

# POLLUTION PREVENTION - INDIVIDUAL/TEAM

## TINKER AIR FORCE BASE, OK





**INTRODUCTION**

Tinker Air Force Base (TAFB), home of the Oklahoma City Air Logistics Center (OC-ALC), provides worldwide technical logistics support to Air Force and Navy weapon systems. TAFB manages 2,261 aircraft, including the B-1, B-2, B-52, C/KC-135, and E-3, and an inventory of approximately 23,000 jet engines.

TAFB is the largest industrial employer in the state, with more than 25,000 civilian and military employees and an economic impact of \$2.53 billion on the six counties surrounding the installation. Complementing TAFB’s dynamic defense mission is its mission of environmental restoration and protection. Tinker’s Environmental Management (EM) Directorate is the active steward of the base’s water, soil, plant, and animal resources, including three creek systems, 15 base ponds, more than 280 species of plants, and 220 species of fish and wildlife. EM is responsible for ensuring environmental compliance is considered at each level of installation decision making and surrounding communities are properly notified of environmental activities taking place at Tinker Air Force Base.

**BACKGROUND**

TAFB’s complex industrial manufacturing processes, aging infrastructure, and ever changing environmental regulations all pose significant environmental challenges to its dual mission of military readiness and environmental stewardship. A fundamental component of the EM Directorate in support of the environmental mission is the Tinker Pollution Prevention (P2) Team.

The P2 Team has focused its efforts on addressing Tinker’s significant environmental aspects: air emissions and hazardous waste. Using the Compliance through Pollution Prevention (CTP2) tool, the highest environmental cost and risk sites are addressed using process specific opportunity assessments (PSOAs). The PSOA studies the entire process and addresses hazardous materials, wastes, energy, and labor. By using this tool, opportunities can be identified that are mutually beneficial to the environment and the base mission.

The Tinker Pollution Prevention Team consists of the following core members:

- Mr. Bede Ley, Chief, Environmental Depot Maintenance Support Branch, OC-ALC/EMPD
- Ms. Patti Shreve, Environmental Engineer, OC-ALC/EMPD
- Mr. Freddie Hall, PhD, Environmental Engineer, OC-ALC/EMPD
- Mr. Steve Potes, Environmental Engineer, OC-ALC/EMPD
- Ms. Van Nguyen, Environmental Engineer, OC-ALC/EMPD
- Mr. Jeff Kindschuh, PE, DEE, Environmental Engineer, OC-ALC/EMPD
- Mr. Roger Ward, Environmental Protection Specialist, OC-ALC/EMOE
- Mr. Kim Kline, Environmental Protection Specialist, OC-ALC/EMOE
- Recycloman and Recyclowoman, Tinker AFB Recycling Superheroes

**POSITION DESCRIPTION**

Bede Ley serves as TAFB’s Pollution Prevention Program Manager. He is responsible for program planning and budgeting. He oversees execution of all pollution prevention projects.

Patti Shreve is the base Environmental Management System (EMS) Coordinator. She has proven instrumental in installation EMS implementation including developing the base environmental policy statement and list of aspects and impacts. She concurrently manages the CTP2 program, the associated compliance site inventory (CSI), and PSOAs.

Freddie Hall, PhD, is TAFB’s water treatment technologies expert. He was crucial to the upgrade of processes at Tinker’s Industrial Wastewater Treatment Plant (IWTP). Dr. Hall has published numerous articles on advancements made in water treatments and is sought after nation-wide to participate in subject conferences.

Steve Potes, a key member of the P2 Team, provides environmental engineering support by identifying and programming pollution prevention projects for the Commodities Production Division. Projects managed by Potes include the implementation of powder coating, the replacement of solvent cleaners, and replacing ozone depleting compounds.



Van Nguyen is an environmental engineer supporting the Aircraft Production Division. She has been integral in efforts to replace alodine, qualify handheld laser paint stripping, and implementation of lean projects. In addition, she is the environmental point of contact for the Aircraft Rapid Improvement Team.

Jeff Kindschuh supports the Maintenance Environmental, Safety, and Occupational Health Office. He employs a programmatic stance to handle various maintenance issues and was vital in the development of standardized policies and procedures for the Maintenance Directorate.

