraded in FY98. A Record of Decision (ROD) for OU1 was signed in FY96. Remedial Actions (RAs) involving construction of a dual-phase treatment system for groundwater trichloroethene-contaminated soil began for Site 31 and the related groundwater plume at OU1. Six landfill sites on the western part of the base were cleaned up. Interim Removal Actions were completed at Site 25 and continued at two sites within the flight line.

In FY97, interim Remedial Design began for a combined treatment facility for Sites 2, 8, and 27. The Interim Removal Action at Site 30 was completed.

In FY98, the OU2 Proposed Plan was approved and the draft final ROD was sent for review. The Groundwater Technical Working Group established requirements for obtaining Operating Properly and Successfully (OP&S) approval from EPA for the OU1 groundwater treatment facility. Source investigation was completed at Sites 2, 8, and 27.

FY99 Restoration Progress

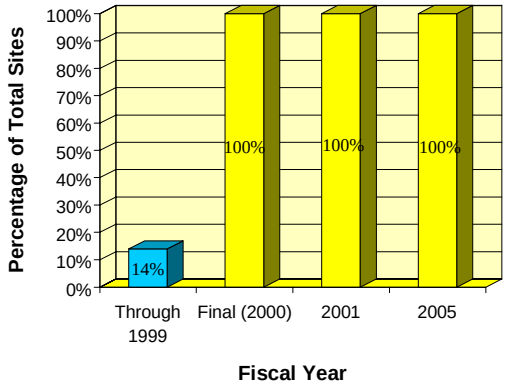
Field activities continued in support of the basewide Remedial Investigation and Feasibility Study, and groundwater monitoring continued in support of the OU1 ROD. A Memorandum of Agreement (MOA) was signed between Air Force Reserve Command (AFRC) and the Air Force Base Conversion Agency for transferring the majority of environmental responsibility.

The OU2 ROD was not approved by regulators because of a change by AFRC in the proposed RA. Requirements for the EPA OP&S approval were not completed because of incomplete plume capture data. The ROD for OU3 was delayed because of continuing differences between AFRC and regulators regarding the effectiveness of the source removal.

Plan of Action

- Continue field activities in support of the basewide RI/FS in FY00
- Obtain approval for the OU2 ROD in FY00
- Complete requirements for EPA OP&S approval in FY00
- Prepare a new MOA with AFRC outlining the separation of environmental cleanup responsibilities in FY00
- Continue to submit all cleanup-associated work plans to the BRAC cleanup team for approval in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: CA917002477500
Size: 5,252 acres
Mission: Maintained and repaired ships and provided logistical support for assigned ship and service craft
HRS Score: NA
IAG Status: Federal Facility Agreement signed in September 1992
Contaminants: Heavy metals, VOCs, PCBs, pesticides, petroleum hydrocarbons, lead oxides, and unexploded ordnance
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $58.8 million
Estimated Cost to Completion (Completion Year): $73.2 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2005

Vallejo, California

Restoration Background

In July 1993, the BRAC Commission recommended closure of Mare Island Naval Shipyard and relocation of the Combat Systems Technical School's Command Activity to Dam Neck, Virginia. The installation closed on April 1, 1996.

Studies since FY80 have identified 28 sites and 20 solid waste management units (SWMUs) at this installation. Sites 1 through 24 were divided into three operable units (OUs).

The installation completed a Preliminary Assessment (PA) for 15 sites in FY83. In FY88, it completed a Site Inspection (SI) for one site and initiated Remedial Investigations and Feasibility Studies (RI/FSs) for 23 sites. In FY90, the installation completed an initial site characterization (ISC) for one underground storage tank (UST) site. In FY91, SIs were completed for 12 sites and PA/SIs were completed for 6 sites. In FY93, the installation completed Interim Remedial Actions for six UST sites and one other site. In FY94, ISCs were completed for seven UST sites and Removal Actions were completed for two sites. The installation also completed a Land Reuse Plan.

In FY95, the installation initiated Removal Actions for five sites and completed a Removal Action for one site. It also began to develop Corrective Action Plans for eight UST sites and completed an Environmental Baseline Survey.

During FY96, the installation's BRAC cleanup team (BCT), which formed in FY94, completed a Removal Action for one site and began Removal Actions for two sites and a no further action (NFA) Record of Decision (ROD) for one site. The team also completed Removal Actions for three sites and the Defense Reutilization and Marketing Office scrap yard. The BCT negotiated a Memorandum of Understanding with the City of Vallejo, the U.S. Fish and Wildlife Service, and the Navy.

In FY97, a Removal Action was initiated for one site. USTs were removed from sites, which then required NFA. In FY98, the installation completed Removal Actions at Sites 5 and 8. The installation also removed 43,000 lineal feet of fuel line. All radiological work was completed and approved by the regulatory agencies.

An administrative record and an information repository were established in FY90. The installation formed a Technical Review Committee in FY90 and converted it to a Restoration Advisory Board (RAB) in FY94. The installation completed its Community Relations Plan in FY92 and updated it in FY94.

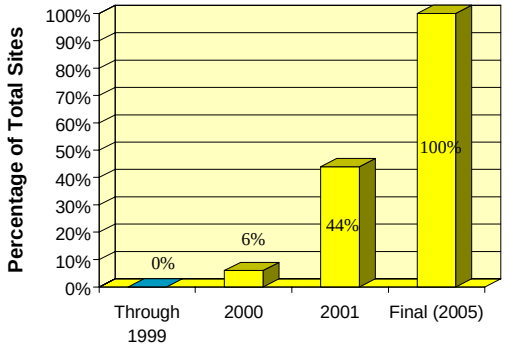
FY99 Restoration Progress

Removal Actions at Sites 13, 16 B-4, and 17 and SWMUs 52 and 54 were completed. Removal of all onshore unexploded ordnance was completed, and all USTs were removed or closed in place. The installation completed polychlorinated biphenyl (PCB) remediation program and field sampling for 20 SWMUs. Transfer of Investigative Area E was delayed by removal of soil contaminated with lead and arsenic. The Roosevelt Terrace transfer is undergoing review by the City of Vallejo. A Technical Assistance for Public Participation grant was completed to train RAB members on the ARCView geographic information system for Installation Restoration data analysis.

Plan of Action

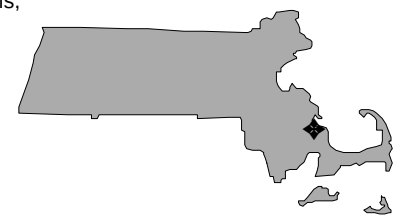
- Issue several RI/FS reports by investigative area in FY00
- Perform transition of cleanup team to Southwest Division from Engineering Field Activity-West in FY00
- Perform early transfer of dredge ponds to private developer in FY00
- Reclassify and transfer uncontaminated parcels in Investigative Area A1 in FY00
- In FY01, issue RODs for RI/FS issued in FY00 and commence Remedial Action design work

Sites Achieving RIP or RC Per Fiscal Year



Massachusetts Military Reservation — Otis Air National Guard Base and Camp Edwards — NPL

FFID: MA157282448700
Size: 22,000 acres
Mission: Provide Army and Air National Guard training and support the East Coast Air Defense and Coast Guard Air and Sea Rescue Units
HRS Score: 45.93; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in April 1992 and amended in June 1995
Contaminants: Waste solvents, emulsifiers, penetrants, photographic chemicals, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $303.3 million
Estimated Cost to Completion (Completion Year): $380.1 million (FY2030)
Final Remedy in Place or Response Complete Date for All Sites: FY2002



Falmouth, Massachusetts

Restoration Background

Studies have identified 82 sites at this installation, including chemical and fuel spill sites, storm drains, landfills, former fire fighter training areas, coal yards, and underground drainage structures. Private and municipal wells near the installation were closed and replaced after off-base migration of groundwater contamination was detected.

Removal Actions for six sumps associated with the underground drainage structures were conducted in FY91. In FY93, a groundwater extraction and treatment system was installed to contain a contaminant plume migrating from a former motor pool and storage yard. Remedial Investigation and Feasibility Study work also began. In FY94, in an Interim Remedial Action (IRA), the largest of four landfills was capped. The Installation Restoration Program began use of thermal desorption to treat more than 22,000 cubic yards of contaminated soil from several sites.

In 1995, an air-sparging system was implemented to remove subsurface soil contamination at Fuel Spill Site 12 (FS-12). In 1996, environmental regulatory agencies accepted the cleanup plan for the reservation. More than 180 underground drainage structures were removed. A private-well sampling program was expanded to monitor on- and off-base drinking water safety. Carbon treatment was initiated at a Town of Falmouth municipal well threatened by a base plume.

In 1997, the Federal Facility Agreement was amended. Final remediation and closure of Firefighter Training Area No. 1 occurred. Fieldwork techniques, such as on-site laboratories and sampling techniques, sonic geophysical analysis, and microwells for ecological studies, were implemented. A Time-Critical Removal Action was initiated in a Town of Falmouth river system to address the FS-28 plume that upwelled into the river.

In FY98, recirculation wells were selected for the Storm Drain 5 (SD-5) south plume. Geologic borings and monitoring well installations were used to further define the SD-5, Chemical Spill 10 (CS-10), and Ashumet Valley plumes. Monitoring wells were installed to define the CS-19 source area. Over 40 monitoring wells were installed for the FS-1 plume investigation. The FS-12 source area remediation project was completed. Ecological studies were conducted on the FS-12, SD-5, and CS-10 plumes. A reactive wall of iron filings was installed for the CS-10 plume. Four new plumes were defined (CS-20, CS-21, FS-13, and FS-29).

FY99 Restoration Progress

Extraction, treatment, and reinjection (ETR) systems were constructed for the CS-10 and Ashumet Valley groundwater plumes. The feasibility of using ETR systems for the western portion of the CS-10 plume, the FS-1 plume, and the Southwest Operable Unit (OU) area is being discussed with regulators. More than 7 million gallons of contaminated groundwater was cleaned daily by the end of FY99.

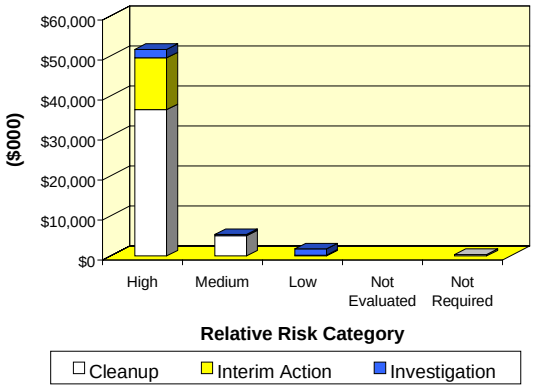
A Proposed Plan was issued for the Southwest OU. The installation continued to monitor natural attenuation at Landfill 1 and constructed five extraction wells. The installation also continued private well testing for area residents and is evaluating the need for further water supply conversions. Evaluation of the reactive wall project continued.

Two pilot projects were constructed in two river systems where cranberry bogs were affected by plumes. Recirculation wells were installed at two locations in the Town of Mashpee.

Plan of Action

- Issue RODS for FS-1, CS-4, CS-20, CS-21, FS-13, FS-28, and FS-29, and design and construct remedial systems as necessary, in FY00
- Continue to issue decision documents in FY00
- Finalize cold-mix asphalt batching design for several source areas and initiate remediation in FY00
- Finalize agreements for town and municipal water connections in Bourne and Falmouth in FY00
- Continue private-well sampling for residences near base plumes in FY00
- Continue operation and maintenance of all remedial systems and monitor effectiveness in FY00

FY00 Funding by Phase and Relative Risk



FFID: CA957002474300
Size: 5,716 acres
Mission: Provided Navigation and Electronic Warfare officer training; housed SAC Bombing and Refueling Squadron
HRS Score: 28.90; placed on NPL in July 1987
IAG Status: IAG signed in 1989
Contaminants: Solvents, jet fuel, petroleum hydrocarbons, and lead
Media Affected: Groundwater and soil
Funding to Date: $153.2 million
Estimated Cost to Completion (Completion Year): $112.3 million (FY2069)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001

Sacramento, California

Restoration Background

In December 1988, the BRAC Commission recommended closure of Mather Air Force Base. Before becoming inactive in FY93, the installation housed the 323d Flying Training Wing, a SAC wing, a reserve air refueling group, and an Army National Guard aviation unit.

Studies have identified 89 sites at the installation, which were grouped into six operable units (OUs): OU1, Aircraft Control and Warning System; OU2, Groundwater; OU3, Soil; OU4, Landfill; OU5, Basewide; and OU6, Supplemental Basewide. Site types include landfills, underground storage tanks (USTs), fire training areas, a trichloroethene disposal site, a weapons storage area, wash-rack areas, spill areas, and waste pits.

Interim Actions included removing USTs and contaminated soil, supplying an alternate water supply for nearby residents, removing sludge from a former wastewater treatment plant, removing petroleum product from soil by vapor extraction, and excavating pesticide contamination from drainage ditches.

In FY90, 48 solid waste management units and two areas of concern were identified. By FY94, Remedial Investigation and Feasibility Study (RI/FS) activities concluded at OU1 and OU4. In FY94, regulatory agencies approved the Record of Decision (ROD) for OU1, and a Restoration Advisory Board (RAB) and a BRAC cleanup team (BCT) were formed.

In FY95, regulatory agencies approved the ROD for OU4. Construction was completed and Remedial Action (RA) began at OU1. Removal Actions were initiated to remediate petroleum contamination at several sites. An Environmental Impact Statement for property reuse and disposal was prepared. In FY96, regulatory agencies approved the ROD for OU2 and OU3. Three landfills were consolidated, and engineered caps were initiated at two of the landfills. The installation completed the RI for OU5.

By FY97, the installation had removed all identified substandard USTs. Two oil-water separator sites were closed. Construction began on the pump-and-treat system for OU2. Soil vapor extraction (SVE) and bioventing in situ soil treatment systems were installed at 11 sites. The Proposed Plan (PP) for OU5 was released.

In FY98, the ROD for OU5 was signed. RA was selected for 7 of the OU's 15 sites. A groundwater pump-and-treat facility for the Main Base/SAC Area plumes began operating. Construction of the groundwater pump-and-treat system for the Site 7 plume began. A passive landfill gas control system was installed at Site 4. In situ soil treatment using SVE and bioventing was installed at five sites, and installation began at five additional sites. A Removal Action memorandum for drainage ditch Site 85 was signed, and excavation of contaminated sediment began. Contaminated sediment also was removed from drainage ditch Sites 13 and 15. Four USTs were discovered and removed. The Mather off-base water supply contingency plan was completed.

FY99 Restoration Progress

A Finding of Suitability for Early Transfer was prepared and approved for part of the Economic Development Conveyance (EDC) Parcel. Operation of the pump-and-treat system for the Site 7 groundwater plume was interrupted because of aggregate mining. A foundation and a cap were constructed for the waste pit at Site 7.

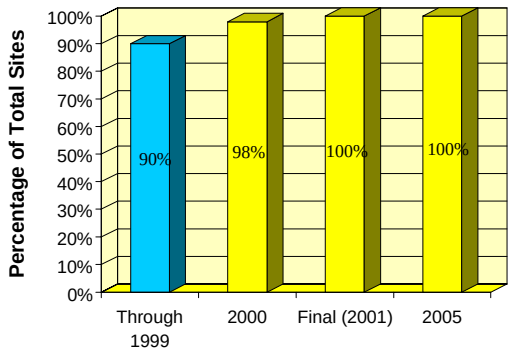
The installation completed RAM for Sites 80 and 88. Phase II of the Main Base/SAC plumes treatment system was expanded into off-base areas, and Phase III expansion began. Remediation of gun range Sites 86 and 87 was completed. The installation constructed and began operating in situ treatment systems at Sites 7, 11, 37, 39, 54, and 59.

At OU6, a Removal Action and data collection for the SVE were completed, and a pilot study for stabilization of lead-bearing soil (Site 89) began. A CERCLA 5-year review was completed for Mather.

Plan of Action

- Update the base cleanup plan in FY00
- Complete an FS, PP, and ROD for OU6 in FY00
- Complete construction and begin operation of the SVE system at Sites 18, 23, and 58 in FY00
- Prepare RA reports in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: WA057182420000
Size: 4,638 acres
Mission: Provide airlift services for troops, cargo, equipment, passengers, and mail
HRS Score: 31.94 (Area D/American Lake Garden Tract); placed on NPL in September 1984
42.24 (Washrack/Treatment Area); placed on NPL in July 1987; deleted from NPL in September 1996
IAG Status: Federal Facility Agreement signed in August 1989; Consent Decree with State of Washington signed in February 1992
Contaminants: VOCs, SVOCs, metals, petroleum/oil/lubricants, pesticides, and radioactive waste
Media Affected: Groundwater and soil
Funding to Date: $19.1 million
Estimated Cost to Completion (Completion Year): $7.9 million (FY2016)
Final Remedy in Place or Response Complete Date for All Sites: FY2007

Tacoma, Washington

Restoration Background

Environmental studies identified 65 sites at this installation. Sites include fire training areas, spill areas, landfills, and waste pits. Two sites were placed on the National Priorities List (NPL): the Area D/American Lake Garden Tract (ALGT) and the Washrack/Treatment Area (WTA). All 65 sites were classified as Remedy in Place by FY96.

Work began at the ALGT site in FY82, after trichloroethene (TCE) was detected in off-site residential wells. An on-site former landfill that was active in the 1960s and 1970s was identified as the source of the TCE. The installation initiated the Remedial Investigation and Feasibility Study (RI/FS) for the ALGT site in FY87 and completed it in FY91. By FY94, the installation had designed, constructed, and begun operating a groundwater treatment system.

The RI/FS for the WTA site, a former outdoor aircraft wash area, was performed from FY90 to FY92. The Record of Decision (ROD) specified that fuel floating on the shallow water table should be removed and fuel-contaminated soil evaluated for cleanup. The ROD required only groundwater monitoring of the leach pits. In FY93, the installation began a pilot test for passive fuel removal and evaluation of natural attenuation, with positive conclusions.

In FY95, McChord evaluated bioremediation at two sites (SS-34 and WP-44). The State of Washington agreed that bioremediation with long-term monitoring (LTM) was appropriate for the two sites. McChord implemented LTM of the natural attenuation at the WTA site and requested that EPA remove the site from the NPL. In FY96, EPA removed the WTA site from the NPL, and the state listed six sites (including SS-34 and WP-44) on its Hazardous Sites List. In FY98, an evaluation of natural attenuation of chlorinated solvents at ALGT was completed.

The installation surveyed and evaluated the local community's interest in forming a Restoration Advisory Board (RAB) in FY95, FY96, and FY98. There was very little interest in forming a RAB due to the maturity of the program and trust in the installation.

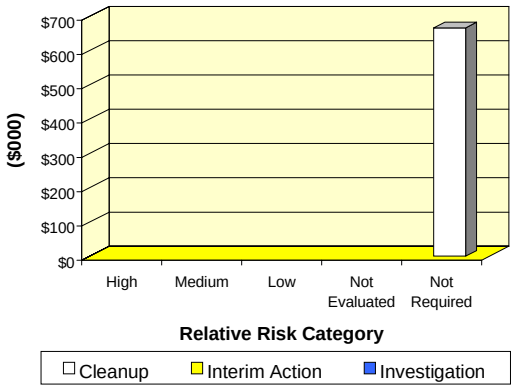
FY99 Restoration Progress

The installation continued operating the ALGT groundwater treatment system and continued the LTM program, reducing the monitoring and sampling costs. The installation, EPA, and the State of Washington performed a 5-year review of the ALGT NPL site and the WTA former NPL site. The installation has started reducing the number of extraction wells at ALGT. The installation also surveyed and evaluated the community's interest in forming a RAB. The anticipated written concurrence on closeout of 27 sites has not yet been received from the regulators.

Plan of Action

- Reduce operations at the groundwater treatment system at ALGT in FY00 by turning off at least one of the three extraction wells
- Continue the installation's LTM program in FY00 while reducing costs
- Continue to encourage Washington regulatory agencies to provide written concurrence on the closeout of 27 sites in FY00

FY00 Funding by Phase and Relative Risk



FFID: CA957172433700
Size: 3,688 acres
Mission: Provide logistics support for aircraft, missile, space, and electronics programs
HRS Score: 57.93; placed on NPL in July 1987
IAG Status: IAG signed in 1989
Contaminants: Solvents, metal plating wastes, caustic cleaners and degreasers, paints, waste lubricants, photochemicals, phenols, chloroform, spent acids and bases, and PCBs
Media Affected: Groundwater and soil
Funding to Date: $403.5 million
Estimated Cost to Completion (Completion Year): $748.2 million (FY2032)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2015

Sacramento, California

Restoration Background

Environmental contamination at McClellan Air Force Base has resulted from sumps near industrial operations, landfills, leaks near industrial waste lines, surface spills, and underground storage tanks (USTs). A study in FY79 detected groundwater contamination, leading to the closure of two on-base and three off-base drinking water wells. In addition to 373 acres of contaminated soil in the vadose zone, three large plumes of contaminated groundwater have been identified over 660 acres.

Sites at the installation were grouped into 11 operable units (OUs), including an installationwide Groundwater OU. Preliminary Assessments and Site Inspections for all OUs, and the Remedial Investigation (RI) for five OUs, have been completed. A streamlining effort resulted in the development of a basewide Engineering Evaluation and Cost Analysis (EE/CA) for implementing soil vapor extraction (SVE) at the base.

In FY93, the installation converted its Technical Review Committee to a Restoration Advisory Board (RAB). More than 800,000 pounds of contaminants has been removed from the soil and groundwater. An interim Record of Decision (ROD) was signed to address polychlorinated biphenyl (PCB) contamination at OU B1.

In FY95, the Groundwater OU interim ROD was signed. The installation has implemented 213 Interim Remedial Actions, including a landfill cap, construction of a groundwater treatment plant, and demolition of an electroplating facility. The UST program has removed or abandoned in place 210 USTs.

In FY97, a dual-phase extraction system was installed to treat volatile organic compound (VOC)–contaminated soil and groundwater. Thirty-six on- and off-base groundwater wells were decommissioned, eliminating possible conduits for additional soil and groundwater contamination. Thirteen USTs were removed, and 33,000 feet of linear piping associated with the industrial waste line was inspected and 4,000 feet repaired.

In FY98, the Phase II groundwater action design was completed and construction started. Three EE/CAs for SVE systems were completed, and fieldwork for an additional 10 EE/CAs began. RIs were completed for five OUs, and a Phase I RI was completed for all 11 OUs.

FY99 Restoration Progress

Installation of the Phase II groundwater system was completed. Three SVE systems were installed, SVE well installations at another 12 sites were completed but require additional work for implementation. Twelve SVE EE/CAs were completed. EPA-stipulated penalties were paid as planned. Six innovative technology demonstrations were completed.

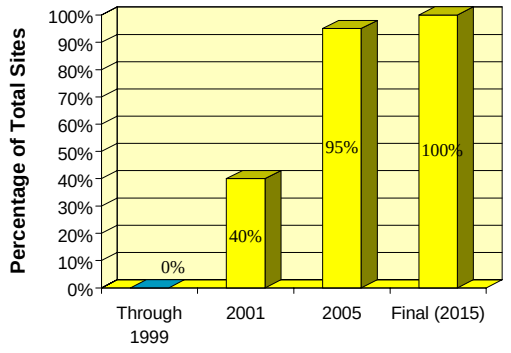
Phase I and Phase II of the RI effort are complete, but data gaps were identified that require additional fieldwork. Planned completion of the ROD for remediating VOCs, which allows final actions for soil before the completion of the installationwide ROD, did not conform to the installation schedule and therefore was not accomplished.

The RAB participated in training activities and document reviews. The installation continues to work with federal, state, and local agencies.

Plan of Action

- Install five SVE systems and connect seven SVE sites to existing systems in FY00
- Complete the VOC ROD in FY00
- The BRAC cleanup team will continue to prepare Environmental Baseline Surveys and Finding of Suitability to Lease documents in FY00
- Complete the final basewide RI in FY01
- Design and install Phase III of the groundwater actions by the end of FY02

Sites Achieving RIP or RC Per Fiscal Year



McGuire Air Force Base NPL

FFID: NJ257182401800
Size: 3,500 acres
Mission: Provide quick-response airlift capabilities for placing military forces into combat situations
HRS Score: 47.20; placed on NPL in October 1999
IAG Status: Federal Facility Agreement under negotiation
Contaminants: VOCs, SVOCs, PAHs, BTEX, TPH, metals, PCBs, and pesticides
Media Affected: Groundwater, soil, and sediment
Funding to Date: $26.9 million
Estimated Cost to Completion (Completion Year): $14.0 million (FY2011)
Final Remedy in Place or Response Complete Date for All Sites: FY2006

Burlington County, New Jersey

Restoration Background

In FY83, Preliminary Assessments identified 16 sites at McGuire Air Force Base (AFB). Examples of these sites include landfills, waste piles, fire training areas, hazardous waste storage areas, and spill sites. Another six sites were identified at the BOMARC facility, a remote location under McGuire AFB jurisdiction. A Stage I site assessment was performed on each site in FY85. The Stage II assessment was completed in FY89 and a new site was identified at McGuire AFB. In total, 17 sites were identified at McGuire AFB and 6 sites at the BOMARC facility.

In the early 1990s, a Remedial Investigation and a Feasibility Study (RI/FS) identified future work requirements for some sites and recommended No Further Response Action Planned (NFRAP) for others. The NFRAP sites were three landfills, a waste pile, and a spill site at McGuire AFB and two discharge pits at the BOMARC facility.

In 1993, Interim Remedial Actions (IRAs) were completed for four sites. At McGuire AFB, soil containing pesticides was removed from a ditch. Additionally, an underground storage tank (UST) and surrounding soil containing spilled chemicals were removed. At the BOMARC facility, a transformer pad along with soil containing polychlorinated biphenyls (PCBs) and a UST were removed. NFRAP designations were assigned to all four IRA sites after the completion of the actions. Another site at McGuire AFB, the Civil Engineering Compound, was assigned NFRAP status after completion of a site investigation.

In the mid-1990s, a basewide study at McGuire AFB identified seven areas of concern. Long-term monitoring (LTM) started at the three landfills that had received NFRAP designations in the early 1990s. Focused Feasibility Studies and Treatability Studies (TSs) delineated PCB contamination at the Defense Reutilization and Marketing Office (DRMO) yard, evaluated the feasibility of using a horizontal well for recovering free product (JP-4) at the Bulk Fuel Storage Area, and determined the need for a basewide background study and an ecological assessment.

In 1998, a TS using pneumatic fracturing technology to increase the permeability of the soil column and to increase the recovery rate of free product (JP-4) was completed at the Bulk Fuel Storage Area.

FY99 Restoration Progress

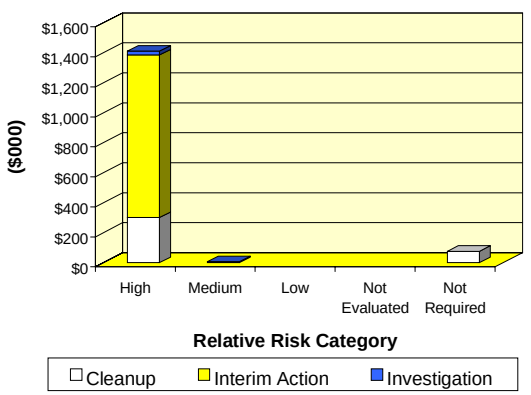
An IRA was completed at the DRMO yard, and surface soil containing PCBs was removed. The basewide background study and the ecological assessment began. A cleanup project for the BOMARC Missile Accident Site is under way as is an RI/FS for the trichloroethene (TCE) groundwater plume. A study to determine the potential for colloidal transport of radionuclides to the groundwater at the BOMARC Missile Accident Site was initiated.

The installation Restoration Advisory Board meets quarterly to provide input on base remedial activities.

Plan of Action

- Implement Phase I of an IRA to remove free product from the Bulk Fuel Storage Area in FY00
- Implement an IRA at a fire training area in FY00
- Complete the basewide background study and ecological assessment in FY00
- Determine the potential for natural attenuation of the TCE groundwater plume in FY00
- Complete study of the potential for colloidal transport in FY00
- Continue LTM of groundwater in FY00
- Promote partnering with EPA Region 2 and state regulators to facilitate National Priorities List cleanup in FY00

FY00 Funding by Phase and Relative Risk

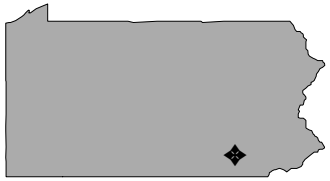


Mechanicsburg Naval Inventory Control Point

Formerly Mechanicsburg Ships' Parts Control Center

NPL

FFID: PA317002210400
Size: 824 acres
Mission: Provide inventory management and supply support for weapons systems
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: PCBs, heavy metals, pesticides, VOCs, SVOCs, and dioxin
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $24.3 million
Estimated Cost to Completion (Completion Year): $19.3 million (FY2009)
Final Remedy in Place or Response Complete Date for All Sites: FY2009



Mechanicsburg, Pennsylvania

Restoration Background

Historical defense industrial and inventory disposal operations have caused contamination at this installation. Environmental investigations conducted since FY84 have identified 15 CERCLA sites.

In FY89, the installation completed a Remedial Investigation and Feasibility Study (RI/FS) for Site 9, the Storm Water Drainage Ditch. Subsequently, Removal Actions were conducted to remove polychlorinated biphenyl (PCB)–contaminated soil from a portion of the ditch and to install fencing and a gabion dam. In FY92, the installation completed an RI/FS for Site 3. In FY93, it completed an RI at Site 1. The Remedial Design (RD) for Site 9 was also completed in FY93, and additional contaminated soil and sediment were removed in the Remedial Action (RA). The installation also completed RD/RA at Site 10 to remove leaking underground storage tanks and contaminated soil.

In FY93, the installation began removing contaminated soil from Site 3 and treating it through bioremediation. In FY95, a Time-Critical Removal Action was conducted at the Tredegar Industries, Inc., property next to the installation. Approximately 600 tons of PCB-contaminated soil was removed.

In FY96, the installation initiated a basewide Ecological Risk Assessment (ERA). The installation prepared a design for groundwater modeling of a landfill at Site 3 and began the Focused FS (FFS). Additional sampling of the biocell soil was also performed. In FY97, a Human Health Risk Assessment at Site 1 was completed, an Interim Remedial Action was initiated at Site 11, and an on-board review of work plans for Site Inspections (SIs) at Sites 12 through 15 was implemented.

In FY98, a Site Management Plan was completed, and the sediment and groundwater monitoring plans were finalized. An RA began at Site 3, and the installation completed soil modeling, a final FS, and an Action Memorandum for soil removal. The FS, the Proposed Remedial Action Plan, and the Record of Decision (ROD) for Site 1 were completed, as was the sediment control project at Site 11.

A Technical Review Committee (TRC) was formed in FY88. To establish greater community involvement, the installation changed the TRC to a Restoration Advisory Board in FY95.

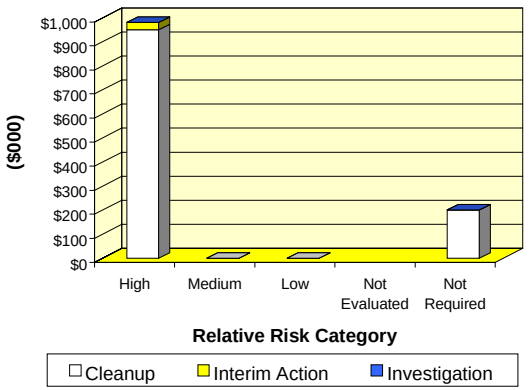
FY99 Restoration Progress

The work plan and fieldwork for the Site 9 ERA were completed. The administrative record was placed on CD-ROM, and the Community Relations Plan, the SI for Sites 12 to 15, the Basewide Quality Assurance Protection Plan, and the basewide background report for soil were finalized. The Site 3 soil removal and closeout report and the Site 15 Action Memorandum were completed. Modification of standard Federal Facility Agreement (FFA) language delayed the completion of this document. RI/FSs were not started for Sites 12 through 15 because soil must be removed from Sites 14 and 15 and a no further action (NFA) document will be signed for 12 and 13.

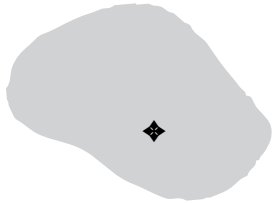
Plan of Action

- Complete FFS and ROD for soil at Site 3 in FY00
- Complete the FFA in FY00
- Complete ERA for Site 9 in FY00
- Complete soil removal at Site 14 in FY00
- Complete Action Memorandum and soil removal at Site 15 in FY00
- Complete SI for four areas of concern in FY00
- Complete NFA report for Site 7 in FY00
- Complete ROD for Site 14 in FY01
- Complete NFA documents for Sites 12 and 13 in FY01

FY00 Funding by Phase and Relative Risk



FFID: MQ917002758400
Size: 1,535 acres
Mission: Provided aviation support services
HRS Score: NA
IAG Status: None
Contaminants: Heavy metals, pesticides, PCBs, and petroleum/oil/lubricants
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $15.2 million
Estimated Cost to Completion (Completion Year): $5.3 million (FY2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Midway Island

Restoration Background

In 1940, a Naval Station was established at Midway Island. In 1978, the station was redesignated as the Naval Air Facility. The Navy operated and maintained the facility and provided services and materials to support aviation activities. Since FY88, studies at the facility have identified 42 sites, including landfills, disposal and storage areas, a former power plant, a rifle range, and pesticide spill areas.

In FY93, the BRAC Commission recommended closure of the facility as an active Naval Air Facility, and the installation was transferred to the U.S. Fish and Wildlife Service (USFWS) for use as a national wildlife refuge while the BRAC cleanup work was completed. In FY93, the installation formed a BRAC cleanup team (BCT). The installation does not have a Restoration Advisory Board because there are no regulatory agencies with authority over the area and no affected community. An information repository was established at the University of Hawaii at Manoa in FY95.

An Environmental Baseline Survey was completed in FY94, and a Human Health Risk Assessment was completed for all 42 sites in FY95. The Executive Order transferring legal enforcement authority to the USFWS was signed on October 31, 1996. On May 22, 1996, custody of, and accountability for, Midway Island was transferred from the Navy to the USFWS. The BCT also finalized the last BRAC Cleanup Plan.

In FY97, the baseline Ecological Risk Assessment for one site was completed and Remedial Investigations and Feasibility Studies were performed for five sites. Removal Actions were completed, involving removal of contaminated soil from eight sites, capping of landfills at two sites, removal of drums from four sites, removal of marine debris from four sites, and capping of abandoned outfalls at one site. Full remediation was completed for soil and groundwater at 15 underground storage tank (UST) sites. By the end of FY97, all environmental work at Midway was complete, with the exception of long-term monitoring (LTM) at Sites 1 and 2. Final base closure was completed on June 30, 1997.

In FY98, the final round of LTM was conducted at the Bulky Waste Landfill (Site 1) and the Runway Landfill (Site 2). Preliminary data indicate that no further action is required. An aviation gasoline line was found, properly cleaned, and abandoned in place, and drums of asphalt were removed and properly disposed of off the island.

FY99 Restoration Progress

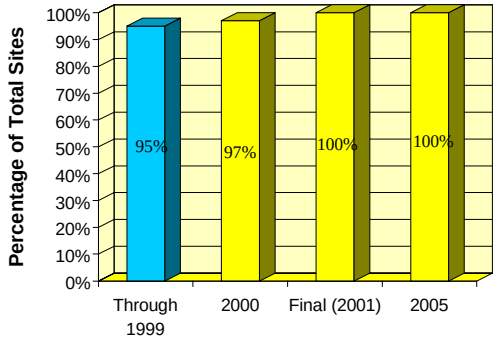
LTM indicated polychlorinated biphenyl (PCB) concentrations of 42 parts per million (ppm) in fish tissue and 27 ppm in the sediment at a local marine area adjacent to the Bulky Waste Landfill. Further PCB testing of a beached tug and barge next to the Bulky Waste Landfill began but was not completed. Beach erosion exposed two USTs on Eastern Island that were missed in previous cleanup efforts. Removal of the USTs is scheduled for December 1999. National Marine Fisheries Service data indicated that Midway seals had blood PCB concentrations above those collected from seals at French Frigate Shoals but still less than 1 mg/kg wet weight.

LTM is expected to indicate whether PCB cleanup goals have been met.

Plan of Action

- Remove beached tug and barge in FY01 if PCB contamination is found

Sites Achieving RIP or RC Per Fiscal Year



Milan Army Ammunition Plant NPL

FFID: TN421382058200
Size: 22,419 acres
Mission: Load, assemble, pack, ship, and demilitarize explosive ordnance
HRS Score: 58.15; placed on NPL in July 1987
IAG Status: IAG signed in 1989
Contaminants: Munitions-related wastes
Media Affected: Groundwater and soil
Funding to Date: $88.5 million
Estimated Cost to Completion (Completion Year): $143.0 million (FY2029)
Final Remedy in Place or Response Complete Date for All Sites: FY2009

Milan, Tennessee

Restoration Background

Preliminary Assessment and Site Inspection activities conducted at Milan Army Ammunition Plant in FY87 identified 25 sites requiring further investigation. The installation grouped the sites into five operable units (OUs).

A Remedial Investigation and Feasibility Study (RI/FS) began in FY88. EPA and state regulatory agencies approved the RI report in FY92. The report recommended no further action at three sites, Remedial Design and Remedial Action (RA) for the O-Line Ponds and associated groundwater, and collection of additional RI data for the remaining sites.

In FY91, the Army discovered the explosive compound RDX in the City of Milan's municipal water supply wells. In FY93, representatives of the Army, the City of Milan, EPA, and the State of Tennessee completed a contingency plan to ensure that safe drinking water would be available to residents. The city completed a new drinking water well field in 1998 using funds provided by the Army.

In FY92, a Record of Decision (ROD) was signed for the construction of the OU1 groundwater treatment plant. This treatment system was built to pump and treat explosives-contaminated groundwater emanating directly from the former O-Line Ponds. Final construction was completed in 1996.

In FY93, a ROD was signed to extend a cap over the former O-Line Ponds to prevent further leaching of explosive contaminants in groundwater. Construction was completed in 1996.

In FY94, a ROD was signed for the construction of a groundwater treatment facility for the Northern Boundary Area (OU3) of the installation. The levels of RDX and TNT were increasing and the contamination was migrating off post. The construction of the treatment facility and subsequent treatment of the groundwater required the installation to obtain an off-post real estate interest. A perpetual lease was signed in September 1996 to obtain this interest.

In FY95, a ROD was signed for construction of a bioremediation facility to remedy the contaminated soil in the Northern Industrial Areas. An industrial landfill was also constructed for disposal of bioremediated soil.

The installation formed a Restoration Advisory Board in FY94.

FY99 Restoration Progress

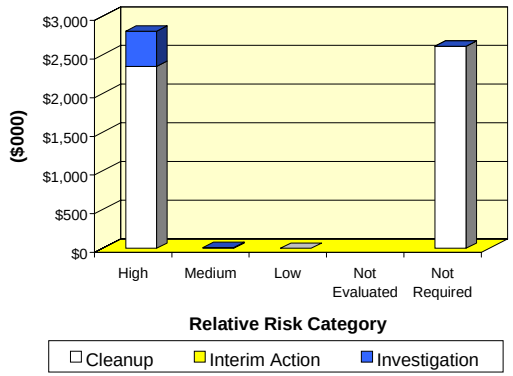
The Army continued to operate the granular activated carbon OU1 groundwater treatment facility. The installation began a 5-year review of the OU1 RA. The construction of the OU3 groundwater treatment facility was completed. The facility is under a capture zone analysis review, which will determine whether additional extraction wells are required. The plant is in full operation, with no detectable explosives contamination discharging into a local tributary.

The Army completed construction of the OU3 and OU4 bioremediation system and optimized the treatment additives to provide the necessary reduction in the explosive compounds contained within the soil matrix. The system is currently in full-scale operation. The Army submitted an Explanation of Significant Differences to the regulators to allow land application of the treated soil. The Army submitted to the regulators a final ROD for OU4, the Western Boundary Area, and Region 1 groundwater treatment. The final RI/FS was submitted for OU4 Regions 2 and 3.

Plan of Action

- Complete RI work on installation groundwater study in FY00
- Submit FS for OU5 Southern Study Area in FY00
- In FY01, test Fenton's reagent to determine its applicability in treating the groundwater aquifer by using hydrogen peroxide

FY00 Funding by Phase and Relative Risk



Moffett Field Naval Air Station

Including Crows Landing Naval Auxiliary Landing Field

NPL/BRAC 1991

FFIDs: CA917002323800 and CA917002757500
Size: 3,097 acres
Mission: Provided support for antisubmarine warfare training and patrol squadrons and served as Headquarters for Commander Patrol Wings of the Pacific Fleet
HRS Score: 32.90; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in September 1990
Contaminants: PCBs, petroleum products, DDT, chlorinated cleaning solvents, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: $76.1 million
Estimated Cost to Completion (Completion Year): $76.9 million (FY2032)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003

Sunnyvale, California

Restoration Background

In July 1991, the BRAC Commission recommended the closure of Moffett Field Naval Air Station. The installation was closed on July 1, 1994, and its activities were transferred to the National Aeronautics and Space Administration (NASA).

Environmental studies since FY84 identified 34 sites at the installation. Site types include landfills, underground storage tanks (USTs), a burn pit, ditches, holding ponds, french drains, maintenance areas, and fuel spill sites. Contaminants include polychlorinated biphenyls (PCBs), petroleum products, DDT, chlorinated solvents, and heavy metals. The installation was divided into seven operable units (OUs). In FY90, initial site characterizations were completed for 3 UST sites, and 14 USTs were removed.

From FY90 to FY94, the installation removed four leaking USTs from one site, removed USTs from a second site, conducted groundwater remediation at three sites, and completed Remedial Investigations (RIs) for OUs 1, 2, and 5 and one other site. The installation also excavated and treated contaminated soil at one site and removed contaminated soil from another.

During FY95, the installation completed a Site Inspection (SI) for one site, RIs for OU6 and three other sites, Feasibility Studies (FSs) for OUs 1 and 5, a Record of Decision (ROD) for no further action (NFA) for seven sites, and a Remedial Action (RA) for one site. The installation designed, constructed, and tested a bioventing treatment system for one site, a soil vapor extraction system for another site, and a recirculating in situ treatment system for a third site.

The installation completed a Phase I Ecological Risk Assessment (ERA) in FY95. In FY96, it initiated FSs for two sites and OU6, signed a ROD and initiated Remedial Design (RD) for one site, initiated RD for one site, and began a ROD for NFA and removed all inactive USTs from one site. RD and groundwater treatment were completed for one site. The installation also completed an Environmental Business Plan.

During FY97, the ROD for OU1 was signed, and the RD and RA for Site 2 were completed. The FS for OU6 was completed along with a Phase II ERA. In FY98, the installation completed construction of one RA at OU5. The facility completed the intensive monitoring portion of the permeable iron cell pilot test and began bench-scale studies of an innovative technology to create in situ reactive zones using the same treatment principles. Transfer of the Naval Air Manor property to a local city was completed.

The installation completed a Community Relations Plan and established an information repository in FY89. In FY94, the installation formed a BRAC cleanup team (BCT) and completed a BRAC Cleanup Plan (BCP). It converted its Technical Review Committee to a Restoration Advisory Board (RAB) in FY95 and updated the BCP in FY97.

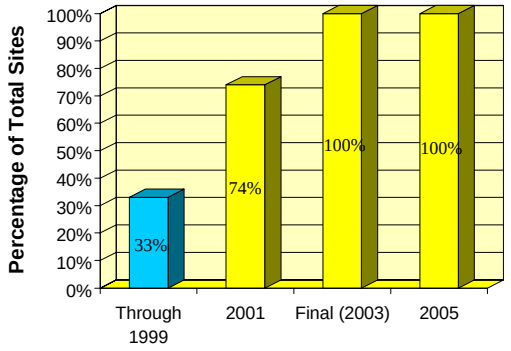
FY99 Restoration Progress

The installation completed landfill consolidation and construction of a cap and completed construction of an RA at the Westside aquifers plume. Pilot studies began for an innovative sodium dithionite, in situ reactive zone technology for groundwater treatment. The FS was completed and the RD has begun on the Site 22 landfill, but the ROD was delayed for negotiation of a less costly but still protective remedy. The basewide FS was completed, and the basewide ROD has begun. The RA for the ecological areas will be delayed until FY01 due to budgetary constraints and to fill data gaps.

Plan of Action

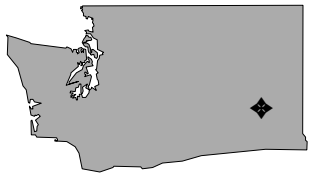
- Construct RA at Site 22 in FY00
- Sign basewide ROD in FY00
- Begin natural attenuation of commingled plume innovative technology pilot study in FY00
- Complete OU6 FS in FY00
- Complete RD in ecological areas in FY00 and RA in FY01
- Complete UST closure reports in FY01

Sites Achieving RIP or RC Per Fiscal Year



Moses Lake Wellfield Contamination Site — Formerly Larson Air Force Base — NPL

FFID: WA09799F331700
Size: 9,607 acres
Mission: Served as tactical air command, air transport, and strategic air command base; provided pilot training
HRS Score: 50.00; placed on NPL in October 1992
IAG Status: IAG signed by EPA and DoD in March 1999
Contaminants: VOCs (specifically TCE), jet fuel, possibly tetraethyl lead and low-level radioactive materials
Media Affected: Groundwater and soil
Funding to Date: $5.7 million
Estimated Cost to Completion (Completion Year): $54.3 million (FY2036)
Final Remedy in Place or Response Complete Date for All Sites: FY2036



Moses Lake, Washington

Restoration Background

Larson Air Force Base (AFB) served as a tactical air command base, then as a military air transport facility and later as a Strategic Air Command base. The installation was sold to the Port of Moses Lake in 1966 and is now operated by the Grant County Airport. Much of the former Larson AFB property serves as a regional aviation, industrial, and educational facility.

Environmental assessments, beginning in FY87, identified four sites that required further investigation: 11 underground storage tanks (USTs) and associated potentially contaminated soil; a trichloroethene (TCE)-contaminated groundwater plume; an area potentially containing low-level radioactive waste; and two disposal areas potentially containing tetraethyl lead. In 1988 the water from the Skyline Water District, south of the former Larson AFB, was found to be contaminated by trichloroethene TCE during routine sampling required by the Washington Department of Health. Two City of Moses Lake potable-water wells were also found to have been contaminated with TCE. The city has performed Remedial Actions at the Wellfield, and concentrations of TCE have been reduced below the levels established in the Federal Drinking Water Standards. The privately owned water supply system of Skyline has not been reconstructed. Other private wells in the study area may be contaminated at levels above allowable Federal levels.

In FY91, a Phase I Remedial Investigation (RI) was initiated by the U.S. Army Corps of Engineers (USACE), Seattle District, to identify potential source areas that would require further characterization. In FY92, 11 USTs were excavated and removed from the site. In FY93, the Phase I RI was completed. In FY94, three additional rounds of groundwater sampling were conducted under an addendum to the Phase I RI. The Port of Moses Lake conducted an Interim Response Action, providing bottled water to the Skyline community from 1994 until July 1999.

In FY94, USACE, Seattle District, under contract to EPA, completed an Engineering Evaluation and Cost Analysis (EE/CA) to evaluate the Skyline drinking water system. The EE/CA was distributed for public comment.

In FY95, USACE, Omaha District, completed a search for potentially responsible parties (PRPs) and a cost allocation effort. USACE, Seattle District, also completed the addendum to the Phase I RI, including additional groundwater sampling.

