

SUCCESS STORY

RAF Lakenheath - MARCH 2001



PRO-ACT

A Base-level Pollution Prevention Resource sponsored by HQ Air Force Center for Environmental Excellence



SPOTLIGHT ON: RAF Lakenheath

Introduction

Royal Air Force (RAF) Lakenheath, United Kingdom (U.K.), home to the 48th Fighter Wing, is located approximately 70 miles northeast of London. The 48th Fighter Wing (FW) motto "Done Right – First Time – On Time" goes hand-in-hand with the wing's mission, to provide responsive air combat power, support, and services. RAF Lakenheath is the largest U.S. Air Force-operated base in England, residence to the only F-15 fighter wing in United States Air Forces in Europe (USAFE), and USAFE's only lead Air Expeditionary Force Wing. The 48th FW was originally known as the 48th Bombardment Group in 1941, with its home at Savannah Air Base, GA. In 1948, with P-47 aircraft in tow, the 48th Fighter-Bomber Wing moved to Chaumont Air Base, France, where they were re-named the "Statue of Liberty Wing" in 1954. Since the 48th FW moved to Lakenheath, U.K. in 1960, it has participated in over 11 deployment missions, including Operation Desert Shield/Desert Storm, Operation Allied Force, Operation Northern Watch, and Operation Deliberate Space Force. In the past, the wing has used several aircraft including the A20, A36, P-47, F-100, F-111 and F-4. Currently, RAF Lakenheath is home to two squadrons of F-15E Strike Eagle's and one squadron of F-15C Eagle's. The F-15C is considered the world's most capable air-to-ground, precision strike fighter, and the F-15E is deemed the world's premier air-to-air superiority, all-weather fighter. Together, these three squadrons are recognized for their ability to, "provide an air combat capability never before seen in the history of airpower."

Team RAF Lakenheath

The 48th FW consists of four major organizations with over 5000 personnel: the 48th Support Group (SPTG), Logistics Group (LG), Medical Group (MDG), and Operations Group (OG). Nearby RAF Feltwell, located approximately 10 miles north of the main base, is also part of the RAF Lakenheath team; RAF Feltwell contains a Department of Defense Education Activity (DoDEA) and Department of Defense Dependents School (DoDDS). The 48th Civil Engineering Squadron,

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under the 48th SPTG, is home to the Environmental Management Flight (48th CES/CEV), led by Flight Commander Captain Lori Kabel, DSN 226-3990.

The 48th CES/CEV maintains working relationships with representatives from organizations within and outside the installation, to ensure that protection of the environment, culture, history, and health are incorporated into each aspect of the wing's mission. RAF Lakenheath's Environmental Protection Committee (EPC) meets quarterly to discuss the status of all environmental programs, address findings from various inspections, and award personnel for environmental contributions and efforts.

Preservation of Natural and Cultural Resources

RAF Lakenheath's EPC works with the Defence Estates, a business unit of the Ministry of Defence (MOD), to form a cohesive team to protect environmental and cultural resources on the installation. The MOD is a government entity that owns approximately 593,000 acres of land throughout England, including RAF Lakenheath, and is responsible for providing defense capabilities for the U.K. and overseas territories. Most MOD sites contain indigenous species of chalk grassland and limestone pavements, rare wildlife, ancient monuments, and buildings. It is the Defense Estates' responsibility to "provide efficient, professional, and cost effective management" of the MOD estate. Many installations, including RAF Lakenheath, contain "sites of special scientific interest," which are special protection/conservation areas. At RAF Lakenheath, conservation of natural history, archaeology, and the environment,

including management of agriculture and forestry, are all areas of concern to the Defense Estates. Mr. Alan Cunningham, the Defence Estates liaison at RAF Lakenheath, Environmental Management Office, assists the CEV flight by working with local statutory bodies such as English Nature, to ensure that activities with environmental impacts are conducted properly.

Awards

Mr. Mike Hastings, Conservation Program Manager, 48th CES/CEV, DSN 226-3990, has contributed greatly in the effort to identify and protect the archaeological and historic properties on RAF Lakenheath. He received Honorable Mention at the Air Force level for the General Thomas D. White Cultural Resources Management Award for Individual Excellence for 1999 and 1998. He was also a team member of the flight who received the General Thomas D. White Cultural Resources Management Team Award for USAFE. Together with Defense Estates representative Mr. Cunningham, Mr. Hastings has carefully administered what is considered the "most diverse and complex cultural assets in the Department of Defense (DoD)."

