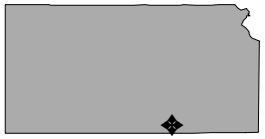
Strother Army Airfield NPL

Size: 1,386 acres
Mission: World War II basic flying training station and tactical training station
HRS Score: Unknown; placed on NPL in May 1986
IAG Status: None
Contaminants: VOCs
Media Affected: Groundwater
Funding to Date: $.03 million
Estimated Cost to Completion (Completion Year): $0.08 million (NA)
Final Remedy In Place or Response Complete Date: NA



Cowley County, Kansas

Restoration Background

The Strother Army Airfield near Winfield, Kansas, was declared as excess to the Government in 1945, and the property was transferred to the Strother Field Airport Commission in 1946. The commission subsequently converted the property into a municipal airport and an industrial park.

On June 10, 1986, the Strother Field Industrial Park was listed on the National Priorities List (NPL). Samples collected and analyzed by the state indicated the presence of volatile organic compounds (VOC), including trichloroethene (TCE) in groundwater. Two inactive solid waste landfills, which were used for disposal of various industrial wastes, exist at the site.

Until 1983, the Strother Field Airport Commission operated a water supply system consisting of eight wells on the site. The contaminated groundwater is no longer used for drinking but is still used for industrial processes. Drinking water was provided by trucks until the commission installed two wells upgradient of the contaminant plume. In 1985, General Electric, a potentially responsible party (PRP), installed groundwater extraction wells and air stripping towers to remove VOCs from the groundwater under an Administrative Order by the Kansas Department of Health and Environment.

The state oversaw an investigation by the PRP that identified the types of contaminants remaining in the groundwater and other areas and has recommended a remedy for final site cleanup. The remedy includes pumping and treating the groundwater and using soil vapor extraction to clean up the soil. Design of the remedy began in late 1994.

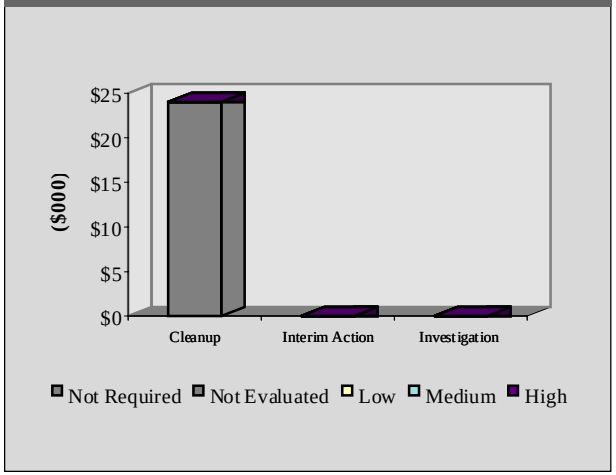
FY97 Restoration Progress

In March 1997, EPA notified the Kansas City District of the U.S. Army Corps of Engineers of DoD's potential liability at the Strother Field Industrial Park Superfund Site. The Kansas City District received authorization in April 1997 to conduct a limited investigation to determine whether DoD should be included as a PRP at the site. DoD has conducted a preliminary evaluation of DoD's liability and is working with the Department of Justice and EPA to determine whether DoD should remain a PRP.

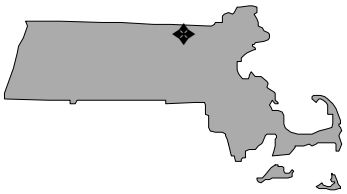
Plan of Action

- In FY98, work with the Department of Justice and EPA to determine DoD's liability, if any, for the former DoD property
- In FY98, plan a further course of action, if necessary

FY98 Funding by Phase and Relative Risk



Size: 2,292 acres
Mission: Train troops and test ordnance, material, 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: $12.5 million
Estimated Cost to Completion (Completion Year): $3.9 million (FY1998)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Middlesex County, Massachusetts

Restoration Background

In July 1995, the BRAC Commission recommended closure of the Sudbury Training Annex. Sudbury Training Annex is a subpost of Fort Devens in eastern Massachusetts. Environmental studies since FY80 have identified several site types, including an old landfill, disposal and dump areas, a fire training pit, ordnance test areas, a leach field, underground storage tanks (UST), 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 at the installation are volatile organic compounds (VOC) and pesticides in groundwater and soil.

Interim Actions conducted at the installation include the 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.

In FY94, the installation conducted Removal Actions involving removal of 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 total number of identified sites to 74. FY95 cleanup and study actions at individual sites included (1) signing of decision documents for no further action at 19 sites; (2) completion of the FS, Proposed Plan and Record of Decision (ROD) for 5 sites, with Remedial Design (RD) activities initiated; (3) completion of final RI completed for five sites; (4) completion of Screening Site Inspections (SSI) for 15 sites; (5) initiation of SSIs for 10 additional sites; and (6) of Engineering Evaluation and Cost Analyses for 4 sites. The installation also conducted a Removal Action to remove 1,200 tons of arsenic-contaminated soil.

The Army signed a ROD for five sites, completed RD for those sites, and began Remedial Action (RA). The installation began an Environmental Baseline Survey, which was nearly complete at the end of FY96. SSIs of 15 sites also were completed. The Army performed Removal Actions at nine sites, resulting in the removal of 11,800 cubic yards of soil contaminated with total petroleum hydrocarbons, polyaromatic hydrocarbons (PAH), and metals. RODs for no further action were signed for five additional sites.

A technical review committee (TRC) was formed in FY90 and meets quarterly. The TRC greatly improved management of the installation cleanup and helped foster partnerships with EPA and state regulatory agencies. Local environmental groups participated in the review process for the installation cleanup program through the TRC. The installation also helped minimize regulatory actions by EPA and the state by adhering to preestablished state cleanup standards for soil. In FY96, The commander of the installation determined that there was insufficient public interest to convert the TRC to a restoration advisory board. The Army appointed a BRAC environmental coordinator to oversee restoration efforts.

FY97 Restoration Progress

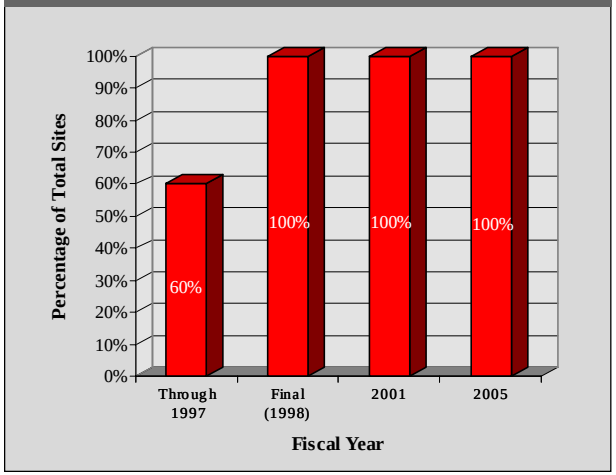
In early FY97, the Army completed Removal Actions at nine sites for metals, pesticides, PAHs, and VOCs. In addition, all outstanding Site Inspections were completed by early FY97. The installation completed an archive search for unexploded ordnance and an installationwide arsenic study. It also installed a landfill cap. Site cleanups were completed, and a ROD for no further action was signed for Sites A4, A7, and A9.

The installation implemented an innovative Geonet gas-venting system and consolidated the removed soil from nine sites as subgrade under the landfill cap, saving off-site disposal expenses. The installation held public hearings and four TRC meetings.

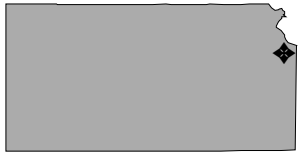
Plan of Action

- Complete survey of cultural and natural resources by FY98
- Transfer installation property to the Department of the Interior, FEMA, and the Department of the Air Force in FY98
- Accomplish site delisting from National Priorities List in FY99
- Complete all BRAC activities except long-term monitoring by end of FY05

Sites Achieving RIP or RC Per Fiscal Year



Size: 9,065 acres
Mission: Manufactured smokeless powder and propellants; on standby 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: $13.1 million
Estimated Cost to Completion (Completion Year): $54.2 million (FY2029)
Final Remedy in Place or Respnse Complete Date: FY2003



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 majority of the installation is on standby, inactive status. Potential sources of contamination at the installation include production line areas, magazine storage areas, and about 50 RCRA solid waste management units (SWMU). EPA proposed listing the installation on the National Priorities List (NPL) after five munitions manufacturing surface impoundments were evaluated as potential sources of hazardous waste.

Prominent site types at the installation include a landfill, open burn areas, aboveground and underground storage tanks (UST), propellant production areas, dump sites, a battery handling area, settling ponds, wastewater lagoons, and a drainage ditch.

A groundwater contamination survey conducted in FY87 and a Site Inspection conducted in FY88 revealed contaminated groundwater at the installation. Results of an analysis also indicated contamination of surface water and sediment by heavy metals. Interim Actions at the installation have included removal of USTs and associated contaminated soil.

The installation's technical review committee, which includes representatives of EPA, state regulatory agencies, the U.S. Army Corps of Engineers, and contractors, continues to meet monthly to discuss restoration activities and devise ways to reduce regulatory impediments.

In FY95, the installation began preparing a community relations plan (CRP). It also began soil and groundwater sampling and analysis and completed investigations of SWMUs. In FY96, the installation submitted the draft CRP to EPA and the Kansas Department of Health and Environment (KDHE) for review.

The Army completed an Ecological Risk Assessment for the entire installation and submitted the document to EPA and 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. This survey concluded that the biological features of surface water appear to be in good condition. A site 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.

The installation completed demolition of one wastewater lagoon and began demolition of a second lagoon. Sludge in the remaining four lagoons is undergoing nitrate reduction by bioremediation. The Army initiated a phytoremediation study of sites contaminated with lead. This study was funded by the Army Environmental Center and conducted by the Tennessee Valley Authority.

FY97 Restoration Progress

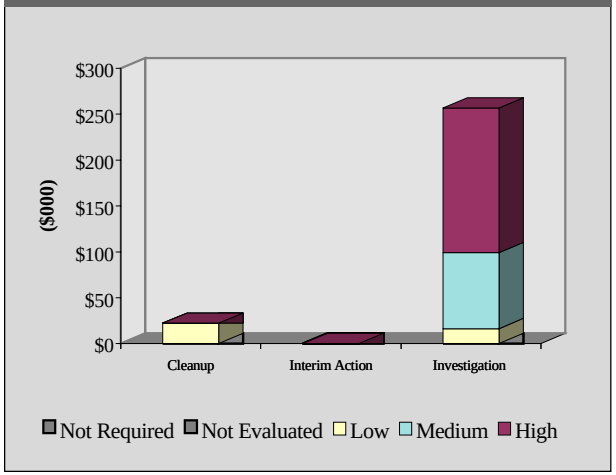
Remedial Design and site cleanup were completed for SWMU 50. RCRA Facility Investigations for 15 priority-one SWMUs were also completed. The installation completed Relative Risk Site Evaluations for all sites. The cleanup of three of the four remaining wastewater lagoons was also completed.