In FY97, the Omaha District Office of Counsel, in coordination with its Department of Justice attorney, negotiated with EPA Region 10 to decide who (EPA, USACE, or PRPs) will take the lead for the RI and Feasibiltiy Study (FS).

In FY98, USACE, Omaha District, in coordination with its Department of Justice attorney, began negotiating with EPA on an Interagency Agreement (IAG) for the RI/FS. The project was turned over to the USACE, Seattle District, for execution of the technical RI/FS.

FY99 Restoration Progress

The IAG was signed and RI/FS work began. The work will determine the extent of the TCE plume. Fieldwork began in July. Twenty-five groundwater monitoring wells were constructed, and several piezometers were installed. Low-flow sampling technology, piezometer data results, geochemical studies of groundwater movement, and other study methods are being used to characterize the extent of contamination in the groundwater. Real estate rights-of entry (ROEs) were obtained for 45 local private residences.

The District sampled and analyzed the water from these private wells to assist in the RI of the contaminated plume.

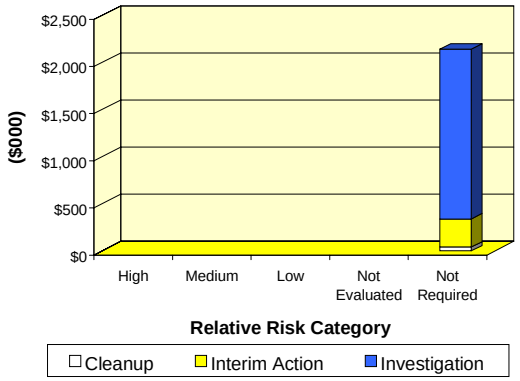
In July, USACE, Seattle District, assumed responsibility for providing bottled water to the Skyline community. A Time-Critical Removal Action (TCRA) was initiated for design and construction of a potable water pipeline from the City of Moses Lake's water distribution system to Skyline. The design was completed. Construction is awaiting receipt of FY00 funding and a Notice to Proceed from EPA.

Contract actions were initiated to expedite the RI of the hangar complex area on the Port of Moses Lake property. Genie Industries Inc. and the U.S. Forest Service have leased property from the Port of Moses Lake in the vicinity of the hangar complex.

Plan of Action

- Complete the draft RI in July 2000
- Complete the Skyline TCRA pipeline installation in FY00
- Complete an Interim Remedial Action for TCE USTs in FY00
- Perform additional sampling of domestic water wells in FY00
- Complete the draft FS in FY01

FY00 Funding by Phase and Relative Risk



Mountain Home Air Force Base NPL

FFID: ID057212455700
Size: 6,000 acres
Mission: Provide composite combat air power worldwide
HRS Score: 57.80; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in January 1992
Contaminants: VOCs, petroleum/oil/lubricants, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: $8.1 million
Estimated Cost to Completion (Completion Year): $0 (FY1996)
Final Remedy in Place or Response Complete Date for All Sites: FY1994

Mountain Home, Idaho

Restoration Background

Environmental studies conducted since FY83 have identified 32 sites at Mountain Home Air Force Base. Sites include landfills, fire training areas, a fuel hydrant system spill area, disposal pits, surface runoff areas, wash racks, ditches, underground storage tanks (USTs), petroleum/oil/lubricant (POL) lines, and a low-level radioactive material disposal site. To improve and accelerate site characterization, the installation grouped the sites into operable units (OUs).

Removal Actions in FY91 and FY92 included clean closure and removal of 12 USTs. In FY93, the installation recommended no further action (NFA) for 15 of 21 sites in OU1. In FY92, Remedial Investigation (RI) activities were initiated for OU3 and OU6. An NFA Record of Decision (ROD) was signed for OU2 and OU4, and an Interim Remedial Action (IRA) was conducted at OU5 (low-level radioactive material site). The IRA consisted of excavating 2 cubic yards of contaminated soil, a pipe, and six 55-gallon drums. Also in FY93, the installation capped 3 acres of one landfill at OU2. In FY95, the installation completed RI activities for OUs 1, 3, 5, and 6; the lagoon landfill; and Fire Training Area 8. A ROD was signed for these areas in FY96.

The regional groundwater was monitored to resolve uncertainties in the groundwater transport model. The perched water at Site ST-11, the flightline fuel spill site, is undergoing long-term monitoring. In FY96, the installation submitted a request to EPA to delete the installation from the National Priorities List (NPL). EPA indicated that it preferred to wait until a required 5-year review had taken place at Site ST-11 before beginning the delisting process.

The installation converted its Technical Review Committee to a Restoration Advisory Board (RAB) in FY94. It holds semiannual RAB meetings and continues to advertise the meetings in the local newspaper to increase public involvement.

FY99 Restoration Progress

The installation continued to monitor regional groundwater for the groundwater transport model and as part of a 5-year monitoring plan. The perched water at Site ST-11 also was monitored as part of a 5-year monitoring plan. The installation continued to pursue deletion from the NPL by performing the actions required in the ROD, including monitoring of regional groundwater.

A contract for updating the Community Relations Plan (CRP) was awarded.

Plan of Action

- Continue to monitor regional groundwater in FY00
- Continue to monitor the perched water at Site ST-11 in FY00
- Continue to pursue deletion of the installation from the NPL in FY00
- Continue to update the CRP in FY00

FY00 Funding by Phase and Relative Risk

All sites are in the long-term monitoring phase.

FFID: SC457002482100
Size: 3,937 acres
Mission: Housed tactical fighter wing
HRS Score: NA
IAG Status: None
Contaminants: Spent solvents, fuel, waste oil, VOCs, metals, asbestos, paints, and thinners
Media Affected: Groundwater and soil
Funding to Date: $42.2 million
Estimated Cost to Completion (Completion Year): $16.3 million (FY2011)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002

Myrtle Beach, South Carolina

Restoration Background

In July 1991, the BRAC Commission recommended closure of Myrtle Beach Air Force Base. On March 31, 1993, the installation closed. Sites identified at the installation include landfills, weathering pits, fire training areas, drainage ditches, hazardous waste storage areas, maintenance areas, underground storage tanks (USTs), explosive ordnance areas, fuel storage areas, a small-arms firing range, and a lead-contaminated skeet range. Contaminants include petroleum hydrocarbons, heavy metals, and volatile organic compounds. The installation has conducted Preliminary Assessments, Site Inspections, Remedial Investigations (RIs), and Feasibility Studies (FSs) for the identified sites.

Interim corrective measures (ICM) were initiated to treat a 50-acre trichloroethene (TCE)-contaminated groundwater plume. The installation also began Remedial Design (RD) and Treatability Studies for the small-arms firing range and firing-in buttress sites. RCRA Facility Investigations (RFIs) have been implemented for the drainage ditches, the Old Entomology Shop, the Armament Shop, and the Old Engine Test Cell. A joint management team, formed in FY91, assumed the role of a BRAC cleanup team in FY93.

In FY94, cleanup was completed at the skeet range. Interim measures included removal of contaminated soil at the weathering pit, removal of 28 USTs and 20 oil-water separators, and evaluation of the integrity of 18 other oil-water separators. The installation also formed a Restoration Advisory Board (RAB). In FY95, the installation prepared a BRAC Cleanup Plan (BCP).

The BCP was updated in FY96. In FY97, the installation completed RI/FS reports, and selected cleanup technologies, for several sites. It also determined the extent of lead contamination in soil at the small-arms firing range and submitted clean-closure plans to the state regulatory agency for two hazardous waste management units and Corrective Action Plans (CAPs) for the hazardous waste tank facility. The installation completed an ICM for the Old Entomology Shop and expanded the ICM for the 50-acre TCE plume. Also in FY97, eight early Removal Actions took place, and the installation completed a Relative Risk Site Evaluation for all sites.

In FY98, ICM was completed for soil removal at the small-arms firing range and landfill caps were implemented at four sites. Supplemental RFI reports were completed for 12 sites and the installation implemented a CAP for air sparging at the MOGAS (motor gasoline) site. The CAP for four UST sites was finalized, and soil removal began at two of the sites. The RFI work plan was completed for two new sites, and a new site was scoped. A basewide monitoring plan was produced and implemented for all sites.

FY99 Restoration Progress

The installation completed fieldwork and submitted the report for the Old Entomology Shop, the New Entomology Shop, and the Armament Shop. The design and work plan for the groundwater remediation system at an off-base site were submitted for approval. RD was completed for two fire training areas and the petroleum/oil/lubricants (POL) site. The RFI work plan and fieldwork were completed for four areas, and RD is scheduled. Monitoring of all sites continues.

Unexploded ordnance (UXO) was discovered at the firing-in buttress site and the Third Street site. Emergency response and scoping for the work plan began.

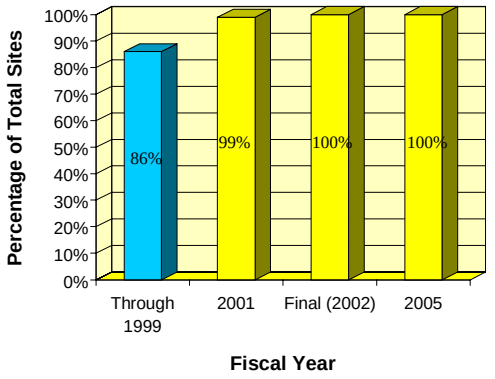
The installation conducted an annual site tour for the RAB.

The planned RD for one fire training area and a weathering pit is on hold pending performance of long-term monitoring to determine the effectiveness of natural attenuation. The planned Corrective Measures Study (CMS) was delayed for the same reason.

Plan of Action

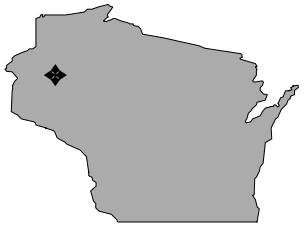
- Review ICM construction reports for the Old Entomology Shop, the New Entomology Shop, and the Armament Shop in FY00
- Complete fieldwork and draft work plan for removal of UXO from the firing-in buttress site and the Third Street site in FY00
- Complete the CMS and the RD for three fire training areas, a weathering pit, and the POL site in FY00
- Continue groundwater monitoring and operation of existing systems in FY00

Sites Achieving RIP or RC Per Fiscal Year



National Presto Industries — Formerly Eau Claire Ordnance Plant No. 1 — NPL

FFID: WI59799F244900
Size: 320 acres
Mission: Manufacture ordnance
HRS Score: 43.7; placed on NPL in June 1986
IAG Status: None
Contaminants: VOCs, including TCE
Media Affected: Groundwater and soil
Funding to Date: $3.2 million
Estimated Cost to Completion (Completion Year): $0.004 million (FY1990)
Final Remedy In Place or Response Complete Date for All Sites: FY1990



Eau Claire, Wisconsin

Restoration Background

Between 1981 and 1985, EPA and the Wisconsin Department of Natural Resources (WDNR) conducted groundwater studies in the general area west of the National Presto Industries (NPI) site (formerly Eau Claire Ordnance Plant No. 1). Volatile organic compounds (VOCs) were detected in groundwater samples. EPA issued an Administrative Order on Consent requiring NPI to design and install an on-site groundwater treatment facility.

In FY91, EPA issued a unilateral order requiring NPI to construct a drinking water system in the town of Hallie. The drinking water system was completed in FY92. Also, in FY92, the U.S. Army Corps of Engineers, Omaha District, awarded a contract for potentially responsible party (PRP) investigation activities, including research into historical activities at the site and evaluation of technical data relating to potential DoD liability. Results of this investigation indicated that DoD has limited, if any, liability.

In FY94, under a Consent Order signed by NPI and EPA, removal activities began at Lagoon No. 1. Final closure of the lagoon is awaiting completion of source removal and issuance of the Record of Decision (ROD). The Remedial Investigation (RI) report identified five source areas and four plumes of groundwater contamination. An on-site groundwater extraction and treatment facility became operational in FY94.

In FY95, a Removal Action was conducted at Lagoon No. 1 to remove waste forge compound liquids and solids. The RI and Feasibility Study (FS) was completed, and a Proposed Plan was issued. A public meeting was held to outline the alternatives included in the RI/FS. WDNR issued a statement on the desired environmental restoration levels; WDNR did not concur in EPA's Proposed Plan.

In FY96, Congress appropriated an additional $15 million for NPI's CERCLA cleanup, and the Army transferred that funding to NPI at the direction of Congress. A ROD was issued with state concurrence.

In FY97, an intermediate design for the Melby Road disposal site was submitted along with an Engineering Evaluation and Cost Analysis and a Remedial Action Plan for Lagoon No. 1. A revised Remedial Design work plan was completed. Work plans also were submitted for the soil vapor extraction (SVE) monitoring wells and ditch and dry well soil sampling. NPI continued to operate several operable units on site. It will continue to extract and treat groundwater for an unknown period.

In FY98, closure of the Melby Road disposal site was completed. Ditch 3 and Dry Wells 2 and 5 were remediated.

FY99 Restoration Progress

Monitoring and operation of the SVE and groundwater systems continued. Closure of Lagoon No. 1 was completed.

Plan of Action

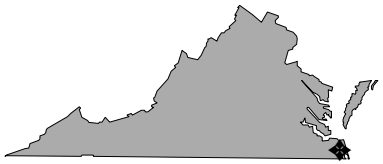
- Continue monitoring and operating SVE and groundwater systems in FY00

FY00 Funding by Phase and Relative Risk

All sites are in the long-term monitoring phase.

Naval Amphibious Base Little Creek — NPL

FFID: VA317002248200
Size: 2,147 acres
Mission: Provide logistics facilities and support services to meet the amphibious warfare training requirements of the Armed Forces
HRS Score: 50; placed on NPL in May 1999
IAG Status: Federal Facility Agreement negotiations to be initiated in FY99
Contaminants: Mixed municipal wastes, VOCs, SVOCs, and heavy metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $14.2 million
Estimated Cost to Completion (Completion Year): $24.4 million (FY2033)
Final Remedy in Place or Response Complete Date for All Sites: FY2014



Virginia Beach, Virginia

Restoration Background

Site types at this installation include landfills, a music equipment plating shop, a laundry waste disposal area, a pentachlorophenol (PCP) dip tank, sandblast yards, battery storage areas, and underground storage tanks (USTs). The installation was proposed for the National Priorities List (NPL) mainly because of the potential for contaminants in the soil and groundwater to migrate to surface water and endanger ecological receptors.

An Initial Assessment Study completed in 1984 identified 17 potentially contaminated sites. Sites 7 and 9 through 13 were recommended for confirmation studies. Sites 4, 5, 15, and 16 were recommended for mitigation measures. Sites 1, 2, 6, 8, 14, and 17 were recommended for no further action (NFA). Site 3 was addressed under a separate program. The six sites recommended for further study were sampled for groundwater, surface water, and sediment contamination in 1986. In 1988, a RCRA Facility Assessment (RFA) identified potential solid waste management units (SWMUs).

In 1991, an interim Remedial Investigation (RI) was conducted. A preliminary Site Inspection (SI) for Sites 4, 5, 15, 16, and 17 detected chemical contaminants of concern in groundwater at Site 5 and elevated levels of polychlorinated biphenyls (PCBs) in soil at Site 16. NFA was proposed for Sites 4, 15, and 17.

From 1993 through 1994, an RI was conducted at Sites 7 and 9 through 13 and an SI was performed at Sites 5 and 16. The RI included a Phase I risk assessment and recommended long-term monitoring (LTM) for Sites 9 and 10 and additional evaluation for Sites 7, 12, and 13. The SI recommended monitoring at Site 5 and a Removal Action at Site 16. In 1995, the PCB-contaminated soil was removed from Site 16 and the site was closed. At Site 11, a source Removal Action was completed. Corrective actions were completed for 10 USTs, and two other UST sites underwent long-term operations.

In FY98, 610 cubic yards of debris was removed from Site 7 and approximately 20 thousand cubic yards of soil was placed over the site landfill. The first round of groundwater sampling for LTM of Site 7 was conducted after the soil cover was constructed. At Site 8 and SWMU 3, field investigations for an SI began. At Site 13, an Engineering Evaluation and Cost Analysis (EE/CA) for removal of PCP-contaminated soil was submitted.

A Community Relations Plan was completed in 1995. A Restoration Advisory Board was established in 1994.

FY99 Restoration Progress

The base was placed on the NPL and began partnering with regulatory agencies. PCP-contaminated soil (442 tons) was removed from Site 13. The EE/CA was finalized for Site 13. The SIs for Site 8 and SWMU 3 were completed, and the SIs for SWMUs 2 and 8 began. Lack of funding and other site priorities delayed SI investigations at SWMUs 1, 4, 5, and 6.

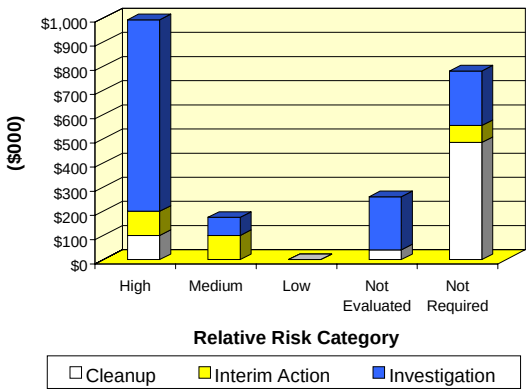
A planned Phase I supplemental RI for Site 11 and a planned Phase II supplemental RI for Sites 12 and 13 were delayed because additional contamination was found and additional work is required. Draft Feasibility Studies (FSs) for Sites 11, 12, and 13 are under way, but were not completed as planned because additional work is required.

The majority of the SWMUs noted in the RFA were reviewed by the Navy, EPA, and the Virginia Department of Environmental Quality, and categorized in preparation for the Federal Facility Agreement (FFA). Also, ecological investigations were started at multiple sites. LTM continued at Sites 7, 9, and 10. A Site Management Plan was completed. The 3-year groundwater monitoring report was submitted for Sites 9 and 10, and master project plans to expedite and promote consistency in the development of future project plans were completed as planned.

Plan of Action

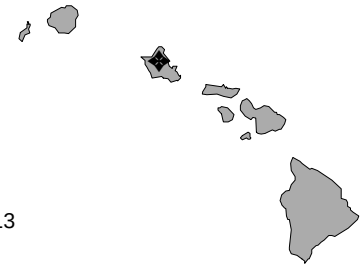
- Begin base background study in FY00
- Continue ecological investigations of multiple sites in FY00
- Draft FFA in FY00
- Complete EE/CA and soil Removal Action at Site 8 in FY00
- Complete FSs for Sites 11, 12, and 13 in FY00
- Develop EE/CA for SWMU 2 in FY00
- Begin RI/FS for SWMU 3 in FY00
- Begin EE/CA and RI and complete SI for SWMU 8 in FY00
- Continue LTM at Sites 7, 9, and 10 in FY00

FY00 Funding by Phase and Relative Risk



Naval Computer and Telecommunications Area Master Station, Pacific — NPL

FFID: HI917002438800
Size: 2,400 acres
Mission: Operate and maintain communications facilities and equipment for Naval shore installations and fleet units in the eastern Pacific
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Draft Federal Facility Agreement was cancelled
Contaminants: PCBs, metals, and petroleum hydrocarbons
Media Affected: Soil
Funding to Date: $7.4 million
Estimated Cost to Completion (Completion Year): $39.3 million (FY2013)
Final Remedy in Place or Response Complete Date for All Sites: FY2013



Wahiawa, Hawaii

Restoration Background

This installation operates six facilities on the island of Oahu but conducts industrial operations primarily at the main station and receiver site in Wahiawa and the Naval Radio Transmitting Facility in Lualualei. The restoration program has focused on those two facilities, where maintenance and operation of electrical transformers and switches have been the primary sources of contamination. The installation was placed on the National Priorities List (NPL) because polychlorinated biphenyl (PCB)–contaminated soil was detected in work and residential areas. Contamination with metals and petroleum hydrocarbons also resulted from the station's operation and maintenance activities.

Investigations began at the installation in FY86. Twenty-four CERCLA sites and 5 underground storage tank (UST) sites were identified. Site Inspections were conducted for Sites 1, 5, 11, and 14 through 19. Expanded Site Inspections (ESIs) were conducted for Sites 1, 5, and 11.

In FY92, the installation conducted a Removal Action at Site 14 for PCB-contaminated soil in the vicinity of eight transformers. A risk assessment prepared after the Removal Action indicated that no further action (NFA) was required. The ESI identified elevated levels of lead and mercury at the Old Wahiawa Landfill and the Building 6 Disposal Area.

In FY95, the installation completed planning documents for the Remedial Investigation and Feasibility Study (RI/FS) at Sites 1, 5, 6, 10, 12, 13, 17, 18, and 20. RI/FS activities included screening risk assessments to determine whether further action was required. The Navy completed a draft Federal Facility Agreement (FFA). The FFA was never finalized. Both EPA and the Navy agreed that an FFA was not necessary for the installation because investigation and cleanup are progressing at the installation.

In FY96, the Navy conducted RI/FS activities at Sites 1 and 5 and determined that NFA was required at UST Site 6. Initial site characterization was conducted at UST Site 8.

In FY97, the installation began RI/FS activities at Sites 2 and 22. A draft Engineering Evaluation and Cost Analysis (EE/CA) was prepared for a Removal Action at transformer locations at Sites 17, 18, and 20.

In FY98, an EE/CA, an Action Memorandum (AM), and planning documents were completed for the Removal Actions at transformer locations at Sites 17, 18, and 20. The installation initiated fieldwork for this Removal Action. Petroleum contamination was identified at UST Site 5.

Because the installation consists of two primary facilities, two Restoration Advisory Boards (RABs) were established. Members of the community have been instrumental in discovering sites and have located numerous wells in the vicinity of the installation. The final Community Relations Plan was completed in FY95.

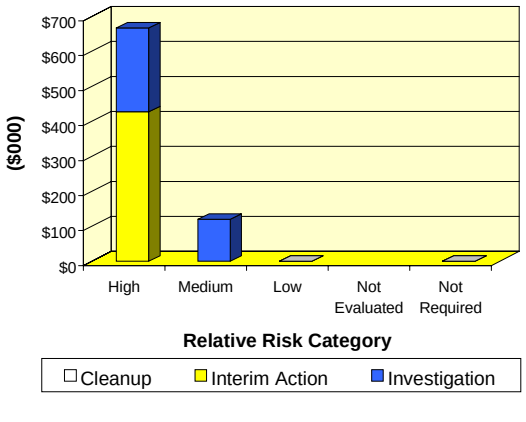
FY99 Restoration Progress

The installation continued RI/FS activities at Sites 1, 2, 5, and 22. The RI/FS required additional work to incorporate new data from Sites 1 and 2 and to comply with updated ecological requirements. Fieldwork for Removal Action at Sites 17, 18, and 20 continued but was not completed because of weather delays and the discovery of additional contamination. The installation completed the work plans for a Removal Site Evaluation (RSE) for a part of Site 18 not addressed in the current Removal Action. The RSE fieldwork, EE/CA, and AM were delayed by lack of funding. The installation began a technology demonstration that will be used in the EE/CA to treat excavated soil from Sites 17, 18, and 20. Remediation of soil contamination at UST Site 5 was completed. Investigation of a potential UST tank site, UST Site 8, was completed, with no tank located.

Plan of Action

- Complete RI/FS at Sites 1, 2, 5, and 22 after analytical data for Sites 1 and 2 have been incorporated and ecological assessments have been updated in FY00
- Complete Removal Action at Sites 17, 18, and 20 in FY00
- Initiate RSE fieldwork, EE/CA, and AM at a portion of Site 18 in FY00
- Complete a technology demonstration for treating soil from Sites 17, 18, and 20 in FY00
- Initiate a Removal Action at Sites 17, 18, and 20 in FY00

FY00 Funding by Phase and Relative Risk



Naval Station TODD–Tacoma

Formerly Commencement Bay

NPL

FFID: WA09799F345500
Size: 191 acres
Mission: Served as shipbuilding facility and reserve shipyard
HRS Score: Unknown
IAG Status: None
Contaminants: VOCs, PNAs, PCBs, and heavy metals, including arsenic, lead, and mercury
Media Affected: Groundwater, sediment, and soil
Funding to Date: $0.2 million
Estimated Cost to Completion (Completion Year): $0.02 million (FY2000)
Final Remedy in Place or Response Complete Date for All Sites: FY2000

Tacoma, Washington

Restoration Background

The former Todd Tacoma shipyard is located on Commencement Bay between Hylebos and Blair Waterways in Tacoma, Washington. The 191-acre facility was acquired between 1942 and 1948 for use by the U.S. Navy. In 1960, all but 8.33 acres was conveyed to the Port of Tacoma. The remainder was retained by the Navy for a Navy and Marine Corps Reserve Training Center.

Between 1917 and 1940, the then privately owned property was in use intermittently for shipbuilding. Beginning in 1940, the western portion of the facility, approximately 74.2 acres, owned at that time by Seattle-Tacoma Shipbuilding Corporation (later called Todd Pacific Shipyards Inc., Tacoma Division), was rapidly developed to support the Navy war effort. Adjacent lands were acquired both by the Navy and by the Maritime Commission to expand the plant. By October 1942, the Maritime Commission had transferred all of its contractual and facility interests to the Navy. Land acquisitions continued until the end of the war, and the facility expanded to 191.04 acres.

After the war, the installation was designated a Naval Industrial Reserve Shipyard, and shipbuilding ceased. In September 1948, the Todd-owned property was acquired by the Navy. In October 1958, the installation was declared excess. The Navy and Marine Reserve Training Center retained 8.33 acres, and the remaining property was conveyed to the Port of Tacoma on January 1, 1960. The Port has leased portions of the facility for business and light industry.

In 1983, the Commencement Bay Nearshore/Tideflats Superfund Site was placed on the National Priorities List (NPL). The former naval yard is adjacent to the mouth of the Hylebos Waterway problem area. Sediment sampling revealed high levels of polychlorinated biphenyls (PCBs) and several other contaminants. On December 21, 1994, the U.S. Army Corps of Engineers (USACE), Seattle District, was sent a potentially responsible party (PRP) letter from the Hylebos PRP Group. On February 6, 1995, EPA Region 10, sent a General Notice Letter to the District Engineer. Other major PRPs include ASARCO Incorporated; Elf Atochem of North America, Inc.; General Metals of Tacoma, Inc.; Kaiser Aluminum & Chemical Corporation; Occidental Chemical Corporation; and the Port of Tacoma.

Investigations of the Commencement Bay Nearshore/Tideflats Superfund Site have been in progress for several years. USACE, Seattle District, received approval to initiate PRP investigations using existing field studies and other sources of information in February 1996. Authority has been granted to determine DoD liability and negotiate a settlement with other PRPs for both the FUDS property and the active Navy training center. A Site Ownership/Operational History (SOOH) was undertaken in June 1997 to develop the information required for a determination of liability. In FY98, the scope of the SOOH expanded to include additional information sources and properties.

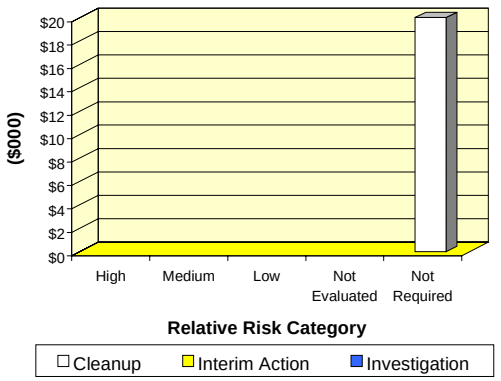
FY99 Restoration Progress

Additional data on past practices were collected and evaluated to enable the Seattle District Office of Counsel to enter discussions with other PRPs. An expanded SOOH was completed in draft, and the new data were evaluated.

Plan of Action

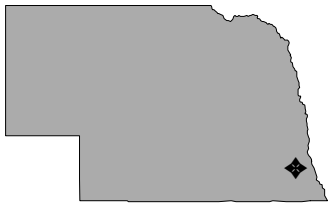
- Begin discussions with other PRPs to apportion liability for contamination restoration early in FY00

FY00 Funding by Phase and Relative Risk



Nebraska Ordnance Plant NPL

FFID: NE79799F041800
Size: 17,214 acres
Mission: Performed ordnance storage and manufacturing activities
HRS Score: 31.94; placed on NPL in August 1990
IAG Status: IAG signed in September 1991
Contaminants: Explosives, VOCs, and PCBs
Media Affected: Groundwater and soil
Funding to Date: $54.1 million
Estimated Cost to Completion (Completion Year): $51.2 million (FY2030)
Final Remedy in Place or Response Complete Date for All Sites: FY2005



Mead, Nebraska

Restoration Background

From 1942 to 1956, the Nebraska Ordnance Plant produced munitions at four bomb-loading lines, stored munitions, and produced ammonium nitrate. The property also contained burn areas, an Atlas Missile facility, and a sewage treatment plant. Most of the property is now owned by the University of Nebraska and used as an agricultural research station. Other parts of the property are owned by the Nebraska National Guard and private entities. The U.S. Army Corps of Engineers (USACE) has identified soil contaminated with polychlorinated biphenyls (PCBs) and munitions, and on-site and off-site groundwater contaminated with explosives and volatile organic compounds (VOCs).

In FY94, USACE completed a Remedial Investigation and Feasibility Study (RI/FS) for soil contamination and prepared a draft final RI/FS report for groundwater. A Time-Critical Removal Action for PCBs was completed.

In FY95, a Record of Decision (ROD) for incineration of contaminated soil at Operable Unit (OU) 1 was approved. USACE completed the Proposed Plan and the FS report for groundwater contamination at OU2 and Phase I RI fieldwork at OU3. EPA approved the final Engineering Evaluation and Cost Analysis (EE/CA) and the design for Removal Actions for two trichloroethene (TCE)-contaminated groundwater plumes. USACE installed activated carbon canister treatment systems to treat contaminated drinking water in on-site wells and completed field investigations to identify explosives waste.

In FY96, USACE completed the Remedial Design (RD) for the OU1 incinerator. The draft final ROD for contaminated groundwater at OU2 was completed. USACE completed the PCB Removal Action, the ordnance and explosives EE/CA and Action Memorandum, and the decision documents for the Removal Action at OU2. The Phase II RI field investigation for OU3 also was completed.

In FY97, construction for the Remedial Action (RA) at OU1 was completed. The draft final RI and draft final Baseline Risk Assessment for OU3 were finished. The design for building demolition and debris removal at the Load Line Buildings was completed. An ordnance and explosives Removal Action was accomplished. USACE provided point-of-use water treatment to residences whose water was affected by the groundwater plume.

USACE converted the Technical Review Committee to a Restoration Advisory Board (RAB) in FY97.

In FY98 USACE completed operations of the OU1 incinerator, treating over 16,000 tons of explosives-contaminated soil. The final RA report was approved by EPA. Construction on the OU2 groundwater containment RA began. The 60 percent design for the full-scale system was submitted. The OU3 RI was approved. However, the Army agreed to do further characterization of several areas. Asbestos removal at the Load Line Buildings was completed.

FY99 Restoration Progress

The demolition of four Load Line Buildings was completed. The OU2 contaminant Removal Action was completed and began operating. The RD for OU2 was also completed. Additional characterization fieldwork, including characterization for explosives of the area near the Lower Platte National Resource District (LPNRD) impoundment, was completed for OU3. A Memorandum of Understanding with LPNRD was completed.

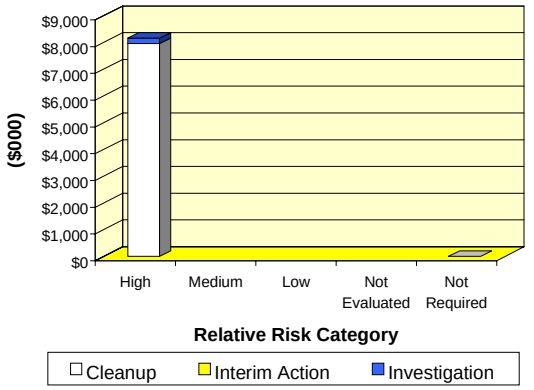
Regional groundwater monitoring continued, as did provision of alternate water supplies to affected residents.

Four RAB meetings were held.

Plan of Action

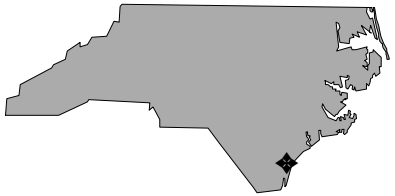
- Award contract for construction of groundwater RA in FY00
- Begin construction of the groundwater RA for OU2 in FY00
- Complete the draft and draft final work plans for the groundwater circulation well pilot study in FY00
- Perform full-scale pilot study to evaluate innovative technologies using groundwater circulation wells in FY00
- Submit the OU3 draft final RI report addendum, revised draft final Baseline Risk Assessment, and draft FS in FY00
- Complete the draft and draft final RD for OU2 Phase II in FY01
- Complete the draft and draft final Proposed Plan and ROD for OU3 in FY01

FY00 Funding by Phase and Relative Risk



New Hanover County Airport NPL

FFID: NC49799F483500
Size: 4 acres
Mission: Served as World War II bomber command and Vietnam-era aerospace defense command
HRS Score: 39.39; placed on NPL in March 1989
IAG Status: None
Contaminants: VOCs and SVOCs
Media Affected: Groundwater
Funding to Date: $1.9 million
Estimated Cost to Completion (Completion Year): $0.8 million (FY2003)
Final Remedy in Place or Response Complete Date for All Sites: FY2003



Wilmington, North Carolina

Restoration Background

In FY87, a Preliminary Assessment and a Site Inspection identified groundwater contamination caused by fire training activities conducted at New Hanover County Airport from FY68 through FY79. Fire training activities involved burning jet fuel, gasoline, fuel oil, and kerosene. The site included a burn pit, a mockup of an aircraft, and a 10,000-gallon aboveground storage tank that supplied fuel to the burn areas. The site also contained several other fire training stations, including a fire smokehouse, a railroad tanker car, and several automobiles. As a result of fire training activities, groundwater was contaminated with benzene.

EPA has identified DoD, New Hanover County, Cape Fear Community College, and the City of Wilmington as potentially responsible parties (PRPs) for the site.

A Removal Action completed in FY91 involved removal of waste materials, contaminated water, contaminated surface and subsurface soil, and structures associated with the fire training activities. Confirmatory soil sampling resulted in a recommendation for no further action at the site.

In FY92, EPA completed the Remedial Investigation and Feasibility Study (FS) for groundwater contamination, and the Record of Decision (ROD) for cleanup was signed. In FY94, PRPs began Remedial Design (RD) work at the airport to collect additional data on groundwater quality. In FY95, two monitoring wells were installed to confirm that contamination had not migrated to the lower groundwater aquifer. A 60 percent RD document was sent to EPA with a recommendation that air sparging be used as a more cost-effective treatment technology.

In FY97, the PRPs used a low-volume, low-flow sampling technique to reevaluate metal contamination in the groundwater. The reevaluation showed that metals were no longer a contaminant of concern. This finding was instrumental in obtaining approval from EPA and the State of North Carolina for implementation of the air-sparging pilot study.

In FY98 the PRPs conducted geoprobe studies to determine the direction of groundwater flow. The air-sparging pilot test and an evaluation of the technology's efficacy were completed.

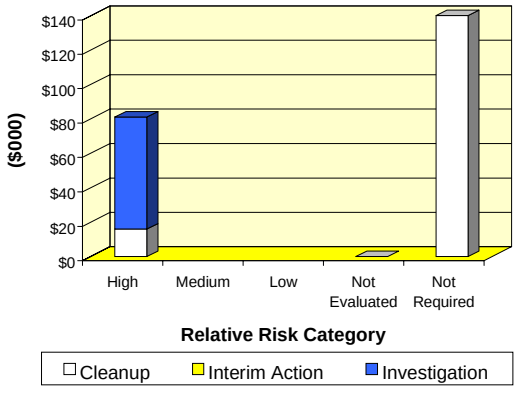
FY99 Restoration Progress

The PRPs installed additional wells and piezometers to aid in RD. The air-sparging pilot test Treatability Study report was completed. Full-scale utilization of the air-sparging technology did not begin because the ROD was not amended by EPA. After an FS amendment was completed, EPA began amending the ROD. However, the ROD could not be implemented in FY99 because the EPA amendment process was not completed. The revision of the RD and evaluation of the settlement of DoD liability have not been accomplished due to a delay in approving the ROD amendment.

Plan of Action

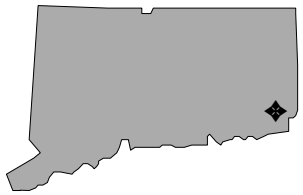
- Revise and finalize the RD to include air sparging in FY00
- Begin full-scale utilization of the air-sparging technology in FY00
- Finalize amendment and implement ROD in FY00 and complete ROD in FY05
- USACE and the Department of Justice will evaluate possible settlement of DoD liability in FY00

FY00 Funding by Phase and Relative Risk



New London Naval Submarine Base NPL

FFID: CT117002202000
Size: 547 acres
Mission: Maintain and repair submarines; conduct submarine training and submarine medical research; provide a home port for submarines
HRS Score: 36.53; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in January 1995
Contaminants: Dredge spoils, incinerator ash, petroleum/oil/lubricants, PCBs, spent acids, pesticides, solvents, construction debris, metals, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $45.6 million
Estimated Cost to Completion (Completion Year): $47.7 million (FY2017)
Final Remedy in Place or Response Complete Date for All Sites: FY2013



Groton, Connecticut

Restoration Background

Studies began at the New London Naval Submarine Base in FY82. Significant sites include the Area A Landfill (Site 2), a number of smaller disposal areas, and fuel and chemical storage areas. Twenty-two CERCLA sites were identified along with underground storage tanks (USTs), which were grouped into two UST sites.

The installation was placed on the National Priorities List (NPL) because of polychlorinated biphenyl (PCB) contamination at Site 2. The landfill was used to dispose of scrap wood, metal, waste chemicals, waste acid, and drums containing solvents. In FY93, the Navy constructed a fence around the landfill as part of an Interim Remedial Action (IRA).

Several Removal Actions have been implemented. In FY91, 19 gas cylinders were removed from Site 8, the Goss Cove Landfill. In FY94, the installation removed 2,000 cubic yards of soil contaminated with PCBs and lead from Site 6. At Site 15, lead-contaminated soil was removed. At Site 9, the installation removed PCB-contaminated oil, sludge, and water from a waste oil tank; the tank was cleaned and abandoned in place.

At UST Sites 1 and 2, the base began installing air-sparging (AS) and soil vapor extraction (SVE) systems to remove gasoline from the subsurface and to bioremediate less volatile fuels.

In FY95, a Record of Decision (ROD) was signed for Site 2 and the installation agreed to cap the landfill as an IRA. The draft Remedial Investigation and Feasibility Study (RI/FS) report was completed for Sites 1 through 11, 13 through 15, and 20.

In FY96, the installation began the FSs for Sites 3 and 8. The installation completed and began operating the AS/SVE systems at UST Sites 1 and 2, and initiated a Phase II Site Inspection (SI) at the Fuel Farm (Site 23). During FY97, the RI for Sites 1 through 11, 13 through 15, and 20, and the corrective action design and Phase II SI for Site 23 were completed. The Area A Landfill was capped. Removal Actions were completed at Site 4 and the Over Bank Disposal Area of Site 3.

In FY98, RODs were signed for Sites 3 and 6. After Removal Actions at Sites 4 and 15, no further action RODs were signed for the two sites. An FS was completed at Site 8.

The installation formed a Technical Review Committee in FY89 and converted it to a Restoration Advisory Board (RAB) in FY94. The RAB meets quarterly.

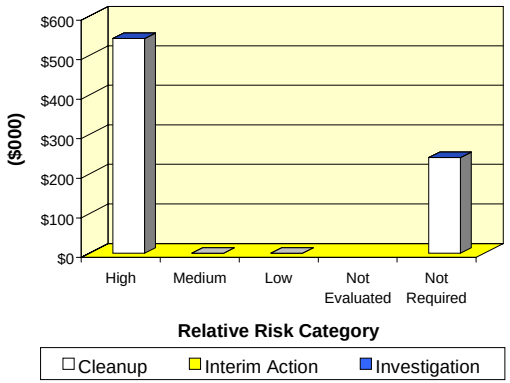
FY99 Restoration Progress

The RI was completed at the lower base, which includes Sites 10, 11, 13, 17, 21, 22, 24, and 25. The RI for the basewide groundwater operable unit (OU) was not completed because the project was not funded. An FS was initiated at the lower base sites and at Site 20. A Proposed Remedial Action Plan (PRAP) was completed and a ROD was signed for Site 8. Remedial Design (RD) began at Site 3, and quarterly groundwater monitoring was conducted at Sites 2 and 6. The AS/SVE system continued to operate at UST Sites 1 and 2. The FS, PRAP, and ROD were not completed at Site 20 because of extensive discussions between the Navy and regulators.

Plan of Action

- Complete FS, PRAP, and ROD for the lower base sites and for Site 20 in FY00
- Continue operation of AS/SVE system at USTs 1 and 2 in FY00
- Continue groundwater monitoring at Sites 2 and 6 in FY00
- Complete RD and Remedial Action (RA) at Site 3 and RD at Site 8 in FY00
- Begin fieldwork for basewide groundwater OU RI in FY00
- Begin RA for Site 8 and RD for the lower base sites in FY01

FY00 Funding by Phase and Relative Risk



FFID: OH557002465000
Size: 70 acres
Mission: Repaired inertial navigation systems and managed Air Force metrology and calibration process
HRS Score: NA
IAG Status: None
Contaminants: VOCs and SVOCs
Media Affected: Groundwater and soil
Funding to Date: $2.9 million
Estimated Cost to Completion (Completion Year): $2.7 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002

Heath, Ohio

Restoration Background

Since 1962, Newark Air Force Base has repaired the inertial guidance and navigational systems used by most aircraft and missiles. The installation also provided specialized engineering assistance to the Air Force and DoD on problems related to inertial guidance and navigation. In July 1993, the BRAC Commission recommended that the installation be closed and the workforce privatized in place. The base closed on September 30, 1996. Its workload has been contracted to private firms on site.

Past waste management activities related to solvents such as freon 113 and 1,1,1-trichloroethane affected groundwater at the installation. Environmental investigations conducted at the installation since FY84 identified five sites that required additional study. In FY89, Site Inspection (SI) activities were completed for another seven sites, consisting of spill sites, a fire training area, and landfill areas.

In FY90, the installation began a Remedial Investigation (RI) and Feasibility Study (FS) for the seven sites identified in the SI. In FY91, No Further Action decision documents were prepared for five of the seven sites. In FY94, the installation formed a BRAC cleanup team (BCT) and completed an Environmental Baseline Survey.

In FY95, the installation formed a Restoration Advisory Board (RAB). Work began on a supplemental RI, which concluded in August 1996 with publication of a final report. This report determined that no further action was needed for five of the seven sites studied. Remedial activities included removal of 17 underground storage tanks, removal of 300 cubic yards of soil from the former hazardous waste storage site (Facility 87), and operation of a soil vapor extraction (SVE) system at Facility 87.

The RAB and the BCT suspended meetings in September 1996.

In FY98, the decontamination of Facilities 102 and 114 (hazardous waste/materials storage buildings) was completed. The extension of the city water line onto the base was started. The SVE system at Facility 87 was removed.

FY99 Restoration Progress

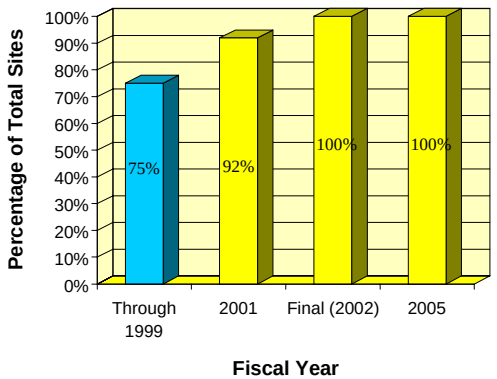
Construction and activation of the city water line were completed. The planned closure of three drinking water wells was delayed because of unforeseen site conditions and delays in appointing a new Air Force Center for Environmental Excellence field engineer. Quarterly sampling of monitoring wells at Facility 87 continued, and the revised Amended Post Closure Plan was submitted. The revised Amended Post Closure Plan was approved by Ohio EPA; this plan requires semiannual groundwater compliance monitoring. The FS at Facility 87 began.

Stage I of the RI for a 13-acre landfill site (LF002) began, requiring direct-push sampling in areas where contamination was detected in 1990, 1991, 1995, and 1996, and issuance of a technical memorandum. The BCT discussed ways of facilitating regulator approval of the Finding of Suitability to Transfer for LF002.

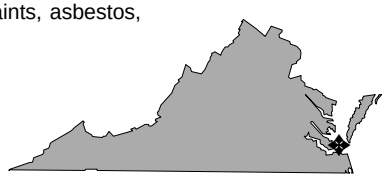
Plan of Action

- Close three drinking water wells in FY00
- Complete Stage I of the LF002 RI in FY00
- Complete the FS and begin Remedial Action for Facility 87 in FY00
- Obtain BCT review of draft plans and draft technical memorandum for Stage I of the RI for LF002 in FY00
- If contamination at LF002 is confirmed to be above residential risk levels, obtain BCT review of the draft final RI and FS reports, the draft final Proposed Plan, and the draft final Record of Decision for LF002 in FY01
- In FY00, the Air Force will conduct interviews with former employees to determine the location and activities performed at a possible fire training area

Sites Achieving RIP or RC Per Fiscal Year



FFID: VA317002741400
Size: 4,631 acres
Mission: Provide services and materials to support the aviation activities and operating forces of the Navy
HRS Score: 50.00; placed on NPL in April 1997
IAG Status: Federal Facility Agreement was signed February 1999
Contaminants: Petroleum products, PCBs, solvents, heavy metals, acids, paints, asbestos, and pesticides
Media Affected: Surface water and sediment
Funding to Date: $73.2 million
Estimated Cost to Completion (Completion Year): $40.0 million (FY2021)
Final Remedy in Place or Response Complete Date for All Sites: FY2014



Norfolk, Virginia

Restoration Background

Studies conducted at Norfolk Naval Base since FY83 have identified 22 sites and 173 solid waste management units (SWMUs). Further actions are required at 10 sites, 4 site screening areas, and 8 areas of concern. Contamination has resulted from maintenance operations for the aircraft, equipment, and vehicles used to carry out the base's mission, and from operation of support facilities, such as hobby shops. Site types at the installation include landfills, ordnance storage areas, waste disposal areas, fire training areas, fuel spill areas, and underground storage tanks. The installation was placed on the National Priorities List (NPL) mainly because of the potential for migration of contaminated surface water into groundwater and soil.

During FY89, the installation completed a Remedial Investigation and Feasibility Study (RI/FS) for Site 4. In FY91, an Expanded Site Inspection was completed for Site 6 and a Remedial Design (RD) was completed for Site 4. During FY94, the installation removed drums and debris at Area B of Site 1 and completed an RI/FS and signed a decision document for the site.

In FY96, a Preliminary Assessment and a Site Inspection were initiated for Site 21, and an RI/FS was initiated for three sites. A baseline Ecological Risk Assessment was completed for Site 3, and construction of an air-sparging (AS) and soil vapor extraction (SVE) system began for the site.

In FY97, the installation completed a draft Federal Facility Agreement (FFA), signed two decision documents, completed an RD, and initiated a Removal Action for Sites 6 and 20. A Remedial Action (RA) was initiated for SWMU 1, the RA for Site 1 was completed, and the pump-and-treat system began operation, and the pump-and-treat system for the Fuel Farms was completed.

