

FY 2003 SECRETARY OF DEFENSE ENVIRONMENTAL AWARDS PROGRAM

POLLUTION PREVENTION PROGRAM— INDUSTRIAL INSTALLATION

ANNISTON ARMY DEPOT



Through its impressive results, the Anniston Army Depot (ANAD) proves itself to be a good neighbor and a true stakeholder in Alabama's environmental future. The depot has achieved excellence in pollution prevention by implementing innovative and effective programs that protect the environment, increase productivity and enhance the Army's readiness.

INTRODUCTION

Established in 1941 for ammunition storage, the Anniston Army Depot (ANAD) is the Army’s leading vehicle and weapon maintenance and repair facility. ANAD is the only Army depot capable of performing maintenance on both heavy- and light-tracked combat vehicles and is designated as the Center of Technical Excellence for the M1 Abrams Tank. In addition, ANAD performs maintenance on individual and crew served weapons as well as land combat missiles and small arms. The depot also stores and maintains conventional ammunition, missiles, seven percent of the nation’s chemical munitions stockpile, and is the site of production of the Army’s newest combat vehicle— the Stryker.

The objectives of ANAD’s Pollution Prevention (P2) program are to eliminate or reduce pollution at the source, rather than control it, and to achieve all agency and regulatory P2 requirements and goals. The leadership at the Army’s premier depot is committed to the concept that combat readiness and responsible environmental stewardship are compatible, achievable, and necessary.

ANAD is located on 15,279 acres in Calhoun County in northeastern Alabama.

BACKGROUND

ANAD’s P2 program was established in 1992. Through the dedication and commitment of leadership and staff, P2 projects implemented since fiscal year 2002 have made significant improvements to on-depot processes while reducing, eliminating, or finding reuse opportunities for waste.

Environmental Challenges

On a daily basis, the depot contends with a

ANAD Profile	
➤	15,000 acres of woodland
➤	10 acres of lakes and streams
➤	4 buffalo in protected habitat
➤	4,784 total employees
➤	2,850 depot employees
➤	\$407.1 million fiscal year (FY) 2002 operating budget



▲ M1 Abrams Tanks are lined up to be upgraded before being returned to soldiers.

legacy of issues related to its industrial mission and role as storage facility for seven percent of the nation’s chemical munitions. Due to the national publicity surrounding the beginning of chemical agent incineration in fiscal year 2003, the local community has a heightened awareness of its military neighbor, and, as a result, is especially sensitive to the depot’s impact on the community.

ANAD is committed to meeting the metrics outlined in its P2 program and those established by regulatory and other monitoring agencies. Since baseline metrics were established in fiscal year 2000, world events have necessitated a significant increase in production and maintenance operations. Traditionally, industrial facilities find it difficult to strike a balance between production and P2 achievement, but ANAD has not bowed to tradition. Instead, the depot has been able to increase production, leveraging it to support improved P2 initiatives, and to continue effective pollution reductions.

Organization, Staffing, and Management

ANAD manages its environmental program through the Directorate of Risk Management (DRK), although other directorates and divisions play crucial roles in the effective implementation of the

