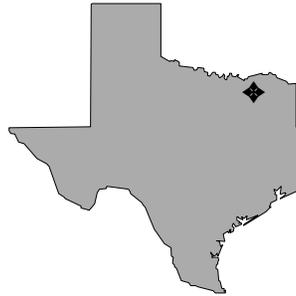


**FFID:** TX657172460500  
**Size:** 706 acres  
**Mission:** Manufacture aircraft and associated equipment  
**HRS Score:** 39.92; placed on NPL in August 1990  
**IAG Status:** IAG signed in 1990  
**Contaminants:** Solvents, paint residues, spent process chemicals, PCBs, waste oils and fuels, heavy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



**Fort Worth, Texas**

**Restoration Background**

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

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

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

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

In FY96, a Record of Decision (ROD) proposed Remedial Actions (RAs) at the remaining two sites. The Air Force decided to

integrate the restoration programs for the Carswell Field sites and the Air Force Plant No. 4 groundwater plume. In FY97, the installation completed a long-term monitoring plan and a Remedial Design (RD) work plan for the East Parking Lot plume.

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

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

**FY99 Restoration Progress**

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

After the unsuccessful use of surfactants and tracer testing, the installation investigated the use of radio frequency heating and six-phase heating to remove DNAPL in the East Parking Lot/ Building 181 area. A phytoremediation project was initiated to dewater the area near Landfill 3. The installation is awaiting final determinations from regulators on the need for an FFS on former Carswell AFB where the plume comingles with other source areas. The RD report for the East Parking Lot was delayed because of

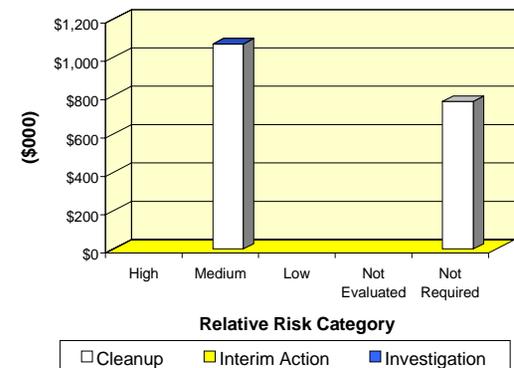
additional details, brought to the installation's attention by Lockheed Martin, concerning possible foreign object damage to F-16 aircraft if extraction wells are placed near the aircraft run-up stations, as proposed.

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

**Plan of Action**

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

**FY00 FUNDING BY PHASE AND RELATIVE RISK**



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



**Columbus, Ohio**

**Restoration Background**

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

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

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

In FY98, a PCB-contaminated soil site was remediated, and regulator concurrence was obtained. Investigations began under Ohio's Voluntary Action Program. Ohio EPA approved closure of a hazardous waste storage site. In addition, Air Force Plant No.

85 property was sold, with sales proceeds to be used for environmental restoration.

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

**FY99 Restoration Progress**

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

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

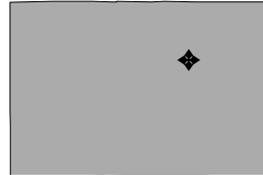
**Plan of Action**

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

**FY00 FUNDING BY PHASE AND RELATIVE RISK**

There are no cost data for this installation.

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



**Waterton, Colorado**

## Restoration Background

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

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

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

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

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

## FY99 Restoration Progress

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

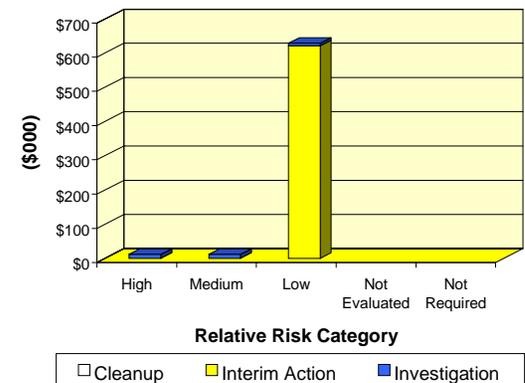
An EE/CA was developed for early action to address soil contamination at two sites. Groundwater monitoring was conducted. Negotiations on the IAG were halted in deference to the signing of a Compliance Order on Consent (COC) between the Air Force and the Colorado Department of Public Health and Environment.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

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

## Plan of Action

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

## FY00 FUNDING BY PHASE AND RELATIVE RISK



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



*Yigo, Guam*

## Restoration Background

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

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

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

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

In FY98, a Record of Decision (ROD) was completed for the MARBO OU, and remediation began at four of the OU's six sites. More than 4,000 barrels of asphalt from the 1950s was collected from three sites in the Main Base OU and recycled. The recycled

asphalt was given to the Government of Guam for road repairs. The installation also began remediation at two sites and seven areas of concern (AOCs) on excess lands in the Harmon OU.

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

## FY99 Restoration Progress

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

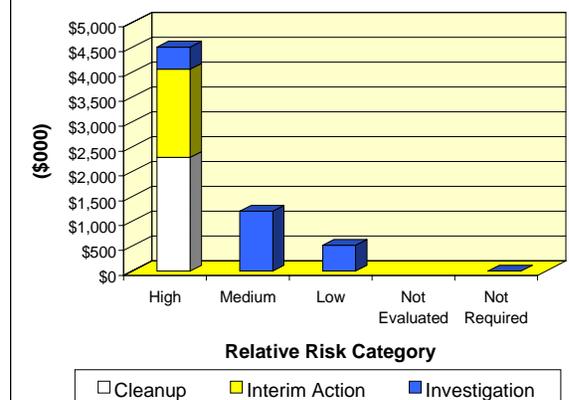
Completion of the Harmon OU ROD was delayed because of remediation delays at two sites. The installation and regulators reached an agreement to halt groundwater monitoring at the Harmon and Northwest Field OUs because concentrations of target analytes did not exceed action levels. LTM began at the MARBO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

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

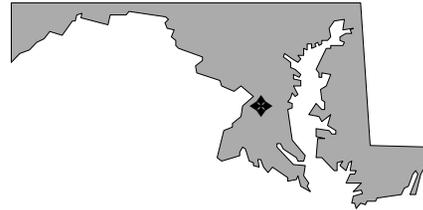
## Plan of Action

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

## FY00 FUNDING BY PHASE AND RELATIVE RISK



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



### Camp Springs, Maryland

### Restoration Background

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

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

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

underwent a PA/SI, RI/FS fieldwork began at Source 4, and a NFRAP decision document was proposed for Source 5. The installation agreed to a groundwater monitoring plan and a 5-year review process for the Source 5 NFRAP decision.

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

### FY99 Restoration Progress

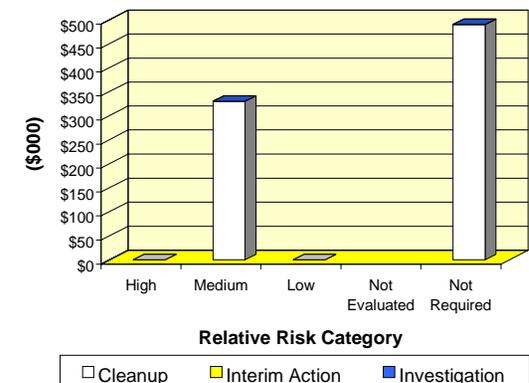
Despite the installation's submittal of rebuttal comments to the proposal to place Andrews Air Force Base on the National Priorities List (NPL), the base was placed on the NPL in May 1999. The RI/FS for LF05 and Source 1 must be revisited because of this NPL placement. The Air Force expects significant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

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

### Plan of Action

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

### FY00 FUNDING BY PHASE AND RELATIVE RISK



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



**Coffee and Franklin Counties, Tennessee**

### Restoration Background

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

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

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

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

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

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

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

### FY99 Restoration Progress

The installation began installing public water connections for residents downgradient of the Site WP-6 plume. Twenty homes will be connected to the water line. Data collection to evaluate the effectiveness of source containment at Site WP-6 is in progress. Delineation of the Site SS-22 plume migration pathway is under way. The installation successfully completed an emergency response action at Site LF-3. A landfill boundary soil gas collection system was designed, contracted for, and constructed to mitigate an emergency situation involving methane

gas migration to a local high school and residences. In addition, 22 SWMUs in Site SS-22 were designated for No Further Action during the year.

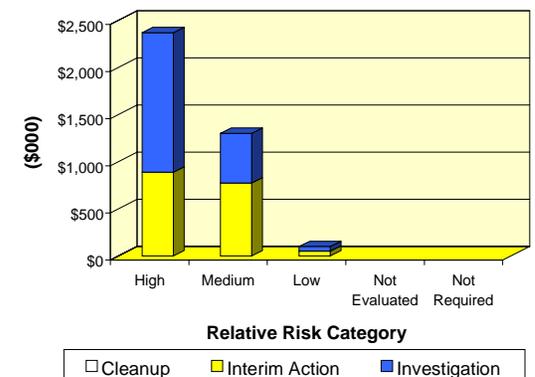
RFI No. 3 fieldwork was completed; however, additional data requirements were identified during the investigation. RFI No. 4 fieldwork was delayed pending regulatory review of the work plan. The ZVID Phase II pilot study is under way. Completion was delayed by construction of a reactor system. CMS efforts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

The RAB was converted to a Community Advisory Board.

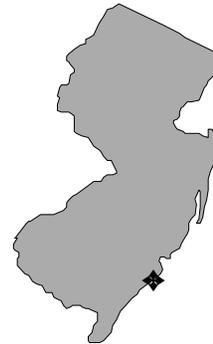
### Plan of Action

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

### FY00 FUNDING BY PHASE AND RELATIVE RISK



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



*Pleasantville, New Jersey*

**Restoration Background**

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

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

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

A Memorandum of Agreement (MOA) between the FAA and the Air National Guard Readiness Center (ANGRC) was signed in FY95. The MOA stipulates that the FAA will perform any

additional studies, and the Remedial Design and Remedial Action if necessary, at ANG sites. ANGRC will provide funding. An SI addendum for additional soil and groundwater sampling at Sites 2, 3, 5, and 6 was performed in FY95. In FY96, the FAA completed fieldwork required under the SI addendum, and the draft SI report.

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

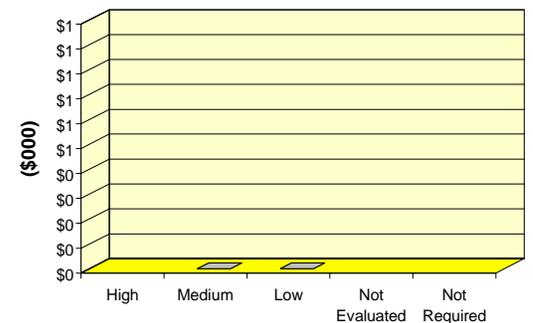
**FY99 Restoration Progress**

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

**Plan of Action**

- Initiate Remedial Investigation in FY00

**FY00 FUNDING BY PHASE AND RELATIVE RISK**



**Relative Risk Category**  
 □ Cleanup    ■ Interim Action    ■ Investigation

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



Austin, Texas

## Restoration Background

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

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

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

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

In FY97, the installation completed 37 Removal Actions; cleanup of Installation Restoration Program (IRP) Sites SS-08, SS-10, and SD17; and the latest EBS. The installation also completed the air injection sparging and soil venting project. The

RAB was disbanded by the community in FY97 because of the successful remediation efforts at the installation.

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

## FY99 Restoration Progress

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

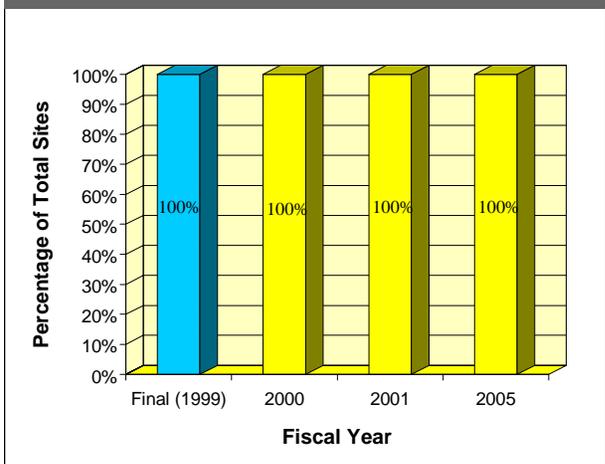
An installation deed transferred 942 acres to the LRA. Of the sites, 439 have been designated for NFA.

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

## Plan of Action

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

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



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



*Brandywine, Maryland*

**Restoration Background**

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

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

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

**FY99 Restoration Progress**

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

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

**Plan of Action**

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

**FY00 FUNDING BY PHASE AND RELATIVE RISK**

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

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



### Atwater, California

### Restoration Background

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

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

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

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

In FY97, the installation completed construction of two pump-and-treat systems (OU1 Phase 2 and Castle Vista). The BRAC

cleanup team (BCT) completed the RD/RA landfill work plan. It also provided the SCOU Proposed Plan for public comment and placed four more sites on Removal Action status. The BCT completed the comprehensive basewide Part I groundwater ROD incorporating OU1, OU2, and Castle Vista.

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

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

### FY99 Restoration Progress

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

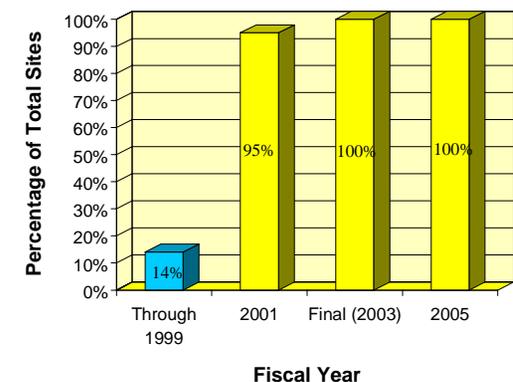
An institutional control (IC) layering strategy worksheet was completed for Parcel A. No land survey is required at this time. The RAB participated in a site tour.

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

### Plan of Action

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

### SITES ACHIEVING RIP OR RC PER FISCAL YEAR



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



### Rantoul, Illinois

### Restoration Background

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

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

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

In FY96, a Remedial Investigation (RI) report for 11 sites was submitted to EPA and the State of Illinois EPA (IEPA), but was rejected. The installation also initiated a groundwater extraction and treatment system at Building 700, a former UST site. Several parcels within Operable Unit (OU) 1 were designated as suitable for transfer. Planning began at former UST sites for sampling soil possibly still contaminated with fuel. Bioremediation and intrinsic

bioremediation TSs for the Building 952 area spill site determined that petroleum levels were below the State of Illinois cleanup levels for petroleum contamination. Two early actions and site cleanups were completed.

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

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

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

### FY99 Restoration Progress

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

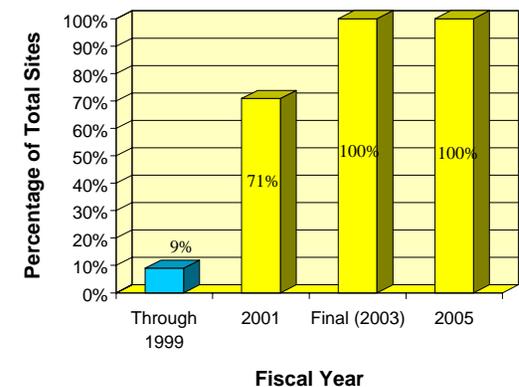
Actions (NTCRAs) to accelerate soil cleanup. RIs were initiated for OU1 and the new OU1 areas of concern.

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

### Plan of Action

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

### SITES ACHIEVING RIP OR RC PER FISCAL YEAR



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



Chicago, Illinois

## Restoration Background

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

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

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

Interim Remedial Actions have included removal of 19 USTs, contaminated soil, and low-level radioactive waste. Eleven ASTs have been closed. Remedial Actions (RAs) include removal of eight ASTs and partial on-site remediation of the south petroleum/oil/lubricant (POL) facility. The IRP sites will be recommended for institutional controls (deed restrictions) once a groundwater classification has been made. One site (LF-001) is

planned for long-term monitoring (LTM); another (RW-011) has been closed with no further action needed. A third site (ST-015) had RA (soil removal); and ST-006, the defuel tank leak, was closed under regulations for leaking USTs.

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

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

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

## FY99 Restoration Progress

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

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

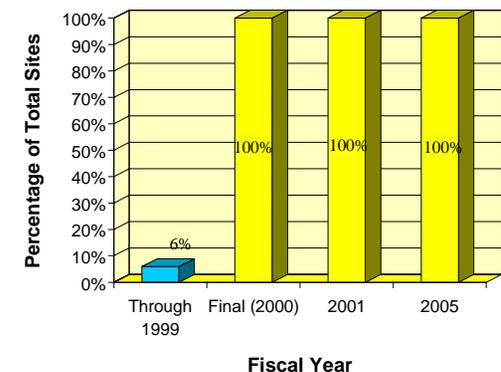
RAs are under way as Engineering Evaluations and Cost Assessments.

The BCTT meets quarterly.

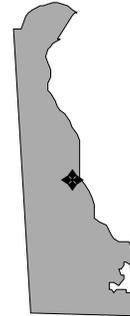
## Plan of Action

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

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



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



**Dover, Delaware**

## Restoration Background

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

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

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

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

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

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

## FY99 Restoration Progress

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

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

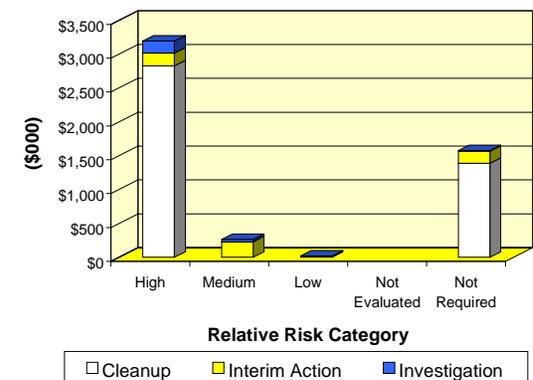
The installation solicited information on community interest in forming a Restoration Advisory Board (RAB) and found that the level of interest was insufficient to justify forming a RAB. The

installation meets monthly with state and federal regulators to discuss cleanup issues.

## Plan of Action

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

## FY00 FUNDING BY PHASE AND RELATIVE RISK



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



**Blytheville, Arkansas**

### Restoration Background

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

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

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

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

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

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

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

### FY99 Restoration Progress

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

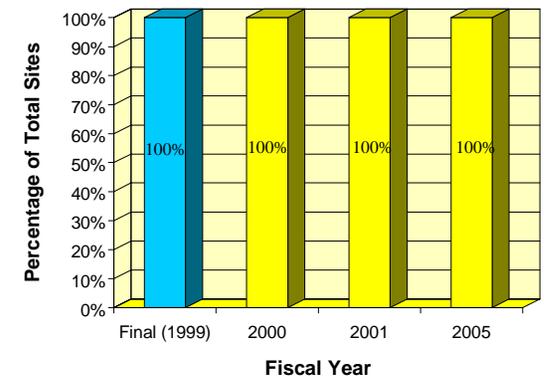
The last remedy in place was completed for all Installation Restoration Program sites. Remedial Action Operations and long-term monitoring are the only actions remaining at these sites.

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

### Plan of Action

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

**SITES ACHIEVING RIP OR RC PER FISCAL YEAR**



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



**Kern County, California**

## Restoration Background

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

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

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

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

dual-phase extraction systems constructed in FY96 began operating in FY97.

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

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

## FY99 Restoration Progress

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

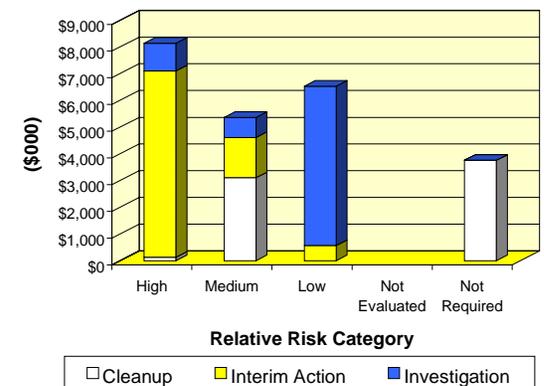
The STAR program for investigating AOCs and sites was completed. A pump-and-treat system was installed at Site 37. The system at Site 133 will be installed next year because of cleanup priorities. The biotrickling filter technology at Site 17 was tested and put into operation. The four technologies to be tested at Site 85 have been reduced to two technologies based on site condi-

tions. These two technologies are free-product skimming combined with pulsed SVE and air sparging (AS). The basewide Ecological Risk Assessment (ERA) and validation studies were initiated at Sites 25, 31, 37, and 133. LTM, groundwater studies, and remediation continued.

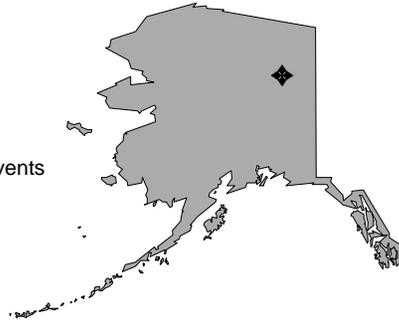
## Plan of Action

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

**FY00 FUNDING BY PHASE AND RELATIVE RISK**



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



*Fairbanks, North Star Borough, Alaska*

## Restoration Background

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

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

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

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

In FY96, RD was conducted for polychlorinated biphenyl (PCB) contamination at SS-067. Bioventing and SVE began at OUs 1

and 2. The installation also completed Removal Actions for lead and POL soil contamination at OU2. A cesspool and a dry well were removed.