In FY98, two AS/SVE systems (Sites 3 and 20) began operation, an RI/FS were completed and an RD was initiated for Site 2, and long-term monitoring and operations and maintenance started at Sites 1, 3, and 20. An Engineering Evaluation and Cost Analysis was completed for Site 5, and a Record of Decision (ROD) was signed for a landfill cap at Site 6. An Interim Remedial Action (IRA) began for Site 22, and IRAs were completed at Site 21 and SWMU 1. Screening began at 15 SWMUs.

The installation formed a Technical Review Committee in FY89 and converted it to a Restoration Advisory Board in FY94. A Community Relations Plan was completed in FY93.

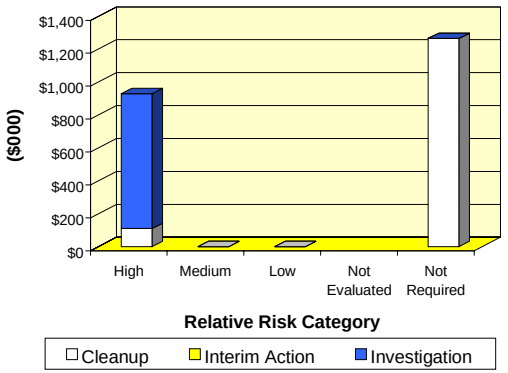
FY99 Restoration Progress

The RI/FS at Site 22 was completed. Because the problem at this site was found to be more extensive than expected, only a portion of the contaminated soil was removed during the IRA. This complicated and delayed the ROD and site cleanup. The site is now being addressed through two RODs. During the IRA at Site 5, initial excavation removed the bulk of the contaminated soil; however, one confirmatory sample showed contamination levels above cleanup goals. An RA and a ROD were initiated at Site 2, and an RA (landfill cap) was initiated at Site 6. An RI/FS was completed at Site 22, and work plans were initiated at SWMUs 9, 10, 14, and 38. The FFA was signed.

Plan of Action

- Sign ROD and complete RA for Site 2 in FY00
- Complete IRA at Site 5 in FY00
- Complete RA at Site 6 and begin LTM in FY00
- Sign ROD for northern part of Site 22 in FY00
- Sign Closeout Reports for five SWMUs in FY00

FY00 Funding by Phase and Relative Risk



Norfolk Naval Shipyard — NPL

FFID: VA317002481300
Size: 795 acres
Mission: Provide logistical support for assigned ships and service craft; perform work in connection with conversion, overhaul, repair, alteration, dry-docking, and outfitting of naval vessels; perform manufacturing, research, development, and test work; and provide services to other activities and units
HRS Score: 50.0; placed on NPL in July 1999
IAG Status: None
Contaminants: Heavy metals, PCBs, VOCs, SVOCs, petroleum/oil/lubricants, and solvents
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $8.2 million
Estimated Cost to Completion (Completion Year): $26.2 million (FY2038)
Final Remedy in Place or Response Complete Date for All Sites: FY2013

Portsmouth, Virginia

Restoration Background

Norfolk Naval Shipyard (NNSY) is located on the western bank of the Southern Branch of the Elizabeth River. It is composed of the main shipyard and three annexes. In 1983, an Initial Assessment Study identified 19 sites at NNSY, 8 of which required further investigation. These sites resulted from past land filling, disposal operations, and the operation of a plating shop. The plating shop site was determined to require no additional action other than monitoring. A RCRA Facility Investigation (RFI) was performed in 1986. An RFI supplement issued in 1987 identified 121 solid waste management units and areas of concern. The installation was placed on the National Priorities List (NPL) in July 1999 because of the potential impact of surface water runoff on Paradise Creek, which is adjacent to the shipyard disposal areas.

Investigations at NNSY have been accelerated by use of such technologies as the Global Positioning System, geoprobe, hydropunch, cone penetrometer, mobile on-site laboratory, and ground-penetrating radar.

An administrative record was established in FY92, and a Community Relations Plan was completed in FY94. The installation formed a Technical Review Committee in FY94 and converted it to a Restoration Advisory Board (RAB) in FY96. The RAB currently convenes three to four times per year.

FY99 Restoration Progress

NNSY initiated a Site Screening Assessment (SSA) to support Federal Facility Agreement (FFA) development. The SSA was revised because of a change in strategy in the NNSY Installation Restoration Program that placed a greater emphasis on use of institutional controls instead of conducting extensive sampling in the Controlled Industrial Area of the shipyard.

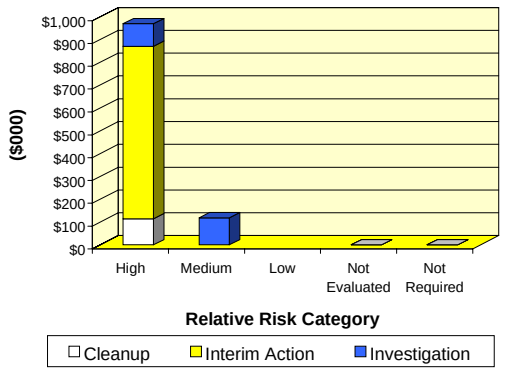
The installation continued working on a Remedial Investigation and Feasibility Study (RI/FS) for Operable Units 1 and 2, which comprise six disposal areas and waste holding and accumulation areas. A Human Health Risk Assessment was performed. An Ecological Risk Assessment (ERA) is under way but was delayed by cooperative development of ERA protocol by the Navy, EPA, and state regulators.

Fieldwork characterizing the nature and extent of dense nonaqueous phase liquid contamination was completed, and operation of a free-product recovery system for light nonaqueous phase liquid contamination began, at the Oil Reclamation Area (Site 5). The RI/FSs for OUs 1 and 2 were delayed because of the delay in the ERA. Regulatory review of the RI for the Plating Shop (Site 17) was completed. NNSY provided technical support to the Department of Justice for settlement of past investigation cost issues at the Atlantic Woods Industries Superfund Site.

Plan of Action

- Perform Removal Action at New Gosport Landfill (Site 1) in FY00
- Complete SSA fieldwork and issue investigation report in FY00
- Initiate RI at St. Helena Annex in FY00
- Sign Records of Decision for the Scott Center Annex Landfill (Site 2) and Site 17 in FY00
- Perform Remedial Design for Site 2 and a Removal Action Engineering Evaluation and Cost Analysis for the Acetylene Waste Lagoon (Site 9) in FY00
- Continue development of the FFA in FY00

FY00 Funding by Phase and Relative Risk



FFID: CA921352066100
Size: 422 acres
Mission: Military Traffic Management Command, Western Area
HRS Score: NA
IAG Status: None
Contaminants: POLs, TCE, solvents, lead, and PCBs
Media Affected: Groundwater and soil
Funding to Date: $15.0 million
Estimated Cost to Completion (Completion Year): $7.2 million (FY2003)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY1996

Oakland, California

Restoration Background

In 1995, the BRAC Commission recommended closure of Oakland Army Base (OARB). The Army closed the installation and ceased operation as scheduled on September 30, 1999.

Between 1989 and 1995, the installation began to characterize potentially contaminated areas through its Installation Restoration Program (IRP). These areas included underground storage tanks (USTs); Berth 6 and 6 ½ where storm drain bedding materials were contaminated with oil and fuel products; pesticides and oil in soil and groundwater at Building 991; lead-contaminated soil at the West Grand Avenue Overpass roadsides; chlorinated solvents in soil and groundwater at Building 807; and soil contaminated with polychlorinated biphenyls (PCBs) at Building 648.

In FY95, implementation of the CERCLA and CERFA requirements under the BRAC Environmental Restoration Program began. The installation surveyed living quarters and recreational areas for lead-based paint and found lead contamination above the action levels in several areas.

In FY96, the installation formed a BRAC cleanup team (BCT) and a Restoration Advisory Board (RAB). The installation conducted an asbestos survey of the housing units and the Child Development Center. Seven of the 31 samples indicated the presence of asbestos in floor tiles, roofing material, and dry wall, but in a form that presented no hazard to residents and workers.

In FY97, the installation initiated Remedial Investigations and Feasibility Studies (RI/FSs) for Operable Units (OUs) 1, 2, 3, and 7, as planned. In FY98, the installation completed an initial BRAC Cleanup Plan and an Environmental Baseline Survey for each of the 26 BRAC parcels that make up the base. Parcels found to have a known or potential release of hazardous materials were surveyed in the follow-on Preliminary Assessment and Site Inspection. The Army restructured funding for cleanup requirements. Activities under the base compliance program continued progressing toward closure of storage tanks and oil-water separators.

FY99 Restoration Progress

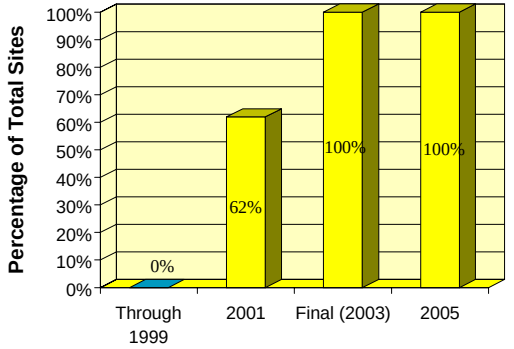
The Army conducted a limited scope independent technical review (ITR) for OUs 2 and 7, which resulted in decreased cleanup requirements for OU2 and an Army proposal to reduce the cleanup levels required for OU7, which is still being negotiated with the regulators. The regulatory agencies approved RIs for OUs 2 and 7. Preparation of Finding of Suitability to Transfer (FOST) documents began for No Further Action parcels in OUs 1 and 3. Funding for the OU4 RI was secured, and the work plan began. The regulatory agencies approved plans for completion of UST removal. OU6 has been vacated with no newly discovered issues. RI/FS work began for OU4.

Regulatory delays in approving the RIs postponed completion of FSs and decision documents. Remedial Actions (RAs) for OUs 1, 2, 3, and 7 are also on hold pending regulatory approval of the RIs.

Plan of Action

- Complete FSs and decision documents for OUs 1, 2, 3, and 7 in FY00
- Complete RI/FS for OU4 in FY00
- Complete storage tank closures in FY00
- Complete a FOST for parcels in OU5 in FY00
- Complete Remedial Design and RA for OUs 2 and 7 in FY00

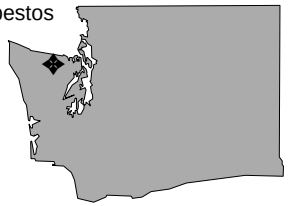
Sites Achieving RIP or RC Per Fiscal Year



Old Navy Dump/Manchester Annex

NPL

FFID: WA09799F832600
Size: 350 acres
Mission: Originally provided harbor defense for Puget Sound; during World War I, tested torpedoes and stored fuel; later served as a fire training school for the Navy and housed an antiaircraft artillery battery
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: IAG signed in July 1997
Contaminants: PCBs, heavy metals, petroleum hydrocarbons, dioxins and furans, and asbestos
Media Affected: Surface water, sediment, and soil
Funding to Date: $5.7 million
Estimated Cost to Completion (Completion Year): $3.2 million (FY2032)
Final Remedy in Place or Response Complete Date for All Sites: FY2008



Kitsap County, Washington

Restoration Background

The Navy owned the Old Navy Dump/Manchester Annex from 1919 to 1960. During that time, a net depot, a fire training area, and a landfill were established at the site. Activities at the property included maintenance, painting, sandblasting, and storage of steel cable net. Domestic waste, wood, and metal waste from the site and the Puget Sound Naval Shipyard were disposed of in a landfill. Currently, the National Oceanic and Atmospheric Administration, the National Marine Fisheries Service (NMFS), an EPA laboratory, and a portion of Manchester State Park occupy the site.

Preliminary Assessments and Site Inspections (PAs/SIs) conducted at the site since FY87 identified past releases of hazardous substances from the three areas. Contaminants include heavy metals, polychlorinated biphenyls (PCBs), petroleum hydrocarbons, dioxins and furans, and asbestos. Contaminants have been detected in soil at the landfill and at the fire training area, as well as in surface water and sediment at the site.

In FY94, the U.S. Army Corps of Engineers (USACE) completed the PA/SI process, and the Manchester Work Group was established to facilitate restoration efforts. The group includes representatives of EPA, the Washington State Department of Ecology, the U.S. Fish and Wildlife Service, tribal governments, and the local community.

During FY95, Phase II Remedial Investigation and Feasibility Study (RI/FS) fieldwork began, and a potential unexploded-ordnance area was identified. USACE, Huntsville Division, determined that the area is not accessible to the general public and thus should be considered for No Further Action.

In FY96, USACE completed the draft RI/FS report. It was determined that Interim Remedial Actions (IRAs) are not appropriate for the site. Additional rounds of groundwater sampling for Phase I and II investigations were conducted. In FY97, the Interagency Agreement (IAG) was signed and the RI/FS was completed. USACE prepared a Proposed Plan, issued a Record of Decision (ROD), and initiated the Remedial Design (RD) and Remedial Action (RA). The RI/FS process was accelerated by use of a landfill cap as a presumptive remedy.

In FY98, the RD/RA scope of work was completed, additional data collection was performed, and the results were documented in an Auxiliary Data Collection Technical Memorandum. The 35 percent RD was submitted for work group review.

Also in FY98, cleanup of the fire training area simulator structures was completed. Dioxin-contaminated debris and soil were excavated from within the simulator structures and disposed of off site. The concrete simulator structures were demolished and disposed of off site. Underground storage tanks (USTs) adjacent to the simulators were cleaned and closed in place. The site was restored by backfilling with clean fill and grading to create a parking lot for NMFS employees.

FY99 Restoration Progress

The final RD for the overall cleanup remedy was completed. Interim submittals at the 35 percent and 95 percent RD stages were coordinated and reviewed by the Manchester Annex Work Group to ensure that all concerns had been addressed before the RD was finalized.

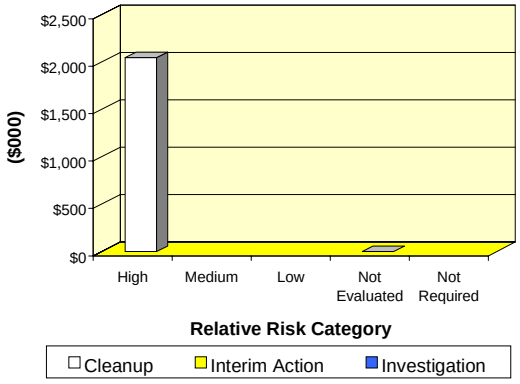
An RA construction contract was awarded for completion of the overall cleanup remedy as specified in the ROD. The contract includes excavating landfill debris from the Clam Bay intertidal zone and constructing a shoreline protection system; placing clean sediment over intertidal Clam Bay sediment areas that exceed cleanup levels; installing a cap over the upland portion of the landfill, and a hydraulic cutoff system along the upgradient edge of the cap; and cleaning and filling in place the remaining USTs.

Design and review meetings were held with the Manchester Annex Work Group to assure members that all concerns about the RD had been addressed. USACE met with Washington State Parks to coordinate the required access agreements and property easements for the RA work. The NMFS and the U.S. Fish and Wildlife Service were also consulted on preparation of a biological assessment for the RA to ensure that threatened and endangered species will not be adversely impacted by RA activities.

Plan of Action

- Complete Phase I of RA construction in FY00
- Initiate Phase II of RA construction in FY00
- Complete Phase II of RA construction in FY01
- Initiate long-term monitoring, operation and maintenance in FY01

FY00 Funding by Phase and Relative Risk



Ordnance Works Disposal Areas

Formerly Morgantown Ordnance Works

NPL

FFID: WV39799F346200
Size: 825 acres
Mission: Manufactured chemicals for ordnance
HRS Score: 35.62; placed on NPL in June 1986
IAG Status: None
Contaminants: PCBs, PAHs, inorganic compounds, arsenic, and mercury
Media Affected: Groundwater and soil
Funding to Date: $2.0 million
Estimated Cost to Completion (Completion Year): $0.3 million (FY2003)
Final Remedy in Place or Response Complete Date for All Sites: FY2003

Morgantown, West Virginia

Restoration Background

On the basis of environmental studies, sites at the Ordnance Works Disposal Areas in Morgantown were grouped into two operable units (OUs). OU1 consists of an old landfill, a shallow disposal area from which topsoil has been removed, and two lagoons from which sludge has been excavated. OU2 consists of all other sites, particularly those located in processing areas.

The Remedial Investigation and Feasibility Study (RI/FS) for OU1 was completed in early FY88. The Record of Decision (ROD) for OU1, signed in FY89, stipulated that soil contaminated with polyaromatic hydrocarbon (PAH) compounds was to be excavated and treated in a bioremediation bed. Soil washing was selected as an alternative remedy if bioremediation proved infeasible.

In FY90, EPA issued Consent Orders for both OUs. In the same year, the potentially responsible parties (PRPs) signed a participation agreement for OU2. In FY94, a pilot-test work plan was approved for the cleanup of soil contamination at OU1, and remedial work began. In FY95, the draft work plan for OU1 Phase II Interim Remedial Actions was submitted to EPA for review.

In FY95, the draft RI report for OU2 was submitted to EPA for review. OU2 areas contained elevated levels of organic and inorganic contaminants. Removal Actions were required for five areas of OU2, two at the main processing building and three at the coke ovens and the by-products area. A Time-Critical Removal Action was proposed for limited areas. This proposal of a Removal Action after the RI phase eliminated the need for an FS.

In FY96, the U.S. Army Corps of Engineers (USACE) reached an agreement on allocating the cost of remediation at OU1.

During FY97, the PRP group, which includes USACE, completed the Removal Actions at OU2 and received EPA concurrence on completion. To improve site management at OU1, the PRP group submitted a Focused Feasibility Study (FFS) to EPA for the OU1 remedy. In August 1998, after state concurrence, EPA approved the remedy proposed for OU1 in the FFS.

A new ROD for OU1 was issued by EPA on September 28, 1999. This supersedes the previous ROD signed in 1989.

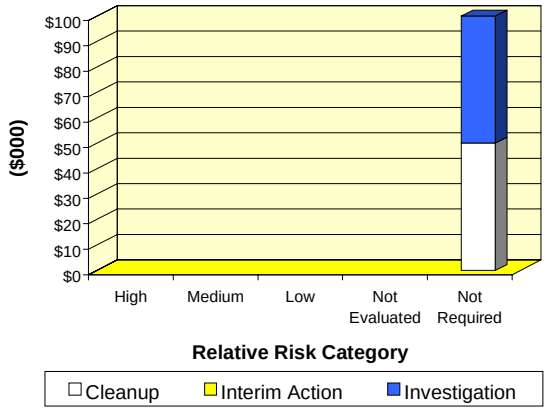
FY99 Restoration Progress

EPA issued a new ROD for OU1 based on the approved FFS. Consent Decree negotiations were not initiated as planned, and the Proposed Plan was not submitted, due to delays in the EPA ROD issuance process.

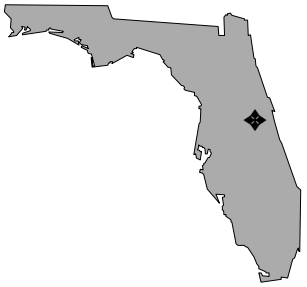
Plan of Action

- Initiate Consent Decree negotiations in FY00
- When PRP allocation issues have been resolved for OU1, begin work on the Proposed Plan for the site, consisting of off-site thermal treatment and on-site landfill capping

FY00 Funding by Phase and Relative Risk



FFID: FL417002473600
Size: 2,052 acres
Mission: Serve as Naval Training Center; formerly used as Army Air Force and Air Force bases
HRS Score: NA
IAG Status: None
Contaminants: Asbestos, paint, petroleum/oil/lubricants, photographic chemicals, solvents, and low-level radioactive wastes
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $20.6 million
Estimated Cost to Completion (Completion Year): $4.8 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Orlando, Florida

Restoration Background

The Orlando Naval Training Center has four areas: the Main Base, Area C, Herndon Annex, and McCoy Annex. Most of the operational and training facilities are located on the Main Base. Area C, west of the Main Base, contains warehouse and laundry operations. Herndon Annex contains warehouse and research facilities. McCoy Annex contains housing and community facilities. From 1941 to 1968, the installation served as an Army Air Base and an Air Force Base. Since 1968, it has been a Naval Training Center. In July 1993, the BRAC Commission recommended closure of the installation and relocation of its activities. The installation closed on April 30, 1999.

Investigations, beginning in FY85, identified 10 CERCLA sites and 4 underground storage tank (UST) program sites. The installation identified 55 areas of concern (AOCs) and more than 300 tank systems requiring removal or assessment. In FY92, the installation replaced three tanks at a UST site. Corrective Action Plans (CAPs) for the three remaining UST sites were completed in FY93.

In FY94, the installation formed a Restoration Advisory Board (RAB) and a BRAC cleanup team (BCT). In FY95, the installation began Remedial Investigation and Feasibility Study (RI/FS) activities at the Main Base Landfill site, completed a CAP for one UST site, and began an Interim Remedial Action (IRA) for groundwater at another UST site. The installation removed 55 tanks and completed 45 UST assessment reports. Also in FY95, the installation completed its Land Reuse Plan, a Community Relations Plan, and an Environmental Baseline Survey.

During FY96, a Preliminary Assessment and Site Inspection (PA/SI) was completed and the RI/FS began at the Laundry Area C site. PA/SI activities at two other sites and a CAP for one UST were completed. In FY97, RI/FS activities began at the McCoy Annex Landfill, the Old Pesticide Shop, and the Groundskeeper Storage Area. An IRA at UST site, McCoy Gas Station, was completed.

By the end of FY98, site screenings had been completed at all AOCs and site screening reports were completed for another 10. The BCT completed a Record of Decision (ROD) and removed and assessed 55 tanks. Soil was removed from Study Areas 27 and 52 and Operable Unit (OU) 3. Fieldwork for the final 13 AOCs began.

FY99 Restoration Progress

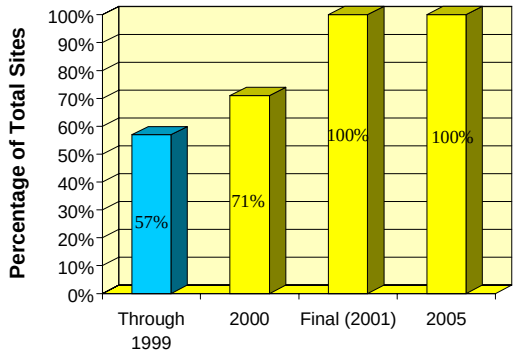
IRAs were completed at 10 RI sites and six tank sites. Fieldwork and reports were completed at 12 AOCs. Thirty-three tanks were removed, and removal reports were completed. The final RI/FS report and the draft ROD were completed for OU3, but the final ROD was not completed because of delays with the IRA.

The draft Finding of Suitability to Lease for McCoy Annex was completed. Draft Findings of Suitability to Transfer (FOSTs) for the public benefit conveyance of Herndon Annex and part of McCoy Annex to the Airport Authority were completed, but the final FOST is still awaiting regulator approval. The design was completed and approved for a pilot study to remediate tetrachloroethene in the source area at the Area C Laundry. The draft RI/FS report was completed for the McCoy Annex Landfill and Area C Laundry.

Plan of Action

- Complete economic development conveyance of 1,425 acres to City of Orlando in FY00
- Complete IRAs at three AOCs, one OU, and one tank site in FY00
- Complete Federal Aviation Administration conveyance of 100 acres and final decision documents for eight AOCs in FY00
- Complete ROD for OUs 3 and 4 and IRAs at two Installation Restoration Program (IRP) sites and four tank sites in FY00
- Close out final three tanks in FY00
- Complete ROD for OU2 in FY01
- Complete final decision documents for nine AOCs and four tank sites in FY01
- Start long-term monitoring at seven IRP sites and four tank sites in FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: TX69799F676300
Size: 16,000 acres
Mission: Produced and stored military weapons
HRS Score: 51.22; placed on NPL in May 1994
IAG Status: Under negotiation
Contaminants: VOCs, SVOCs, heavy metals, chlordane, UXO, and explosives
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $0.3 million
Estimated Cost to Completion (Completion Year): $3.7 million (FY2004)
Final Remedy in Place or Response Complete Date for All Sites: FY2004

Pantex Village, Texas

Restoration Background

The former Pantex Ordnance Plant began operations in 1942 as an Army Ordnance Corps facility. The property is owned by the U.S. Department of Energy (DOE) and Texas Tech University. Operations conducted there include fabrication, assembly, testing, and disassembly of nuclear ammunition and weapons. Sources of contamination have included burning of chemical waste in unlined pits, burial of waste in unlined landfills, and discharge of plant wastewaters into on-site surface water.

Environmental studies of the southern 5,000 acres, owned by Texas Tech University, began in FY88. A Preliminary Assessment and Site Inspection in FY90 identified nine areas of emphasis (AOEs) for investigation. It was suspected that some AOEs contained ordnance and explosives (OE). An Interim Remedial Action was conducted at three AOEs to remove OE from soil to a depth of 3 feet.

In FY94, a Phase I Remedial Investigation and Feasibility Study (RI/FS) began for two AOEs. RI/FS activities included sampling of surface and subsurface soil, sediment, surface water, and groundwater. The analysis indicated that explosives, mercury, lead, chromium, and chlordane were the primary contaminants of concern. The installation began an Engineering Evaluation and Cost Analysis (EE/CA) of four AOEs where Non-Time-Critical Removal Actions might be necessary.

In FY95, the final Phase I RI report was completed for the hazardous, toxic, and radioactive waste (HTRW) project, and the draft EE/CA report was completed for the OE project. In addition, a public meeting was held to present information about environmental restoration projects at the installation. DOE and Texas Tech University established a partnership with the Texas Natural Resource Conservation Commission (TNRCC) to continue quarterly groundwater sampling.

In FY96, representatives of Texas Tech University, DOE, the community, and TNRCC met to review the site's status and discuss concerns. TNRCC did not agree with the recommendation of the EE/CA report. Therefore, the cleanup remedy recommended in the report was not implemented.

In FY97, contracts were awarded for the DOE potentially responsible party (PRP) and the Texas Tech property record search. The Phase II HTRW investigation began for the Texas Tech property. The DOE record search was completed, and a final report was submitted.

In FY98 the HTRW investigation for Texas Tech and the findings report were completed. The PRP record search for Texas Tech also was completed.

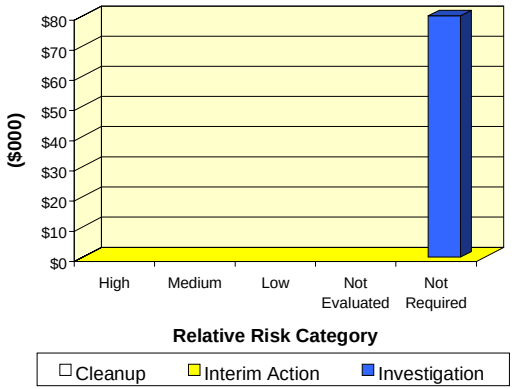
FY99 Restoration Progress

Although the RI of the Texas Tech site has been completed, further long-term sampling is required. Some data from the original site investigation and from the RI were analyzed by ITS Laboratory of Richardson, Texas. ITS has since admitted that it committed laboratory fraud. The Department of Justice is investigating this case, and all suspect data have been forwarded to it. Further sampling is required to substantiate the conclusions of the previous, possibly tainted samples. Because of the need for additional testing at the site, the proposed FY99 meeting with DOE and Texas Tech to determine PRP responsibility and the HTRW investigation reports has been delayed until FY00. The recommended cleanup of the EE/CA report for Texas Tech was completed.

Plan of Action

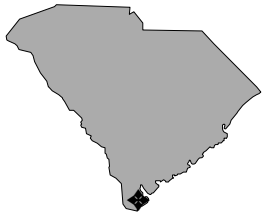
- Complete additional confirmation testing in FY00
- Complete HTRW investigation report in FY00
- Meet with DOE and Texas Tech in FY00 to determine PRP liability

FY00 Funding by Phase and Relative Risk



Parris Island Marine Corps Recruit Depot NPL

FFID: SC417302276300
Size: 8,043 acres
Mission: Receive, recruit, and combat-train enlisted personnel upon their enlistment in the Marine Corps
HRS Score: 50.00; placed on NPL in December 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Industrial wastes, pesticides, paint, petroleum/oil/lubricants, solvents, ordnance compounds, metals, acids, and electrolytes
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $6.5 million
Estimated Cost to Completion (Completion Year): $15.2 million (FY2011)
Final Remedy in Place or Response Complete Date for All Sites: FY2009



Parris Island, South Carolina

Restoration Background

The Parris Island Marine Corps Recruit Depot (MCRD) was listed on the National Priorities List (NPL) in December 1994. The listing was due to contamination at two landfill sites. Investigations at that time identified 48 potential CERCLA and RCRA sites. Most of the sites are landfills or spill areas where groundwater and sediment are contaminated with solvents and petroleum/oil/lubricants.

In FY86, an Initial Assessment Study identified 16 sites, 10 of which were designated Response Complete (RC). In FY87, a Site Inspection (SI) was initiated for all sites. EPA prepared a RCRA Facility Assessment (RFA) for the installation in FY90. The RFA identified 44 solid waste management units (SWMUs) and 4 areas of concern (AOCs). All identified CERCLA sites were included as SWMUs or AOCs. Of the originally identified 48 potential sites, the Navy, Marines, and EPA designated 25 as official sites. Ten of these sites were designated RC. All tanks were removed and cleanup was completed at two sites. Five sites required no further action. In FY93, the installation completed an Expanded Site Inspection at the Causeway Landfill.

During FY95, Remedial Actions began involving tank removals, soil removal, free-product recovery, and soil vapor extraction at one underground storage tank (UST) site. Four storage tanks were removed. An Interim Remedial Action (IRA) was conducted at one landfill site. Twelve sites that had been designated RC were reopened, with three reclassified as RC. The Agency for Toxic Substances and Disease Registry performed an initial Public Health Assessment for the installation.

During FY96, the installation began Remedial Investigation and Feasibility Study (RI/FS) activities at four sites and completed Preliminary Assessment and SI activities at three. The installation began an IRA at a spill area and completed an assessment of contamination at UST 2. A draft Federal Facility Agreement (FFA) was prepared.

In FY97, a Corrective Action Plan for UST 2 was completed and the corrective action was implemented. The installation also completed the IRA and began long-term monitoring for UST 1.

In FY98, RI/FS activities began at six sites. Limited additional sampling was conducted at Sites 9 and 15 to clarify conditions. A pump-and-treat system, established at Site 45, began removing contaminated groundwater.

In FY96, the installation began to compile an administrative record and submitted a draft Community Relations Plan (CRP) to the regulatory agencies. The CRP was completed in FY98. There has been no community interest in forming a Restoration Advisory Board.

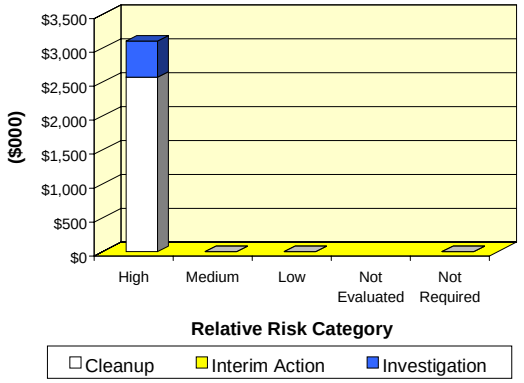
FY99 Restoration Progress

A draft RI/FS was submitted for Site 3. Work continued on the RI/FS for Sites 1, 2, and 12. Work on Site 14 is on hold until the investigations at these other sites are complete. A work plan was approved and sampling was completed at Site 21. An IRA (pump-and-treat system) continued to remove contamination from the groundwater at Site 45. The contract for this IRA runs through FY00. Monitoring continued at USTs 1 and 2, and contracts for contamination assessments were awarded for Building 4022 and the depot gas station. FFA negotiations are on hold.

Plan of Action

- Prepare Records of Decision for Sites 1, 2, and 3 in FY00
- Complete FFA in FY00
- Construct a landfill cap at Sites 1 and 3 in FY00
- Submit RI/FS reports for Sites 1, 2, 3, 12, 21 in FY00
- Continue IRA and begin RI/FS at Site 45 in FY00
- Continue monitoring at USTs 1 and 2 in FY00
- Complete contamination assessment at the gas station and Building 4022 in FY00

FY00 Funding by Phase and Relative Risk



Patuxent River Naval Air Station NPL

FFID: MD317002453600
Size: 6,800 acres
Mission: Test and evaluate naval aircraft systems
HRS Score: 36.87; placed on NPL in May 1994
IAG Status: None
Contaminants: Heavy metals, pesticides, organics, petroleum/oil/lubricants, solvents, and UXO
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $20.6 million
Estimated Cost to Completion (Completion Year): $93.8 million (FY2015)
Final Remedy in Place or Response Complete Date for All Sites: FY2014

Lexington Park, Maryland

Restoration Background

Studies beginning in FY84 showed 46 Installation Restoration Program sites at Patuxent. Three sites were placed on the National Priorties List (NPL): a Fishing Point landfill site (Site 1), the Former Sanitary Landfill (Site 11), and the Pest Control Shop (Site 17). Wastes managed at Site 1 included mixed solid wastes, petroleum/oil/lubricants (POL), paints, thinners, solvents, pesticides, and photographic laboratory wastes. Wastes handled at Site 11 include mixed solid wastes, POL, paints, thinners, solvents, and pesticides. Pesticides were handled at Site 17.

Metals and pesticides, semivolatiles, and volatiles were released from landfills and spills, causing contamination of soil, groundwater, surface water, and sediment at the various Installation Restoration (IR) sites. Remedial Investigation and Feasibility Study (RI/FS) activities included installation of shallow and deep monitoring wells and collection of soil borings, groundwater, soil, sediment, and fish. Hydrogeologic testing was conducted. Between FY86 and FY98, the installation completed removal of drums, polychlorinated biphenyl–contaminated soil, pesticide-contaminated soil, and ordnance.

In FY94, Interim Remedial Actions (IRAs) included an ordnance sweep for remaining unexploded ordnance (UXO). Shoreline stabilization prevented erosion of a Fishing Point landfill into the Chesapeake Bay. During FY96, the installation began a five-phase RI/FS for 16 sites. A Record of Decision (ROD) was signed, and the installation completed a Corrective Action Plan (CAP) at Site 11. Dry well and sediment removal was completed at Site 24. The predesign and design phases began for an IRA at Site 6.

Sixteen underground storage tanks (USTs), identified between FY87 and FY93, were grouped into six areas for further investigation. Interim Actions (IAs) at two of the areas included groundwater treatment and recovery of free product. Corrective Measures Design at UST 1 and a Removal Action at UST 5 were implemented. The installation prepared a CAP for UST 6. In FY97, one early action was performed and a landfill cap was installed. A corrective action (CA) at UST 4 and two IAs at UST 6 also were implemented. IRAs were completed at Sites 11 and 24.

In FY98, the installation completed a Removal Action at Site 34, began the Remedial Design (RD) for Sites 1 and 12, and initiated a Remedial Action (RA) for Site 17. The draft final Site Inspection (SI) document was submitted for regulatory review, and RD at Site 17 was completed. CAs were completed at UST 5.

The installation formed a Technical Review Committee in FY90 and completed a Community Relations Plan in FY91. A Restoration Advisory Board was established in FY94. The Navy regularly updates an administrative record and two information repositories, both of which were established in FY95.

FY99 Restoration Progress

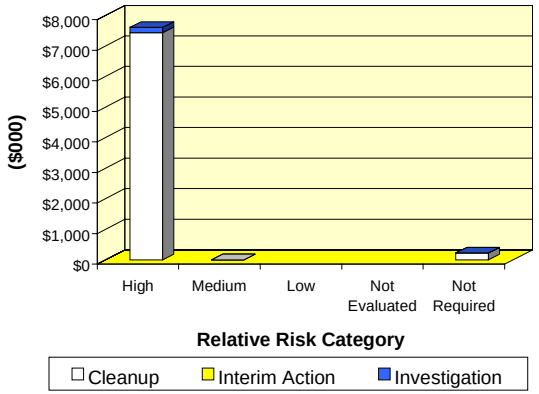
A Proposed Plan (PP) and a ROD were completed. The RA contract for Site 17 was awarded, but the RA was not completed because of lack of funding and increased scope of work. The contract was for a Focused Feasibility Study, PP, ROD, RD, and RA was awarded and completed for Site 6 (Bohneyard). The RA involved installing a soil cover system over unpaved areas and asphalt paving for other vehicle parking and access roads. The RI/FS was awarded and the SI was completed for Sites 3, 31, 39, 41, and 47.

The RD, PP, ROD, and RA planned for Sites 1 and 12 were not completed due to a lack of funding. A contract for RI/FS for Sites 4, 5, and 27 was delayed due to lack of funding. The RI planned for Sites 3, 31, and 39 was not completed because the SI took longer than expected. Sites 41 and 47 were added to the planned RI. A Removal Action for Site 23 was found to be unnecessary. The SI for Sites 48, 49, and 50 was not completed due to lack of funding. Lack of funding delayed the conversion of the administrative record to CD-ROM.

Plan of Action

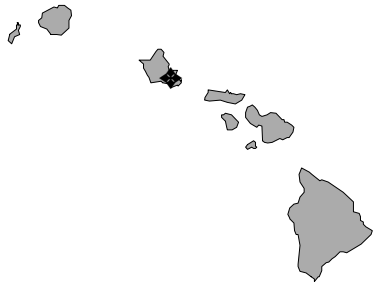
- Complete RD, PP, ROD, and RA at Sites 1 and 12 in FY00
- Complete additional sampling, and RA at Site 17 in FY00
- Continue partnering efforts and Pax River page updates in FY00
- Begin LTM at Site 11 in FY00
- Complete RI/FS at Sites 4, 5, and 27 and complete SI for Sites 48, 49, and 50 in FY00
- Complete RI for Sites 3, 31, 39, 41, and 47 in FY01
- Begin PP and ROD for Sites 4, 5, and 27 in FY01
- Convert administrative record to CD-ROM in FY01

FY00 Funding by Phase and Relative Risk



Pearl Harbor Naval Complex NPL

FFIDs: HI917002434200, HI917002477900, HI917002434100, HI917002434000, HI917002433900, and HI917002433400
Size: 2,162 acres
Mission: Provide primary fleet support in the Pearl Harbor area
HRS Score: 70.82; placed on NPL in October 1992
IAG Status: Federal Facility Agreement signed in March 1994
Contaminants: VOCs, SVOCs, heavy metals, PCBs, pesticides, petroleum hydrocarbons, and solvents
Media Affected: Groundwater and soil
Funding to Date: $88.7 million
Estimated Cost to Completion (Completion Year): $141.9 million (FY2019)
Final Remedy in Place or Response Complete Date for All Sites: FY2013



Pearl Harbor, Hawaii

Restoration Background

The Pearl Harbor Naval Complex consists of six installations: the Fleet and Industrial Supply Center, the Naval Station, the Naval Magazine, the Naval Shipyard and Intermediate Maintenance Facility, the Public Works Center, and the Inactive Ship Maintenance Facility. Fuel supply activities, landfills, and other support operations have contaminated the soil and groundwater with volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals.

The installation has conducted investigations and cleanups under CERCLA and RCRA at over 30 sites since FY83. Between FY91 and FY93, Interim Remedial Actions (IRAs) included excavation of polychlorinated biphenyl (PCB)– and dieldrin-contaminated soil at the Pearl City Junction and excavation of PCB-contaminated soil at transformer locations at the Armed Services Special Educational Training Services School. Five underground storage tanks and tetrachloroethene-contaminated soil were removed from the Aiea Laundry site (Site 31) in FY94. Approximately 7,000 cubic yards of soil was excavated, removed, treated, and backfilled at Site 22.

During FY97, IRAs were initiated at Sites 37 and 46 and completed at Sites 8 and 36. Long-term monitoring began at one site. Site Inspections (SIs) were initiated for Sites 40 through 42. At Site 34, a solvent extraction technology was used to remove PCBs from concrete. PCB-contaminated sediment was removed from the catch basin in Site 13. The capping of the landfill marked completion of cleanup at Site 8; groundwater monitoring will continue for 5 years. A Removal Site Evaluation (RSE) and a design package were used at Site 45 to address petroleum contamination. A Remedial Investigation and Feasibility Study (RI/FS) for Site 19, a Removal Action design for Sites 4 and 34, and a Site Summary Process for the complex continued.

In FY98, fieldwork for Sites 22 and 27 was completed. Final Engineering Evaluation and Cost Analysis (EE/CA) and design documents for Site 4 were completed. The construction for Removal Actions at Sites 37 and 46 was completed. The SI was revised and finalized at Sites 40, 41, and 42. The Removal Action was completed at Site 42.

A Technical Review Committee, formed in FY90, was converted to a Restoration Advisory Board (RAB) in FY95. The installation established three information repositories in FY90 and an administrative record in FY92. A Community Relations Plan was completed in FY92 and updated in FY95.

FY99 Restoration Progress

The Waipio Peninsula Site Summary Report (SSR) was initiated, and the Ford Island SSR was completed. An RI/FS for Site 51 began. The Removal Action for diesel fuel at Site 31 was initiated. The soil vapor extraction system for chlorinated solvents at Site 31 was deactivated in early FY99. Soil vapor concentrations along the property line dropped to undetectable levels. The RI/FS for Sites 19 and 31 continued. The EE/CA, Action Memorandum, and design documents were not completed as planned for Site 45 due to an extended demonstration period for the electroheating product removal technology caused by contractor scheduling conflicts and an extended regulatory review period.

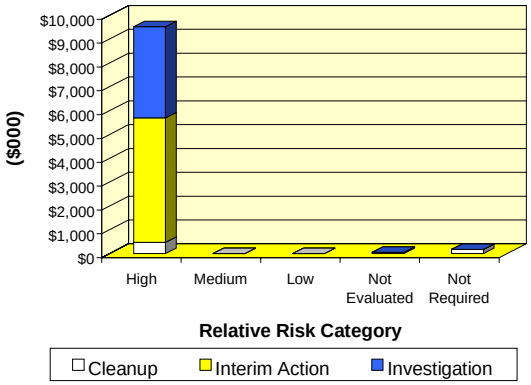
Final planning documents for a Removal Action at Sites 20, 21, and 29 were completed, along with the fieldwork for an RSE and a draft EE/CA. The Phase II RI report for Site 22 was completed. Remedial Action Operations (RA-O) continued at Sites 36, 37, and 46. A Removal Action was completed at Site 39. Groundwater RI planning documents were completed for Sites 33 and 39. A draft EE/CA was prepared to address the product plume at Magazine Loch (Site 25). A Removal Action continued at Sites 10 and 45 with Superfund Innovative Technology Evaluation (SITE) program demonstrations of electrokinetics and product removal technologies. A Removal Action was initiated for Site 41. A Removal Action for PCB-contaminated soil at Site 34 began, and a Treatability Study was completed. Planning for an RSE began for Site 43. A Removal Action for Site 4 was implemented.

Three RAB meetings were held in FY99.

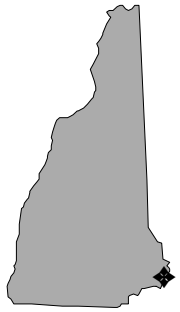
Plan of Action

- Complete Waipio Peninsula, West Loch, Pearl City Peninsula, Inactive Ship Maintenance Facility, and Bishop Point SSRs in FY00
- Begin a No Further Action Record of Decision at Site 22 and a groundwater RI for Sites 33 and 39 in FY00
- Continue the 5-year groundwater monitoring program at Site 8 and the RI/FS at Sites 19, 31, and 51 in FY00
- Finalize the EE/CA and design and begin construction for a Removal Action at Sites 33, 39, and 45 in FY00
- Finalize the EE/CA and design documents for a Removal Action at Site 25 in FY00
- Continue Removal Action with EPA SITE program using electrokinetics at Site 10; Removal Action at Sites 4, 34, 41, and 43; and RA-O at Sites 37 and 46 in FY00–FY01

FY00 Funding by Phase and Relative Risk



FFID: NH157002484700
Size: 4,257 acres
Mission: Served as Strategic Air Command bomber and tanker base
HRS Score: 39.42; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in 1991
Contaminants: VOCs, spent fuels, waste oils, petroleum/oil/lubricants, pesticides, and paints
Media Affected: Groundwater and soil
Funding to Date: $139.6 million
Estimated Cost to Completion (Completion Year): $57.0 million (FY2046)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Portsmouth/Newington, New Hampshire

Restoration Background

The BRAC Commission recommended closure of Pease Air Force Base in 1988. In March 1991, the installation was closed. Studies identified the following site types: fire training areas, burn pits, industrial facilities, landfills, and underground storage tanks (USTs). Groundwater and soil are contaminated with petroleum products (JP-4 jet fuel) and industrial solvents, such as trichloroethene (TCE).

Prior to closure, the installation completed Interim Remedial Actions at four sites, soil removal at three sites, and test pit operations at two sites. It also completed one bioventing and three soil vapor extraction (SVE) Treatability Studies, and removed 158 USTs and associated contaminated soil. A BRAC cleanup team (BCT) formed in FY93.

During FY95, six Records of Decision (RODs) were signed. Cleanup actions were completed at seven locations, and a remediation system was put into operation at Fire Training Area 2. A Restoration Advisory Board (RAB) was formed. A citizens group has participated in meetings and helped develop cleanup options.

In FY96, LF-5 capping was completed, construction of the SVE and air-sparging system at Site 45 began, and wetland restoration at LF-6 was completed. Construction began on the bioventing system at Site 13, the SVE and air-sparging system in Zone 2, and the groundwater recovery system in Zone 3. The installation began implementing the groundwater containment system at Site 32. Final Remedial Investigation and Feasibility Study (RI/FS) work was completed for the Brooks and Ditches Operable Unit (OU).

In FY97, the final ROD for the Brooks and Ditches OU was signed. The remaining remediation systems were brought on line, and operations and maintenance and long-term monitoring (LTM) began at the remaining sites. A new area of contamination, Site 46, Communications Building 22, was discovered. The Air Force immediately began site characterization and RI.

In FY98, Remedial Action (RA) optimization was performed for several systems. A source soil Removal Action and additional characterization were completed at Site 49. Confirmatory soil sampling was conducted at Site 45. An Operating Properly and Successfully document was completed for LF-5. An Engineering Evaluation and Cost Analysis (EE/CA) project for Site 49 and a streamlined RI/FS were initiated.

FY99 Restoration Progress

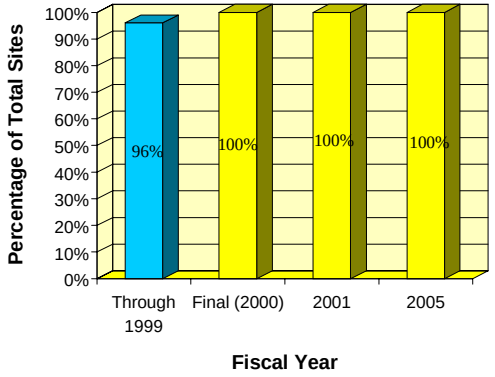
RA system operations and monitoring continued. Trend analysis, including system and monitoring plan optimization activities, was conducted. A permeable reactive wall source area action was implemented at Site 73. The EE/CA fieldwork and report were completed for Site 49.

LTM plans for Zones 2 and 3 and Site 8 were streamlined, resulting in an approximately one-third reduction of sampling frequency and/or sampling points.