Roger Ward is Tinker's Solid Waste Program Manager. His direct supervision of the EM fluorescent tube universal waste program is a model for the installation. Moreover, Mr. Ward initiated a program to divert 100 tons of wood pallets from landfill disposal.

Kim Kline is the Recycling Program Manager. He has spearheaded various projects to boost recycling areas across the installation. His efforts increased the types and quantities of materials being recycled at TAFB.

Two very important members of Tinker's P2 Team are Recycloman and Recyclowoman, TAFB's recycling superheroes. They use their superpowers for good by promoting recycling and raising base environmental awareness.

## AWARDS AND SERVICES

TAFB received prestigious awards during the achievement period for developing and implementing the best pollution prevention program within the major command, the Air Force (AF), and among all federal agencies.

The 2004 Air Force Materiel Command (AFMC) P2 Award and 2004 Air Force General Thomas D. White Pollution Prevention Award for Team Excellence are highly esteemed honors. These awards recognize outstanding achievements in reducing or eliminating waste streams and pollution throughout base operations, including reducing the use of ozone-depleting substances (ODS) and other hazardous chemicals, and fostering pollution prevention awareness.



Recycling Program Manager, Kim Kline, led a systematic recycling initiative lauded by the Office of the Federal Environmental Executive, capturing a White House Closing the Circle Award for TAFB.

Van Nguyen was selected as the 2004 EM Employee of the Year for her pollution prevention related projects for the Aircraft Production Division. These projects, involving paint and repaint processes, are environmentally beneficial and provided an improved process for the affected shops.

Members of the P2 team are active in many professional organizations and committees. Jeff Kindschuh serves as a member of the Society of American Military Engineers (SAME) Oklahoma City Post Readiness Committee. Others on the P2 team are also active in SAME. In addition, Tinker is a charter member of the Oklahoma Military Environmental Group and Central Oklahoma Clean Cities.

## ACCOMPLISHMENTS

### MATERIAL SUBSTITUTION

Each member of TAFB's P2 Team has made significant contributions to the installation's environmental program, specifically within the pollution prevention field. By supporting a myriad of pollution prevention initiatives, the P2 Team has helped the installation achieve significant gains in material substitution.



**Powder coating at TAFB drastically reduces hazardous compounds.**

TAFB implemented powder coating in two paint shops resulting in a 90% volatile organic compound (VOC) reduction and \$180,000 in annual savings. The replacement of high VOC paints with powder coating

reduces flow time by a factor of five to one, improves durability, and decreases the compliance burden. Implementation of this zero VOC/zero



hazardous air pollutant (HAP) coating was a cooperative effort between the P2 Team, the Maintenance Directorate, system engineers, and the AF Research Laboratory. Two additional powder coating booths are being installed based on the success of this demonstration.

TAFB further reduced VOCs by 16 tons through incorporation of an alternative cleaner called Hurrisafe 9065. This aqueous based cleaner is a drop-in replacement for PD-680, MEK, acetone, and isopropyl alcohol. By working with process and system engineers, the product was approved for use on air accessories, constant speed drives, and aircraft components. The improved process has produced cleaner parts, fewer rejects and benefited the environment.

### PROCESS MODIFICATION OR IMPROVEMENT



Process improvements at IWTP result in greater cost savings for the AF.

Under the direction of Dr. Hall, TAFB vastly improved sludge dewatering at the IWTP through the reduction of hazardous waste disposal by 6.9 million pounds. This is Tinker's largest waste stream, and more than 90 percent

of Tinker's hazardous waste volume was eliminated, resulting in \$1.3 million in annual savings.

TAFB also executed innovative methods to recycle plating wastewater treatment sludge by sending it to a metal recycler. This same process can be used for plasma spray and grinding dust. When fully implemented, more than 84,000 pounds of wastewater sludge will be diverted from landfills.

A collaborative effort between the P2 Team and the Installation Restoration Program resulted in an outstanding base-wide composting program. Grass and leaves are composted with fuel contaminated soils to speed remediation, reducing time and cost. Soils are then reused, resulting in the diversion of 30 tons of organic material. TAFB also partnered with nearby communities to obtain wood mulch at no cost for use on newly planted seedlings.