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

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

## FY99 Restoration Progress

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

program. Asbestos and building debris were removed and disposed of.

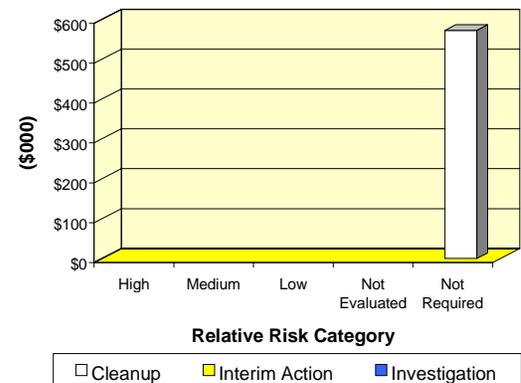
Long-term operations (LTO) and long-term monitoring (LTM) continued at all active IRP sites. Significant groundwater contamination was discovered at Site OT-008 during a delineation effort. Characterization of the contaminant plume is under way to determine whether the plume contains additional constituents.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

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

## Plan of Action

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

## FY00 FUNDING BY PHASE AND RELATIVE RISK



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



### Rapid City, South Dakota

### Restoration Background

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

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

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

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

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

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

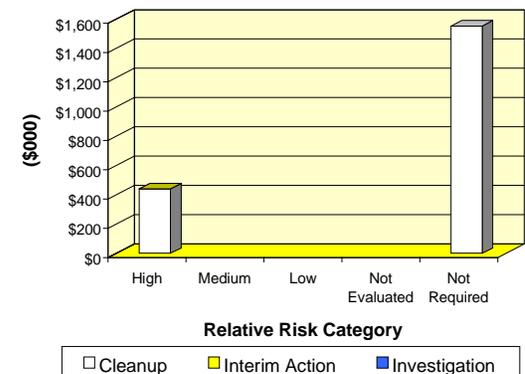
### FY99 Restoration Progress

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

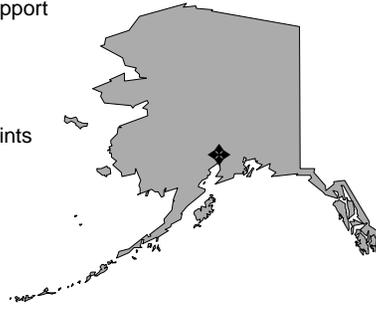
### Plan of Action

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

### FY00 FUNDING BY PHASE AND RELATIVE RISK



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



**Anchorage, Alaska**

## Restoration Background

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

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

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

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

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

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

## FY99 Restoration Progress

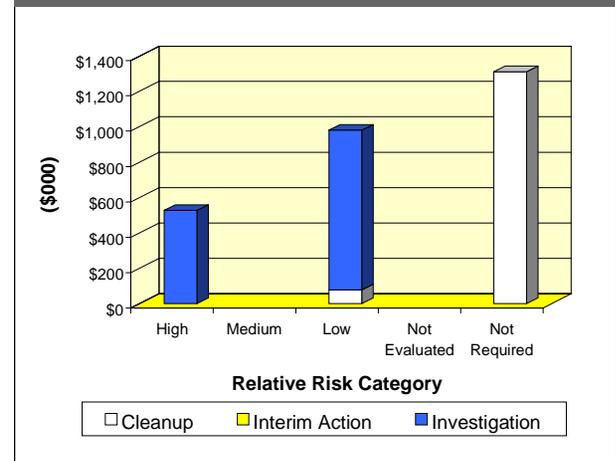
PCB removal and the RA completion report for OU3 were completed; no further work is needed for this OU. Shutdown of the groundwater treatment system at OU2 was completed. The annual beach sweep at LF04 removed 67,000 pounds of debris. Long-term operations (LTO) continued at the OU5 engineered wetland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

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

## Plan of Action

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

## FY00 FUNDING BY PHASE AND RELATIVE RISK



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



### Alexandria, Louisiana

### Restoration Background

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

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

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

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

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

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

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

### FY99 Restoration Progress

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

The planned modification of the Hazardous and Solid Waste Amendments (HSWA) permit may not be necessary because the Air Force Base Conversion Agency is planning to enter into a

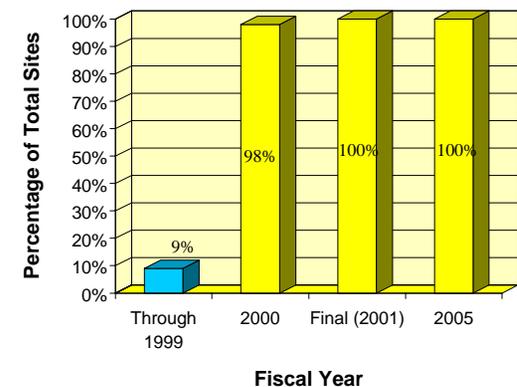
compliance agreement that allows LDEQ to regulate sites included in the HSWA permit. This permit would be allowed to expire in 2001.

Three RAB meetings were held in FY99.

### Plan of Action

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

### SITES ACHIEVING RIP OR RC PER FISCAL YEAR



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



### Cheyenne, Wyoming

## Restoration Background

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

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

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

In FY97, an Engineering Evaluation and Cost Analysis, an Action Memorandum, and a Removal Action design for excavating

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

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

## FY99 Restoration Progress

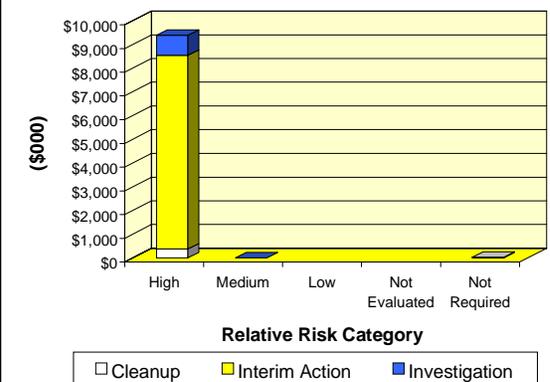
The iron filings wall at Spill Site 7 was installed ahead of work plan requirements. The GCL cover for Landfill 6 was completed ahead of FFA Dispute Resolution Committee requirements. Comprehensive RI efforts began in Zones A, B, and C. The basewide Type Ia 5-year review was completed, indicating that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

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

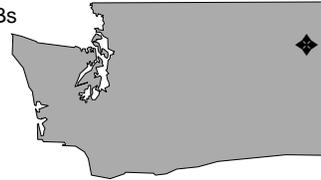
## Plan of Action

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

## FY00 FUNDING BY PHASE AND RELATIVE RISK



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



### Spokane County, Washington

### Restoration Background

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

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

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

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

The installation completed an RI/FS for 20 sites in FY96, and the Air Force signed a ROD for the sites. Because of contamination identified during the PA/SI, seven AOCs were transferred to the Installation Restoration Program. In FY97, groundwater air-

sparging and soil bioventing systems were implemented at the former fire training area. The final Public Health Assessment report was released, validating the base's cleanup program.

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

### FY99 Restoration Progress

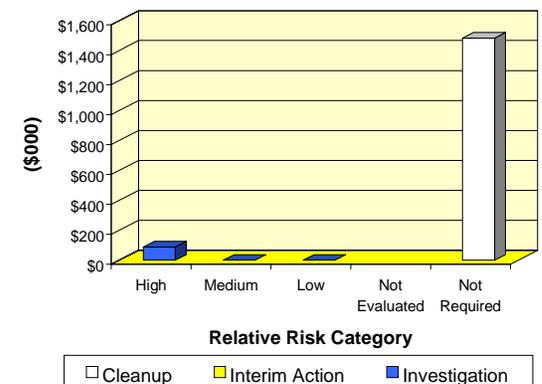
The installation, in cooperation with EPA and the state, began a 5-year review to ensure that selected remedies protect human health and the environment. LTM and operations and maintenance (O&M) data are being evaluated. Interim Removal Actions were completed at the waste storage area, waste fuel operations,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

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

### Plan of Action

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

### FY00 FUNDING BY PHASE AND RELATIVE RISK



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



**Kettering, Ohio**

**Restoration Background**

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

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

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

In FY95, all but one of the remaining polychlorinated biphenyl (PCB)-containing transformers were removed from the installation. In FY96, the installation completed an Environmental Impact Statement, updated the installationwide EBS, and completed a Record of Decision. Remedial Design and Remedial Action (RA) activities began at the installation. A Memorandum of Agreement (MOA) between the DLA and the Air Force Base Conversion Agency (AFBCA) was signed. Phase I of the Remedial Investigation and Feasibility Study (RI/FS) was completed. In

FY97, No Further Remedial Action Planned documents were signed for 23 sites. All USTs were removed and parcels were transferred by the end of FY97.

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

**FY99 Restoration Progress**

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

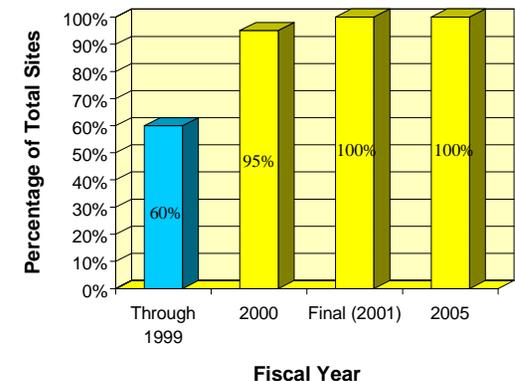
Long-term operations and LTM began at Site R2. The RA for LF008 began. Parcel F (17 acres) was transferred.

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

**Plan of Action**

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

**SITES ACHIEVING RIP OR RC PER FISCAL YEAR**



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



*Victorville, California*

## Restoration Background

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

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY84. The installation has completed Relative Risk Site Evaluation at all sites. In FY91, the installation implemented an Interim Remedial Action at OU1. Other Interim Actions at the installation have included removal of more than 80 USTs and contaminated soil, and cleanup and closure of a hazardous waste storage yard. In FY91, a RCRA Facility Assessment identified 113 solid waste management units. In FY92, the installation prepared an Engineering Evaluation and Cost Analysis and installed a pumping system at OU2. A BRAC cleanup team (BCT) was formed in FY92, and the installation's Technical Review Committee was converted to a Restoration Advisory Board in FY94. The installation closed on December 15, 1992. The BCT continues to meet monthly.

In FY93, the installation completed a final draft FS and a Proposed Plan for OU1 and began an Environmental Baseline Survey. In FY94, the Air Force and regulatory agencies signed a final Record of Decision (ROD) for OU1.

In FY95, the installation removed 30 oil-water separators and associated contaminated soil, began operation of bioventing systems at seven fuel-contaminated sites, and removed and disposed of soil from a low-level radioactive waste disposal site. All basewide RI/FS fieldwork was completed, and a draft report was issued.

In FY96, mobile recovery units were developed to remove JP-4 jet fuel from contaminated groundwater at OU2. Removal of the liquid fuel distribution system and of all USTs was completed. The installation also began cleanup by bioventing at six fuel spill sites.

In FY97, the installation completed all landfill closures and landfill-surface rehabilitation projects and the Phase II construction of the OU1 treatment system.

In FY98, the remedial project managers signed the ROD for OU3. The base began a study on the effectiveness of the pump-and-treat system. A basewide sampling and analysis plan also was completed.

## FY99 Restoration Progress

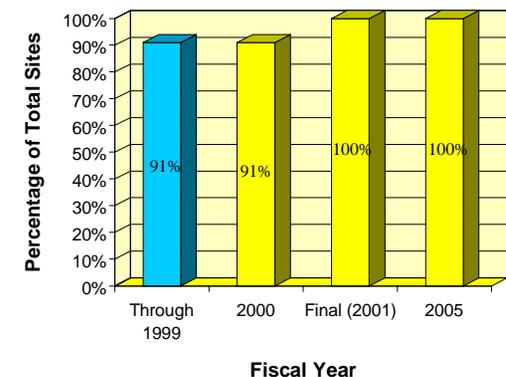
Approximately 20,000 gallons of free product was removed at OU2. A Remedial Action was implemented at OT-51, and a basewide groundwater monitoring project was approved, with funding scheduled for FY00. Long-term operations and monitoring continued at OU1 and OU2. All remaining UST locations were identified.

The OU2 FS was not submitted for review as planned because the soil vapor extraction (SVE) pilot system was still being constructed. This system was not completed because of a lack of funds. Closeout of bioventing sites, which was also planned for FY99, did not occur because work plans were not approved by the remedial project managers. Lead was not removed from the indoor firing range as planned because it was determined that for the planned reuse of this area it does not pose a health hazard.

## Plan of Action

- Complete construction of the SVE pilot system for OU2 and begin operation in FY00
- Initiate a CERCLA-mandated 5-year review of the overall cleanup program in FY00
- Complete closeout of remaining biovent sites in FY00
- Continue to submit all work plans to the BCT for approval in FY00
- Initiate sampling at identified UST sites in FY00
- Continue removal of free product at OU2 in FY01
- Continue long-term operations and monitoring at OU1 and OU2 through FY31

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**FFID:** NY257002445100  
**Size:** 3,638 acres  
**Mission:** Operate air refueling and long-range bombardment facility  
**HRS Score:** 34.20; placed on NPL in July 1987  
**IAG Status:** Federal Facility Agreement signed in June 1990  
**Contaminants:** VOCs, heavy metals, PCBs, grease, degreasers, caustic cleaners, dyes, penetrants, pesticides, and solvents  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$101.4 million  
**Estimated Cost to Completion (Completion Year):** \$43.9 million (FY2033)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2003



Rome, New York

## Restoration Background

In FY81, a Preliminary Assessment and a Site Inspection (SI) identified 54 sites at Griffiss Air Force Base. Site types include landfills, underground storage tanks (USTs), fire training areas, disposal pits, and spill areas. Possible off-site groundwater contamination was identified.

Interim Actions conducted at the facility between FY86 and FY91 included modification of a landfill cap and removal of contaminated soil and USTs from a tank farm, various disposal pits, and the area adjacent to an aircraft nosedock. During FY91 and FY92, an \$8 million alternative water distribution system was constructed to serve community residents outside of the installation. Remedial Investigations (RIs) of the areas of concern (AOCs) began in FY93.

In FY95, work began on numerous UST closures and contaminated-soil removals. The installation also completed an Environmental Baseline Survey (EBS). A final reuse plan was submitted. A BRAC cleanup team (BCT) and a Restoration Advisory Board (RAB) were formed. A Local Redevelopment Authority was formed to address socioeconomic issues related to closure of the installation. A BRAC Cleanup Plan was completed.

In 1996, the installation completed an Environmental Impact Statement and issued a final reuse Record of Decision (ROD) for the BRAC III realignment. In FY96, 96 of the 210 UST sites and hydrant fuel systems were closed. The installation also began Feasibility Study (FS) activities. Design work began for an Interim Remedial Action (IRA) at seven AOCs.

In FY97, the final RI report for 31 AOCs (Federal Facility Agreement sites) was completed. Thirteen draft Proposed Plans (PPs) for no further action (NFA) were submitted. The FS process began with submission of the draft Remedial Alternative Development and Screening Report.

In FY98, IRAs were completed on three of the seven IRA sites. The final supplemental investigation report was completed for the 31 AOCs. Five RODs were submitted. A landfill consolidation program began. Draft PPs were submitted for Landfills 1, 2/3, 5, 6, and 7. The final Remedial Designs for the landfills began. The close spill sites program began with submission of the draft Phase I work plan. A RCRA closure report was submitted for 76 areas. Concurrence has been received on 16 areas.

## FY99 Restoration Progress

The installation completed IRAs for five sites, and closure documents are being prepared and reviewed. The landfill consolidation program was completed. The AOC Expanded Site Inspection (ESI) was completed. An ESI addendum is under review by regulators. The PP was completed for Landfill 1. Other landfill PPs, RODs, and closure designs were delayed because of the Woodstock 99 event. The planned landfill remediation was delayed for completion of the PPs and RODs. The BCT decided to conduct additional creek sampling before finalizing the planned FS.

A total of 54,030 tons of polychlorinated biphenyl (PCB)-contaminated soil and 11,785 tons of lead-contaminated soil were removed. Of the 368 identified USTs, 330 have been removed,

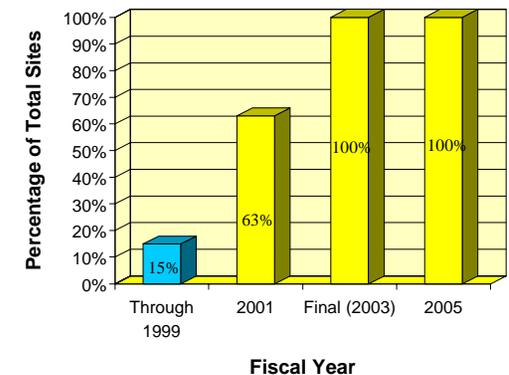
and 36,000 tons of petroleum-contaminated soil was remediated using the land-farming process.

Technical Assistance for Public Participation assistance has been provided for review of the final PPs for CERCLA sites. The BCT established an NFA, land use restriction, and institutional control policy.

## Plan of Action

- Complete PPs and RODs for landfills in FY00
- Begin closure of Landfill 1 in FY00, and closure of remaining landfills in FY01
- Complete the AOC ESI in FY00 and begin the FS in FY01
- Complete the FS for installation creeks in FY00 and initiate the PP and ROD in FY01

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**FFID:** IN557212447200  
**Size:** 2,722 acres  
**Mission:** House a refueling wing; formerly housed a bombardment wing  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Household and industrial waste, spent solvents, fuels, waste oil, pesticides, lead, munitions, asbestos, potential radiation contamination, PCBs, and lead-based paint  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$12.1 million  
**Estimated Cost to Completion (Completion Year):** \$6.9 million (FY2010)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2001  
**Final Remedy in Place or Response Complete Date for Non-BRAC Sites:** FY2001



**Peru, Indiana**

**Restoration Background**

In July 1991, the BRAC Commission recommended realignment of Grissom Air Force Base. When the installation was realigned in September 1994, the Air Force retained approximately 1,400 acres for military activities, and 1,300 acres was returned to the community for redevelopment. Grissom is a joint-use base, which uses both BRAC and Environmental Restoration Account funds to reach cleanup goals.

Remedial Investigation and Feasibility Study (FS) activities began in FY91. The installation has completed clean closure at underground storage tank (UST) removal sites and finalized No Further Action (NFA) documents for 22 BRAC areas of concern (AOCs).

In FY94, the installation formed a BRAC cleanup team (BCT) and prepared a BRAC Cleanup Plan (BCP). The basewide Environmental Baseline Survey (EBS) was completed. The installation also completed Supplemental EBSs on specific parcels.

In FY95, the installation began use of ex situ bioremediation, natural attenuation (NA), and geoprobe technology. Site characterization and Corrective Action Plans began at UST sites in the former Military Family Housing Area and at the BX gas station. The installation formed a Restoration Advisory Board (RAB).

In FY96, the installation developed a Focused FS (FFS) and completed an asbestos survey of BRAC buildings. An economic development conveyance was signed in May 1996. In FY97, investigation of 9 AOC sites and 40 oil-water separators and

removal of USTs were completed. The installation completed the first Finding of Suitability for Early Transfer.

In FY98, an unexploded ordnance (UXO) statement of clearance was issued for the munitions burn and burial area, and the Environmental Investigation was completed. Projects at Oil-Water Separator 896, the interim hazardous waste storage site, and former leaking UST sites were initiated. The BCT reached consensus on closure, with NFA, of the firing-in butt. The BCP abstract was updated.

**FY99 Restoration Progress**

Monitored NA began to address groundwater contamination at the BX and flightline gas stations. The BCT resolved to conduct subsurface investigations at the B-58 aircraft burial site. The munitions burn and burial area report was finalized with a No Further Remedial Action Planned (NFRAP) decision document (DD). A methane gas study was completed. Nine NFRAP documents were signed to close out AOCs, and 10 Findings of Suitability to Transfer were signed. The Military Family Housing UST sites were closed, with NFA required.

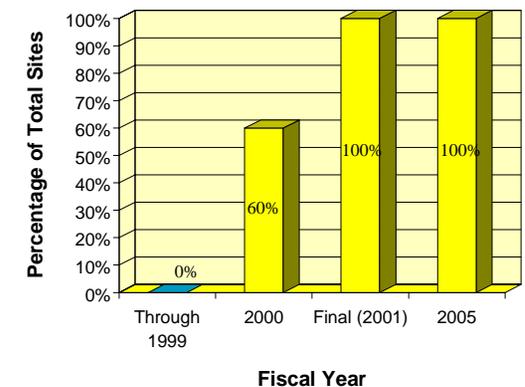
The planned finalization of the FFS and signing of the Remedial Action (RA) DD for the fire protection training areas were delayed because of lack of funding. A need for additional funding also delayed execution of the UXO survey for the firing-in butt and the grenade training range and RA at the outdoor small-arms firing range (SAFR) and the indoor SAFR. Because of CERCLA liabilities, the installation decided not to sign a DD establishing institutional controls as the remedy for metals in the groundwater.