Plan of Action

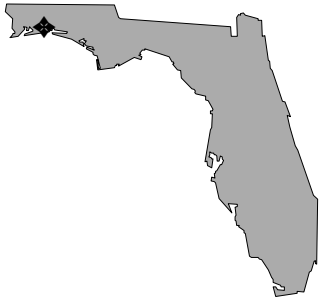
- Continue RA system operations, monitoring, LTM, and trend analysis in FY00
- Complete Operating Properly and Successfully documents for seven sites in FY00
- Implement result of the EE/CA for Site 49 and complete RA decision document in FY00
- Review transfer and cleanup documents by the BCT in FY00

Sites Achieving RIP or RC Per Fiscal Year



Pensacola Naval Air Station NPL

FFID: FL417002461000
Size: 5,874 acres
Mission: Serve as a flight training center
HRS Score: 42.40; placed on NPL in December 1989
IAG Status: Federal Facility Agreement signed in October 1990
Contaminants: Ammonia, asbestos, benzene, cyanide, heavy metals, paints, PCBs, pesticides, phenols, plating wastes, and chlorinated and nonchlorinated solvents
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $50.5 million
Estimated Cost to Completion (Completion Year): $44.0 million (FY2019)
Final Remedy in Place or Response Complete Date for All Sites: FY2013



Pensacola, Florida

Restoration Background

This installation, which now serves as a flight training center, was formerly a naval air rework facility and aviation depot. Operations that have caused contamination at the station include machine shops, a foundry, coating and paint shops, paint stripping and plating shops, various maintenance and support facilities, landfills, and storage facilities. Investigations have identified 38 CERCLA sites, 1 solid waste management unit (SWMU), and 15 underground storage tank (UST) sites. Site types include landfills, disposal sites, polychlorinated biphenyl (PCB) transformer and spill areas, industrial wastewater treatment plant areas, and evaporation ponds. Corrective measures have been taken at two UST sites. Cleanup activities, including installation of a groundwater pump-and-treat system, have been conducted at the SWMU.

In FY94, the installation removed a waste tank. It also removed industrial sludge containing heavy metals from sludge-drying beds and stained soil from various sites. A fence was installed to restrict access to an area containing drums. In FY95, the installation began Interim Remedial Actions (IRAs) at four sites and completed the Remedial Investigation and Feasibility Study (RI/FS) and the Proposed Plan (PP) for an additional site. A Record of Decision (ROD) was signed for no further action (NFA) at Site 39. RI reports were submitted for 10 sites, and RI fieldwork was completed for 2. Five petroleum-contaminated sites were closed.

In FY96, a new CERCLA site was added to the program. The installation completed an RI/FS and IRAs for four sites. The installation submitted an RI report for seven sites, completed an RI for Site 1, completed RI fieldwork for three sites, and initiated RIs for nine other sites. Remedial Design (RD) activities began at Sites 32, 33, and 35.

In FY97, RI/FSs for Sites 4, 16, 28, and 36; an RI for nine sites; and RD for Sites 32, 33, and 35 were completed. An RD and a Remedial Action (RA) began at five sites. Monitoring for UST 17 continued. A hazardous waste permit reissued for SWMU 1 allowed USGS to begin a natural attenuation (NA) evaluation.

In FY98, RIs at Sites 15, 19, 21, and 23; RI/FSs for Sites 7 and 18; and IRAs for Sites 1, 9, 10, 17, 18, and 25 were completed. The FS, RA, PP, ROD, and RD for Site 1, and the FS and PP for Site 2, were completed. The RA for Site 32 was started. The RODs for Sites 17 and 42 were signed by the commanding officer of the installation. USGS continued the NA evaluation, and Fenton's reagent/hydrogen peroxide injection technology was implemented for source removal of contamination at SWMU 1.

The installation formed a Technical Review Committee in FY90 and converted it to a Restoration Advisory Board in FY94.

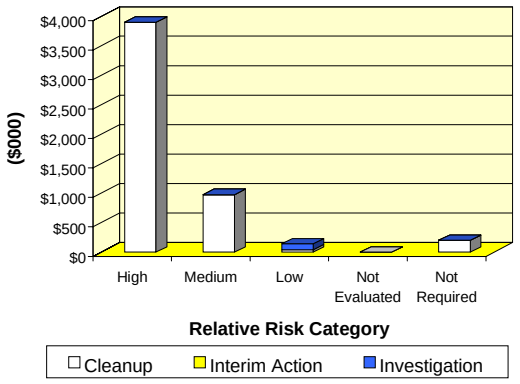
FY99 Restoration Progress

RODs for Sites 9, 17, 29, and 42 were completed, with state concurrence pending for Sites 9, 29, and 42. The RD and ROD for Site 2 were delayed by discussions concerning the impacts of recent hurricanes. The ROD for Site 15 was delayed because of additional discussions on the preferred treatment alternative. The Memorandum of Agreement on land use controls was signed by the commanding officer. The site assessment report (SAR) for UST 14 was started. SARs for USTs 15, 20, 21, 23, and 26 are under way. Funding was not available to start the SAR for UST 24. A monitoring-only plan for Site 1162 and an NFA designation for Site 1140 were approved. The RA and the RD for Site 1 were completed ahead of schedule. The SAR for Site 22 was completed. Site 22 is being transferred to the UST program.

Plan of Action

- Obtain concurrence on RODs for Sites 9, 29, and 42 in FY00
- Complete RODs for Sites 8, 15, 24, 38, and 40; RIs for Sites 40, 41, and 43; and FSs for Sites 11, 12, 25, 26, 27, and 30 in FY00
- Begin RD for Site 15 in FY00
- Complete SARs for UST Sites 14 and 23 in FY00
- Begin SARs for UST Sites 24 and 25 and begin RA for UST Site 18 in FY00
- Complete RODs for Sites 2, 11, 12, 25, 26, 27, 30, and 41 and SARs for UST Sites 15, 20, 21, 24, and 25 in FY01
- Start RD for Sites 8, 24, and 38 in FY01
- Complete Remedial Action Plans for USTs 1107, 1120, and 1159 in FY01

FY00 Funding by Phase and Relative Risk



FFIDs: PA317002775600, PA317002219800, and PA317002241800
Size: 1,492 acres
Mission: Provide logistical support for ships and service craft; overhaul, repair, and outfit ships and craft; conduct research and development; test and evaluate shipboard systems
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, heavy metals, PCBs, solvents, and VOCs
Media Affected: Groundwater and soil
Funding to Date: $20.1 million
Estimated Cost to Completion (Completion Year): $0.8 million (FY2015)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000

Philadelphia, Pennsylvania

Restoration Background

The Philadelphia Naval Complex comprises the Philadelphia Naval Shipyard (NSY), Naval Station (NS), and Naval Hospital. In December 1988, the BRAC Commission recommended closure of the Philadelphia Naval Hospital. In July 1991, it recommended closure of the Philadelphia NS and the Philadelphia NSY.

Site types at the complex include landfills, oil spill areas, and disposal areas where petroleum/oil/lubricants and heavy metals have been released into groundwater and soil. A Preliminary Assessment and Site Inspection completed in FY88 identified 15 sites.

In FY90, the installation completed Remedial Investigation and Feasibility Study (RI/FS) activities at four sites and began RI/FS activities for eight sites and Remedial Design and Remedial Action (RD/RA) activities for four sites. Removal Actions were conducted at three of four newly identified underground storage tank (UST) sites. In FY92, a RCRA Facility Assessment identified 167 solid waste management units (SWMUs) and 15 areas of concern (AOCs). The Navy began a focused RCRA Facility Investigation (RFI) to address 15 SWMUs and AOCs. The first phase of remediation was completed in FY92, and a Record of Decision (ROD) was signed for four sites. In FY93, two Interim Remedial Actions (IRAs) were completed at six sites.

Environmental Baseline Surveys were completed for the hospital in FY94 and for the shipyard and naval station in FY95. An EBS Phase II investigation required study of 57 areas at the complex. Twenty-one areas required further evaluation. During FY95, the installation signed an amended ROD, completed remediation of four sites, completed an RI and an IRA for Site 4, and initiated Removal Actions at two UST sites at the hospital. During FY96, the installation completed the RA at four sites, closed out two sites, completed a design and remedy for an RA at one UST site, initiated Removal Actions at four sites, and drafted and submitted an Environmental Impact Statement.

In FY97, the installation began riverbank stabilization at Site 5 and sand blasting grit removal at Site 2. It also completed RDs at one UST site, completed remedial activities at two other UST sites, initiated two RAs, and completed two RAs. The installation closed two sites and completed the corrective measures implementation and the RFI for an SWMU.

In FY98, RODs were signed for Sites 1, 2, and 15, and a decision document was signed to implement institutional controls on naval station property for nonresidential use.

The complex formed a Technical Review Committee in FY89 and established a Restoration Advisory Board. In FY95, an information repository was established and the Community Relations Plan was written. The complex formed a BRAC cleanup team and prepared a BRAC Cleanup Plan (BCP) in FY94. The BCP was revised in FY97.

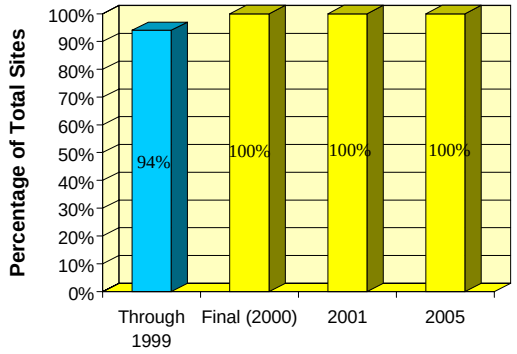
FY99 Restoration Progress

All RAs required for property transfer were completed, and Findings of Suitability to Transfer for two additional parcels were signed.

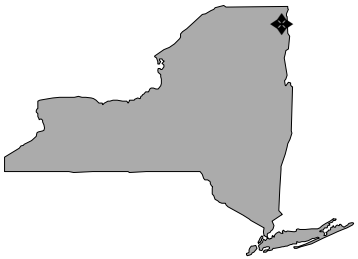
Plan of Action

- Initiate long-term monitoring in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: NY257002477400
Size: 3,447 acres
Mission: Former bomber and tanker aircraft operations
HRS Score: 30.34; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in July 1991 (effective September 1991)
Contaminants: Organic solvents, pesticides, fuels, PCBs, and lead
Media Affected: Groundwater and soil
Funding to Date: $36.9 million
Estimated Cost to Completion (Completion Year): $45.3 million (FY2191)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Plattsburgh, New York

Restoration Background

Environmental studies since FY87 identified 40 sites at this base for investigation and closure. Site types include underground storage tanks (USTs), aboveground storage tanks, landfills, industrial facilities, spill sites, and training areas. Regulatory concurrence has been received for closeout of 11 sites. The installation was placed on the National Priorities List (NPL) after the former Fire Training Area was determined to be a source of chlorinated solvents and benzene, toluene, ethyl benzene, and xylene contamination in groundwater.

The installation began a Remedial Investigation and Feasibility Study (RI/FS) in FY89. In FY91, the installation completed a Removal Action for soil contaminated with the pesticide DDT and for an abandoned UST. In FY92, a soil Removal Action was completed and a free-product removal system was constructed at the former Fire Training Area.

In FY93, the installation removed a UST that had contained DDT, closed a pretreatment facility, and removed soil contaminated with lead. The installation completed Records of Decision (RODs) for three sites and constructed two landfill caps. In FY94, the installation formed a Restoration Advisory Board (RAB).

In FY95, the installation removed soil contaminated with fuel from two sites and prepared final RODs for the Pesticide Storage Tank and a landfill. The installation received regulatory concurrence for no further action at seven sites and completed surveys for endangered species and archaeology. An installationwide Environmental Impact Statement and a comprehensive Land Reuse Plan were completed, and a Community Relations Plan was drafted.

In FY96, the groundwater treatment facility for free-product recovery at the former Fire Training Area was upgraded, and a source Removal Action using soil vapor extraction (SVE) and bioventing was initiated. Two additional Removal Actions using SVE began, and contaminated soil at three other sites was removed.

In FY97, the latest versions of the BRAC Cleanup Plan and the Environmental Baseline Survey (EBS) were completed. In FY98, two landfill caps and three contaminated-soil Removal Actions were completed. RODs for implementing institutional controls were signed for two sites. The first 5-year review of Plattsburgh Air Force Base remedial activities and a Phase II archaeological survey were completed.

FY99 Restoration Progress

Contaminated soil was removed at one site, and an RI was completed for two sites. Public and regulatory meetings were held to address and resolve comments on the groundwater impact study, and additional fieldwork was completed. Negotiations continued with the New York State Historic Preservation Office on completing a Cold War resources survey and a programmatic agreement for preservation and transfer of cultural resources associated with Plattsburgh Air Force Base.

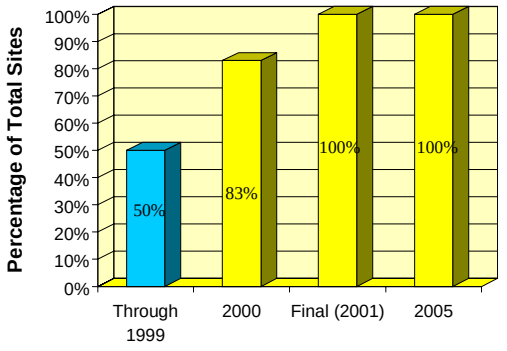
Public interest in cleanup activities at the installation increased. The RAB met eight times and participated in a site tour. The installation met with the Town of Plattsburgh and Lake Champlain Committee to resolve cleanup concerns.

The planned finalization of five RODs was delayed because of several ongoing technical issues and regulatory concerns. Decommissioning of groundwater wells is on hold until additional groundwater characterization and evaluations are complete. Evaluation of miscellaneous environmental factors, updates to the basewide EBS, and closure investigations and remediation of petroleum handling and storage facilities were delayed due to contractor delays and a focus on higher priority work.

Plan of Action

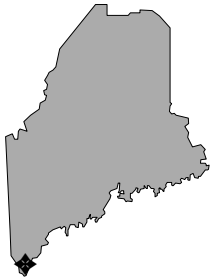
- Finalize RODs for five sites in FY00
- Complete evaluation of miscellaneous environmental factors and update basewide EBS in FY00
- Complete closure investigation and remediation of petroleum handling and storage facilities in FY00
- In FY00, complete Cold War resources survey and enter into a Memorandum of Agreement with the New York State Historic Preservation Office for preservation and transfer of historic property

Sites Achieving RIP or RC Per Fiscal Year



Portsmouth Naval Shipyard NPL

FFID: NH117002201900
Size: 278 acres
Mission: Maintain, repair, and overhaul nuclear submarines
HRS Score: 67.70; placed on NPL in May 1994
IAG Status: Federal Facility Agreement signed in 1999
Contaminants: Heavy metals, PCBs, pesticides, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $22.4 million
Estimated Cost to Completion (Completion Year): $83.4 million (FY2022)
Final Remedy in Place or Response Complete Date for All Sites: FY2011



Kittery, Maine

Restoration Background

Portsmouth Naval Shipyard was placed on the National Priorities List (NPL) in May 1994 because of groundwater contamination at sites on the island and because past activities may have adversely impacted sensitive wetland communities around and downstream of the facility.

A Preliminary Assessment in FY83 and a Site Inspection in FY86 identified four potentially contaminated sites. A RCRA Facility Assessment in FY86 identified 28 solid waste management units (SWMUs). Site types at the installation include a landfill, a salvage and storage area, and waste oil tanks. In FY92, the installation completed a RCRA Facility Investigation (RFI).

In FY94, the installation completed an interim measure at the Defense Reutilization and Marketing Office scrap yard, installed a cap on part of the scrap yard, and completed a groundwater and soil gas survey at another SWMU. The installation completed RFI fieldwork, developed onshore media protection standards (MPSs), and completed draft offshore Ecological and Human Health MPSs. Seven underground storage tanks (USTs) were removed during the RFI.

In FY95, the installation prepared final reports on fieldwork conducted in FY94. The installation developed a work plan for monitoring of the Piscataqua River and initiated an Ecological Risk Assessment (ERA) of the Piscataqua River and Great Bay Estuary. A draft Feasibility Study (FS) report for 11 SWMU sites was submitted to regulatory agencies.

In FY96, the installation began negotiating with EPA and the Maine Department of Environmental Protection (MDEP) on a Federal Facility Agreement (FFA). A work plan for investigating groundwater and seeps was completed. Another work plan was prepared for site characterizations at four SWMUs.

During FY97, the installation completed a work plan for SWMUs 10 and 29 and Phase I groundwater modeling for SWMUs 8, 9, 10, 11, and 27. The installation initiated a Removal Action at SWMU 9 and completed and signed a No Further Action document for SWMUs 12, 13, 16, and 23.

In FY98, the installation completed a work plan for Sites 30, 31, and 32 and finished Phase II groundwater modeling for SWMUs 8, 9, 10, 11, and 27. Fieldwork for SWMU 10 and Sites 29, 30, 31, and 32 was completed. The installation completed a Removal Action at SWMU 9 and initiated cleanup of the tank farm. A work plan and fieldwork for three SWMUs and two sites were completed. The basewide groundwater sampling program also was completed.

The installation's Technical Review Committee, formed in FY87, was converted to a Restoration Advisory Board (RAB) in FY95. The Community Relations Plan, developed in FY93, was updated in FY96 and FY97.

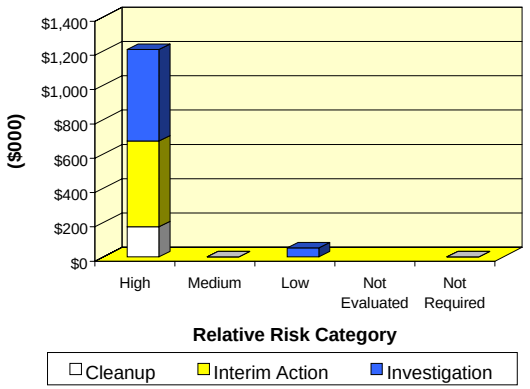
FY99 Restoration Progress

The installation completed negotiations and signed the FFA with EPA. It also completed the survey of Operable Unit (OU) 3 using a state-of-the-art metal-sensing device (MTADS) and the report for basewide groundwater sampling. Completion of the offshore ERA was delayed for completion of an interim Record of Decision (ROD) and Round 1 of interim monitoring for OU4, Offshore Areas of Concern. Phase II onshore/offshore contaminant fate-and-transport modeling was completed.

Plan of Action

- Complete ERA in FY00
- Complete Site Screening Report for three sites in FY00
- Complete supplemental Remedial Investigation report for two sites in FY00
- Complete FS for OU3 (Jamaica Island Landfill) in FY00
- Complete ROD for OU3 in FY01

FY00 Funding by Phase and Relative Risk



FFID: CA921372067600
Size: 27,827 acres
Mission: Housed 7th Infantry Division (Light); supports the Defense Language Institute Foreign Language Center, currently at the Presidio of Monterey, California
HRS Score: 42.24; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in July 1990
Contaminants: VOCs, petroleum hydrocarbons, heavy metals, and pesticides
Media Affected: Groundwater and soil
Funding to Date: $193.1 million
Estimated Cost to Completion (Completion Year): $334.8 million (FY2033)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003

Marina, California

Restoration Background

From 1917 to 1994, Fort Ord served primarily as a training and staging installation for infantry units. In July 1991, the BRAC Commission recommended closing Fort Ord and moving the 7th Infantry Division (Light) to Fort Lewis, Washington. The Army closed Fort Ord in September 1994.

In FY87, a hydrogeological investigation identified the sanitary landfills at Fort Ord as potential sources of contamination for the city of Marina's backup drinking water supply well. In FY89, a Remedial Investigation and Feasibility Study (RI/FS) began for the landfills. In FY90, a Preliminary Assessment and Site Inspection identified 61 sites, including landfills, underground storage tanks, motor pools, family housing areas, a fire training area, an 8,000-acre impact area, and an explosive ordnance disposal area. The installation determined that petroleum hydrocarbons and volatile organic compounds (VOCs) had migrated into groundwater.

In FY94, the installation converted its Technical Review Committee (TRC) to a Restoration Advisory Board (RAB) and formed a BRAC cleanup team (BCT). In FY95, the installation constructed a groundwater treatment system at the post landfill and completed a Record of Decision (ROD) for Fritzsche Army Air Field (FAAF) Operable Unit (OU) 1.

In FY96, the Army completed Proposed Plans (PPs) and a ROD for the RI sites and remediation of lead-contaminated soil at the Beach Ranges Site 3. The Army began to cap the OU2 landfill and construct a groundwater pump-and-treat system. The landfill, with a groundwater treatment system, was proposed as a corrective action management unit to allow consolidation of waste. In FY97, the BCT completed a ROD for remedial sites, an interim ROD for Site 3, and an explanation of significant differences for OU2.

In FY98, the installation completed design of the Site 12 groundwater pump-and-treat system, waste removal at six sites, and closure and cap construction for 143 acres of the 150-acre landfill. It also consolidated over 300,000 cubic yards of waste into OU2 and recycled over 750,000 pounds of lead from Site 3. It prepared a report on potential disposal areas at FAAF and completed Removal Actions at Sites 34 and 39a for clean closure. The Army completed Phase I and Phase II Engineering Evaluations and Cost Analyses (EE/CAs) addressing Removal Actions for ordnance and explosives (OE) sites. EPA and California EPA concurred on the Phase I EE/CA and Action Memorandum (AM) 1 for the 12 No Action OE sites. In light of the Army's notice that it would conduct an RI/FS of OE at the former Fort Ord, a federal district court dismissed a lawsuit challenging the Army's approach to UXO response activities at the installation. The RI/FS is ongoing.

FY99 Restoration Progress

Long-term monitoring data for OU1 and OU2 groundwater treatment systems indicated the need for specific construction enhancements, which were designed and approved. The installation constructed a groundwater pump-and-treatment system for Site 12 and drafted an OE work plan for a recurring review report for EE/CA Phase I sites. Assessment or cleanup of sites affected by OE continued; however, because of completion of the Phase II AM, all ongoing OE clearance activities will transition to Non-Time-Critical Removal Actions (NTCRAs). The installation began a multiphase RI/FS for OE and completed Remedial Action (RA) and post-remediation risk assessment reports, except those addressing Site 39.

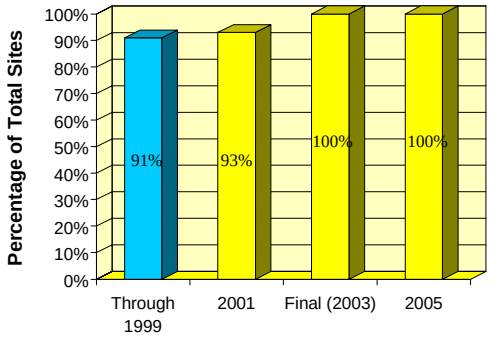
The installation could not prepare an agreement for cleanup of OE due to delays in the development of appropriate agreement language. The Ecological Risk Assessment, PP, and final ROD for Site 3 are awaiting review of confirmation sampling results. The Army did not complete waste removal at Site 39 because the area requiring RA is much larger than anticipated. The installation submitted a RCRA closure plan for three sites for regulatory review; however, only one plan was reviewed and implemented. The installation could not complete the planned FOSTs due to the OE lawsuit.

The installation reestablished the TRC and dissolved the RAB, but developed alternative public outreach initiatives to provide for public input. The Strategic Management Analysis Requirement Technology team was established to address OE cleanup.

Plan of Action

- Continue NTCRAs for OE sites in FY00
- Complete RCRA closures for Building T-111 and the former open-burn/open-detonation area in FY00
- Review two Findings of Suitability for Early Transfer in FY00
- Begin construction enhancements for the groundwater treatment systems at OUs in FY00
- Continue RA at Site 39 in FY00–FY01

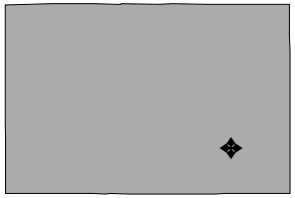
Sites Achieving RIP or RC Per Fiscal Year



Pueblo Chemical Depot

BRAC 1988

FFID: CO821382072500
Size: 23,121 acres
Mission: Store chemical munitions
HRS Score: NA
IAG Status: None
Contaminants: Heavy metals, petroleum/oil/lubricants, VOCs, SVOCs, pesticides, explosives, PCBs, and UXO
Media Affected: Groundwater and soil
Funding to Date: $79.4 million
Estimated Cost to Completion (Completion Year): $89.8 million (FY2030)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2011



Pueblo, Colorado

Restoration Background

In December 1988, the BRAC Commission recommended realignment of the Pueblo Depot Activity, primarily because of chemical demilitarization. In October 1996, the Army placed Pueblo Depot Activity under the Chemical and Biological Defense Command and changed its name to Pueblo Chemical Depot. Sites include a landfill, open burning and detonation grounds, an ordnance and explosives waste area, lagoons, former building sites, oil-water separators, a TNT washout facility and discharge system, and hazardous waste storage units. Heavy metals, volatile organic compounds (VOCs), and explosives are the primary contaminants affecting soil and groundwater.

Between FY89 and FY94, the Army conducted RCRA Facility Investigations (RFIs) for 45 solid waste management units (SWMUs). In FY94, the installation formed a Restoration Advisory Board (RAB) and a BRAC cleanup team (BCT). The installation completed a final CERFA report, and the community formed a Local Redevelopment Authority, which prepared a Land Reuse Plan.

In FY95, the installation constructed a groundwater extraction and treatment system to remediate and prevent off-site migration of contaminated groundwater. RFI and corrective measure work also began on seven additional SWMU sites.

In FY96, the installation conducted cleanup and removal of TNT washout buildings and identified the source of TNT by-products in an off-post spring. The installation developed Team Pueblo to coordinate public involvement in restoration, reuse, closure, and cleanup activities.

In FY97, the Environmental Baseline Survey (EBS) and the Finding of Suitability to Lease (FOSL) were completed for 74 buildings, which were released for reuse. Demolition of TNT buildings, clearance of unexploded ordnance, removal of the deactivation incinerator and 6 underground storage tanks, decontamination of 2 buildings, and demolition of 28 structures also occurred. RFI work also began on three new SWMU sites.

In FY98, the installation completed soil removal at the TNT washout lagoons (SWMU 17) and stored the contaminated soil in permitted buildings for eventual treatment. A temporary groundwater filter unit was installed at Ciruli Spring to remove TNT contamination from a drinking water source. An EBS and a FOSL were completed for 766 buildings. One additional SWMU site was identified.

FY99 Restoration Progress

The installation implemented full-scale bioremediation of the 21,000 cubic yards of TNT-contaminated soil excavated from SWMU 17. Groundwater treatment at the landfill and Ciruli Spring and soil remediation at the area south of B Block continued. The installation postponed hot spot removal within the landfill because of funding constraints. A hot spot consisting of soil contaminated with TCE was identified near monitoring well CM1, which led the state to designate CM1 as a new SWMU site. The Army is investigating off-installation contamination discovered in public drinking wells and associated with the TNT washout facility at SWMU 17. The Army is providing drinking water to nine off-site well water users.

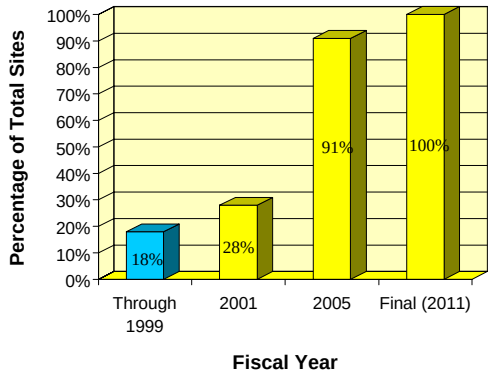
The Army cleaned up or demolished the 700 Area and 180 Series buildings. Buildings 591 and 592 were modified and repaired for use for TNT bioremediation. The installation postponed EBS, FOSL, and early transfer activities due to funding constraints and concerns about chemical demilitarization issues.

The installation submitted a No Further Action (NFA) methodology report and a justification package for six SWMUs to the state for approval of NFA designation in the RCRA Part B permit. By reducing the analytes to be tested, the sitewide groundwater monitoring program was simplified and condensed. The Army conducted an independent technical review of the environmental cleanup program, which resulted in numerous recommendations on the installation's overall strategy and on specific technical issues. A new SWMU site was identified by the state in the 700 Building area. The BCT prepared a draft final version of BRAC Cleanup Plan version 3, but funding constraints and chemical demilitarization issues delayed the plan's completion. RAB members approved the RAB charter.

Plan of Action

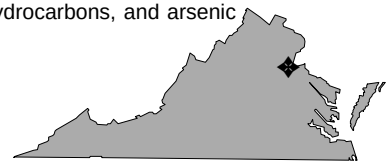
- Delete five SWMUs from the RCRA Part B permit in FY00
- Implement the CM1 corrective measure in FY00
- In FY00, define nature and extent of off-site contamination related to the TNT washout facility
- Complete the RFI work plan for Mercury Storage Building 543 and version 3 of the BCP in FY00
- Optimize sitewide groundwater monitoring program in FY00
- Complete bioremediation of 21,000 cubic yards of TNT-contaminated soil in FY00–FY01
- Design and implement corrective measure for off-site contamination related to the TNT washout facility and hot spot removal at the landfill in FY01

Sites Achieving RIP or RC Per Fiscal Year



Quantico Marine Corps Combat Development Command — NPL

FFID: VA317302472200
Size: 60,000 acres
Mission: Provide military training and support research, development, testing, and evaluation of military hardware
HRS Score: 50.00; placed on the NPL in June 1994
IAG Status: RCRA FFCA signed December 31, 1991; Federal Facility Agreement signed February 4, 1999
Contaminants: PCBs, pesticides, VOCs, phenols, heavy metals, petroleum hydrocarbons, and arsenic
Media Affected: Surface water, groundwater, sediment, and soil
Funding to Date: $35.3 million
Estimated Cost to Completion (Completion Year): $100.7 million (FY2014)
Final Remedy in Place or Response Complete Date for All Sites: FY2014



Quantico, Virginia

Restoration Background

Quantico Marine Corps Combat Development Command operated a municipal landfill throughout the 1970s. After the 26-acre landfill closed, the area was used by the Defense Reutilization and Marketing Office as a scrap yard. During that time, polychlorinated biphenyl (PCB)–containing transformers were drained onto the ground so that copper and transformer casings could be recovered. Contamination at the old landfill area was the primary reason for the installation's placement on the National Priorities List (NPL). Other sites at the installation include surface disposal areas, underground storage tanks (USTs), and disposal pits that contain contaminated soil, surface water, and sediment.

Since FY81, 260 solid waste management units (SWMUs) have been identified at Quantico. Naval data show an official count of 28 Installation Restoration sites, 71 SWMUs, and 2 USTs. Between FY81 and FY94, the installation completed Preliminary Assessments (PAs) for 17 sites and 24 SWMUs, Site Inspections (SIs) for 7 sites, RCRA Facility Assessments for 4 SWMUs, and RCRA Facility Investigations for 5 SWMUs. A Corrective Measures Study was completed for one SWMU. In addition, initial site characterizations were completed for two UST sites, and an investigation was completed for one UST site.

The installation has completed several Interim Remedial Actions (IRAs), including in situ soil treatment and long-term monitoring (LTM) for one SWMU; removal of PCB-contaminated soil and scrap metal from two sites; removal and incineration of pesticide- and arsenic-contaminated soil from one site; installation of runoff controls at one site; removal of waste from an embayment and placement of a stone revetment along the shoreline; and removal of petroleum-contaminated drums, tanks, and bulk containers from a UST site.

During FY95, the installation completed a Corrective Measures Design (CMD), began corrective measures implementation (CMI), and started capping a landfill for one SWMU. CMD, CMI, and final Remedial Action (RA) for removal of contaminated soil also were completed. Operations and maintenance and LTM were initiated for two SWMUs.

During FY96, the installation prepared Remedial Investigation and Feasibility Study (RI/FS) work plans for seven sites. In FY97, the installation signed a Record of Decision (ROD) for one site, began two early actions, and began LTM for one SWMU and RI/FSs for several sites. In FY98, the IRA for capping the landfill was completed. IRAs also were completed at two UST sites.

A Technical Review Committee was formed in FY89. In FY92, the installation established three information repositories, each containing a copy of the administrative record. In FY95, a Community Relations Plan was completed.

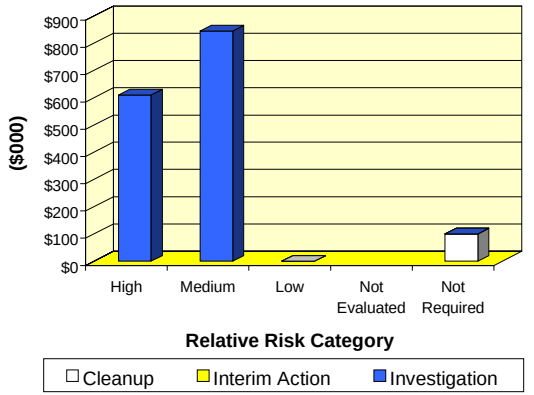
FY99 Restoration Progress

An RI is under way at Site 20, and an FS is nearing completion at Site 4. Two No Further Action (NFA) RODs are being prepared for signature for Sites 1 and 5. The Site 17 ROD was put on hold until the RI/FS is completed. Proposed Remedial Action Plans for Sites 1 and 17 were completed. Site screenings at 15 areas of concern were completed. Based on the results of the screening, all but two of the sites will require further investigation. Two SWMUs were closed. Sampling reports for 20 sites and 5 site screening areas are on hold, pending the completion of the basewide background report. Of the 260 sites identified at Quantico, 99 are being investigated, 157 are awaiting investigation, and 4 have been recommended for NFA. With the basewide background report nearly finalized, it is possible that many of the 99 sites currently under investigation will be recommended for NFA. A Federal Facility Agreement was signed in February 1999.

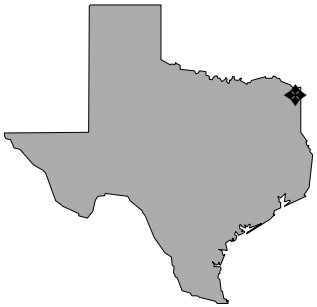
Plan of Action

- Finalize and sign NFA RODs at Sites 1 and 5 in FY00
- Update and finalize RI at Site 17 in FY00
- Complete basewide background report in FY00
- Complete SIs at 35 sites in FY00
- Complete PAs at 40 sites in FY00
- Complete site screening process at 10 sites in FY00
- Finalize RI and initiate FS at Site 20 in FY00
- Finalize FS at Site 4 in FY00

FY00 Funding by Phase and Relative Risk



FFID: TX621382073800
Size: 19,081 acres (includes 625 acres that have been transferred to LRA in June 1999)
Mission: Provide maintenance for light combat vehicles, support rubber production, store ammunition, and conduct training
HRS Score: NA
IAG Status: None
Contaminants: TCE
Media Affected: Groundwater, surface water, and sediment
Funding to Date: $16.2 million
Estimated Cost to Completion (Completion Year): $20.9 million (FY2002)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY2002



Texarkana, Texas

Restoration Background

In July 1995, the BRAC Commission recommended realignment of Red River Army Depot. Of 765 acres of BRAC property, 625 acres was transferred to Local Redevelopment Authority (LRA) in June 1999. All maintenance missions except those related to the Bradley Fighting Vehicle Series were recommended for relocation to other depots. The installation will retain its ammunition storage, intern training, civilian training, and rubber production missions.

Areas of environmental concern at the depot included the oil-water separator lagoons, spill sites associated with previous industrial and pre-RCRA disposal activities, and spill sites associated with pesticide storage and mixing activities. Trichloroethene (TCE) is the main contaminant affecting groundwater at the installation.

Interim Actions at the installation include removing the former Hays Treatment Plant Dunbar filter beds, demolishing buildings and Army-peculiar equipment, and removing contaminated soil. In FY95, the installation formed a BRAC cleanup team (BCT). The community formed an LRA. The installation continued its partnership with the Texas Natural Resource Conservation Commission through the Defense and State Memorandum of Agreement program. The installation removed more than 2,000 cubic yards of contaminated sediment from the north and south stormwater drainage ditches in the Wastewater Treatment Area.

In FY96, the installation commander formed a Restoration Advisory Board. The installation prepared the final draft Environmental Baseline Survey (EBS) report. The BCT prepared version 1 of the BRAC Cleanup Plan (BCP).

In FY97, the Red River Local Redevelopment Authority (RRLRA) requested that the Army modify the excess footprint at the installation to make the footprint contiguous. The new footprint total is 765 acres. Because of this change, a draft Supplemental EBS was completed. The installation completed closure of the final and intermediate lagoons at the industrial waste treatment plant.

In FY98, the installation completed sampling on the remaining 148 acres of BRAC property and prepared a Treatability Study informing the regulators of the status of the TCE-contaminated groundwater. Based on the results of the study, the installation reevaluated risk associated with the Western Industrial Area (WIA) groundwater and recommended no action. The Army completed three of four tasks in the risk assessment and a Corrective Measures Study (CMS) for nine sites. The installation also developed heavy-metals background levels for soil and prepared a master Finding of Suitability to Lease for the excess footprint.

FY99 Restoration Progress

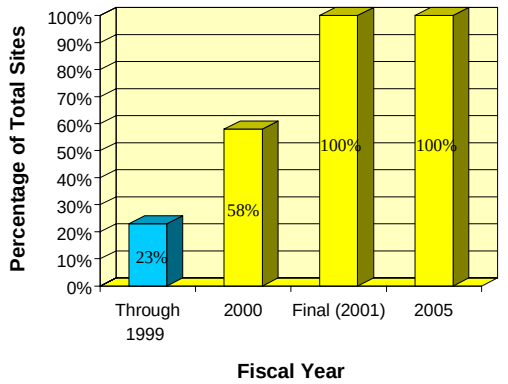
The Army proposed Remedial Actions (RAs) for five sites, but did not initiate the RAs because the sites qualified to be closed by deed notice instead of soil removal. The Army transferred 625 acres to the RRLRA and completed the draft final version of the Cultural Resources Memorandum of Agreement (MOA). The Finding of Suitability to Transfer (FOST) for all Environmental Condition of Property 1 through 4 sites was completed. The installation removed soil and sediment at the pesticide pit site to obtain closure for soil in accordance with the Texas Risk Reduction Standards.

The installation completed the BCP version 2 final draft, but completion of the final version was delayed by a change in contractor personnel. Completion of the risk assessments for the WIA and pesticide pit was delayed by BCT disagreements. The FOST for privatization of utilities was not completed because the Army did not receive a formal presentation of rates from the RRLRA to determine whether utility privatization is economical.

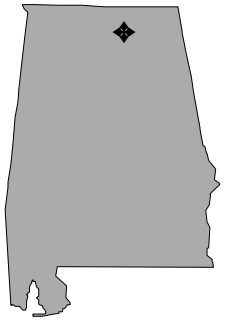
Plan of Action

- Complete BCP version 2 in FY00
- Transfer Water Tower and 68 acres to RRLRA in FY00
- Complete Cultural Resources MOA in FY00
- Complete WIA and pesticide pit risk assessment in FY00
- Complete CMS for the WIA and pesticide pit and obtain BCT approval in FY01
- Design, obtain BCT approval for, and initiate all RAs planned for excess footprint in FY01
- Initiate long-term monitoring at pesticide pit and WIA in FY02

Sites Achieving RIP or RC Per Fiscal Year



FFID: AL421382074200
Size: 38,300 acres
Mission: Army Aviation and Missile Command
HRS Score: 33.40; placed on NPL in June 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Heavy metals, solvents, CWM, and pesticides
Media Affected: Groundwater, sediment, and soil
Funding to Date: $68.4 million
Estimated Cost to Completion (Completion Year): $234.6 million (FY2015)
Final Remedy in Place and Response Complete Date for All Sites: FY2012



Huntsville, Alabama

Restoration Background

Past operations at the Redstone Arsenal (RSA) include production, receipt and shipment, storage, demilitarization, and disposal of chemical and high-explosive munitions. Commercial chemical pesticides also have been produced at the installation. RSA currently conducts military research and development, manages procurement, and supports the Army's aviation and missile weapons systems.

Studies beginning in FY77 have identified 298 sites at RSA. Of these sites, 216 are Army sites and 82 are sites at Marshall Space Flight Center (MSFC), which is the responsibility of NASA. Site types include past disposal sites, landfills, open burning and open detonation (OB/OD) areas, chemical munitions disposal sites, and solvent spill sites. Primary contaminants of concern are heavy metals, solvents, chemical weapons/munitions (CWM), and pesticides.

In FY94, Interim Remedial Actions (IRAs) began at three dismantled lewisite manufacturing plants and at the closed portions of the OB/OD grounds. Also in FY94, RSA formed a Technical Review Committee and established information repositories at five locations. In FY95, the Army identified 11 sites as requiring no further action (NFA). The installation completed three IRA designs, including three groundwater extraction and treatment systems and a RCRA cap.

In FY96, Site Inspection fieldwork began at 38 sites, Remedial Investigation (RI) activities continued at 39 sites, and Feasibility Study (FS) activities began at 10 sites. The Army constructed a groundwater extraction system and an air stripper and began treating contaminated groundwater in the upper aquifer at the Closed Unlined Sanitary Landfill. RSA officials surveyed the public to determine community interest in forming a Restoration Advisory Board. Little interest was expressed.

In FY97, the installation completed the RCRA cap for the closed lewisite manufacturing plant. All fieldwork for a Removal Action involving an industrial septic tank system was completed. The Army completed NFA decision documents (DDs) for three sites and Proposed Plans for four sites. The installation organized sites into operable units (OUs) and developed an installationwide RI work plan.

In FY98, the Army completed construction and start-up of the groundwater extraction and treatment plant at the OB/OD grounds. The installation submitted a DD and six interim Records of Decision (RODs) for regulator review. Construction of the soil vapor extraction (SVE) system for solvent-contaminated soil began at the OB/OD grounds. A horizontal well was used to dewater the soil for this system.

FY99 Restoration Progress

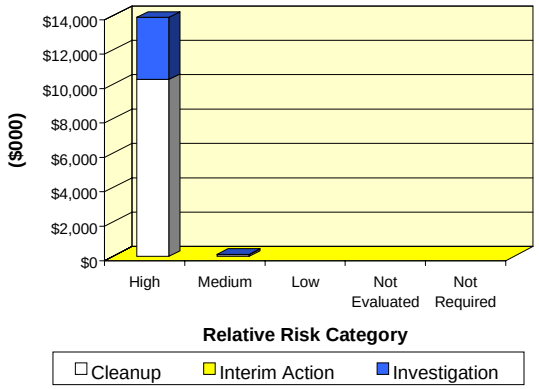
Negotiations continued toward a Federal Facility Agreement (FFA). RSA also completed nine RI/FSs and integrated the SVE system with the existing RSA-13 treatment plant. Completion of the groundwater remediation system at OU10 was delayed due to placement of the effluent discharge line; however, the equipment foundation pad and 50 percent of the effluent pipeline were installed.

The installation closed out OU3 with an NFA ROD. Other RODs were delayed because of regulator issues. The installation closed out MSFC-60 with an NFA DD. It also initiated design of two remediation systems to control contaminant source migration to off-post receptors. RSA further reduced contaminant sources by using SVE and air-stripping technologies at OU14 and OU10, respectively. Operation of the remediation system at the former RSA Rocket Engine Facility North Plant was not completed due to a delay in availability of construction parts.

Plan of Action

- Complete negotiations for the FFA in FY00
- Complete two Removal Actions in FY00 at a waste accumulation area and a rock quarry
- Close out OUs 1, 6c, and 13 with RODs for five sites in FY00
- Begin operating remediation system at the former RSA Rocket Engine Facility North Plant in FY00
- Complete eight RI/FSs and prepare up to eight Remedial Designs and Proposed Plans in FY00
- Continue to participate in the Alabama Partnering Initiative in FY00
- Install site fencing as an institutional control in OU6, OU8, and OU15 in FY00
- Extend the existing soil caps on two arsenic waste lagoons in FY00

FY00 Funding by Phase and Relative Risk



FFID: TX857152409100
Size: 2,987 acres
Mission: Conducted pilot training
HRS Score: NA
IAG Status: Federal Facility Agreement signed in 1987 and closed in June 1999
Contaminants: VOCs, petroleum/oil/lubricants, metals, pesticides, and herbicides
Media Affected: Groundwater and soil
Funding to Date: $74.6 million
Estimated Cost to Completion (Completion Year): $46.3 million (FY2029)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999

Lubbock, Texas

Restoration Background

In July 1995, the BRAC Commission recommended closure of Reese Air Force Base, which is used for pilot training and related activities. The installation closed in September 1997.

Preliminary Assessments and Site Inspections conducted from FY84 through FY88 identified 13 sites, including landfills, surface impoundments, underground storage tanks (USTs), sludge spreading areas, industrial drain lines, and fire training areas.

In FY93, the installation began an Interim Remedial Action (IRA) in which an alternative source of drinking water was provided to off-base residences and businesses whose well water was contaminated. Studies determined that the base was the source of trichloroethene (TCE) contamination in the sole-source aquifer for the region. An Environmental Working Group was formed in FY93 to expedite restoration.

In FY95, the installation reached an agreement with the State of Texas to implement an IRA for controlling a plume of TCE-contaminated groundwater. Under the IRA, the base installed a groundwater extraction and treatment system with an air stripper to treat groundwater contaminated with TCE and other volatile organic compounds (VOCs). A Restoration Advisory Board was formed.

In FY96, the installation began a Corrective Measures Study to address contaminated media identified during a RCRA Facility Investigation (RFI) and completed construction of a soil vapor extraction system. A BRAC cleanup team (BCT) was established.

In FY97, the installation completed the RFI initiated in FY96 and began RFIs at 20 solid waste management units. Wells were installed at the boundary of the installation, and an Environmental Baseline Survey and an Environmental Impact Survey were completed.

In FY98, RCRA Permit Closure Reports were submitted to the regulators for Picnic Lake and Golf Course Lake. The industrial drain line was cleaned, and 14 USTs were removed. The design of the composite cap at the Southwest Landfill began.

FY99 Restoration Progress

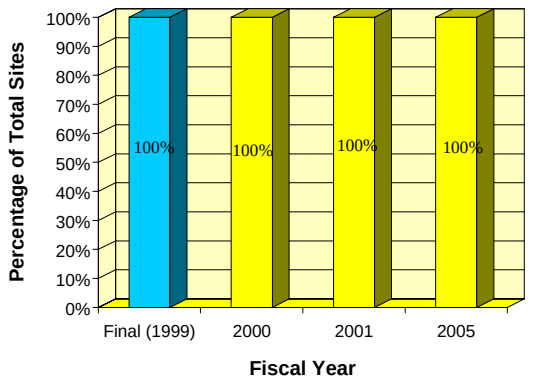
Two large pump-and-treat systems were constructed to remediate two TCE plumes, which extend off base. A 24-acre RCRA landfill cap was completed, and all necessary real estate transactions were finished. All remaining USTs, aboveground storage tanks, and oil-water separators were removed. Lead-contaminated soil was removed from the small-arms firing range, and the site was closed. The closure certification report for the Picnic Lake and Golf Course Lake RCRA permit was approved; the process to modify the permit is under way. The modification will delete the Picnic Lake and Golf Course Lake from the permit.

The installation reached the Final Remedy in Place milestone in September 1999, only 24 months after base closure. All investigation and closure reports have been completed and approved by the regulatory agencies. The BCT achieved a cost avoidance of $9.6 million through partnering, innovative process management, and expedited Remedial Actions.