CRP completion, scheduled for FY97, was postponed because of delays in EPA review.

Plan of Action

- Form a restoration advisory board in January 1998
- Submit final CRP in FY98
- Close last wastewater lagoon in FY98
- Complete the Interim Remedial Action for SWMU 50 in FY98 and for SWMUs 10/11 and 22/32 by FY99
- Complete Feasibility Study for 12 SWMUs in FY98 and for 13 SWMUs in FY99
- Complete groundwater investigations at Operable Unit 1 by FY99

FY98 Funding by Phase and Relative Risk



Size: 5,044 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 low-level radioactive material
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $131.0 million
Estimated Cost to Completion (Completion Year): $220.6 million (FY2023)
Final Remedy in Place or Response Complete Date: FY2008

Oklahoma City, Oklahoma

Restoration Background

Environmental studies at Tinker Air Force Base have revealed contamination at Soldier Creek and Building 3001, as well as a 220-acre contaminant plume in the upper aquifer. Additional sites include landfills, underground storage tanks (UST), waste pits, fire training areas, spill sites, and low-level radioactive waste sites.

The installation has implemented numerous 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.

In FY94, to combine technology demonstrations and save time and money, a partnership was established among the installation, the Tyndall Air Force Base Armstrong Laboratory, North Dakota State University, and the U.S. Army Corps of Engineers Waterways Experimental Research Station.

The installation also participated in EPA's Superfund Innovative Technology Evaluation program. Through a partnership with EPA, the Department of Energy, and the New Jersey Institute of Technology, the installation demonstrated pneumatic fracturing, which is designed to improve permeability in fine-grained formations. In FY94, fieldwork was completed on the project and a final report was prepared.

In FY95, the installation expanded the fuel recovery system at the North Tank Operable Unit (OU) and all USTs were removed from four sites. The installation also began a Phase II RCRA Facility Investigation 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. Remedial Actions involving the treatment of fuel and solvent contamination also were implemented at two sites.

Also in FY95, a two-dimensional (2-D), high-resolution seismic reflection study was completed along a 3-mile stretch to identify preferential contaminant-migration pathways. To improve site characterization, the installation began using a geographic information system (GIS) to centrally manage and analyze data collected during environmental investigations.

The installation completed a Phase II RFI Report in FY96. 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 of the IWTP/SCOBGW OU also was completed.

The installation formed its restoration advisory board (RAB) in FY94 and completed selection of RAB members in FY95 by naming 16 community representatives. During FY96, the RAB participated in the Renew America National Town Meeting and the Oklahoma Governor's Conference on the Environment. It also published a newsletter, *The Link*.

FY97 Restoration Progress

The installation removed low-level radioactive waste and completed cleanup of Radioactive Waste Disposal Site 1030W. In addition, the base completed the capping preparation of Landfill 2, capping of Landfill 4, construction of a bioventing system for the Fuel Purge Facility, and construction of another treatment system for the Area A Service Station. Implementation of these early response actions reduced the risk of five high-risk sites, thereby achieving Air Force and DoD risk reduction goals.

The installation implemented several fieldwork techniques including 2-D/3-D shallow seismic reflection, a Global Positioning System (GPS)–based radiation detection system, and a GPS magnetic and electromagnetic induction survey. In addition, a surfactant-enhanced contaminant recovery demonstration took place.

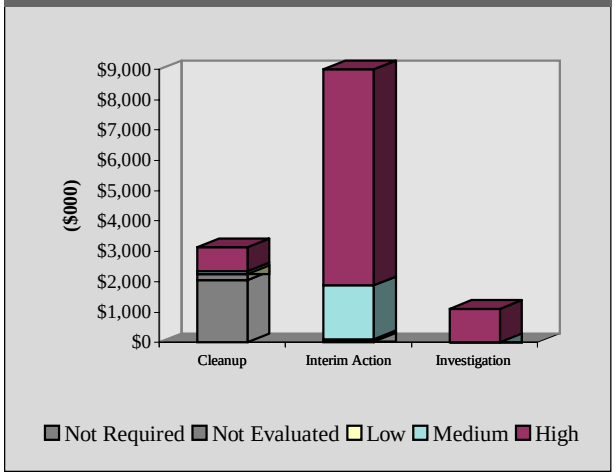
The restoration program was restructured with regulatory buy-ins that integrated site characterization and interim and final response actions. To expedite document review, regulators were provided with detailed briefings on the action before the review.

Delays in regulatory approval held up some actions scheduled for completion in FY97.

Plan of Action

- Install a RCRA cap at Landfills 5 and 2 and a SW Quadrant Groundwater Containment System in FY98
- Complete Proposed Plan and sign ROD for IWTP/SCOBGW OU in FY98
- Conduct a source removal at Waste Pit 1 in FY98

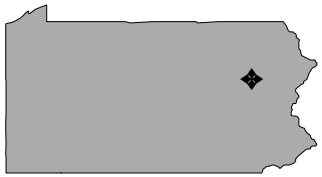
FY98 Funding by Phase and Relative Risk



Tobyhanna Army Depot

NPL

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: $13.7 million
Estimated Cost to Completion (Completion Year): $15.9 million (FY2011)
Final Remedy in Place or Response Complete Date: FY2011



Tobyhanna, Pennsylvania

Restoration Background

Environmental studies since FY80 have identified several sites at the installation, including landfills, a disposal pit, underground storage tanks (UST), 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 training area. The most prominent sites are the burn areas and a drum staging area, which together form Operable Unit (OU) 1. Contamination at these sites includes volatile organic compounds (VOC), solvents, and heavy metals in groundwater; solvents, heavy metals, polychlorinated biphenyls (PCB), and petroleum/oil/lubricants (POL) in surface water and sediment; and solvents, heavy metals, PCBs, POLs, and UXO in soil.

The installation initiated several Interim Actions between FY87 and FY91. It provided bottled water to 26 residences and 1 business. In FY91, it constructed a water line extension from the installation to the affected residents. Since FY90, the installation also removed 17 USTs.

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY90. In FY92, the installation completed RI fieldwork at OU1 and a Treatability Study of a soil volatilization technology. In FY94, the installation completed the Phase I RI field investigation at 11 sites, submitted a draft technical report for regulatory review, and initiated a Removal Action at 1 of the 11 sites. In addition, the installation has begun a basewide Ecological Risk Assessment (ERA).

In FY95, the installation submitted an RI work plan for construction and installation of groundwater wells at the Inactive Sanitary Landfill. It also submitted a proposal to address three OUs comprising five sites. In addition, the installation conducted an Interim Remedial Action at OU1 Area B to remove contaminated soil, eliminating the need to treat the soil on site.

Since the Federal Facility Agreement (FFA) was signed in FY90, installation personnel have worked closely with regulatory agencies on the performance of restoration activities. In FY95, the commander formed a restoration advisory board (RAB). Early RAB meetings focused on restoration activities, monitoring of results, and evaluation of Proposed Plans. The installation initiated partnering efforts with EPA Region 3 and the U.S. Army Center for Health Promotion and Preventive Medicine to jointly prepare risk assessments.

In FY96, the installation increased the RAB's involvement in the cleanup process to facilitate document review. The RAB helped coordinate the efforts of the installation and the local government in application of geographic information systems (GIS). The installation continued to work in partnership with EPA and the Pennsylvania Department of Environmental Protection to jointly prepare Proposed Remedial Action Plans and RODs for OU1 and OU4. The installation also completed a verification study of 11 areas of concern (AOC).

The installation completed negotiations with EPA and the Pennsylvania Department of Environmental Protection on the restoration of OU1 and drafted the Proposed Plan. In addition, a cleanup action was completed at Oakes Swamp, AOC 8. EPA approved additional steps for the ERA and continued the basewide ERA to identify sites that could pose significant ecological risks.

FY97 Restoration Progress

The installation completed a Record of Decision (ROD) for OU1 groundwater that specifies natural attenuation in conjunction with long-term monitoring. This is significant in that Pennsylvania formerly had a background-level ARAR. Risk-based standards will result in a significant cost avoidance. The RI for the Inactive Sanitary Landfill was also completed. Additionally, a close out document has been drafted to permit the closure of 35 no-further-action sites.

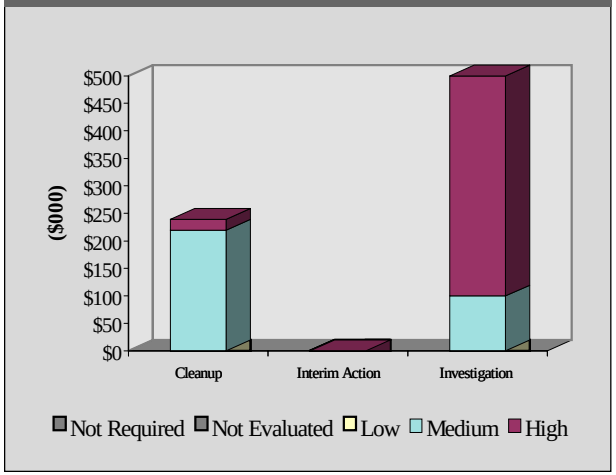
The RAB members became involved in reviewing proposed remedial action plans and draft RODs, and also offered input on the cleanup process. This helped to speed up the review process. The RAB also assisted in coordinating efforts between the installation and the local governments in the application of GIS.

The first item in the current plan of action was not completed as scheduled because of the FFA. The fourth and fifth items in the plan of action were not delayed because they are pending EPA review.

Plan of Action

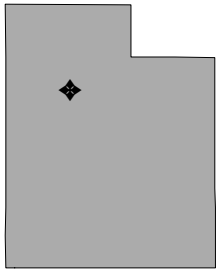
- Complete two RODs for additional OUs in FY98
- Amend the FFA in FY98
- Complete the basewide ERA in FY98
- Initiate the FS for the Inactive Sanitary Landfill in FY99
- Complete all RODs by FY00

FY98 Funding by Phase and Relative Risk



Tooele Army Depot (North Area) NPL/BRAC 1993

Size: 24,732 acres
Mission: Store munitions and maintain equipment
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: $74.3 million
Estimated Cost to Completion (Completion Year): $134.0 million (FY2037)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Tooele, Utah

Restoration Background

In July 1993, the BRAC Commission recommended realignment of Tooele Army Depot and its reduction to a depot activity and placement under the command and control of Red River Army Depot. The commission also recommended retaining the depot's conventional ammunition storage and chemical demilitarization missions. The Army will transfer 1,700 acres and retain 23,032 acres for the ammunition mission.