The RAB met quarterly, and the BCP abstract was updated.

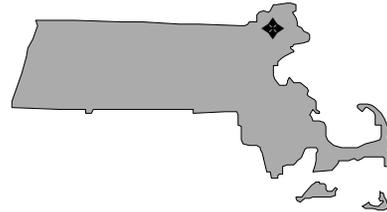
**Plan of Action**

- Finalize the FFS, sign the RA DD, and begin monitored NA at the fire protection training areas in FY00
- Sign RA DDs for Landfills 1 and 2 in FY00
- Complete soil removal and closure of the abandoned UST site in FY00
- Obtain a certificate of clearance for the firing-in butt and the grenade training range in FY00
- Investigate and close out the interim RCRA hazardous waste storage area in FY00
- Complete the sale and transfer of Parcels K and L to the City of Belton, and transfer Parcels F and G in FY00
- Conduct investigation and cleanup at the B-58 aircraft site in FY00–FY01
- Execute RA at the outdoor SAFR and the indoor SAFR in FY00 and sign an NFA DD in FY01
- Submit the RA DD for groundwater contamination at the BX and flightline gas stations in FY01

**SITES ACHIEVING RIP OR RC PER FISCAL YEAR**



**FFID:** MA157172442400  
**Size:** 826 acres  
**Mission:** Support Electronic System Center  
**HRS Score:** 50.00; placed on NPL in May 1994  
**IAG Status:** None  
**Contaminants:** VOCs, chlorinated solvents, gasoline, jet fuel, tetraethyl lead, PCBs, and mercury  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$29.7 million  
**Estimated Cost to Completion (Completion Year):** \$15.4 million (FY2020)  
**Final Remedy in Place or Response Complete Date for All Sites:** FY2000



### Bedford, Massachusetts

## Restoration Background

Historical operations at Hanscom Air Force Base involved generation, use, and disposal of numerous hazardous substances. Possible sources of contamination include a former industrial wastewater treatment system, a former filter-bed/landfill area, a jet fuel residue and tank sludge area, two landfills, three former fire training areas, a paint waste disposal area, a mercury spill area, the former aviation fuel handling and storage facilities, underground storage tanks (USTs), and various fuel spill areas.

Studies completed from the mid-1980s to the early 1990s identified 22 sites. For 14 of these sites, remedies are in place or response has been completed and no further response is planned. No Further Remedial Action Planned (NFRAP) decision documents are pending for two additional sites. Remedial Investigations and Feasibility Studies (RIs/FSs) are under way at the remaining six sites, and Interim Remedial Actions (IRAs) have been completed or are under way at five of the six.

In FY88, the final Remedial Action (RA) was completed at the closed municipal waste landfill, and IRAs were completed at three high-risk sites in Operable Unit (OU) 1. In FY89, the final RA was completed for the mercury release site. In FY90, Interim Actions included removing nonoperating tanks and petroleum-contaminated soil at UST sites. In FY91, the installation began operating an OU1 groundwater collection and treatment system to remove volatile organic compounds (VOCs) from groundwater and completed an IRA at the Army and Air Force Exchange Service (AAFES) service station UST site.

In FY94, the installation removed more than 1,300 tons of contaminated soil from a former UST site. In FY95, the installation began an IRA involving a dual-phase groundwater

extraction and soil vapor extraction system at the former aviation fuel handling and storage area for remediation of petroleum releases. The installation's Technical Review Committee was converted to a Restoration Advisory Board (RAB).

In FY97, the installation automated the groundwater recovery and treatment system at OU1 and added two recovery wells to the collection system. Human Health and Ecological Risk Assessments were completed for the capped municipal waste landfill, and Massachusetts Contingency Plan (MCP) documentation was filed to establish natural attenuation as the final remedy for the AAFES service station UST site.

In FY98, the installation completed Site Inspections (SIs) at two UST sites, an RI at the former filter-bed/landfill site, and groundwater monitoring at OU1 and the AAFES service station site. Tufts University completed an environmental technology initiative at OU1, which EPA has publicized as a success story.

## FY99 Restoration Progress

The installation completed the Human Health and Ecological Risk Assessments for the former filter-bed/landfill site, however, technical problems delayed these activities at the former aviation fuel site. The installation completed the Ecological Risk Assessment for OU1 and groundwater monitoring at several sites. The installation hosted an Air Force Technology Transfer Project to demonstrate vacuum-enhanced recovery of chlorinated hydrocarbons from groundwater at Site FT01 in OU1. MCP documentation was filed to establish natural attenuation as the final remedy for the Base Motor Pool UST site.

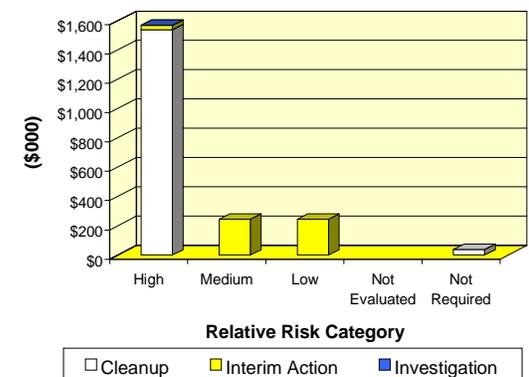
The FS and ROD process for OU1 and OU3 continued. Operation of the groundwater recovery and treatment system at OU1 and the dual-phase recovery and treatment system at the former aviation fuel handling and storage area also continued. Long-term monitoring (LTM) at the AAFES service station site and long-term maintenance at the capped municipal waste landfill continued. Completion of No Further Action decision documents for two UST sites was delayed because manpower was diverted to the more time-sensitive OMB Circular A-76 requirements.

The RAB met twice in FY99.

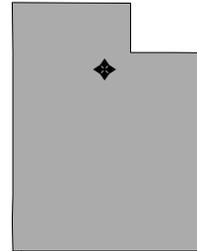
## Plan of Action

- Complete the Human Health and Ecological Risk Assessments and the RI for the former aviation fuel site in FY00
- Complete NFRAP decision documents for two UST sites in FY00
- Complete the FS and the ROD process for OU1 and OU3 in FY00
- Convert the OU1 IRA to final remedy and begin design and construction of the final remedy for the former filter-bed/landfill site in FY00
- Continue operating IRAs at OU1 and the former aviation fuel site in FY00
- Continue LTM of natural attenuation at the AAFES service station and Base Motor Pool sites, and long-term maintenance of the capped municipal waste landfill in FY00

## FY00 FUNDING BY PHASE AND RELATIVE RISK



**FFID:** UT857172435000  
**Size:** 6,666 acres  
**Mission:** Provide logistics support for weapons systems  
**HRS Score:** 49.94; placed on NPL in July 1987  
**IAG Status:** IAG signed in April 1991  
**Contaminants:** Solvents, sulfuric acid, chromic acid, metals, and petroleum wastes  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$124.0 million  
**Estimated Cost to Completion (Completion Year):** \$227.2 million (FY2049)  
**Final Remedy in Place or Response Complete Date for All Sites:** FY2006



Ogden, Utah

## Restoration Background

Between FY82 and FY87, Preliminary Assessment and Site Inspection activities were completed at Hill Air Force Base. Since FY87, 105 sites have been identified. Forty of these sites have been grouped into nine operable units (OUs). Site types include disposal pits, landfills, surface impoundments, underground storage tanks (USTs), fire training areas, firing ranges, discharge and wastewater ponds, a contaminated building, a munitions dump, and spill sites.

The base installed 10 systems to treat groundwater contaminated with trichloroethene (TCE) at 11 separate plumes, capped 3 landfills, capped 1 of the discharge and wastewater ponds at OU3, and installed 4 treatment systems to treat springs contaminated with TCE. The installation also completed decision documents for 63 sites, signed Records of Decision (RODs) for 6 OUs, and signed 3 interim RODs.

In FY95, the installation began work on the Remedial Investigation and Feasibility Study (RI/FS) for OUs 5 and 6 and implemented Phase I of the Interim Remedial Action at OU8. In FY96, a ROD was signed for Chemical Pit 3 (OU2), and construction of a containment system began. Four UST sites were closed, and five decision documents and the ROD for OU2 were completed. The installation also completed Remedial Design and Remedial Action (RD/RA) activities at OU7 and completed the design and implemented the RA for upgrading the horizontal drain system at Landfill 1.

In FY97, a ROD was signed for OU6, and the RD phase began. More than 200 areas of concern in OU9 were investigated and closed, requiring no further action. In FY98, a hydraulic barrier was constructed and began operating at OU2; over 42,000 gallons

of solvent has been removed, with a 98 percent removal efficiency. An innovative asphalt cap was designed and constructed for OU3. At off-base areas with groundwater contamination, a natural attenuation cleanup strategy was employed, and an innovative aeration curtain was used to prevent contamination from moving into the local community. A ROD was signed for six sites in OU1.

The installation formed a Restoration Advisory Board (RAB) in FY94.

## FY99 Restoration Progress

A groundwater collection trench and a spring collection and treatment system were installed at OU2. A groundwater pump-and-treat system and a natural attenuation and monitoring system were installed at OU6. At OU8, a groundwater pump-and-treat system was installed. Construction design was completed for six sites in OU1. Three sites were closed.

Additional site closures were delayed, pending regulatory concurrence. Signing of an innovative cleanup agreement for the Utah Test and Training Range (UTTR) was delayed, pending Air Force review. The test demonstration of an innovative technology using co-metabolic cleanup of TCE was delayed because of technical issues.

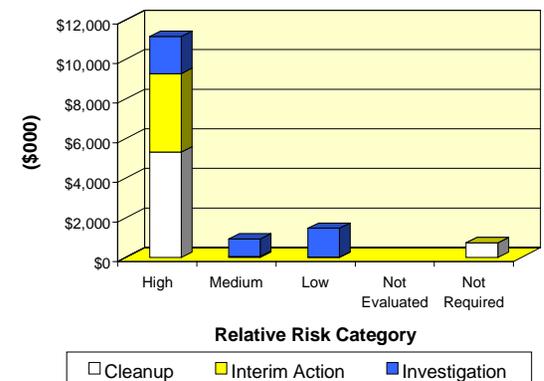
A basewide approach to groundwater sampling at post-ROD sites resulted in a reduction in the amount of needed sampling and a cost avoidance of \$750,000. Consolidation of the management and operation of groundwater treatment systems has produced a \$700,000 cost avoidance.

The RAB participated in four training sessions and three site tours. RAB attendance increased.

## Plan of Action

- Initiate construction of groundwater collection and treatment systems at six sites in FY00
- Sign innovative cleanup agreement for the UTTR in FY00
- Implement natural attenuation off base at OU1 in FY00
- Close seven sites in FY00 and three sites in FY01
- Continue partnering with regulatory agencies and fostering RAB involvement in FY00–FY01
- Complete construction of RA at six sites in FY01

## FY00 FUNDING BY PHASE AND RELATIVE RISK



**FFID:** MI557002476000  
**Size:** 5,215 acres  
**Mission:** Conducted long-range bombardment and air refueling operations  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Petroleum, pesticides, heavy metals, and solvents  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$41.3 million  
**Estimated Cost to Completion (Completion Year):** \$31.9 million (FY2012)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2002



### Gwinn, Michigan

### Restoration Background

In July 1993, the BRAC Commission recommended closure of K.I. Sawyer Air Force Base, inactivation of the 410th Wing, and transfer of the base's mission. In September 1995, the installation officially closed.

Environmental studies have been in progress at the installation since FY84. Twenty-five sites were identified as requiring additional investigation. Sites include landfills, fire training areas, underground storage tanks (USTs), aboveground storage tank (AST) spill sites, drainage pits, and a drainage pond. Petroleum hydrocarbons, trichloroethene (TCE), tetrachloroethene, vinyl chloride, 4-methyl phenol, and heavy metals are the primary contaminants affecting soil and groundwater.

Interim Remedial Actions include removal of USTs; removal and cleanup of contaminated soil; installation of 14 groundwater extraction wells; construction and operation of a groundwater treatment plant; removal of fuel from groundwater at the former petroleum/oil/lubricant (POL) storage area; and installation of pilot-scale bioventing systems. A downgradient fuel recovery trench is also being used to capture contaminants at the leading edge of the POL Area fuel plume. No Further Action closure documents are complete for five sites. An impermeable membrane cap has been installed at Landfills 3 and 4.

RCRA closure plans have been developed for the Explosive Ordnance Disposal (EOD) Range. The installation received regulatory concurrence on its Environmental Baseline Survey in FY94. A Restoration Advisory Board (RAB) was formed in FY94. In FY95, the Local Redevelopment Authority submitted a reuse plan.

Seven large aboveground fuel storage tanks and the aircraft hydrant refueling system were removed. RCRA corrective measures were completed at two interim status hazardous waste storage facilities. Remedial Action (RA) at the small-arms firing range was completed, and additional testing indicated no migration of lead into groundwater. Closeout was achieved for approximately 200 areas of concern (AOCs).

In FY98, RIs were completed at FT-06, LF-01, LF-04, and ST-04. Investigations were completed, and several AOCs were closed out. An emergency interceptor trench was installed downgradient of ST-04. Five regulated USTs were removed. Four Remedial Action Plans (RAPs) were completed. The abstract for the BRAC Cleanup Plan was updated.

### FY99 Restoration Progress

RAs completed at the EOD Range included installation of a permeable membrane liner, clean cover material, topsoil, and vegetation. An upgraded contaminant capture system was installed at the leading edge of the ST-04 contaminant plume.

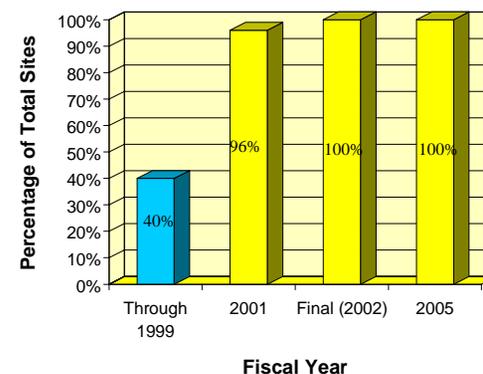
The RAP for FT-06 was delayed pending results from the pilot-scale soil vapor extraction (SVE) system. RAPs were completed for LF-01 and ST-04. RA was completed at LF-01 and began at ST-04. The pump-and-treat system at DP-02 and the bioventing system at ST-04 continued operating as planned.

The RAB met quarterly. Technical Assistance for Public Participation (TAPP) funding was obtained and used for technical review of documents for Sites ST-04, FT-06, and LF-01.

### Plan of Action

- Finalize RAP for FT-06 in FY00
- Install full-scale SVE system at FT-06 in FY00
- Continue long-term operations of the DP-02 pump-and-treat system in FY00
- Initiate long-term monitoring of landfill caps in FY00
- Complete demolition and removal of ASTs for the Wells Terminal in FY00
- Complete RAP and RA for Wells Terminal in FY01

### SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**FFID:** TX657172433300  
**Size:** 3,997 acres  
**Mission:** Provide depot-level aircraft and engine repair  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Metals, VOCs, and SVOCs  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$146.8 million  
**Estimated Cost to Completion (Completion Year):** \$193.0 million (FY2025)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2003  
**Final Remedy in Place or Response Complete Date for Non-BRAC Sites:** FY2004



San Antonio, Texas

## Restoration Background

In July 1995, the BRAC Commission recommended closure and realignment of Kelly Air Force Base (AFB). The Defense Distribution Depot, San Antonio, will be closed, and the airfield and all associated support activities will be realigned to Lackland Air Force Base in Texas.

Investigations have identified 52 sites and several areas of interest on base, including landfills, spill sites, former fire training areas, low-level radioactive waste sites, underground storage tanks, aircraft maintenance areas, sludge lagoons, and sludge-spreading beds. Two former range sites were added to the program in FY98. Sites are separated into five zones: Zone 1, properties west of Leon Creek (to be realigned to Lackland AFB); Zone 2, south and west of the runway; Zone 3, industrial operations area; Zone 4, an area known as east Kelly; and Zone 5, flightline, warehouses, and administrative support operations (portions of which are to be realigned to Lackland AFB). Since 1996, Kelly has used both BRAC and Environmental Restoration Account funds to reach cleanup goals.

A basewide groundwater and surface water monitoring program began in FY94. By the end of FY95, final reports had been prepared for Remedial Investigation and Feasibility Study (RI/FS) phases for 41 sites in Zones 1, 2, and 3.

A BRAC cleanup team formed in FY96, and the first BRAC Cleanup Plan was issued. In FY97, a Zone 4 site was remediated, and the property leased. A source area was discovered in Zone 3 at Site MP. The final Zone 5 RI report and the Zone 3 groundwater decision document were submitted for regulatory review. Monitoring for natural attenuation parameters was completed.

In FY98, a state groundwater permit and compliance plan were issued. An effluent polishing facility was added to the existing groundwater treatment plant. Long-term operations and long-term monitoring optimization studies began for existing remedial systems. Arsenic-contaminated soil was removed from Site S-7 in east Kelly. A Removal Action began at a newly discovered source area, a spill site at the former metal plating shop. More than 1,000 gallons of dense nonaqueous phase liquid was removed. Investigations concluded at the Site MP source area. A Technical Assistance for Public Participation (TAPP) application was developed, and contracts were awarded.

## FY99 Restoration Progress

Stormwater reroutes were completed for cross connections within the base. Delineation and characterization were completed for Zone 3. Sampling was conducted in the off-base area. The Remedial Actions (RAs) for Zones 2 and 3 are under way. A slurry wall was installed for the former metal plating shop. A project was initiated to remove radioactive sources at RD-1. Bioaugmentation was implemented at a chlorinated solvent spill site in the industrial area of the base.

The on- and off-base RI, and construction of the Interim Remedial Action (IRA) for groundwater, began for Zone 4. Completion of these projects was delayed because regulator comments prompted additional sampling. Additional groundwater modeling also is required to support some of the recommended alternatives in the FS for Zone 5. The Quintana Road Culvert project began. Additional IRAs, planned for groundwater in Zone 1, were delayed until a soil Corrective Measures Study (CMS) is completed. A combined soil and groundwater corrective measures

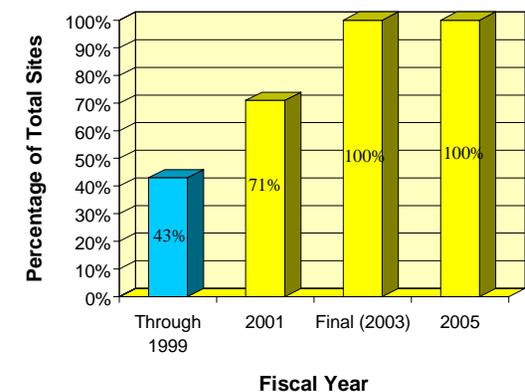
implementation work plan (CMIWP) will provide the design for the system.

A TAPP grant allowed the base's Restoration Advisory Board to review the basewide groundwater assessment and the Agency for Toxic Substances and Disease Registry Public Health Assessment.

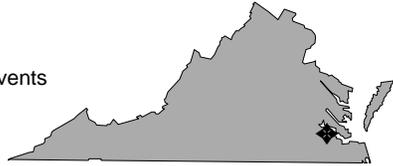
## Plan of Action

- Complete the Zone 1 soil CMS; the Zone 2, 3, and 5 CMSs; and the Zone 2 CMIWP in FY00
- Complete the Zone 4 soil RI and the off-base RI addendum in FY00
- Complete the IRA for Site S-1 in FY00
- Continue the bioaugmentation project in FY00
- Complete construction of a hydraulic barrier to control contaminated groundwater flow in FY00

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**FFID:** VA357212447700  
**Size:** 3,152 acres  
**Mission:** Air Combat Command Headquarters, 1st Fighter Wing, 74th Tactical Control Facility, 480th Reconnaissance Technical Group, and NASA Langley Research Center  
**HRS Score:** 50.00; placed on NPL in May 1994  
**IAG Status:** Federal Facility Agreement under negotiation  
**Contaminants:** Petroleum products, chlordane, PCBs, heavy metals, and solvents  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$46.3 million  
**Estimated Cost to Completion (Completion Year):** \$29.0 million (FY2006)  
**Final Remedy in Place or Response Complete Date for All Sites:** FY2005



**Hampton, Virginia**

**Restoration Background**

Langley Air Force Base has been an airfield and an aeronautical research center since 1917 and is the home base of the 1st Fighter Wing and Headquarters Air Combat Command.

In FY81, a Preliminary Assessment, a Site Inspection (SI), and additional studies identified 45 sites at the installation, including landfills, underground storage tanks (USTs), a bulk fuel distribution system, and storm sewers. Investigations have determined that contaminants are migrating into Tabb Creek, the Back River, and ultimately the Chesapeake Bay.