Additionally, trees removed during base construction projects are used to create fish habitats in base ponds. Now these ponds support "trophy" bass!

### IMPROVED MATERIAL MANAGEMENT

TAFB has developed outstanding methods to recycle hazardous chemicals/materials. These methods include accomplishing a major recycling effort of more than 57,000 gallons per year of machine coolant, saving \$107,000 annually. 200+ tons of hazardous chemicals and materials are now diverted each year.

One hazardous material management initiative in place is to eliminate non-hazardous items from the tracking system to streamline user input and enhance system efficiency. Currently, TAFB has eliminated approximately 28% of the items that required authorization.

### COMPLIANCE WITH EXECUTIVE ORDER (EO) 13123, "GREENING THE GOVERNMENT THROUGH EFFICIENT ENERGY MANAGEMENT," JUNE 3, 1999

The energy management program at TAFB diligently pursued energy savings opportunities throughout the achievement period. More than \$1.75 million was invested in Utility Energy Services Contracts (UESC) to upgrade Tinker facilities. One UESC project installed infrared heating in two base hangars. This project will reduce energy consumption by 25,000 MBtu/yr and save more than \$145,000 each year.

A major task at hand for the energy management program involves meeting the goal to conduct an energy audit on 10% of all facilities each year. Over the past two years, more than one-fifth of the installation, over 3 million square feet has been surveyed for energy improvements; all facility projects are reviewed for compliance using requirements contained in the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Addendum 90.1.

### COMPLIANCE WITH EXECUTIVE ORDER (EO) 13148, "GREENING THE GOVERNMENT THROUGH LEADERSHIP IN ENVIRONMENTAL MANAGEMENT," APRIL 26, 2000

Tinker's OC-ALC commander issued a base-wide Environmental Policy Statement stressing a



commitment to preserving the environment. TAFB set goals consistent with the policy statement, performed a gap analysis, and hosted a local review by the Environmental Protection Agency (EPA). EM developed an implementation plan for fielding an ISO-14001-like EMS by December 31, 2005, the EO 13148

requirement. An Aspect Register was created from the Inventory of Activities working in conjunction with base stakeholders to identify and prioritize all environmental impacts associated with the aspects. Capitalizing on the existing pollution prevention program, the prioritized aspects are being used to systematically perform opportunity assessments, improve stakeholder environmental awareness, and encourage involvement in reducing their respective aspects' impacts to the environment. With 3,000+ compliance sites and 25,000 personnel, EM is meeting the challenge head-on.

Training is another element of EMS implementation. General EMS awareness training has been provided to a broad range of base personnel while practitioner training has been conducted with the core EMS team. Targeted awareness training is tailored to the specific aspects to which personnel are associated. Any findings of non-compliance in the annual assessments will initiate a review of training requirements. The first official EMS management review during spring 2005 will also serve as additional awareness training for the executive staff.

Tinker has complied with all requisite Federal Compliance "Right-To-Know" Laws and Pollution Prevention Requirements. A database was created and refined to increase the accuracy of Toxics Release Inventory reporting. TAFB met the associated EO goal 3 years ahead of schedule with an 82% reduction of more than 1.3 million pounds; the largest reduction in the Department of Defense (DoD). TAFB takes a proactive role in the Local Emergency Planning Committee and participates in joint exercises with the surrounding community.



Transportation vehicles in and around TAFB use environmentally friendly alternatives to gasoline.

## COMPLIANCE WITH EXECUTIVE ORDER (EO) 13149, "GREENING THE GOVERNMENT THROUGH FEDERAL FLEET AND TRANSPORTATION EFFICIENCY," APRIL 21, 2000

Tinker has long been a DoD leader in alternative fuel vehicles from implementing compressed natural gas (CNG) vehicles to being the first AFMC base to implement biodiesel in 2002! More than 75% of the fleet operates on alternative

fuels such as CNG, biodiesel, propane, and electric. Each year more than 200,000 gallons of alternative fuels are used reducing air emissions by 20 tons! This aggressive alternative fuels program has led to a 17.5% reduction in petroleum usage since 1999, paving the way to the EO goal of 20%.