Archaeological Finds

The land now occupied by RAF Lakenheath has been inhabited since around 10,000 B.C. To date, there are 20 archaeologically recorded and preserved sites on the installation. Digs performed at RAF Lakenheath include discoveries from the Neolithic, Bronze, Iron, Saxon, Roman, Medieval, and Modern Ages. Items such as beads, spears, pottery, and bones are given to the proper government authorities for preservation. More than 350 skeletal remains have been found on the installation since 1957. During the 1997 construction of USAFE's largest dormitory at RAF Lakenheath, 261 graves were discovered. One grave contained an intact Saxon warrior buried fully armed, along with his horse. By 1999, another horse and



Saxon Warrior with Horse

rider, and 50 other Saxons were disinterred from the new Skills and Development Center project site. The buried horse, discovered in 1999, is the only known archaeological find in the U.K. to contain a fully outfitted horse, complete with bridle. This type of burial method is thought to be an ancient pagan ritual intended to prepare the warrior for his next life. The site was of specific interest to archaeologists and historians because it demonstrated the method by which horse bridling and saddling was done during the Saxon time period, approximately 1500 years ago. Due to the successful relationship established between the installation and local entities, such as Defense Estate, the Suffolk County Council, and the County Archaeological Team, Mr. Hastings was permitted to conduct tours of the various dig sites for schools and base personnel. A showcase of over 80 of the artifacts found on these sites was also used to share the area's past history.

Promoting Environmental Awareness

Earth Week is a well-planned environmental awareness event at RAF Lakenheath. It is planned by a committee comprised of individuals from RAF Lakenheath, RAF Feltwell and RAF Mildenhall, who begin planning the event as early as January each year. "Preserving the Earth for the Next Millennium" was the theme for the 2000 celebration. For additional information on Lakenheath's Earth Day and Earth Week celebrations, contact Ms. Jean Dennett, Administration Officer, 48th CES/CEV, DSN 226-3990, secretary of the Earth Day Committee.

Earth Day/Week Events

Earth Day 2000 kicked-off with the "Lakenheath Warren Clean-Up," where participants assisted in collecting litter from a former rabbit farm, or warren, adjacent to RAF Lakenheath. Throughout the week, participants enjoyed face painting, recycling competitions, and a poem and poster contest. The installation also mobilized an environmental display trailer that provided information on environmental awareness and prizes to children. On "Community Day" or "Garden Clean-Up Day," participants help clean-up gardens for local elderly and disabled citizens. Additionally, the base sponsors a Golf Tournament to generate revenue to help fund Earth Week events. The last day of Earth Week, "Green Wheel Day," is dedicated to encouraging base personnel to walk, ride bikes, or car pool to work. Other events celebrating Earth Week and promoting environmental awareness are summarized below.

Story Time - *Trevor the Tree*, an environmental awareness story, is a favorite at the Child Development Center. Written by Mr. Rex Keegan at RAF Lakenheath, the story's main character is a small Oak tree named Trevor. It teaches an environmental lesson by illustrating the effects of deforestation on ecosystems. When the story is read to the children, cutouts are placed on a flannel board to help illustrate the story. For a copy of *Trevor the Tree*, please contact PRO-ACT at DSN 240-4215.

Pond Dipping - Over 250 school children participated in "Pond Dipping," an event held at Peacekeeper Park. Children are given small nets to dip in the pond to capture examples of indigenous aquatic creatures. Local experts were available to identify the children's "finds" as insect, fish, or amphibian. The children are also provided with magnifiers, to examine their findings, and can identify species by using a "bug dial." The dial rotates and classifies insects based on the tail, number of legs, and how it moves (flying, crawling, etc.). The "finds" are then returned promptly to their habitat. Although hosted by the base, the event is a joint effort with support from several area organizations.