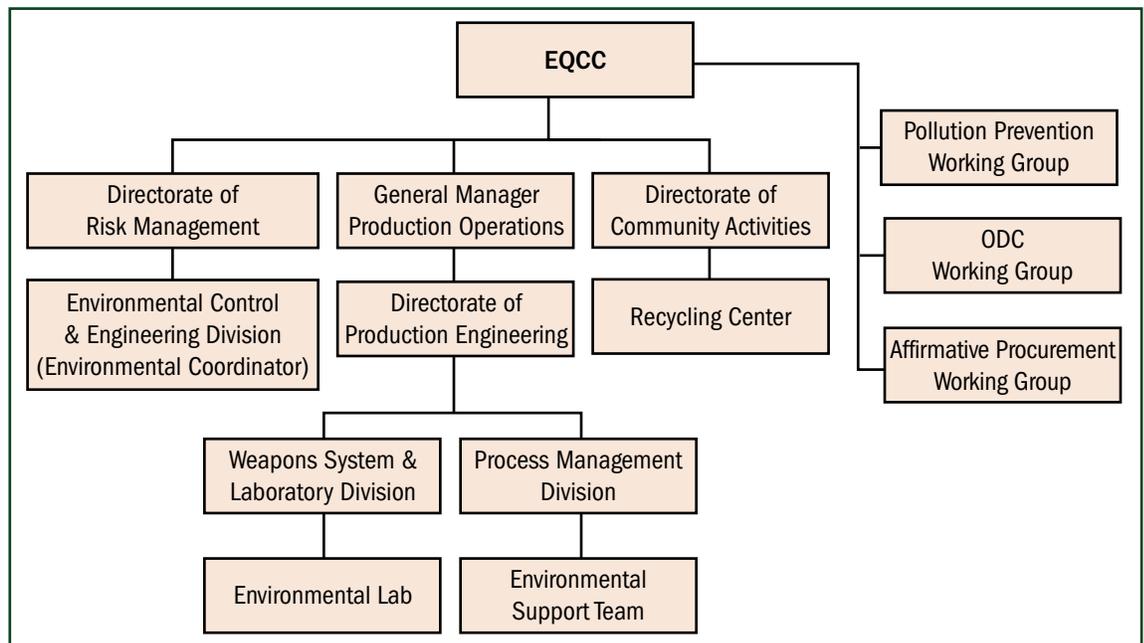
environmental and P2 programs. An organizational chart outlining ANAD's environmental program is shown in Exhibit 1.

Using an effective Environmental Quality Control Committee (EQCC) appointed by the Commander and comprised of representatives of all directorate and tenant organizations,

the P2 staff and P2 Working Group (WG) “push the envelope” for technology development and implementation. The EQCC, established to advise the Commander on environmental priorities, policies, strategies and programs, coordinates environmental program activities, including the P2 program.

The P2 Program Manager is assigned to the DRK Environmental Control and Engineering Division, and serves as action officer for three highly-successful P2-related WGs (the P2WG, Affirmative Procurement (AP) WG and Ozone Depleting Chemicals (ODC) WG) and maintains P2 Project Records developed for P2 opportunities. The more than 20 members of the P2WG include representatives from environmental, production, contracting, engineering, legal and tenant activities.

The success of the P2 program lies with the commitment of its senior leadership. Directors (GS-14s) who are strongly committed to environmental stewardship actively chair all WGs. The success of the proactive P2 program results from the involvement and support of the working groups as well as the interaction and partnerships with the community.



▲ Exhibit 1. ANAD Environmental Program

Completion of Environmental Management System (EMS) ISO 14001 Focal Point Analysis

An effective Environmental Management System (EMS) enhances P2 programs. Similar to a P2 Opportunity Assessment, an EMS goes beyond compliance-driven evaluations. The depot's EMS encompasses traditional P2 solutions and also focuses on environmental, safety and health impacts. The EMS also integrates these issues into the depot's larger mission, while increasing capacity, productivity and production. Additionally, it provides a robust extension to the P2 program by evaluating and ranking aspects and impacts on a process-by-process basis. The EMS Team works in close coordination with the P2WG to share findings and ideas and create program synergies.

ANAD has completed EMS ISO 14001 Focal Point Analyses for six operations, including machining, welding and several painting operations.

These operations are ISO 14001 conformant and are re-audited every 90 days. Goals, objectives, and targets were developed based on the identification of aspects and impacts to reduce the effects of these operations on the environment. The analyses will be completed for the remaining industrial operations by September 2004 and allow for implementation of a mission-focused EMS.

ANAD has also partnered with the Department of Defense (DoD) EMS Alliance under which the EMS program implementation is being mentored by the University of Tennessee. This Alliance will allow ANAD to take its lessons learned to assist other installations in implementing EMS. This partnership not only demonstrates our commitment to implementing an effective EMS program depot-wide, but also to ensuring the success of EMS across DoD. Additionally, ANAD is developing a long-term Sustainable Operations Plan to reduce its impact on the environment and the cost of operations while enhancing mission performance.