In FY85, the installation discovered additional fuel contamination and free-product plumes. Subsequently, the installation replaced the fuel distribution system, investigated contaminated sediment in the storm sewers, and conducted Removal Actions to address free product at eight sites. Corrective Action Plans for the eight petroleum-contaminated sites were completed, and USTs at those sites were removed. Removal Actions to remediate soil and groundwater contamination began at three other sites. Additional actions at the sites included removal of abandoned USTs and free product, and installation of a treatment plant to remove emulsified fuel from groundwater.

In FY93, the installation began SIs at 33 sites and Remedial Action (RA) construction at six sites. In FY95, the installation completed construction of a second groundwater extraction and treatment system for petroleum-contaminated groundwater at two sites. A soil vapor extraction system also was implemented to remediate petroleum-contaminated soil near the BX Gas Station. The installation's Restoration Advisory Board participated in the Streamlined Oversight Initiative, which involved formation of the Langley Partnership to improve communica-

tion and to set cleanup priorities. In FY96, Remedial Investigations (RIs) began at 13 sites, and the installation completed SI activities at 33 sites and Removal Actions at 2 sites. In FY97, the installation implemented Removal Actions at three sites.

In FY98, the installation completed Interim Remedial Actions for two sites, signed decision documents (DDs) designating No Further Remedial Action Planned (NFRAP) for three sites, and completed Proposed Plans (PPs) for two sites. Three areas of concern were established that later became Environmental Restoration Program sites, for a total of 48 sites. Nine USTs were removed from three sites, a recovery system and monitoring wells were upgraded at three sites, and one petroleum/oil/lubricants (POL) site was closed with a NFRAP designation approved by the state. A former wastewater treatment plant was removed to eliminate a pathway to the Back River.

**FY99 Restoration Progress**

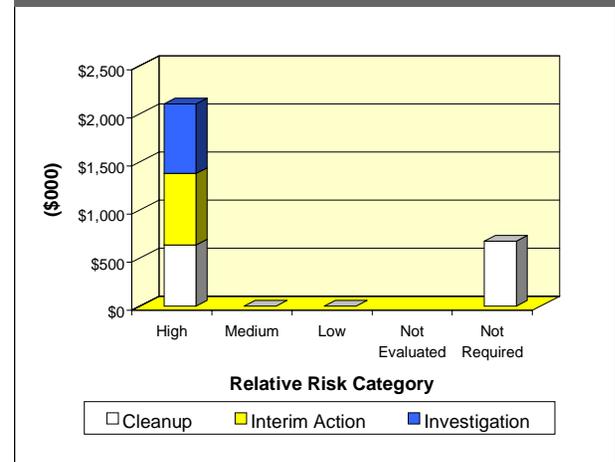
Three Records of Decision (RODs), six DDs, and two No Further Action letters were signed. The installation closed out eight sites. One Removal Action was completed, resulting in the closure of 85 monitoring wells. Free-product removal was conducted at 13 POL sites. The installation completed an interim groundwater approach, including RODs, for two sites. Three additional POL sites were closed. The installation developed an Ecological Summary Report for all sites.

The installation continued to use streamlined oversight tools and the Langley Partnership. The Finding of Fact for the Federal Facility Agreement (FFA) was revised, and a draft Site Management Plan was developed. The FFA is under negotiation.

**Plan of Action**

- Continue to use streamlined oversight tools and the Langley Partnership in FY00
- Sign three RODs in FY00
- Complete RIs for six sites in FY00
- Complete the PP for 10 sites in FY00

**FY00 FUNDING BY PHASE AND RELATIVE RISK**



**FFID:** ME157002452200  
**Size:** 9,477 acres  
**Mission:** Support B-52 bombers and KC-135 tankers  
**HRS Score:** 34.49; placed on NPL in February 1990  
**IAG Status:** Federal Facility Agreement signed in April 1991; revision signed in 1994  
**Contaminants:** VOCs, waste fuels, oils, spent solvents, PCBs, pesticides, and heavy metals  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$117.4 million  
**Estimated Cost to Completion (Completion Year):** \$82.3 million (FY2299)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2000



### Limestone, Maine

### Restoration Background

Loring Air Force Base was established in 1952 to support B-52 bombers and KC-135 tankers. In July 1991, the BRAC Commission recommended closure of the base. The Flightline and Nose Dock Areas, where industrial shops and maintenance hangars were located, are the primary areas at which wastes were released into soil and groundwater.

Environmental studies began at the base in FY84. Sites include spill areas, landfills, fire training areas, underground storage tanks (USTs), aboveground storage tanks, and low-level radioactive waste areas. In FY93, sites were grouped into 13 operable units (OUs). Interim Remedial Actions initiated in FY93 include removal of free product at three sites, source removal at two sites, and Treatability Studies of bioventing at one site and of solvent extraction at another site.

In FY94, Remedial Actions (RAs) were completed for two OUs. An Environmental Baseline Survey (EBS) was completed, and the installation received regulatory concurrence on the designations. A BRAC cleanup team (BCT) and a Restoration Advisory Board (RAB) were formed.

In FY95, Interim Actions were completed at six sites and initiated at another six. In FY96, the installation demonstrated an innovative emission control system using soil vapor extraction at the Base Laundry. Landfill covers were completed at 2 sites, bioventing systems installed at 8 sites, Interim Actions completed at 15 sites, and numerous USTs removed. Polychlorinated biphenyl (PCB) cleanups began at an underground transformer site and for the base drainage system. Four Records of Decision (RODs) were signed for 31 sites. A Corrective Action

Plan was submitted to the state regulatory agency to address contamination from numerous fuel tank sites.

In FY97, the installation implemented a decision for remediation of the Surface Drainage OU and initiated the cleanup plan for pipeline from the installation to Searsport. Early Removal Actions took place at OU5 and at two pump houses in OU10.

In FY98, a ROD was completed for eight Installation Restoration Program sites. The BCT determined that the final 10 source control sites would be best handled in a FY99 source control ROD. It also initiated the site closure process and developed a strategy in coordination with the Local Redevelopment Authority for eventual deed transfer of property. The BCT published an updated BRAC Cleanup Plan. The installation completed the RA for basewide surface drainage. A Remedial Investigation and Feasibility Study for the Basewide Groundwater OU was completed. Cleanup of fuel spill sites was completed under Maine regulations. Investigative efforts at the base quarry revealed a buried drum disposal site. The BCT immediately executed a Removal Action, excavating and disposing of over 300 drums, some containing hazardous wastes.

### FY99 Restoration Progress

The last two installation RODs for the remaining 10 source control sites and the Basewide Groundwater OU were completed. Construction of the cover at Landfill 3 was nearly completed. A 5-year review was initiated after EPA set an FY00 due date. Characterization of the quarry was completed, and the installation decided not to proceed with a full-scale pilot study. A long-term groundwater monitoring plan was developed and implemented. The wetland mitigation project was constructed. A

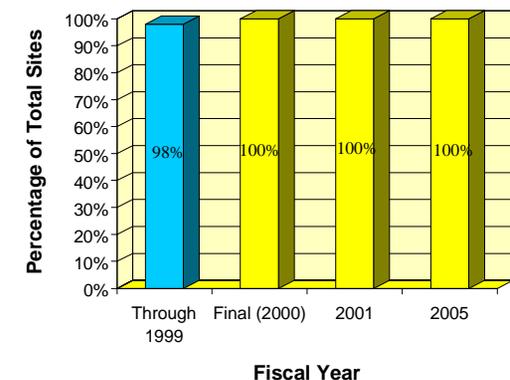
supplemental EBS and a Finding of Suitability to Transfer (FOST) for 2,000 acres of clean property were drafted. The installation implemented diffusion sampling techniques to identify potential groundwater discharge points in the base drainage. Fuel spill cleanup along the 180-mile pipeline was initiated, but funding prioritization delayed completion.

The RAB met four times and participated in a site tour of construction activities.

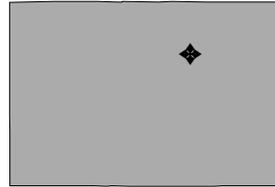
### Plan of Action

- Complete the 5-year review in FY00
- Complete the FOST for 2,000 acres in FY00
- Complete construction at Landfill 3 for Last Remedial Action in Place in FY00
- Complete the quarry demonstration project in FY00
- Monitor groundwater and operate active soil cleanup systems in FY00

### SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**FFID:** CO857002413000  
**Size:** 1,866 acres  
**Mission:** House the 3400th Technical Training Wing; served as a technical training center  
**HRS Score:** NA  
**IAG Status:** IAG under negotiation  
**Contaminants:** Waste oil, general refuse, fly ash, coal, metals, fuels, VOCs, solvents, and petroleum hydrocarbons  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$45.8 million  
**Estimated Cost to Completion (Completion Year):** \$41.3 million (FY2030)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2001



*Denver, Colorado*

## Restoration Background

In 1991, the BRAC Commission recommended closure of all but 108 acres at Lowry. It was recommended that the 1001st Space Systems Squadron, DFAS, and the Air Force Reserve Personnel Center remain at Lowry in cantonment areas. The installation closed in September 1994.

Sites at the installation include fire training areas, landfills, a fly ash disposal area, coal storage yards, and underground storage tanks (USTs). Interim Remedial Actions (IRAs) have included removal of 20 USTs, removal of free product from the water table, closure of off-base wells, operation of an in situ bioventing system, and construction of an aboveground bioremediation land-treatment area. In FY94, the installation began a RCRA Facility Investigation and a basewide groundwater investigation to determine the extent of trichloroethene (TCE) contamination. IRAs have been installed to treat TCE contamination at the source area and at the base boundary to capture the TCE plume before it leaves the base.

In FY95, the installation conducted Phase II site assessments for eight UST sites. The installation also began IRAs involving placing extraction wells at the boundaries of the installation to intercept the TCE groundwater plume and installing bioventing systems at two petroleum-contaminated sites. A Focused Feasibility Study was conducted to characterize a landfill before closure. An Environmental Baseline Survey (EBS) was completed. In addition, the installation's Technical Review Committee was converted to a Restoration Advisory Board (RAB), and a BRAC cleanup team (BCT) was formed.

In FY96, the facility assessment, fieldwork for 18 areas of concern, and Phase I of the basewide groundwater investigation

were completed. Actions included initiation of Remedial Investigations (RIs) for five study areas and long-term monitoring and operations and maintenance of bioventing systems at two UST sites. The installation also completed removal of all USTs.

In FY97, a Local Redevelopment Authority (LRA) road project was used to cap part of a former coal storage yard. Second-level site assessments were accomplished. The EBS for the BRAC 95 parcel was completed, and an Environmental Impact Statement was initiated. A hydraulic containment system for the TCE plume began operation, and construction began on an interim response for OU5. Final actions at the fly ash disposal area (OU3) were completed.

In FY98, second-level site assessments began at removed-UST locations. The dual-phase vapor extraction system at the TCE source area began operation. The cleanup of contaminated soil and storage tanks at the Auto Hobby Shop (OU4) was completed. Feasibility Studies (FSS) at three sites and the Landfill Zone were completed. RD for the remainder of the coal storage yard was initiated. Final definition of the groundwater contamination at OU5 was accomplished.

## FY99 Restoration Progress

The draft RI for basewide groundwater investigations was completed. Removal actions began for USTs, aboveground storage tanks (ASTs), and oil-water separators. The IRAs planned at OU5 underwent peer review. In addition, long-term operations and maintenance (LTOM) began at the Auto Hobby Shop and for basewide groundwater at the source area reduction and boundary area hydraulic containment system.

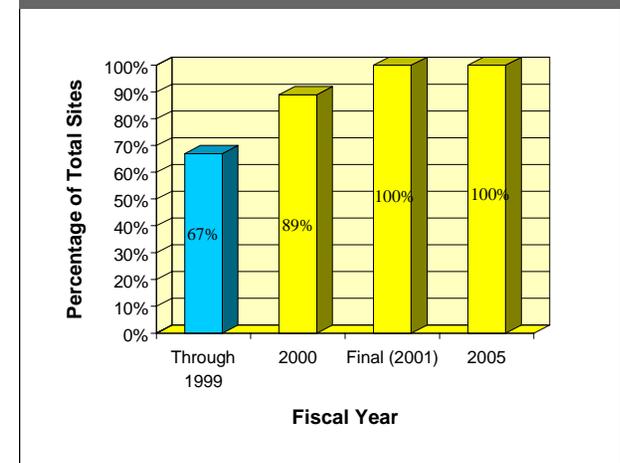
The installation is evaluating the possibility of transferring landfill closure and LTOM to the LRA. It decided not to split OU5 sites into separate FS documents, as originally planned, because doing so would create delays and additional costs. Peer review and project initiation delayed the contract award and the RA for the Firing and Skeet Ranges. RAs at the Coal Storage Zones also have been delayed, pending ROD completion.

The BCT's partnership with the LRA resulted both in the redevelopment authority's receiving clean property immediately and in cost avoidance. A Technical Assistance for Public Participation contract was awarded to the RAB for review of the OU5 documentation.

## Plan of Action

- Complete the final RI, the draft final FS, and pilot studies for basewide groundwater in FY00
- Complete LTOM for the Auto Hobby Shop in FY00
- Award contract and initiate RA for the Firing and Skeet Ranges and complete RA at the Coal Storage Zone West in FY00
- Complete UST, AST, and oil-water separator site Removal Actions in FY00
- Complete delineation of soil hot spots at the Fire Training Zone in FY00
- Complete the FS and ROD, and initiate RA, for Coal Storage Zone East in FY00

**SITES ACHIEVING RIP OR RC PER FISCAL YEAR**



**FFID:** CA957212452700  
**Size:** 6,545 acres  
**Mission:** Maintain, repair, and refuel aircraft  
**HRS Score:** 31.94; placed on NPL in November 1989  
**IAG Status:** Federal Facility Agreement signed in September 1990  
**Contaminants:** VOCs, petroleum/oil/lubricants, and PCBs  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$133.6 million  
**Estimated Cost to Completion (Completion Year):** \$27.1 million (FY2021)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2000  
**Final Remedy in Place or Response Complete Date for Non-BRAC Sites:** FY2001



*Riverside, California*

## Restoration Background

In July 1993, the BRAC Commission recommended that March Air Force Base undergo realignment. It was recommended that the installation serve as an Air Reserve Base once realignment was completed. Base realignment occurred in April 1996.

Environmental studies at the installation began in FY84. A Preliminary Assessment and Site Inspection identified 28 sites, including three fire training areas, seven inactive landfills, several underground storage tanks, an engine test cell (Site 18), sludge drying beds at a sewage treatment plant, and various spill sites. March is a joint-use base that uses both BRAC and Environmental Restoration Account funds to reach cleanup goals.

An Engineering Evaluation and Cost Analysis, a Removal Action, and a groundwater extraction and treatment system were completed to prevent off-base migration of contaminated groundwater. The installation also began a Removal Action for the Panero hydrant refueling system and treatment of contaminated soil. In FY91, sites were grouped into three operable units (OUs).

In FY94, generic remedies, including modified RCRA caps and stream modifications, were initiated at some landfill sites. Modified vapor extraction and recovery systems were used to clean up contaminants in soil and groundwater. The Technical Review Committee was converted to a Restoration Advisory Board. The installation also completed an Environmental Baseline Survey.

In FY95, Removal Actions were conducted at five sites, and two landfills were closed. A soil vapor extraction pilot system was installed at Site 31 (Solvent Spill), and an air-sparging system was

installed at Site 18. These systems were upgraded in FY98. A Record of Decision (ROD) for OU1 was signed in FY96. Remedial Actions (RAs) involving construction of a dual-phase treatment system for groundwater trichloroethene-contaminated soil began for Site 31 and the related groundwater plume at OU1. Six landfill sites on the western part of the base were cleaned up. Interim Removal Actions were completed at Site 25 and continued at two sites within the flight line.

In FY97, interim Remedial Design began for a combined treatment facility for Sites 2, 8, and 27. The Interim Removal Action at Site 30 was completed.

In FY98, the OU2 Proposed Plan was approved and the draft final ROD was sent for review. The Groundwater Technical Working Group established requirements for obtaining Operating Properly and Successfully (OP&S) approval from EPA for the OU1 groundwater treatment facility. Source investigation was completed at Sites 2, 8, and 27.

## FY99 Restoration Progress

Field activities continued in support of the basewide Remedial Investigation and Feasibility Study, and groundwater monitoring continued in support of the OU1 ROD. A Memorandum of Agreement (MOA) was signed between Air Force Reserve Command (AFRC) and the Air Force Base Conversion Agency for transferring the majority of environmental responsibility.

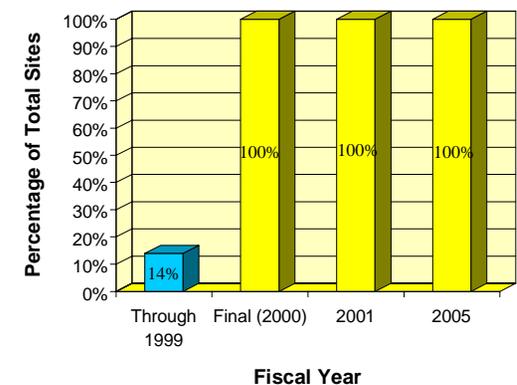
The OU2 ROD was not approved by regulators because of a change by AFRC in the proposed RA. Requirements for the EPA OP&S approval were not completed because of incomplete plume capture data. The ROD for OU3 was delayed because of continu-

ing differences between AFRC and regulators regarding the effectiveness of the source removal.

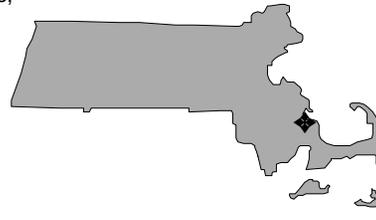
## Plan of Action

- Continue field activities in support of the basewide RI/FS in FY00
- Obtain approval for the OU2 ROD in FY00
- Complete requirements for EPA OP&S approval in FY00
- Prepare a new MOA with AFRC outlining the separation of environmental cleanup responsibilities in FY00
- Continue to submit all cleanup-associated work plans to the BRAC cleanup team for approval in FY00

**SITES ACHIEVING RIP OR RC PER FISCAL YEAR**



**FFID:** MA157282448700  
**Size:** 22,000 acres  
**Mission:** Provide Army and Air National Guard training and support the East Coast Air Defense and Coast Guard Air and Sea Rescue Units  
**HRS Score:** 45.93; placed on NPL in November 1989  
**IAG Status:** Federal Facility Agreement signed in April 1992 and amended in June 1995  
**Contaminants:** Waste solvents, emulsifiers, penetrants, photographic chemicals, and VOCs  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$303.3 million  
**Estimated Cost to Completion (Completion Year):** \$380.1 million (FY2030)  
**Final Remedy in Place or Response Complete Date for All Sites:** FY2002



Falmouth, Massachusetts

**Restoration Background**

Studies have identified 82 sites at this installation, including chemical and fuel spill sites, storm drains, landfills, former fire fighter training areas, coal yards, and underground drainage structures. Private and municipal wells near the installation were closed and replaced after off-base migration of groundwater contamination was detected.

Removal Actions for six sumps associated with the underground drainage structures were conducted in FY91. In FY93, a groundwater extraction and treatment system was installed to contain a contaminant plume migrating from a former motor pool and storage yard. Remedial Investigation and Feasibility Study work also began. In FY94, in an Interim Remedial Action (IRA), the largest of four landfills was capped. The Installation Restoration Program began use of thermal desorption to treat more than 22,000 cubic yards of contaminated soil from several sites.

In 1995, an air-sparging system was implemented to remove subsurface soil contamination at Fuel Spill Site 12 (FS-12). In 1996, environmental regulatory agencies accepted the cleanup plan for the reservation. More than 180 underground drainage structures were removed. A private-well sampling program was expanded to monitor on- and off-base drinking water safety. Carbon treatment was initiated at a Town of Falmouth municipal well threatened by a base plume.

In 1997, the Federal Facility Agreement was amended. Final remediation and closure of Firefighter Training Area No. 1 occurred. Fieldwork techniques, such as on-site laboratories and sampling techniques, sonic geophysical analysis, and microwells for ecological studies, were implemented. A Time-Critical

Removal Action was initiated in a Town of Falmouth river system to address the FS-28 plume that upwelled into the river.

In FY98, recirculation wells were selected for the Storm Drain 5 (SD-5) south plume. Geologic borings and monitoring well installations were used to further define the SD-5, Chemical Spill 10 (CS-10), and Ashumet Valley plumes. Monitoring wells were installed to define the CS-19 source area. Over 40 monitoring wells were installed for the FS-1 plume investigation. The FS-12 source area remediation project was completed. Ecological studies were conducted on the FS-12, SD-5, and CS-10 plumes. A reactive wall of iron filings was installed for the CS-10 plume. Four new plumes were defined (CS-20, CS-21, FS-13, and FS-29).

**FY99 Restoration Progress**

Extraction, treatment, and reinjection (ETR) systems were constructed for the CS-10 and Ashumet Valley groundwater plumes. The feasibility of using ETR systems for the western portion of the CS-10 plume, the FS-1 plume, and the Southwest Operable Unit (OU) area is being discussed with regulators. More than 7 million gallons of contaminated groundwater was cleaned daily by the end of FY99.