Plan of Action

- Construct off-base water lines in contaminated areas to reduce long-term liabilities and costs in FY00
- Achieve Operating Properly and Successfully determination in FY00
- Continue to optimize long-term costs, including costs for groundwater monitoring and system operations, in FY00
- Complete a Finding of Suitability to Transfer for 2,400 acres in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: MO757002429200
Size: 428 acres
Mission: Housed the 442d Fighter Wing; supported A-10 aircraft
HRS Score: NA
IAG Status: None
Contaminants: Petroleum/oil/lubricants, PAHs, PCBs, VOCs, and heavy metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $6.3 million
Estimated Cost to Completion (Completion Year): $1.4 million (FY2008)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003

Kansas City, Missouri

Restoration Background

In July 1991, the BRAC Commission recommended closure of Richards-Gebaur Air Reserve Station, the transfer of the 442d Tactical Fighter Wing to Whiteman Air Force Base, and the transfer of the 36th Aeromedical Evacuation Squadron and the 77th and 78th Aerial Port Squadrons to Peterson Air Force Base. The installation was closed on September 30, 1994.

Environmental studies have been in progress at the installation since FY82. Prominent site types include a fire training area, vehicle maintenance areas, hazardous waste drum storage areas, fuel storage areas, and underground storage tanks (USTs). The installation conducted several Interim Remedial Actions (IRAs), including soil bioventing, removal of contaminated soil, and removal of polychlorinated biphenyl (PCB)–contaminated equipment. In FY95, the installation completed an IRA involving the removal of two USTs. The installation also installed a passive soil bioventing system at a former UST site.

An Environmental Baseline Survey (EBS) was completed in FY94. The installation uses interim leases to lease parcels to the Kansas City Aviation Department (KCAD). Runway and aviation support facilities were transferred to KCAD before the installation was closed. Facilities permitted to the Marine Corps were also available for immediate reuse. Supplemental EBSs are used as attachments to Finding of Suitability to Lease and Finding of Suitability to Transfer documents as further property is leased and transferred.

In FY97, a groundwater survey was conducted for the central drainage area and five sites. The EBS was revised.

In FY98, the installation's BRAC cleanup team (BCT) agreed to institute the state's Cleanup Levels for Missouri (CALM) guidance. The BRAC Cleanup Plan was updated. Fourteen USTs were registered and closed. Installation Restoration Program (IRP) decision documents were signed by the BCT, resulting in the closure of three areas of concern. The remaining property was leased to KCAD under an interim lease. Memorandums of Agreement were signed with the Army (for the Belton Training Complex) and the Marine Corps (for presently occupied Marine facilities). The installation IRP is being managed from Rickenbacker Air National Guard Base in Columbus, Ohio, because the Air Force closed the environmental office at Richards-Gebaur.

The station holds quarterly Restoration Advisory Board (RAB) meetings to keep the public informed of ongoing environmental activities at the base.

FY99 Restoration Progress

A basewide Evaluation and Consolidation Study was completed. The installation began a basewide Remedial Investigation and Feasibility Study (RI/FS). Remedial Action (RA) began at 15 additional sites slated for closure.

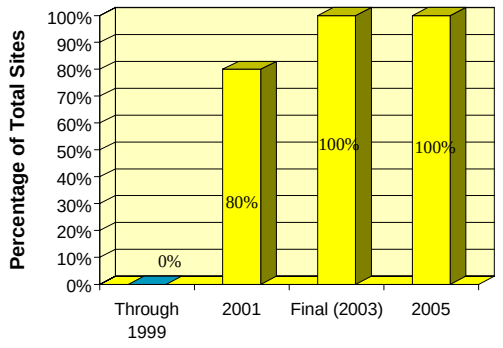
The BCT agreed to use the promulgated CALM guidance as closure guidelines for the installation, in conjunction with other Applicable or Relevant and Appropriate Requirements. The BCT also attended several partnering meetings. The RAB met quarterly.

Closure investigations and transfer of Parcels K and L have been delayed because of changed funding priorities. Both parcels are offered for public sale by the General Services Administration and will be leased in the interim. Closure of eight additional former UST sites was also delayed because of funding issues.

Plan of Action

- Investigate the fuel hydrant line and the industrial waste line in FY00
- Complete closure of eight UST sites, the industrial waste line, and the fuel hydrant line in FY00
- Continue the basewide RI/FS in FY00
- Close up to 15 additional sites in FY00
- Complete most necessary RAs in FY00
- Complete remaining RAs and transfer remaining Air Force property by FY03

Sites Achieving RIP or RC Per Fiscal Year



FFID: OH557002454400
Size: 2,016 acres
Mission: Provide base of support for one fighter wing, one refueling wing, and one airlift group
HRS Score: 50.00; proposed for NPL in January 1994
IAG Status: None
Contaminants: Pesticides, paint, spent fuel, waste oil, solvents, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: $22.2 million
Estimated Cost to Completion (Completion Year): $5.9 million (FY2015)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001

Columbus, Ohio

Restoration Background

In July 1991, the BRAC Commission recommended closure of Rickenbacker Air National Guard Base. In July 1993, realignment was recommended rather than base closure. The installation was realigned on September 30, 1994. Rickenbacker was recommended for listing on the National Priorities List (NPL) because of the potential effects of contamination on underlying groundwater, which supplies drinking water to 150,000 residents in nearby communities.

A Restoration Advisory Board formed and a basewide Environmental Baseline Survey was completed in FY94. In FY95, the final Environmental Impact Statement was published and a Record of Decision (ROD) was signed.

From FY96 through FY97, a supplemental Remedial Investigation (RI) and report were completed. Remedial Actions (RAs) included removal of 59 underground storage tanks (USTs), 28 aboveground storage tanks, and asbestos; closure of abandoned fuel lines; and demolition of the heat and water plant lagoons. A Treatability Study (TS) and a risk assessment began at the former hazardous waste storage area (HWSA) to investigate potential risk-based closure of the facility. No Further Remedial Action Planned (NFRAP) documents were signed for 16 Installation Restoration Program (IRP) sites and 3 areas of concern (AOCs). Seven other IRP sites were closed with regulatory concurrence.

In FY98, the installation published a final Phase II RI report, a draft final Feasibility Study (FS) for five IRP sites, and a draft scientific management position paper on the ecological risk associated with the basewide storm drainage system (Site 25).

Twelve NFRAP documents were signed, covering nine IRP sites and three AOCs. An amended closure plan for the former HWSA (IRP Site 1) was submitted to Ohio EPA. RAs included removal of three USTs at Facility 544 and contaminated soil at two former gas stations, Sites 6 and 45. Final investigations of petroleum-contaminated soil were conducted along an abandoned fuel line, at two pump houses, and at Facility 544. Remedial Design (RD) began for five IRP sites.

FY99 Restoration Progress

The final FS was published, and the Proposed Plan, draft RA decision document, and RD were completed for five IRP sites. RA was not initiated at the sites because of delays in completing the RA decision document. The closure plan for Site 1 was reevaluated.

The ecological risk situation at Site 25 was discussed but remains unresolved. TSs for groundwater were required for the abandoned fuel line and two pump houses before the Remedial Action Plans (RAPs) could be completed; however the installation did begin removing petroleum-contaminated soil at these sites.

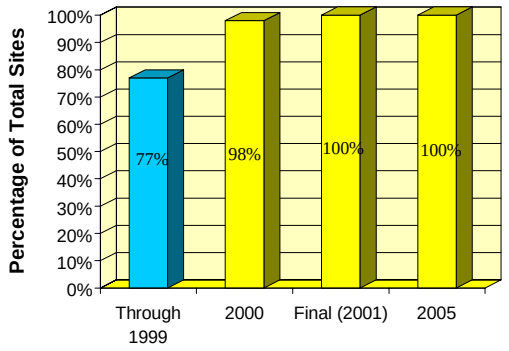
Response Complete (RC) status was achieved for IRP Site 6. RC status for five additional sites was delayed because of ecological risk, transfer, and regulatory approval issues. Additional soil and groundwater sampling was completed at Facility 544.

The BRAC cleanup team meets monthly.

Plan of Action

- Complete RAPs, construct RA, and begin monitored natural attenuation at five IRP sites in FY00
- Achieve site closure for six IRP sites in FY00
- Analyze the sampling results from Facility 544 and determine whether additional remediation is required in FY00
- Complete the RAPs, remove petroleum-contaminated soil, and install groundwater treatment systems at the abandoned fuel line and two pump houses in FY00
- Amend the RCRA post-closure plan for Site 1 to include groundwater remediation in FY00

Sites Achieving RIP or RC Per Fiscal Year



Riverbank Army Ammunition Plant NPL

FFID: CA921382075900
Size: 172 acres
Mission: Manufacture grenades, projectiles, and steel cartridge casings
HRS Score: 63.94; placed on NPL in February 1990
IAG Status: IAG signed in April 1990
Contaminants: Chromium, cyanide, and zinc
Media Affected: Groundwater and soil
Funding to Date: $43.1 million
Estimated Cost to Completion (Completion Year): $18.6 million (FY2015)
Final Remedy in Place and Response Complete Date for All Sites: FY1998

Riverbank, California

Restoration Background

In 1942, the Army constructed what is now the Riverbank Army Ammunition Plant as an aluminum reduction plant to supply military requirements. Since 1951, the installation has manufactured steel cartridge cases for the Army and the Navy. Other manufactured products include grenades and projectiles, which the Army ships to other ammunition plants for loading operations.

In FY85, chromium was detected in drinking water wells at residences west of the installation. As an Interim Action, the installation began a quarterly groundwater monitoring program. The Army provided alternative water supplies from deeper groundwater wells to five residences with contaminated wells. A Preliminary Assessment and Site Inspection identified the following sites: an industrial wastewater treatment plant, an abandoned landfill, and four evaporation and percolation ponds located north of the plant near the Stanislaus River.

An FY90 Interim Action included construction of a groundwater extraction and treatment system. In FY92, the Army constructed a water distribution system for 70 nearby residences. In FY93, the regulatory agencies approved the final Remedial Investigation and Feasibility Study report, and the Army presented the Proposed Plan to the public for review. The plan recommended (1) expansion of the groundwater extraction and treatment system to provide complete capture of the contaminated groundwater plume and (2) placement of a final cap over the abandoned landfill.

In FY94, the installation completed a Removal Action at the four evaporation and percolation ponds and received approval from EPA and the state regulatory agency for the first installationwide Record of Decision. The installation also formed a Technical Review Committee, which meets monthly. In FY95, the installation completed construction of the landfill cap.

In FY96, the Army constructed the off-site groundwater extraction system to minimize migration of the plume and to demonstrate capture of the plume. The installation began a maintenance program for the landfill cap.

In FY97, the installation completed expansion of the groundwater extraction and treatment system and began long-term monitoring (LTM). The petition to delete the installation from the National Priorities List (NPL) was submitted. EPA approved the preliminary Closeout Report and the Remedial Action Completion Report. Riverbank became the first DoD installation on the NPL to reach the construction complete milestone.

In FY98, the installation eliminated chemical use at the interim groundwater treatment system by using an ion exchange system to remove chromium and cyanide contaminants from the groundwater.

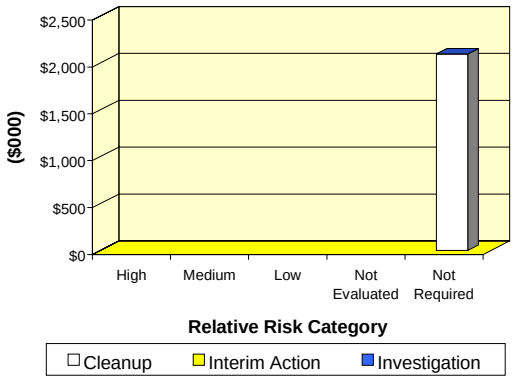
FY99 Restoration Progress

The installation continued to optimize the groundwater treatment system. The Army added the successful ion exchange system to the overall treatment system. This addition resulted in a 40 percent reduction in operating costs in its first year of implementation. The installation began an optimization effort to further reduce LTM costs.

Plan of Action

- Complete closeout of Remedial Actions by FY03
- Achieve NPL deletion by FY03

FY00 Funding by Phase and Relative Risk



Robins Air Force Base NPL

FFID: GA457172433000
Size: 8,855 acres
Mission: Provide logistics support for aircraft
HRS Score: 51.66; placed on NPL in July 1987
IAG Status: IAG signed in July 1989
Contaminants: VOCs, paint strippers and thinners, paints, solvents, phosphoric and chromic acids, oils, cyanide, and carbon remover
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $101.1 million
Estimated Cost to Completion (Completion Year): $294.7 million (FY2033)
Final Remedy in Place or Response Complete Date for All Sites: FY2004

Houston County, Georgia

Restoration Background

In FY82, Preliminary Assessments and Site Inspections were completed for 33 sites at this installation. The most significant site is Landfill No. 4 and the adjacent Sludge Lagoon (WP-014). The site is divided into three operable units (OUs): source control (OU1), wetlands (OU2), and groundwater (OU3). Primary contaminants at the site include trichloroethene and tetrachloroethane in soil and groundwater. Since FY82, 8 additional sites have been added to the Installation Restoration Program (IRP), for a total of 41 sites.

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY86 and FY88. An interim Record of Decision (ROD) was completed for OU1 in FY91, OU2 in FY94, and OU3 in FY95. In FY93, the installation constructed run-on controls and completed the pilot-scale system for lagoon solidification at OU1. In FY94, the installation completed Phase I of the leachate collection system. In FY95, a pilot system was constructed for the Phase II leachate collection system. In FY96, the installation completed design of the Phase II leachate collection system, Sludge Lagoon solidification, design of the OU2 sediment containment system, and Remedial Design (RD) for the groundwater treatment facility at the National Priorities List (NPL) site. In FY98, the installation completed construction of the groundwater treatment facility for OU3 and the Base Industrial Area. The installation also completed the OU1 cover.

To date, 14 of the 41 IRP sites have been closed, requiring no additional cleanup funds in out years. There are six ongoing RIs, and the installation intends to add three sites to the Hazardous Waste Facility Permit for No Further Action.

A Technical Review Committee formed in FY89 was converted to a Restoration Advisory Board (RAB) in FY94. The RAB received the "Secretary of the Air Force Environmental Excellence Recognition Award." RAB meetings are held quarterly, and training and site tours are available to RAB members.

FY99 Restoration Progress

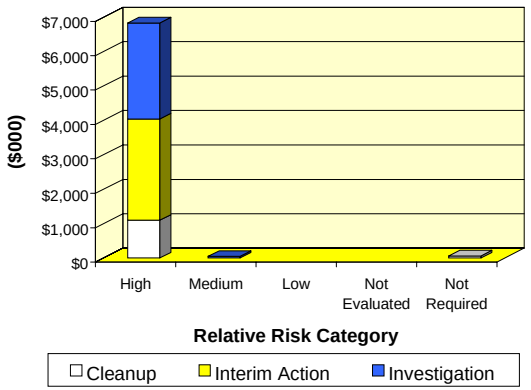
The installation completed the RD and began construction on the final Remedial Action (RA) for LF03 and OT17. Draft RCRA Facility Investigations (RFIs) were completed for OT20, SS35, SS36, and OT37 and submitted to the Georgia Environmental Protection Department (GA EPD) for approval. Fieldwork was completed at DC34 and OT38. The OU2 sediment containment project was completed.

The installation requested GA EPD approval for closure of three sites. Completion of the RCRA permit modification is needed to finalize closure. The installation continued operating the bioventing system for SS10 and the groundwater treatment plant for OT20 and LF04. Final RAs continued at SS10 and OT29, and the installation continued basewide groundwater sampling.

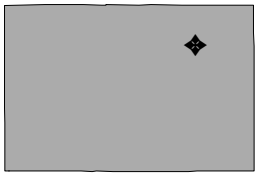
Plan of Action

- Complete RD for SS39 in FY00
- Complete RFIs and begin Corrective Action Plans for OT20, DC34, SS35, OT37, and OT38 in FY00
- Obtain final approval for site closure of FT05, FT07, and FT08 in FY00
- Continue operation of interim measures at LF04 and OT20 in FY00
- Continue final RA operations at LF03, SS10, OT17, and OT29 in FY00
- Continue basewide groundwater sampling in FY00
- Complete the Proposed Plan and the final ROD for OU1 and OU3 in FY00

FY00 Funding by Phase and Relative Risk



FFID: CO821382076900
Size: 17,228 acres
Mission: Manufactured and stored chemical munitions
HRS Score: 58.15; placed on NPL in July 1987
IAG Status: IAG and Federal Facility Agreement signed in 1989
Contaminants: Pesticides, chemical agents, VOCs, chlorinated organics, PCBs, UXO, heavy metals, and solvents
Media Affected: Groundwater and soil
Funding to Date: $958.1 million
Estimated Cost to Completion (Completion Year): $989.1 million (FY2041)
Final Remedy in Place and Response Complete Date for All Sites: FY2010



Adams County, Colorado

Restoration Background

Rocky Mountain Arsenal operated as a chemical munitions production facility from 1942 until 1982. It has been the focus of an aggressive soil and groundwater contamination cleanup program since the 1980s. Contaminated sites included liquid waste in unlined and lined lagoons and basins, open burning and detonation areas, and landfills that received both liquid and solid wastes.

In FY84, the Army completed a Preliminary Assessment and Site Inspection that identified 179 potentially contaminated sites. Subsequently, the installation was divided into two operable units (OUs): the On-Post OU and the Off-Post OU. The Army completed Remedial Investigation and Feasibility Study activities at both OUs by FY96. Identification of additional sites raised the total number to 209.

The Army has completed 14 emergency responses at 17 sites at the arsenal. Four groundwater extraction and treatment systems have been installed on site and one off site. In FY90, 10.5 million gallons of chemical wastewater and 580,000 cubic yards of contaminated soil were removed from the Basin F Area. Hundreds of drums of waste and tons of asbestos and related materials were disposed of off post. The installation closed 450 abandoned wells and the sewer systems in the South Plants, and closed and removed the former hydrazine blending facility. It also used a submerged quench incineration system to remediate liquid waste removed from Basin F. The Army later dismantled the system and removed it from the installation.

In FY94, the Army converted its Technical Review Committee to a Restoration Advisory Board (RAB).

In FY96, the Army and regulators signed Records of Decision (RODs) for both OUs. An oversight partnership formed in FY96 and developed a Remedial Design Implementation Schedule for the On-Post OU in FY97. The Army completed Remedial Designs (RDs) for chemical and sanitary sewer plugging and for the trenches remediation. The design for the consolidation area within Basin A was also completed.

In FY98, the installation's contractor completed a design for an on-site hazardous waste landfill (HWL), and construction began at the Basin A Consolidation Area and the HWL. The Army completed Remedial Actions (RAs) for chemical and sanitary sewer plugging, off-post soil tillage, the off-post water supply system, and modification of the North Boundary containment system for treatment of N-nitro-sodimthyamine. RD was completed for four of the Phase I (outlying area) RAs.

FY99 Restoration Progress

The Basin A Consolidation Area, Phase I of the HWL, and the landfill wastewater treatment system reached construction completion and are now operational. The program manager implemented an innovative waste tracking system to provide control over structural debris and excavated soil that were disposed of on site. An RA was completed for the off-post well closure. The contractor completed RD for seven RAs.

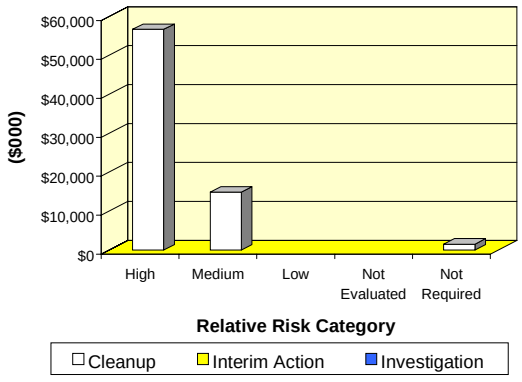
The Program Manager postponed four Phase I RDs, however, these were not critical path projects and did not impact the target completion date. The RDs for burial trench soil remediation, munitions testing soil remediation, and miscellaneous structure demolition and removal were postponed for incorporation of new field data. The RD for demolition of the South Plants agent structures was postponed for development of agent monitoring protocols. This RD delay, in turn, delayed the award of Phase I contracts. All four RDs for Phase II RAs began.

Implementation of installationwide programs and operation of groundwater treatment systems continued.

Plan of Action

- Complete RA for trench slurry walls and post-ROD Removal Actions for structures in FY00
- Complete RA for four Phase I projects and the confined flow system well closure project in FY00
- Complete RD for the four remaining Phase I projects in FY00
- Complete RD for two Phase II projects and one Phase III project in FY00
- Complete Treatability Studies for two Phase II projects in FY00
- Continue implementing installationwide programs and operating groundwater treatment systems in FY00
- Initiate CERCLA 5-year site review in FY00
- Award contracts for Phase I RAs and begin remediation in FY00
- Continue off-post and on-post water acquisition tasks in FY00

FY00 Funding by Phase and Relative Risk



FFID: CA921382078000
Size: 485 acres
Mission: Repair and maintain communications and electronic equipment
HRS Score: 44.46; placed on NPL in July 1987
IAG Status: IAG signed in 1988
Contaminants: Waste oil and grease; solvents; metal plating wastes; and wastewater containing caustics, cyanide, and metals
Media Affected: Groundwater and soil
Funding to Date: $58.4 million
Estimated Cost to Completion (Completion Year): $7.6 million (FY2004)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1997

Sacramento, California

Restoration Background

In July 1987, the BRAC Commission recommended closure of the Sacramento Army Depot. The Army decommissioned the installation in March 1995.

The installation conducted environmental studies that identified 55 sites, 47 of which required no further action. The remaining sites were divided into four operable units (OUs). The installation conducted Remedial Investigation and Feasibility Study (RI/FS) activities for the four OUs between FY89 and FY92, and an installationwide RI/FS began in FY92. The Army and regulatory agencies signed Records of Decision (RODs) for all four OUs. The Army completed the Remedial Actions (RAs) at all sites, except groundwater cleanup, which requires long-term operation.

In FY93, the installation completed the RA at the Tank No. 2 OU. This RA consisted of use of a soil vapor extraction (SVE) system to clean up soil contaminated with organic solvents. In FY94, air sparging was used to treat soil and groundwater at Parking Lot 3 and the Freon 113 Areas. Operation of an SVE system achieved Phase I cleanup goals at the South Post Burn Pits, the source of off-site groundwater contamination. Also in FY94, the installation completed a pilot-scale test of soil washing at the Oxidation Lagoons, a BRAC Cleanup Plan, and a CERFA report. The commander formed a Restoration Advisory Board in FY94.

In FY95, an installationwide ROD and the Environmental Impact Statement (EIS) for disposal and reuse were completed and signed. Other environmental restoration efforts included surveys of all asbestos and lead-based paint and radiation surveys of buildings.

In FY96, the installation completed upgrades of the groundwater treatment plant for long-term monitoring and operations. Upgrades to the system included new piping systems and additional extraction wells. Sacramento Army Depot removed the source of groundwater contamination. The installation completed an RA at the Oxidation Lagoons and the South Post Burn Pits. The soil from those two areas was treated and placed in stabilization pits. The Nuclear Regulatory Commission (NRC) approved closeout of the NRC license. In addition, EPA concurred with the determination that the treatment system at Parking Lot 3 is in place and functioning as designed.

In FY97, the Army initiated a partial National Priorities List (NPL) deletion request for areas not associated with groundwater contamination. The Army also determined that a cap for the Old Burn Pits was unnecessary.

In FY98, Finding of Suitability to Transfer (FOST) and BRAC Disposal Support Packages (BDSPs) were developed for two of the last three parcels to be transferred. The installation also identified the cause of performance problems with horizontal extraction wells installed in FY96.

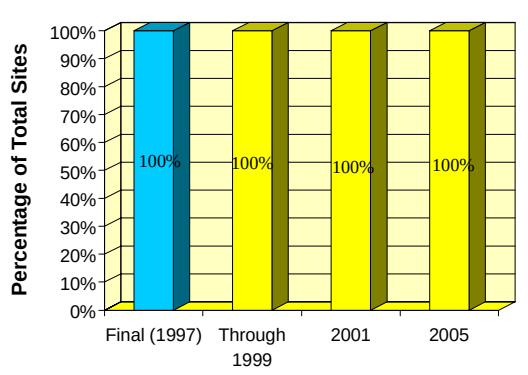
FY99 Restoration Progress

The Army completed the FOSTs and BDSPs for two of the last three parcels to be transferred. Both FOSTs have been signed, and parcel transfer is awaiting development of deed packages. The installation has received Operating Properly and Successfully designation from regulators for the South Post Groundwater Treatment Plant (GWTP), which will allow transfer of the final parcel during groundwater remediation. The U.S. Army Environmental Center (AEC) conducted an Independent Technical Review to evaluate the cost-effectiveness of the groundwater treatment system and other cleanup efforts. It also completed groundwater modeling efforts, which will be incorporated into the Plume Capture Assessment Report. Additional efforts are expected based on initial regulatory review. The approval of future closeout phases is dependent on the installation's ability to demonstrate plume capture. The Parking Lot 3 cleanup is near completion.

Plan of Action

- Complete FOST, BDSP, and covenant package for the transfer of final parcel in FY00
- Complete Closure Plan outlining strategies and requirements in FY00
- Begin closeout of Parking Lot 3 in FY00
- Continue optimization of groundwater treatment system in FY00

Sites Achieving RIP or RC Per Fiscal Year



San Bernardino Engineering Depot NPL

FFID: CA99799F558700
Size: 1,663 acres
Mission: World War II Engineer storage depot, Quartermaster repair facility, and prisoner of war camp
HRS Score: Unknown
IAG Status: None
Contaminants: TCE, PCE, and Freon 11 and 12
Media Affected: Groundwater
Funding to Date: $4.9 million
Estimated Cost to Completion (Completion Year): $1.7 million (FY2000)
Final Remedy in Place or Response Complete Date for All Sites: FY2000

San Bernardino, California

Restoration Background

The former San Bernardino Engineering Depot, commonly known as Camp Ono, consists of 1,662.82 acres and is located 4 miles northwest of central San Bernardino, California. The site of the former camp is now largely within the boundaries of that City. The property comprising Camp Ono was leased by the U.S. Army beginning on December 15, 1941. The San Bernardino Engineer Depot was used as a military storage depot, a tent repair facility, and a prisoner of war (POW) camp. For a time, the site served as part of the Communications Zone of the Desert Training Center, a large multistate area where troop maneuvers were held. Operations included routine vehicle maintenance, supply, storage, tent repair, motor pool operations, a sewage disposal system, and a station hospital. A POW camp occupied the upper reaches of the site, having taken over the station hospital 6 months after its completion. At the depot, POWs performed routine repairs on Army vehicles, loaded and unloaded stored materiel, and operated a large facility where tents and web and duck goods were repaired. The camp was closed in mid-1947, and all leases terminated by the end of 1948. Uses of the property after the Army's departure included a steel rolling mill, mineral processing, machine shops, steel fabrication, poultry farms, agricultural commodities storage, gasoline service stations, and various private manufacturing and warehousing operations. Current land development includes industrial buildings, shopping centers, multifamily apartment buildings, and single-family homes. Some areas remain undeveloped.

There are five parcels of depot property within the Newmark Groundwater Contamination Site. The site was added to the National Priorities List (NPL) in 1989, after discovery of groundwater contamination during a water supply monitoring program. The Newmark and Muscoy operable units (OUs) are located on the east and west sides of the site, respectively.

The discovery of tetrachloroethene (PCE) and trichloroethene (TCE) in the groundwater resulted in the closure of a number of water supply wells. The state brought some of the wells back into operation by installing air-stripping towers on eight wells and carbon filtration systems on the other four.

An EPA investigation was initiated in FY90 to identify the source of the Newmark plume contaminants and to identify ways of controlling continued downgradient migration while removing contaminants. EPA conducted Remedial Investigation and Feasibility Study activities in FY91, FY92, and FY95 and completed two Records of Decision in FY93 and FY94. The site has been divided into three OUs. In FY92, an investigation of the Muscoy OU was initiated. EPA separated the area into two projects in FY94: one to address the spread of contamination and the other to investigate the source of contamination.

The U.S. Department of Justice and the U.S. Army Corps of Engineers (USACE) have been working closely with EPA to investigate the nature and extent of the contamination. Efforts by USACE have included research of military archives, numerous interviews, seismic and magnetometer surveys of the subsurface, soil gas sampling, soil borings, and construction of six monitoring wells.

During FY98, USACE developed an overall investigation strategy and technical approaches for investigating potential sources. USACE's investigation work plans undergo a stringent EPA concurrence process. Consultation with the U.S. Fish and Wildlife Service was completed concerning potential impacts on several endangered species; the San Bernardino Kangaroo Rat was listed as an endangered species.

FY99 Restoration Progress

Installation of 11 soil gas borings (0 to 150 feet), installation of 3 groundwater monitoring wells, and testing of the groundwater were completed in the area of the former sewage treatment facility. A site investigation report was completed and submitted.

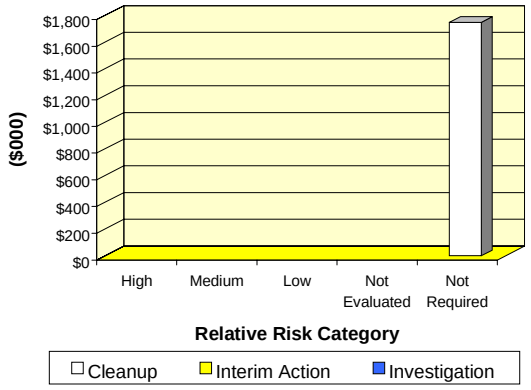
The work plan for investigation of the upper portion of Parcel 1 of the former engineering depot was approved. Under this plan, a seismic survey, 50 soil gas borings (0 to 30 feet), 20 bedrock borings, three groundwater monitoring wells, and testing of groundwater were completed. The resulting data are being analyzed.

The work plan for investigation of the former engineering depot operational sites throughout all five parcels is under development. This investigation is meant to find indications of surface releases. The work set forth in this plan will cover nine potential areas with 110 soil gas surveys.

Plan of Action

- Complete site investigation reports for upper portions of Parcel 1 in FY00
- Complete work plan and execute field activities for soil gas surveys in the vicinity of San Bernardino Engineering Depot project in FY00
- Complete the work plan and execute field activities near former non-DoD airport in FY00
- Evaluate all data that indicate presence of contaminant plumes for the possibility of surface releases in FY00

FY00 Funding by Phase and Relative Risk



FFID: CA917002320200
Size: 541 acres
Mission: Provided recruit training for enlisted personnel and specialized training for officers and enlisted personnel
HRS Score: NA
IAG Status: None
Contaminants: Paint, pesticides, solvents, and petroleum/oil/lubricants
Media Affected: Soil and groundwater
Funding to Date: $24.3 million
Estimated Cost to Completion (Completion Year): $19.3 million (FY2012)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY2012

San Diego, California

Restoration Background

In July 1993, the BRAC Commission recommended closure of this installation and relocation of personnel, equipment, and mission support to other Naval training centers. Certain installation facilities and activities will be retained to support other Naval operations in the San Diego area; 503 acres will be available for transfer. The installation closed in April 1997.

In FY86, an Initial Assessment Study identified 12 sites that might present environmental problems: five sites are being addressed under CERCLA; seven under the underground storage tank (UST) program. Sites include a landfill and petroleum-contaminated areas. In FY91, a Site Inspection (SI) was completed at one UST site and an SI and a Phase I Remedial Investigation (RI) were completed at another. In FY92, free-product removal was completed at a UST site. In FY94, the installation completed an Interim Removal Action at a landfill.

An Environmental Baseline Survey (EBS), completed in FY94, identified 85 points of interest (POIs), later increased to 93. Many POIs were designated for No Further Action (NFA). A revised EBS was completed in FY95, and a Preliminary Assessment (PA) was completed for three sites, one of which requires NFA. Remedial Designs (RDs) were completed for two sites. An Expanded SI (ESI) was completed for one UST site. Petroleum-contaminated soil was removed from three UST sites. Human Health and Ecological Baseline Risk Assessments were completed for one site.

In FY96, the installation completed an ESI and initiated an Engineering Evaluation and Cost Analysis (EE/CA) for one site. SIs were completed for two sites, one of which required NFA. An EBS identified two additional sites under the CERCLA program, and a PA/SI was completed. The installation completed an investigation at four UST sites, a Corrective Action Plan (CAP) for two UST sites, and excavation of contaminated soil at another UST site. Cleanup began at the two sites covered by the CAP. During FY97, the installation began an RI for one site and groundwater monitoring at a UST site. RD and corrective actions were completed for these UST sites. Cleanup of Sites 7 and 10 was completed.

In FY98, the installation completed site assessments for the remaining 18 POIs. An ESI began at Site 15. At Site 14, an extended site assessment was completed and an EE/CA was initiated. An RI work plan was finalized for Site 12. The long-term operations at Site 11 were completed. Site 10 confirmation sampling began. The Interim Remedial Action (IRA) at Site 1 was completed, and a basewide groundwater study began.

A Community Relations Plan was developed in FY92 and updated in FY95. A Restoration Advisory Board (RAB), a BRAC cleanup team, and an information repository containing the administrative record were established in FY94. The installation completed a BRAC Cleanup Plan (BCP), which was updated in FY98.

FY99 Restoration Progress

The installation signed the Record of Decision for an Environmental Impact Statement, transferred Site 3 to the San Diego Marine Corps Recruit Depot, and closed Site 8. EE/CA was initiated, but was not completed due to complications with the early transfer to the Port of San Diego. An Action Memorandum (AM), a Remedial Action (RA), and subsequent Remedial Action-Operations and long-term operations for Site 1 will be accomplished by the Port of San Diego.

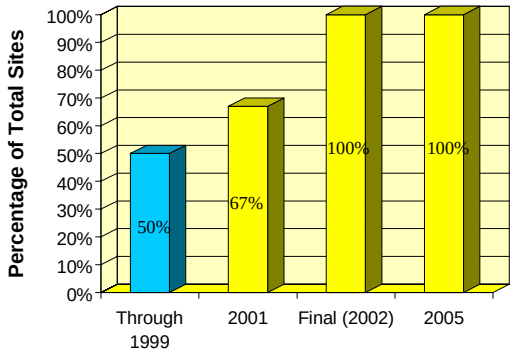
The installation completed confirmatory sampling and a closure report for Site 10 and fieldwork for the RI at Site 12. No IRA for additional soil cleanup was required at Site 11.The draft RI document and the award of the contract for the Feasibility Study (FS) for Site 12 were not completed due to delays in completing the draft RI work plan. The installation completed the EE/CA, AM, and RA for Site 14 and the ESI for Site 15, but the ESI recommended further action.

The installation updated the BCP and completed and received regulatory concurrence for the basewide groundwater study. The planned Finding of Suitability to Transfer (FOST) was not completed for all parcels due to long-term monitoring actions at Sites 8, 11, 14, and 15.

Plan of Action

- Complete EE/CA and Finding of Suitability for Early Transfer for Site 1 in FY00
- Complete RI for Site 12 and initiate FS in FY00
- Complete site closure report for Site 12 and receive approval for No Further Response Action designation in FY00
- Initiate pilot study for Site 15 in FY00
- Complete the FOST for all parcels except the Boat Channel (Site 12) in FY00
- Complete a business plan (in lieu of BCP) in FY00 and FY01
- Complete the FOST for the Boat Channel (Site 12) in FY01

Sites Achieving RIP or RC Per Fiscal Year



Sangamo Electric Dump/Crab Orchard National Wildlife Refuge

Formerly Illinois Ordnance Plant **NPL**

FFID: IL59799F221600
Size: 43,000 acres
Mission: Manufacture and load ordnance for shipping
HRS Score: 43.70; placed on NPL in July 1987
IAG Status: IAG signed in September 1991
Contaminants: Organic solvents, inorganic compounds, PAHs, PCBs, munitions, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: $0.8 million
Estimated Cost to Completion (Completion Year): $34.1 million (FY2014)
Final Remedy in Place or Response Complete Date for All Sites: FY2014

Carterville, Illinois

Restoration Background

The former Illinois Ordnance Plant, which operated from 1942 to 1945, is located on the eastern portion of the U.S. Fish and Wildlife Service's Crab Orchard National Wildlife Refuge. The ordnance plant served as a manufacturing and loading site for high-explosive shells, bombs, and other weapons components.

Thirty-three areas were identified for site investigation. These areas were grouped into four operable units (OUs): the PCB OU, the Metals OU, the Miscellaneous OU, and the Explosives and Munitions Manufacturing Area OU. EPA was established as the lead agency for the PCB OU through a Consent Decree issued to Sangamo Electric, Inc. The U.S. Fish and Wildlife Service (USFWS) is responsible for the Metals OU and the Miscellaneous Area OU. The Department of the Army, represented by the U.S. Army Corps of Engineers (USACE), is responsible for the Explosives and Munitions Manufacturing Area OU.

In FY88, a Preliminary Assessment (PA) was conducted at the areas associated with the ordnance plant. A Site Inspection (SI), focusing on 14 sites, also was completed. Results of the PA and the SI did not indicate widespread contamination. Two surface munitions bunkers were demolished in FY92. Other unsafe buildings were demolished in FY93.

In FY93, a Remedial Investigation and Feasibility Study (RI/FS) was completed for the PCB OU and the Metals OU. A Record of Decision (ROD) designating the environmental restoration alternative for the Metals OU was signed, and most Remedial Design and Remedial Action (RD/RA) activities for that OU were completed in FY95. The ROD for the PCB OU was completed.

An RI was completed to study the presence and magnitude of contamination at the Explosives and Munitions Manufacturing Area OU. Fieldwork at the OU included installation of monitoring wells, collection of soil borings and sediment samples, and excavation of magnetic anomalies. In FY95, the FS for this OU was completed, the RI began at the Miscellaneous Area OU, and an Engineering Evaluation and Cost Analysis (EE/CA) for ordnance and explosives waste (OEW) was undertaken.

In FY96, USACE completed the ROD for the Explosives and Munitions Manufacturing Area OU and began fieldwork for the OEW EE/CA. A draft report was issued; preliminary study indicated a need for institutional controls. The parties involved determined that the U.S. Fish and Wildlife Service must provide preliminary investigations for uncharacterized sites.

In FY97, the ROD for the Explosives and Munitions Manufacturing Area OU was signed, and cleanup of the PCB OU was completed. USACE expedited approval of well abandonment plans by adapting previously approved work plans.

During FY98, risk evaluations were completed for all sites. Facilitated partnering was discontinued in July 1998, at which time Illinois EPA withdrew from the partnership. The RA for hazardous, toxic, and radioactive waste and OEW at the Explosives and Munitions Manufacturing Area OU began. The USACE, EPA, Illinois EPA, and USFWS participated in formal partnering from November 1996 through July 1998.

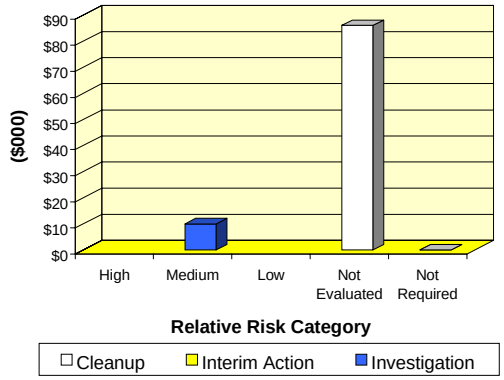
FY99 Restoration Progress

The scheduled RA for the Explosives and Munitions Manufacturing Area OU was not completed because additional contamination was found at the site, which requires removal.

Plan of Action

- Complete the RA for Explosives and Munitions Manufacturing Area OU by June 2000

FY00 Funding by Phase and Relative Risk



FFID: IL521382080300
Size: 13,062 acres
Mission: Receive, store, and demilitarize ammunition; manufacture ammunition-specific equipment
HRS Score: 42.20; placed on NPL in March 1989
IAG Status: IAG signed in 1989
Contaminants: Explosives, metals, solvents, petroleum/oil/lubricants, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $67.4 million
Estimated Cost to Completion (Completion Year): $196.4 million (FY2032)
Final Remedy in Place and Response Complete Date for BRAC Sites: FY2005

Savanna, Illinois

Restoration Background

In July 1995, the BRAC Commission recommended closure of the Savanna Depot Activity and relocation of the U.S. Army Defense Ammunition Center and School to McAlester Army Ammunition Plant in Oklahoma.

The installation began operation in 1917 as the Savanna Proving Grounds. During the 1920s, the mission changed to include storage, receipt, issuance, demilitarization, and renovation of ammunition.

Contaminants were released at landfills; the open burning and open detonation ground; the fire training area; and ammunition load, assemble, and pack facilities. Remedial Investigation and Feasibility Study (RI/FS) activities, beginning in FY89, delineated the extent of explosives-contaminated groundwater, soil, and sediment at all sites.

In FY90, a Remedial Action began at the TNT washout lagoons to remove contaminated sediment. In FY92, the Army and regulators signed a Record of Decision approving incineration of TNT-contaminated soil and sediment from the site. In FY93, the installation began full-scale sediment removal, incineration, and ash-processing.

In FY93, the Army began using high-temperature thermal treatment for cleanup of volatile organic compound (VOC)–contaminated soil at the fire training area. In FY94, the installation completed incineration of TNT-contaminated sediment. In FY95, the installation completed a trial burn for the high-temperature thermal treatment system at the fire training area.

In FY96, the Army formed a BRAC cleanup team (BCT) and a Restoration Advisory Board. The installation drafted the RI/FS report for sites with anticipated cleanups. The installation also completed RCRA closure and cleanup activities at the ammunition deactivation furnace. The BCT completed a draft Environmental Baseline Survey (EBS) report and submitted it for regulatory review.

In FY97, the installation completed cleanup of the fire training area and completed a BRAC Cleanup Plan. The Army signed a Total Environmental Restoration Contract, with Savanna as the anchor installation. In FY98, the installation developed the design for the cleanup of the reserve motor pool and completed the remediation of the polychlorinated biphenyl (PCB) vault. Remediation began in the open burning grounds (OBG).

FY99 Restoration Progress

The installation obtained funding for cleanup of the pesticide burial area and began an Engineering Evaluation and Cost Analysis (EE/CA) for a Removal Action. However, the identified pesticide is a listed hazardous waste under RCRA. Therefore, the Army postponed additional work until Army attorneys could notify the U.S. Department of Agriculture (USDA) that it is a potentially responsible party (PRP) and that the Army will attempt to recover the cleanup costs from USDA. The Removal Action is on hold.

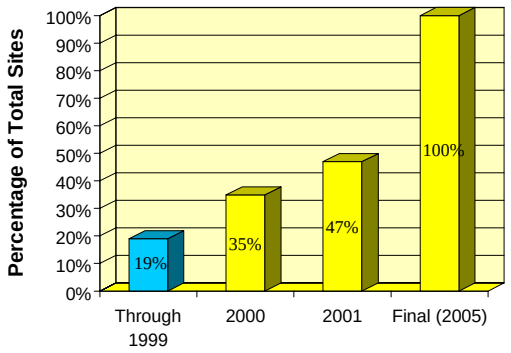
The Army completed the OBG soil pile removal. Twenty thousand cubic yards of lead-contaminated soil was removed from the site and transported to a commercial landfill. Seven thousand cubic yards required stabilization before disposal. The Army submitted the OBG Ecological Risk Assessment (ERA) sampling plan to the regulators for review. The planning team and the ERA planning group wrote critical management objectives, which are under review by the regulators.

The Army updated the CERFA report and the EBS. The installation began an unexploded ordnance (UXO) EE/CA to identify areas that require UXO sweeps before the property is transferred. The depot submitted a work plan to the regulators for review. Dispute resolution may be required to resolve regulator concerns about the UXO sweep methods and plan.

Plan of Action

- Resolve UXO and ecological risk issues with the regulators and initiate fieldwork in FY00
- Begin fieldwork at OBG in FY00
- Continue Preliminary Assessment, Site Inspection, and RI fieldwork until Phase I is completed on all sites in FY01
- Complete Removal Action at the pesticide burial area by FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: NY221382083000
Size: 10,594 acres
Mission: Receive, store, distribute, maintain, and demilitarize conventional ammunition, explosives, and special weapons; store, maintain, and issue general supplies, including hazardous materials
HRS Score: 37.30; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in January 1993
Contaminants: Chlorinated solvents, radioactive isotopes, heavy metals, and petroleum hydrocarbons
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $65.3 million
Estimated Cost to Completion (Completion Year): $83.9 million (FY2004)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2004

Romulus, New York

Restoration Background

In July 1995, the BRAC Commission recommended closing Seneca Army Depot, except for an enclave that will store hazardous materials and ores. The installation is scheduled to close in FY00.

During its operation, the installation stored munitions and supplies and distributed them to the Army. Such operations included demilitarization and disposal of munitions and explosives. Studies since FY78 have identified the following sites or site types: an open burning (OB) ground, an ash landfill, other landfills, low-level radioactive waste burial grounds, underground storage tanks (USTs), spill areas, fire training areas, and munitions disposal areas.

In FY94, the installation completed a solid waste management classification study, identifying 72 solid waste management units (SWMUs). Thirty-six units required no further action (NFA) or completion reports, 8 required Removal Actions, and 28 required Remedial Investigations and Feasibility Studies (RI/FSs). The 28 sites requiring RI/FSs were divided into 13 groups. Interim Actions included removal of several USTs and associated contaminated soil.

In FY95, the installation completed a Removal Action at the ash landfill. Approximately 35,000 cubic yards of soil was removed and treated.

In FY96, the installation completed RI/FSs for the first two groups of sites and drafted a Proposed Plan (PP). RI/FS work plans began for the remaining groups. Fieldwork began for three of the groups. The installation converted its Technical Review Committee to a Restoration Advisory Board and established a BRAC cleanup team. It also submitted a draft CERFA report to the regulatory agencies for concurrence. The community formed a Local Reuse Authority and began developing a Land Reuse Plan.

In FY97, the installation completed an Environmental Baseline Survey (EBS). In FY98, it completed an Environmental Impact Statement (EIS) for BRAC closure and began two RIs. The installation also changed an RI to an Engineering Evaluation and Cost Analysis (EE/CA) for a Removal Action and began two additional Removal Actions. The installation initiated a Treatability Study (TS) for reactive wall treatment of the trichloroethene (TCE) plume and began Remedial Designs for the ash landfill and the OB ground.

FY99 Restoration Progress

The Army completed the Record of Decision (ROD) for the OB ground, but the RODs for the ash landfill, the fire training area, and the deactivation furnaces were delayed by prolonged negotiations. The installation continued RIs at four sites. The beginning of long-term monitoring is awaiting completion of the RODs. The installation prepared an NFA decision document instead of a planned RI.

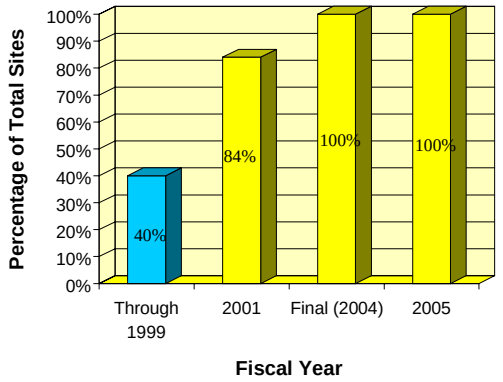
The innovative use of a treatment wall technology at the installation was successful. The TS at the Ash landfill continued to gather initial data. An independent technical review recommended a plan for a Removal Action for another site, but the regulatory agencies disagree about whether removal is appropriate based on the available data. The installation initiated the OB ground Remedial Action (RA). The first phase of this RA requires ordnance removal. The installation initiated a UXO EE/CA and completed the EE/CA for transfer of the prison parcel with one site requiring a Removal Action. The installation negotiated a reduced scope of work with the State Historic Preservation Office for survey of the ammunition storage area and initiated the resultant survey effort, leading toward a Memorandum of Agreement.