PROGRAM SUMMARY

The depot's first P2 Plan was completed in 1992 and last updated in August 2002. The revision of the depot-wide P2 Management Action Plan (MAP) builds upon the P2 program goals and objectives, provides status updates on P2 projects and recommends new initiatives to achieve further waste reduction, cost savings and environmental protection. It is a comprehensive plan that integrates four related programs—P2, ODC Elimination, AP and integrated solid waste management into a single P2 plan.

Program Goals

The goals of the P2 program focus on hazardous and non-hazardous waste reduction and on reduced consumption of resources. Additionally, the P2 Plan includes the goal of training employees in AP. Significant progress has been made in the following areas toward the achievement of the P2 goals:

- Development of a formal method of documenting P2 opportunities by means of the ANAD P2 Project Record. This form allows for electronic submission of recommendations and suggestions to the P2WG. The P2 Project Record provides a background description of the problem or issue, the project description and benefits, an economic analysis and the risks involved. Project Record forms are presented to the P2WG for initial screening.



▲ An aerial view showing the depot's industrial complex.

The forms are then further explored for implementation by one of several standing P2WG subcommittees or referred to another organization.

- Training and establishment of cross-functional P2 Opportunity Assessment Teams to evaluate production shops and operations and to identify opportunities to reduce hazardous materials, and hazardous and solid waste.
- Partnerships with local, state, and DoD organizations including the U.S. Environmental Protection Agency (EPA) Waste Wise Program, the National Pollution Prevention Roundtable, the National Recycling Coalition and the Alabama/DoD P2 Partnership.
- P2 awareness for all employees and participation in national events, such as Earth Day.

Pollution Prevention Working Group (P2WG)

Since its inception in 2001, the P2WG, which is chaired by the Director of Production, has implemented or evaluated the following types of initiatives for implementation:

- 15 to reduce hazardous waste
- 17 to decrease solid waste
- 10 to eliminate restricted chemical usage
- 12 to reduce air emissions
- 10 to lessen wastewater generation
- 6 to limit hazardous material usage

PROGRAM ACCOMPLISHMENTS

The P2 program has achieved significant cost savings and sizable reductions in the generation (and need for disposal) of hazardous and non-hazardous waste. These savings and reductions not only protect the environment, they enhance the depot's ability to meet its military mission by increasing productivity and leveraging savings. ANAD frequently uses new technologies and products to assist the depot in achieving its goals under the P2 program.

ANAD has achieved significant P2 milestones through innovative programs implemented by depot and tenant employees. These reductions have been achieved by material substitutions, process modifications and improved hazardous material/waste management. Additional accomplishments were achieved in the areas of process improvement initiatives, material management and continued compliance with Executive Orders.

Material Substitution

Steam Cleaning

In early 2002, the combined efforts of the P2WG and Directorate of Production (DP) personnel identified a replacement steam cleaning compound, which eliminated Toxics Release Inventory (TRI) reportable requirements for glycol ethers and diethanolamine. ANAD reported zero releases of these chemicals for the following reporting year, compared to 12,800 pounds of both chemicals reported for the previous year.

PROCESS IMPROVEMENT INITIATIVES

During fiscal year 2002-03, several process improvement initiatives began in painting operations, which resulted in significant reductions in the generation of hazardous waste.

Paint Reduction Program

ANAD generates about 200,000 pounds of paint waste annually. A contributing factor to paint waste generation is excessive air and pot pressures on the paint sprayers. The Paint

Reduction Program (PRP) utilized a two-pronged approach to achieve paint use reductions. First, in April 2002, the PRP established institutional controls to reduce paint waste generation and air emissions. PRP activities to date include:

- Revision of process procedures to reduce air and pot pressure requirements.
- Enhanced surveillance of painting operations for conformance with process procedures.
- Paint gun nozzle cleaning and reuse (rather than disposal).
- Air filter replacement (reducing frequency of maintenance and change-out).
- Enhanced employee training.

▶ ANAD personnel demonstrates improved painting techniques implemented under the PRP



◀ A technician checks the pot pressures on painting equipment.