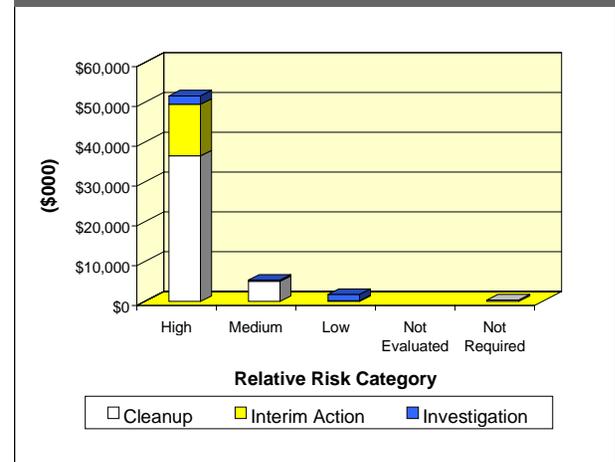
A Proposed Plan was issued for the Southwest OU. The installation continued to monitor natural attenuation at Landfill 1 and constructed five extraction wells. The installation also continued private well testing for area residents and is evaluating the need for further water supply conversions. Evaluation of the reactive wall project continued.

Two pilot projects were constructed in two river systems where cranberry bogs were affected by plumes. Recirculation wells were installed at two locations in the Town of Mashpee.

**Plan of Action**

- Issue RODS for FS-1, CS-4, CS-20, CS-21, FS-13, FS-28, and FS-29, and design and construct remedial systems as necessary, in FY00
- Continue to issue decision documents in FY00
- Finalize cold-mix asphalt batching design for several source areas and initiate remediation in FY00
- Finalize agreements for town and municipal water connections in Bourne and Falmouth in FY00
- Continue private-well sampling for residences near base plumes in FY00
- Continue operation and maintenance of all remedial systems and monitor effectiveness in FY00

**FY00 FUNDING BY PHASE AND RELATIVE RISK**



**FFID:** CA957002474300  
**Size:** 5,716 acres  
**Mission:** Provided Navigation and Electronic Warfare officer training; housed SAC Bombing and Refueling Squadron  
**HRS Score:** 28.90; placed on NPL in July 1987  
**IAG Status:** IAG signed in 1989  
**Contaminants:** Solvents, jet fuel, petroleum hydrocarbons, and lead  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$153.2 million  
**Estimated Cost to Completion (Completion Year):** \$112.3 million (FY2069)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2001



**Sacramento, California**

## Restoration Background

In December 1988, the BRAC Commission recommended closure of Mather Air Force Base. Before becoming inactive in FY93, the installation housed the 323d Flying Training Wing, a SAC wing, a reserve air refueling group, and an Army National Guard aviation unit.

Studies have identified 89 sites at the installation, which were grouped into six operable units (OUs): OU1, Aircraft Control and Warning System; OU2, Groundwater; OU3, Soil; OU4, Landfill; OU5, Basewide; and OU6, Supplemental Basewide. Site types include landfills, underground storage tanks (USTs), fire training areas, a trichloroethene disposal site, a weapons storage area, wash-rack areas, spill areas, and waste pits.

Interim Actions included removing USTs and contaminated soil, supplying an alternate water supply for nearby residents, removing sludge from a former wastewater treatment plant, removing petroleum product from soil by vapor extraction, and excavating pesticide contamination from drainage ditches.

In FY90, 48 solid waste management units and two areas of concern were identified. By FY94, Remedial Investigation and Feasibility Study (RI/FS) activities concluded at OU1 and OU4. In FY94, regulatory agencies approved the Record of Decision (ROD) for OU1, and a Restoration Advisory Board (RAB) and a BRAC cleanup team (BCT) were formed.

In FY95, regulatory agencies approved the ROD for OU4. Construction was completed and Remedial Action (RA) began at OU1. Removal Actions were initiated to remediate petroleum contamination at several sites. An Environmental Impact Statement for property reuse and disposal was prepared. In FY96,

regulatory agencies approved the ROD for OU2 and OU3. Three landfills were consolidated, and engineered caps were initiated at two of the landfills. The installation completed the RI for OU5.

By FY97, the installation had removed all identified standard USTs. Two oil-water separator sites were closed. Construction began on the pump-and-treat system for OU2. Soil vapor extraction (SVE) and bioventing in situ soil treatment systems were installed at 11 sites. The Proposed Plan (PP) for OU5 was released.

In FY98, the ROD for OU5 was signed. RA was selected for 7 of the OU's 15 sites. A groundwater pump-and-treat facility for the Main Base/SAC Area plumes began operating. Construction of the groundwater pump-and-treat system for the Site 7 plume began. A passive landfill gas control system was installed at Site 4. In situ soil treatment using SVE and bioventing was installed at five sites, and installation began at five additional sites. A Removal Action memorandum for drainage ditch Site 85 was signed, and excavation of contaminated sediment began. Contaminated sediment also was removed from drainage ditch Sites 13 and 15. Four USTs were discovered and removed. The Mather off-base water supply contingency plan was completed.

## FY99 Restoration Progress

A Finding of Suitability for Early Transfer was prepared and approved for part of the Economic Development Conveyance (EDC) Parcel. Operation of the pump-and-treat system for the Site 7 groundwater plume was interrupted because of aggregate mining. A foundation and a cap were constructed for the waste pit at Site 7.

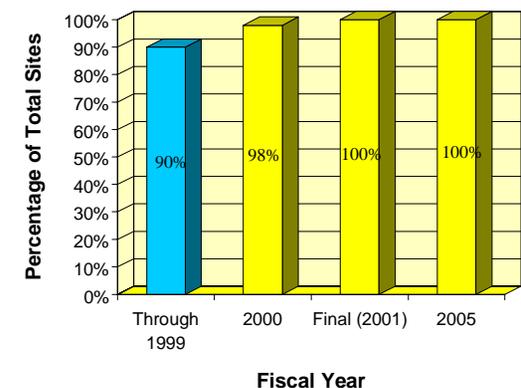
The installation completed RAM for Sites 80 and 88. Phase II of the Main Base/SAC plumes treatment system was expanded into off-base areas, and Phase III expansion began. Remediation of gun range Sites 86 and 87 was completed. The installation constructed and began operating in situ treatment systems at Sites 7, 11, 37, 39, 54, and 59.

At OU6, a Removal Action and data collection for the SVE were completed, and a pilot study for stabilization of lead-bearing soil (Site 89) began. A CERCLA 5-year review was completed for Mather.

## Plan of Action

- Update the base cleanup plan in FY00
- Complete an FS, PP, and ROD for OU6 in FY00
- Complete construction and begin operation of the SVE system at Sites 18, 23, and 58 in FY00
- Prepare RA reports in FY00

**SITES ACHIEVING RIP OR RC PER FISCAL YEAR**



<b>FFID:</b>	WA057182420000
<b>Size:</b>	4,638 acres
<b>Mission:</b>	Provide airlift services for troops, cargo, equipment, passengers, and mail
<b>HRS Score:</b>	31.94 (Area D/American Lake Garden Tract); placed on NPL in September 1984 42.24 (Washrack/Treatment Area); placed on NPL in July 1987; deleted from NPL in September 1996
<b>IAG Status:</b>	Federal Facility Agreement signed in August 1989; Consent Decree with State of Washington signed in February 1992
<b>Contaminants:</b>	VOCs, SVOCs, metals, petroleum/oil/lubricants, pesticides, and radioactive waste
<b>Media Affected:</b>	Groundwater and soil
<b>Funding to Date:</b>	\$19.1 million
<b>Estimated Cost to Completion (Completion Year):</b>	\$7.9 million (FY2016)
<b>Final Remedy in Place or Response Complete Date for All Sites:</b>	FY2007



**Tacoma, Washington**

**Restoration Background**

Environmental studies identified 65 sites at this installation. Sites include fire training areas, spill areas, landfills, and waste pits. Two sites were placed on the National Priorities List (NPL): the Area D/American Lake Garden Tract (ALGT) and the Washrack/Treatment Area (WTA). All 65 sites were classified as Remedy in Place by FY96.

Work began at the ALGT site in FY82, after trichloroethene (TCE) was detected in off-site residential wells. An on-site former landfill that was active in the 1960s and 1970s was identified as the source of the TCE. The installation initiated the Remedial Investigation and Feasibility Study (RI/FS) for the ALGT site in FY87 and completed it in FY91. By FY94, the installation had designed, constructed, and begun operating a groundwater treatment system.

The RI/FS for the WTA site, a former outdoor aircraft wash area, was performed from FY90 to FY92. The Record of Decision (ROD) specified that fuel floating on the shallow water table should be removed and fuel-contaminated soil evaluated for cleanup. The ROD required only groundwater monitoring of the leach pits. In FY93, the installation began a pilot test for passive fuel removal and evaluation of natural attenuation, with positive conclusions.

In FY95, McChord evaluated bioremediation at two sites (SS-34 and WP-44). The State of Washington agreed that bioremediation with long-term monitoring (LTM) was appropriate for the two sites. McChord implemented LTM of the natural attenuation at the WTA site and requested that EPA remove the site from the NPL. In FY96, EPA removed the WTA site from the NPL, and the state listed six sites (including SS-34 and WP-

44) on its Hazardous Sites List. In FY98, an evaluation of natural attenuation of chlorinated solvents at ALGT was completed.

The installation surveyed and evaluated the local community's interest in forming a Restoration Advisory Board (RAB) in FY95, FY96, and FY98. There was very little interest in forming a RAB due to the maturity of the program and trust in the installation.

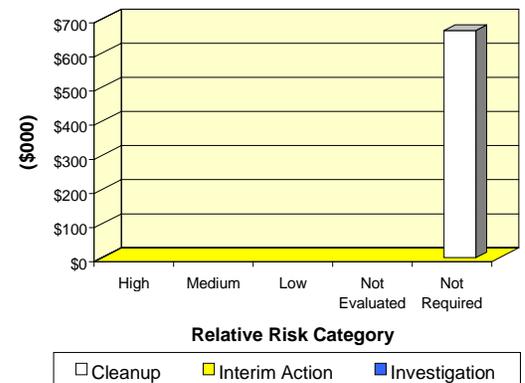
**FY99 Restoration Progress**

The installation continued operating the ALGT groundwater treatment system and continued the LTM program, reducing the monitoring and sampling costs. The installation, EPA, and the State of Washington performed a 5-year review of the ALGT NPL site and the WTA former NPL site. The installation has started reducing the number of extraction wells at ALGT. The installation also surveyed and evaluated the community's interest in forming a RAB. The anticipated written concurrence on closeout of 27 sites has not yet been received from the regulators.

**Plan of Action**

- Reduce operations at the groundwater treatment system at ALGT in FY00 by turning off at least one of the three extraction wells
- Continue the installation's LTM program in FY00 while reducing costs
- Continue to encourage Washington regulatory agencies to provide written concurrence on the closeout of 27 sites in FY00

**FY00 FUNDING BY PHASE AND RELATIVE RISK**



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



### Sacramento, California

## Restoration Background

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

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

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

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

In FY97, a dual-phase extraction system was installed to treat volatile organic compound (VOC)-contaminated soil and

groundwater. Thirty-six on- and off-base groundwater wells were decommissioned, eliminating possible conduits for additional soil and groundwater contamination. Thirteen USTs were removed, and 33,000 feet of linear piping associated with the industrial waste line was inspected and 4,000 feet repaired.

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

## FY99 Restoration Progress

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

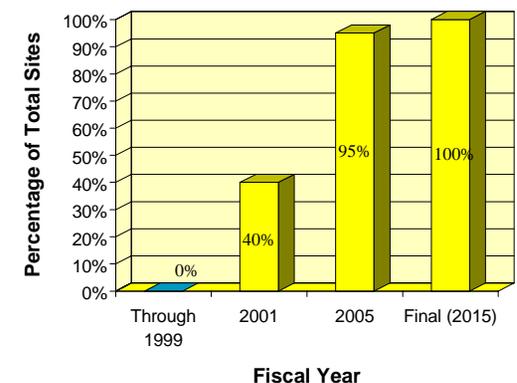
Phase I and Phase II of the RI effort are complete, but data gaps were identified that require additional fieldwork. Planned completion of the ROD for remediating VOCs, which allows final actions for soil before the completion of the installationwide ROD, did not conform to the installation schedule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

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

## Plan of Action

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

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**FFID:** NJ257182401800  
**Size:** 3,500 acres  
**Mission:** Provide quick-response airlift capabilities for placing military forces into combat situations  
**HRS Score:** 47.20; placed on NPL in October 1999  
**IAG Status:** Federal Facility Agreement under negotiation  
**Contaminants:** VOCs, SVOCs, PAHs, BTEX, TPH, metals, PCBs, and pesticides  
**Media Affected:** Groundwater, soil, and sediment  
**Funding to Date:** \$26.9 million  
**Estimated Cost to Completion (Completion Year):** \$14.0 million (FY2011)  
**Final Remedy in Place or Response Complete Date for All Sites:** FY2006



**Burlington County, New Jersey**

- Continue LTM of groundwater in FY00
- Promote partnering with EPA Region 2 and state regulators to facilitate National Priorities List cleanup in FY00

## Restoration Background

In FY83, Preliminary Assessments identified 16 sites at McGuire Air Force Base (AFB). Examples of these sites include landfills, waste piles, fire training areas, hazardous waste storage areas, and spill sites. Another six sites were identified at the BOMARC facility, a remote location under McGuire AFB jurisdiction. A Stage I site assessment was performed on each site in FY85. The Stage II assessment was completed in FY89 and a new site was identified at McGuire AFB. In total, 17 sites were identified at McGuire AFB and 6 sites at the BOMARC facility.

In the early 1990s, a Remedial Investigation and a Feasibility Study (RI/FS) identified future work requirements for some sites and recommended No Further Response Action Planned (NFRAP) for others. The NFRAP sites were three landfills, a waste pile, and a spill site at McGuire AFB and two discharge pits at the BOMARC facility.

In 1993, Interim Remedial Actions (IRAs) were completed for four sites. At McGuire AFB, soil containing pesticides was removed from a ditch. Additionally, an underground storage tank (UST) and surrounding soil containing spilled chemicals were removed. At the BOMARC facility, a transformer pad along with soil containing polychlorinated biphenyls (PCBs) and a UST were removed. NFRAP designations were assigned to all four IRA sites after the completion of the actions. Another site at McGuire AFB, the Civil Engineering Compound, was assigned NFRAP status after completion of a site investigation.

In the mid-1990s, a basewide study at McGuire AFB identified seven areas of concern. Long-term monitoring (LTM) started at the three landfills that had received NFRAP designations in the early 1990s. Focused Feasibility Studies and Treatability Studies (TSs) delineated PCB contamination at the Defense Reutilization and Marketing Office

(DRMO) yard, evaluated the feasibility of using a horizontal well for recovering free product (JP-4) at the Bulk Fuel Storage Area, and determined the need for a basewide background study and an ecological assessment.

In 1998, a TS using pneumatic fracturing technology to increase the permeability of the soil column and to increase the recovery rate of free product (JP-4) was completed at the Bulk Fuel Storage Area.

## FY99 Restoration Progress

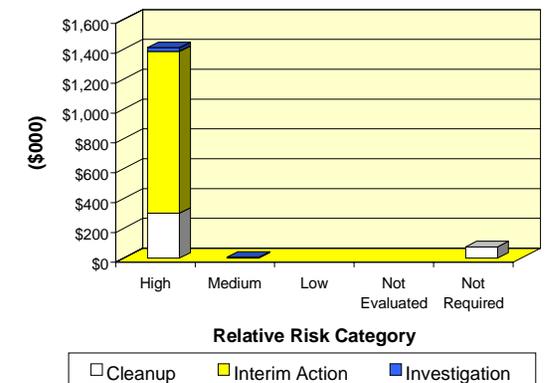
An IRA was completed at the DRMO yard, and surface soil containing PCBs was removed. The basewide background study and the ecological assessment began. A cleanup project for the BOMARC Missile Accident Site is under way as is an RI/FS for the trichloroethene (TCE) groundwater plume. A study to determine the potential for colloidal transport of radionuclides to the groundwater at the BOMARC Missile Accident Site was initiated.

The installation Restoration Advisory Board meets quarterly to provide input on base remedial activities.

## Plan of Action

- Implement Phase I of an IRA to remove free product from the Bulk Fuel Storage Area in FY00
- Implement an IRA at a fire training area in FY00
- Complete the basewide background study and ecological assessment in FY00
- Determine the potential for natural attenuation of the TCE groundwater plume in FY00
- Complete study of the potential for colloidal transport in FY00

**FY00 FUNDING BY PHASE AND RELATIVE RISK**



**FFID:** ID057212455700  
**Size:** 6,000 acres  
**Mission:** Provide composite combat air power worldwide  
**HRS Score:** 57.80; placed on NPL in August 1990  
**IAG Status:** Federal Facility Agreement signed in January 1992  
**Contaminants:** VOCs, petroleum/oil/lubricants, and heavy metals  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$8.1 million  
**Estimated Cost to Completion (Completion Year):** \$0 (FY1996)  
**Final Remedy in Place or Response Complete Date for All Sites:** FY1994



**Mountain Home, Idaho**

**Restoration Background**

Environmental studies conducted since FY83 have identified 32 sites at Mountain Home Air Force Base. Sites include landfills, fire training areas, a fuel hydrant system spill area, disposal pits, surface runoff areas, wash racks, ditches, underground storage tanks (USTs), petroleum/oil/lubricant (POL) lines, and a low-level radioactive material disposal site. To improve and accelerate site characterization, the installation grouped the sites into operable units (OUs).

Removal Actions in FY91 and FY92 included clean closure and removal of 12 USTs. In FY93, the installation recommended no further action (NFA) for 15 of 21 sites in OU1. In FY92, Remedial Investigation (RI) activities were initiated for OU3 and OU6. An NFA Record of Decision (ROD) was signed for OU2 and OU4, and an Interim Remedial Action (IRA) was conducted at OU5 (low-level radioactive material site). The IRA consisted of excavating 2 cubic yards of contaminated soil, a pipe, and six 55-gallon drums. Also in FY93, the installation capped 3 acres of one landfill at OU2. In FY95, the installation completed RI activities for OUs 1, 3, 5, and 6; the lagoon landfill; and Fire Training Area 8. A ROD was signed for these areas in FY96.

The regional groundwater was monitored to resolve uncertainties in the groundwater transport model. The perched water at Site ST-11, the flightline fuel spill site, is undergoing long-term monitoring. In FY96, the installation submitted a request to EPA to delete the installation from the National Priorities List (NPL). EPA indicated that it preferred to wait until a required 5-year review had taken place at Site ST-11 before beginning the delisting process.

The installation converted its Technical Review Committee to a Restoration Advisory Board (RAB) in FY94. It holds semiannual RAB meetings and continues to advertise the meetings in the local newspaper to increase public involvement.

**FY99 Restoration Progress**

The installation continued to monitor regional groundwater for the groundwater transport model and as part of a 5-year monitoring plan. The perched water at Site ST-11 also was monitored as part of a 5-year monitoring plan. The installation continued to pursue deletion from the NPL by performing the actions required in the ROD, including monitoring of regional groundwater.

A contract for updating the Community Relations Plan (CRP) was awarded.

**Plan of Action**

- Continue to monitor regional groundwater in FY00
- Continue to monitor the perched water at Site ST-11 in FY00
- Continue to pursue deletion of the installation from the NPL in FY00
- Continue to update the CRP in FY00

**FY00 FUNDING BY PHASE AND RELATIVE RISK**

All sites are in the long-term monitoring phase.

**FFID:** SC457002482100  
**Size:** 3,937 acres  
**Mission:** Housed tactical fighter wing  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Spent solvents, fuel, waste oil, VOCs, metals, asbestos, paints, and thinners  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$42.2 million  
**Estimated Cost to Completion (Completion Year):** \$16.3 million (FY2011)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2002



### Myrtle Beach, South Carolina

## Restoration Background

In July 1991, the BRAC Commission recommended closure of Myrtle Beach Air Force Base. On March 31, 1993, the installation closed. Sites identified at the installation include landfills, weathering pits, fire training areas, drainage ditches, hazardous waste storage areas, maintenance areas, underground storage tanks (USTs), explosive ordnance areas, fuel storage areas, a small-arms firing range, and a lead-contaminated skeet range. Contaminants include petroleum hydrocarbons, heavy metals, and volatile organic compounds. The installation has conducted Preliminary Assessments, Site Inspections, Remedial Investigations (RIs), and Feasibility Studies (FSs) for the identified sites.

Interim corrective measures (ICM) were initiated to treat a 50-acre trichloroethene (TCE)-contaminated groundwater plume. The installation also began Remedial Design (RD) and Treatability Studies for the small-arms firing range and firing-in buttress sites. RCRA Facility Investigations (RFIs) have been implemented for the drainage ditches, the Old Entomology Shop, the Armament Shop, and the Old Engine Test Cell. A joint management team, formed in FY91, assumed the role of a BRAC cleanup team in FY93.