Environmental studies have been under way at the installation since FY79. Sites identified include open burning and open detonation areas, an ammunition demilitarization facility, landfills, firing ranges, industrial sites, underground storage tanks (UST), surface impoundments and lagoons, and drain fields. Organic solvents are the primary contaminants affecting groundwater.

Tooele's environmental program is regulated under a CERCLA Federal Facility Agreement (FFA) and a RCRA corrective action permit dated 1991. To date, 56 sites have been addressed under RCRA or CERCLA. Of the 56 sites, 4 require no further action under CERCLA and another 4 require no further action under RCRA.

Interim Actions completed at the installation include construction of an industrial wastewater collection system and treatment facility, removal of polychlorinated biphenyl (PCB)–contaminated soil, cleanup of residual sludge from a degreaser unit, and removal of other soil and debris. In FY93, the installation completed an Interim Remedial Action at the Tire Disposal site. It also began using a groundwater extraction and treatment system to clean up water contaminated with solvent in a plume extending approximately 4 miles by 2 miles.

In FY94, the installation removed 13 USTs. In addition, the Army and EPA approved a Record of Decision addressing six sites (with determinations of no further action for four of the six). A final CERFA report was completed and submitted to the regulatory agencies for review. The installation converted its technical review committee to a restoration advisory board, which addresses issues related to the BRAC environmental program. The installation holds periodic public meetings to discuss milestones related to the CERCLA and RCRA corrective action programs.

In FY95, the BRAC cleanup team (BCT) prepared Version II of the BRAC Cleanup Plan. BCT members also participated in the preparation of 10 finding-of-suitability-to-lease (FOSL) documents. The installation prepared a draft disposal and reuse Environmental Impact Statement (EIS) and identified 932 acres as CERFA-clean. In addition, the community completed a draft land reuse plan.

In FY96, Tooele Army Depot completed the Disposal and Reuse EIA after obtaining approval from the regulatory agencies. The document covers 1700 acres available for transfer. The installation completed a Finding of Suitability for Transfer (FOST) to transfer the Consolidated Maintenance Facilities to the Tooele City Redevelopment Agency. For all sites, the Army completed RCRA Facility Inspection and Remedial Investigation (RFI/RI) activities. Regulators have approved all RFIs/RIs with the exception of Group C, which includes SWMUs 49 through 57. Those studies recommended no further action at 10 of the 29 sites.

The installation completed two small Remedial Actions (soil and drum removals) conducted under the FFA were completed and their close-out reports accepted by regulatory agencies. The Army initiated Corrective Measures Studies (CMS) at 20 sites and Feasibility Studies (FS) at 11 sites.

FY97 Restoration Progress

During FY97, the installation delineated the contaminated groundwater plume and prepared FOSTs for the remaining BRAC property. A treatibility study successfully demonstrated the effectiveness of treating explosives-contaminated soil through windrow composting. Composting is a remedial alternative being considered for use at TEAD-81, the TNT Washout Facility. Regulatory Agencies have concurred with the designation of 340 acres as CERFA clean.

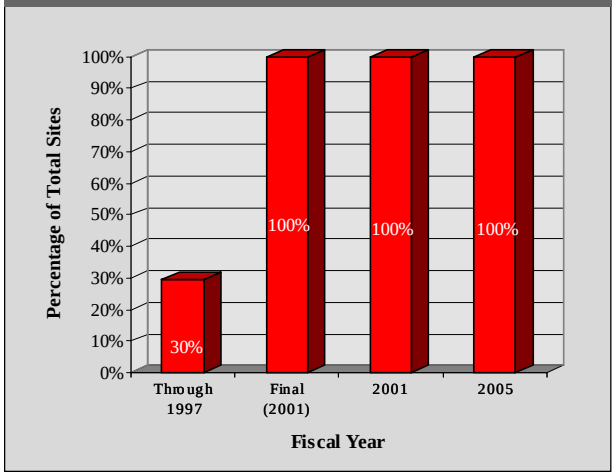
The BCT executed a FOSL for the Master Lease, completed the Master Lease, and completed and received approval for RCRA Facility Investigations (RFI) at 7 sites, completed RFI at 9 sites, and initiated Corrective MEasures Studies (CMS) on 7 sites. All investigations are now complete and remedial alternatives are being evaluated.

The first, third and fifth items on the current plan of action were scheduled for completion in FY97. They were postponed due to delay in completing the EOD risk assessment, delays in regulatory approval and lack of funding.

Plan of Action

- Conduct two Removal Actions in FY98
- Execute a lease for remaining BRAC property (to the Tooele Reuse Authority) in FY98
- Complete soil washing at the Skeet Range in FY98
- Further propose CERFA-uncontaminated acreage in FY98
- Complete all CMSs and FSs in FY99
- Have BRAC cleanup activities operating by FY07

Sites Achieving RIP or RC Per Fiscal Year



Travis Air Force Base

NPL

Size: 5,025 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, and July 1996
Contaminants: VOCs, heavy metals, and PAHs
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $54.3 million
Estimated Cost to Completion (Completion Year): $144.8 million (FY2032)
Final Remedy in Place or Response Complete Date: FY2005

Solano County, California

Restoration Background

Travis Air Force Base has supported Air Force operations since 1943 by providing services to troops, cargo, and equipment. Historical activities resulted in numerous releases of fuels, solvents, and petroleum/oils/lubricants, which migrated into groundwater beneath the installation. 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 entire installation into four operable units (OU).

The Air Force implemented several Interim Actions at the installation, including the 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 the use of horizontal wells, two-phase extraction systems, bioventing, and bioslurping. The installation also completed an analysis of the feasibility of applying intrinsic remediation to petroleum-contaminated groundwater that lies underneath the base gasoline station.

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 general public. The installation completed field investigations for three of the four OUs and Remedial Investigation (RI) Reports for the North and East Industrial OUs. The installation also completed one TCE Removal Action at the storm sewer outfall and implemented another TCE Removal Action incorporating horizontal extraction wells and two-phase extraction technology.

During FY96, the installation developed a model to help set priorities among high-relative-risk sites for Remedial Action. The installation also developed a chemical reference handbook for the public that describes the contaminants present at the installation and the potential effects of those contaminants on human health and the environment.

In FY96, the installation also completed the RI Report for the West Industrial OU and combined the North, East, and West Industrial OUs (NEWIOU) into a single OU for the Feasibility Study (FS), the Proposed Plan, and the Record of Decision (ROD). This consolidation saved both time and money. The FS for the NEWIOU and the Proposed Plan for the groundwater part of the NEWIOU were completed. Work began on expanding the Interim Action for the installation's largest TCE groundwater plume to an additional source area. The Interim Action at the outfall in Union Creek was completed, and the treatment facility was secured.

FY97 Restoration Progress

The RI for the West/Annexes/Basewide OU and the expansion of the Interim Action for the installation's largest TCE-contaminated groundwater plume were completed. One early action occurred in August 1997. Cone penetrometer testing in FY97 accelerated fieldwork.

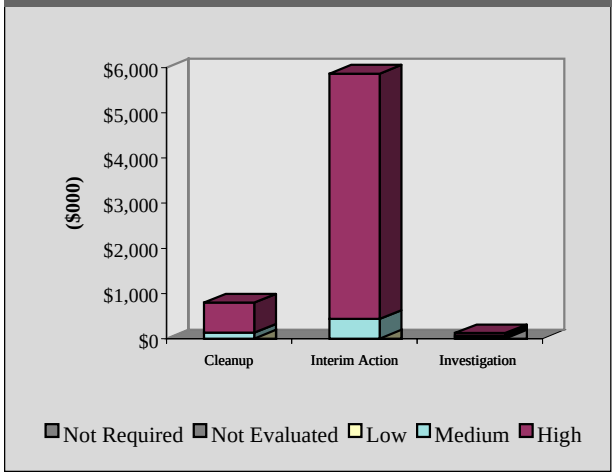
Consultation helped resolve issues with regulatory agencies, and an Interim ROD was successfully negotiated with state agencies. The RAB encouraged communication with the community through a RAB/Installation Restoration Program (IRP) display booth at two Air Expos and an Earth Day RAB/IRP Panel.

Several activities scheduled for completion in FY97 were deferred until FY98 because regulatory coordination and review time exceeded that allowed for in the project schedule.

Plan of Action

- Complete the Interim ROD for groundwater in the NEWIOU in FY98
- Complete the NEWIOU Proposed Plan for surface water, sediment, and soil in FY98
- In FY98, begin the Remedial Action at three sites from which contaminated groundwater has migrated off site
- Develop a model for evaluating the effectiveness of natural attenuation for remediation of groundwater plumes in FY98
- Employ two-phase extraction technology in FY99

FY98 Funding by Phase and Relative Risk



Size: 522 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: $15.2 million
Estimated Cost to Completion (Completion Year): $89.8 million (FY2004)
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. The commission recommended relocating the Naval Reserve Center to Alameda, California, and the Naval Technical Training Center to Great Lakes, Illinois, and Little Creek, Virginia. Operational closure was completed on September 1997.

Thirty-one sites, including a former fire training area, a landfill, a former dry-cleaning facility, an old bunker area, fuel farms, and a service station, have been identified since environmental investigations began at the installation. Contamination at the sites 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 FY95, the installation began removing floating product from one site and contaminated soil from another. Of the 73 underground storage tanks (UST) identified at Treasure Island, 37 have been removed and 14 have been closed in place. An Environmental Baseline Survey (EBS) was completed for all sites in FY95. Under the EBS, nine parcels were designated as CERFA-clean.

The installation formed a technical review committee and converted it to a restoration advisory board (RAB) in FY94. Twenty community members serve on the RAB and participate in monthly meetings with the installation and regulatory agencies. The installation completed a community relations plan (CRP) in FY92 and established two information repositories and an administrative record. The CRP was updated in FY97. A BRAC cleanup team (BCT) was established in FY94. The team has conducted site tours and workshops for RAB members and members of the local community. The installation completed a BRAC Cleanup Plan (BCP) in FY94 and updated it in FY95.

During FY96, the RAB met monthly, the BCP was updated, and a land reuse plan was completed. Findings of suitability to lease were also completed for six buildings, and the buildings were leased to the city of San Francisco for movie and television production. A finding of suitability to transfer was completed for transfer of 35.5 acres to the U.S. Department of Labor. Also during FY96, the installation completed an RI for 25 onshore sites. The removal of floating product continued at one site. A Record of Decision (ROD) for no further action was initiated for two sites. In addition, a corrective action plan was initiated for nine UST sites, two USTs were removed from one site, and 11 USTs were closed in place. A bench-scale soil bioremediation Treatability Study was initiated at one site. In addition, a Phase II Ecological Risk Assessment was completed for 21 onshore sites.