Second, High Volume Low Pressure (HVLP) paint guns are being installed in all painting operations. Use of the HVLP paint guns will result in a one-third reduction in gallons of paint used and hazardous waste generated, increased production, reduced volatile organic compounds (VOCs) and Hazardous Air Pollutant (HAP) emissions, and enormous overall cost savings. HVLP paint guns will save more than 35,000 gallons of paint per year at a cost savings of more than \$3.7 million. Additionally, another \$100,000 in hazardous waste disposal costs will be realized.

IMPROVED MATERIAL MANAGEMENT

Remarketing Program

A major emphasis of the P2 program is improvement in the procurement, use, management and disposition of chemicals on the depot. Historically, a large volume of unused hazardous materials was disposed of as hazardous waste. In early fiscal year 2002, an internal re-marketing program was developed to identify opportunities for material reuse before useful shelf-life had been exceeded. The re-marketing program substantially reduced procurement and waste disposal costs. Reusable materials are re-marketed to the depot, its tenants and other installations. Since the program's inception, ANAD has avoided more than \$50,000 in waste disposal costs and realized a cost savings of nearly \$10,000, while generating about \$5,000 in recycling revenue.

COMPLIANCE WITH EXECUTIVE ORDER (EO) 13148 AND EO 13123

ANAD promotes conservation through energy monitoring and energy awareness programs. The program awards recognize employee and tenant contributions toward the attainment of depot and EO 13123 energy goals.

In mid-2002, the depot was awarded the first task order of an Energy Savings Performance Contract (ESPC) to reduce energy consumption. The ESPC encompasses six projects that will conserve 72,800 MMBTU of energy with overall cost savings of the ESPC projected to be \$625,800.

RECYCLING PROGRAM

ANAD's recycling program saves money and reduces waste, while generating its own funding resources and covering the budget for staff and equipment. The Qualified Recycling Program (QRP) collects, segregates, and processes not only traditional recyclables, including metal, glass, paper, scrap wood, plastic, aluminum cans and wood chips, but also non-traditional items such as petroleum products and batteries. In fiscal



▲ Two of the depot's recycling experts feed mounds of paper into the massive shredder. This is just one of the many recycling operations that are not only self-sustaining, but show a significant annual profit that is ultimately used for depot-wide environmental enhancements.

year 2002-03, the QRP recycled or diverted more than 16,500 tons of materials; avoided \$382,000 in disposal costs; and generated \$1,056,100 in revenue (through August 2003). For fiscal year 2002 and fiscal year 2003, ANAD diverted 59.7 and 54.6 percent respectively, of its solid waste from land-fills and incineration through the recycling program, exceeding the DoD Measure of Merit goal of 40 percent, despite a dramatic increase in production.

Scrap Wood and Pallet Management

In fiscal year 2002-03, for the second and third consecutive time, ANAD participated in EPA's Waste Wise program, which allows organizations to design their own solid waste reduction programs to eliminate costly municipal solid waste, benefiting their fiscal base and the environment. As part of this program, federal agencies are encouraged to establish five-year goals in waste reduction, recycling and AP. One of the depot's goals is to reduce wood waste by 35 percent in the next five years. ANAD's QRP had an aggressive pallet reuse program in fiscal year 2002, reclaiming 8,766 pallets, saving nearly \$104,000 in new pallet procurement costs, and

avoiding \$27,000 in waste disposal costs that resulted in the depot meeting this goal early. Another wood waste reduction initiative consisted of using wood chips for on-depot landscaping, avoiding about \$50,000 annually in waste disposal costs.

Battery Recycling

The P2 program collects and ships used batteries to an off-depot recycler. All types are collected, including nickel, cadmium, alkaline, magnesium, lithium ion, lead-acid and mercury-bearing batteries. In fiscal year 2002, more than 600 pounds of batteries were recycled at no cost to the depot.