RAF Feltwell. The Liberty Wing Recycling Program is managed as if it were a commercial business and is the only USAFE base recycling program that is paying for itself with revenues collected from in-house recycling. Currently, the program is achieving revenue of approximately \$90,000 per year, and is actually avoiding a cost of \$150,000 by conducting the program "in-house." Participation in recycling in 1999 resulted in the diversion of over 2,800 tons of solid waste. This equates to a 50% solid waste diversion rate from the FY 98 baseline, far above the required 40% DoD goal (which does not need to be met until 2005).

The Liberty Wing Recycling Program utilizes six people and three trucks to perform three weekly pick-up routes around the installation. Curbside recycling is also provided to over 800 military family housing units and 200 industrial areas every two weeks. Last year alone, between 2,500 and 3,000 tons of would-be waste were picked up through the curbside program. After waste is collected, each item is evaluated to determine if there is a possible second use. The efforts of the 48th CES/CEV group have not gone unnoticed. In 1999, the group won the General Thomas D. White Recycling Award for the Non-Industrial Division. For his specific endeavors, TSgt Berdis also received the General Thomas D. White Honorable Mention Air Force Award for Individual Excellence in Recycling.

Energy Conservation

At RAF Lakenheath, October is dedicated to motivating the installation to be "energy conscious." Events planned for the month are designed to create a general base awareness of energy conservation, and instill a desire to help conserve natural resources. During energy awareness month, a poster contest is held for base residents. Entrants submit pictures of energy saving practices such as turning lights off, hanging clothes to dry, and turning water faucets off. According to Captain Brech, Chief, Maintenance Engineering, 48th CES/CEOM, DSN 226-5370, a significant drop in wattage usage occurs following the event. Energy saving posters are distributed from the Maintenance Engineering office throughout the installation to remind office personnel to use low-wattage light bulbs and purchase energy-efficient appliances for buildings.

Recycling Program

RAF Lakenheath's commitment to the environment is well represented in their recycling program. Technical Sergeant (TSgt) Dave Berdis, 48th CES/CEV, DSN 226-3990, manages the Resource, Recovery, and Recycling Program (RRRP), also known as the Liberty Wing Recycling Program, for RAF Lakenheath and

Program Details

The recycling staff has placed recycling bins at various locations throughout the base, each properly labeled for the products that should be placed in them. One bin is designated for newspapers and magazines; another bin is for tin cans, aluminum cans, and plastic containers (without caps). A brown bin is designated for organic waste such as grass cuttings, leaves, fruit and vegetables, eggshells, bread, and coffee grounds. Cardboard, glass bottles, wood pallets, computer discs, and aerosol spray cans need to be dropped off at the recycling center. Scrap metal is collected and sorted



Recycling Collection Point

by type, and home compost kits are distributed throughout military family housing at RAF Feltwell for the collection of organic waste. The combined results of these efforts have reduced landfill waste by about 20% in the last year.

One of the more distinctive efforts of the RAF Lakenheath recycling program involves recycling of textiles and used clothing. Personnel at RAF Lakenheath and RAF Feltwell have the opportunity to recycle used clothing and shoes by placing them in separate bags for pick up by the recycling staff. The articles are first brought to the Airman's Attic at RAF Lakenheath to determine if they are reusable on the installation. If not, the articles are packaged and shipped through a British textile recycler to third world countries for distribution to the poor. If this is not a feasible option, the articles can be reused as insulation for automobiles, reused in the making of blankets, or shredded and used for rags. In 1999, RAF Lakenheath was able to recover approximately 23,500 pounds of textiles.

Recycling How-To Guide

The recycling staff realized that to maintain a successful program, education of the base population was essential. A *How-To-Recycle* guide was created for personnel at RAF Lakenheath and RAF Feltwell. Briefly, the guide explains that recycling is mandatory on military installations according to Air Force Instruction (AFI) 32-7080, *Pollution Prevention Program*, 12 May 1994. The guide further explains the types of items that can be recycled and the location of drop-off points around the installation. Additional information is provided for recyclable items that must be cleaned, crushed, or have caps removed. Lists of items that cannot be recycled are also included in the guide with a brief explanation of the reason the items are not recyclable. The guide also includes information about recycling old clothing, composting Christmas trees, and drop-off points for recyclables in the local community, the Forest Heath District Council area. RAF Lakenheath personnel work closely with the local council environment team on recycling and waste management.