The Federal Facility Site Remediation Agreement, signed in FY92, was amended during FY96 to include three newly identified sites and to group offshore Installation Restoration Sites 13 and 27 into one offshore operable unit (OU). The schedule in Appendix D of the agreement was revised to conform to the comprehensive strategy set forth in the BCP.

FY97 Restoration Progress

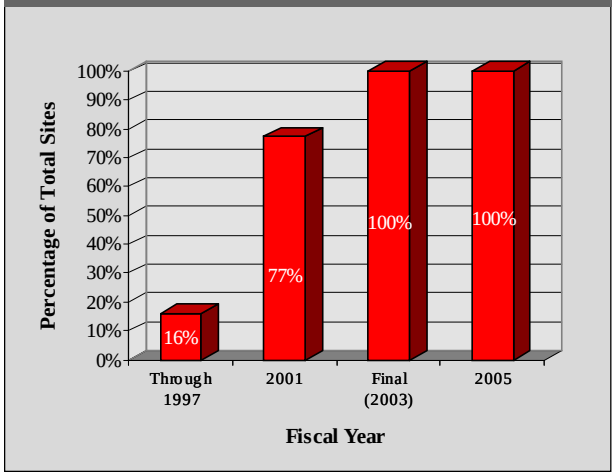
The installation initiated an installationwide interim groundwater monitoring program. The CRP was updated. The installation transferred nine sites to the CAP. In FY97, the BCT held BCT meetings, as well as RAB meetings.

Some activities scheduled for completion in FY97 were delayed because of delays in funding.

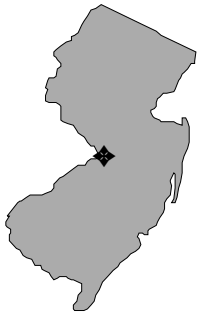
Plan of Action

- Complete FSs for 21 onshore sites in FY98
- Initiate Remedial Action Plan and ROD for remaining onshore sites in late FY98
- Begin groundwater sampling in FY98
- Complete an RI for one offshore OU site in FY98
- Complete an FS for one offshore OU in FY98
- Complete a Remedial Design (RD) for UST sites and initiate the RD for fuel lines in FY98

Sites Achieving RIP or RC Per Fiscal Year



Size: 66 acres
Mission: Test engine systems and components
HRS Score: NA
IAG Status: None
Contaminants: Trichloroethene, ethylene glycol, freon, fuels, and solvents
Media Affected: Groundwater and soil
Funding to Date: $10.9 million
Estimated Cost to Completion (Completion Year): $8.2 million (FY2005)
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 will be transferred to the Arnold Engineering Development Center and the Patuxent River Naval Air Station. The installation is scheduled to close in September 1998.

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 (UST), disposal areas, and spill sites. The TCE-contaminated groundwater is the issue of greatest concern at the installation.

Since FY86, environmental studies at the installation have identified nine CERCLA sites and two UST sites. Removal of a tank and its associated contaminated soil was completed for UST 2 in FY92 and for UST 1 in FY93. The two UST sites then were recommended for no further action.

During FY95, the installation initiated an Interim Remedial Action to treat TCE-contaminated groundwater at Site 1. To identify fractures and establish the properties of the rock, the U.S. Geological Survey conducted geophysical borehole investigations in conjunction with performance of aquifer tests by the Navy. Data from the investigations will enable the Navy to place future monitoring wells accurately to delineate the groundwater plume.

A technical review committee was formed in FY91 and converted to a restoration advisory board (RAB) in FY93. The 12 members of the RAB include representatives of the Navy, EPA, the state, and the local community. In FY94, a BRAC cleanup team (BCT) was formed. Its membership includes representatives of the Navy, EPA, and the state.

The BCT prepared a BRAC Cleanup Plan in FY95 and developed a partnering agreement that established a series of goals for community involvement in the cleanup process. Under the partnering effort, members of the reuse committee commented on the Environmental Baseline Survey (EBS).

To accelerate community reuse of installation property, a local company used one bulding under an interim lease. The installation has been divided into three parcels of property and an EBS completed for all parcels. One area covering about 10 acres has been identified as CERFA-clean.

During FY96, the design of a modified treatment plant was completed and the design of an iron-filings treatment system for Site 1 was initiated. Removal of contaminated sludge was completed at Site 3. The installation also initiated Phase II of the EBS for the three parcels of property and completed a Land Reuse Plan. Several activities planned in FY96 were deferred because of funding constraints and delays in regulatory review.

FY97 Restoration Progress

Construction of a modified treatment plant for groundwater contamination and installation of monitoring wells at Site 1 were completed. In addition, the installation completed the Remedial Investigation and Feasibility Study for Site 2 and Sites 4 through 9. A decision document for no further action was prepared for Site 3. Also completed were Phase II of the EBS and design of the final iron-filings treatment system for Site 1 groundwater contamination. The iron-filings treatment system was implemented at the installation.

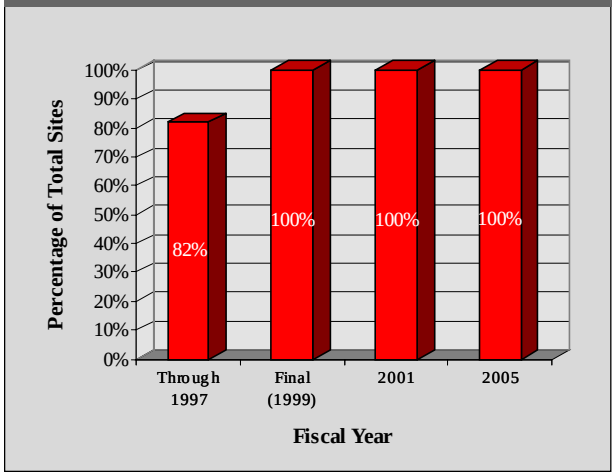
The BCT prepared and reviewed the latest versions of the BCP and the EBS. It also conducted Site 3 decision-document review, Site 1 groundwater investigation, Site 8 barometric well closure, and preparation of a no-further-action document for Sites 2, 5, 6, 7, and 9, among other activities.

The Environmental Impact Statement (EIS), which was scheduled for completion in FY97, was delayed because of delays in the reuse plan.

Plan of Action

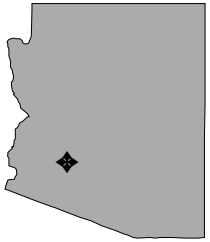
- Complete an EIS in FY98
- Investigate possible leaking lines in the barometric well at Site 8 in FY98
- Complete Site 1 Focused Feasibility Study in FY98
- Complete the no-further-action decision document for Sites 2, 4, 5, 6, 7 and 9 in FY98
- Finalize decision document for Sites 1 and 8 in FY98
- Complete latest versions of EBS Phase III and BRAC Cleanup Plan in FY98
- Close the installation in FY98

Sites Achieving RIP or RC Per Fiscal Year



Tucson International Airport NPL

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: $7.4 million
Estimated Cost to Completion (Completion Year): $13.8 million (FY1999)
Final Remedy in Place or Response Complete Date: FY1995



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), which has been detected 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. 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 FY96, 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. During the summer of 1996, the installation began construction of a permanent groundwater extraction, treatment, and recharge system to clean up contaminated groundwater.

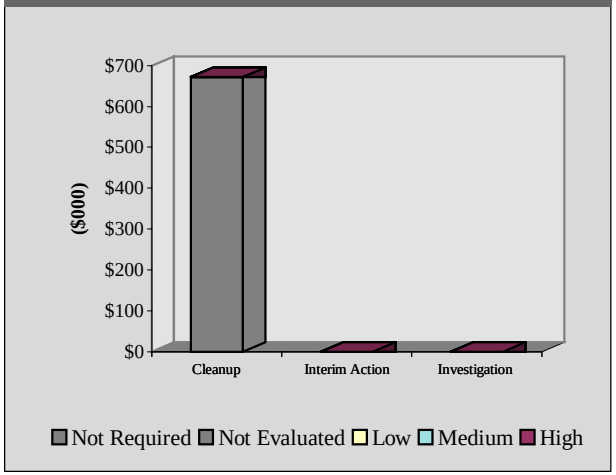
FY97 Restoration Progress

The groundwater extraction and treatment system and the soil vapor extraction and treatment system were installed and operated continuously in FY97. Restoration advisory board activities with the UCAB were successful, as were continuing partnering efforts with other agencies.

Plan of Action

- In FY98, continue partnership with EPA Region 9 and the Arizona Department of Environmental Quality
- Prepare pump-and-treat system for groundwater media in FY98
- Complete soil cleanup at Site 5 in FY98

FY98 Funding by Phase and Relative Risk



Size: 1,383 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: Under negotiation
Contaminants: VOCs, dichloroethane, trichloroethene, BTEX, naphthalene, petroleum hydrocarbons, and pentachlorophenol
Media Affected: Surface water, groundwater, and soil
Funding to Date: $40.4 million
Estimated Cost to Completion (Completion Year): $2.8 million (FY2005)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2002

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 in support of El Toro Marine Corps Air Station.

Environmental studies since FY85 have identified 16 CERCLA sites, 250 areas of concern, 129 underground storage tank (UST) sites, and 19 aboveground storage tank sites. Currently, 24 CERCLA sites are in the study phase, and the Expanded Site Inspection (ESI) phase or the Remedial Investigation and Feasibility Study (RI/FS) phase has been completed at 14 of those sites.

Two phases, preliminary review and a Visual Site Inspection and sampling visit, of a three-phase RCRA Facility Assessment (RFA) have been completed. Phase III of the RFA is ongoing at 12 sites. Interim Remedial Actions completed at the installation include removal of USTs and construction of a drainage system to collect contaminated surface water. In FY86, the installation completed a Removal Action involving excavation and disposal of contaminated soil. In FY88, a Gunite concrete slurry wall was installed at the same site. In FY92, 39 tanks were removed at the Fuel Farm. Thirty additional USTs were removed in FY93.

In FY95, the installation undertook Engineering Evaluations and Cost Analyses for three sites at which Removal Actions are planned. Contaminated soil was removed from the Fuel Farm, and an innovative treatment process was used to accelerate the cleanup schedule for the Fuel Farm to meet the reuse priority.

The installation also began a parcel-specific Environmental Baseline Survey (EBS) to support transfer of clean property in FY96. It has proposed 1,285 acres as clean, and the regulatory agencies have orally concurred in this determination.