Affirmative Procurement (AP)

AP is an important component of the P2 program. The government mandates that certain products purchased by federal agencies be manufactured with or include recycled or recovered content. ANAD has developed a model AP program that focuses primarily on buying recycled materials, but features an added objective to purchase Environmentally Preferable Products (EPPs). EPPs have a lesser or reduced effect on human health and the environment compared with competing products and services. ANAD leadership recognized the importance of the program in overall operations and environmental stewardship and formed a separate EQCC AP Working Group (APWG) in April 2002 to promote AP. The APWG is chaired by the Director of Contracting and has representatives from all directorates.

In fiscal year 2002-03, ANAD accomplished the following achievements in the AP program:

- Trained more than 300 depot, tenant and contractor employees in AP requirements;
- Issued “Buying Recycled” guidance for employees and vendors;
- Implemented a local contract clause requiring use of recycled products, or justification for non-use, for all solicitations over \$100,000;
- Coordinated a contract clause requirement with the Corps of Engineers to require use of

recycled products, or justification for non-use, in all job-order construction contracts;

- Updated local credit card purchasing system to track recycled content purchases; and
- Constructed new playground equipment, renovated two bathhouses at the depot’s recreational lake using guideline items (shower and restroom partitions), and renovated the gymnasium using floor matting made from recycled tennis shoes.



▲ Carol Mitrison, marketing officer from the morale, welfare and recreation division, displays a sample of the “new” recycled content (old sneakers) flooring in the renovated Physical Fitness Center.

EDUCATION, OUTREACH, AND PARTNERING

The P2 program is designed to invite and include community involvement. ANAD reaches out to the community by leading or participating in the following public programs:

- **Bring From Home** program, in which employees drop off newspapers, magazines, cardboard, plastic, glass and steel and aluminum cans at designated depot locations. This program processed 160,000 pounds of recyclables in fiscal year 2002-03. The drop-off locations are stationed inside ANAD’s fence line and manned by recycling personnel during working hours. The collection bins are secured at the Recycling Center at the close of business to eliminate the drop-off of nontraditional items such as batteries and hazardous waste;
- **Annual Depot Clean-up/Recycle-A-Thons** to remove excess furniture and other materials from work areas

- **Saturday Sales** conducted weekly for employees and local residents to purchase scrap wood, pallets, wood chips, mulch and used furniture;
- **Adopt-A-School** programs at two schools to promote environmental stewardship. Participants are taught about recycling and its environmental impacts; and
- Agreement with the Federal Corrections Institute (FCI) Talladega Prison, whereby ANAD processes prison recyclables and provides training to prison staff.

In May 2002, ANAD hosted an Alabama/DoD Partnership meeting to demonstrate innovative recycling methods used to recycle hazardous and non-hazardous waste and secure viable markets for recyclables, while generating revenue.



▲ Thelma McCullough, recycling division chief, speaks to the depot's "mentoring" school students on recycling efforts.

P2 concepts are also incorporated into the annual Hazardous Waste Operations and Emergency Response (HAZWOPER) Technician Level training provided to employees via the Local Access Network (LAN). P2 topics are covered during weekly Morning Show broadcasts and regularly in the biweekly newspaper, **TRACKS**. National events, such as Earth Day, are also used to emphasize P2 messages. Participation by the entire workforce, including tenant and contractor staff, is highly encouraged. To further promote

P2, the P2WG recognizes employees at monthly meetings. Both the P2WG and APWG are finalizing procedures for implementing internal employee incentive awards programs for significant contributions.



▲ Coldwater Elementary School students proudly display their Earth Day Award certificates.

Research, Development, and Technology Demonstration/Validation

Currently, the depot maintains more than 125 solvent parts washer vats. With production increasing, hazardous waste generation from the solvent washers has increased to 400,000 pounds in calendar year 2001—an 11 percent increase over calendar year 2000. The P2WG is currently working with the parts washers service contractor to identify a use for the solvent to make it a recyclable material, thus eliminating ultimate disposal of the solvent as a hazardous waste and potentially avoiding more than \$100,000 in disposal costs.