Results and recommendations from an Environmental Baseline survey (EBS) are under negotiation with the regulatory agencies. The agreement about the status of these sites has not been completed. The installation delayed NFA decision documents planned for 45 SWMUs because of higher priority issues. Planned FOSTs for three parcels were not issued because the parcels will not be suitable to transfer until resolution of issues about new sites identified in the EBS.

Plan of Action

- Complete RODs for the ash landfill, fire training areas, deactivation furnaces, and munitions washout facility in FY00
- Complete NFA decision documents in FY00
- Complete transfer of three parcels (the prison site, the North depot, and the airfield) in FY00
- Complete Removal Actions in FY00
- Close installation in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: CA921382084300
Size: 36,322 acres
Mission: Receive, store, and maintain conventional ammunition to support demilitarization of conventional ammunition and receive, store, maintain, and issue operational project stocks and general supplies
HRS Score: NA
IAG Status: Two-party Federal Facility Agreement signed in May 1991
Contaminants: Petroleum products, solvents, and explosives
Media Affected: Groundwater and soil
Funding to Date: $35.5 million
Estimated Cost to Completion (Completion Year): $20.8 million (FY2025)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY2006

Herlong, California

Restoration Background

In 1995, the BRAC Commission recommended realignment of Sierra Army Depot. Approximately 4,537 acres was identified as excess. Contamination at the depot originated from burn trenches, explosives leaching beds, landfills, burial sites, spill sites, sewage lines, underground storage tanks, sumps, and fire training areas. Primary contaminants in soil and groundwater include trichloroethene (TCE), petroleum products, and explosives. Investigations identified 23 sites; 12 sites required no further action.

Restoration activities in FY95 included a bioventing project at the active fire training area and signing of a Record of Decision (ROD) for nine sites, seven of which specified a monitored natural attenuation remedy. The Army completed a design implementing composting to treat soil contaminated with explosives. In FY96, the Army developed a design for preventing off-post migration of a TCE-contaminated groundwater plume. It also developed an early warning groundwater transducer program to monitor petroleum and TCE plumes near the potable water supply network. By the end of FY96, RODs had addressed 17 of Sierra's 23 sites. Also in FY96, the installation formed a BRAC cleanup team (BCT). The latest version of the BRAC Cleanup Plan was published in FY97.

In FY97, the Army completed an Environmental Baseline Survey, and finished a Report of Availability and an Environmental Condition of Property (ECP) report for the BRAC cantonment parcel. The installation updated its Community Relations Plan and used the plan to establish a Restoration Advisory Board.

In FY98, the depot used contaminated soil from the BRAC property Rifle Range to resurface the impact berm at an active range on the retained parcel. The BRAC range was remediated and closed. The installation also completed a Removal Action for the BRAC construction debris area. An Engineering Evaluation and Cost Analysis (EE/CA) project design was completed for the BRAC unexploded ordnance (UXO) areas. Preliminary screening at a contaminated soil area indicated that the site required no further action. The installation also completed reviews of three ECPs. RODs were signed for the Defense Reutilization and Marketing Office site. The selected remedy includes active bioventing of soil with a hot-spot removal, and natural attenuation for groundwater. The installation completed soil removals to close two other sites.

FY99 Restoration Progress

The installation completed one property transfer to the Federal Bureau of Prisons. It also removed all depleted uranium (DU) munitions, completed the final two Remedial Investigation (RI) reports, and remediated the TNT soil area, Building 1003 soil, and the large sewage treatment pond beds. Biocomposting was completed.

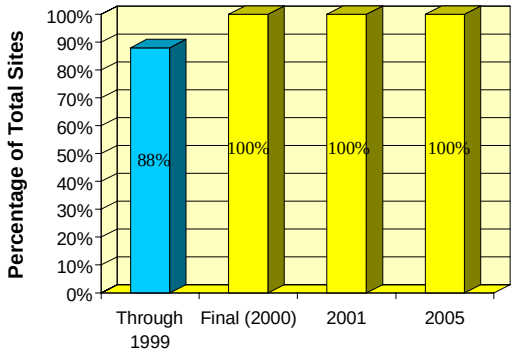
Following new state underground tank removal guidance, the installation began cleanup of a diesel-contaminated soil site. The state accepted the installation's proposal to reuse soil contaminated at 2,000 parts per million (ppm) or less (total petroleum hydrocarbons–diesel) for the construction base of a hard-capped storage lot. Regulators worked with the installation to develop an innovative approach to dealing with lead-contaminated soil. The approach involved in situ soil treatment using lead-trapping technology. The installation added one building with approximately 0.7 acres to the areas considered CERFA-clean.

The scheduled transfer of two properties to Susanville Indian Rancheria was delayed, one transfer by easement issues at the sponsoring agency and the other because the request for the property was withdrawn.

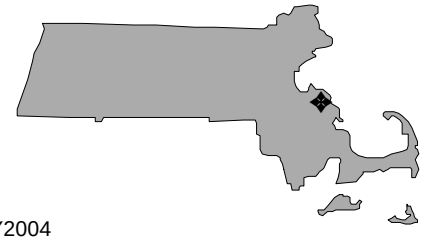
Plan of Action

- Complete BRAC ordnance and explosives and UXO EE/CA for Honey Lake East Shore and associated parcels in FY00
- Complete DU closeout report in FY00
- Complete 5-year report on monitored natural attenuation at TNT area in FY00
- Install and begin operating a remediation system and complete one BRAC property transfer in FY00
- Complete the action plan and ROD for the Honey Lake East Shore in FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: MA117002202200
Size: 2,174 acres
Mission: Provided administrative coordination and logistical support for Reserve Units; provided logistical support for the Marine Air Reserve Training Detachment South Weymouth
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Petroleum hydrocarbons, solvents, acids, paints, metals, photographic chemicals, and industrial wastes
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $20.1 million
Estimated Cost to Completion (Completion Year): $10.6 million (FY2017)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2004



Weymouth, Massachusetts

Restoration Background

In July 1995, the BRAC Commission recommended closure of the South Weymouth Naval Air Station (NAS). Operations were transferred to the Brunswick NAS, and aircraft, personnel, and equipment were relocated. The installation was closed on September 30, 1997.

Initially, eight CERCLA sites and one RCRA underground storage tank (UST) site were identified at the installation. One of the CERCLA sites, Site 6, is being investigated as a UST site. Prominent site types include a landfill, a tank storage area, a tank farm where jet fuel is stored in five USTs, a rubble disposal area, and a fire training area.

The installation completed a Preliminary Assessment for five sites in FY88. The waste oil tank was removed from UST 1 in FY91, and a Site Inspection was completed for eight sites in FY92. Also in FY92, several compressed chlorine gas cylinders and pesticide containers were removed from an old sewage treatment plant (Site 7). In FY93, an initial investigation was completed for the UST site. In FY93, the installation conducted a second Removal Action at Site 7 to remove contaminated soil and liquids.

In FY94, the year NAS South Weymouth was placed on the National Priorities List (NPL), the Agency for Toxic Substances and Disease Registry (ATSDR) completed an abbreviated Public Health Assessment of the installation. No major health hazards were identified. In FY95, the installation identified additional contamination at UST 1. UST 2 was identified at the Squantum Gardens Housing Area. A Removal Action for contaminated soil was completed for the site.

In FY96, the Navy implemented a Remedial Investigation (RI) work plan for seven Installation Restoration (IR) sites. The installation formed a BRAC cleanup team (BCT). A Corrective Action Plan was completed for UST 1.

In FY97, the design for UST 1 and the corrective action for UST 2 were completed. In addition, Phase I of the Environmental Baseline Survey (EBS) was finished and Phase II was initiated. A geographic information system was implemented at the NAS.

In FY98, the draft RI Phase I report was finalized. An RI Phase II work plan was implemented. ATSDR completed a draft Public Health Assessment report for the installation. All seven IR sites were reviewed for possible use of presumptive remedies, and a surface debris Removal Action work plan was initiated for these sites. A Site Management Plan (SMP) was initiated in preparation for Federal Facility Agreement (FFA) negotiations.

The installation established a Technical Review Committee in FY92 and converted it to a Restoration Advisory Board (RAB) in FY94. The installation established an administrative record and four information repositories in FY92 and completed its Community Relations Plan (CRP). The CRP was updated in FY98 and submitted to all participants in the Installation Restoration Program (IRP). A BRAC Cleanup Plan was released. A draft Technical Assistance for Public Participation (TAPP) application was prepared by the RAB in cooperation with the Navy in FY98.

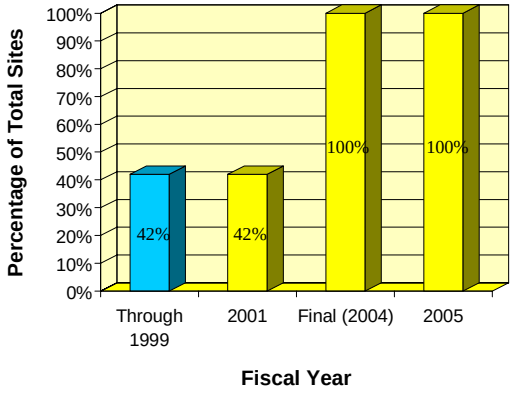
FY99 Restoration Progress

FFA negotiations began, and the SMP was developed and reviewed. The RAB met 10 times, and the BCT met frequently. The Navy conducted site tours. Informal partnering has continued. The EBS Phase II work plan and the surface debris Removal Action for four IR sites were completed. IRP team review indicated that NAS CERCLA sites did not meet the requirements for application of presumptive remedies and innovative and improved technologies. The TAPP grant was awarded. The RI Phase II work plan was completed, and the field program was initiated for all seven IR sites.

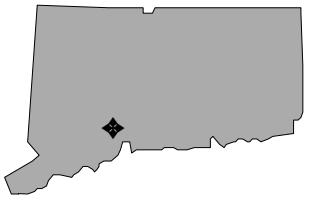
Plan of Action

- Complete the SMP and the FFA in FY00
- Complete Remedial Action for UST 1 in FY00
- Complete RI Phase II risk assessments and reports for all sites in FY00
- Review all seven IR sites as candidates for presumptive remedies and innovative technologies and improved technologies in FY00
- Submit to the Navy a second TAPP application for environmental technical assistance in FY00
- Begin Feasibility Studies for all IR sites in FY00
- Complete No Further Action Records of Decision (RODs) for three IR sites in FY00
- Initiate IRAs for two IR sites in FY00
- Initiate Proposed Plans and RODs for four IR sites in FY01
- Continue partnering with EPA and the Massachusetts Department of Environmental Protection in FY00 and FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: CT121382292400
Size: 124 acres
Mission: Manufacture engines for heavy armor vehicles and rotary wing aircraft
HRS Score: NA
IAG Status: None
Contaminants: PCBs, asbestos, fuel-related VOCs, solvents, metals, and PAHs
Media Affected: Groundwater, soil, surface water, and sediment
Funding to Date: $17.1 million
Estimated Cost to Completion (Completion Year): $0.3 million (FY2001)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Stratford, Connecticut

Restoration Background

In July 1995, the BRAC Commission recommended closure of the Stratford Army Engine Plant. The installation closed in September 1998.

Since FY91, environmental studies at the installation have identified the following sites: transformers that contain polychlorinated biphenyls (PCBs), underground storage tanks (USTs), sludge lagoons, a fire training and explosives equipment testing area, hazardous materials and hazardous waste storage areas, and buildings constructed with asbestos-containing materials. Preliminary studies indicated that contaminants might include PCBs, fuel-related volatile organic compounds (VOCs), solvents, metals, polyaromatic hydrocarbons (PAHs), and asbestos.

Interim Actions at the installation have included removal of 27 USTs, capping of two sludge lagoons, and capping of one large parking lot area to immobilize contaminated soil. The installation closed two USTs in place. In FY95, the installation began a Remedial Investigation (RI) to identify and characterize contamination and affected media throughout the installation.

In FY96, the Army appointed a BRAC environmental coordinator and formed a BRAC cleanup team (BCT). The community formed a Local Redevelopment Authority to address socioeconomic issues related to closure of the installation and to develop a Land Reuse Plan. Phase II of the RI was completed. The installation began an asbestos survey of all buildings and started the NEPA process, including an archive search. A draft final Environmental Baseline Survey (EBS) and a draft BRAC Cleanup Plan (BCP) were completed.

In FY97, the installation received concurrence from the appropriate regulatory agencies on the EBS and CERFA reports. RI Phase III began. The BCT reviewed the EBS and CERFA reports. An updated BCP was completed. The installation implemented systems for monitoring schedules and budgets.

In FY98, the installation implemented a Community Relations Plan, which includes establishment of a staffed on-site public information repository. The installation also began a Time-Critical Removal Action (TCRA) to address high concentrations of hexavalent chromium in soil in the old chrome-plating area. The installation began a major sitewide RI and Feasibility Study (FS) for a 76-acre upland portion of the property. The RI/FS includes performance of all risk assessments needed to expedite transfer of the property.

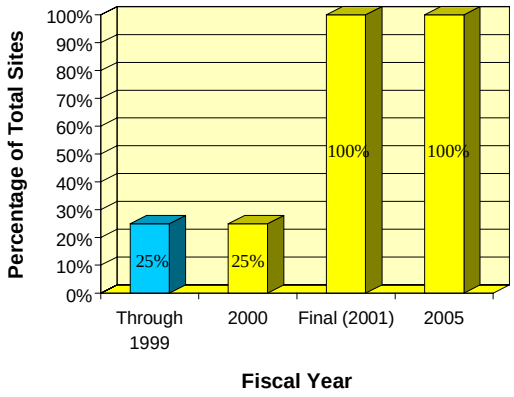
FY99 Restoration Progress

The installation completed the investigation phase of two Engineering Evaluations and Cost Analyses (EE/CAs), one for Soils Operable Unit (OU) 01 (Causeway) and one for Groundwater OU02. The installation also completed a TCRA for the chrome-plating room (off-site disposal of heavy metal–contaminated soil and dust) and the RI phase of the RI/FS. The FS will be completed with the EE/CA. Version 2 of the BCP also was completed. An EE/CA approach is being used for remediating the causeway portion of the tidal flats. The proposed use of the land after transfer was revised, and it is no longer necessary to exchange fluids in the PCB-containing transformers to permit the transformers' reclassification by the Army.

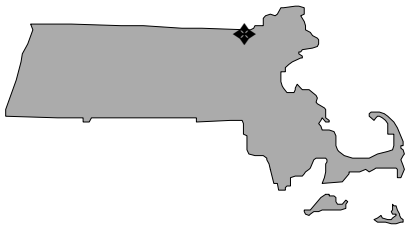
Plan of Action

- Complete decision documents (DDs) for Soils OU01 and the EE/CAs for Groundwater OU02 in FY00
- Complete sitewide FS and EE/CA in FY00
- Integrate DDs into the sitewide Record of Decision (ROD) in FY00
- Complete the Proposed Plan and the ROD in FY00
- Initiate proposed remedies, with all in place and operating in FY01
- Initiate drafting of Finding of Suitability to Transfer (FOST) for completion in FY01
- Operate remediation of Soils OU01 and Groundwater OU02 in FY01

Sites Achieving RIP or RC Per Fiscal Year



FFID: MA121402300900
Size: 2,292 acres
Mission: Train troops and test ordnance, materiel, and equipment
HRS Score: 35.57; placed on NPL in February 1990
IAG Status: IAG signed in May 1991
Contaminants: VOCs, PCBs, pesticides, and heavy metals
Media Affected: Groundwater and soil
Funding to Date: $12.8 million
Estimated Cost to Completion (Completion Year): $0.7 million (FY2000)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Middlesex County, Massachusetts

Restoration Background

In July 1995, the BRAC Commission recommended closure of the Sudbury Training Annex, a subpost of Fort Devens in eastern Massachusetts. Studies since FY80 identified several sites, including an old landfill, disposal and dump areas, a fire training pit, ordnance test areas, a leach field, underground storage tanks (USTs), a drum storage area, a burning ground area, and a chemical research and development area. In FY86, Remedial Investigation and Feasibility Study (RI/FS) activities confirmed groundwater contamination at two sites. The primary contaminants are volatile organic compounds (VOCs) and pesticides in groundwater and soil.

Interim Actions have included removal of drums, petroleum-contaminated soil, and a UST. In the mid-1980s, the installation excavated fuel-contaminated soil from a burning ground area and polychlorinated biphenyl (PCB)–contaminated soil from a transformer storage area. After the installation's National Priorities List (NPL) designation in 1990, a Technical Review Committee (TRC) was formed.

Between FY94 and FY96, the installation removed 2,300 tons of contaminated soil, 15 tons of debris, 107 abandoned drums, and 13 abandoned oil USTs. In FY95, the installation identified two additional sites, bringing the site total to 74. Actions included signing decision documents for no further action (NFA) at 19 sites; completing the final RI/FS and Proposed Plan for 5 sites; completing Site Inspections (SIs) for 15 sites; initiating SIs for 10 sites; and performing Engineering Evaluations and Cost Analyses for 4 sites. The installation also removed 1,200 tons of arsenic-contaminated soil. The Army completed the Remedial Design, and began Remedial Action at nine sites, resulting in removal of 11,800 cubic yards of soil contaminated with total petroleum hydrocarbons, polyaromatic hydrocarbons, and metals. Records of Decision (RODs) for NFA were signed for five additional sites.

In FY97, all outstanding SIs were completed. The installation completed an archive search for unexploded ordnance (UXO) and installed a landfill cap. Site cleanups were completed, and a ROD for NFA was signed, for Sites A4, A7, and A9.

In FY98, the installation closed 93 monitoring wells, 5 abandoned septic systems, and 4 water supply wells. A 3-year installationwide arsenic study was completed. Two sites were identified for limited Removal Action. Draft Environmental Condition of Property (ECP) statements and Memoranda of Agreement (MOAs) were sent to the U.S. Army Forces Command (FORSCOM) for review. A cultural and natural resources survey, a UXO survey, and an Environmental Baseline Survey were completed; one building requires UXO clearance.

FY99 Restoration Progress

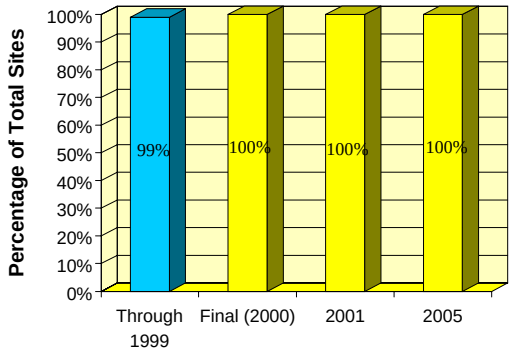
The installation completed asbestos abatement and two removals and received regulatory concurrence on the No Risk designation from the installation-widearsenic study. Regulators drafted a final closeout report for NPL deletion. The installation was not deleted from the NPL because regulators required additional Removal Actions. The installation sent final MOAs and ECPs with a BRAC Disposal Support Package to FORSCOM for property transfer, but the actual property transfer is not yet complete. The installation also completed the third year of long-term monitoring, with the 5-year review due in 2001. Sudbury received regulatory concurrence on a finding of No Human Health or Environmental Risk.

Study Area P27 was declared an imminent hazard because of high arsenic levels in the soil (1,200 parts per million) and will require a Time-Critical Removal Action.

Plan of Action

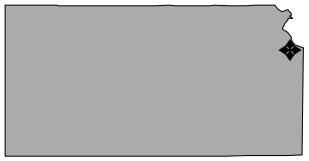
- Obtain regulatory signatures on No Action under CERCLA for arsenic investigation and for all remaining study areas (16) in FY00
- Complete and sign final NPL Closeout Report/Deletion and complete all BRAC 95 and CERCLA activities in FY00
- Sign NFA decision document for the installation-wide arsenic investigation, including 13 associated study areas, in FY00
- Sign NFADDs for remaining study areas in FY00
- Close the TRC and public repositories in FY00

Sites Achieving RIP or RC Per Fiscal Year



Sunflower Army Ammunition Plant — Proposed NPL

FFID: KS721382087800
Size: 9,065 acres
Mission: Manufactured smokeless powder and propellants; on standby status for production of nitroguanidine
HRS Score: 50.00; proposed for NPL in February 1995
IAG Status: None
Contaminants: Nitrates, sulfates, lead, chromium, and propellants
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $16.6 million
Estimated Cost to Completion (Completion Year): $43.4 million (FY2032)
Final Remedy in Place or Response Complete Date for All Sites: FY2010



De Soto, Kansas

Restoration Background

The Sunflower Army Ammunition Plant began operations in 1942. Its primary mission was to manufacture smokeless powder and propellants. Additional installation operations included the manufacture and regeneration of nitric and sulfuric acids and munitions proving. The installation no longer has a mission, and all real property is being designated as excess. Sources of contamination at the installation include production line areas, magazine storage areas, and 52 RCRA solid waste management units (SWMUs). EPA proposed placing the installation on the National Priorities List (NPL) after evaluating five munitions manufacturing surface impoundments as potential sources of hazardous waste.

Prominent site types at the installation include landfills, open burn and open detonation (OB/OD) areas, propellant production areas, dump sites, a battery handling area, settling ponds, wastewater lagoons, and drainage ditches.

A groundwater contamination survey in FY87 and a Site Inspection in FY88 revealed contaminated groundwater at the installation. An analysis also indicated contamination of surface water and sediment with heavy metals. Interim Actions have included removal of underground storage tanks and associated contaminated soil and cleanup of an asbestos dump.

The Army submitted an Ecological Risk Assessment (ERA) for the entire installation to EPA and the Kansas Department of Health and Environment (KDHE) for review. The assessment concluded that no further action was necessary for most of the areas studied. A final survey of benthic macroinvertebrates was completed; the survey concluded that biological features of surface water appear to be in good condition. A 1996 visit and summary conducted by the Agency for Toxic Substances and Disease Registry identified no specific environmental or public health concerns related to the installation.

In FY98, the Army completed the restoration of the remaining wastewater lagoon. Groundwater and soil sampling and analysis were completed for all SWMUs. EPA and KDHE approved the installation's ERA and Community Relations Plan. The installation has a Technical Review Committee and a Restoration Advisory Board (RAB).

FY99 Restoration Progress

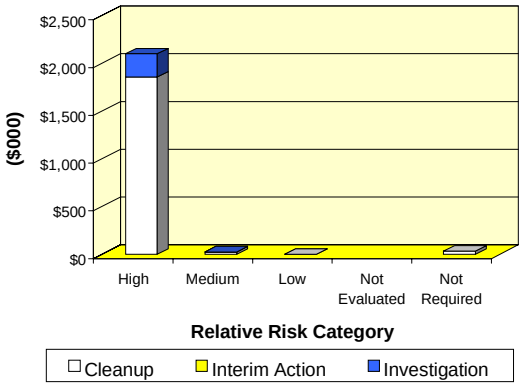
The Army completed a draft Corrective Measures Study for SWMUs 10/11 and 22/32 and initiated a Remedial Action for SWMU 50 (North). The Army did not complete the planned Interim Remedial Action (IRA) for SWMU 50 (North) because the scope of work changed significantly and the additional funds needed to complete the expanded task were not available. Remediation of SWMU 23 was completed; closure is awaiting regulator approval. The installation prepared a final work plan for additional investigation activities at SWMUs 33, 34, and 35. EPA and KDHE approved the final RCRA Facility Investigation (RFI) reports for SWMUs 1, 2, 3, 6, 12, 13, 27, 36, 47, and 48. The RFIs for SWMUs 14, 21, 24, 25, 30, and 33 through 36 were not completed because of the discovery of potential by fraudulent laboratory manipulation of organic data. This issue has not been resolved. The Army completed a draft off-site well survey and submitted it to EPA and KDHE. The U.S. Army Center for Health Promotion and Preventive Medicine completed field evaluations for SWMUs 53 and 54.

The installation delayed long-term monitoring (LTM) of groundwater beneath the lagoons because of a change in funding sources. The groundwater investigations for OU1 were not completed due to a lack of funding. Lack of funding also delayed the completion of a grazing study, but a sufficient amount of testing has been completed to assure the regulatory agencies that cattle grazing on the installation is not a problem.

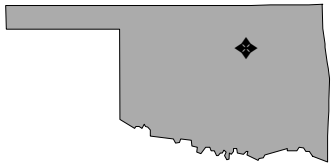
Plan of Action

- Complete Removal Actions for SWMUs 10/11 and 22/32 in FY00
- Complete IRAs for SWMU 50 (North) in FY00
- Begin LTM for SWMUs 13, 27, 41, and 42 in FY00
- Complete the grazing study in FY00
- Complete closure of the OB/OD site (SWMU 23) in FY00

FY00 Funding by Phase and Relative Risk



FFID: OK657172439100
Size: 5,041 acres
Mission: Repair aircraft, weapons, and engines
HRS Score: 42.24; placed on NPL in July 1987
IAG Status: IAG signed in September 1988
Contaminants: Organic solvents, heavy metals, and petroleum
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $157.8 million
Estimated Cost to Completion (Completion Year): $136.7 million (FY2023)
Final Remedy in Place or Response Complete Date for All Sites: FY2005



Oklahoma City, Oklahoma

Restoration Background

Environmental studies at Tinker Air Force Base revealed a 220-acre contaminant plume in the upper aquifer at Soldier Creek and Building 3001. Additional sites include landfills, underground storage tanks (USTs), waste pits, fire training areas, spill sites, and low-level radioactive waste sites.

The installation has implemented Interim Actions, including removal of contaminated soil and USTs and installation of landfill caps, free-product recovery systems, bioventing systems, a biostripping system, and a solidification and stabilization system. A Record of Decision (ROD) was signed for Building 3001 in FY90, and a groundwater extraction and treatment system is operating at the site. A ROD for Soldier Creek was signed in FY93.

The installation formed its Restoration Advisory Board (RAB) in FY94.

In FY95, the installation expanded the fuel recovery system at the North Tank Operable Unit (OU) and removed all USTs from four sites. The installation also began a Phase II RCRA Facility Investigation (RFI) for 18 sites and completed the majority of the Remedial Investigation (RI) for the Industrial Wastewater Treatment Plant (IWTP)/Soldier Creek Off-Base Groundwater (SCOBGW) OU. A bioslurping system and a bioventing system were installed to treat fuel-contaminated soil. In addition, Remedial Actions (RAs) involving treatment of fuel and solvent contamination were implemented at two sites. The installation began using a geographic information system (GIS) to improve site characterization.

In FY96, the installation completed the Phase II RFI report. Actions to increase product recovery and reduce the volume of extracted groundwater were implemented at fuel-contaminated sites. Seven interim corrective actions were initiated, and one was completed. A draft final RI and Feasibility Study (FS) for the IWTP/SCOBGW OU also was completed.

In FY97, the installation removed low-level radioactive waste and completed the cleanup of Radioactive Waste Disposal Site 1030W. In addition, the base completed the capping preparation for Landfill 2, capping of Landfill 4, construction of a bioventing system for the Fuel Purge Facility, and construction of a treatment system for the Area A Service Station. These early response actions reduced the risk level of five sites from high to low.

In FY98, the installation completed construction of RCRA caps for Landfills 2 and 5. One hundred gallons of trichloroethene was recovered from 60 million gallons of groundwater pumped from the Building 3001 area. A groundwater treatment plant for the southwest quadrant of the base was constructed, addressing groundwater contamination under 25 percent of the Installation Restoration Program sites on base. The installation reduced the relative risk of four sites from high to low.

FY99 Restoration Progress

The draft final SCOBGW risk assessment was submitted to regulators. Completion of the FS, the Proposed Plan (PP), and the ROD for the SCOBGW OU was delayed because of lengthy regulator review of the risk assessment. A contract was awarded for construction of a RCRA cap at Landfill 6. Delays in this process changed the completion date for construction. A groundwater treatment system was constructed for the Gator Groundwater Management Unit.

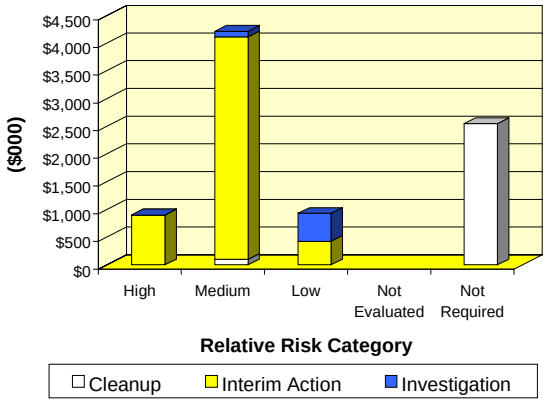
Closure letters were received for the 3700 Fuel Yard and the Purge Facility. The 5-year review of National Priorities List (NPL) treatment systems was submitted to EPA for review. The Oklahoma Department of Environmental Quality designated No Further Action for the remaining radioactive waste disposal sites. The installation combined operation of the treatment systems for Building 3001 and the Southwest Groundwater Management Unit.

The RAB met quarterly. Meetings with state regulators resulted in acceptance of basewide background values for organic and inorganic compounds in soils, as well as the closure of seven solid waste management units (SWMUs) and one area of concern.

Plan of Action

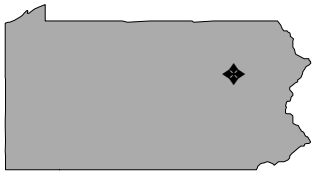
- Complete the SCOBGW OU FS, PP, and ROD in FY00 and the RD in FY01,
- Complete construction of a RCRA cap at Landfill 6 in FY00
- Finalize Air Force documentation formally closing the four radioactive waste disposal sites in FY00
- Close the Fire Training Area 1 and Supernatant Pond sites in FY00
- Complete an Interim Remedial Action at the IWTP in FY00
- Complete decision documents for all six landfills in FY01
- Complete construction of final phase of a treatment system at 290 Fuel Farm in FY01
- Begin RA for SCOBGW OU in FY02

FY00 Funding by Phase and Relative Risk



Tobyhanna Army Depot — NPL

FFID: PA321382089200
Size: 1,293 acres
Mission: Provide logistics for communications and electronics equipment
HRS Score: 37.93; placed on NPL in August 1990
IAG Status: IAG signed in September 1990
Contaminants: Heavy metals, VOCs, PCBs, petroleum/oil/lubricants, and UXO
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $13.9 million
Estimated Cost to Completion (Completion Year): $3.4 million (FY2021)
Final Remedy in Place or Response Complete Date for All Sites: FY2011



Tobyhanna, Pennsylvania

Restoration Background

Environmental studies at Tobyhanna Army Depot began in FY80. Identified sites include landfills, a disposal pit, underground storage tanks (USTs), burn areas, drum staging areas, a surface disposal area, a waste treatment plant, a spill site area, an unexploded ordnance (UXO) area, and a fire fighting training area. The most prominent sites are the burn areas and a drum staging area, which constitute Operable Unit (OU) 1. Contamination at these sites includes volatile organic compounds (VOCs), solvents, and heavy metals in groundwater; solvents, metals, polychlorinated biphenyls (PCBs), and petroleum/oil/lubricants (POL) in surface water and sediment; and solvents, metals, PCBs, POL, and UXO in soil.

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY90. In FY91, the installation constructed a water line extension to residences affected by contamination in OU1. In FY92, the installation completed RI fieldwork at OU1 and a Treatability Study of a soil volatilization technology. In FY94, the installation began an installationwide Ecological Risk Assessment (ERA).

In FY95, the installation conducted an Interim Remedial Action at OU1 Area B to remove contaminated soil. The installation formed a Restoration Advisory Board (RAB).

In FY96, the installation, EPA, and the Pennsylvania Department of Environmental Protection drafted the Proposed Plan for OU1. A cleanup action was completed at Oakes Swamp, Area of Concern (AOC) 8. In FY97, the installation completed a ROD for OU1 groundwater, specifying natural attenuation with long-term monitoring. The Army completed an RI for construction and installation of groundwater monitoring wells at the Inactive Sanitary Landfill.

In FY98, the installation completed a closeout document for 35 No Further Action (NFA) sites. The installation also completed ERA fieldwork. A Burn Pan was removed at AOC 58, the fire fighting training area. The Army constructed four additional off-site monitoring wells adjacent to the Inactive Sanitary Landfill to determine whether contaminants had migrated. A Remedial Design document for long-term monitoring at OU1 was completed. The installation also completed a new Community Relations Plan, which was very favorable to the depot.

FY99 Restoration Progress

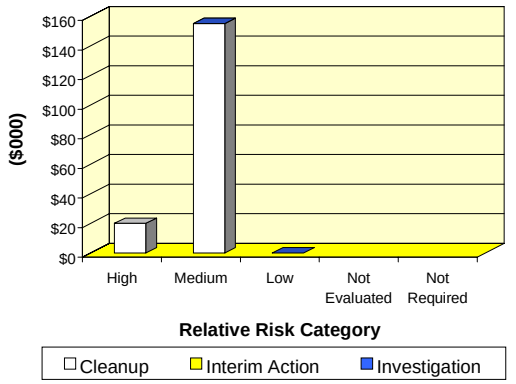
The installation completed a closeout document for 18 additional NFA sites and continued groundwater monitoring at OU1 and AOC 1. Health Risk Assessments were completed for two sites. The installation completed a Quality Assurance Project Plan for groundwater sampling and analysis at AOC 1. The RAB reviewed all of these documents as well as the Installation Action Plan and work plans.

EPA's Biological Technical Assistance Group is reviewing the final ERA document. The unexpected length of this review is due to a change of personnel at EPA. Less costly, yet sufficient, Health Risk Assessments were completed in lieu of the scheduled Focused Feasibility Studies.

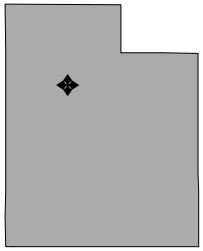
Plan of Action

- Remove sewage drying beds at AOC 32 in FY00
- Complete a closeout document for five NFA sites in FY00
- Complete Proposed Remedial Action Plans for two sites in FY00
- Complete two RODs in FY00
- Finalize the ERA in FY00
- Complete all decision documents by FY01
- Continue groundwater monitoring at OU1 and AOC 1 until FY21

FY00 Funding by Phase and Relative Risk



FFID: UT821382089400
Size: 23,732 acres
Mission: Store and demilitarize munitions
HRS Score: 53.95; placed on NPL in August 1990
IAG Status: Federal Facility Agreement signed in September 1991
Contaminants: Solvents, metals, explosives, petroleum hydrocarbons, and PCBs
Media Affected: Groundwater and soil
Funding to Date: $83.7 million
Estimated Cost to Completion (Completion Year): $107.5 million (FY2028)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2005
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY2009



Tooele, Utah

Restoration Background

In July 1993, the BRAC Commission recommended realignment of the Tooele Army Depot (TEAD) maintenance mission. The commission recommended that the depot retain its conventional ammunition storage and chemical demilitarization missions. The Army transferred the 1,700-acre BRAC parcel using early transfer authority in 1999 and will retain 23,032 acres for the conventional ammunition mission.

Studies have been under way at the installation since FY79. Site characterizations included open burning and open detonation areas, an ammunition demilitarization facility, landfills, firing ranges, industrial sites, underground storage tanks (USTs), surface impoundments and lagoons, and drain fields. Organic solvents are the primary contaminants affecting groundwater.

TEAD's environmental programs are regulated under a CERCLA Federal Facility Agreement (FFA) and a RCRA corrective action permit. The installation has investigated 57 active sites and completed response actions at 17 sites (6 under CERCLA and 11 under RCRA).

In FY93, TEAD installed a pump-and-treat system as an Interim Removal Action to remove trichloroethene from a groundwater plume. In FY94, the Army, EPA, and the State of Utah approved a Record of Decision for six sites. Four of the six sites were No Further Action (NFA) sites.

In FY95, the community completed a draft Land Reuse Plan. The installation formed a BRAC cleanup team and a Restoration Advisory Board.

In FY96, TEAD completed the disposal and reuse Environmental Impact Statement (EIS) for the 1,700 acres available for transfer, and was able to transfer 41 acres to the Tooele City Redevelopment Agency. In FY97, the installation delineated the on-post extent of another contaminated groundwater plume and initiated investigations to determine the source of contamination. The installation initiated Corrective Measures Studies (CMSs) and Feasibility Studies (FSs) for all sites requiring further actions. The installation completed an Interim Removal Action at the TNT Washout Facility, consisting of the removal and off-site disposal of settling basins containing explosives-contaminated sediment.

In FY98, the installation submitted a Finding of Suitability for Early Transfer (FOSET) for the remainder of the BRAC property for regulator approval. The installation removed two USTs and presented a bioventing system design to the regulators for treatment of the contaminated soil. The installation completed the remedial work for two BRAC sites and optimized the groundwater treatment system installed in FY93. The installation decided to compost explosives-contaminated soil and completed two Interim Removal Actions, one at the Chemical Range, and the other at the Building 1301Washout Pond.

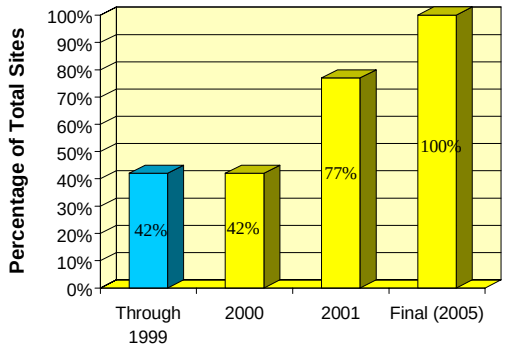
FY99 Restoration Progress

The installation transferred the remainder of the 1,700 acres to the Tooele City Redevelopment Agency under the Early Transfer Authority. The regulators required more data to complete CMSs and FSs. TEAD installed bioventing systems to remediate contaminated soils. It also conducted risk assessment studies to develop a response alternative to address the groundwater contamination associated with the BRAC sites. The Phase I BRAC RCRA Facility Investigation (RFI) for groundwater contaminant sources was not completed due to additional sampling requirements.

Plan of Action

- Initiate Remedial Design (RD) for RCRA corrective action in FY00
- Complete Phase I BRAC RFI (on-post portion) and initiate Phase I BRAC RFI (off-post portion) in FY00
- Initiate required RD for FFA sites in FY00
- Initiate source removal soil vapor extraction pilot studies, if required, in FY00
- Initiate Interim Action for source removal of groundwater contamination (BRAC parcel) in FY00
- Initiate Site Management Plan for land use controls in FY00 and begin RCRA corrective action in FY01
- Complete all required CMSs and FSs in FY00–FY01
- Complete remediation of two UST sites in FY01

Sites Achieving RIP or RC Per Fiscal Year



Travis Air Force Base NPL

FFID: CA957182457500
Size: 6,277 acres
Mission: Provide air refueling and strategic airlift services for troops, cargo, and equipment
HRS Score: 29.49; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in September 1990 and amended in May 1993, October 1995, July 1996, November 1997, and July 1998
Contaminants: VOCs, heavy metals, and PAHs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $70.6 million
Estimated Cost to Completion (Completion Year): $150.3 million (FY2049)
Final Remedy in Place or Response Complete Date for All Sites: FY2004

Solano County, California

Restoration Background

Travis Air Force Base has supported Air Force operations since 1943. Historical activities at the base have resulted in numerous releases of fuels, solvents, and petroleum/oils/lubricants, which migrated into groundwater. Since FY85, studies have identified a number of sites, including old landfills, a closed sewage treatment plant, four fire training areas, disposal pits, spill areas, the storm sewage drainage system, a pesticide disposal site, and a low-level radioactive waste burial site. In FY93, the Air Force divided the installation into four operable units (OUs).

The Air Force implemented several Interim Actions at the installation, including removal of 27 underground storage tanks. Granular activated carbon treatment systems were installed to treat groundwater contaminated with trichloroethene (TCE) at a storm sewer outfall in Union Creek and a source area for the installation's largest TCE groundwater plume. Treatability Studies were conducted in FY94 on use of horizontal wells, two-phase extraction systems, bioventing, and bioslurping.

The installation completed field investigations and Remedial Investigation (RI) reports for all OUs. It also completed one TCE Removal Action at the storm sewer outfall and implemented another TCE Removal Action.

In FY96, the installation combined the North, East, and West Industrial OUs into a single OU (NEWIOU) for the Feasibility Study (FS), the Proposed Plan, and the Record of Decision (ROD). The FS for the NEWIOU and the Proposed Plan for the groundwater part of the NEWIOU were completed. In FY97, the RI for the West/Annexes/Basewide OU (WABOU) and the expansion of the Interim Action for the installation's largest TCE-contaminated groundwater plume were completed.

In FY98, an interim ROD for groundwater in NEWIOU was completed and signed. The NEWIOU Proposed Plan for surface water, sediment, and soil was completed and public comments received. The base completed the FS and Proposed Plans for groundwater and soil sites at WABOU. Interim Remedial Actions (IRA) began at two of three sites from which contaminated groundwater had migrated off site, and at two additional sites. Interim Remedial Design began on 14 other groundwater sites. A two-phase extraction well was installed in a suspected area of free-phase TCE.

In FY95, the installation formed a Restoration Advisory Board (RAB) and established the RAB Relative Risk Focus Group to address restoration priorities, the Technical Review Focus Group to review draft documents, and the Community Relations Focus Group to disseminate information to the public.

FY99 Restoration Progress

The WABOU groundwater interim ROD was signed. The WABOU soil ROD is still being negotiated with regulators. The NEWIOU soil, sediment, and surface water ROD was delayed, pending approval of the WABOU soil ROD.

Removal Actions were planned for two sites: one site received institutional controls per agreement with the RAB, the other site was delayed because agency review of the draft Action Memorandum took longer than anticipated.

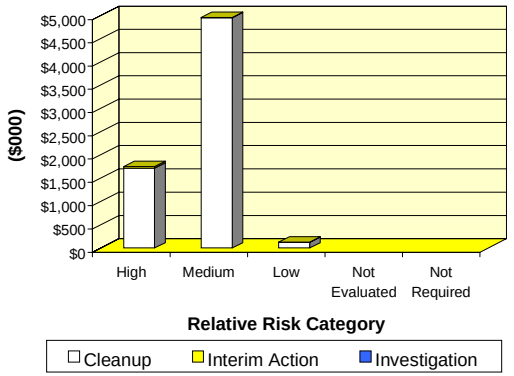
The IRA on the last groundwater plume that extends off base was delayed because the installation was unable to reach a purchase agreement with a neighboring property owner. Travis was unable to obtain adequate access to a second property, which delayed plume delineation. The plume was larger than expected at a third off-base site. While partial Remedial Action (RA) was accomplished, a new access agreement must be negotiated to complete the work. IRAs at seven other groundwater sites are under way.

The installation also conducted a base tour for the RAB and regulatory agencies.

Plan of Action

- Complete IRAs at nine groundwater sites in FY00
- Complete the WABOU soil ROD in FY00
- Complete IRAs at three sites with off-base groundwater plumes in FY01
- Complete the Removal Action at Cypress Lakes Golf Course in FY00
- Begin construction of a landfill cap in FY01
- Begin RA at seven soil sites in FY00
- Complete the NEWIOU soil, sediment, and surface water ROD in FY01
- Complete RA at eight WABOU soil sites in FY01
- Complete IRAs at all groundwater sites in FY06

FY00 Funding by Phase and Relative Risk



FFID: CA917002333000
Size: 1,080 acres
Mission: Provide services and materials to support units of operating forces and shore activities
HRS Score: NA
IAG Status: Federal Facility Site Remediation Agreement signed in September 1992
Contaminants: Petroleum hydrocarbons, VOCs, SVOCs, chlorinated solvents, metals, pesticides, and PCBs
Media Affected: Groundwater and soil
Funding to Date: $25.3 million
Estimated Cost to Completion (Completion Year): $49.7 million (FY2007)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003

Treasure Island, California

Restoration Background

In July 1993, the BRAC Commission recommended closure of Treasure Island Naval Station with relocation of the Naval Reserve Center and the Naval Technical Training Center. Operational closure was completed in September 1997.

Twenty-nine sites, including a former fire training area, a landfill, a former dry-cleaning facility, an old bunker area, fuel farms, and a service station, were identified. Contamination is largely the result of migration of petroleum products from fueling operation areas. A Preliminary Assessment and a Site Inspection were completed for 26 sites in FY88.

Remedial Investigation and Feasibility Study (RI/FS) activities were initiated for 22 sites in FY93. In FY94, three additional sites, including the former skeet range and the areas under the bay bridge and on and off ramps, were included in the Installation Restoration Program (IRP). A BRAC cleanup team was established, and the installation completed a BRAC Cleanup Plan. In FY95, the installation began removing floating product from one site and contaminated soil from another. Of the 75 potential underground storage tanks (USTs), 40 were removed, 14 were closed in place, 20 were found to be nonexistent, and 1 was scheduled for removal. An Environmental Baseline Survey was completed for all sites in FY95.

During FY96, the Local Reuse Authority completed a draft reuse plan. The Federal Facility Site Remediation Agreement was amended to include three newly identified sites and to group Sites 13 and 27 into one offshore operable unit (OU). In FY97, nine IRP sites were transferred to the petroleum Corrective Action Plan (CAP) program for fast-track cleanup.

In FY98, the installation completed removal or closure in place of all underground fuel lines, a draft RI report for offshore sediment, and fieldwork for additional characterization of Site 12. The summary report for additional characterization of Site 24 and the draft CAP for nine petroleum IRP sites also were completed. An ecological validation study work plan was developed for Sites 11, 28, and 29.

The installation completed a Community Relations Plan and established two information repositories and an administrative record in FY92. It formed a Technical Review Committee and converted this to a Restoration Advisory Board in FY94.

FY99 Restoration Progress

The installation completed an Interim Removal Action for lead-contaminated soil at Site 12 Building 1207/1209 and initiated a removal at Building 1133. Also at Site 12, the installation completed the OU draft final RI report, initiated and completed Technical Assistance for Public Participation grant for the RAB for review of the RI, and completed fieldwork for additional characterization. The draft final RI report for offshore sediment also was completed. The removal of the remaining UST was not accomplished because funds were transferred to high-risk sites for Interim Remedial Action.

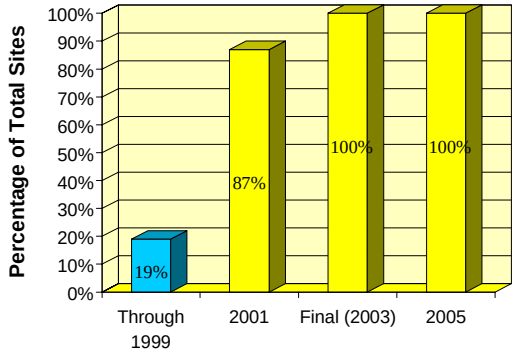
The installation initiated a pilot-scale test to evaluate the viability of bioventing combined with biosparging for remediating petroleum-contaminated soil and groundwater at Site 6.

The RI/FS, a draft Remedial Action Plan (RAP), and a Record of Decision (ROD) for onshore and offshore sites were not completed because of lack of regulatory concurrence. Disagreements with regulatory agencies delayed the CAP, design, and initial remediation for petroleum sites. A difference of opinion among the team members delayed completion of a No Further Action (NFA) RAP and ROD for Sites 1 and 3. CAPs and Remedial Designs (RDs) for UST and fuel-line sites were not completed because funds were reallocated to high-risk sites. Adequate funds were not received for completion of the asbestos abatement and the structure and soil lead abatement for pre-1960 housing. The City's leasing and development priorities for housing and waterfront uses and the ongoing Environmental Impact Statement/Environmental Investigation Report required a revised schedule and parceling for Findings of Suitability to Transfer for the first phase of property disposal.