The BRAC Cleanup Team (BCT), which was formed in FY94, meets regularly to address cleanup issues at the installation and to expedite the remediation process. During FY95, the BCT, in cooperation with the Local Redevelopment Authority (LRA), developed strategies for cleanup based on the draft land reuse plan (LRP). A restoration advisory board (RAB), formed in 1994, comprises seven subcommittees organized to address specific areas of concern or interest.

In FY96, RI/FS fieldwork was completed at Operable Unit (OU) 1, OU2, and OU3; a draft ESI was issued for 5 sites; a draft RFA was issued for 15 sites; and the final Phase III RFA was issued. Also, an on-site remediation project was completed at the Fuel Farm, and a draft LRP was finalized and submitted to the Department of Housing and Urban Development. The BCT negotiated with the LRA to determine the priority for reuse parcels without compromising mission requirements or cleanup activities. Draft findings of suitability to transfer were prepared for eight parcels, and environmental work was completed to clear six parcels for transfer.

FY97 Restoration Progress

Removal Actions for Sites 2, 9, and 13W and the ESI for five sites were completed. The final RI/FS for OU3 was issued, and a landfill containment presumptive remedy was implemented.

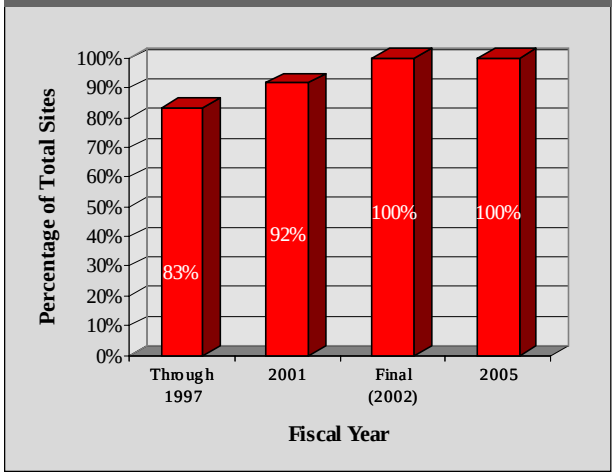
The BCT reviewed draft RI/FSs for OU1 and OU2, sampling plans, and a draft Record of Decision (ROD) for OU3. The BCT also agreed on data quality objectives for Site 9N and completed the latest BRAC Cleanup Plan (BCP) and EBS.

Discovery of a trichloroethene plume at Site 13 delayed some activities scheduled for completion in FY97. The OU3 ROD was not signed because of Marine Corps BRAC office direction.

Plan of Action

- Complete RI/FS at eight sites and issue final RI/FS at OUs 1 and 2 in FY98
- Complete latest BCP and EBS (parcel-specific) and update CERFA EBS in FY98
- Complete RCRA cleanups at 15 sites in FY99
- Transfer at least 10 parcels of property in early FY99
- Complete corrective action plans for all UST sites in FY99
- Sign three RODs for six sites and complete Remedial Actions in FY99

Sites Achieving RIP or RC Per Fiscal Year



Twin Cities Army Ammunition Plant NPL

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: $105.9 million
Estimated Cost to Completion (Completion Year): $215.4 million (2080)
Final Remedy in Place or Response Complete Date: FY2007

Arden Hills, Minnesota

Restoration Background

Since FY81, environmental studies verified that past waste disposal practices released hazardous contaminants into soil, groundwater, and sediment, which migrated into the Minneapolis-St. Paul groundwater supply. Twenty-eight sites are grouped into three operable units (OU), which include former landfills, burning and burial grounds, ammunition testing and disposal sites, industrial operations buildings, and sewer system discharge areas.

Ammunition-related metals, volatile organic compounds (VOC), and polychlorinated biphenyls (PCB) are the primary soil contaminants at the installation. Soil vapor extraction (SVE) systems have been installed to remove VOCs from soil. In 1989, the thermal treatment of 1,400 cubic yards of PCB-contaminated soil was completed.

VOCs are the primary contaminants in groundwater. In FY86, groundwater extraction and treatment systems were installed. In FY88, the installation constructed the Boundary Groundwater Recovery System (BGRS) 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 in FY90. In FY93, 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. In addition, a boundary plume containment system designed to prevent the off-post migration of VOCs in shallow groundwater was initiated.

The installation established a technical review committee (TRC) in 1985 and a restoration advisory board (RAB) in FY96 to allow community input on cleanup decisions.

In FY96, the installation continued work on the Outdoor Firing Range Remedial Investigation/Feasibility Study (RI/FS), the Grenade Range FS, and closure of Site F. The Water Tower Area site was closed, and a well advisory was implemented for OUs 1, 2, and 3.

FY97 Restoration Progress

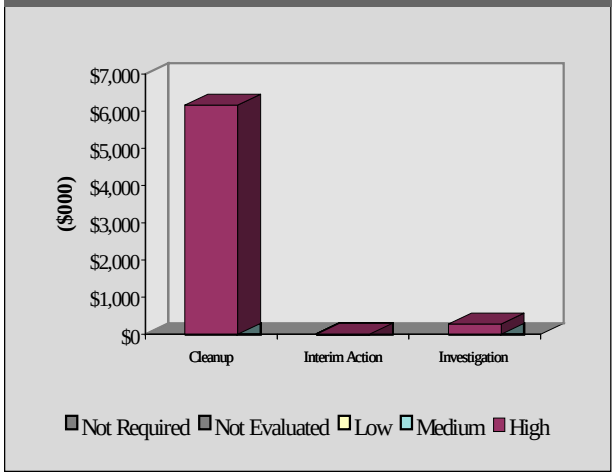
The Army implemented the alternate water supply plan, abandoning five residential wells. Five other wells were considered for alternate water supply and/or abandonment. For OU1, the installation completed or initiated construction at the two sites and installed two performance-monitoring wells. Upon completion of the OU2 FS, the installation drafted the OU2 ROD. Engineering Evaluations/Cost Analyses (EE/CA) were also drafted for the Grenade Range and the Outdoor Firing Range areas. The Army initiated Remedial Design (RD) for eight Shallow Soil Sites and two Deep Soil Sites and completed the removal of all contaminated soil from the Ammunition Burning Ground. The installation drafted an Ecological Risk Assessment (ERA) of surface water and sediment for the entire installation. A field investigation to characterize soil at the north boundary used accelerated field techniques (geoprobe and a mobile laboratory) to accomplish rapid results.

The signing of the OU2 ROD was scheduled for FY97 but was delayed because new guidance was proposed by EPA. Completion of Tier I and Tier II was delayed because of lack of concurrence by the regulators and lack of funds.

Plan of Action

- Continue alternate water supply plan and complete construction of containment wells and performance monitoring wells for OU1 in FY98
- Complete OU2 ROD, closure of Site F, and EE/CAs for Grenade Range and Outdoor Firing Range in FY98
- Complete RD and initiate Remedial Action (RA) for five sites and complete RD for Deep Groundwater Source Control at OU2 in FY98
- Complete Tier I ERA of surface water and sediment and Tier II Investigation in FY98
- Initiate phytoremediation demonstration project at Site C in FY98
- Complete RD and initiate RA for five sites at OU2 in FY99
- Complete RA for five sites at OU2 in FY99
- Complete characterization of two sites at OU2 in FY00
- Complete Tier II ERA in FY99
- Operate and maintain all RAs at OUs 1 through 3 in FY00
- Complete RI and EE/CAs for Primer Tracer Areas at OU2 in FY00-FY03
- Initiate all remaining RAs by FY05

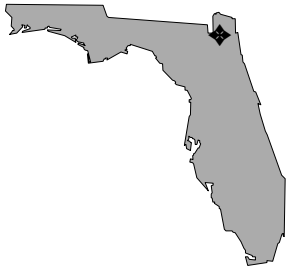
FY98 Funding by Phase and Relative Risk



Tyndall Air Force Base

NPL

Size: 28,824 acres
Mission: Provide advanced F-15 fighter training
HRS Score: 50.00; proposed for NPL in June 1996
IAG Status: None
Contaminants: Petroleum/oil/lubricants, chlorinated solvents, pesticides, metals, PCBs, and general refuse
Media Affected: Groundwater, surface water, sediment, and soil
Funding to Date: $8.7 million
Estimated Cost to Completion (Completion Year): $28.7 million (FY2001)
Fianl Remedy in Place or Response Complete Date: FY2001



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 installation currently leases or owns an additional 300 acres in neighboring areas.

Initial environmental studies, beginning in FY81, identified 18 sites at the installation. By FY92, an additional 18 sites had been identified. Principal site types include fire training areas, spill sites, landfills, and disposal trenches. Of the 36 sites, one (OT-18, Lynn Haven Defense Fuel Supply Point) is being cleaned up under the direction of the Defense Logistics Agency. Five of the remaining 35 sites are located in the neighboring area.

In FY95, a RCRA Facility Assessment (RFA) identified 58 solid waste management units (SWMU) and 18 areas of concern.

In FY94 and FY96, efforts were undertaken to establish a restoration advisory board (RAB). The installation distributed a survey to solicit community concerns and interest in forming a RAB. Public response indicated a high level of trust and no need for a RAB. In light of Tyndall's status on the National Priorities List (NPL), the issue will be addressed again in FY98. As an additional measure, a community relations plan (CRP) has been completed to inform the public and include them in the Installation Restoration Program (IRP).

During FY96, the installation entered into a partnership with the Florida Department of Environmental Protection (FDEP), EPA, and restoration contractors.

Technologies implemented at several sites include dual-phase vacuum extraction, microbubble injection, and bioslurping. The installation completed pilot tests for dual-phase vacuum extraction, soil vapor extraction (SVE), and air sparging at site SS-15. A bioslurp field test was completed at Site FT-23 and resulted in recovery of more than 2 gallons of free-product emulsion per hour over a 2-day period.

The installation completed a well assessment report for all 141 monitoring wells. At Site FT-16, a contamination assessment report (CAR) was completed. The installation also completed Chemical Data Acquisition Plan Addendum 3 for Site OT-29. Remedial Investigation (RI) fieldwork was conducted at Sites SS-20, SS-26, and OT-29. The installation also completed RCRA clean-closure activities at Site LF-36, as required by FDEP.

FY97 Restoration Progress

The installation signed decision documents and received no-further-action concurrence from FDEP and EPA for 13 sites. Interim Remedial Actions were initiated at three sites, and the CAR for Site SS-19 was completed. In addition, the air sparging/SVE pilot test for Site FT-16 was completed.