Missile Recycling

In December 2002, the Anniston Munitions Center (ANMC), a major tenant activity, began operation of the Missile Recycling Center (MRC). Historically, Open Burn/Open Detonation (OB/OD) processes were used as the principal methods for demilitarization, releasing pollutants into the surrounding air and groundwater. The MRC technologies provide environmentally friendly recycling alternatives that meet the legislative requirements and EO mandates for environmentally compliant tactical missile conventional munitions demilitarization. Since



▲ An employee at the Missile Recycling Center removes the TOW missile flight motor during the disassembly process.

operations began, ANMC MRC has processed over 3,000 tube-launched, optically-tracked wire-guided missiles. The initial operational data (Table 1) show that the MRC has a total Resource Recovery and Recycling (R3) capability.

Table 1. Reductions Achieved From MRC Process		
Tactical Missile Component	Total Pounds from 5,000 Missiles	Pounds from Projected Workload of 160,000 Tow Missiles over next 10 Years
Aluminum	116,900	3,272,200
Chromium	600	16,800
Beryllium	0.01	0.28
Cadmium	0.014	0.392
Copper	1,550	446,440
Lead	340	9,250
Manganese	215	6,020
Nickel	122	3,416
Nitroglycerin	12,500	350,000
Phosphorus	2.2	61.6
Zinc	340	9,250

In addition to tactical missile storage, ANAD also has the demilitarization potential of 2,000 tons of gun propellant (Table 2).

Table 2. Components in One Pound of Gun Propellant		
Gun Powder Ingredient	Weight/Pounds	Pounds Released over 10 year period (2,000 tons)
Dibutylphthalate	0.044	3,176,000
Dinitrotoluene	0.088	352,000
K Nitrate	0.0064	25,600
Diphenylamine	0.0094	37,600
Lead	0.0143	57,200
Nitroglycerin	0.1773	709,200

The demilitarization by the R3 process of these munitions in lieu of OB/OD is environmentally significant in the reduction of HAPs and other TRI chemicals.

Reductions Achieved

Tables 3 and 4 summarize reductions achieved, cost savings realized, and revenues generated for fiscal year 2002-03. Factors used to measure the quantitative P2 reductions achieved include acquisition and disposal records of hazardous chemicals and substances; product consumption records and analysis; and Emergency Planning and Community Right-to-Know Act (EPCRA), P2, and shelf-life management studies and analyses. While the accomplishments achieved through education and outreach are more qualitative, they are equally significant.

Table 3. P2 Initiative Reductions	
P2 Initiative	Reduction Achieved
Steam cleaning	12,800 pounds of TRI chemicals avoided
Paint process improvements	35,000 gallons of paint saved
QRP recycling program	16,500 tons of solid waste avoided
Petroleum product recycling	375,000 gallons of used petroleum products recycled; 11,000 pounds of ethylene glycol eliminated from waste stream

In addition, the P2 program achieved less quantifiable savings, including prolonging the life of solid waste landfills through waste reduction and recycling and improving air quality through

reduced emissions. ANAD used factors to evaluate life-cycle costs including capital, labor, operation and maintenance and energy costs over the life of a given facility. The impacts of a given project on ANAD's mission were also considered.

Table 4. P2 Initiative Cost Savings/Revenue Generated	
P2 Initiative	Cost Savings/Revenue Generated
Paint process improvements	\$3.7 million saved
Remarketing	\$50,000 waste disposal costs saved; \$10,000 additional savings
QRP recycling program	\$382,000 disposal costs saved; \$1.056 million revenue generated
Scrap wood and pallet recycling	\$104,000 procurement costs avoided; \$27,000 waste disposal costs avoided; \$50,000 additional waste disposal costs avoided through wood chip reuse
Petroleum product recycling	\$718,000 waste disposal costs avoided; \$168,000 in revenue generated

CONCLUSION

ANAD continues to achieve excellence in P2 by implementing innovative and effective programs that protect the environment, save money, increase productivity and enhance the Army's military readiness. The depot has successfully formed P2 partnerships with federal, state and local agencies and civilian, industrial and business communities. All organizations depot-wide have been actively involved in the management and reduction of potential pollutants. ANAD has become a leader in its community as well as the nation in demonstrating its commitment to environmental quality and pollution prevention.