In FY94, cleanup was completed at the skeet range. Interim measures included removal of contaminated soil at the weathering pit, removal of 28 USTs and 20 oil-water separators, and evaluation of the integrity of 18 other oil-water separators. The installation also formed a Restoration Advisory Board (RAB). In FY95, the installation prepared a BRAC Cleanup Plan (BCP).

The BCP was updated in FY96. In FY97, the installation completed RI/FS reports, and selected cleanup technologies, for several sites. It also determined the extent of lead contamination

in soil at the small-arms firing range and submitted clean-closure plans to the state regulatory agency for two hazardous waste management units and Corrective Action Plans (CAPs) for the hazardous waste tank facility. The installation completed an ICM for the Old Entomology Shop and expanded the ICM for the 50-acre TCE plume. Also in FY97, eight early Removal Actions took place, and the installation completed a Relative Risk Site Evaluation for all sites.

In FY98, ICM was completed for soil removal at the small-arms firing range and landfill caps were implemented at four sites. Supplemental RFI reports were completed for 12 sites and the installation implemented a CAP for air sparging at the MOGAS (motor gasoline) site. The CAP for four UST sites was finalized, and soil removal began at two of the sites. The RFI work plan was completed for two new sites, and a new site was scoped. A basewide monitoring plan was produced and implemented for all sites.

## FY99 Restoration Progress

The installation completed fieldwork and submitted the report for the Old Entomology Shop, the New Entomology Shop, and the Armament Shop. The design and work plan for the groundwater remediation system at an off-base site were submitted for approval. RD was completed for two fire training areas and the petroleum/oil/lubricants (POL) site. The RFI work plan and fieldwork were completed for four areas, and RD is scheduled. Monitoring of all sites continues.

Unexploded ordnance (UXO) was discovered at the firing-in buttress site and the Third Street site. Emergency response and scoping for the work plan began.

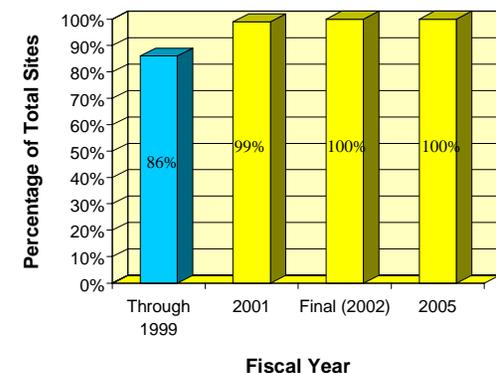
The installation conducted an annual site tour for the RAB.

The planned RD for one fire training area and a weathering pit is on hold pending performance of long-term monitoring to determine the effectiveness of natural attenuation. The planned Corrective Measures Study (CMS) was delayed for the same reason.

## Plan of Action

- Review ICM construction reports for the Old Entomology Shop, the New Entomology Shop, and the Armament Shop in FY00
- Complete fieldwork and draft work plan for removal of UXO from the firing-in buttress site and the Third Street site in FY00
- Complete the CMS and the RD for three fire training areas, a weathering pit, and the POL site in FY00
- Continue groundwater monitoring and operation of existing systems in FY00

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**FFID:** OH557002465000  
**Size:** 70 acres  
**Mission:** Repaired inertial navigation systems and managed Air Force metrology and calibration process  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** VOCs and SVOCs  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$2.9 million  
**Estimated Cost to Completion (Completion Year):** \$2.7 million (FY2005)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2002



Heath, Ohio

**Restoration Background**

Since 1962, Newark Air Force Base has repaired the inertial guidance and navigational systems used by most aircraft and missiles. The installation also provided specialized engineering assistance to the Air Force and DoD on problems related to inertial guidance and navigation. In July 1993, the BRAC Commission recommended that the installation be closed and the workforce privatized in place. The base closed on September 30, 1996. Its workload has been contracted to private firms on site.

Past waste management activities related to solvents such as freon 113 and 1,1,1-trichloroethane affected groundwater at the installation. Environmental investigations conducted at the installation since FY84 identified five sites that required additional study. In FY89, Site Inspection (SI) activities were completed for another seven sites, consisting of spill sites, a fire training area, and landfill areas.

In FY90, the installation began a Remedial Investigation (RI) and Feasibility Study (FS) for the seven sites identified in the SI. In FY91, No Further Action decision documents were prepared for five of the seven sites. In FY94, the installation formed a BRAC cleanup team (BCT) and completed an Environmental Baseline Survey.

In FY95, the installation formed a Restoration Advisory Board (RAB). Work began on a supplemental RI, which concluded in August 1996 with publication of a final report. This report determined that no further action was needed for five of the seven sites studied. Remedial activities included removal of 17 underground storage tanks, removal of 300 cubic yards of soil from the former hazardous waste storage site (Facility 87), and operation of a soil vapor extraction (SVE) system at Facility 87.

The RAB and the BCT suspended meetings in September 1996.

In FY98, the decontamination of Facilities 102 and 114 (hazardous waste/materials storage buildings) was completed. The extension of the city water line onto the base was started. The SVE system at Facility 87 was removed.

**FY99 Restoration Progress**

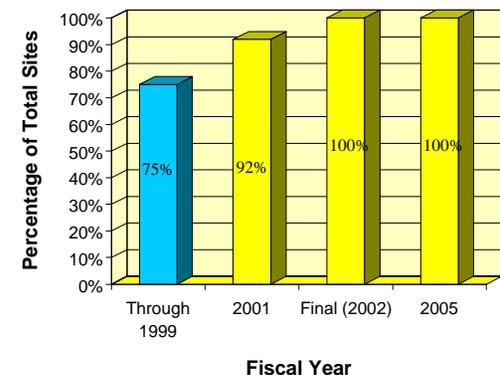
Construction and activation of the city water line were completed. The planned closure of three drinking water wells was delayed because of unforeseen site conditions and delays in appointing a new Air Force Center for Environmental Excellence field engineer. Quarterly sampling of monitoring wells at Facility 87 continued, and the revised Amended Post Closure Plan was submitted. The revised Amended Post Closure Plan was approved by Ohio EPA; this plan requires semiannual groundwater compliance monitoring. The FS at Facility 87 began.

Stage I of the RI for a 13-acre landfill site (LF002) began, requiring direct-push sampling in areas where contamination was detected in 1990, 1991, 1995, and 1996, and issuance of a technical memorandum. The BCT discussed ways of facilitating regulator approval of the Finding of Suitability to Transfer for LF002.

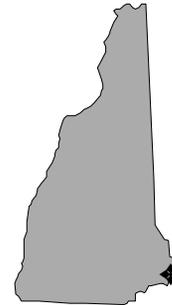
**Plan of Action**

- Close three drinking water wells in FY00
- Complete Stage I of the LF002 RI in FY00
- Complete the FS and begin Remedial Action for Facility 87 in FY00
- Obtain BCT review of draft plans and draft technical memorandum for Stage I of the RI for LF002 in FY00
- If contamination at LF002 is confirmed to be above residential risk levels, obtain BCT review of the draft final RI and FS reports, the draft final Proposed Plan, and the draft final Record of Decision for LF002 in FY01
- In FY00, the Air Force will conduct interviews with former employees to determine the location and activities performed at a possible fire training area

**SITES ACHIEVING RIP OR RC PER FISCAL YEAR**



**FFID:** NH157002484700  
**Size:** 4,257 acres  
**Mission:** Served as Strategic Air Command bomber and tanker base  
**HRS Score:** 39.42; placed on NPL in February 1990  
**IAG Status:** Federal Facility Agreement signed in 1991  
**Contaminants:** VOCs, spent fuels, waste oils, petroleum/oil/lubricants, pesticides, and paints  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$139.6 million  
**Estimated Cost to Completion (Completion Year):** \$57.0 million (FY2046)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2000



Portsmouth/Newington, New Hampshire

**Restoration Background**

The BRAC Commission recommended closure of Pease Air Force Base in 1988. In March 1991, the installation was closed. Studies identified the following site types: fire training areas, burn pits, industrial facilities, landfills, and underground storage tanks (USTs). Groundwater and soil are contaminated with petroleum products (JP-4 jet fuel) and industrial solvents, such as trichloroethene (TCE).

Prior to closure, the installation completed Interim Remedial Actions at four sites, soil removal at three sites, and test pit operations at two sites. It also completed one bioventing and three soil vapor extraction (SVE) Treatability Studies, and removed 158 USTs and associated contaminated soil. A BRAC cleanup team (BCT) formed in FY93.

During FY95, six Records of Decision (RODs) were signed. Cleanup actions were completed at seven locations, and a remediation system was put into operation at Fire Training Area 2. A Restoration Advisory Board (RAB) was formed. A citizens group has participated in meetings and helped develop cleanup options.

In FY96, LF-5 capping was completed, construction of the SVE and air-sparging system at Site 45 began, and wetland restoration at LF-6 was completed. Construction began on the bioventing system at Site 13, the SVE and air-sparging system in Zone 2, and the groundwater recovery system in Zone 3. The installation began implementing the groundwater containment system at Site 32. Final Remedial Investigation and Feasibility Study (RI/FS) work was completed for the Brooks and Ditches Operable Unit (OU).

In FY97, the final ROD for the Brooks and Ditches OU was signed. The remaining remediation systems were brought on line, and operations and maintenance and long-term monitoring (LTM) began at the remaining sites. A new area of contamination, Site 46, Communications Building 22, was discovered. The Air Force immediately began site characterization and RI.

In FY98, Remedial Action (RA) optimization was performed for several systems. A source soil Removal Action and additional characterization were completed at Site 49. Confirmatory soil sampling was conducted at Site 45. An Operating Properly and Successfully document was completed for LF-5. An Engineering Evaluation and Cost Analysis (EE/CA) project for Site 49 and a streamlined RI/FS were initiated.

**FY99 Restoration Progress**

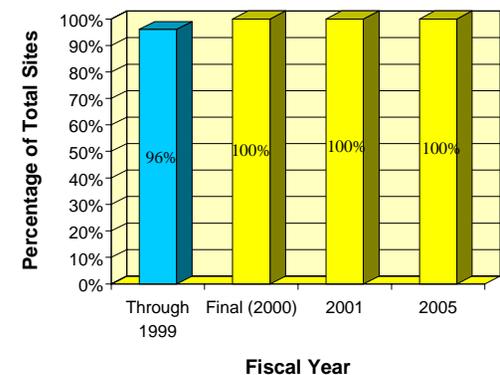
RA system operations and monitoring continued. Trend analysis, including system and monitoring plan optimization activities, was conducted. A permeable reactive wall source area action was implemented at Site 73. The EE/CA fieldwork and report were completed for Site 49.

LTM plans for Zones 2 and 3 and Site 8 were streamlined, resulting in an approximately one-third reduction of sampling frequency and/or sampling points.

**Plan of Action**

- Continue RA system operations, monitoring, LTM, and trend analysis in FY00
- Complete Operating Properly and Successfully documents for seven sites in FY00
- Implement result of the EE/CA for Site 49 and complete RA decision document in FY00
- Review transfer and cleanup documents by the BCT in FY00

**SITES ACHIEVING RIP OR RC PER FISCAL YEAR**



**FFID:** NY257002477400  
**Size:** 3,447 acres  
**Mission:** Former bomber and tanker aircraft operations  
**HRS Score:** 30.34; placed on NPL in November 1989  
**IAG Status:** Federal Facility Agreement signed in July 1991 (effective September 1991)  
**Contaminants:** Organic solvents, pesticides, fuels, PCBs, and lead  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$36.9 million  
**Estimated Cost to Completion (Completion Year):** \$45.3 million (FY2191)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2001



*Plattsburgh, New York*

## Restoration Background

Environmental studies since FY87 identified 40 sites at this base for investigation and closure. Site types include underground storage tanks (USTs), aboveground storage tanks, landfills, industrial facilities, spill sites, and training areas. Regulatory concurrence has been received for closeout of 11 sites. The installation was placed on the National Priorities List (NPL) after the former Fire Training Area was determined to be a source of chlorinated solvents and benzene, toluene, ethyl benzene, and xylene contamination in groundwater.

The installation began a Remedial Investigation and Feasibility Study (RI/FS) in FY89. In FY91, the installation completed a Removal Action for soil contaminated with the pesticide DDT and for an abandoned UST. In FY92, a soil Removal Action was completed and a free-product removal system was constructed at the former Fire Training Area.

In FY93, the installation removed a UST that had contained DDT, closed a pretreatment facility, and removed soil contaminated with lead. The installation completed Records of Decision (RODs) for three sites and constructed two landfill caps. In FY94, the installation formed a Restoration Advisory Board (RAB).

In FY95, the installation removed soil contaminated with fuel from two sites and prepared final RODs for the Pesticide Storage Tank and a landfill. The installation received regulatory concurrence for no further action at seven sites and completed surveys for endangered species and archaeology. An installationwide Environmental Impact Statement and a comprehensive Land Reuse Plan were completed, and a Community Relations Plan was drafted.

In FY96, the groundwater treatment facility for free-product recovery at the former Fire Training Area was upgraded, and a source Removal Action using soil vapor extraction (SVE) and bioventing was initiated. Two additional Removal Actions using SVE began, and contaminated soil at three other sites was removed.

In FY97, the latest versions of the BRAC Cleanup Plan and the Environmental Baseline Survey (EBS) were completed. In FY98, two landfill caps and three contaminated-soil Removal Actions were completed. RODs for implementing institutional controls were signed for two sites. The first 5-year review of Plattsburgh Air Force Base remedial activities and a Phase II archaeological survey were completed.

## FY99 Restoration Progress

Contaminated soil was removed at one site, and an RI was completed for two sites. Public and regulatory meetings were held to address and resolve comments on the groundwater impact study, and additional fieldwork was completed. Negotiations continued with the New York State Historic Preservation Office on completing a Cold War resources survey and a programmatic agreement for preservation and transfer of cultural resources associated with Plattsburgh Air Force Base.

Public interest in cleanup activities at the installation increased. The RAB met eight times and participated in a site tour. The installation met with the Town of Plattsburgh and Lake Champlain Committee to resolve cleanup concerns.

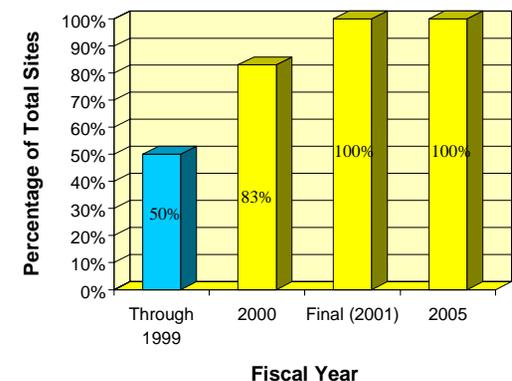
The planned finalization of five RODs was delayed because of several ongoing technical issues and regulatory concerns. Decommissioning of groundwater wells is on hold until additional

groundwater characterization and evaluations are complete. Evaluation of miscellaneous environmental factors, updates to the basewide EBS, and closure investigations and remediation of petroleum handling and storage facilities were delayed due to contractor delays and a focus on higher priority work.

## Plan of Action

- Finalize RODs for five sites in FY00
- Complete evaluation of miscellaneous environmental factors and update basewide EBS in FY00
- Complete closure investigation and remediation of petroleum handling and storage facilities in FY00
- In FY00, complete Cold War resources survey and enter into a Memorandum of Agreement with the New York State Historic Preservation Office for preservation and transfer of historic property

**SITES ACHIEVING RIP OR RC PER FISCAL YEAR**



**FFID:** TX857152409100  
**Size:** 2,987 acres  
**Mission:** Conducted pilot training  
**HRS Score:** NA  
**IAG Status:** Federal Facility Agreement signed in 1987 and closed in June 1999  
**Contaminants:** VOCs, petroleum/oil/lubricants, metals, pesticides, and herbicides  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$74.6 million  
**Estimated Cost to Completion (Completion Year):** \$46.3 million (FY2029)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY1999



Lubbock, Texas

**Restoration Background**

In July 1995, the BRAC Commission recommended closure of Reese Air Force Base, which is used for pilot training and related activities. The installation closed in September 1997.

Preliminary Assessments and Site Inspections conducted from FY84 through FY88 identified 13 sites, including landfills, surface impoundments, underground storage tanks (USTs), sludge spreading areas, industrial drain lines, and fire training areas.

In FY93, the installation began an Interim Remedial Action (IRA) in which an alternative source of drinking water was provided to off-base residences and businesses whose well water was contaminated. Studies determined that the base was the source of trichloroethene (TCE) contamination in the sole-source aquifer for the region. An Environmental Working Group was formed in FY93 to expedite restoration.

In FY95, the installation reached an agreement with the State of Texas to implement an IRA for controlling a plume of TCE-contaminated groundwater. Under the IRA, the base installed a groundwater extraction and treatment system with an air stripper to treat groundwater contaminated with TCE and other volatile organic compounds (VOCs). A Restoration Advisory Board was formed.

In FY96, the installation began a Corrective Measures Study to address contaminated media identified during a RCRA Facility Investigation (RFI) and completed construction of a soil vapor extraction system. A BRAC cleanup team (BCT) was established.

In FY97, the installation completed the RFI initiated in FY96 and began RFIs at 20 solid waste management units. Wells were installed at the boundary of the installation, and an Environmental Baseline Survey and an Environmental Impact Survey were completed.

In FY98, RCRA Permit Closure Reports were submitted to the regulators for Picnic Lake and Golf Course Lake. The industrial drain line was cleaned, and 14 USTs were removed. The design of the composite cap at the Southwest Landfill began.

**FY99 Restoration Progress**

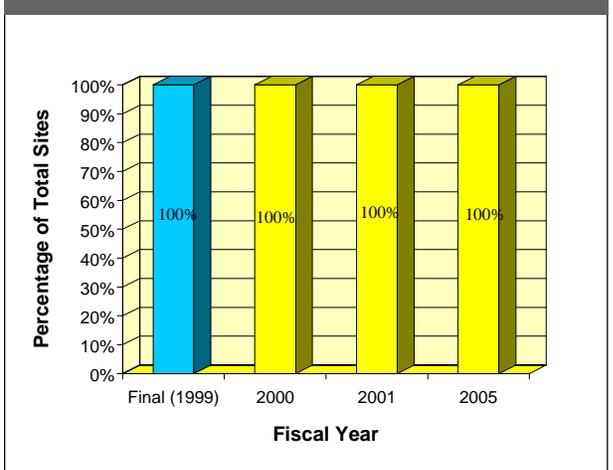
Two large pump-and-treat systems were constructed to remediate two TCE plumes, which extend off base. A 24-acre RCRA landfill cap was completed, and all necessary real estate transactions were finished. All remaining USTs, aboveground storage tanks, and oil-water separators were removed. Lead-contaminated soil was removed from the small-arms firing range, and the site was closed. The closure certification report for the Picnic Lake and Golf Course Lake RCRA permit was approved; the process to modify the permit is under way. The modification will delete the Picnic Lake and Golf Course Lake from the permit.

The installation reached the Final Remedy in Place milestone in September 1999, only 24 months after base closure. All investigation and closure reports have been completed and approved by the regulatory agencies. The BCT achieved a cost avoidance of \$9.6 million through partnering, innovative process management, and expedited Remedial Actions.

**Plan of Action**

- Construct off-base water lines in contaminated areas to reduce long-term liabilities and costs in FY00
- Achieve Operating Properly and Successfully determination in FY00
- Continue to optimize long-term costs, including costs for groundwater monitoring and system operations, in FY00
- Complete a Finding of Suitability to Transfer for 2,400 acres in FY00

SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**FFID:** MO757002429200  
**Size:** 428 acres  
**Mission:** Housed the 442d Fighter Wing; supported A-10 aircraft  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Petroleum/oil/lubricants, PAHs, PCBs, VOCs, and heavy metals  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$6.3 million  
**Estimated Cost to Completion (Completion Year):** \$1.4 million (FY2008)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2003



**Kansas City, Missouri**

## Restoration Background

In July 1991, the BRAC Commission recommended closure of Richards-Gebaur Air Reserve Station, the transfer of the 442d Tactical Fighter Wing to Whiteman Air Force Base, and the transfer of the 36th Aeromedical Evacuation Squadron and the 77th and 78th Aerial Port Squadrons to Peterson Air Force Base. The installation was closed on September 30, 1994.

Environmental studies have been in progress at the installation since FY82. Prominent site types include a fire training area, vehicle maintenance areas, hazardous waste drum storage areas, fuel storage areas, and underground storage tanks (USTs). The installation conducted several Interim Remedial Actions (IRAs), including soil bioventing, removal of contaminated soil, and removal of polychlorinated biphenyl (PCB)-contaminated equipment. In FY95, the installation completed an IRA involving the removal of two USTs. The installation also installed a passive soil bioventing system at a former UST site.

An Environmental Baseline Survey (EBS) was completed in FY94. The installation uses interim leases to lease parcels to the Kansas City Aviation Department (KCAD). Runway and aviation support facilities were transferred to KCAD before the installation was closed. Facilities permitted to the Marine Corps were also available for immediate reuse. Supplemental EBSs are used as attachments to Finding of Suitability to Lease and Finding of Suitability to Transfer documents as further property is leased and transferred.