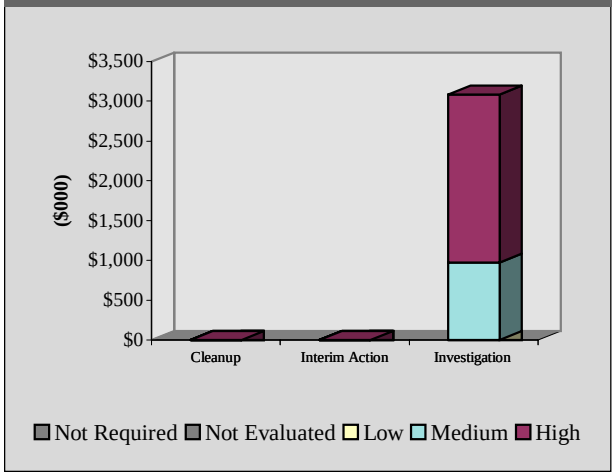
The installation's partnership with FDEP, EPA, and restoration contractors evolved into a cohesive and efficient project team that meets every month. This project team also serves as the technical review committee.

Turnover of personnel caused delays in some actions scheduled for FY97. In addition, several investigations showed that the projects originally planned were not applicable. Site OT-29 was placed on the NPL and has more-widespread contamination than initially anticipated. Interim Remedial Actions (IRA) for Sites SS-20 and SS-21 were not conducted because contamination levels were lower than thought.

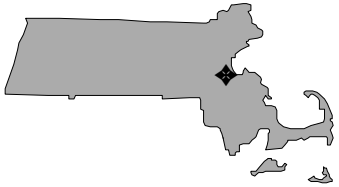
Plan of Action

- Complete RIs for Sites FT-17 and SS-26 in FY98
- Conduct RI fieldwork at Site OT-29 in FY98
- Conduct IRAs for Sites SS-20, OT-21, and FT-23 in FY98
- Conduct post-IRA groundwater assessment for OT-21 in FY98
- Modify and continue air sparging/SVE pilot test for Site FT-16 in FY98
- Complete CARs for Sites SS-20 and FT-23 in FY98
- Reduce the relative risk at least one site in FY98
- Sign decision documents and receive no-further-action concurrence from FDEP and EPA for two additional sites in FY98
- Use consensus scoping to complete project planning and award by second quarter of FY98

FY98 Funding by Phase and Relative Risk



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: $13.5 million
Estimated Cost to Completion (Completion Year): $46.0 million (FY2030)
Final Remedy in Place or Response Complete Date: FY2003



Natick, Massachusetts

Restoration Background

Since 1954, the former Natick Laboratory has supported several industrial, laboratory, and storage activities for research and development in food science and aeromechanical, clothing, material, and equipment engineering. Operations at the installation used various volatile organic compounds (VOC), including tetrachloroethene (PCE), trichloroethene (TCE), carbon disulfide, benzene, and chloroform. Site types at the installation 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 subsequent studies also contained VOCs.

The installation completed an Expanded Site Inspection in FY92 that confirmed TCE contamination in groundwater. A Remedial Investigation (RI) and Feasibility Study began in FY93. The Phase I RI Report for the Building T-25 area was drafted in FY94. In FY95, the installation started Phase II RI activities.

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 (PCB)–contaminated soil from an exploded transformer.

The installation conducted a groundwater pump test in the Building T-25 area and used the information collected to characterize conditions in the area and provide hydrogeologic data for Interim Actions and design activities. In FY95, the Army completed a groundwater flow model for the Building T-25 area to determine the effects of pumping of on- and off-site drinking water wells on migration of the contaminant plume.

After its placement on the National Priorities List (NPL) in May 1994, the installation increased partnering efforts with state and federal regulatory agencies and worked to keep open communication lines with the community. The installation also drafted a community relations plan. In FY95, the installation established a restoration advisory board (RAB).

In FY96, the installation conducted an extensive 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.

A step test to determine which monitoring wells might be used as extraction wells was completed. The installation also began developing the work plan for the RI of the former proposed gymnasium site. The installation began receiving drinking water from public wells; therefore, sampling of the installation's drinking water wells was discontinued.

In FY96 all active sites received an initial Relative Risk Site Evaluation ranking, which incorporated the views of the regulatory agencies. The installation provided two semiannual environmental newsletters to the community and conducted the second annual public availability session. The RAB met nine times over the year, receiving and reviewing work plans and reports and participating in relative risk rankings for NPL sites.

FY97 Restoration Progress

The installation monitored groundwater contaminant levels in the monitoring well network on a quarterly basis. It also employed accelerated fieldwork techniques. Bimonthly meetings were held with regulators, increasing coordination between regulators and installation. In addition, sequential review of documents was implemented to expedite document review.

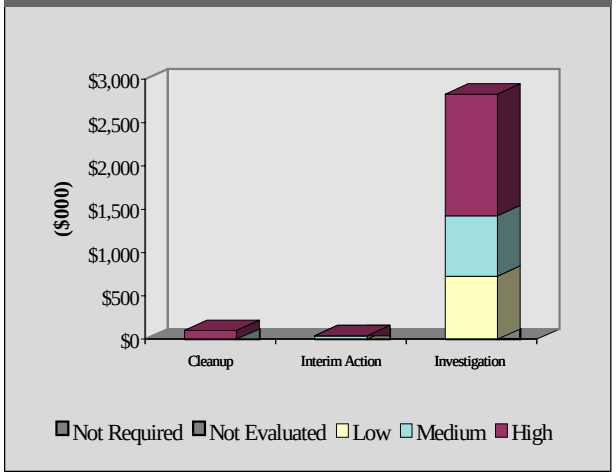
To resolve issues with regulators, the installation established a consensus approach to new work. Field screening with geoprobe and ground penetrating radar was used to advance quickly toward an area of concern, expediting site characterization. The installation initiated partnering with EPA, the state, and the town on the first Remedial Action; held nine RAB meetings; and sent out three environmental newsletters.

All activities in the current plan of action were scheduled for completion in FY97. They were delayed because of increased input from regulatory agencies and the RAB.

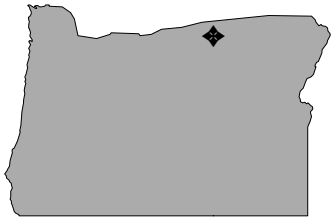
Plan of Action

- Complete fieldwork for the RI of the former proposed gymnasium site in FY98
- Continue quarterly monitoring of groundwater contaminant levels in the monitoring well network, both on and off site, in FY98
- In FY98, implement the T-25-Area approved Treatability Study plan for containing contamination within the post boundaries
- Complete plans for removal of pesticide-contaminated soil in FY98

FY98 Funding by Phase and Relative Risk



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: $48.0 million
Estimated Cost to Completion (Completion Year): $42.2 million (FY2023)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY1998



Hermiston, Oregon

Restoration Background

In 1941, the Army established Umatilla Chemical Depot Activity 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 the realignment of the installation.

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 (OU).

During the Remedial Investigation in FY89, a pilot bioremediation study investigated the effectiveness of composting for treatment of contaminated soil. In FY92, the Army signed a Record of Decision (ROD) selecting bioremediation by windrow composting as the treatment for the Washout Lagoon Soil OU. A ROD was signed for the Deactivation Furnace OU, selecting solidification and stabilization of lead-contaminated soil. In FY93, the Army and regulators signed two RODs for no further action at two landfills. Phase I Remedial Designs (RD) for the washout lagoons and the deactivation furnace were completed in the same year, and cleanup contracts were awarded.

In FY94, the installation completed Phase I of the bioremediation program for explosives-contaminated soil in the washout lagoon and stabilized approximately 4,800 cubic yards of lead-contaminated soil from the deactivation furnace. To meet BRAC program milestones, the installation finished transferring its conventional weapons mission to another installation.

Also in FY94, a BRAC cleanup team (BCT) was formed, a BRAC Cleanup Plan (BCP) completed, and the installation's technical review committee converted to a restoration advisory board. In FY95, the installation designated 14,000 acres as CERFA-clean, and regulatory agencies concurred on about 11,000 acres. The installation completed RODs for the Groundwater OU, the Washout Plant OU, the Miscellaneous Sites OU, and the Ammunition Demolition Activity Area (ADA) OU. A decision document was completed for supplementary sites.

In FY95, the installation removed 13 underground storage tanks. The installation began surface sweep and clearance of unexploded ordnance (UXO) at the ADA OU. The RD was completed for groundwater treatment and for soil stabilization at the Miscellaneous Sites OU, the ADA OU, and the Bomb Washout Plant OU. The RD for the Groundwater OU addressed a 170-acre plume contaminated with explosives.

In FY96, Umatilla Depot began constructing the groundwater treatment facility and remediating contaminated soil at the ADA OU, the Miscellaneous Sites OU, and the Bomb Washout Plant OU. The lead-based-paint assessment was completed, as was bioremediation of 10,000 cubic yards of explosives-contaminated soil.

FY97 Restoration Progress

The Army began operation of the groundwater facility and completed remediation for contaminated soil in the ADA OU, the Miscellaneous Sites OU, and the Bomb Washout Plant OU.

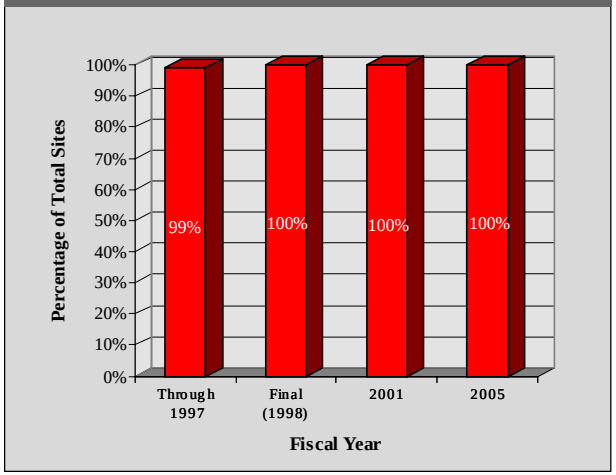
The BCT held quarterly progress meetings, approved the final Environmental Monitoring Plan for the Active Landfill OU, held scoping meetings for the closure cap at the Landfill OU, conducted UXO subsurface characterization at the ADA OU, and completed the latest BCP. The BCT also began preparing clean-closure documents for ADA and Washout Lagoon soil, the Miscellaneous Sites U, the Deactivation Furnace OU, and the Bomb Washout Plant OU.

The first two activities in the current plan of action were scheduled for completion in FY97. They were delayed because of late release of funding to cap the landfill and insufficient funding so that only two of four closure documents were completed.