### RECYCLING PROGRAM

TAFB is recognized as a prime advocate for the recycle of various materials. Highlights of TAFB's award winning program include a hard-hitting approach to increase the types and quantities of materials to be recycled. Tinker implemented a system to recycle junk mail, magazines, and shredded paper at no cost to the government, diverting more than 80 tons of waste from landfill disposal the first year. To improve the system for distribution and pick-up of recycled materials, TAFB procured recycling drop-off units for the collection of aluminum cans, glass, and plastics. Color-coded curbside bins for aluminum cans, newspaper, and glass for the military family housing area were also purchased. As a result, participation in curbside recycling has shown a ten-fold increase since October 2002. New containers for recycling in office areas were also purchased leading to an increase in white paper recycling by 120% and increased revenues of more than \$3,000 per month. The solid waste diversion rate at TAFB has been increased by 17% since October 2002.

### GREEN PROCUREMENT

With the support of senior leadership, a cross-functional team worked to close the recycle loop by employing the TAFB Green Procurement Program. Tinker strongly encourages purchasing environmentally friendly products by posting a

base-wide policy statement, issuing a Green Procurement Plan, and including specific requirements in various contracts to enforce purchasing guidelines.

Tinker promotes the Green Procurement Program through training, promotional briefings, an informational web page, and brochures. The well-known program motto is “Everything deserves a second chance, buy recycled.”

The specific legal requirements in regard to the EPA’s purchase of recycled materials are assured through inclusion of Federal Acquisition Regulation clauses and boiler plate language in contracts. Tinker monitors the Green Procurement Program through spot checks of credit card and contract purchases, annual review of the plan, and reviewing the status of Environmental Compliance Assessment and Management Program (ECAMP) findings.

**EDUCATION, OUTREACH, AND PARTNERING**

TAFB’s programs and activities enhance environmental awareness and community involvement both on and off-site. Tinker maintains open communication with the public and has an active Community Advisory Board that reviews the program and disseminates pertinent information via the web and newsletters. This medium allows for the public to voice comments, questions, or concerns through email, phone calls, and open meetings. TAFB’s visionary Outreach Program extends beyond the fence line, including a fishing clinic for special needs children and Sciencefest Oklahoma, interacting and educating 4,500+ students from around the state.



**Tinker’s recycling superhero duo teach area children to protect our environment.**

Two annual public events held at TAFB are America Recycles Day and Pollution Prevention Awareness Day. These events educate the public on local initiatives to reduce pollution. Tinker’s recycling super-duo, Recycloman and Recyclowoman, continually make a dull subject fun! These two

use their *super powers for good* to “spread the word” about recycling both on-base and at events in the local communities. TAFB’s outreach activities demonstrate Tinker’s commitment to environmental stewardship and to being a good neighbor.

**GREEN BUILDINGS**

Training has been accomplished on Leadership in Energy and Environmental Design (LEED). This training has resulted in LEED philosophies being inserted into projects in the design phase. In the future, Tinker will continue to pursue LEED certification on new construction.

**REDUCTIONS ACHIEVED**

Significant reductions have been achieved at Tinker AFB throughout the award period. Reductions are described below.

<b>IWTP Optimization</b>	3,450 tons hazardous waste reduction
<b>Powder Coating</b>	1 ton VOC reduction
<b>Coolant Recycling</b>	200 ton decrease in disposal
<b>Energy</b>	25,000 MBtu/yr decrease
<b>Solvent Substitution</b>	16 tons VOC reduction
<b>Recycle Metal Sludge</b>	42 tons diverted
<b>Composting</b>	30 tons diverted
<b>Alternative Fuels</b>	200,000 gallons used 20 ton air emissions decrease
<b>Recycling</b>	17% diversion increase, 120% increase in white paper, 80 tons mixed paper, 100 tons pallets

**SUMMARY**

Over the past two years, the Tinker P2 Team has helped the installation eliminate pollution by more than 4,000 tons and realize cost savings of \$1.5 million. The P2 Team will continue to investigate and coordinate cost saving pollution prevention initiatives to help preserve the environment for future generations while supporting TAFB’s military operations at home and abroad. Tinker Air Force Base is an exemplary model of environmental stewardship.