Promoting Recycling

The U.K.'s Forest Heath District Council recognizes the need for children to be educated on the benefits of recycling. To keep the children's interest, the council created a recycling mascot, Cyril the Squirrel, to promote recycling concepts to local school children and communities. TSgt Berdis observed the success the council was having with Cyril, and with the council's approval, Sammy the Squirrel, Cyril's American

"cousin" was created to team up with Cyril and promote recycling to RAF Lakenheath children.



Sammy the Squirrel with TSgt Berdis

Pollution Prevention

RAF Lakenheath uses pollution prevention (P2) practices to reduce and eliminate the use of hazardous materials and releases of pollutants into the environment. The installation has aggressively identified hazardous waste streams, and the processes generating them to determine if economical P2 solutions exist. RAF Lakenheath has exceeded waste reduction and elimination targets every year, even with 66 waste streams, 45 satellite accumulation points (SAPs), and 1 hazardous waste site. Mr. Rich Allen, 48th CES/CEV, DSN 226-3990, Hazardous Waste Program Manager, provided information about several improvements made on the installation to lower hazardous waste quantities.

Rapid Runway Repair

A major environmental success at RAF Lakenheath involved the reutilization of over 2,500 Rapid Runway Repair (RRR) wartime-contingency chemical kits. The kits contained over 40 tons of chemicals in a two-part powder/liquid form that were stored for runway damage repair during war-time operations. The kits were past their expiration date, and were slated for disposal as hazardous waste. Mr. Allen researched local companies and found a manufacturer who could use the powder portion of the kits in their acrylic flooring process. Additionally, the manufacturer agreed to ship the remainder of the product they were unable to use back to its original producer. The company, Acryliccon U.K. Ltd., picked up all the kits and saved the base over \$26,000 in disposal costs.

DRMO

A new contract established in December 1999 between RAF Lakenheath and the Defense Reutilization and Marketing Office (DRMO) allowed for the recycling of several products that were once disposed of as hazardous waste. Some of the items now being recycled at RAF Lakenheath include lithium, Ni-cad, magnesium, mercury, carbon zinc, alkaline and lead acid batteries, anti-freeze, fluorescent tubes, and paint. Recycling of these items is expected to reduce the total annual hazardous waste generated by 70%.

Skips

At RAF Lakenheath, skips are an economical alternative to storing hazardous waste in 55-gallon overpack drums. A skip is a sealed and locked rain-proof disposal dumpster that holds 20-drums worth of hazardous waste product. A single 55-gallon drum costs approximately \$35, while a skip costs \$77, resulting in a saving of over \$3,000 during the first quarter of 2000. Using skips instead of 55-gallon overpack drums is also less labor-intensive.

Corrosion Control

The 48th FW Corrosion Control Shop, in cooperation with 48th CES/CEV, researched and implemented several P2 alternatives over the last few years. One of the more efficient alternatives is the purchase of a solvent recovery system, which enables the shop to recycle all waste paint and paint thinners. The thinner is reclaimed, and paint waste is turned into solidified sludge. The process reduces hazardous paint waste from 800 to 400 gallons per year. Over \$1,600 per year is saved by recycling used thinner.

Other P2 solutions implemented at the Corrosion Control Shop include the new Sponge Jet method of paint removal and the Alodine dip tank. The Sponge Jet, used instead of bead blasting or other similar



Sponge Jet

methods, reduces the amount of paint dust particles in the air, which in turn means less dust in the air filters, and a reduced quantity of filters turned-in annually as hazardous waste. The Sponge Jet paint removal machine sprays small pieces of sponge at a high rate of speed at equipment like Aerospace Ground Equipment (AGE). The sponge pieces can then be scooped up and reused up to 10 times before disposal.

Purchase of an Alodine dip tank for use in the Corrosion Control Shop has reduced Alodine usage from 40 to 10 gallons per year. Aircraft parts and AGE equipment parts can now be dipped in this tank rather than pouring small amounts of Alodine directly on the part to be cleaned. The Alodine waste stream was reduced from 80 to 20 gallons per year.