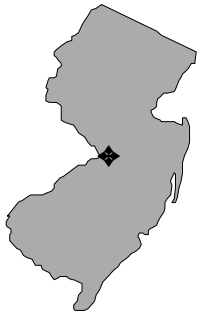
Plan of Action

- Complete lead removal at Building 1133 and pilot-scale test technology evaluation at Site 6 in FY00
- Conduct pilot phase and main investigation sampling, soil gas sampling, and additional sampling for Site 12 Debris Areas in FY00
- Perform free-product removal at CAP sites in FY00
- Complete RI report for offshore and onshore sites, and RCRA CAPS in FY00
- Remove remaining USTs, complete asbestos abatement, and perform groundwater monitoring and Tidal Study in FY00
- Complete a NFA RAP and ROD for Sites 1 and 3 in FY00
- Complete structure and soil lead abatement for pre-1960 housing in FY00

Sites Achieving RIP or RC Per Fiscal Year



FFID: NJ217002269500
Size: 529 acres
Mission: Test engine systems and components
HRS Score: NA
IAG Status: None
Contaminants: Trichloroethene, freon, fuels, mercury, and solvents
Media Affected: Groundwater and soil
Funding to Date: $19.8 million
Estimated Cost to Completion (Completion Year): $12.9 million (FY2016)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999



Trenton, New Jersey

Restoration Background

In July 1993, the BRAC Commission recommended closure of this installation. Operations were transferred to the Arnold Engineering Development Center and the Patuxent River Naval Air Station in December 1998, which was the date of operational closure.

Contamination at the installation resulted from various fuels used to operate engines during tests and from trichloroethene (TCE), ethylene glycol, and freon used to cool the air entering the engines. Residues of fuels and solvents have been detected in groundwater and soil. Site types include underground storage tanks (USTs), disposal areas, and spill sites.

Studies at the installation since FY86 have identified nine CERCLA sites and two UST sites. Removal of a tank and associated contaminated soil was completed for UST 2 in FY92 and for UST 1 in FY93. The two UST sites were then recommended for no further action (NFA).

In FY94, a BRAC cleanup team (BCT) was formed. The BCT prepared a BRAC Cleanup Plan (BCP) in FY95. The installation was divided into four parcels of property, and an Environmental Baseline Survey (EBS) was completed for all parcels.

During FY95, the installation began an Interim Remedial Action for treatment of TCE-contaminated groundwater at Site 1. In FY96, a modified treatment plant was designed, contaminated sludge was removed from Site 3, and the installation completed a Land Reuse Plan.

In FY97, the installation completed construction of the modified treatment plant for groundwater contamination, installation of monitoring wells at Site 1, the Remedial Investigation and Feasibility Study for Site 2 and Sites 4 through 9, draft Phase II of the EBS, and design and implementation of an iron-filings treatment system for Site 1 groundwater contamination. A decision document for NFA was prepared for Site 3. The BCT prepared updated versions of the BCP and the EBS and conducted the Site 1 groundwater investigation, Site 8 barometric well closure, and preparation of an NFA document for Sites 2, 5, 6, 7, and 9.

In FY98, the installation completed a draft Environmental Impact Study and then changed it to an Environmental Assessment. Decision documents were completed for Sites 1 through 9. The installation also completed a draft decision document for Site 1 groundwater, a revised draft EBS Phase II report, and a Focused Feasibility Study (FSS). The installation completed soil removal at Site 1, a cap for Site 4, and Remedial Actions at 23 EBS areas of concern (AOCs). Six additional USTs were removed, and the groundwater treatment plant was expanded. The installation removed sediment, which contained mercury, from outfalls and catch basins. The source of the mercury was identified, and areas in the outfalls and catch basins were remediated. Leaking lines in the barometric well at Site 8 were investigated and a decision document was completed for this site.

A Technical Review Committee was formed in FY91 and converted to a Restoration Advisory Board in FY93.

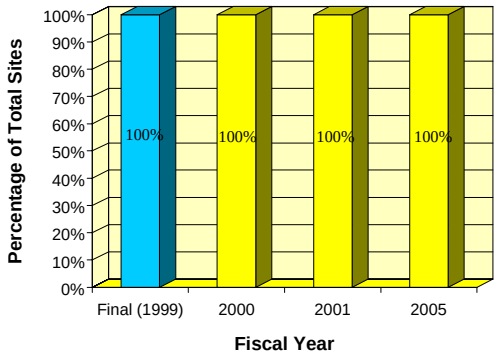
FY99 Restoration Progress

The installation completed the FFS and the decision document for Site 1 groundwater. Work plans were finalized and fieldwork was completed for an off-site Ecological Investigation and a Storm Sewer Infiltration Study. Off-site residential well sampling also was performed. The EBS Phase II report was finalized, and remediation was completed at the remaining EBS AOCs. The closeout report for mercury was completed, but regulator comments delayed issuance of the final report. The Finding of Suitability to Transfer for Parcels A, B, and D was delayed because the decision document for Site 1 groundwater was not completed until September 1999. The installation of off-site wells furthered progress on delineation of Site 1 groundwater.

Plan of Action

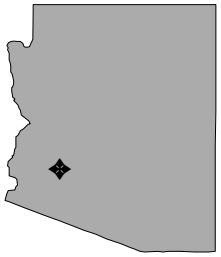
- Complete the off-site Ecological Investigation and the Storm Sewer Infiltration Study in FY00
- Complete off-site well installation in FY00
- Continue operation and maintenance of the Site 1 treatment plant in FY00 and FY01
- Complete the Classification Exception Area Report in FY00
- Perform long-term monitoring for mercury in FY00 and FY01

Sites Achieving RIP or RC Per Fiscal Year



Tucson International Airport NPL

FFID: AZ957282593400
Size: 84 acres
Mission: Provide Air National Guard training
HRS Score: 57.86; placed on NPL in September 1983
IAG Status: Federal Facility Agreement signed in October 1994
Contaminants: TCE, tetrachloroethene, chromium, petroleum hydrocarbons, and petroleum/oil/lubricants
Media Affected: Groundwater and soil
Funding to Date: $8.9 million
Estimated Cost to Completion (Completion Year): $12.7 million (FY2021)
Final Remedy in Place or Response Complete Date for All Sites: FY1997



Tucson, Arizona

Restoration Background

Environmental studies at Tucson International Airport have identified eight sites, including fire training areas, solvent dumping areas, storm drainage discharge areas, the old wash rack area, petroleum/oil/lubricant areas, and spill areas. Waste disposal and spill sites have had the greatest effect on the environment. The principal contaminant is trichloroethene (TCE) in groundwater. Tetrachloroethene and chromium also have affected groundwater, but to a lesser extent. In addition, total petroleum hydrocarbons have been detected in soil at the installation. In FY94, the installation finished Remedial Investigation activities for all identified sites.

The installation established successful partnerships with citizens and regulators. The Unified Community Advisory Board (UCAB) provides a forum in which citizens and organizations can discuss current environmental issues. The UCAB consists of community members; regulators; and responsible parties such as Air Force Plant 44, Burr-Brown Corporation, the Airport Authority/City of Tucson, West Cap Industries (defunct), and the Air National Guard. Representatives of regulatory agencies, the State of Arizona, Pima County, and the City of Tucson, and leaders of community groups regularly attend meetings of the board.

In FY97, the installation complied with the Federal Facility Agreement and reevaluated all sites through the Relative Risk Site Evaluation process. A Record of Decision was completed for the cleanup of contaminated soil. The installation also finished construction of a permanent groundwater extraction, treatment, and recharge system to clean up contaminated groundwater. The groundwater extraction and treatment system for all sites began operating in FY97. In FY98, the soil vapor extraction and treatment system at Site SS05 accomplished its mission by reducing contaminant concentration in soil vapor to levels that have negligible impact on groundwater.

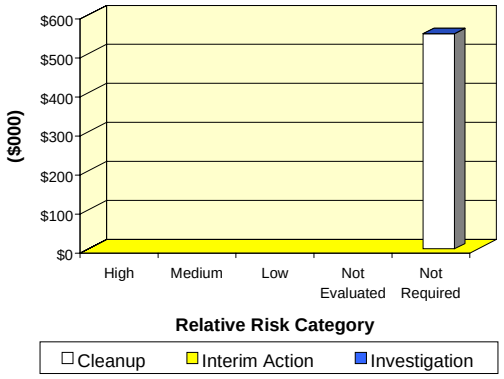
FY99 Restoration Progress

The groundwater extraction and treatment system continued to operate. Restoration Advisory Board activities with UCAB have been successful, as have continuing partnering efforts with EPA Region 9 and the Arizona Department of Environmental Quality.

Plan of Action

- Continue partnership with EPA Region 9 and the Arizona Department of Environmental Quality in FY00
- Continue operating the groundwater extraction and treatment system in FY00
- Continue participation in UCAB in FY00

FY00 Funding by Phase and Relative Risk



Tustin Marine Corps Air Station

FFID: CA917302478300
Size: 1,603 acres
Mission: Provide services and materials to support operations of the Third Marine Aircraft Wing; provide operations training facility support; operate helicopter outlying fields and maintain area landing sites; operate air traffic control facility; provide weather support
HRS Score: NA
IAG Status: Federal Facility Site Remediation Agreement signed in August 1999
Contaminants: VOCs, dichloroethane, dichloroethene, trichloroethene, trichloropropane, BTEX, naphthalene, petroleum hydrocarbons, pentachlorophenol, and MTBE
Media Affected: Surface water, groundwater, and soil
Funding to Date: $42.7 million
Estimated Cost to Completion (Completion Year): $0 (FY2031)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999

Tustin, California

Restoration Background

In July 1991, the BRAC Commission recommended closure of Tustin Marine Corps Air Station with retention of the family housing and related personnel facilities to support El Toro Marine Corps Air Station.

Studies since FY85 have identified 16 CERCLA sites, 278 areas of concern (AOCs), 129 underground storage tank (UST) sites, and 25 aboveground storage tank sites.

Two phases of a three-phase RCRA Facility Assessment (RFA) have been completed. Interim Remedial Actions completed at the installation include removal of USTs and construction of a drainage system. In FY92, 39 tanks were removed at the Fuel Farm; 30 more tanks were removed in FY93.

A BRAC cleanup team (BCT) was formed in FY94. In FY95, the installation began Engineering Evaluations and Cost Analyses for three sites. Contaminated soil was removed from the Fuel Farm. The installation began a parcel-specific Environmental Baseline Survey (EBS).

In FY96, Remedial Investigation and Feasibility Study (RI/FS) fieldwork was completed at Operable Unit (OU) 1, OU2, and OU3; a draft RFA was issued for 15 sites; and the final Phase III RFA was issued. Remediation was completed at the Fuel Farm, and a draft Land Reuse Plan was submitted for approval.

During FY97, Removal Actions for AOC MWA-3 and Sites 2, 9, and 13W were finished; the Expanded Site Inspections (ESIs) were completed for five sites; the final RI/FS was issued for OU3; and a landfill containment presumptive remedy was implemented. The BCT reviewed sampling plans and a draft Record of Decision (ROD) for OU3.

In FY98, the BCT accepted the final RI for OUs 1 and 2, and reviewed the draft FS. The latest version of the BRAC Cleanup Plan (BCP) was issued. The installation evaluated alternatives to the proposed improvements to the Peters Canyon Flood Control Channel, which is adjacent to OU3. The Tustin Spur of the JP-5 jet fuel supply line was closed in place.

A Restoration Advisory Board (RAB) was formed in FY94. RAB meetings have been held on a bimonthly basis.

FY99 Restoration Progress

The planned OU1 FS was delayed because regulators requested an indoor air quality risk assessment. The delay of the FS delayed the ROD for this OU. The planned ROD for 23 OU2 sites was delayed because of groundwater concerns. To accelerate site closures and to properly address groundwater concerns, OU2 was reorganized and now consists of 12 soil sites. A new operable unit, OU4, was formed, comprising 11 groundwater sites that were formerly part of OU2. The FS for OU2 was completed, and the draft Proposed Plan (PP) was released. The OU3 (Site 1) ROD is ready to be finalized.

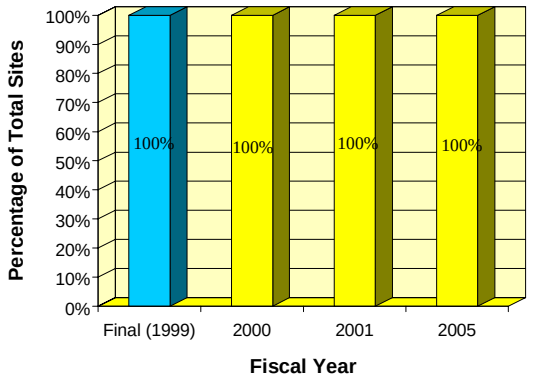
All USTs were removed, and cleanup of 15 RCRA sites (AOCs) was completed. The three RCRA Part B permitted-storage facilities were closed out through the Department of Toxic Substances Control (DTSC). Another 42 AOCs received No Further Action (NFA) concurrence from the BCT. A Business Plan (BP) was issued instead of the BCP, saving funds and streamlining the summary report. A parcel-specific EBS was deemed unnecessary, and a draft CERFA basewide EBS was issued in March.

A Federal Facility Site Remediation Agreement was signed in August 1999 between the Navy and DTSC.

Plan of Action

- Issue a revised draft FS, a final FS, and a draft PP for OU1 in FY00
- Finalize the PP and sign the NFA ROD for OU2 in FY00
- Finalize the ROD and issue a draft Remedial Design for OU3 in FY00
- Release the OU4 Focused FS and pursue a pilot study for Site 6 in FY00
- Issue an amended Action Memorandum and a draft Closure Report for Site 9A/9B in FY00
- Delineate the MTBE plume at UST Site 222 in FY00
- Issue and implement a Corrective Action Plan for the MTBE plume in FY00
- Close out the remaining 167 AOCs in FY00
- Update the BP in FY00

Sites Achieving RIP or RC Per Fiscal Year



Twin Cities Army Ammunition Plant NPL

FFID: MN521382090800
Size: 2,370 acres
Mission: Modified caretaker; provide support to DoD tenants; formerly manufactured small-arms ammunition and projectile casings
HRS Score: 59.60; placed on NPL in September 1983
IAG Status: Federal Facility Agreement signed in August 1987
Contaminants: VOCs, PCBs, and heavy metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $124.5 million
Estimated Cost to Completion (Completion Year): $80.4 million (FY2040)
Final Remedy in Place or Response Complete Date for All Sites: FY2006

Arden Hills, Minnesota

Restoration Background

Studies conducted since FY81 have verified that past waste disposal practices at this installation released hazardous contaminants into soil, groundwater, and sediment, which migrated into the Minneapolis-St. Paul groundwater supply. Twenty-eight sites, including former landfills, burning and burial grounds, ammunition testing and disposal sites, industrial operations buildings, and sewer system discharge areas, are grouped into three operable units (OUs).

Ammunition-related metals, volatile organic compounds (VOCs), and polychlorinated biphenyls (PCBs) are the primary soil contaminants at the installation. The Army has installed soil vapor extraction systems to remove VOCs from soil.

VOCs are the primary contaminants in groundwater. From FY86 to FY93, the Army installed groundwater extraction and treatment systems. The installation constructed a boundary groundwater recovery system to contain and treat VOC-contaminated groundwater at the installation's southwest boundary. The Army provided a permanent groundwater treatment system for the city of New Brighton, and the installation provided a municipal water supply hookup at the Lowry Grove Trailer Park.

In FY94, the OU3 Plume Groundwater Recovery System and the OU1 and OU3 municipal drinking water interconnection became operational. A boundary plume containment system was initiated to prevent off-post migration of VOCs in shallow groundwater. In FY96, the Army closed the Water Tower Area site and implemented a well advisory for OUs 1, 2, and 3. The installation established a Technical Review Committee in 1985 and a Restoration Advisory Board (RAB) in FY96.

In FY97, the Army implemented the alternate water supply plan, abandoning five residential wells. For OU1, two performance-monitoring wells were installed. On completion of the OU2 Feasibility Study, the installation drafted the OU2 Record of Decision (ROD). The Army began Remedial Design (RD) for eight shallow soil sites and two deep soil sites and completed removal of all contaminated soil from Site F.

In FY98, the Army and regulators signed an installationwide ROD. The Army completed the RD for six sites, initiated RD for five sites, and started Remedial Action (RA) for two sites. The RA (construction) for OU1 was completed; two additional containment wells and six additional performance monitoring wells were installed. The Army completed Engineering Evaluations and Cost Analyses (EE/CAs) for the Outdoor Firing Range, the Grenade Range, and the VOC-contaminated soil at Site A. It initiated a Removal Action at the Outdoor Firing Range and abandoned one residential well. The Tier I Ecological Risk Assessment (ERA) was completed.

FY99 Restoration Progress

Final cleanup continued at OU2. The Army completed RD for five sites, continued RA for two sites, and initiated RA for five sites at OU2. The Army also provided two private well owners and one commercial well owner with hookups to the municipal water supply. Regulatory approval was received for the Site F Closure Report, and the draft OU1 RA report was submitted for regulatory review. Dump characterization concluded at two sites, and the Removal Actions at the Grenade and Outdoor Firing Ranges continued. The statutory 5-year review of OU1, OU2, and OU3 began. RAs for deep groundwater in OUs 1 and 3 are expected to be operated and maintained for the next 40 years.

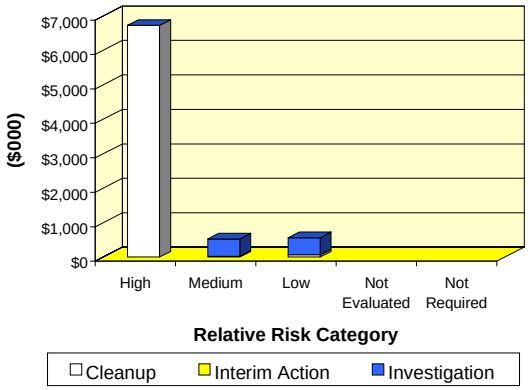
The Army did not complete the Tier II ERA as planned because of the lengthy review process. However, the work plan for the Tier II ERA for surface water and sediment was completed, and the field investigations began. The Army delayed the RA for eight sites at OU2 because there was unexpected asbestos, ammunition parts, and more contamination than originally believed.

The RAB applied for and received technical assistance through the Technical Assistance for Public Participation (TAPP) program. The TAPP project provided community members of the RAB with technical review of restoration documents and with reports summarized in nontechnical terms so that all RAB members could readily understand the issues and decisions reached on cleanup activities at the installation by Army and the regulators.

Plan of Action

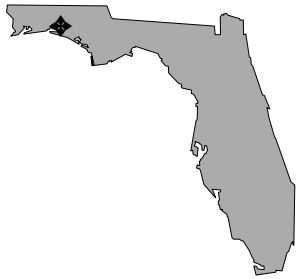
- Complete RD for five sites, initiate RA at four sites, and complete RA at five sites in OU2 in FY00
- Complete RI and EE/CAs for two primer tracer areas in OU2 from FY00 to FY02
- Operate and maintain all RAs at OU1 and OU3 from FY00 to FY40
- Complete RD for three sites and RA for two sites in FY01
- Complete Tier II ERA in FY03

FY00 Funding by Phase and Relative Risk



Tyndall Air Force Base NPL

FFID: FL457152412400
Size: 28,824 acres
Mission: Provide advanced F-15 fighter training
HRS Score: 50.00; placed on NPL in March 1997
IAG Status: IAG under negotiation
Contaminants: Petroleum/oil/lubricants, chlorinated solvents, pesticides, metals, PCBs, and general refuse
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $6.4 million
Estimated Cost to Completion (Completion Year): $19.4 million (FY2006)
Final Remedy in Place or Response Complete Date for All Sites: FY2004



Panama City, Florida

Restoration Background

Tyndall Field was activated in 1941 as the Flexible Gunnery School of the U.S. Army Air Corps. The installation became Tyndall Air Force Base in 1947 when the Air Force became a separate branch of the military. The current mission is F-15 training under the 325th Fighter Wing.

Environmental studies, beginning in FY81, have identified 36 Environmental Restoration Account sites. An FY95 RCRA Facility Assessment identified 58 solid waste management units and 18 areas of concern, many which were under the Installation Restoration Program (IRP). The installation completed RCRA clean-closure activities in 1996. The primary site responsible for the base's inclusion on the National Priorities List (NPL), Site OT029 Shoal Point Bayou, has DDT pesticide contamination.

In FY97, the installation signed decision documents and received No Further Action concurrence from the Florida Department of Environmental Protection (FDEP) and EPA for 11 sites. It achieved site consolidation at two sites. Interim Remedial Actions (IRAs) and Removal Actions were studied or conducted at six sites to reduce risks to human health and the environment. Free-product removal and excavation of contaminants helped eliminate source areas.

The installation partnership with FDEP, EPA, and restoration contractors has evolved into a project team serving as the Technical Review Committee. In FY94 and FY97, there were efforts to establish a Restoration Advisory Board (RAB). Public response indicated a high level of trust and no need for a RAB. A Community Relations Plan (CRP) was completed to inform the public.

The installation is completing study phases to determine appropriate Remedial Actions (RAs) and is conducting IRAs to reduce potential exposure. Recent IRP activities focus on Site Inspections, Remedial Investigations (RIs), and Contamination Assessment Reports (CARs).

FY99 Restoration Progress

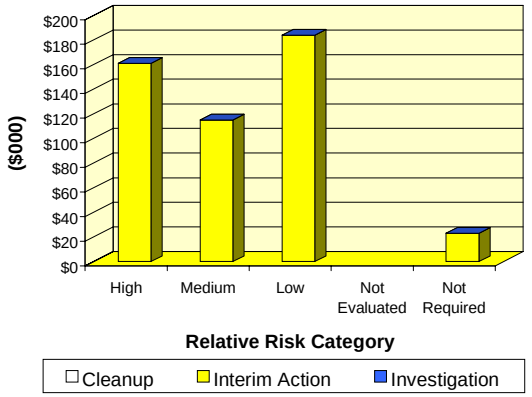
RI characterization fieldwork for LF006, LF007, FT017, and OT029 was completed. A Baseline Risk Assessment (BRA) is under way at all sites. Regulatory concurrence was received for the CARs for Sites SS015, SS019, and FT023, and work on associated Remedial Action Plans began. A preliminary draft Public Health Assessment has been completed, indicating no immediate health concerns or needed RAs. Relative risk classifications were reevaluated, and risk levels were reduced for four sites. A basewide background study was conducted, which identified existing metals values and water levels for future remedial screening.

Natural attenuation (NA) has been evaluated at FT016 and SS019. Neither site qualified for NA under Florida's requirements. A Remedial Action Plan, including a dual-phase extraction system, will be implemented to bring SS019 contamination levels within Florida NA default limits.

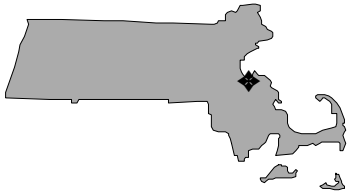
Plan of Action

- Complete BRA and RI reports for LF006, LF007, SS026, and FT017 in FY00
- Complete a pesticide reference study in FY00
- Receive concurrence on No Further Remedial Action Planned documents for LF002, LF005, LF009, LF010, and OT024 in FY00
- Continue RI/BRA work for OT029 in FY00 and complete by FY01

FY00 Funding by Phase and Relative Risk



FFID: MA121382063100
Size: 78 acres
Mission: Research and develop food, clothing, equipment, and materials to support military operations
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: None
Contaminants: Pesticides, herbicides, pentachlorophenol, solvents, and VOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $18.2 million
Estimated Cost to Completion (Completion Year): $32.9 million (FY2030)
Final Remedy in Place or Response Complete Date for All Sites: FY2003



Natick, Massachusetts

Restoration Background

Since 1954, this installation has supported industrial, laboratory, and storage activities for research and development in food science and in aeromechanical, clothing, material, and equipment engineering. Operations used various volatile organic compounds (VOCs), including tetrachloroethene, trichloroethene (TCE), carbon disulfide, benzene, and chloroform. Site types include contaminated buildings, spill sites, storage areas, disposal pits, dry wells, and underground storage tanks.

In FY89, soil gas surveys detected VOCs under Building T-25 and the former proposed gymnasium areas. Groundwater, soil, and surface water samples collected during later studies also contained VOCs.

The installation completed an Expanded Site Inspection in FY92 that confirmed TCE contamination in groundwater. A Remedial Investigation and Feasibility Study (RI/FS) began in FY93. The installation has performed several Interim Actions, including removal of waste and contaminated soil and pavement from the drum storage area. The installation also removed a 1,000-gallon waste oil storage tank and associated contaminated soil and removed polychlorinated biphenyl–contaminated soil from an exploded transformer.

After its placement on the National Priorities List (NPL), the installation increased efforts to partner with state and federal regulators and to communicate with the community. The installation established a Restoration Advisory Board (RAB) in FY95.

In FY96, the installation conducted a Phase II RI of the Building T-25 area to address the concerns of regulatory agencies and the RAB. The Army completed the first iteration of the groundwater model, detailing movement of water and contaminants within the complex alluvial aquifer. The Phase I RI for the Building T-25 area was completed, incorporating the views of the regulatory agencies. The installation began receiving drinking water from public wells and discontinued sampling of the installation's drinking water wells.

Also in FY96, all active sites received an initial Relative Risk Site Evaluation ranking, which incorporated the views of the regulatory agencies. The RAB received and reviewed work plans and reports and participated in relative risk rankings of NPL sites.

In FY97, the installation performed quarterly monitoring of groundwater contaminant levels in the monitoring well network. Bimonthly meetings with regulators increased coordination between regulators and the installation. To resolve issues with regulators, the installation established a consensus approach to new work. Field screening with geoprobe and ground-penetrating radar was used to expedite site characterization.

In FY98, the installation completed fieldwork for the RI at the former proposed gymnasium site and removed pesticide-contaminated soil. The installation also started the approved Building T-25 Treatability Study (TS) to contain contamination within the post boundaries and began investigating the boiler plant site.

FY99 Restoration Progress

The installation completed and issued draft RIs for the gymnasium site and the water well supply site. The installation is awaiting regulator comments on the draft RIs. FSs may not be necessary. The installation also held a public hearing on the Building T-25 groundwater Proposed Plan, issued a draft Record of Decision (ROD), and completed fieldwork on the Tier II Ecological Risk Assessment on the Building T-25 Outfall. The final Focused FS/TS of the Building T-25 area was also completed. Soldier Systems Center (SSC) continued to operate the TS system to produce containment of the Building T-25 groundwater plume.

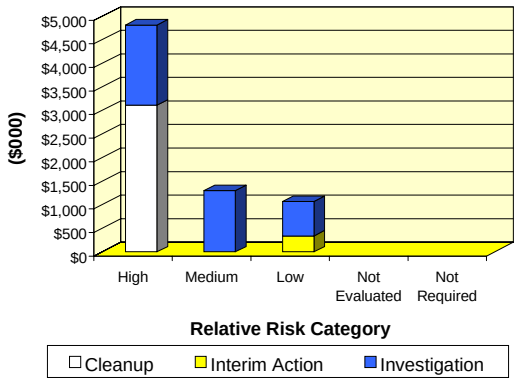
The installation was unable to begin the planned Removal Action at the boiler plant because of data quality problems; resampling was necessary.

SSC's RAB has been active for 5 years, meeting nine times a year to review documents, prioritize sites and actions, and offer advice on restoration activities. SSC meets biweekly with EPA and the Massachusetts Department of Environmental Protection to facilitate restoration progress.

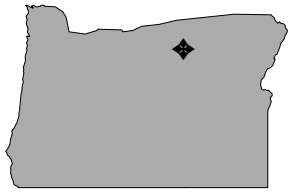
Plan of Action

- Begin an FS of installation outfalls in FY00
- Begin Interim Removal Action at the gymnasium site in FY00
- Begin implementation of the Building T-25 groundwater ROD in FY00
- Begin a Removal Action at the boiler plant in FY00

FY00 Funding by Phase and Relative Risk



FFID: OR021382091700
Size: 19,729 acres
Mission: Store ammunition
HRS Score: 31.31; placed on NPL in July 1987
IAG Status: Federal Facility Agreement signed in October 1989
Contaminants: Explosives, UXO, heavy metals, pesticides, and nitrates
Media Affected: Groundwater and soil
Funding to Date: $49.4 million
Estimated Cost to Completion (Completion Year): $23.0 million (FY2023)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002



Hermiston, Oregon

Restoration Background

In 1941, the Army established Umatilla Ordnance Depot as an ordnance facility for storing conventional munitions. Between 1945 and 1955, the installation's functions expanded to include demolition, renovation, and maintenance of ammunition. In 1962, the Army began to store chemical munitions at the depot. In December 1988, the BRAC Commission recommended realignment of the installation. In FY98, the installation officially changed its name from Umatilla Ordnance Depot to Umatilla Chemical Depot.

Studies from FY87 to FY90 identified 80 sites, including explosives-washout lagoons, an open burning and open detonation area, pesticide disposal pits, a deactivation furnace, and landfills. In FY92, the sites were grouped into nine operable units (OUs). Also in FY92, the Army signed a Record of Decision (ROD) selecting bioremediation by windrow composting as the treatment for the contaminated soil at the Washout Lagoon Soil OU. A ROD was also signed for the Deactivation Furnace OU.

In FY93, the Army and regulators signed two RODs for no further action at two landfills. In FY94, the installation completed Phase I of the bioremediation program for explosives-contaminated soil in the washout lagoon and stabilized lead-contaminated soil from the deactivation furnace. The installation transferred its conventional weapons mission to another installation. The commander formed a BRAC cleanup team (BCT), which completed a BRAC Cleanup Plan (BCP), and converted the installation's Technical Review Committee to a Restoration Advisory Board.

In FY95, the installation completed RODs for the Groundwater (GW) OU, the Bomb Washout Plant OU, the Miscellaneous Sites OU, and the Ammunition Demolition Activity Area (ADA) OU. The Army completed the Remedial Design (RD) for groundwater treatment and soil stabilization at the Miscellaneous Sites OU, the ADA OU, and the Bomb Washout Plant OU. The RD for the GW OU addressed a 350-acre plume contaminated with explosives.

In FY96, the Army completed a lead-based paint assessment and bioremediation of 10,000 cubic yards of explosives-contaminated soil. In FY97, the Army began operating a groundwater treatment facility constructed in FY96 and completed remediation of contaminated soil in the ADA OU, the Miscellaneous Sites OU, and the Bomb Washout Plant OU.

In FY98, the installation completed landfill closure and capping. It also completed geophysical mapping and an Engineering Sampling Analysis Report for UXO in the ADA OU. All remaining heating oil underground storage tanks were removed and converted to aboveground propane tanks.

FY99 Restoration Progress

The installation completed the Environmental Baseline Survey and the Finding of Suitability to Lease for the lease of 100/200 series warehouses. The U.S. Army Corps of Engineers, Huntsville Division, awarded a contract for the geophysical mapping and UXO clearance of the 650-acre quality assurance (QA) function range. The installation completed the Remedial Action (RA) report for the Bomb Washout Plant OU. The RA for ADA completion was delayed until completion of the Site 19 supplemental soil investigation. The planned National Priorities List (NPL) partial deletion is on hold pending issuance of the RA report.

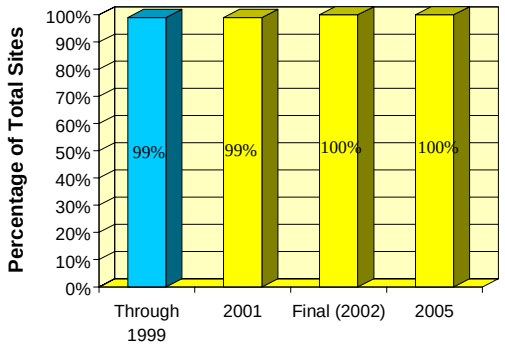
The installation entered dispute resolution with EPA Region 10 regarding UXO issues in the ADA. Official land reuse decisions caused a delay in UXO cleanup negotiations for the ADA. The BCP version 5 and statement of work for additional soil sampling of the ADA sites were completed.

The BCT met with the Oregon Department of Environmental Quality to request a review of Landfill OU monitoring and a reduction in long-term monitoring requirements. A new monitoring plan is being written to reduce sampling requirements.

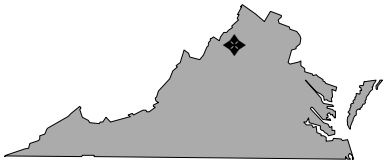
Plan of Action

- Complete ADA supplemental soil investigation and remediation in FY00
- Complete RA report for GW OU in FY00
- Complete and sign interim lease for 100/200 series warehouses and rail classification yard with Umatilla local reuse authority during FY00
- Complete UXO geophysical mapping and clearance of QA function range in FY00
- Complete RA report for ADA in FY01
- Negotiate UXO cleanup levels for ADA OU in FY01
- Complete NPL partial deletion in FY01
- Prepare remaining documentation required for property transfer in FY06–FY07

Sites Achieving RIP or RC Per Fiscal Year



FFID: VA321382093100
Size: 696 acres
Mission: Provide logistical support for assigned signals intelligence and electronics warfare weapon systems and equipment; provide communication jamming and intelligence fusion material capability
HRS Score: NA
IAG Status: None
Contaminants: Metals, cyanide, VOCs, petroleum hydrocarbons, PCBs, photographic wastes, and asbestos
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $9.3 million
Estimated Cost to Completion (Completion Year): $0 (FY2030)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003
Final Remedy in Place or Response Complete Date for Non-BRAC Sites: FY1999



Vint Hill Farms, Virginia

Restoration Background

In 1993, the BRAC Commission recommended closure of Vint Hill Farms Station. The Commission required the relocation of the maintenance and repair functions of the Army Communications-Electronic Command (CECOM), Intelligence Material Management Center (IMMC) to Tobyhanna Army Depot, Pennsylvania. The Commission also directed the transfer of the remaining components of IMMC, the Intelligence and Electronic Warfare Directorate, and the Program Execution Office for Intelligence and Electronic Warfare and Program Manager Signal Warfare to Fort Monmouth, New Jersey. The other non-CECOM activities were considered discretionary moves and were relocated primarily to Fort Belvoir, Virginia. The installation officially closed on October 1, 1997. The installation is in a caretaker status, providing minimal operations and maintenance and oversight of remedial activities until the Army transfers the property.

During the 1940s and 1950s, Vint Hill Farms Station served as a training center for Signal Corps personnel and as a refitting station for signal units. In FY90, a Preliminary Assessment (PA) identified 26 sites, including underground storage tanks (USTs), landfills, lagoons, storage areas, pit areas, fire training areas, disposal areas, spill sites, areas with asbestos-containing materials, lead-based paint areas, and transformers containing polychlorinated biphenyls (PCBs). The installation conducted Removal Actions for USTs, contaminated soil, and PCB-containing transformers. In FY90, soil and groundwater sampling revealed petroleum and solvent contamination.

In FY94, an enhanced PA identified 16 additional sites. Twelve of these sites were recommended for no further action (NFA). The installation formed a BRAC cleanup team and completed the final CERFA report and an Environmental Baseline Survey.

In FY95, the Army completed a Land Reuse Plan and submitted it to the regulatory agencies for approval. The installation also initiated a Remedial Investigation and Feasibility Study (RI/FS) for the Phase I reuse area identified by the Local Redevelopment Authority and began an Environmental Impact Statement (EIS). The installation formed a Restoration Advisory Board.

In FY96, the Army completed a final Site Inspection (SI) report identifying 24 sites for further investigation. RI/FS Phase I fieldwork was completed. In FY97, four areas requiring environmental evaluation (AREEs) were recommended for remediation, and the remaining AREEs were recommended for NFA. Regulators approved the recommended Interim Remedial Actions (IRAs) for the four AREEs slated for remediation, and the Army prepared Proposed Plans for these actions. The Army completed Phase II RI fieldwork.

In FY98, the Army submitted the final Phase I RI report and the draft Phase II RI report to the regulatory agencies. The Army recommended and completed IRAs for three AREEs and began an FS for AREE 1, the former landfill. The Army issued the final EIS and Record of Decision.

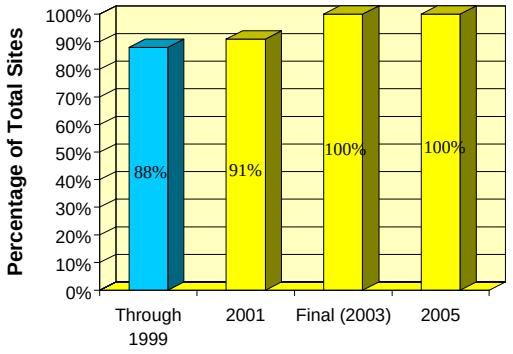
FY99 Restoration Progress

The installation completed five decision documents for Phase I RI sites, the first Finding of Suitability to Transfer (FOST) for the associated 691 acres (of a total 701 acres), and the transfer by deed. The installation continued Remedial Action (RA) for Phase I sites, in coordination with the regulators, and Remedial Design (RD) and RA at active sites in the remaining 10 acres anticipated to be suitable for transfer in FY01 to FY03. It also completed the Phase II RI/FS report. The Phase II report recommended three AREEs for remediation.

Plan of Action

- Complete Phase II FS/RD for active sites in FY00
- Begin long-term monitoring at AREE 1 after completion of associated RD activities in FY00
- Complete Phase II activities for three restoration sites in FY01 and for three compliance sites in FY03
- Complete Phase II decision documents and FOSTs in FY01–FY03

Sites Achieving RIP or RC Per Fiscal Year



Warminster Naval Air Warfare Center Aircraft Division — NPL/BRAC 1991

FFID: PA317002454500
Size: 817 acres
Mission: Perform research, development, testing, and evaluation for Naval aircraft systems and antisubmarine warfare systems; perform associated software development
HRS Score: 57.93; placed on NPL in October 1989
IAG Status: Federal Facility Agreement signed in September 1990
Contaminants: VOCs, heavy metals, firing range wastes, fuels, industrial wastewater sludges, nonindustrial solid wastes, paints, PCBs, sewage treatment sludge, and solvents
Media Affected: Groundwater and soil
Funding to Date: $18.3 million
Estimated Cost to Completion (Completion Year): $25.3 million (FY2039)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1999

Warminster Township, Pennsylvania

Restoration Background

In July 1991 and July 1995, the BRAC Commission recommended that Warminster Naval Air Warfare Center Aircraft Division be realigned and closed. The installation closed in March 1997.

In FY79, metals and volatile organic compounds (VOCs), primarily trichloroethene (TCE) and tetrachloroethane, were detected in local groundwater wells. Studies have identified nine sites, eight of which were recommended for further investigation. Site types include waste burn pits, sludge disposal pits, landfills, waste pits, and a fire training area.

One underground storage tank and associated contaminated soil were removed between FY86 and FY90. In FY93, the installation signed a Record of Decision (ROD) for Operable Unit (OU) 1. Remedial Design (RD) activities for the site were completed in FY94.

In FY93 and FY94, the installation completed groundwater Remedial Investigation and Feasibility Study (RI/FS) activities for eight sites. A BRAC cleanup team was established in FY94. In FY95, the installation completed a Remedial Action (RA) for residential wells contaminated with TCE. The installation also completed a BRAC Cleanup Plan (BCP) and a Phase I Environmental Baseline Survey (EBS) and began Phase II EBS.

The Navy installed temporary treatment systems at each affected well and worked with EPA and the local water authority to provide public water service to affected residential areas. In FY96, groundwater RI/FS activities at Site 9 and the RD for Sites 4 and 8 were completed. During FY97, one Removal Action was completed at Site 4 and another was initiated at Site 6. The installation also completed an RA at OU3 and started long-term monitoring. Groundwater investigations for Area D concluded when an interim ROD was signed.

In FY98, the installation issued a final RI report for Area D sources. Fieldwork was completed and draft reports issued for EBS Phase II work, including risk assessments. The installation initiated a Removal Action at Area A (Site 1) and conducted pump tests at Areas A and D. Supplemental investigations for Site 5 and suspected trenches were initiated. The latest version of the BCP was completed. The draft Phase III RI/FS for media other than groundwater was completed. An interim RD/RA for groundwater at Areas A and D was initiated.

The installation's Technical Review Committee, formed in FY88, was converted to a Restoration Advisory Board in FY94. The installation also completed its Community Relations Plan and established an administrative record in FY94.

FY99 Restoration Progress

The Navy and EPA signed an explanation of significant differences for the groundwater in Area C. The document included a change to the final Area C groundwater ROD, incorporating institutional controls (ICs) that would prevent the use of groundwater that presented an unacceptable risk to human health. These ICs would also protect the integrity and effectiveness of the extraction well network. A Removal Action was completed, and the Navy and EPA signed a No Further Action (NFA) ROD for soil, surface water, and sediment at Site 8. In addition, the Navy completed a source removal at Sites 1, 2, and 3. Groundwater in Areas A and D underwent treatment, with the installation of extraction wells connected to the wastewater treatment plant. The Navy continued off-base and perimeter monitoring.

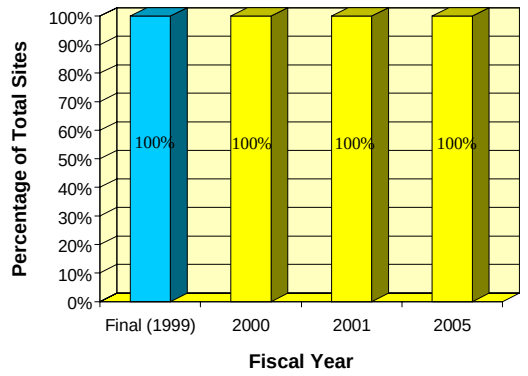
Northern Division signed a Finding of Suitability to Transfer (FOST) for Parcel 4. The Navy issued a final RI for Area D sources.

The preferred alternative for Site 6 was changed. The new action involves installation of 2 feet of soil cover and implementation of ICs. This change, if approved, will result in cost savings of approximately $1 million. An Environmental Baseline Survey for Transfer (EBST) and draft FOSTs for public benefit conveyance (PBC) and economic development conveyance (EDC) parcels for Phase 1 were prepared.

Plan of Action

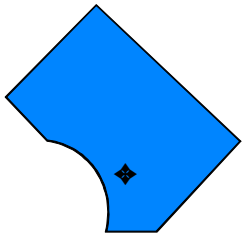
- Sign an NFA ROD for Site 4; Area D soil, sediment, and surface water; and Area B groundwater in FY00
- Sign a ROD for Area A; Site 6 and 7 soil, sediment, and surface water; and Area A and D groundwater in FY00
- Continue perimeter and off-base monitoring in FY00
- Complete the EBST and FOSTs for the remaining PBC and EDC parcels in FY00

Sites Achieving RIP or RC Per Fiscal Year



Washington Navy Yard NPL

FFID: DC317002431000
Size: 63.3 acres
Mission: As the Navy's Quarterdeck in the Washington area, provide resources, including administrative space, housing, training facilities, logistical support, and supplies, for Washington Navy Yard tenants and other assigned units
HRS Score: 48.57; placed on NPL in July 1998
IAG Status: Federal Facility Agreement signed in June 1999
Contaminants: PCBs, pesticides, solvents, and metals
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $11.3 million
Estimated Cost to Completion (Completion Year): $40.6 million (FY2016)
Final Remedy in Place or Response Complete Date for All Sites: FY2014



Washington, D.C.

Restoration Background

Investigations at the Washington Navy Yard (WNY) have identified 15 sites, including 3 leaking underground storage tank (UST) sites. Contaminants released from past storage and disposal operations at the installation may have migrated into shallow and deep aquifers and the Anacostia River. A RCRA Consent Order, signed in July 1997, has been added into WNY's Federal Facility Agreement (FFA), which was signed on in June 1999. A Site Management Plan (SMP) for WNY is under review by the regulatory agencies.

WNY's SMP outlines all projects and schedules that are being conducted under the FFA. Each regulatory agency and the Navy will use the SMP to track the progress of investigations and cleanup actions. Both EPA Region 3 and the District of Columbia Environmental Health Administration are reviewing the SMP. Work plans were developed and reviewed for the RCRA Facility Investigation (RFI) of basewide groundwater and Site 16, a former dive shop area where mercury was detected during an unrelated UST investigation. The RFI work plans and other work plans approved while WNY was governed by the Consent Order will be the implementing documents for investigations and actions continued under the FFA.

The WNY Restoration Advisory Board meets bimonthly and has participated in relative risk ranking activities for the facility. The Community Relations Plan (CRP) developed under RCRA will be revised to reflect the FFA status.

FY99 Restoration Progress

To minimize potential for exposure of the Anacostia River to contamination, the installation completed a Time-Critical Removal Action for Site 16, which contained mercury-contaminated soil. An Engineering Evaluation and Cost Analysis (EE/CA) was not required because the Removal Action was time critical. A final closure report for the site was completed and submitted to EPA.

Cleaning the WNY storm sewer system complied with the requirements of a Consent Decree between the Navy and the Earthjustice legal defense fund. Repairs to portions of the storm sewer, identified in the televising process, have begun.

Additional fieldwork was completed for Removal Site Evaluations at Sites 7, 11, and 13. No EE/CAs began for these sites because the site evaluations indicated that Removal Actions were not necessary. Land use controls are being developed for Site 10 as Interim Actions until a site Remedial Investigation (RI) can be completed. The EE/CA for Site 10 was finalized. The planned Action Memorandum (AM) for Site 10 was not completed because Naval District Washington did not complete the two base instructions that were to be implemented by the AM.

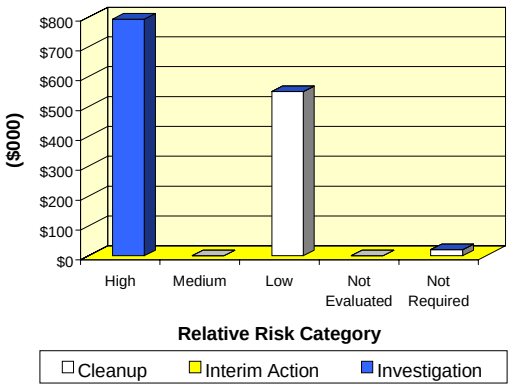
The fieldwork for a basewide groundwater investigation is under way. This fieldwork includes taking sediment samples from the Anacostia River adjacent to WNY, from District of Columbia storm sewer outfalls, and from areas upstream from WNY. Background samples for the basewide investigation are being collected upgrade of the facility. A CERCLA SMP was submitted to EPA, Washington, D.C. (EPA/D.C.) A Corrective Action Plan (CAP) for UST sites WNY 111 and 71 was submitted for approval. Corrective action remediation will begin upon CAP approval.

The WNY FFA was signed in June 1999 and became effective on September 27, 1999.

Plan of Action

- Conduct a Human Health Risk Assessment for soil at Site 16 in FY00
- Submit a Removal Site Evaluation report for Sites 7, 11, and 13 in early FY00
- Submit an AM for land use controls at Site 10 in FY00
- Develop a technical memorandum summarizing the river sediment sampling results and submit to EPA/D.C. in FY00
- Begin an RI for soil at Site 5 in FY00
- Conduct follow-up sampling for the basewide investigation, including additional background sampling in FY00
- Submit an RI report for the basewide groundwater investigation and Sites 4, 6, and 14 in FY00
- Submit an RI report for Site 16 to EPA/D.C. in FY00
- Continue repairs and replacements of the base storm sewer system in FY00
- Submit master project plans to EPA/D.C. to expedite the investigation and the start-up of future actions on WNY in FY00
- Revise the RCRA CRP to more closely reflect the requirements of the FFA in FY00

FY00 Funding by Phase and Relative Risk



West Virginia Ordnance Works — NPL

FFID: WV39799F346100
Size: 2,704 acres
Mission: Manufactured TNT
HRS Score: 35.72; placed on NPL in September 1983
IAG Status: First IAG signed in September 1987; second IAG signed in July 1989
Contaminants: TNT, DNT, and organic compounds
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $52.2 million
Estimated Cost to Completion (Completion Year): $38.9 million (FY2027)
Final Remedy in Place or Response Complete Date for All Sites: FY2005

Point Pleasant, West Virginia

Restoration Background

From 1941 to 1946, West Virginia Ordnance Works manufactured TNT from toluene, nitric acid, and sulfuric acid. By-products of the manufacturing process included TNT, DNT, and organic compounds, which were released into groundwater, soil, surface water, and sediment. Principal sites include TNT manufacturing areas, wastewater sewer lines, and wastewater ponds known as the "Red and Yellow Water Ponds."