In FY97, a groundwater survey was conducted for the central drainage area and five sites. The EBS was revised.

In FY98, the installation's BRAC cleanup team (BCT) agreed to institute the state's Cleanup Levels for Missouri (CALM) guidance. The BRAC Cleanup Plan was updated. Fourteen USTs were registered and closed. Installation Restoration Program (IRP) decision documents were signed by the BCT, resulting in the closure of three areas of concern. The remaining property was leased to KCAD under an interim lease. Memorandums of Agreement were signed with the Army (for the Belton Training Complex) and the Marine Corps (for presently occupied Marine facilities). The installation IRP is being managed from Rickenbacker Air National Guard Base in Columbus, Ohio, because the Air Force closed the environmental office at Richards-Gebaur.

The station holds quarterly Restoration Advisory Board (RAB) meetings to keep the public informed of ongoing environmental activities at the base.

## FY99 Restoration Progress

A basewide Evaluation and Consolidation Study was completed. The installation began a basewide Remedial Investigation and Feasibility Study (RI/FS). Remedial Action (RA) began at 15 additional sites slated for closure.

The BCT agreed to use the promulgated CALM guidance as closure guidelines for the installation, in conjunction with other Applicable or Relevant and Appropriate Requirements. The BCT also attended several partnering meetings. The RAB met quarterly.

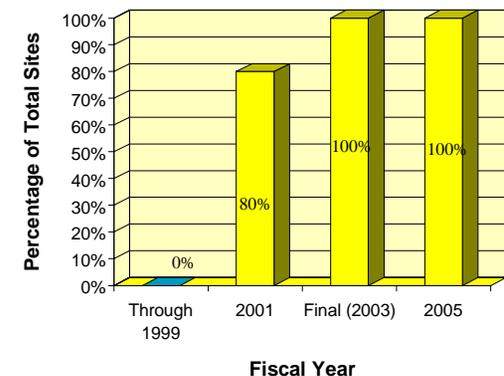
Closure investigations and transfer of Parcels K and L have been delayed because of changed funding priorities. Both parcels are offered for public sale by the General Services Administration and

will be leased in the interim. Closure of eight additional former UST sites was also delayed because of funding issues.

## Plan of Action

- Investigate the fuel hydrant line and the industrial waste line in FY00
- Complete closure of eight UST sites, the industrial waste line, and the fuel hydrant line in FY00
- Continue the basewide RI/FS in FY00
- Close up to 15 additional sites in FY00
- Complete most necessary RAs in FY00
- Complete remaining RAs and transfer remaining Air Force property by FY03

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**FFID:** OH557002454400  
**Size:** 2,016 acres  
**Mission:** Provide base of support for one fighter wing, one refueling wing, and one airlift group  
**HRS Score:** 50.00; proposed for NPL in January 1994  
**IAG Status:** None  
**Contaminants:** Pesticides, paint, spent fuel, waste oil, solvents, and heavy metals  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$22.2 million  
**Estimated Cost to Completion (Completion Year):** \$5.9 million (FY2015)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2001



*Columbus, Ohio*

## Restoration Background

In July 1991, the BRAC Commission recommended closure of Rickenbacker Air National Guard Base. In July 1993, realignment was recommended rather than base closure. The installation was realigned on September 30, 1994. Rickenbacker was recommended for listing on the National Priorities List (NPL) because of the potential effects of contamination on underlying groundwater, which supplies drinking water to 150,000 residents in nearby communities.

A Restoration Advisory Board formed and a basewide Environmental Baseline Survey was completed in FY94. In FY95, the final Environmental Impact Statement was published and a Record of Decision (ROD) was signed.

From FY96 through FY97, a supplemental Remedial Investigation (RI) and report were completed. Remedial Actions (RAs) included removal of 59 underground storage tanks (USTs), 28 aboveground storage tanks, and asbestos; closure of abandoned fuel lines; and demolition of the heat and water plant lagoons. A Treatability Study (TS) and a risk assessment began at the former hazardous waste storage area (HWSA) to investigate potential risk-based closure of the facility. No Further Remedial Action Planned (NFRAP) documents were signed for 16 Installation Restoration Program (IRP) sites and 3 areas of concern (AOCs). Seven other IRP sites were closed with regulatory concurrence.

In FY98, the installation published a final Phase II RI report, a draft final Feasibility Study (FS) for five IRP sites, and a draft scientific management position paper on the ecological risk associated with the basewide storm drainage system (Site 25).

Twelve NFRAP documents were signed, covering nine IRP sites and three AOCs. An amended closure plan for the former HWSA (IRP Site 1) was submitted to Ohio EPA. RAs included removal of three USTs at Facility 544 and contaminated soil at two former gas stations, Sites 6 and 45. Final investigations of petroleum-contaminated soil were conducted along an abandoned fuel line, at two pump houses, and at Facility 544. Remedial Design (RD) began for five IRP sites.

## FY99 Restoration Progress

The final FS was published, and the Proposed Plan, draft RA decision document, and RD were completed for five IRP sites. RA was not initiated at the sites because of delays in completing the RA decision document. The closure plan for Site 1 was reevaluated.

The ecological risk situation at Site 25 was discussed but remains unresolved. TSs for groundwater were required for the abandoned fuel line and two pump houses before the Remedial Action Plans (RAPs) could be completed; however the installation did begin removing petroleum-contaminated soil at these sites.

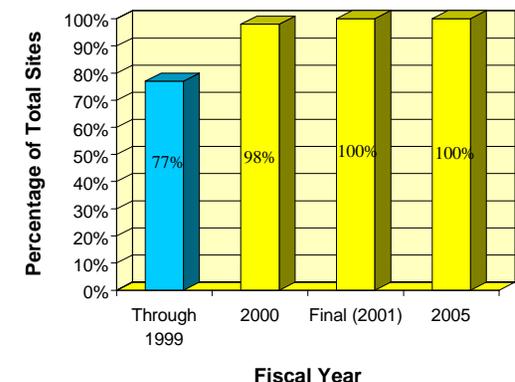
Response Complete (RC) status was achieved for IRP Site 6. RC status for five additional sites was delayed because of ecological risk, transfer, and regulatory approval issues. Additional soil and groundwater sampling was completed at Facility 544.

The BRAC cleanup team meets monthly.

## Plan of Action

- Complete RAPs, construct RA, and begin monitored natural attenuation at five IRP sites in FY00
- Achieve site closure for six IRP sites in FY00
- Analyze the sampling results from Facility 544 and determine whether additional remediation is required in FY00
- Complete the RAPs, remove petroleum-contaminated soil, and install groundwater treatment systems at the abandoned fuel line and two pump houses in FY00
- Amend the RCRA post-closure plan for Site 1 to include groundwater remediation in FY00

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**FFID:** GA457172433000  
**Size:** 8,855 acres  
**Mission:** Provide logistics support for aircraft  
**HRS Score:** 51.66; placed on NPL in July 1987  
**IAG Status:** IAG signed in July 1989  
**Contaminants:** VOCs, paint strippers and thinners, paints, solvents, phosphoric and chromic acids, oils, cyanide, and carbon remover  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$101.1 million  
**Estimated Cost to Completion (Completion Year):** \$294.7 million (FY2033)  
**Final Remedy in Place or Response Complete Date for All Sites:** FY2004



*Houston County, Georgia*

- Continue final RA operations at LF03, SS10, OT17, and OT29 in FY00
- Continue basewide groundwater sampling in FY00
- Complete the Proposed Plan and the final ROD for OU1 and OU3 in FY00

## Restoration Background

In FY82, Preliminary Assessments and Site Inspections were completed for 33 sites at this installation. The most significant site is Landfill No. 4 and the adjacent Sludge Lagoon (WP-014). The site is divided into three operable units (OUs): source control (OU1), wetlands (OU2), and groundwater (OU3). Primary contaminants at the site include trichloroethene and tetrachloroethane in soil and groundwater. Since FY82, 8 additional sites have been added to the Installation Restoration Program (IRP), for a total of 41 sites.

Remedial Investigation and Feasibility Study (RI/FS) activities began in FY86 and FY88. An interim Record of Decision (ROD) was completed for OU1 in FY91, OU2 in FY94, and OU3 in FY95. In FY93, the installation constructed run-on controls and completed the pilot-scale system for lagoon solidification at OU1. In FY94, the installation completed Phase I of the leachate collection system. In FY95, a pilot system was constructed for the Phase II leachate collection system. In FY96, the installation completed design of the Phase II leachate collection system, Sludge Lagoon solidification, design of the OU2 sediment containment system, and Remedial Design (RD) for the groundwater treatment facility at the National Priorities List (NPL) site. In FY98, the installation completed construction of the groundwater treatment facility for OU3 and the Base Industrial Area. The installation also completed the OU1 cover.

To date, 14 of the 41 IRP sites have been closed, requiring no additional cleanup funds in out years. There are six ongoing RIs, and the installation intends to add three sites to the Hazardous Waste Facility Permit for No Further Action.

A Technical Review Committee formed in FY89 was converted to a Restoration Advisory Board (RAB) in FY94. The RAB received the "Secretary of the Air Force Environmental Excellence Recognition Award." RAB meetings are held quarterly, and training and site tours are available to RAB members.

## FY99 Restoration Progress

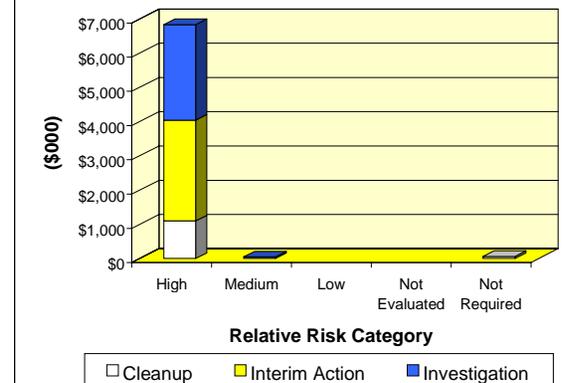
The installation completed the RD and began construction on the final Remedial Action (RA) for LF03 and OT17. Draft RCRA Facility Investigations (RFIs) were completed for OT20, SS35, SS36, and OT37 and submitted to the Georgia Environmental Protection Department (GA EPD) for approval. Fieldwork was completed at DC34 and OT38. The OU2 sediment containment project was completed.

The installation requested GA EPD approval for closure of three sites. Completion of the RCRA permit modification is needed to finalize closure. The installation continued operating the bioventing system for SS10 and the groundwater treatment plant for OT20 and LF04. Final RAs continued at SS10 and OT29, and the installation continued basewide groundwater sampling.

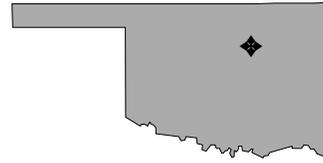
## Plan of Action

- Complete RD for SS39 in FY00
- Complete RFIs and begin Corrective Action Plans for OT20, DC34, SS35, OT37, and OT38 in FY00
- Obtain final approval for site closure of FT05, FT07, and FT08 in FY00
- Continue operation of interim measures at LF04 and OT20 in FY00

**FY00 FUNDING BY PHASE AND RELATIVE RISK**



**FFID:** OK657172439100  
**Size:** 5,041 acres  
**Mission:** Repair aircraft, weapons, and engines  
**HRS Score:** 42.24; placed on NPL in July 1987  
**IAG Status:** IAG signed in September 1988  
**Contaminants:** Organic solvents, heavy metals, and petroleum  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$157.8 million  
**Estimated Cost to Completion (Completion Year):** \$136.7 million (FY2023)  
**Final Remedy in Place or Response Complete Date for All Sites:** FY2005



Oklahoma City, Oklahoma

**Restoration Background**

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

The installation has implemented Interim Actions, including removal of contaminated soil and USTs and installation of landfill caps, free-product recovery systems, bioventing systems, a biostripping system, and a solidification and stabilization system. A Record of Decision (ROD) was signed for Building 3001 in FY90, and a groundwater extraction and treatment system is operating at the site. A ROD for Soldier Creek was signed in FY93.

The installation formed its Restoration Advisory Board (RAB) in FY94.

In FY95, the installation expanded the fuel recovery system at the North Tank Operable Unit (OU) and removed all USTs from four sites. The installation also began a Phase II RCRA Facility Investigation (RFI) for 18 sites and completed the majority of the Remedial Investigation (RI) for the Industrial Wastewater Treatment Plant (IWTP)/Soldier Creek Off-Base Groundwater (SCOBGW) OU. A bioslurping system and a bioventing system were installed to treat fuel-contaminated soil. In addition, Remedial Actions (RAs) involving treatment of fuel and solvent contamination were implemented at two sites. The installation began using a geographic information system (GIS) to improve site characterization.

In FY96, the installation completed the Phase II RFI report. Actions to increase product recovery and reduce the volume of

extracted groundwater were implemented at fuel-contaminated sites. Seven interim corrective actions were initiated, and one was completed. A draft final RI and Feasibility Study (FS) for the IWTP/SCOBGW OU also was completed.

In FY97, the installation removed low-level radioactive waste and completed the cleanup of Radioactive Waste Disposal Site 1030W. In addition, the base completed the capping preparation for Landfill 2, capping of Landfill 4, construction of a bioventing system for the Fuel Purge Facility, and construction of a treatment system for the Area A Service Station. These early response actions reduced the risk level of five sites from high to low.

In FY98, the installation completed construction of RCRA caps for Landfills 2 and 5. One hundred gallons of trichloroethene was recovered from 60 million gallons of groundwater pumped from the Building 3001 area. A groundwater treatment plant for the southwest quadrant of the base was constructed, addressing groundwater contamination under 25 percent of the Installation Restoration Program sites on base. The installation reduced the relative risk of four sites from high to low.

**FY99 Restoration Progress**

The draft final SCOBGW risk assessment was submitted to regulators. Completion of the FS, the Proposed Plan (PP), and the ROD for the SCOBGW OU was delayed because of lengthy regulator review of the risk assessment. A contract was awarded for construction of a RCRA cap at Landfill 6. Delays in this process changed the completion date for construction. A groundwater treatment system was constructed for the Gator Groundwater Management Unit.

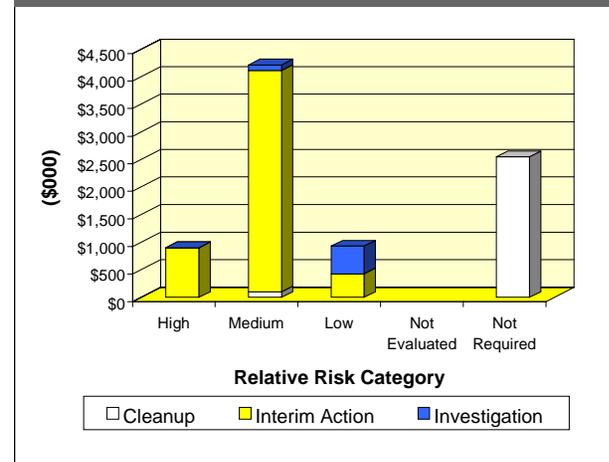
Closure letters were received for the 3700 Fuel Yard and the Purge Facility. The 5-year review of National Priorities List (NPL) treatment systems was submitted to EPA for review. The Oklahoma Department of Environmental Quality designated No Further Action for the remaining radioactive waste disposal sites. The installation combined operation of the treatment systems for Building 3001 and the Southwest Groundwater Management Unit.

The RAB met quarterly. Meetings with state regulators resulted in acceptance of basewide background values for organic and inorganic compounds in soils, as well as the closure of seven solid waste management units (SWMUs) and one area of concern.

**Plan of Action**

- Complete the SCOBGW OU FS, PP, and ROD in FY00 and the RD in FY01,
- Complete construction of a RCRA cap at Landfill 6 in FY00
- Finalize Air Force documentation formally closing the four radioactive waste disposal sites in FY00
- Close the Fire Training Area 1 and Supernatant Pond sites in FY00
- Complete an Interim Remedial Action at the IWTP in FY00
- Complete decision documents for all six landfills in FY01
- Complete construction of final phase of a treatment system at 290 Fuel Farm in FY01
- Begin RA for SCOBGW OU in FY02

**FY00 FUNDING BY PHASE AND RELATIVE RISK**



**FFID:** CA957182457500  
**Size:** 6,277 acres  
**Mission:** Provide air refueling and strategic airlift services for troops, cargo, and equipment  
**HRS Score:** 29.49; placed on NPL in November 1989  
**IAG Status:** Federal Facility Agreement signed in September 1990 and amended in May 1993, October 1995, July 1996, November 1997, and July 1998  
**Contaminants:** VOCs, heavy metals, and PAHs  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$70.6 million  
**Estimated Cost to Completion (Completion Year):** \$150.3 million (FY2049)  
**Final Remedy in Place or Response Complete Date for All Sites:** FY2004



### Solano County, California

### Restoration Background

Travis Air Force Base has supported Air Force operations since 1943. Historical activities at the base have resulted in numerous releases of fuels, solvents, and petroleum/oils/lubricants, which migrated into groundwater. Since FY85, studies have identified a number of sites, including old landfills, a closed sewage treatment plant, four fire training areas, disposal pits, spill areas, the storm sewage drainage system, a pesticide disposal site, and a low-level radioactive waste burial site. In FY93, the Air Force divided the installation into four operable units (OUs).

The Air Force implemented several Interim Actions at the installation, including removal of 27 underground storage tanks. Granular activated carbon treatment systems were installed to treat groundwater contaminated with trichloroethene (TCE) at a storm sewer outfall in Union Creek and a source area for the installation's largest TCE groundwater plume. Treatability Studies were conducted in FY94 on use of horizontal wells, two-phase extraction systems, bioventing, and bioslurping.

The installation completed field investigations and Remedial Investigation (RI) reports for all OUs. It also completed one TCE Removal Action at the storm sewer outfall and implemented another TCE Removal Action.

In FY96, the installation combined the North, East, and West Industrial OUs into a single OU (NEWIOU) for the Feasibility Study (FS), the Proposed Plan, and the Record of Decision (ROD). The FS for the NEWIOU and the Proposed Plan for the groundwater part of the NEWIOU were completed. In FY97, the RI for the West/Annexes/Basewide OU (WABOU) and the expansion of the Interim Action for the installation's largest TCE-contaminated groundwater plume were completed.

In FY98, an interim ROD for groundwater in NEWIOU was completed and signed. The NEWIOU Proposed Plan for surface water, sediment, and soil was completed and public comments received. The base completed the FS and Proposed Plans for groundwater and soil sites at WABOU. Interim Remedial Actions (IRA) began at two of three sites from which contaminated groundwater had migrated off site, and at two additional sites. Interim Remedial Design began on 14 other groundwater sites. A two-phase extraction well was installed in a suspected area of free-phase TCE.

In FY95, the installation formed a Restoration Advisory Board (RAB) and established the RAB Relative Risk Focus Group to address restoration priorities, the Technical Review Focus Group to review draft documents, and the Community Relations Focus Group to disseminate information to the public.

### FY99 Restoration Progress

The WABOU groundwater interim ROD was signed. The WABOU soil ROD is still being negotiated with regulators. The NEWIOU soil, sediment, and surface water ROD was delayed, pending approval of the WABOU soil ROD.

Removal Actions were planned for two sites: one site received institutional controls per agreement with the RAB, the other site was delayed because agency review of the draft Action Memorandum took longer than anticipated.

The IRA on the last groundwater plume that extends off base was delayed because the installation was unable to reach a purchase agreement with a neighboring property owner. Travis was unable to obtain adequate access to a second property, which delayed plume delineation. The plume was larger than expected at a third

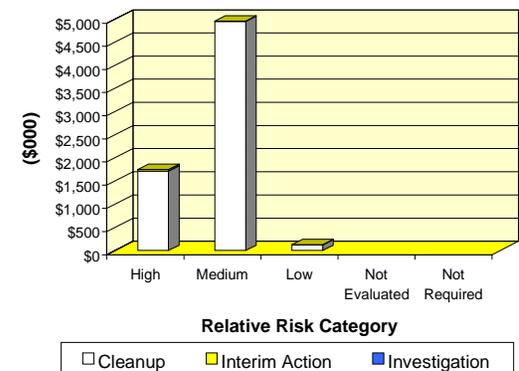
off-base site. While partial Remedial Action (RA) was accomplished, a new access agreement must be negotiated to complete the work. IRAs at seven other groundwater sites are under way.

The installation also conducted a base tour for the RAB and regulatory agencies.