Alodine Dip Tank

Transportation

In July 1998, a pollution prevention opportunity assessment (P2OA) was conducted at the 48th Transportation Shop, resulting in the replacement of a 50 year old paint booth. The old booth used a waterfall system that sucked paint overspray into the water, which then had to be disposed of as hazardous waste. Dust was also drawn into the paint booth, and subsequently onto anything being painted, creating a need for "re-sprays." These problems made it necessary to use large volumes of water, resulting in a larger hazardous waste volume. The old paint booth was also too small to accommodate some of the larger vehicles in the RAF Lakenheath fleet, meaning that vehicles were either painted one-half at a time or sent to a contractor for painting, which could cost as much as \$33,000 per year.

RAF Lakenheath was able to procure an unused 60-foot paint booth from another RAF installation. The new booth has doubled painting capability and has a larger, more efficient, draw down system that uses

two independent configurations of filtration so one end of the booth can be used for one project while the other end can be used for another. The new paint booth uses less paint, thereby diminishing the contaminated water/paint hazardous waste stream. The booth also has a computerized heating, filtration, and airflow system, which allows paint to dry within one hour.

Oil/Waste Separator

The Liquid Fuels Maintenance Shop recently purchased an oil/water separator (OWS) to minimize a large hazardous waste stream and the associated handling and disposal expenses. The shop was using a contractor to remove rainwater and fuel slicks from the berms and dikes surrounding the fuel tanks, which was subsequently disposed of as hazardous waste. The fee of \$1,400 per month to perform this service was considered extremely expensive since the majority of this mixture consisted of water. Now the OWS separates oil and fuel from the water, allowing the clean water to be released back to the environment. The remaining oil/fuel mixture is disposed of as hazardous waste. Start-up cost of the OWS was approximately \$20,000, with an expected savings of approximately \$33,000 per year. For more information contact Staff Sergeant (SSgt) Jarrod Thomas, 48th Civil Engineering Squadron, Liquid Fuels Maintenance (CES/CEOIL), DSN 226-1324.

Fuel Spill Reduction

Liquid Fuels Maintenance Shop also identified a P2 opportunity regarding refilling operations of aboveground storage tanks (ASTs), and other generator tanks. Fuel was spilling during refilling operations, which prompted shop personnel to conduct a study that identified two processes where the fuel spilling could be avoided, consequently eliminating personal and environmental hazards associated with fuel spills.

- **Process I** - While filling ASTs, fuel was becoming trapped between the hose connection and the fill pipe valve. Once the connection was broken, the fuel remaining in the connector spilled out into a tank bund/dike. To prevent this potential environmental problem, shop personnel installed dry break connections at the fill lines, which prevented the fuel from remaining in the connector piece, so that when disengaged, no fuel remained in the connector to be spilled.
- **Process II** - The volume gauges on generator fuel tanks were beyond their life cycle, and replacement parts were no longer available, causing fuel to spill during tank filling. Shop

personnel purchased new uniform volume gauges for the fuel tanks that eliminated the need to guess fuel quantity when refilling generator tanks. The base-wide upgrade to these new gauges has greatly reduced the frequency of tanks being overfilled due to unknown fuel quantities in the tanks.

Another problem area reviewed by the Liquid Fuels Maintenance Shop involved the calibration of fuel dispensing units (gas stations). The shop decided to perform calibrations in-house instead of using a contractor. By purchasing their own calibration units called Prover Cans, RAF Lakenheath will see a savings of approximately \$1,600 in the first year alone, with a recurring cost savings of \$4,000.00 thereafter. For more information contact SSgt Jarrod Thomas, 48th CES/CEOIL, DSN 226-1324.