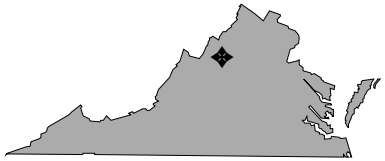
Plan of Action

- Complete closure and capping of the active landfill in FY98
- Prepare closure documents for Bomb Wash Out Plant OU, ADA OU, Deactivation Furnace OU, and Landfill OU in FY98.
- Complete National Priorities List delisting documents in FY98
- Complete negotiation for UXO cleanup at ADA OU in FY98
- Complete next BCP in FY99
- Prepare the remaining documentation needed for property transfer in FY01–FY03

Sites Achieving RIP or RC Per Fiscal Year



Size: 701 acres
Mission: Provide logistics 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: $8.4 million
Estimated Cost to Completion (Completion Year): $4.4 million (FY2001)
Final Remedy in Place or Respone Complete Date for BRAC Sites: FY1999



Vint Hill Farms, Virginia

Restoration Background

In July 1993, the BRAC Commission recommended the closure of Vint Hill Farms Station and the subsequent relocation of the maintenance and repair functions of the Intelligence Material Management Center to Tobyhanna Army Depot, Pennsylvania, and transfer of the remaining components to Fort Monmouth, New Jersey.

The installation officially closed on October 1, 1997. The installation is in a caretaker status, providing minimal operation and maintenance (O&M) and oversight of remedial activities until final transfer can be made. 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. More recently, the installation also conducted military intelligence and communication activities.

In FY90, a Preliminary Assessment (PA) identified 26 sites, including underground storage tanks (UST), landfills, lagoons, storage areas, pit areas, fire training areas, disposal areas, spill sites, areas with asbestos-containing materials, lead-based paint areas, and transformers with polychlorinated biphenyls (PCB).

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 FY92, the installation suggested treating the groundwater by using an oil-water separator and carbon filtration.

In FY94, an enhanced PA identified 16 additional sites. Twelve of these sites were recommended for no further action (NFA). An installation-wide Site Inspection (SI) also began in FY94, and the Army submitted two draft Site Characterization Reports on UST sites to the regulatory agencies for review.

In FY94, the installation formed a BRAC cleanup team (BCT) and completed the final CERFA Report and Environmental Baseline Survey, which identified 417 acres as CERFA-clean. The BCT expedited the document review process by conducting scoping meetings to incorporate regulatory requirements into SI and Remedial Investigation and Feasibility Study (RI/FS) activities.

In FY95, the installation formed a restoration advisory board to help facilitate communication among the regulatory agencies, contractors, and members of the local community. The land reuse plan was completed and submitted to the regulatory agencies for approval. The installation also initiated an RI/FS for the Phase I reuse priority area, as identified by the Local Redevelopment Authority, and an Environmental Impact Statement (EIS).

In FY96, the Army completed a final SI Report identifying 24 sites for further investigation. The RI/FS Phase I fieldwork was completed. Execution of the Phase II RI/FS was assigned to the U.S. Army Corps of Engineers (USACE) for inclusion in the Total Environmental Restoration Contract.

FY97 Restoration Progress

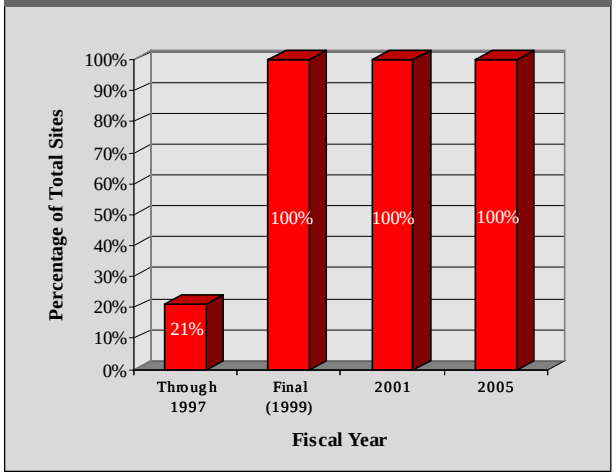
The Army submitted the Phase I RI Report to the regulatory agencies for review and approval. The report recommended only four areas requiring environmental evaluation (AREE) for remediation, all others were recommended for NFA. The Army recommended Interim Remedial Actions for the four AREEs needing remediation and received regulatory approval. The Army also prepared Proposed Plans for these actions and published them for public comment. Remedial work should be completed in December 1997. The Army also completed Phase II RI fieldwork. Partial concurrence was received on 417 acres proposed as CERFA-uncontaminated acreage.

The first, fourth, and fifth activities in the current plan of action were originally scheduled for completion in FY97. They were delayed because regulatory reviews took more time than anticipated.

Plan of Action

- Complete a decision document for Phase I RI/FS sites and begin Remedial Design and Remedial Action (RD/RA) in FY98
- In FY98, complete Phase II draft RI Report and forward to regulators for comment and concurrence
- Complete supplemental fieldwork and FS and begin RD/RA for Phase II sites in FY98
- Issue final EIS and Record of Decision in FY98
- In FY00, complete action directed by the Phase II RI/FS, an effort to be conducted by USACE and its contractor
- Complete all BRAC activities by the end of FY01

Sites Achieving RIP or RC Per Fiscal Year



Warminster Naval Air Warfare Center Aircraft Division — NPL/BRAC 1991

Size: 839 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: $13.1 million
Estimated Cost to Completion (Completion Year): $14.7 million (FY2005)
Final Remedies in Place or Response Complete Date for BRAC Sites: FY1998

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, with final transfer of property targeted for December 1998.

In FY79, metals and volatile organic compounds (VOC), primarily trichloroethene (TCE) and tetrachloroethane, were detected in local groundwater wells. Environmental studies at the installation have identified nine sites, of which eight were recommended for further investigation. Site types include waste burn pits, sludge disposal pits, landfills, waste pits, and a fire training area.

Identification and removal of one underground storage tank and contaminated soil occurred 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. The installation's contract for an extraction and treatment system for the groundwater at OU1 now includes OU3.

In FY93 and FY94, the installation completed groundwater Remedial Investigation and Feasibility Study (RI/FS) activities for eight sites. In FY96, groundwater RI/FS activities at Area D, known as Site 9, were completed, and the RD for Sites 4 and 8 was completed.

In FY95, the installation completed a Remedial Action (RA) for residential wells contaminated with TCE. The Navy distributed bottled water, installed temporary treatment systems at each affected well, and worked with EPA and the local water authority to install public water service for the affected residential areas.

A BRAC cleanup team was established in FY94. The installation completed the BRAC Cleanup Plan and a Phase I Environmental Baseline Survey (EBS) in FY95. The property was divided into eight parcels, with 353 acres identified as CERFA-clean. In FY95, the installation began a Phase II EBS, which is continuing through FY98 with the goal of area of concern (AOC) closeout by Removal Action Contract (RAC) remediation, CSO housekeeping, or risk assessment documentation.

A technical review committee, formed in FY88, was converted to a restoration advisory board (RAB) in FY94. The installation completed its community relations plan and established an administrative record in that same year.

FY97 Restoration Progress

A source Removal Action was completed at Site 4, and another was initiated at Site 6. Ongoing investigation will determine what, if any, additional Site 6 source removal is needed. The installation completed a final Remedial Action at OU3, began operation of an extraction and treatment system, and started long-term monitoring (LTM).

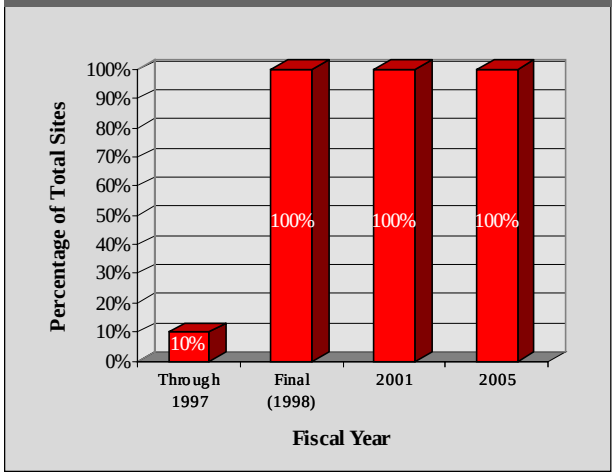
Ongoing, regularly scheduled Tier II meetings between the Navy and EPA have improved site management and helped resolve issues.

Off-site access and funding problems; extended review periods and scoping issues; and the high priority given to the groundwater effort, findings of suitability to lease (FOSL), and findings of suitability to transfer (FOST) delayed accomplishment of some activities scheduled for completion in FY97.

Plan of Action

- Complete Phase II EBS in FY98
- Sign final ROD for Sites 5 through 7 (Area B) in FY98
- Continue long-term operations at Area C in FY98
- Continue perimeter and off-base well sampling program in FY98
- Complete Phase III RI/FS for media other than groundwater in FY98
- Initiate and complete interim RD/RA for Areas A and D groundwater in FY98
- Initiate Area A and D source removal in FY98
- Issue ROD for no further action for Sites 4 and Site 6 source removal in FY98
- Complete RI well installation, water-level measurements, and sampling on and off base in FY98
- In FY98, issue FOST and FOSL for parcels as installation restoration sites are addressed
- Initiate RD/RA for Areas A, B, and D groundwater in FY98
- Complete RA for OU1 in FY98
- Initiate RD/RA or a Removal Action in FY99 at Sites 1 through 3, 8, and 9, as appropriate
- Begin long-term monitoring for OU1 in FY99

Sites Achieving RIP or RC Per Fiscal Year

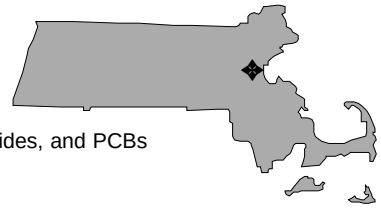


Watertown Army Research Laboratory

Formerly the Army Material Technology Laboratory

NPL/BRAC 1988

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: $90.6
Estimated Cost to Completion (Completion Year): $10.5 million (FY2006)
Final Remedy in Place or Response Complete Date for BRAC Sites: FY2001



Watertown, Massachusetts

Restoration Background

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

Environmental studies at the installation concluded that most of the soil was contaminated with heating oil, pesticides, and polychlorinated biphenyls (PCB). 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 different areas (indoor, outdoor, and Charles River).

During this process, the installation completed several Interim Actions, including 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-contaminated 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 the removal and demolition of the tank farm (Structure 295). A cost saving resulted from using the tank farm structure as beneficial backfill.

The Army and regulators signed a Record of Decision (ROD) for the Outdoor Soil and Groundwater Operable Unit (OU) in September 1996. In response to a request from the Watertown Arsenal Development Corporation (ADC), the BCT expedited development of a second ROD for Building 131. This ROD would allow cleanup of the Outdoor OU parcel in the first quarter of FY97 and transfer of the property in the spring of 1997.