Preliminary Assessments and Site Inspections (SIs) in FY81 and FY82 identified two operable units (OUs). The property is now divided into 13 OUs. From FY88 to FY93, contaminated soil was capped in the TNT manufacturing area. Caps for the ponds and the reservoir (OUs 2 and 3) were completed, and the installation began Remedial Investigation and Feasibility Study (RI/FS) activities at OUs 8, 9, and 11. The U.S. Army Corps of Engineers (USACE) began operations and maintenance and long-term monitoring (LTM) for OUs 1, 2, and 3. OU13 is the Pantasote Area. EPA has the lead on this OU.

In FY94, the Site Management Plan for the former installation was completed. Remedial Design (RD) activities were completed for OU4 and the groundwater extraction and treatment system. Expanded SIs (ESIs) began. USACE removed 546 tons of hazardous material from the TNT manufacturing area and backfilled open pits and manholes.

In FY95, USACE completed Removal Actions for asbestos in the acids area and two powerhouses and performed follow-on building demolition. USACE also began quarterly LTM of the adjacent Point Pleasant and Camp Conley municipal water supply wells. At OU6, sampling was completed, and the RD began for construction of wetlands. Potentially responsible party (PRP) efforts were initiated for OU7. A risk assessment began at OU11.

During FY96, USACE submitted a risk assessment and an RI report to EPA Region 3 and started an FS at OUs 8, 9, and 11. It also initiated final Baseline Risk Assessments for OUs 10 and 12.

In FY97, USACE completed construction of the groundwater extraction and treatment system and submitted a Remedial Action report for OU4. The final Alternative Analysis report for OU5 and the final Baseline Risk Assessment for OUs 10, 11, and 12 also were submitted to EPA. USACE presented a draft FS for OU10, a draft risk evaluation for ESI 3, and a Proposed Plan for OU11. The conceptual design for OU5 was initiated.

USACE worked with the Technical Review Committee (TRC) to reestablish project priorities. A draft no-action Record of Decision (ROD) for OU11 was developed in FY97.

During FY98, USACE completed a sitewide groundwater model and converted the TRC to a Restoration Advisory Board (RAB). A draft FS for OU4 Alternative Analysis was completed to identify ways of bringing the system into compliance with state discharge standards. USACE developed draft decision documents for ESIs 1, 2, 3, 8, and 9. Draft Proposed Plans for OU10 and OU12 were completed.

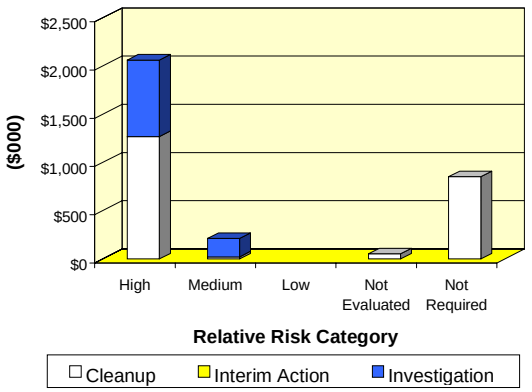
FY99 Restoration Progress

The ROD at OU5 and the final documents for ESIs 1, 2, 3, 8 and 9 were not completed, due to a backlog of documents at EPA. The OU1 burning ground investigation was completed. The Proposed Plan for OU12 was completed and presented to the public for comments. The Proposed Plan for OU10 was delayed because the state requested additional sampling. The FS for OU4 Alternative Analysis was completed. A 5-year review report was submitted, and a UST confirmation study was completed. A Removal Action at ESI 8 was initiated. Additional sampling at ESI 3 was completed. Partnering with EPA is under way to relieve the backlog of documents awaiting EPA review.

Plan of Action

- Complete RODs for OUs 5, 10, 11, and 12 in FY00
- Complete the final decision documents for ESIs 1 and 3 through 9 in FY00
- Complete OU4 corrective action RD in FY00
- Complete UST removal at ESI 5 in FY00
- Continue LTM activities at OUs 1, 2, 3, and 11 and AOC 2 in FY00 and FY01
- Complete OU4 corrective action in FY01
- Complete FS for OU8 and OU9 in FY01
- Complete ESI 2 final decision document in FY01

FY00 Funding by Phase and Relative Risk



Whidbey Island Naval Air Station — Ault Field and Seaplane Base — NPL

FFID: WA017002336100
Size: 7,000 acres
Mission: Serve as training and operations center for the EP-3 Aries Orion antisubmarine and EA-6B Prowler radar jamming aircraft squadrons; serve as center for U.S. Navy and Marine Corps reserve training in the Pacific Northwest
HRS Score: 39.64 (Seaplane Base); placed on NPL in February 1990; delisted from NPL in 1995
48.48 (Ault Field); placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in September 1990
Contaminants: Chlorinated solvents, PCBs, and PAHs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $79.3 million
Estimated Cost to Completion (Completion Year): $21.0 million (FY2017)
Final Remedy in Place or Response Complete Date for All Sites: FY2009

Oak Harbor, Washington

Restoration Background

Whidbey Island Naval Air Station occupies four areas on Whidbey Island, Washington: Ault Field, the Seaplane Base, the Coupville Outlying Field, and the Lake Hancock Target Range. The Seaplane Base and Ault Field were placed on the National Priorities List (NPL) in February 1990. Past disposal practices from aircraft maintenance, vehicle maintenance, public works shop activities, and fire fighting training activities have contributed to contamination.

Investigations initially identified 52 sites, which were grouped into five operable units (OUs). Eighteen of the sites, designated as OU4, were later recommended for No Further Action. Between 1993 and 1996, four Records of Decision (RODs) were developed to cover the remaining OUs. No sites were identified at Coupville. Oversight of Lake Hancock was delegated to the State of Washington, and a Phase II Site Hazard Assessment was initiated. Thirty-six underground storage tank (UST) sites were not covered by the RODs.

In FY90, the Navy signed a Federal Facility Agreement (FFA) for Ault Field and the Seaplane Base. The FFA specified that 26 sites would undergo more intensive sampling under a Hazardous Waste Evaluation Study (HWES) for potential inclusion in a Remedial Investigation and Feasibility Study (RI/FS). After the HWES in FY94, two additional sites were recommended for an RI/FS because of soil and groundwater contamination. Removal Actions were recommended for seven sites.

From FY91 to FY95, UST Removal Actions and Interim Remedial Actions, were conducted at the installation. In FY94, the installation conducted corrective actions at 16 UST sites not covered under the RODs. In FY95, the installation completed RI/FS activities at OU3. A ROD was signed and a Remedial Design (RD) completed for another OU. Remedial Actions (RAs) were completed at two other OUs, and additional USTs were removed. Groundwater contamination from OU1, Area 6, was threatening the water supply of private landowners. A landfill cap, a pump-and-treat system, and a groundwater injection system were constructed to control the contamination. The groundwater contains petroleum hydrocarbons, inorganic compounds, and polyaromatic hydrocarbons (PAHs). The Seaplane Base was delisted from the NPL and from the State of Washington's Hazardous Sites List. Soil excavation activities have sufficiently reduced the threat to human health and the environment.

During FY96, the installation completed an RA for contaminated sediment from OU3 runway ditches. The landfill cap and the pump-and-treat system at OU1 were upgraded. A ROD was signed and RD was initiated for OU5. One UST was closed.

In FY97, the installation completed the RD and the RA for three sites at OU5. The landfill cap also was completed. RODs for three sites were signed, and RDs for two sites were completed.

In FY98, operations and maintenance (O&M) and long-term monitoring (LTM) were conducted at OUs 1 and 5. The 5-year reviews for OUs 1, 2, 3, and 5 were combined and completed.

In FY94, the installation converted its Technical Review Committee to the Navy's first Restoration Advisory Board. The installation completed a Community Relations Plan in FY91 and updated it in FY95 and FY96.

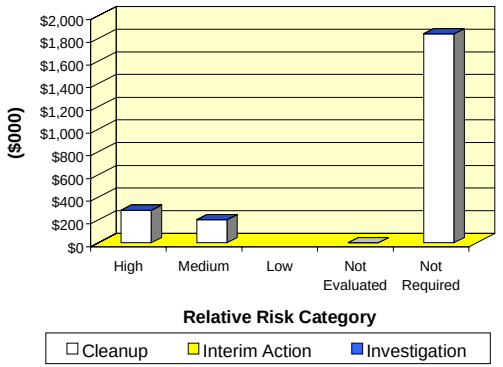
FY99 Restoration Progress

O&M and LTM continued at OUs 1 and 5. Studies to control treatment system biofouling problems and a project to upgrade the pump-and-treat system controls were initiated at OU1, Area 6. The U.S. Geological Survey (USGS) was tasked with evaluating the effectiveness of the pump-and-treat system at OU1 and proposing alternatives.

Plan of Action

- Continue O&M and LTM at OUs 1 and 5 in FY00
- Conduct soil removal at OU2 in FY00
- Evaluate biofouling recommendations and USGS study for OU1 in FY00
- Initiate proposals to suspend some pump-and-treat operations at OU5 in FY00
- Suspend pump-and-treat operation and complete removal operations at OU2 in FY00
- Propose that Ault Field, except for OU1, be delisted from the NPL, and request that the State of Washington provide oversight at OU5 in FY00 as a condition of the delisting.
- Submit a Closure Report to the State of Washington for Lake Hancock, proposing No Further Action in FY00

FY00 Funding by Phase and Relative Risk



White Oak Naval Surface Warfare Center — BRAC 1995

FFID: MD317002344400
Size: 710 acres
Mission: Research, develop, test, and evaluate ordnance technology
HRS Score: NA
IAG Status: None
Contaminants: Explosive compounds, waste oil, PCBs, heavy metals, VOCs, and SVOCs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $20.8 million
Estimated Cost to Completion (Completion Year): $15.9 million (FY2007)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2003

Silver Spring, Maryland

Restoration Background

In July 1995, the BRAC Commission recommended closure of White Oak Naval Surface Warfare Center. The facility closed in July 1997. The General Services Administration and the Local Redevelopment Authority developed a Land Reuse Plan.

Activities at the installation included landfill disposal of oils, polychlorinated biphenyls (PCBs), solvents, paint residue, and other chemicals (including mercury); disposal of chemical research wastewater in dry wells; burning of explosive ordnance; and composting of sludge. Records also indicate that a radium spill occurred. Contaminants of concern are volatile organic compounds (VOCs); PCBs; cadmium; chromium; lead; mercury; nickel; and ordnance compounds, such as RDX and TNT.

Studies identified 14 sites, 7 of which required no further action (NFA) after the Preliminary Assessment in FY84. The remaining sites proceeded to the Site Inspection (SI) phase, which was completed in FY87. Contamination was detected at all seven sites, and further investigation was recommended. A fence was installed around the Apple Orchard Landfill site due to PCB-contaminated surface soil. In FY89, a RCRA Facility Assessment identified 97 solid waste management units (SWMUs) and 19 areas of concern (AOCs). Thirty-eight SWMUs required further investigation.

The installation completed the Remedial Investigation and Feasibility Study (RI/FS) phase for all seven remaining sites in FY93. The Human Health Risk Assessment identified a present risk at the Apple Orchard Landfill site and a potential risk at the remaining six sites. Source removal was recommended for five sites and encapsulation for two sites. The installation began Remedial Design (RD) for six sites in FY94. In FY96, the installation formed a BRAC cleanup team (BCT); completed RDs for Sites 8, 9, and 11; and completed an Environmental Baseline Survey. In FY97, the installation finished Interim Remedial Actions (IRAs) for Sites 8, 9, and 11; completed several underground storage tank removals; and initiated RI/FS for Sites 7 and 9.

In FY98, the RCRA 7003 Order was issued. Of the 18 sites (AOC 1) scheduled for RI/FSs, 7 had RI/FSs initiated, 9 were recommended for NFA, and 2 were recommended for Removal Actions. IRAs were initiated at Sites 1, 4, 28, and 46. A new Removal Action was initiated at Site 46, and work was broken into two phases, surface water and groundwater contamination. The installation also completed an SI at the site. A basewide background study and site screenings of Sites 1, 5, 6, 12, 13, 28, 29, 31, 32, and 33 (AOC 1) and AOC 100 were compiled. The installation began a basewide explosives survey, site screening at AOC 2, and basewide storm and sanitary sewer investigations. Removal Actions were planned at Sites 10 and 14.

A Technical Review Committee, formed in FY89, was converted to a Restoration Advisory Board in FY96. The installation established an administrative record, an information repository, and a Community Relations Plan in FY94.

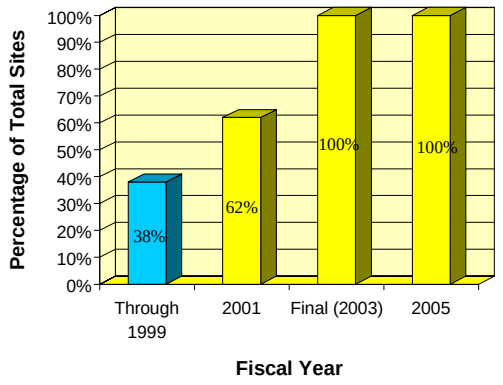
FY99 Restoration Progress

A draft RCRA Facility Investigation of Sites 2, 3, 4, 7, 8, 9, and 11 and a draft Site Screening Report for AOC 2 for initial screening were completed. An NFA report on 50 sites was completed, and an RI for OU1, which includes Site 46, was initiated. Second and third quarter sampling for basewide groundwater monitoring was completed, and explosives survey investigations were initiated. An inflow and infiltration study for SWMUs 46 and 48 and a Removal Action at Site 46 were initiated. Draft Engineering Evaluations and Cost Analyses for Sites 1, 4, 28, and 33, and a Removal Action at Sites 4 and 33 were completed. The Proposed Plan (PP) and Record of Decision (ROD) for Sites 8, 10, and 14 were postponed due to insufficient data. Clean closure of Site 3 was postponed due to low BRAC funding. The RI for AOC 2 was delayed because of regulatory review of the draft Site Screening Report. Removal Actions were completed at Sites 4 and 33. Site 1 was designated part of Site 2. Sites 10 and 14 were reevaluated and are under risk analysis; they are expected to be NFA. The Site 28 scrap yard was surface cleaned, and an RI report is being prepared that is expected to lead to NFA. The BCT has continued partnering.

Plan of Action

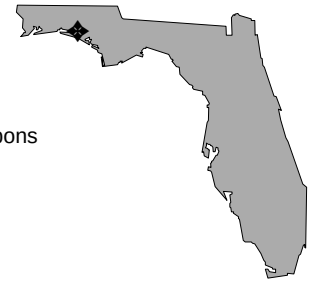
- Prepare Corrective Measures Study and begin interim ROD for Site 11 in FY00
- Complete White Oak Web page and geographic information system in FY00
- Continue partnering efforts in FY00
- Complete PPs and RODs for Sites 8 and 33 in FY00
- Begin Removal Action for Site 3 and basewide explosives remediation in FY01
- Complete RA for OU1 and PPs and RODs for Sites 10 and 14 in FY01
- Begin RD for Sites 1 and 2 in FY00 and begin Remedial Action (RA) for Sites 1 and 2 in FY01
- Conduct, if needed, the RI for AOC 2 in FY00 and the Removal Action for AOC 2 in FY01

Sites Achieving RIP or RC Per Fiscal Year



Whiting Field Naval Air Station NPL

FFID: FL417002324400
Size: 3,842 acres
Mission: Train student naval aviators
HRS Score: 50.00; placed on NPL in May 1994
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Pesticides, PCBs, VOCs, heavy metals, and chlorinated hydrocarbons
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $25.7 million
Estimated Cost to Completion (Completion Year): $33.0 million (FY2031)
Final Remedy in Place or Response Complete Date for All Sites: FY2012



Milton, Florida

Restoration Background

In FY85, a Preliminary Assessment (PA) identified 23 sites at Naval Air Station (NAS) Whiting Field. In FY89, a supplemental PA identified five sites at the Outlying Landing Field (OLF) Barin. Site types include disposal areas and pits, storage areas, spill areas, landfills, a disposal and burning area, a maintenance area, underground storage tanks (USTs) and fuel pits, fire training areas, and drainage ditches. There are 39 CERCLA sites.

In FY87, Site 5 was determined to require no further action (NFA). In FY89, Remedial Investigation and Feasibility Study (RI/FS) activities began for most sites. In FY92, soil contaminated with mercury, lead, and methylene chloride was detected at the OLF Barin. RI/FS activities began for the five original sites, five new sites at OLF Barin, and six sites at NAS Whiting Field. In FY94, the installation completed a Baseline Risk Assessment for the OLF Barin and a Baseline Risk Assessment work plan for the NAS. In FY95 and FY96, the installation completed RI/FS activities and closed four sites at OLF Barin.

Chlorinated hydrocarbon contamination was detected, and 19 tanks identified at six UST sites. Between FY92 and FY95, Removal Actions were completed for all USTs and associated soil, two UST sites were closed, and a Corrective Action Plan (CAP) was completed for one UST site.

In FY97, cleanup of five sites was completed, and the sites closed, at OLF Barin: two sites required NFA; two required Interim Removal Actions, then NFA; and one site required a Remedial Action. At the NAS, groundwater was isolated as a separate site, enabling the installation to finish field investigations at 13 sites. Clear Creek and off-base migration received preliminary investigation. A large UST site was investigated and given a monitoring-only designation because of changes in state regulations and the low risk of migration of contamination. The NAS completed a CAP and began a Remedial Design for one UST site.

In FY98, RI reports were written for nine sites at NAS, FS reports were written for two sites, and a Proposed Plan (PP) and draft Record of Decision (ROD) were written for one site. Field investigations were finished at six sites. The installation completed an RI/FS for Site 122, previously Site 22, at OLF Barin.

The NAS formed a Technical Review Committee (TRC) in FY89. A Community Relations Plan (CRP), completed in FY91, was updated in FY95. NAS formed a TRC for OLF Barin in FY92; the OLF Barin's CRP was completed in FY93. In FY95, both TRCs were converted to Restoration Advisory Boards (RABs). The RABs received training on the Technical Assistance for Public Participation program and the Technical Assistance Grant program.

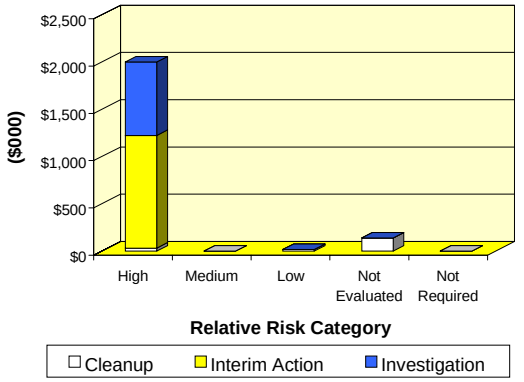
FY99 Restoration Progress

RI reports were completed for 11 sites, draft RI reports were written for 6 sites, Interim Remedial Actions were completed at 4 sites, and FS reports and PPs were completed for three sites. RODs were signed for Sites 1 and 2, and a Memorandum of Agreement for land use controls (LUCs) was signed. NFA letters were completed for Sites 36 and 37, and fieldwork began on seven sites, one being groundwater, at NAS. An instruction for LUCs was signed at OLF Barin. The remaining RI/FS, PPs, and RODs planned for FY99 were not completed due to a change in Florida guidance for cleanup. Long-term monitoring (LTM) for Site 2894 was requested in late FY99, but state approval was not received. Petroleum-contaminated soil cleanup was conducted along an abandoned fuel pipeline. The Federal Facility Agreement (FFA) was not signed as planned and is still in draft form.

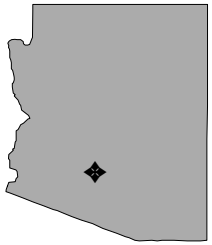
Plan of Action

- Complete RODs for six sites at NAS in FY00
- Complete groundwater investigation at NAS in FY00
- Sign FFA in FY00
- Complete RODs for 12 sites at NAS in FY01
- Install remediation system at Site 1438 in FY01
- Start LTM for Site 2894 in FY00

FY00 Funding by Phase and Relative Risk



FFID: AZ957002858200
Size: 4,042 acres
Mission: Supported pilot training and ground equipment maintenance
HRS Score: 37.93; placed on NPL in November 1989
IAG Status: Federal Facility Agreement signed in 1990
Contaminants: VOCs, petroleum/oil/lubricants, heavy metals, and pesticides
Media Affected: Groundwater and soil
Funding to Date: $43.6 million
Estimated Cost to Completion (Completion Year): $21.6 million (FY2027)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2000



Mesa, Arizona

Restoration Background

In July 1991, the BRAC Commission recommended closure of this installation. The installation closed on September 30, 1993.

Before base closure, environmental studies identified 15 sites at the installation. These sites were consolidated into three operable units (OUs). In FY93, an Environmental Assessment of 30 additional areas resulted in creation of two more OUs, including 17 new Installation Restoration Program (IRP) sites. OU1 contains 10 sites; OU2 is the liquid fuels storage area; OU3 consists of Fire Protection Training Area No. 2 and a collapsed stormwater line; OU4 contains 9 sites; and OU5 contains 9 sites. A sixth OU was created by Consensus Statement at the April 1997 Technical Working Group Meeting at Williams (Site SS-17 was moved from OU4 to maintain the OU4 schedule). OU6 is the Old Pesticide/Paint Shop.

Removal Actions and Interim Remedial Actions included removal of buried containers, contaminated soil, and 12 underground storage tanks (USTs). In FY93, a Record of Decision (ROD) was signed for OU2, and the installation began Remedial Design (RD) and Remedial Action activities. Soil at OU2 is being treated by soil vapor extraction (SVE). An Environmental Baseline Survey was completed.

In FY94, a ROD was signed for OU1, and all known USTs and oil-water separators were removed. A free-product extraction system was installed at IRP Site ST-12 (OU2). In FY95, the installation removed a UST from the Airfield Site and removed stained-soil areas, drums, and asbestos-containing material from the Concrete Hardfill Site. Risk assessments were prepared for two sites, and decision documents recommending No Further Action were prepared for five sites at OU5. The installation also completed a Feasibility Study (FS), a Proposed Plan (PP), and a draft ROD for OU3. At OU1, a landfill cap was installed. In FY94, the installation formed a BRAC cleanup team and a Restoration Advisory Board, and the Community Relations Plan was revised.

In FY96, a ROD was signed for OU3. Treatability Studies (TSs) of free-product removal, natural attenuation, bioventing, and SVE were initiated at OU2. The installation completed Remedial Investigations (RIs) at OU4 and OU5. Oil-contaminated soil at the Civil Engineering Prime Beef Yard Site was removed.

In FY97, an OU3 TS addressing vadose zone contamination, and an Engineering Evaluation and Cost Analysis were completed. RD activities began. The ROD for OU5 was signed. The latest version of the BRAC Cleanup Plan was completed.

In FY98, a focused FS (FFS) for the liquid fuels storage area (ST-12) was initiated. An FS and a PP were completed for OU4, resulting in lead removal, disposal, and capping at the South Desert Village Housing Area. Investigations at SS-17 (Old Pesticide/Paint Shop) showed no contamination in groundwater and no unacceptable risks to human health. A risk assessment at FT-02 (Fire Protection Training Area No. 2) showed that no further action at the site was required. The Air Force and EPA agreed that no further testing for pesticides was required at the Williams Golf Course.

FY99 Restoration Progress

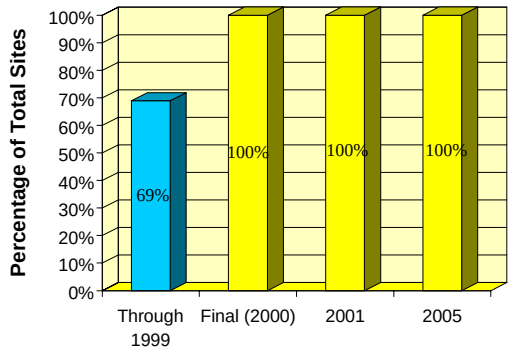
A new contract began for long-term operations and maintenance at ST-12 and LF-04. Investigations began for tetrachloroethene and trichloroethene contamination at LF-04.

The installation obtained one of the necessary agency signatures on the OU4 ROD, with other signatures pending.

Plan of Action

- Complete the signature process for the OU4 ROD in FY00
- Obtain all necessary signatures for an OU3 ROD amendment in FY00
- Complete an FFS and a PP for OU2 and begin a ROD amendment in FY00
- Achieve Last Remedy in Place status for OU6 in FY00

Sites Achieving RIP or RC Per Fiscal Year



Willow Grove Naval Air Station Joint Reserve Base NPL

FFID: PA317002231200
Size: 1,090 acres
Mission: Serve as Reserve Naval Air Station for aviation training activities
HRS Score: 50.00; placed on NPL in September 1995
IAG Status: Federal Facility Agreement under negotiation
Contaminants: Heavy metals, PCBs, petroleum/oil/lubricants, and solvents
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $5.3 million
Estimated Cost to Completion (Completion Year): $33.9 million (FY2021)
Final Remedy in Place or Response Complete Date for All Sites: FY2009

Willow Grove, Pennsylvania

Restoration Background

Studies at this installation identified 11 CERCLA sites and 2 RCRA sites. Site types include landfills, underground storage tanks (USTs), and a fire training area. Decision documents recommending no further action (NFA) have been submitted for five sites.

In FY86, Preliminary Assessments were completed for nine sites. Five of these sites were recommended for further investigation because of potential contamination of surface water and groundwater. In FY90, all nine sites were included in a Site Inspection (SI), along with a new site (Navy Fuel Farm [Site 10]). An Expanded SI was recommended for Site 7 because of trace levels of methylene chloride. Remedial Investigations and Feasibility Studies (RI/FSs) were recommended for Sites 1, 2, 3, and 5. Decision documents recommending NFA for Sites 4, 6, 7, 8, and 9 were submitted to EPA Region 3. In FY92, two 210,000-gallon USTs were removed from Site 10.

In FY93, an RI for Sites 1, 2, 3, and 5 recommended a Phase II RI/FS. In FY95, a Phase II RI work plan was issued for these four sites, and 6,000 cubic yards of soil was removed from Site 10. A state-approved plan allowed removed soil from Site 10 to be spread on another area at the installation.

During FY97, a draft Site Management Plan (SMP) and the Phase II RI work plan were completed. Use of vacuum-enhanced recovery of light nonaqueous phase liquids (LNAPL) with full-time water table depression, and immunoassay kits for polychlorinated biphenyl (PCB) screening accelerated characterization and fieldwork. In FY98, a draft Phase II RI report was submitted to regulators for review.

The installation formed a Technical Review Committee in FY90. In FY91, it established an administrative record and an information repository. In FY95, the installation established a Restoration Advisory Board (RAB). A Community Relations Plan was developed in FY97.

FY99 Restoration Progress

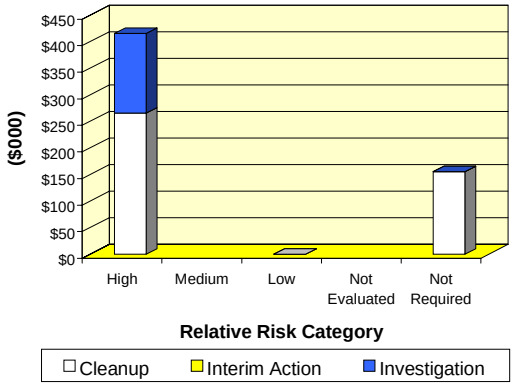
EPA Region 3 did not initiate Federal Facility Agreement negotiations as anticipated. In addition, the draft Phase II RI was not finalized because of complex issues relating to two of the four Installation Restoration (IR) sites. The Navy has decided to split out the IR sites and submit four separate Phase II RI documents. The new RI documents are now being rewritten, beginning with Site 5 the Fire Training Area. Additional investigative data will be included, per regulatory comments. The rewrite of the Phase II RI report was delayed because of the development of individual FS documents. The SMP also could not be finalized as planned. Because the base's main priority was continuation of the Phase II RI report, initiation of RI/FS activities for Site 11 was deferred.

The Interim Remedial Action (IRA) for PCB-contaminated soil at Site 1 was completed. Approximately 1,100 tons of soil was removed, and appropriate confirmation samples were taken. Operation of the LNAPL recovery system continued at Site 10. The RAB met three times, focusing on summarizing data collected for the Air Force's and the Navy's IR programs. The Navy gave a focused presentation for IR Site 5 and a status update on the IRA for Site 1 soil.

Plan of Action

- Complete additional investigations (Phase II RI) and submit a draft FS for soil and groundwater remediation at Site 5 in FY00
- Submit NFA Records of Decision for Site 1 soil in FY00
- Resubmit focused version of Phase II RI for Site 2, the Antenna Field Landfill, in FY00
- Continue operation of LNAPL recovery system at Site 10 in FY00 and FY01
- Hold quarterly RAB meetings in FY00 and FY01
- Complete CERCLA documentation for Site 2 in FY01
- Complete Remedial Design and award Remedial Action for preferred remedy for Site 5 in FY01

FY00 Funding by Phase and Relative Risk



Wright-Patterson Air Force Base NPL

FFID: OH557172431200
Size: 8,511 acres
Mission: Serve as host to many organizations, including Headquarters to Air Force Materiel Command
HRS Score: 57.85; placed on NPL in October 1989
IAG Status: IAG signed in March 1991
Contaminants: Waste oil and fuels, acids, plating wastes, and solvents
Media Affected: Groundwater and soil
Funding to Date: $178.2 million
Estimated Cost to Completion (Completion Year): $43.5 million (FY2028)
Final Remedy in Place or Response Complete Date for All Sites: FY2001

Dayton, Ohio

Restoration Background

Past activities at Wright-Patterson Air Force Base created spill sites and unlined waste disposal areas, including landfills, fire training areas, underground storage tanks, earth fill disposal areas, and coal storage areas. Investigations identified 68 sites. Soil and groundwater have been contaminated with volatile organic compounds; semivolatile organic compounds; and benzene, toluene, ethyl benzene, and xylene compounds. Fire training exercises conducted in unlined pits contaminated soil and groundwater with fuel and its combustion by-products. In FY97, two new sites, Contaminated Groundwater Area A/C and Contaminated Groundwater Area B were added to address comingled groundwater plumes and expedite source area site closure.

In FY89, the installation began Remedial Investigation and Feasibility Study (RI/FS) activities for 39 sites. Early in FY92, the installation completed a Removal Action along the installation boundary to intercept and treat contaminated groundwater flowing toward wellfields in the city of Dayton.

In FY94, the Record of Decision (ROD) for Landfills 8 and 10 was approved and the Remedial Design (RD) was completed for capping the landfills. An Engineering Evaluation and Cost Analysis and a Removal Action Plan for all landfills were approved by the regulatory agencies.

In FY95, the installation began constructing a Remedial Action (RA) at Landfills 8 and 10 and performed an Interim Action at Landfill 5 for constructing a landfill cap. A Restoration Advisory Board (RAB) was formed. In FY96, a ROD was completed for 21 sites that required no further action. RD was initiated for Landfills 1through 4, 6, and 7.

In FY97, RIs were completed at the remaining 10 sites in Operable Units 8, 9, and 11. A bioslurper was installed and began operating at Fuel Spill Site 5. A natural attenuation ROD for Fuel Spill Sites 2, 3, and 10 was completed. The installation continued its involvement as a principal partner in a "Groundwater 2000" initiative to preserve and protect the region's sole-source drinking water aquifer. A landfill cover was completed at Landfill 11.

In FY98, a final ROD was completed for 40 Installation Restoration Program sites. Landfill caps were installed for Landfills 1, 2, 6, 7, and 9, and a french drain was installed at Spill Site 11. The installation completed excavation of the Landfill 12 contents. A Removal Action was designed, and construction work began, at Heating Plant 5.

FY99 Restoration Progress

A ROD was completed and signed for groundwater, requiring continued pump-and-treat remediation near Landfill 5, RA in Area B to address a localized vinyl chloride plume, and long-term monitoring (LTM) of groundwater conditions basewide. A Treatability Study (TS) was initiated to determine the effectiveness of in situ chemical oxidation in treating the vinyl chloride plume.

A Removal Action was completed at Heating Plant 5. Phase I of monitoring-well abandonment began. A draft delisting petition for the soil portion of the base was prepared. A new source of tricholorethene contamination was discovered at a facility slated for demolition.

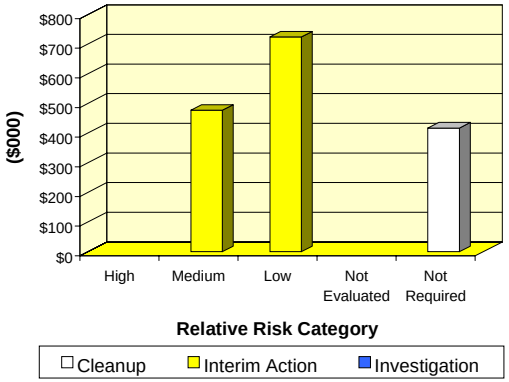
The Agency for Toxic Substances and Disease Registry conducted a Public Heath Assessment, which concluded that Wright-Patterson poses "no apparent public health hazard" and that all mitigating actions are in place to prevent human exposure to contaminants. A project to modify the groundwater treatment system to reduce operating costs was delayed pending results of an in situ oxidation study.

The RAB meets every 3 months.

Plan of Action

- Conduct Phase II of monitoring-well abandonment in FY00
- Conduct a Removal Action at Building 20059 in FY00
- Conduct a Preliminary Assessment and Site Inspection at Building 20079 in FY00
- Complete the TS for in situ oxidation for the TCE plume in FY00
- Achieve partial delisting from the National Priorities List in FY00
- Continue operations and maintenance and LTM activities in FY00–FY01
- Modify the groundwater treatment system to reduce operation and maintenance costs in FY02

FY00 Funding by Phase and Relative Risk



FFID: MI557002427800
Size: 4,626 acres
Mission: Conducted tactical fighter and bomber training
HRS Score: 50.00; proposed for NPL in January 1994
IAG Status: None
Contaminants: Jet fuel and waste oil, spent solvents, VOCs
Media Affected: Groundwater and soil
Funding to Date: $36.8 million
Estimated Cost to Completion (Completion Year): $14.4 million (FY2031)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001

Oscoda, Michigan

Restoration Background

In July 1991, the BRAC Commission recommended closure of Wurtsmith Air Force Base, transfer of KC-135 aircraft to the Air Reserve Component, retirement of the assigned B-52G aircraft, and inactivation of the 379th Bombardment Wing. The installation closed on June 30, 1993.

Sites at the installation include a waste solvent underground storage tank (UST), bulk storage areas for petroleum/oil/lubricants (POL), aboveground storage tanks (ASTs), fire training areas, and an aircraft crash site. Volatile organic compounds (VOCs) at the installation include trichloroethene; dichloroethene; vinyl chloride; and benzene, toluene, ethyl benzene, and xylenes, all of which primarily affect groundwater.

Interim Actions at the installation provided drinking water to potentially affected communities in the area. Air strippers were installed to treat groundwater contaminated with VOCs. Remedial Actions (RAs) included implementation of three groundwater extraction and treatment systems with air stripping capabilities. The installation's BRAC cleanup team, which formed in FY94, developed a BRAC Cleanup Plan.

In FY95, Supplemental Environmental Baseline Surveys were completed. Draft Feasibility Studies (FSs) were completed for seven sites, and the installation obtained the concurrence of the regulatory agencies on nine sites designated for no further action. In addition, the installation conducted Relative Risk Site Evaluations at all sites. An RA for removal of eight USTs and most of the piping for the hydrant refueling system also was completed. Additional Interim Actions included removal of the hydrant refueling system and closure of five oil-water separators. The installation also installed groundwater monitoring wells.

During FY96, the installation removed 38 USTs and 10 ASTs. Three large bulk fuel tanks were dismantled. Two of the three sewage treatment plant lagoons were closed and the sludge removed. The installation submitted No Further Remedial Action Planned decision documents for seven sites. Bioventing was implemented at the former POL storage yard to degrade semivolatiles in the soil.

In FY97, design began on an enhanced in situ bioremediation process for groundwater at LF30/31. Through the Restoration Advisory Board (RAB), the installation obtained stakeholder concurrence on the Remedial Action Plan (RAP) for LF30/31. Field investigations at Landfills 62 and 63 indicated that no further action is required. The water and sewer systems ceased operating, but physical closure was cancelled at the request of the Township of Oscoda so that the plant could be used as a municipal sewage treatment plant.

In FY98, investigations were completed for 7 sites and 31 areas of concern. Intrinsic remediation monitoring systems were completed for ST-41, SS-42, and SS-51. Air-sparging and soil vapor extraction wells were installed at SS-06 and SS-08. Regulatory concurrence was obtained on a draft report for two landfills.

FY99 Restoration Progress

The Remedial Design (RD) for OT-24 was completed. The RD for LF30/31 was terminated after a Treatability Study indicated it would not be as successful as predicted in the FS. The RD for FT-02 was delayed, and a change in technology to natural attenuation is being considered. Regulator comments delayed completion of the RD for OT-16.

An Interim Action was executed to remove sand discolored by the venting groundwater from LF30/31 from the beachfront of the off-base YMCA camp. This sand was not a health hazard but was an aesthetic issue and had an economic impact on YMCA business. New free product recovery pumps at the Benzene Plant removed several thousands of gallons of fuel (JP-4) from the water table, which is expected to significantly reduce overall cleanup time.

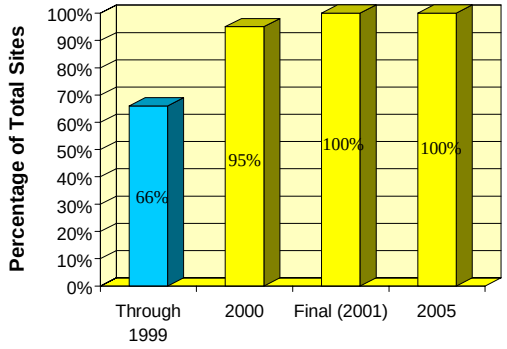
Regulator concurrence has been obtained on approximately 85 percent of all decision documents, with outstanding issues on LF30/31 and FT-02. Development of a consolidated RAP document is under way.

The RAB met twice.

Plan of Action

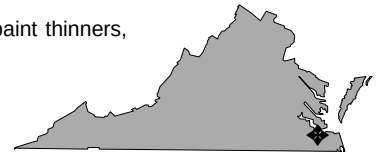
- Complete FS for LF30/31 in March 2000
- Sign decision document and initiate RD for LF30/31 in FY00
- Complete construction on RA system for OT-24 in FY00
- Complete consolidated RAP document and obtain regulator concurrence in FY00
- Complete construction of RA system for OT-16 in FY00
- Complete construction of RA systems for LF30/31 and FT-02 in FY01

Sites Achieving RIP or RC Per Fiscal Year



Yorktown Naval Weapons Station NPL

FFID: VA317002417000
Size: 10,624 acres
Mission: Provide ordnance technical support and related services; provide maintenance, modifications, production, loading, off-loading, and storage for the Atlantic Fleet
HRS Score: 50.00; placed on NPL in October 1992
IAG Status: Federal Facility Agreement signed in September 1994
Contaminants: Acids, asbestos, explosives, cadmium, lead, mercury, nickel, paint thinners, solvents, PCBs, varnishes, and waste oil
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $30.0 million
Estimated Cost to Completion (Completion Year): $25.8 million (FY2015)
Final Remedy in Place or Response Complete Date for All Sites: FY2008



Yorktown, Virginia

Restoration Background

Since FY84, studies at Yorktown Naval Weapons Station identified 50 sites. No further action (NFA) has been recommended for 13 sites. The installation was placed on the National Priorities List (NPL) primarily because of six sites identified in FY92, which are hydrologically connected to the Chesapeake Bay. Contaminants include explosive nitramine compounds and primarily affect groundwater, surface water, and sediment.

During FY93, the installation completed an initial site characterization for all four underground storage tank (UST) sites. A Corrective Action Plan was completed. In FY95, corrective actions were completed for USTs 1 and 2.

Between FY84 and FY93, the installation completed an Initial Assessment Study for 19 sites, a confirmation study for 15 sites, and a Site Inspection (SI) for one site. During FY94, a Remedial Investigation and Feasibility Study (RI/FS) was completed for one site and Removal Actions were completed for three sites. The installation completed an SI for one solid waste management unit (SWMU). A comprehensive Site Management Plan was completed in FY94. The installation initiated a Treatability Study (TS) for treatment of explosives-contaminated soil.

During FY95, the installation completed an SI for three SWMUs, completed an RI, and signed a Record of Decision (ROD) for NFA for two sites and one SWMU. During FY96, the installation completed an SI for eight SWMUs. An RI/FS was completed and Remedial Design initiated for another site. RI/FSs were initiated at eight sites and five SWMUs. Three fire training pits and associated contaminated soil, a UST and piping, and underwater ordnance items were removed from two SWMUs.

In FY97, RI/FSs were completed for four sites. The installation completed field and bench-scale TSs for one site and began Remedial Action (RA) for one site. SIs were completed at four SWMUs/Site Screening Areas (SSAs). Early actions took place at two SSAs.

In FY98, an anaerobic bioslurry biocell technology was successfully used to treat 1,200 cubic yards of explosives-contaminated soil. An RA was completed at one site, and long-term monitoring (LTM) was initiated. RAs were initiated for three sites. An additional biotreatment technology was used to remediate soil contaminated with explosives and listed hazardous waste. As part of the demonstration project, the contractor contributed 50 percent of the capital and remedial costs, saving the Navy approximately $200,000.

A Technical Review Committee, formed in FY91, was converted to a Restoration Advisory Board in FY95. A Community Relations Plan was completed the same year.

FY99 Restoration Progress

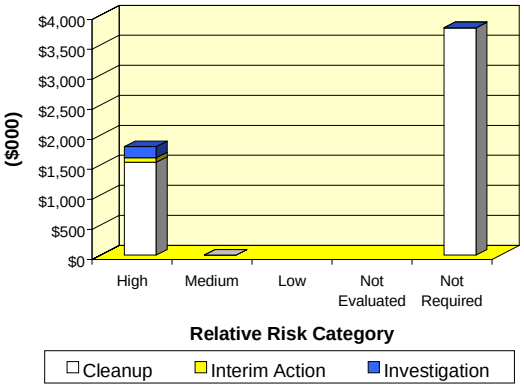
RODs were signed for four sites. A ROD planned for two additional sites was delayed until FY00 because of resource constraints. RAs were initiated at three sites and two SSAs and completed at two sites and one SSA. An RA planned for a third site is in progress but was delayed because of construction issues and inclement weather.

LTM was conducted at four sites. RI/FS activities were initiated at four sites, completed at two sites, and are under way at two sites. The planned completion of six RI/FSs was delayed because of a shift in priorities by the Navy and regulatory concerns at other sites. All field investigations of the SSAs were completed. The final SSA report was delayed due to a change in site priorities. Removal Actions were completed at two SSAs.

Plan of Action

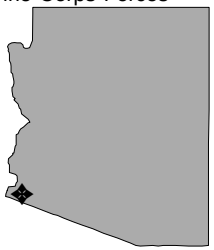
- Sign RODs for five sites in FY00
- Initiate RA at four sites in FY00
- Complete RA at three sites and one SSA in FY00
- Conduct LTM at four sites in FY00
- Finalize RI/FS for three sites and one SSA in FY00
- Finalize Site Screening Report for 10 SSAs in FY00
- Sign Closeout Reports for eight SSAs in FY00

FY00 Funding by Phase and Relative Risk



Yuma Marine Corps Air Station NPL

FFID: AZ917302449300
Size: 3,000 acres
Mission: Support tactical aircrew combat training for Pacific and Atlantic Fleet Marine Corps Forces
HRS Score: 32.24; placed on NPL in February 1990
IAG Status: Federal Facility Agreement signed in January 1992
Contaminants: JP-5, petroleum hydrocarbons, SVOCs, trihalomethanes, and VOCs
Media Affected: Groundwater and soil
Funding to Date: $39.5 million
Estimated Cost to Completion (Completion Year): $33.2 million (FY2016)
Final Remedy in Place or Response Complete Date for All Sites: FY2014



Yuma, Arizona

Restoration Background

Investigations conducted between FY85 and FY92 identified 20 CERCLA sites and 5 underground storage tank (UST) sites at Yuma Marine Corps Air Station. Site types include landfills, sewage lagoons, liquid waste disposal areas, and ordnance and low-level radioactive material disposal sites.

Under the Federal Facility Agreement, sites were divided into three operable units (OUs): OU1, installationwide groundwater contamination; OU2, surface and subsurface soil contamination at 18 sites; and OU3, potential future sites.

In FY80, the installation removed sealed pipes containing low-level radioactive dials, gauges, and tubes at one site. It completed Site Inspections at 2 sites in FY88 and at 10 sites in FY91. In FY93, the installation removed 92 waste drums from a drum storage site. Initial site characterizations were completed at two UST sites in FY93 and one UST site in FY94. The installation also constructed three air-sparging and soil vapor extraction (AS/SVE) systems.

In FY95, the installation completed a Corrective Action Plan (CAP) at one UST site. The draft Remedial Investigation (RI) report for OU1 was submitted for regulatory approval. The OU2 RI report was submitted.

In FY96, field investigations at OU3 and RIs for OU1 and OU2 were completed. A draft Proposed Plan (PP) for OU2 was submitted. Fifty UST site assessments were performed at UST Units 2, 3, and 4. Approximately 40 USTs were declared to be candidates for clean closure.

In FY97, six USTs were closed and draft CAPs for four others were completed. A Removal Action and a closeout report were completed for UST B1040. Feasibility Studies were completed for OU1 and OU2, and a draft PP was completed for OU1.

In FY98, approximately 8 million gallons of groundwater was treated. Two full-scale UST systems using AS/SVE and free-product removal were implemented. The Arizona Department of Environmental Quality (ADEQ) approved monitored natural attenuation as the remedial alternative for the Motor Transportation Pool. Eight USTs were removed. The OU2 Record of Decision (ROD) was signed. The CAPs are awaiting ADEQ approval.

In FY95, the installation converted its Technical Review Committee to a Restoration Advisory Board. The Community Relations Plan was updated in FY94.

FY99 Restoration Progress

A 6-month vertical recirculation pilot study was successfully performed at the facility boundary, treating 13 million gallons of contaminated groundwater. The AS/SVE system, used in the hot spot Removal Action, was 75 percent installed. The Remedial Action (RA) for OU2 was completed. Three Voluntary Environmental Mitigation Use Restrictions were prepared and submitted, and four UST remedial systems were in operation. The installation developed a long-term monitoring (LTM) plan, and CAPs for the gas station and the fuel farm were submitted. The OU1 ROD is being revised.

Plan of Action

- Finalize the OU1 ROD in FY00
- Implement the RA for OU1 in FY00
- Implement the RA for the Federal Facility Agreement Assessment Program in FY00
- Initiate the long-term operation of the OU1 groundwater remediation systems in FY01
- Finalize and implement an LTM Plan/Program in FY01
- Complete active UST remediation in FY01

FY00 Funding by Phase and Relative Risk