HAZMART Pharmacy

The Hazardous Materials Pharmacy (HAZMART) at RAF Lakenheath maintains the largest hazardous materials USAFE account. HAZMART personnel manage and maintain six warehouses with over 35,000 hazardous material line items at a value of more than \$450,000. The HAZMART Pharmacy services 397 shops on RAF Lakenheath, as well as numerous individual users. The HAZMART Pharmacy uses a custom-engineered chemical separation system, the Hazardous Characteristic Code (HCC) Segregation Method, to identify and divide the chemical inventory. Previous to the implementation of this system, the HAZMART Pharmacy segregated all chemicals by "like" containers. The HCC method ensures that all hazardous items are segregated by their chemical composition as required by Air Force Joint Manual (AFJMAN) 23-209, *Storage and Handling of Hazardous Material*, 13 January 1999. The system is supported by an automated stock number user directory function that performs weekly verifications of each warehouse's items and flags those that could potentially be improperly warehoused. The HCC system, in conjunction with the automated directory, also provides HAZMART personnel with a ready reference of hazardous material inventory to determine all possible warehouse locations available for storage of new hazardous materials. The creation and implementation of the HCC method has provided a safer working environment by reducing the possibility of potential explosions and fires resulting from improper storage of hazardous materials. Additionally, the costs associated with this process were limited to the man-hours of HAZMART personnel, who performed the

research, created, planned, and implemented the systems. For more information on the HCC system, contact TSgt Thomas Leggett, 48th SUPS/LGSDH, DSN 226-2175, Non Commissioned Officer in Charge (NCOIC).

UST Program

In 1992, the *Overseas Environmental Baseline Guidance Document* (OEBGD) identified a requirement to remove or replace all underground storage tanks (USTs) in order to be in compliance with AFI 32-7044, *Storage Tank Compliance*, 25 April 1994. All existing USTs are to be properly closed if they are not needed, or they must be upgraded or replaced to meet the new UST requirements by 2004. All new USTs (those constructed after 1 October 1994) must demonstrate that they are "protected from corrosion, provided with spill/overflow prevention, and have incorporated leak detection methods." This is also echoed in the Final Governing Standards (FGS) for the United Kingdom. With these instructions in mind, Ms. Adele Turner, 48th CES/CEV, DSN 226-5982, established a tank identification program and initiated a tank removal process for all unused tanks. RAF Lakenheath has identified 176 USTs with capacities ranging from 300 to 3,000,000 gallons. Tanks may be empty, or filled with anything from fuel, hazardous waste, or water. All the identified USTs have been programmed for removal or replacement, and current status indicates that RAF Lakenheath will be finished with this process in early 2003, well before the 2004 deadline.

There are currently 37 USTs in the process of being removed or replaced. Additionally, there are some empty tanks that cannot be removed, so they are cleaned and filled with either foam or concrete and abandoned in place. The tank removal plan is progressing quite well due to the relationship established with the contractor performing the work. Ms. Turner constructs Statements of Work (SOWs) specific to each tank removal project, and works closely with the contractor to identify exactly what needs to be accomplished at each site. Due to the numerous "sites of special scientific interest" locations on the installation, Ms. Turner has to be very careful with the removal of the USTs, especially when it involves excavation of the surrounding soil. Since some of the

soil contains various species of flora that are the only viable population left in the U.K., the 48th CES/CEV and Bioenvironmental worked together to perform extensive soil sampling. Only soil with fuel contamination that exceeds 1000 parts per million (ppm) is taken off site. Contractors are briefed that close monitoring of the soil is imperative. This has saved RAF Lakenheath in excess of \$50,000 in backfill materials as well as contaminated soil disposal costs.

Team Success

Team RAF Lakenheath continues to provide a forum for environmental education and awareness for base personnel and the public. By incorporating pollution prevention into missions and day-to-day base operations, there have been significant reductions in quantities of solid and hazardous waste as well as a reduction in disposal costs. RAF Lakenheath has been successful in using new innovative technologies to make necessary practices more environmentally friendly. Team RAF Lakenheath's most recognized accomplishment has been the relationships formed between U.K. officials and the public to promote environmental education and protect the valuable historical, cultural, and environmental resources of the United Kingdom.



Team RAF Lakenheath

Left to Right: Mike Hastings, Alan Cunningham, Jean Dennett, Adele Turner, Clive Nicholls, Rich Allen.

The AFCEE Team - Recognized as a customer-oriented leader and the preferred provider of environmental, planning, design, and construction services.

Pollution Prevention Success Stories - RAF Lakenheath, March 2001

Need more information? Contact PRO-ACT at DSN 240-4214, (800) 233-4356, or pro-act@hqafcee.brooks.af.mil.



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