Working with the RAB and the Watertown ADC, the BCT identified and approved an alternative remedy that reduced the remediation effort by 1 year, with sizable savings. During the design phase, the BCT reevaluated the risks associated with the Indoor OU cleanup. This reevaluation resulted in reduced cleanup cost. In addition, all indoor remediation should now be complete during FY98.

FY97 Restoration Progress

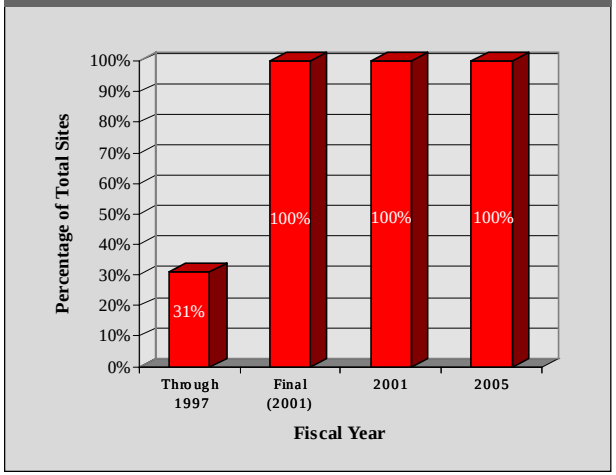
The installation initiated soil and indoor remediation. It also initiated a finding of suitability to transfer for various properties and completed cleanup for 11 soil areas. Document review was expedited through simultaneous review by all agencies. The BCT separated the 11-acre River Park Parcel from the 37-acre Installation Parcel for future resolution, coordinated soil remediation, assessed indoor cleanup criteria, and developed the Charles River RI/FS and the Building 60/227 petroleum reference criteria.

The first three activities on the current plan of action were originally scheduled for completion in FY97. They were delayed because RI/FS data indicated that the extent of contamination and the size of the contaminated area were greater than anticipated.

Plan of Action

- Complete soil remediation in FY98
- Complete indoor remediation and cleanup in FY98
- Complete RI for Charles River Area in FY00
- Complete transfer of 37 acres in FY98
- Nominate installation as a National Historical Site in FY98
- Complete NEPA Environmental Assessment at River Park in FY98
- Complete RODs at Charles River Park and Charles River in FY00
- Transfer Charles River Park in FY98
- Complete all BRAC activities by the end of FY01

Site Achieving RIP or RC Per Fiscal Year



Weldon Spring Ordnance Works NPL

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, PCB, PAH, and low-level radioactive material
Media Affected: Groundwater and soil
Funding to Date: $141.0 million
Estimated Cost to Completion (Completion Year): $104.6 million (FY2013)
Final Remedy In Place or Response Complete Date: FY2013

Weldon Spring, 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.

Sites at the Weldon Spring Ordnance Works include lagoons, landfills, burning grounds, and trinitrotoluene (TNT) and DNT production lines. Ongoing environmental studies, beginning in FY77, have revealed contamination of groundwater and soil. Initial assessments indicated the presence of explosives, lead, asbestos, pentachlorophenol (PCP), and polyaromatic hydrocarbons (PAH). Areas containing radioactive material also were identified; those areas are being addressed and remediated by the U.S. Department of Energy (DOE), with the cost of remediation shared by DoD and DOE.

Cleanup activities at the former DoD property are grouped into two operable units (OU): OU1 includes contamination of soil and pipelines, and OU2 includes groundwater contamination. Remedial Investigation and Feasibility Study (RI/FS) activities at OU1 began in FY91. The RI Report was completed in FY92.

The U.S. Army Corps of Engineers (USACE) conducted several studies that relate to remediation efforts at the site: a biodegradation research study with the University of Idaho (FY92); a historical survey of past activities at the installation, with the University of Cincinnati (FY94); and a study, with Texas A&M University, of the genetic effects of hazardous substances on organisms. USACE also established two community focus groups that included representatives of environmental groups and members of the community. The goal of the focus groups was to obtain objective, unbiased viewpoints on cleanup decisions.

In FY94, the Kansas City District of USACE began predesign studies and initiated the Remedial Design (RD) for OU1. The predesign studies and RD were completed in FY95. USACE also worked in a partnership with DOE to prepare final joint RI/FS work plans for OU2 and to jointly complete two rounds of quarterly groundwater monitoring.

During FY96, USACE completed the RD and the ROD for OU1. The draft RI for OU2 was submitted to the regulatory agencies for review. In addition, groundwater monitoring was completed at OU2.

A technical review committee (TRC) meets periodically to discuss cleanup issues and address comments on documents. TRC members include representatives of the community, the state regulatory agency, EPA, and other government entities, including the U.S. Geological Survey, the U.S. Army Reserve, and DOE.

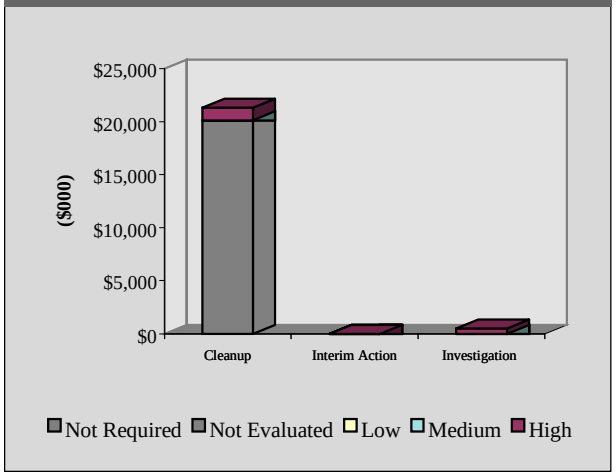
FY97 Restoration Progress

USACE Kansas City District completed the combustion Risk Assessment for OU1. A Remedial Action (RA) contract was awarded, and preparation began for the OU1 work plan. Groundwater monitoring for OU1 resumed in FY97 and will continue for approximately 2 years. USACE finalized the RI and prepared the draft FS for OU2. USACE completed underground storage tank (UST) removal in FY97. USACE also held a partnering conference and developed a restoration advisory board (RAB) to increase the level of community participation in project activities and to address community concerns.

Plan of Action

- Finalize Proposed Plan for OU2 in FY98
- Complete RA work plans for OU1 in FY98
- Erect and operate incinerator in FY98
- Continue partnering meetings with regulatory agencies and operate RAB in FY98
- Complete remaining OU1 cleanup activities in FY99
- Prepare and complete ROD for OU2 in FY99

FY98 Funding by Phase and Relative Risk



West Virginia Ordnance Works NPL

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: $46.4 million
Estimated Cost to Completion (Completion Year): $23.0 million (FY2022)
Final Remedy In Place or Response Complete Date: FY2022

Point Pleasant, West Virginia

Restoration Background

From 1941 to 1946, the 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 site types include TNT manufacturing areas, wastewater sewer lines, and wastewater ponds known as the "Red and Yellow Water Ponds."

Preliminary Assessments and Site Inspections (SI) in FY81 and FY82 identified two operable units (OU). The former DoD property is now divided into 12 OUs. Restoration activities include capping contaminated soil, capping two ponds and a reservoir, constructing a groundwater extraction and treatment system, and building three ponds for wetlands mitigation.

In FY88, contaminated soil was capped in the TNT manufacturing area. Caps for the ponds and the reservoir (OUs 2 and 3) were completed in FY92. In FY93, 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) also began operation and maintenance (O&M) and long-term monitoring (LTM) for OUs 1, 2, and 3.

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. RI activities continued for the other OUs and Expanded Site Inspections (ESI) were initiated. Sampling and RD activities continued at OU6. USACE removed 546 tons of hazardous material from the TNT manufacturing area and backfilled open pits and manholes.

Also in FY95, USACE completed Removal Actions for asbestos in the acids area and two powerhouses and performed follow-on building demolition. USACE also initiated quarterly LTM of the adjacent Point Pleasant and Camp Conley municipal water supply wells. Also in FY95, USACE began construction of a groundwater extraction and treatment system at OU4 and continued RI activities at OU5. At OU6, sampling was completed, and the RD was initiated for the construction of wetlands. Potentially responsible party (PRP) efforts began for OU7, and RI activities continued for the other OUs. A risk assessment was initiated at OU11.

USACE formed a restoration advisory board (RAB), which meets every 2 months. Agenda items for RAB meetings include the current status of restoration activities, future activities, ESI and RI data, issues related to PRPs, local issues and concerns, and socioeconomic effects on the local community.

During FY96, USACE continued O&M and LTM for OUs 1, 2, and 3; RI at OU5; ESI activities; and RD at OU6. USACE also continued PRP efforts at OU7. USACE submitted a risk assessment and an RI report to EPA Region 3 and initiated FS at OUs 8, 9, and 11. USACE also initiated final Baseline Risk Assessments for OUs 10 and 12.

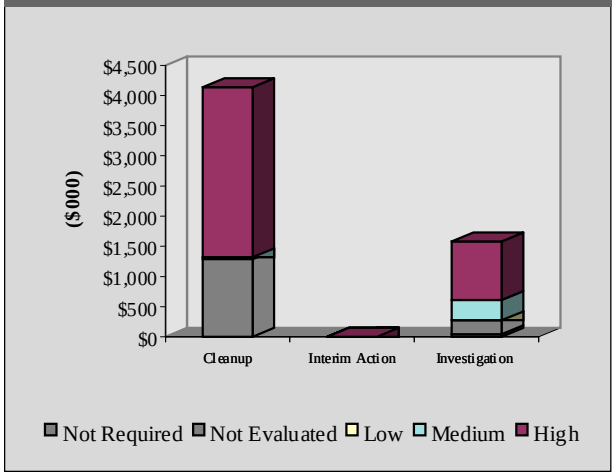
FY97 Restoration Progress

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 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 also was initiated.

USACE worked with the RAB to reestablish project priorities and participated in the county fair. Additionally, a no-action Record of Decision (ROD) was reached for OU11 through partnering with regulatory agencies.

Some activities scheduled for completion in FY97 were delayed because of a shift in project priorities. Also, the FSs for OU10 and OU11 were not recommended.

Plan of Action

- Complete OU11 ROD (no action) in FY98
- Complete sitewide groundwater model in FY98
- Revise OU5 ROD in FY98
- Conduct Removal Action for OU5 in FY98
- Complete OU1 burning grounds investigation in FY98
- Extend burning ground cap in FY98
- Develop decision documents for ESIs 1, 2, 3, 8, and 9 in FY98
- Complete Proposed Plan and ROD for OU10 in FY98
- Complete Proposed Plan and ROD for OU12 in FY98

FY98 Funding by Phase and Relative Risk