### Plan of Action

- Complete IRAs at nine groundwater sites in FY00
- Complete the WABOU soil ROD in FY00
- Complete IRAs at three sites with off-base groundwater plumes in FY01
- Complete the Removal Action at Cypress Lakes Golf Course in FY00
- Begin construction of a landfill cap in FY01
- Begin RA at seven soil sites in FY00
- Complete the NEWIOU soil, sediment, and surface water ROD in FY01
- Complete RA at eight WABOU soil sites in FY01
- Complete IRAs at all groundwater sites in FY06

### FY00 FUNDING BY PHASE AND RELATIVE RISK



**FFID:** AZ957282593400  
**Size:** 84 acres  
**Mission:** Provide Air National Guard training  
**HRS Score:** 57.86; placed on NPL in September 1983  
**IAG Status:** Federal Facility Agreement signed in October 1994  
**Contaminants:** TCE, tetrachloroethene, chromium, petroleum hydrocarbons, and petroleum/oil/lubricants  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$8.9 million  
**Estimated Cost to Completion (Completion Year):** \$12.7 million (FY2021)  
**Final Remedy in Place or Response Complete Date for All Sites:** FY1997



Tucson, Arizona

## Restoration Background

Environmental studies at Tucson International Airport have identified eight sites, including fire training areas, solvent dumping areas, storm drainage discharge areas, the old wash rack area, petroleum/oil/lubricant areas, and spill areas. Waste disposal and spill sites have had the greatest effect on the environment. The principal contaminant is trichloroethene (TCE) in groundwater. Tetrachloroethene and chromium also have affected groundwater, but to a lesser extent. In addition, total petroleum hydrocarbons have been detected in soil at the installation. In FY94, the installation finished Remedial Investigation activities for all identified sites.

The installation established successful partnerships with citizens and regulators. The Unified Community Advisory Board (UCAB) provides a forum in which citizens and organizations can discuss current environmental issues. The UCAB consists of community members; regulators; and responsible parties such as Air Force Plant 44, Burr-Brown Corporation, the Airport Authority/City of Tucson, West Cap Industries (defunct), and the Air National Guard. Representatives of regulatory agencies, the State of Arizona, Pima County, and the City of Tucson, and leaders of community groups regularly attend meetings of the board.

In FY97, the installation complied with the Federal Facility Agreement and reevaluated all sites through the Relative Risk Site Evaluation process. A Record of Decision was completed for the cleanup of contaminated soil. The installation also finished construction of a permanent groundwater extraction, treatment, and recharge system to clean up contaminated groundwater. The groundwater extraction and treatment system for all sites began operating in FY97. In FY98, the soil vapor extraction and

treatment system at Site SS05 accomplished its mission by reducing contaminant concentration in soil vapor to levels that have negligible impact on groundwater.

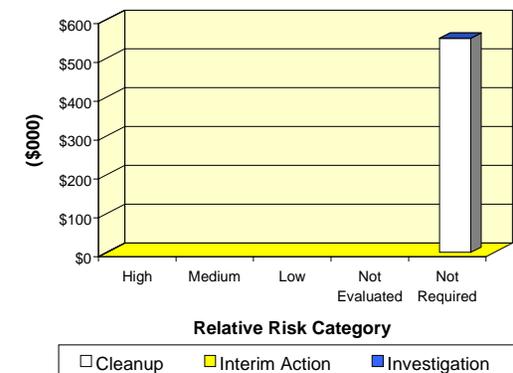
## FY99 Restoration Progress

The groundwater extraction and treatment system continued to operate. Restoration Advisory Board activities with UCAB have been successful, as have continuing partnering efforts with EPA Region 9 and the Arizona Department of Environmental Quality.

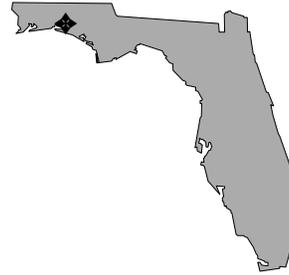
## Plan of Action

- Continue partnership with EPA Region 9 and the Arizona Department of Environmental Quality in FY00
- Continue operating the groundwater extraction and treatment system in FY00
- Continue participation in UCAB in FY00

FY00 FUNDING BY PHASE AND RELATIVE RISK



**FFID:** FL457152412400  
**Size:** 28,824 acres  
**Mission:** Provide advanced F-15 fighter training  
**HRS Score:** 50.00; placed on NPL in March 1997  
**IAG Status:** IAG under negotiation  
**Contaminants:** Petroleum/oil/lubricants, chlorinated solvents, pesticides, metals, PCBs, and general refuse  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$6.4 million  
**Estimated Cost to Completion (Completion Year):** \$19.4 million (FY2006)  
**Final Remedy in Place or Response Complete Date for All Sites:** FY2004



*Panama City, Florida*

## Restoration Background

Tyndall Field was activated in 1941 as the Flexible Gunnery School of the U.S. Army Air Corps. The installation became Tyndall Air Force Base in 1947 when the Air Force became a separate branch of the military. The current mission is F-15 training under the 325th Fighter Wing.

Environmental studies, beginning in FY81, have identified 36 Environmental Restoration Account sites. An FY95 RCRA Facility Assessment identified 58 solid waste management units and 18 areas of concern, many which were under the Installation Restoration Program (IRP). The installation completed RCRA clean-closure activities in 1996. The primary site responsible for the base's inclusion on the National Priorities List (NPL), Site OT029 Shoal Point Bayou, has DDT pesticide contamination.

In FY97, the installation signed decision documents and received No Further Action concurrence from the Florida Department of Environmental Protection (FDEP) and EPA for 11 sites. It achieved site consolidation at two sites. Interim Remedial Actions (IRAs) and Removal Actions were studied or conducted at six sites to reduce risks to human health and the environment. Free-product removal and excavation of contaminants helped eliminate source areas.

The installation partnership with FDEP, EPA, and restoration contractors has evolved into a project team serving as the Technical Review Committee. In FY94 and FY97, there were efforts to establish a Restoration Advisory Board (RAB). Public response indicated a high level of trust and no need for a RAB. A Community Relations Plan (CRP) was completed to inform the public.

The installation is completing study phases to determine appropriate Remedial Actions (RAs) and is conducting IRAs to reduce potential exposure. Recent IRP activities focus on Site Inspections, Remedial Investigations (RIs), and Contamination Assessment Reports (CARs).

## FY99 Restoration Progress

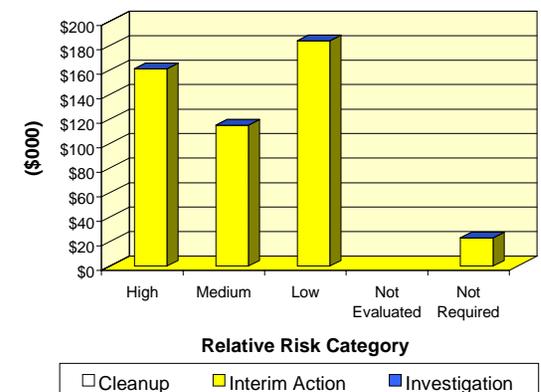
RI characterization fieldwork for LF006, LF007, FT017, and OT029 was completed. A Baseline Risk Assessment (BRA) is under way at all sites. Regulatory concurrence was received for the CARs for Sites SS015, SS019, and FT023, and work on associated Remedial Action Plans began. A preliminary draft Public Health Assessment has been completed, indicating no immediate health concerns or needed RAs. Relative risk classifications were reevaluated, and risk levels were reduced for four sites. A basewide background study was conducted, which identified existing metals values and water levels for future remedial screening.

Natural attenuation (NA) has been evaluated at FT016 and SS019. Neither site qualified for NA under Florida's requirements. A Remedial Action Plan, including a dual-phase extraction system, will be implemented to bring SS019 contamination levels within Florida NA default limits.

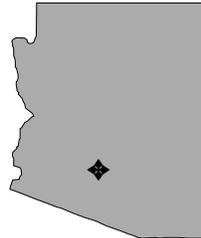
## Plan of Action

- Complete BRA and RI reports for LF006, LF007, SS026, and FT017 in FY00
- Complete a pesticide reference study in FY00
- Receive concurrence on No Further Remedial Action Planned documents for LF002, LF005, LF009, LF010, and OT024 in FY00
- Continue RI/BRA work for OT029 in FY00 and complete by FY01

**FY00 FUNDING BY PHASE AND RELATIVE RISK**



**FFID:** AZ957002858200  
**Size:** 4,042 acres  
**Mission:** Supported pilot training and ground equipment maintenance  
**HRS Score:** 37.93; placed on NPL in November 1989  
**IAG Status:** Federal Facility Agreement signed in 1990  
**Contaminants:** VOCs, petroleum/oil/lubricants, heavy metals, and pesticides  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$43.6 million  
**Estimated Cost to Completion (Completion Year):** \$21.6 million (FY2027)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2000



**Mesa, Arizona**

**Restoration Background**

In July 1991, the BRAC Commission recommended closure of this installation. The installation closed on September 30, 1993.

Before base closure, environmental studies identified 15 sites at the installation. These sites were consolidated into three operable units (OUs). In FY93, an Environmental Assessment of 30 additional areas resulted in creation of two more OUs, including 17 new Installation Restoration Program (IRP) sites. OU1 contains 10 sites; OU2 is the liquid fuels storage area; OU3 consists of Fire Protection Training Area No. 2 and a collapsed stormwater line; OU4 contains 9 sites; and OU5 contains 9 sites. A sixth OU was created by Consensus Statement at the April 1997 Technical Working Group Meeting at Williams (Site SS-17 was moved from OU4 to maintain the OU4 schedule). OU6 is the Old Pesticide/Paint Shop.

Removal Actions and Interim Remedial Actions included removal of buried containers, contaminated soil, and 12 underground storage tanks (USTs). In FY93, a Record of Decision (ROD) was signed for OU2, and the installation began Remedial Design (RD) and Remedial Action activities. Soil at OU2 is being treated by soil vapor extraction (SVE). An Environmental Baseline Survey was completed.

In FY94, a ROD was signed for OU1, and all known USTs and oil-water separators were removed. A free-product extraction system was installed at IRP Site ST-12 (OU2). In FY95, the installation removed a UST from the Airfield Site and removed stained-soil areas, drums, and asbestos-containing material from the Concrete Hardfill Site. Risk assessments were prepared for two sites, and decision documents recommending No Further Action were prepared for five sites at OU5. The installation also completed a

Feasibility Study (FS), a Proposed Plan (PP), and a draft ROD for OU3. At OU1, a landfill cap was installed. In FY94, the installation formed a BRAC cleanup team and a Restoration Advisory Board, and the Community Relations Plan was revised.

In FY96, a ROD was signed for OU3. Treatability Studies (TSs) of free-product removal, natural attenuation, bioventing, and SVE were initiated at OU2. The installation completed Remedial Investigations (RIs) at OU4 and OU5. Oil-contaminated soil at the Civil Engineering Prime Beef Yard Site was removed.

In FY97, an OU3 TS addressing vadose zone contamination, and an Engineering Evaluation and Cost Analysis were completed. RD activities began. The ROD for OU5 was signed. The latest version of the BRAC Cleanup Plan was completed.

In FY98, a focused FS (FFS) for the liquid fuels storage area (ST-12) was initiated. An FS and a PP were completed for OU4, resulting in lead removal, disposal, and capping at the South Desert Village Housing Area. Investigations at SS-17 (Old Pesticide/Paint Shop) showed no contamination in groundwater and no unacceptable risks to human health. A risk assessment at FT-02 (Fire Protection Training Area No. 2) showed that no further action at the site was required. The Air Force and EPA agreed that no further testing for pesticides was required at the Williams Golf Course.

**FY99 Restoration Progress**

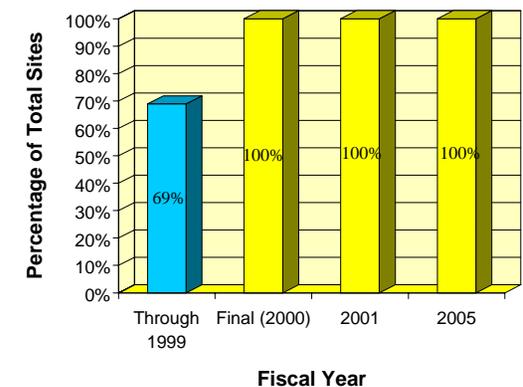
A new contract began for long-term operations and maintenance at ST-12 and LF-04. Investigations began for tetrachloroethene and trichloroethene contamination at LF-04.

The installation obtained one of the necessary agency signatures on the OU4 ROD, with other signatures pending.

**Plan of Action**

- Complete the signature process for the OU4 ROD in FY00
- Obtain all necessary signatures for an OU3 ROD amendment in FY00
- Complete an FFS and a PP for OU2 and begin a ROD amendment in FY00
- Achieve Last Remedy in Place status for OU6 in FY00

**SITES ACHIEVING RIP OR RC PER FISCAL YEAR**



**FFID:** OH557172431200  
**Size:** 8,511 acres  
**Mission:** Serve as host to many organizations, including Headquarters to Air Force Materiel Command  
**HRS Score:** 57.85; placed on NPL in October 1989  
**IAG Status:** IAG signed in March 1991  
**Contaminants:** Waste oil and fuels, acids, plating wastes, and solvents  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$178.2 million  
**Estimated Cost to Completion (Completion Year):** \$43.5 million (FY2028)  
**Final Remedy in Place or Response Complete Date for All Sites:** FY2001



### Dayton, Ohio

### Restoration Background

Past activities at Wright-Patterson Air Force Base created spill sites and unlined waste disposal areas, including landfills, fire training areas, underground storage tanks, earth fill disposal areas, and coal storage areas. Investigations identified 68 sites. Soil and groundwater have been contaminated with volatile organic compounds; semivolatile organic compounds; and benzene, toluene, ethyl benzene, and xylene compounds. Fire training exercises conducted in unlined pits contaminated soil and groundwater with fuel and its combustion by-products. In FY97, two new sites, Contaminated Groundwater Area A/C and Contaminated Groundwater Area B were added to address comingled groundwater plumes and expedite source area site closure.

In FY89, the installation began Remedial Investigation and Feasibility Study (RI/FS) activities for 39 sites. Early in FY92, the installation completed a Removal Action along the installation boundary to intercept and treat contaminated groundwater flowing toward wellfields in the city of Dayton.

In FY94, the Record of Decision (ROD) for Landfills 8 and 10 was approved and the Remedial Design (RD) was completed for capping the landfills. An Engineering Evaluation and Cost Analysis and a Removal Action Plan for all landfills were approved by the regulatory agencies.

In FY95, the installation began constructing a Remedial Action (RA) at Landfills 8 and 10 and performed an Interim Action at Landfill 5 for constructing a landfill cap. A Restoration Advisory Board (RAB) was formed. In FY96, a ROD was completed for 21 sites that required no further action. RD was initiated for Landfills 1 through 4, 6, and 7.

In FY97, RIs were completed at the remaining 10 sites in Operable Units 8, 9, and 11. A bioslurper was installed and began operating at Fuel Spill Site 5. A natural attenuation ROD for Fuel Spill Sites 2, 3, and 10 was completed. The installation continued its involvement as a principal partner in a "Groundwater 2000" initiative to preserve and protect the region's sole-source drinking water aquifer. A landfill cover was completed at Landfill 11.

In FY98, a final ROD was completed for 40 Installation Restoration Program sites. Landfill caps were installed for Landfills 1, 2, 6, 7, and 9, and a french drain was installed at Spill Site 11. The installation completed excavation of the Landfill 12 contents. A Removal Action was designed, and construction work began, at Heating Plant 5.

### FY99 Restoration Progress

A ROD was completed and signed for groundwater, requiring continued pump-and-treat remediation near Landfill 5, RA in Area B to address a localized vinyl chloride plume, and long-term monitoring (LTM) of groundwater conditions basewide. A Treatability Study (TS) was initiated to determine the effectiveness of in situ chemical oxidation in treating the vinyl chloride plume.

A Removal Action was completed at Heating Plant 5. Phase I of monitoring-well abandonment began. A draft delisting petition for the soil portion of the base was prepared. A new source of trichloroethene contamination was discovered at a facility slated for demolition.

The Agency for Toxic Substances and Disease Registry conducted a Public Health Assessment, which concluded that Wright-

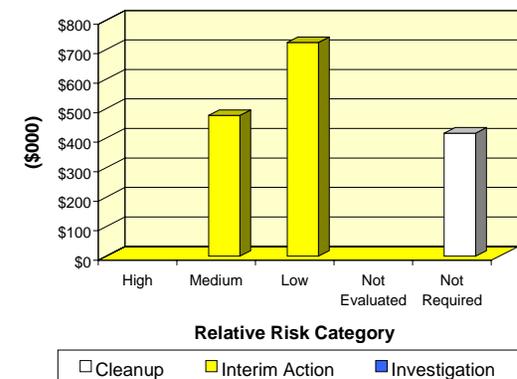
Patterson poses "no apparent public health hazard" and that all mitigating actions are in place to prevent human exposure to contaminants. A project to modify the groundwater treatment system to reduce operating costs was delayed pending results of an in situ oxidation study.

The RAB meets every 3 months.

### Plan of Action

- Conduct Phase II of monitoring-well abandonment in FY00
- Conduct a Removal Action at Building 20059 in FY00
- Conduct a Preliminary Assessment and Site Inspection at Building 20079 in FY00
- Complete the TS for in situ oxidation for the TCE plume in FY00
- Achieve partial delisting from the National Priorities List in FY00
- Continue operations and maintenance and LTM activities in FY00-FY01
- Modify the groundwater treatment system to reduce operation and maintenance costs in FY02

### FY00 FUNDING BY PHASE AND RELATIVE RISK



**FFID:** MI557002427800  
**Size:** 4,626 acres  
**Mission:** Conducted tactical fighter and bomber training  
**HRS Score:** 50.00; proposed for NPL in January 1994  
**IAG Status:** None  
**Contaminants:** Jet fuel and waste oil, spent solvents, VOCs  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$36.8 million  
**Estimated Cost to Completion (Completion Year):** \$14.4 million (FY2031)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2001



### Oscoda, Michigan

## Restoration Background

In July 1991, the BRAC Commission recommended closure of Wurtsmith Air Force Base, transfer of KC-135 aircraft to the Air Reserve Component, retirement of the assigned B-52G aircraft, and inactivation of the 379th Bombardment Wing. The installation closed on June 30, 1993.

Sites at the installation include a waste solvent underground storage tank (UST), bulk storage areas for petroleum/oil/lubricants (POL), aboveground storage tanks (ASTs), fire training areas, and an aircraft crash site. Volatile organic compounds (VOCs) at the installation include trichloroethene; dichloroethene; vinyl chloride; and benzene, toluene, ethyl benzene, and xylenes, all of which primarily affect groundwater.

Interim Actions at the installation provided drinking water to potentially affected communities in the area. Air strippers were installed to treat groundwater contaminated with VOCs. Remedial Actions (RAs) included implementation of three groundwater extraction and treatment systems with air stripping capabilities. The installation's BRAC cleanup team, which formed in FY94, developed a BRAC Cleanup Plan.

In FY95, Supplemental Environmental Baseline Surveys were completed. Draft Feasibility Studies (FSS) were completed for seven sites, and the installation obtained the concurrence of the regulatory agencies on nine sites designated for no further action. In addition, the installation conducted Relative Risk Site Evaluations at all sites. An RA for removal of eight USTs and most of the piping for the hydrant refueling system also was completed. Additional Interim Actions included removal of the hydrant refueling system and closure of five oil-water

separators. The installation also installed groundwater monitoring wells.

During FY96, the installation removed 38 USTs and 10 ASTs. Three large bulk fuel tanks were dismantled. Two of the three sewage treatment plant lagoons were closed and the sludge removed. The installation submitted No Further Remedial Action Planned decision documents for seven sites. Bioventing was implemented at the former POL storage yard to degrade semivolatiles in the soil.

In FY97, design began on an enhanced in situ bioremediation process for groundwater at LF30/31. Through the Restoration Advisory Board (RAB), the installation obtained stakeholder concurrence on the Remedial Action Plan (RAP) for LF30/31. Field investigations at Landfills 62 and 63 indicated that no further action is required. The water and sewer systems ceased operating, but physical closure was cancelled at the request of the Township of Oscoda so that the plant could be used as a municipal sewage treatment plant.

In FY98, investigations were completed for 7 sites and 31 areas of concern. Intrinsic remediation monitoring systems were completed for ST-41, SS-42, and SS-51. Air-sparging and soil vapor extraction wells were installed at SS-06 and SS-08. Regulatory concurrence was obtained on a draft report for two landfills.

## FY99 Restoration Progress

The Remedial Design (RD) for OT-24 was completed. The RD for LF30/31 was terminated after a Treatability Study indicated it would not be as successful as predicted in the FS. The RD for FT-02 was delayed, and a change in technology to natural

attenuation is being considered. Regulator comments delayed completion of the RD for OT-16.

An Interim Action was executed to remove sand discolored by the venting groundwater from LF30/31 from the beachfront of the off-base YMCA camp. This sand was not a health hazard but was an aesthetic issue and had an economic impact on YMCA business. New free product recovery pumps at the Benzene Plant removed several thousands of gallons of fuel (JP-4) from the water table, which is expected to significantly reduce overall cleanup time.

Regulator concurrence has been obtained on approximately 85 percent of all decision documents, with outstanding issues on LF30/31 and FT-02. Development of a consolidated RAP document is under way.

The RAB met twice.

## Plan of Action

- Complete FS for LF30/31 in March 2000
- Sign decision document and initiate RD for LF30/31 in FY00
- Complete construction on RA system for OT-24 in FY00
- Complete consolidated RAP document and obtain regulator concurrence in FY00
- Complete construction of RA system for OT-16 in FY00
- Complete construction of RA systems for LF30/31 and FT-02 in FY01

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR

