

Public Works *Digest*

In this issue:

The Environment





U.S. Army Installation
Management Command

2511 Jefferson Davis Highway
Arlington, Virginia 22202-3926

Public Works Digest is an unofficial publication of the U.S. Army Installation Management Command, under AR 360-1, The Army Public Affairs Program. Method of reproduction: photo-offset; press run: 1,500; estimated readership: 40,000. Editorial views and opinions expressed are not necessarily those of the Department of the Army.

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Layout:
Corporate Visions, Inc.
Washington, DC

On the cover:
Construction workers build barracks for the 2nd Brigade at Fort Bragg, N.C., using steel made from recycled material. Using recycled material saves money, conserves resources and prevents overloading of landfills. Photo by Jonas Jordan, U.S. Army Corps of Engineers, Savannah District

 Printed on recycled paper.

Environmental Management.....

- 3-4 Environmental stewardship: it's about Soldier, Family readiness *by Lt. Gen. Robert Wilson*
- 5-6 Corps supports Army's diverse environmental needs *by Lt. Gen. Carl A. Strock*
- 7-8 Sustainability program works to meet needs of present, future *by Col. Jeffrey G. Phillips and Douglas A. Warnock*
- 8 Web-based guidance for water conservation offered *by Richard Scholze*
- 9 Environmental program transforms to keep pace with Army *by Krishna Ganta*
- 10 Army Compatible Use Buffer program advances sustainability *by Lt. Col. Michael Speth and Nancy Natoli*
- 11-12 Army mandates 'green' construction *by Andrea Takash*
- 12-13 Army installations lead the pace in recycling *by William F. Eng*
- 14 Environmental documentation for real property transactions policy signed *by Jim Jenkins*
- 14 Bulletin describes recycling potential for roofing, siding materials *by Stephen Cosper*
- 15 Removal options for World War II wood available *by Stephen Cosper*
- 15 Installations continue commitment to safe pest control in child environments *by Joe Tarnopol*

Environmental Cleanup

- 16 Army reaffirms cleanup program management *by Kristine Kingery*
- 17-18 Corps strategy addresses military munitions across globe *by Andrea Takash*
- 18-19 Alaska District's ROST saves time, money in looking for fuel contamination *by Pat Richardson and Lisa Geist*
- 19 It's coming down

Environmental Successes

- 20 Tiny species gets major protection from Army in Hawaii *by Stefanie Gardin*
- 21 Burning now prevents problems later at Camp Atterbury *by Amy May*
- 22-23 LEED takes hold at Fort Bragg *by Rob Harris*
- 23 Forts McPherson, Gillem work to leave positive legacy *by Victor Bonilla*
- 24-25 Fort Lewis chapel move epitomizes sustainability *by Kayla Overton*
- 25 Korea's Area I conducts environmental assessment *by Margaret Banish-Donaldson*
- 26 Public Works, Environmental Office partner at Fort Hunter Liggett *by Lawrence E. Moore*
- 27 Hohenfels HMCC workers 'refuse' to settle for conformity *by Justin Ward*
- 28-29 Savannah District uses sustainability to make life better for Soldiers *by Billy Birdwell*
- 29 New bullet trap provides safer, more environmentally friendly shooting ranges *by Joe G. Tom, Charles A. Weiss Jr. and Philip G. Malone*
- 30 Fort Bliss achieves AAP equivalent with Programmatic Agreement *by Russell Sackett*

Who's Who in AEC

- 31 AEC employee wins DoD award for Chesapeake Bay support *by Kristin Miller*

Army Environmental Awards

- 32 Army recognizes top environmental programs *by Deborah Elliott*
- 32-33 Fort Drum cultural resource efforts support warfighting mission *by Deborah Elliott*
- 33-34 Fort Lewis on its way to zero net waste generation *by Deborah Elliott*
- 34 Radford removes toxic red water from TNT production *by Deborah Elliott*
- 35 Individual turns historical site into urban training complex at Camp Atterbury *by Deborah Elliott*
- 36 Letterkenny's 'lean' manufacturing produces real-world results *by Deborah Elliott*
- 37 Fort Riley cleans uphill *by Deborah Elliott*
- 38 Camp Edwards recovers training grounds *by Deborah Elliott*
- 39 Grafenwoehr prepares ground for Stryker unit *by Kristin Miller*

More Top Honors

- 40 IMCOM announces 2006 DPW Awards winners *by Brig. Gen. John A. Macdonald*
- 40 Corps employees receive value engineering awards
- 40 USAG Japan achieves excellence
- 41 Pohakuloa Training Area garners 2006 USFWS top partner award *by Stefanie Gardin*

Professional Development

- 42 CP-18 Leadership Development Program important to way ahead *by Lt. Gen. Carl A. Strock*
- 43 Training targets installation energy reduction goals *by Dana Finney*
- 43 LonWorks building automation systems workshop to be held at Fort Hood *by David Schwenk*



Environmental stewardship: it's about Soldier, Family readiness

by Lt. Gen. Robert Wilson

The Installation Management Command is committed to supporting an expeditionary Army at war, while transforming. We demonstrate that commitment every day by focusing on Soldier and Family readiness, and supporting the mission command. As many of you have heard me say before, the concept of "Installations as Flagships" is all about Soldier and Family readiness.

There is also an environmental component to "Installations as Flagships." Through sound environmental stewardship, we preserve ranges and training areas to support Soldier readiness; we provide a clean, healthy environment for Families to live, work and play; and we posture installations to preserve our natural infrastructure — land, air and water resources — well into the future. Indeed, sound environmental stewardship is one more way we demonstrate our commitment to Soldier and Family readiness.

We have made great strides in developing environmental strategies to meet the Army's readiness needs. In cantonment areas, our strategies will promote sustainability. For ranges and training areas, our strategies will preserve training capability. And our strategies for environmental restoration will return contaminated properties to a useful condition. Through the implementation of innovative environmental strategies, we are posturing the Army for success in preserving land, water and air resources for the future.

Cantonment areas – promoting sustainability

Our cantonment areas are challenged with the many changes occurring on installations from modularity, Base Realignment and Closure, the global repositioning of forces and the prospect of future growth of the Army. Using innovative environmental strategies, these stresses provide an opportunity for positive changes and improvements to the quality of the infrastructure in our cantonment areas.

One such innovative strategy involves the use of sustainable design principles.



Lt. Gen. Robert Wilson
Photo by Monica King

Sustainable designs are a simple concept to grasp. The buildings are designed to include features that make them environmentally friendly, minimizing impacts to the environment in their surroundings.

While many people may think that sustainable building designs focus on energy efficiencies, there are actually a number of other environmental advantages. For instance, a sustainable building may incorporate design features to collect rain water from roofs and save the water in storage basins for landscaping uses, thereby reducing pollution from storm drain runoff in rivers and lakes. Another sustainable building design feature is a sod roof, which increases green space, promotes energy conservation and reduces the "concrete jungle" heat signature.

Another innovative strategy involves the increased use of building deconstruction and material techniques. The Army's construction diversion policy directs that at least 50 percent of all construction debris, by weight, be diverted from landfills. Instead of past practices where materials from demolished buildings were trucked to landfills, many materials are now salvaged and the proceeds used to offset the deconstruction costs. This technique results in the recycling of many materials and reduces landfill requirements.

As we eliminate World War II-era buildings, for example, we are able to salvage or recycle many of the valuable, old growth wood products. Similarly, deconstructed masonry from demolished buildings can be

used as crushed aggregate to upgrade and repair vehicle trails, reducing erosion and saving money on material costs. In addition, we are now implementing smarter design and construction practices to make the deconstruction at the end of a building's life span a logical sequence in the life cycle of our facilities.

Our cantonment area environmental strategies are not limited to infrastructure. As an example, eight installation child development centers have been awarded the Integrated Pest Management (IPM) Star Certification. IPM is a common sense approach to solving pest problems, while emphasizing prevention and least-toxic control options to reduce pest and pesticide risks. The Army leads the Department of Defense in this program, which is the nation's most exclusive honor, and has reduced pesticide exposure risks to pre-school-age children on Army installations. (Editor's note: See article on page 15.)

Training areas – preserving capability

The Army's ranges are vital to the combat readiness of our forces. Management of these areas through long-term, sustainable practices is essential to maintaining viable ranges and preserving training capability.

The Army Compatible Use Buffer (ACUB) program, one of the Army's newest success stories, is being used to address encroachment. Issues of noise, light, and frequency degradation have increased as civilian communities expand along installation boundaries. Ultimately, Army training and testing missions can be adversely impacted by these issues.

The ACUB program provides a long term tool to reduce the potential for encroachment along critical installation boundaries. By working with local, state and private organizations, the Army is able to establish partnerships and leverage funding sources to promote conservation easements. These easements, which create buffers between training areas and civilian communities, preserve training capability. They reduce the impact of military training on the surrounding community and



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they promote development of ecological areas, which reduces the potential for training constraints from the management of endangered species. (Editor's note: See article on page 10.)

Other success stories in our land management practices include contributions to local communities for schools and roads, the sale of timber harvested on installations and vibrant conservation programs. As an example of the latter, an Army garrison was selected by the U.S. Fish and Wildlife Service as winner of the Military Installation Conservation Partner Award for 2006, for their "significant natural resource conservation achievements through cooperative work with the service and others." (Editor's note: see story on page 41.) This prestigious award highlights just one of many installations where innovative environmental practices have become the standard.

Environmental restoration

Each year the Army makes a significant investment in repairing environmental damage to lands or structures on our installations. We continue to build on past success by restoring environmentally contaminated properties to useful purposes through the Installation Restoration Program and the Military Munitions Response Program.

Both programs have helped the Army make significant gains in environmental restoration. In 2006, for example, Army restoration efforts resulted in the removal of 7,250 acres of Army property from the National Priority List. Parts of the restored lands were transferred to other government agencies for use as conservation and recreation areas.

Conclusion

Through the implementation of innovative environmental strategies and sound

sustainable practices, Army installations are leading the way in environmental stewardship. Effective environmental stewardship on Army installations will play an increasingly important role in preserving our ability to train Soldiers, provide a healthy quality of life for Families and be good neighbors to our surrounding communities.

We don't need to look too far into the future to see "A Fort Ahead." Today's Army installations are already beginning to look a lot like Fort Ahead. They are actively involved in environmental stewardship, because it is one more way the Installation Management Command can contribute to Soldier and Family readiness.

Support and Defend!

Lt. Gen. Robert Wilson is the assistant chief of staff for installation management and commander, Installation Management Command. **PWD**

A FORT AHEAD

REDUCING THE FOOTPRINT OF THE ARMY

Sustainability—accomplishing today's mission in a way that enables future operations—now governs Army installation operations. Many installations today are putting 25-year sustainability plans into action. Here's a look inside a sustainable post where a generation of Soldiers live and train on an installation designed to last. It's about having the natural resources they need to train, a healthy environment in which to live, and the support of local communities and the American people.

GREEN BUILDING
Green installations improve working and living conditions for Soldiers and their families.

- Green buildings save energy and improve worker productivity and comfort.
- Deconstruction conserves resources and expedites land reuse.
- Porous pavement reduces erosion, runoff and spread of contamination.
- Comprehensive outreach keeps families and neighbors involved.
- Green family housing saves resources and improves quality of life.
- Landscaping using local plants and shrubs reduces water consumption.

CANTONMENT AREA
Green installations improve working and living conditions for Soldiers and their families.

- Green buildings save energy and improve worker productivity and comfort.
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- Comprehensive outreach keeps families and neighbors involved.
- Green family housing saves resources and improves quality of life.
- Landscaping using local plants and shrubs reduces water consumption.

ALTERNATIVE ENERGY
Alternative energy and fuels reduce dependence, pollution, costs.

- Photovoltaic cells convert sunlight to electricity.
- Carpooling, vanpooling and other regional transportation systems reduce emissions and save resources.
- Efficiently managing, replacing or reducing use of hazardous materials reduces hazardous waste.
- Recycling and green procurement saves valuable materials through removal from the waste stream.

MATERIALS MANAGEMENT
Wise management of resources increases productivity and decreases costs.

PUBLIC OUTREACH
Wise management of resources increases productivity and decreases costs.

PUBLIC WORKS
Wise management of resources increases productivity and decreases costs.

NATIVE LANDSCAPING
Landscaping using local plants and shrubs reduces water consumption.

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NATIVE LANDSCAPING
Landscaping using local plants and shrubs reduces water consumption.

HYBRID TACTICAL VEHICLES
Tactical vehicles with hybrid power reduce air pollution and noise.

HARDENED FACILITIES
Harden training areas to protect training areas today.

ENVIRONMENTAL TRAINING
Ranges managed for recovery provide landscaping that improves realism in training.

COMPATIBLE USE BUFFER
Buffers separate training from communities, provide valuable endangered species habitat.

SUSTAINABLE RANGE MANAGEMENT
Ranges managed for recovery provide landscaping that improves realism in training.

RANGES
Installations ensure future readiness by protecting training areas today.

- Buffers separate training from communities, provide valuable endangered species habitat.
- Wise management of natural resources and species keeps training areas viable.
- Harden tank trails reduce erosion.
- Ranges managed for recovery provide landscaping that improves realism in training.
- Tactical vehicles with hybrid power reduce air pollution and noise.

SUSTAINABILITY GOALS
The Army Strategy for the Environment lists six goals for the Army Sustainability Program:

- GOAL: Foster a Sustainability Ethic.** Foster an ethic within the Army that takes on beyond environmental compliance to sustainability.
- GOAL: Strengthen Army Operations.** Strengthen Army Operational capability by reducing our environmental footprint through more sustainable practices.
- GOAL: Meet Test, Training, and Mission Requirements.** Meet current and future training, testing and other mission requirements by sustaining land, air and water resources.
- GOAL: Minimize Impacts and Total Ownership Costs.** Minimize impacts and total ownership costs of Army systems, material, facilities and operations by integrating the principles and practices of sustainability.
- GOAL: Enhance Well-Being.** Enhance the well-being of our Soldiers, sailors, families, neighbors and communities through leadership in sustainability.
- GOAL: Drive Innovation.** Use innovative technology and the principles of sustainability to meet our needs and anticipate future Army challenges.

FOR MORE INFORMATION, VISIT <http://www.sustainability.army.mil>.

"A Fort Ahead" provides a look inside a sustainable post where a generation of Soldiers live and train on an installation designed to last. It's about having the natural resources they need to train, a healthy environment in which to live and the support of local communities and the American people. Go to <http://aac.army.mil/usaec/publicaffairs/update/sum06/sum0613.html> to learn more.



Corps supports Army's diverse environmental needs

by Lt. Gen. Carl A. Strock

As the commander of the U.S. Army Corps of Engineers, one of my primary responsibilities is to focus Corps talent and energy to sustain the environment, in order to accomplish our worldwide missions and secure the future. The Army faces the most significant realignment of forces since World War II, so we must refocus technical and support elements to ensure the most effective and efficient response to national and international requirements. Environmental sustainability underpins all these requirements.

The Corps Environmental Operating Principles serve to guide Corps support of the Oct. 1, 2004, *Army Strategy for the Environment*. Applying these principles enables the Environmental Community of Practice (COP) to develop and maintain the technical skills necessary to position the Corps to respond to Army needs. The Environmental COP, now headed by Dr. Ed Theriot, continuously seeks ways to further incorporate the Environmental Operating Principles as the Corps embraces the triple bottom line of sustainability: mission, environment and community.

One way the Corps does this is by helping the Army develop a strategic process to ensure no net loss of wetlands on our installations. We will avoid use of wetlands when possible, minimize use when we must and mitigate for unavoidable losses. With the assistant chief of staff for installation management, the Corps is exploring the possibilities of using wetlands banking — creating wetland habitat in advance of a need for mitigation — as a means to improve cost effectiveness and reduce the mission impacts of wetland mitigation.

Not only is project-by-project wetland mitigation inefficient and expensive, it is “nickel and diming” the range program to death, something the Army cannot afford since it foresees an escalation in wetland impacts associated with military range construction in the near future. Costs associated with wetland banking or other pro-



Lt. Gen. Carl A. Strock
Photo by F.T. Eyre

grammatic approaches range from \$5,000 to \$400,000 per acre depending on location and other factors. The Army needs an approach that controls those costs.

Other approaches being considered are compatible-use buffers and building new or restoring degraded wetlands to fulfill estimated future-year defense program requirements. Army and Corps staff members are pursuing these approaches as a concerted, coordinated effort to identify areas of high military construction density and highest mitigation priority. They will develop a proposal to execute wetlands banking or other approaches in the most cost effective manner and present an investment strategy to senior Army leadership as a collective front.

Another challenge is the ever-growing requirements regarding military munitions response and cleanup. I tapped the Corps' expertise gained from years of cleaning up unexploded ordnance, discarded military munitions and munitions constituents for the Formerly Used Defense Sites program to help address these needs across an array of programs and locations, both here and overseas. The Corps' Military Munitions Support Services (M2S2) strategy consolidates munitions support into one mission area with a continuing, special emphasis on safety. It was my intent that M2S2 will allow the Corps to spiral our capabilities into the current force while providing coordinated, quality services. (*Editor's note: See article on page 17.*)

The Corps is committed to and



USACE Environmental Operating Principles

- Strive to Achieve Environmental Sustainability.** An environment maintained in a healthy, diverse and sustainable condition is necessary to support life.
- Consider Environmental Consequences.** Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of Corps programs and act accordingly in all appropriate circumstances.
- Seek Balance and Synergy** among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.
- Accept Responsibility.** Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.
- Mitigate Impacts.** Seeks ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work.
- Understand the Environment.** Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
- Respect Other Views.** Respect views of individuals and groups interested in Corps activities, actively listen, and learn from their perspective in the search to find innovative win-win solutions to the nation's problems, solutions that also protect and enhance the environment.



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actively supports the ACSIM's Feb. 6, 2006, policy memo, *Sustainable Management of Waste in Military Construction, Renovation and Demolition Activities*, which directed all military construction projects to include contract provisions for a minimum of 50 percent by weight solid-waste landfill diversion. For many years, the Engineer Research and Development Center's Construction Engineering Research Laboratory (ERDC-CERL) has been involved in research, technology transfer and assistance to installations in different methods of removing structures from installations and for faster and better methods of construction and demolition (C&D) waste diversion.

Their efforts have dealt with issues such as the behavior of lead-based paint in wood and concrete to support safe reuse of these materials. In addition to working with the ACSIM and Corps headquarters in developing policy, CERL has conducted workshops for Corps districts and installations and at Army environmental training symposia to assist in such diversion efforts. ERDC-CERL continues to assist districts and installations in implementing C&D waste diversion practices and to advise ACSIM solid waste management personnel on facilities demolition and recovery issues.

As the Corps manager for the Facilities Reduction Program (FRP), the Engineering and Support Center (Huntsville Center) actively supports the ACSIM waste diversion policy by placing C&D waste diversion goals in its contracts and requiring reports from its contractors. In 2006, a collaboration of Fort Myer, Va., the Huntsville Center, Baltimore District and several contractors diverted from the landfill nearly 90 percent by weight of the material from implosion of a 12-story apartment building, resulting in a savings of more than \$1 million.

On the programmatic level, Huntsville Center posts estimated C&D diversion quantities by project on the Engineering Knowledge Online FRP Virtual Team Page, <https://eko.usace.army.mil/virtual-teams/armyfrp>, which also has links to the FRP Online Best Practices Toolbox. This

information should prove useful to both installations and Corps districts.

The Seattle District is also a leader in helping achieve C&D waste diversion goals. Since 2005, Seattle District has incorporated C&D waste diversion requirements into all appropriate projects. Their FRP and military construction demolitions, renovations and new construction projects have exceeded goals by obtaining 75- to 100-percent by weight diversion of the C&D waste generated without impact to time or schedule. The district works with local resources and markets to build and develop outlets for C&D material, and educates its project managers and design and construction teams so that the recovery criteria is workable and enforceable.

Another environmental initiative vital to successful implementation of the Base Realignment and Closure 2005 program is a timely, thorough National Environmental Policy Act process. The NEPA Support Team, led by Dr. Neil Robison of Mobile District, is involved in planning, coordinating and executing this important work with installations, Army Environmental Command, the ACSIM and other Army stakeholders.

The team is developing the Timely Stationing Programmatic Environmental Impact Statement and coordinating this activity with the many other ongoing NEPA actions. The Corps is embracing Army measures to streamline the process including central management, standard formats and electronic reviews. Cooperation at all levels is essential for the Army to meet its commitments.

Sustainable design, development

The Corps is committed to providing sustainable design and development. Military construction projects must be capable of achieving a Leadership in Energy and Environmental Design Silver level of sustainability in the U.S. Green Building Council rating system. Military housing must achieve a Sustainable Project Rating Tool Gold rating level. Corps construction is also following the direction of the Energy Policy Act of 2005. New projects will con-

sume 30 percent less energy than American Society of Heating, Refrigeration and Air Conditioning Engineers 90.1 design levels. They will also have energy metering, use Energy Star- and Federal Energy Management Program-rated products and use premium efficient motors.

We are also working with the Army, the Department of Defense and the Department of Energy to implement a long term strategy to achieve the environmental goals of Executive Order 13423, *Strengthening Federal Environmental, Energy and Transportation Management*.

Environmental challenges are diverse and affect everything the Corps does. As it rises to meet these challenges, the Corps is not only getting the job done today, it is sustaining the environment and the Army for the future.

Essays on!

At the time this commentary was written, Lt. Gen. Carl A. Strock was the chief of engineers and commanding general of the U.S. Army Corps of Engineers. **PWD**

Van Antwerp becomes chief of engineers, USACE commander

Lt. Gen. Robert L. Van Antwerp became the 52nd chief of engineers and commander of the U.S. Army Corps of Engineers May 18. He assumed this position from Lt. Gen. Carl A. Strock who is retiring after 36 years of military service. Van Antwerp's previous assignment was commanding general, U.S. Army Accessions Command and deputy commanding general for Initial Military Training at Fort Monroe, Va.



Sustainability program works to meet needs of present, future

by Col. Jeffrey G. Phillips and Douglas A. Warnock

From the very beginning of environmental awareness, America protected its environment by complying with existing environmental laws, a method known as compliance-based environmental protection. The Army, as part of American society, used the same method. While a compliance-based environmental program has served the Army well, it is insufficient for the maintenance of long-term installation viability.

Many installations require thousands of acres of training lands, plentiful and clean drinking water, and energy to heat and cool buildings and fuel vehicles. It is important that the Army sustains these resources for future generations.

The definition of sustainability continues to evolve. From an Army perspective, sustainability is “an installation’s ability to successfully accomplish its current missions without compromising its ability to meet future mission requirements.” Simply put, sustainability means meeting the needs of the present without compromising the needs of future generations.

Sustainability is not a new concept. Several major corporations embrace the practice. In fact, the government focused on sustainability as early as 1910 when President Theodore Roosevelt acknowledged that the government and its citizens have an obligation to protect natural resources from waste in the present while preserving them for the future.

“I recognize the right and duty of this generation to develop and use the natural resources of our land; but I do not recognize the right to waste them, or to rob, by wasteful use, the generations that come after us,” he said in a speech at Osawat-omie, Kansas.

The term was used by the United Nations Brundtland Commission, which coined what has become the most often-quoted definition of sustainable development — “development that meets the needs

of the present without compromising the ability of future generations to meet their own need.”

The Army Strategy for the Environment: Sustain the Mission – Secure the Future establishes a long-range vision that enables the Army to meet its mission today and into the future. Sustainability, based on the “triple bottom line” of mission, community and environment, is the foundation for this strategy. It is a paradigm that addresses both present and future needs while strengthening community partnerships that improve the ability to organize, equip, train and deploy Soldiers as part of the joint force. For the purposes of the strategy, a sustainable Army simultaneously meets current as well as future mission requirements worldwide, safeguards human health, improves quality of life and enhances the natural environment.

Installation sustainability moves beyond simply solving today’s problems. A sustainable Army is one that wins today’s battles while laying the foundation for future success. It connects today to tomorrow with sound business and environmental practices. Sustainability is conducting operations and missions in a manner that will not prevent the ability to conduct necessary operations and missions 25 or 30 years from now and will not affect the ability of the surrounding communities to be healthy places to live and work in the future.

The Army is translating these definitions and elements into doctrine. The strategy links six goals to the triple bottom line. The triple bottom line is not about shifting the focus among mission, community and environment, because shifting the focus sometimes means compromise. Rather, the intent is to strike a balance among the three to ensure all are equally considered and addressed simultaneously.

To integrate the six goals, Headquarters, Department of the Army has developed a *Strategic Implementation Plan for Sustain-*



The triple bottom line

ability. The strategic plan focuses on five overarching themes, nine objectives and 31 critical tasks that fit under the overarching themes and are designed to integrate the six goals to create a sustainable Army.

A fundamental tenet of sustainability is to recognize that installations must take a cross-functional approach for sustainability to be successful. For example, sustainability is not a Directorate of Public Works or environmental function. It touches the entire Army and all functional areas across an installation. However, one office should have oversight of an installation sustainability initiative.

Most garrison commanders have designated the strategic planning function to oversee the sustainability program, and many installations assign it to the Plans, Analysis and Integration Office. Other installations will tag the Strategic Planning Office or Transformation Office. The idea is to have the activity that touches the entire organization — cross-functionally — be the sustainability champion.

HQDA formed the Army Sustainability Committee to provide strategic advice in integrating and implementing sustainability and sustainable design and development into appropriate Army policies, procedures and publications, thereby instilling the sustainability ethic across all Army functional areas.



Web-based guidance for water conservation offered

by Richard Scholze

A new Public Works Technical Bulletin (PWTB) titled *Water Conservation and Water Efficiency Guidance* is now available at http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_46.pdf. This bulletin provides information to make Directorates of Public Works aware of a new water conservation and water efficiency web page, which is part of the Army's sustainability program web site. Providing this information on a web site ensures it stays up to date as water-related regulations and directives change over time.

The water conservation web page is located at: <https://eko.usace.army.mil/fa/water/>. It features current Army and federal guidance documents and links to other information sources. Information is available to assist installations in meeting the requirements of producing and implementing a water management plan. The site also enables sharing of information from lessons learned about water conservation within the Army community, such as determining and characterizing water consumption at facilities.

Requirements from Army and federal regulations, legislation, Department of Defense Instructions, Executive Orders and Army campaign plans, and requirements for low-impact development and Leadership in Energy and Environmental Design for New Construction are promoting and mandating water conservation on installations as part of the Army Energy Strategy and other programs.

In January, the president issued an Executive Order directing that installations reduce water consumption by 3 percent annually. As an example of the potential costs savings, consider that an installation

might pay about \$8 per thousand gallons for water and wastewater. (Wastewater costs are often billed as a percentage of water costs.) If water use were reduced by only 15 percent, the installation could save \$1.3 million dollars and 160 million gallons of water per year.

Each installation is required to implement a water management plan and water efficiency best management practices (BMPs). The 10 BMPs are: *public information and education program; distribution system audits, leak detection and repair; water-efficient landscaping; toilets and urinals; faucets and showerheads; boiler/steam systems; single-pass cooling systems; cooling tower systems; miscellaneous water-using processes; and water reuse and recycling.*

Water consumption at military installations has not been well quantified due to lack of comprehensive metering. The web site offers approaches for determining consumption. While comprehensive metering is the most exact way to determine consumption, a selective metering approach may provide appropriate information.

The web site also presents more depth on the various BMPs. For example, under the *distribution system audits, leak detection and repair* category, a well-implemented program can help installations reduce water losses and make better use of limited resources. Benefits include reduced operating costs, extension of existing supplies to



Replacing older washing machines with newer models that conserve water and energy can help lower costs. Photo by Jonas Jordan, U.S. Army Corps of Engineers, Savannah District

defer new construction, reduced power costs and increased knowledge of the distribution system. Leak detection survey payback can occur in as short as a few months.

This effort is especially important now as many installations privatize their water and wastewater utilities with accompanying higher rates. A comprehensive water management and conservation program will save tens or hundreds of millions of gallons of water and hundreds of thousands of dollars at individual installations per year while protecting a valuable resource and reaffirming the Army's commitment to sustainability and wise stewardship.

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Richard Scholze is a project manager at the Engineer Research and Development Center, Construction Engineering Research Laboratory in Champaign, Ill. **PWD**

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Thirteen installations have formally pursued the quest for sustainability. Each held sustainability-planning workshops to involve the local stakeholders and developed installation sustainability plans to document their 25-year sustainability goals. Six other installations are in the

planning stages for developing their sustainability workshops.

For more information, visit the Army sustainability web site, www.sustainability.army.mil.

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PWD



Environmental program transforms to keep pace with Army

by Krishna Ganta

Imagine the day when Army leaders and managers — from garrison to headquarters — can access environmental program performance at the touch of a button. As the Army transforms in response to both external and internal drivers, its environmental leaders have an obligation to ensure that the environmental people, business processes and technology transform accordingly. Consequently, the Army Environmental Program initiated business transformation efforts in 2005 to streamline or eliminate redundant operations and to focus efforts to better support the core warfighting mission.

The Army Environmental Program is implementing its initiative through involved leadership and governance, the application of business transformation principles and the active participation of Army environmental professionals. Army leaders recognize the need to take a careful look at the people, processes and technology that have been supporting the environmental program and to ascertain what needs to be improved.

This effort requires many hours of environmental technical staff participation to identify and define the necessary business processes, data requirements and supporting tools. However, anticipated loss of technical staff due to retirements and Base Realignment and Closure changes means loss of their collective knowledge and experience. It is a race to complete the business process improvement before losing their institutional expertise.

The opportunity at hand is to refine the program's business processes to align with the new organizational design and establish the Army Environmental Business Enterprise Architecture and supporting information systems for performance management and improved situational awareness at all command levels.

To facilitate the transformation, the Office of the Directorate for Environmental Programs established the Executive Steering Committee, consisting of senior leaders,

stakeholders and customers. The steering committee communicates environmental program priorities, captures stakeholders' interests, monitors progress and helps resolve issues. Initial transformation efforts have focused on the Headquarters, Department of the Army level, Army commands, direct reporting units and Reserve components, with continuing efforts now to include regions and installations, and to eventually interface with other installations and environment stakeholders.

The Army Environmental Program Business Transformation effort started with outlining current environmental business processes and identifying gaps and overlaps, which were completed in 2006. Subsequently, a comprehensive business process review was conducted to ensure that the environmental programs align with *The Army Strategy for the Environment*.

The Army Environmental Business Process Review involved the examination and analysis of the existing environmental business areas and the definition of critical objectives, targets and success indicators — or performance metrics — for each business area. The performance metrics are measurable indicators that can be used to assess progress in achieving program objectives, as well as to provide feedback and insight to leadership.

The review clarified and refined the future business areas. The critical objectives for the future business areas provide the framework for developing the Army Environmental Program Business Enterprise Architecture and help drive other aspects of the environmental program business transformation. The business enterprise architecture development describes and documents



Krishna Ganta
Photo courtesy of the
Office of Assistant Chief
of Staff for Installation
Management

the processes, workflows, business rules, operating requirements, data requirements and definitions, and applications to accomplish the objectives, as well as the technical infrastructure, services and standards for each environmental program business area. The undertaking results in the development of an enterprise transition plan for moving the Army Environmental Program from the current state to the future state.

Lastly, a supporting enterprise system will be built to collect information and generate actionable knowledge. This information technology will provide managers at every command level ready access to Army Environmental Program information for improved situational awareness. This awareness will enable managers and leaders to gauge progress and to evaluate and realign performance to support the mission.

The information technology governance process identifies the specific activities, documents and information required by leadership for decision approval for business transformation initiatives. As the Army Environmental Program Business Transformation is integrated into the Army Installations and Environment Domain governance structure, the improved Army Environmental Program will become institutionalized and will be more effective and efficient.

With the direction and support of effective leadership, the use of business transformation principles such as business process review and business enterprise architecture, and the active participation of the environmental community, the Army Environmental Program can and will achieve measurable improvements in performance as it successfully transitions from its current state to a more effective and efficient state.

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PWD



Army Compatible Use Buffer program advances sustainability

by Lt. Col. Michael Speth and Nancy Natoli

The Army Compatible Use Buffer (ACUB) program is one of several tools being used by the Army to promote long-term installation sustainability. Through ACUBs, installations work with partners to protect land near key training and testing areas and critical habitat without acquiring new land for Army ownership. By sustaining these areas as natural habitats, open space and working lands, ACUBs help remove or avoid limitations and restrictions to military operations and secure current and future accessibility, capability and capacity for training and testing.

As part of the ACUB process, installations establish long-term plans for anticipated population growth, environmental and other landscape conditions, and partnering potential. The long-term plan ensures that compatible land uses around the Army's priority and strategic installations protect training and testing assets for Soldiers.

Since 2003, the ACUB program has demonstrated its importance as an effective

tool for installations to sustain training and testing capabilities. As of March, ACUB proposals have been approved at 19 active and National Guard installations. This amounts to more than 60,000 acres of buffer lands permanently protected around Army installations.

The Army's partners accomplished this with more than \$130 million of other funds, leveraging limited Army and Office of the Secretary of Defense funds. In addition, the Army formed national partnerships with Ducks Unlimited and the U.S. Department of Agriculture (USDA) National Resources Conservation Service (NRCS), agreeing to share resources, promote organizational missions and priorities, pursue innovative projects that enhance wetlands and waterfowl habitat, and achieve land conservation goals.

Partnership accomplishments are many. Land Legacy Inc. purchased a conservation easement on farmland adjacent to Fort Sill, Okla., using USDA NRCS funds. Off-post habitat at Fort Bragg, N.C., was

protected leading to early recovery of the Sandhills population of the red-cockaded woodpecker. The State of Washington's Veteran's Conservation Corps enabled veterans to work with Fort Lewis, Wash., and its ACUB partners to restore sensitive grassland prairies. These are a few examples of ACUB program successes.

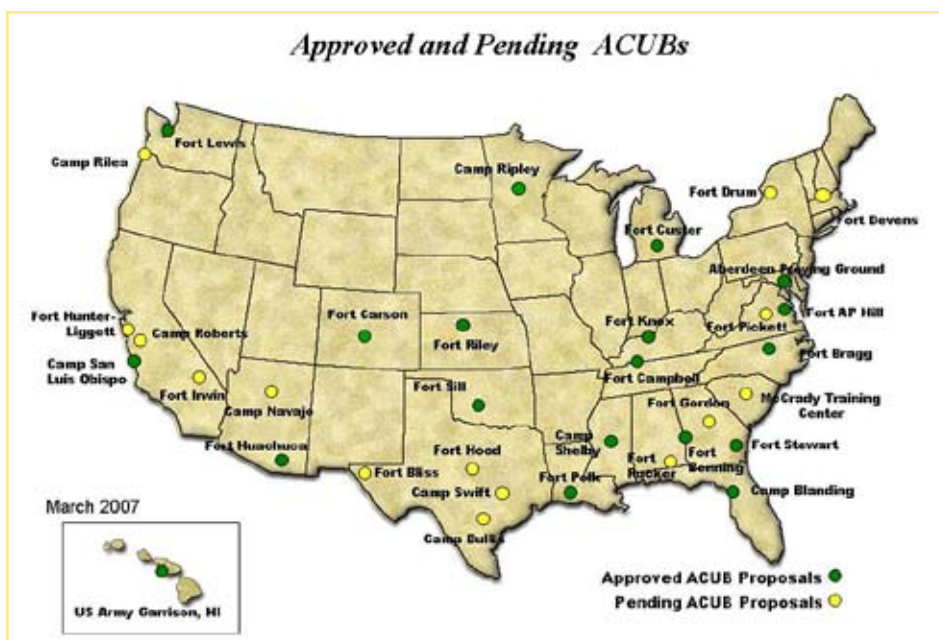
Greater benefits are expected in the future as the ACUB program explores wetlands conservation and stream restoration banking, renewable energy alternatives, and cultural and historic resource protection on ACUB parcels. The program's goal over the next year is to use existing and new programs and partners to leverage additional limited resources and dramatically increase benefits.

At Fort Drum, N.Y., for example, off-site wetland enhancement on ACUBs is planned to yield mitigation credit toward on-site wetland impacts from range construction projects. This project helps the Army reduce on-site wetland mitigation costs and protect key training areas. For the partner, Ducks Unlimited, this project achieves program priorities like land protection and restoration and enhancement of wetland and upland habitats. Such ACUB projects demonstrate the ingenuity and creativity found only when multiple partners work together toward common objectives in support of the mission, the environment and the community.

For more information on the ACUB program visit <http://www.sustainability.army.mil/>.

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Map courtesy of Army Environmental Command, Army Compatible Use Buffer Team



Army mandates 'green' construction

by Andrea Takash

Imagine an environmentally friendly building where the work force controls the office temperatures, solar panels generate electricity and rainwater soaks back into the ground recharging the aquifer. This is not a tale of an office building for a Fortune 500 company. It is a true story about new features in military construction.

Starting with fiscal year 2008, all new military vertical building construction projects must be capable of achieving a Silver rating level in the Leadership in Energy and Environmental Design for New Construction (LEED-NC). Army Family Housing and Residential Communities Initiative will continue to attain the Sustainable Project Rating Tool's, or SpiRiT, Gold rating level.

As one of the U.S. Army Corps of Engineers' centers of standardization, the Engineering and Support Center, Huntsville, Ala., (Huntsville Center) is prepared to support the requirement.

"As Huntsville Center project teams work on the various standard designs for Army installations, the teams will ensure that the LEED requirement is met," said Todd DuVernay, chief of Huntsville Center's Specifications and Service Branch and a LEED-accredited professional.

The U.S. Green Building Council (USGBC), a non-profit organization, developed LEED as a rating system that provides standards for the design, construction and operation of "green" buildings. Buildings that meet certain requirements can achieve certified Silver, Gold or Platinum ratings. The LEED requirements fall under five focus areas: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

People use the word "sustainable" frequently when referring to environmentally friendly products. When it comes to designing buildings, the word takes on an extensive definition.

"Sustainable design and development (SDD) meets human needs by maintaining a balance between development, social equality, ecology and economics," said Annette Stumpf, a project manager at the Engineer Research and Development Center's Construction Engineering Research Laboratory. She is also a LEED-accredited professional. "SDD also considers the environmental impact, energy use, natural resources, economy and quality of life."

DuVernay pointed out that sustainable features benefit the work force, too.

"Studies have shown that when people breathe clean air in their office and control their heating, air conditioning and lighting, they perform better," he said. "These features also have shown a decrease in absenteeism."

To be successful in using SDD and meeting LEED requirements, DuVernay stressed the needs to start at the beginning of the project and include a representative from each engineering discipline.

"The team must do a good job of identifying sustainable features at the beginning of the planning phase," he said. "The funding, design and construction of LEED buildings will work better if design integration between all disciplines starts at the planning phase and keeps going through building operations."

Huntsville Center's team for the Army community service center standard design started planning for LEED requirements in the initial phase of the design.

"At the start, we searched out every avenue for sustainable features. We set project goals and came up with the best product for the user," said Marilyn Scott, an architect



The Corps of Engineers built several sustainable features into the Golden Knights Parachute Team's headquarters building at Fort Bragg, N.C. Photo by Jonas Jordan, U.S. Army Corps of Engineers, Savannah District

in Huntsville Center's Architecture Branch. "As we move along in the design, we will see what features will really work."

The team is examining a variety of ways to employ sustainable features, Scott said.

"One aspect that we are looking at is mechanical equipment as means of increasing energy efficiency," she said. "We are continually looking at ways to cut costs on energy use. We want Army installations to be able to maximize all of the sustainable features in the design."

Under the Army's mandate, project teams must evaluate the project using the LEED checklist, which includes various sections where projects earn points under the five focus areas.

"Project teams do not have to certify the project through the USGBC, but the teams must self-rate the project," Stumpf said. "Teams are encouraged to register projects on the USGBC web site because this gives them access to more resources and support from the USGBC."

Project teams are required to include a LEED-accredited professional.

"In order to get accredited, people must take the LEED accreditation test," DuVernay said. "I encourage people to put LEED accreditation on their individual development plan and study before taking the test. Even if people do not get accredited, it is important to understand LEED. ➤"



Army installations lead the pace in recycling

by William F. Eng

America recycles, but less than 30 percent of municipal solid waste (MSW) — more commonly known as refuse, trash or garbage — is actually recycled or composted by American communities, according to a joint study by *BioCycle* and the Earth Engineering Center of Columbia University. Yet, Army installations, always in the forefront, diverted out of the waste stream through recycling and reuse nearly 40 percent of the MSW that they generated in fiscal year 2005. In FY 2006, Army installations diverted 43 percent of the waste generated.

All this diverting and recycling has a big payback, not just to the environment, but also to the Army's economic well-being.

A large quantity of solid waste on Army installations comes from the demolition of old and obsolete buildings, the clearing of land for development and construction of new facilities. The amount of wastes from construction and demolition (C&D) activities on Army installations ranges from 1.5 to 2 times the amount of MSW, depending on the renovation and new construction taking place.

In FY 2006, the Army generated 2.33 million tons — or 4,650,200,000 pounds — of MSW and C&D wastes. Nearly 60 percent of this was diverted from the waste stream through reuse and recycling, which garnered the Army almost \$75 million in economic benefits.

An institution more than 230 years old has its share of old, obsolete buildings. The Facilities Reduction Program (FRP), a

multi-year, multi-million-dollar effort to eliminate more than 50 million square feet of excess and obsolete infrastructure, has made marked progress. The program encompasses all forms of building removal, including imploding, bulldozing, deconstructing and moving whole buildings.

It wasn't too long ago that buildings were demolished in the old fashioned "smash-and-trash" way. They were either knocked down with a wrecking ball or bulldozed over, scooped up into dump trucks and hauled to the nearest open dump or C&D landfill. Farmers and owners of vacant tracts of land would often take the material as free fill to level property for later development. The environmental movement and, more recently, the sustainability movement have rekindled interest in salvaging usable components and materials from buildings before they are torn down, so these items can be reused elsewhere or processed for another use, saving the cost of purchasing new materials.

Examples of Army installation recycling initiatives include:

Fort Bragg, N.C. — The Residential Communities Initiative (RCI) partnership removed reusable kitchen cabinets, plumbing fixtures, lighting, doors and hardwood flooring from old Family housing that would be renovated or replaced by new structures. Picerne Military Housing, the RCI partner, has to build 834 new homes, replace 1,818 homes and renovate 1,993 others over a 10-year period (2004-2014). Much of the old building materials, fixtures and furnishings will go to the Fayetteville



Curbside recycling in housing areas is typical on Army installations. Photos courtesy of the Office of the Assistant Chief of Staff for Installation Management



Workers deconstruct a World War II-era warehouse at Fort Carson, Colo.

Re-Store, a Habitat for Humanity affiliate. Re-Store workers stripped the reusable items from the buildings to be renovated or removed, saving Picerne the labor, hauling and disposal costs.

This practice saves Picerne money, which can go into better housing for the Soldiers, and keeps usable materials out of the landfill. It also provides good building supplies at low cost to those who cannot afford the price of new materials to repair their homes. The Habitat Re-Store uses the profits from the sale of donated items in its well-known program to provide affordable housing through "sweat equity" for deserving low to moderate income families. It's win-win-win all around.

Fort Campbell, Ky. — In the 1980s and '90s, Fort Campbell demolished

(continued from previous page)

There should not be only one person on the team that understands the LEED requirements."

Stumpf agreed with DuVernay.

"Team members need to actually read the LEED resources. It is common sense, but people need to learn it," she said.

For more information on LEED, visit

the USGBC web site at www.usgbc.org or the Engineering Knowledge Online site at <https://eko.usace.army.mil/fa/sdd/>.

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(continued from previous page)

between 300 and 400 World War II-era buildings and more than 100 Korean War-era structures. In a more recent eight-year period, more than 1,000 Family housing units were torn down. A typical Korean War-era building produces about 7,800 cubic yards of wastes if demolished the old fashioned way. Installation planners estimated the full impact of all projected C&D activities would be 1.2 million cubic yards of debris, which would quickly overwhelm the on-post disposal facilities. This information led Fort Campbell to partner in mid-2002 in a pilot deconstruction project with the University of Florida's Powell Center for Construction and Environment (PCCE).

Fort Campbell made five World War II, wood-framed buildings with 20,000 to 25,000 square feet available for PCCE. The Austin, Texas, Habitat for Humanity affiliate, with labor provided by teams of AmeriCorps volunteers, deconstructed under laboratory-like conditions. PCCE provided on-site supervision and guidance, and collected and evaluated data describing the deconstruction duration and cost, and the quantities of recovered materials. PCCE also provided lessons learned with recommended revisions to each deconstruction plan, as well as conclusions about safety, efficiency, management and other project performance parameters.

Fort Jackson, S.C. – The 29-year-old, 40-foot-tall, wooden Victory Tower used to train recruits in rappelling and rope climbing, along with the 57-year-old, massive-wood-beamed Jenkins Street Chapel full of still-usable pews and other items of religious worship, were among the 50 to 60 structures scheduled to be removed in the fall of 2005.

Many of the disassembled building components were donated to local organizations. Other parts were acquired by Habitat for Humanity Re-Stores, recycling facilities and Goodworks, a South Carolina

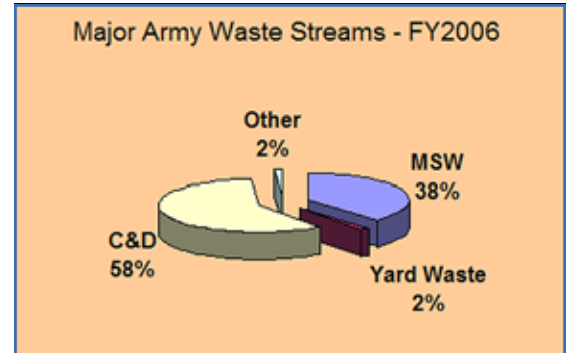
nonprofit that works with senior citizens in need. According to the group's director, Goodworks used some of the old fencing from Fort Jackson to build access ramps for two elderly amputees.

Fort Leonard Wood, Mo. – The Army partnered with American Eagle Communities under the RCI program to construct 1,877 new and 337 renovated homes, while demolishing 2,131 old ones to make way for the replacements. Through early planning and research to match sources of recoverable materials with potential users, the RCI partners were able to reduce a \$7 million demolition and disposal budget item to just \$4.2 million, while keeping more than 65 percent of the waste materials out of the landfill.

Their strategy was three-pronged: soft-stripping of specific building components; recycling of asphalt, concrete and organic materials; and grinding waste materials before disposal. The RCI partner hired a specialty company to strip all the cabinets, finished woods, kitchen and bath fixtures, exterior facades and appliances. The contractor then marketed and resold most of them. Donations of salvaged items were also made to Habitat for Humanity.

Every item salvaged yielded multiple benefits. Recovered wood flooring, for example, saved hundreds of trees from being cut down and the energy to transport the trees to a mill, produce new flooring and transport the product to a building to be installed. Also saved were the energy and financial cost to dispose of the old flooring. The ground-up asphalt, concrete and organics are being stockpiled for incorporation into foundations, road base and landscaping.

American Eagle estimated that it saved almost \$2,000 per demolished building through innovative reuse and recycling of the salvaged building materials.



Major components of the Army solid waste stream. From the Army Solid Waste Annual Reporting System

Fort Myer, Va. – Tencza Terrace, a 12-story, concrete-and-masonry apartment building built in 1966 had outlived its usefulness and was slated for demolition in 2006. Every bit of the building that could be recovered and recycled would mean less material would be needed to level the site for future construction.

Under a \$1.6 million contract, the interior was soft-stripped. Ninety-five percent of the building's copper wiring and steel piping, and 80 percent of its metal studs and fasteners were recycled. Sixty-five thousand pounds of dry wall or sheet rock was ground into fertilizer. The playground equipment, worth \$100,000, was relocated to Fort Belvoir, Va., for free, saving \$35-40,000 in disposal costs. All the steel doors and metal window frames were removed for recycling, before the building was imploded June 4, 2006. The concrete and masonry rubble was ground and spread over the site.

The contractor estimated savings of \$100,000 and a month's time by taking the building apart and recycling the materials as compared to traditional demolition methods.

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Environmental documentation for real property transactions policy signed

by Jim Jenkins

The deputy assistant chief of staff for installation management signed a new policy for environmental documentation to support real property transactions March 15. The memorandum transmits the revision contained in a section of the draft of Army Regulation 200-1, *Real Property Acquisition, Leases, Outgrants and Disposal Transactions*.

The main elements of the new policy are:

- Instead of the requirement to prepare an environmental baseline study (EBS) for real property transactions, the Army will use an “environmental condition of property (ECP) report,” which is essentially an EBS-plus. The “plus” may be a requirement to do a follow-on study to address uncertainties in the first phase of the report, which mirrors the EBS. The content of the ECP report is flexible and depends on the circumstances. An ECP report will normally result in a conclu-

sion regarding the advisability of the transaction and form the basis for “findings of suitability,” if applicable, to the transaction.

- The ECP report and, if applicable, the findings of suitability, are an integral part of the report of availability or the disposal report that form the basis on which the Army official with delegated authority approves the real property transaction and the U.S. Army Corps of Engineers prepares the required legal documents, land use controls and covenants.
- Instead of the requirement for the old ECOP (environmental condition of property) for transfers between the Army and other federal agencies, the Army will prepare an ECP report and document any required remediation in a memorandum of agreement with the transferee.
- For properties the Army is leasing on active installations, it will document suit-

ability for leasing in the report of availability for the property (AR 405-80), rather than the old requirement for a FOSL (finding of suitability to lease).

- Deficiencies in how the old AR 200-1 addressed real property transactions affecting the National Guard Bureau and state guard components have been corrected.
- A table that summarizes the required documentation for various types of real property transactions is included.

The policy has been posted on the ACSIM/Environment/Cleanup site on Army Knowledge on Line, <https://www.us.army.mil/suite/folder/632010>.

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Bulletin describes recycling potential for roofing, siding materials

by Stephen Cospers

A new Public Works Technical Bulletin (PWTB) titled *Recycling Exterior Building Finish Materials* describes the recycling potential of a variety of materials used as roofing and siding products.

Roofing waste comprises a surprisingly high portion of the U.S. waste stream. About 10 million tons of asphalt roofing, the most common type, are landfilled each year. There are several technically feasible options for recycling asphalt shingles. Issues of economics, marketing and specifications are being worked out by industry and government transportation agencies. See <http://www.shinglerecycling.org/> for the latest information.

While most construction and demolition debris by weight on Army installations is composed of structural materials, exterior finish materials are still significant, and

proper management of these can help meet the Army requirement for 50 percent waste diversion from all construction projects. For some renovation projects, exterior finishes could comprise most of the waste material.

The PWTB also addresses recycling possibilities for a variety of other roofing and siding materials, such as wood, metals, bricks and plastics. Sustainable choices for roofing and siding in new construction are also discussed.

PWTB 200-1-44 can be downloaded from the PWTB page of the Whole Building Design Guide, Construction Criteria Base, http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215.

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Workers remove asphalt shingles during a pilot deconstruction project at Fort Campbell, Ky., in 2002. Photo by Stephen Cospers

Stephen Cospers is a researcher in the Environmental Processes Branch at the U.S. Army Engineer Research and Development Center's Construction Engineering Research Laboratory in Champaign, Ill. **PWD**



Removal options for World War II wood available

by Stephen Cospser

Now available for free download is Public Works Technical Bulletin (PWTB) 200-1-45, *Deconstruction of WWII-Era Wood Framed Buildings*. This bulletin describes options and installation experiences in removing old wood buildings.

The Army has made considerable progress in removing World War II buildings from the real property inventory. According to data from the Headquarters Executive Information System, a U.S. Army Corps of Engineers' real property inventory, there were 21,000 of these buildings at Army installations in 1990; only 6,000 remained at the beginning of fiscal year 2007.

However, in part due to this aggressive demolition schedule, government landfills are losing capacity quickly, and the cost of off-site landfill disposal continues to increase. A hidden cost of this typical practice is the long-term maintenance of government landfills. An Army policy titled *Requirements for Sustainable Management of*

Waste in Military Construction, Renovation and Demolition Activities requires 50 percent waste diversion for all Army construction projects. The Office of the Assistant Chief of Staff for Installation Management issued this revised policy in July 2006.

This PWTB details the experience of several installations in implementing alternative building removal programs that divert significant percentages of waste material from landfills. The term "deconstruction" sometimes has the connotation of stick-by-stick disassembly. However, a better definition, used here, is one that incorporates a spectrum of options, all of which can achieve waste diversion goals.

PWTB 200-1-45 can be downloaded from the PWTB page of the Whole Building Design Guide, Construction Criteria Base, http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215.



Mechanical equipment can make deconstruction more efficient. Here, a trackhoe lifts a section of floor structure during a demonstration project at Fort McClellan, Ala., in 2003. Photo by Joyce Baird

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Installations continue commitment to safe pest control in child environments

by Joe Tarnopol

The Army's commitment to safe and healthy environments for children continues, as more installation Child Development Centers achieve the Integrated Pest Management (IPM) Star certification. IPM is a common-sense approach to solving pest problems that emphasizes prevention and least-toxic control options to reduce pest and pesticide risks.

This program offers the nation's most exclusive honor for the reduction of pesticide exposure risks to preschool-age children. This award is presented only after a passing score on a rigorous on-site evaluation by an independent pest management professional, and installations have to be recertified every three years. The IPM Institute of North America, which is sanctioned by the Environmental Protection Agency, performs this evaluation.

The Army's IPM principles include:

- incorporation of pest management operations into mandatory planning documents that are reviewed by professional pest management consultants;
- application of pesticides by trained and certified Department of Defense or contract applicators;
- the keeping and annual reporting of permanent application records to Army and DoD; and
- application of pesticides only when necessary, using lowest-toxicity product applied when children are not directly exposed, and notification is made before and after application.

The Army leads the DoD and the nation in implementing IPM Star standards that ensure a safe environment for Soldiers' children. As of April 6, eight installations have received this coveted award.



Carlisle Barracks, Pa., proudly announces that it is the first Army installation to receive the Integrated Pest Management Star award. Photo courtesy of the Army Environmental Command Public Affairs Office

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Army reaffirms cleanup program management

by Kristine Kingery

The assistant chief of staff for installation management has approved an updated Army Environmental Cleanup Strategic Plan for fiscal years 2008-09. The strategic plan builds on efforts begun in 2003 and updated in 2005 for FYs 2006-07. It provides a roadmap to guide the Army in attaining its environmental cleanup vision.

The strategy is an enduring document that directs development and implementation of future strategic and program management plans. It establishes the ISO (International Organization for Standardization) 14001 Environmental Management System Standard as a framework for addressing cleanup requirements regardless of the funding source and complies with the Government Performance and Results Act.

The strategy demonstrates the Army's sustained commitment to address contamination resulting from past operations and supports the objectives of Army Transformation. The cleanup strategy is distinct from the Army Strategy for the Environment, which details environmental quality programs supporting the Army mission.

The strategic plan outlines targets and success indicators to insure that objectives are achieved. Within the OACSIM, all cleanup program areas are now managed from one environmental cleanup division.

The Army Environmental Cleanup Strategic Plan is organized around nine program areas: active installation restoration, excess installations restoration, Base Realignment and Closure cleanup, Formerly Used Defense Sites, Installation Management Command compliance-related cleanup, Army National Guard compliance-related cleanup, Army Reserves compliance-related cleanup, special installation compliance-related cleanup and Army remediation overseas.

The Military Munitions Response Program will be executed within other program areas.

Each program area in the strategic

"The Army will be a national leader in cleaning up contaminated land to protect human health and the environment as an integral part of its mission."

— Vision statement, Army Environmental Cleanup Strategic Plan

plan is organized to achieve overarching environmental cleanup objectives; review of specific targets and success indicators occurs during semiannual management reviews. Cleanup objectives include goals established by the Office of the Secretary of Defense as well as Army-unique objectives.

OSD goals are aimed at completing cleanup at sites, completing cleanup at installations and completing the program. Army-unique objectives include a requirement to maintain all cleanup information in a permanent archive and attain remedy in place or response complete milestones within seven years for any new compliance-related cleanup sites.

Program managers develop program management plans to address specific targets and success indicators. Installations develop management action plans, sometimes called installation action plans. The OACSIM updates the strategic plan about every other year in conjunction with the program objective memorandum cycle at Headquarters, Department of the Army. Program management plans and installation action plans are updated annually.

What does the Army expect from installations? Long-term environmental liability is the second largest liability facing the Department of Defense. DoD financial managers are placing heavy emphasis on gaining an unqualified audit opinion on all programs, but especially on environmental programs. Accordingly, cost estimates that installations include in cost-to-complete predictions following investigation or design work will come under increasing scrutiny and must be auditable and verifiable.

The Army is also looking to streamline project execution and contract administra-

tion costs. For example, the plan establishes a target for program management at 11 percent of total program costs for the active installation cleanup program.

The Army Environmental Cleanup Strategic Plan is designed to provide more consistency and accountability in all Army environmental cleanup program areas while demonstrating that the Army is achieving cleanup results. The plan is posted on DENIX at: <https://www.denix.osd.mil/denix/Public/Library/Cleanup/Final-Army-Environmental-Cleanup-Strategic-Plan-20-Mar07.pdf>.

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Corps strategy addresses military munitions across globe

by Andrea Takash

As the execution agent for the Formerly Used Defense Sites (FUDS) Program and other military munitions services, the U.S. Army Corps of Engineers uses two decades of experience to continuously improve this vital mission. To enhance the services it provides, the Corps established a Military Munitions Support Services strategy, known as M²S².

“This is a partnership between various munitions-related programs and Corps offices,” said Edwin Theriot, chief of the Corps’ Environmental Community of Practice. “The goal is to share best practices and resources across the Corps to conduct our work safely and in the most efficient manner to better support the warfighter and reduce the cost to our customers.”

M²S² encompasses the full spectrum of the Corps’ military munitions work. The formalization of M²S² does not generate a new program. It gathers all Corps munitions programs into a unified configuration, with the goal of delivering improved management and execution of those programs.

“I view this as a toolbox of military munitions services that the Corps can provide to its customers,” said Patti Berry, acting special assistant for M²S².

“It focuses the expertise and talent we have gained from years of working in the Formerly Used Defense Sites Program on the military munitions mission,” said Bob Lubbert, chief of the FUDS program, which currently funds M²S². “With M²S², we are able to apply that expertise to other military applications.

M²S² involves military munitions responses to address munitions and explosives of concern and munitions constituents, including conventional munitions and chemical warfare materiel, range maintenance and clearance operations, and readiness support. M²S² also includes activities in support of overseas missions involving munitions, such as those in Iraq.

“The Coalition Munitions Clearance (CMC) Program in Iraq has destroyed more than 400,000 tons of ammunition,

secured more than 340,000 tons of ammunition for future Iraqi Army operations and logged more than 21 million hours,” said Bill Sargent, program manager for CMC. “There is no telling how many Soldiers and Iraqi civilians that we have saved by the amount of ammunition we are taking off the streets.”

Headquarters USACE, through the Environmental Community of Practice, manages and oversees M²S² work through the M²S² special assistant, component program managers, major subordinate commands or divisions, five designated military munitions (MM) design centers and 10 MM remedial action districts. The design centers and remedial action districts work with the geographic district responsible for managing the project.

Four of the MM design centers are at the Corps’ South Pacific Division; U.S. Army Engineering and Support Center, Huntsville (Huntsville Center); Omaha District and Baltimore District. The fifth design center, the Recovered Chemical Warfare Materiel (RCWM) design center, located at Huntsville Center, is the only organization authorized to execute any phase of a recovered non-stockpile CWM response.

All five design centers conduct the preliminary assessment, site inspection, remedial and removal investigation, and design phases of the Comprehensive Environmental Response, Compensation and Liability Act.

The MM remedial action districts conduct remedial and removal actions, long term monitoring, and range maintenance and clearance operations. The remedial action districts are: Huntsville Center and



More than 400,000 pounds of ordnance awaits removal at Fort Irwin, Calif. Photo courtesy of U.S. Army Engineering and Support Center

Sacramento, Honolulu, Fort Worth, Louisville, Baltimore, Savannah, Los Angeles, Omaha and Mobile districts.

As a design center and remedial action district, Baltimore District brings a highly trained and experienced team to the table.

“Baltimore District maintains several areas of specialized expertise, including the preparation of explosives safety submissions, implementation of time critical removal actions, and technical problem solving on dredging and beach replenishment projects in munitions hazard areas,” said Christopher Evans, program manager for Baltimore District’s MM design center. “We also are managing site inspections and operational range assessments nationwide at active Army installations for the Army Environmental Command.”

Omaha District is the contract service center executing the U.S. Air Force Military Munitions Response Program.

“On this program, Omaha District has successfully integrated more standard site evaluation activities with innovative airborne and ground-based technologies,” said Jerry Hodgson, chief of Omaha District’s MM design center. “Omaha District also specializes in the use of Wide Area Assessment, HeliMag and ground-based geophysical surveying and discrimination technolo- ➤



Alaska District's ROST saves time, money in looking for fuel contamination

by Pat Richardson and Lisa Geist

The U.S. Army Corps of Engineers' Alaska District has a new tool for investigating petroleum contaminated sites. By giving project delivery teams real time data and quickly characterizing the location of fuel in the ground, the state-of-the-art Rapid Optical Screening Tool (ROST) saves the district and its customers time and money.

"ROST is the best investigative tool for hydrocarbons currently available," said Ken Andraschko, an environmental engineer and Alaska District's innovative technology advocate. Andraschko was instrumental in bringing the new technology to the district.

For four years, the district has used ROST to detect petroleum derived contaminants including gasoline, diesel, heating oil, jet fuel, bunker fuel and some of the heavier hydrocarbons like creosote and coal tar. Fewer than 20 units operate worldwide.

Alaska District has two of the newest and most mobile units. The district put

together its first ROST system in September 2003 to support the U.S. Army Alaska Directorate of Public Works. This system, mounted on the back of a truck, accomplished pioneering work at two Fort Wainwright projects with known contamination of unknown extent.

The district's Formerly Used Defense Sites (FUDS) program purchased a second ROST in December 2004. This system, now operated by the Environmental Engineering Branch, is mounted on a small



Alaska District employees operate the ROST (left) on the deck of a barge off-shore from the Port of Anchorage. Photo by Scott Kendall

tracked vehicle so it can be operated in hard-to-access spaces.

"It is ideal for Alaska where there are no roads to remote sites," Andraschko said. "It can be loaded on an airplane, barge, ➤

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gies. We recently awarded a \$25 million contract specifically for the nationwide deployment of these technologies."

Fort Worth District also manages a niche in the military munitions arena.

"We have extensive experience with UXO (unexploded ordnance) clearances in advance of new MILCON (military construction) range construction projects," said Mark Simmons, program manager for Fort Worth District's MM remedial actions. "Another one of our specialties includes supporting the investigations of open burn/open detonation grounds."

In addition to the MM design centers and remedial action districts, there are three centers of expertise and a Corps laboratory included on the M²S² team.

"The MM Center of Expertise based at Huntsville Center and the Hazardous,

Toxic and Radioactive Waste Center of Expertise based in Omaha, Neb., provide technical support to all M²S² program elements," Berry said. "The Range and Training Lands Program Center of Expertise, located at Huntsville Center, supports the design and construction of a variety of range projects for active duty Army installations."

The U.S. Army Engineer Research and Development Center (ERDC) provides assistance through munitions-related research, development, test and evaluation services.

"ERDC, as part of the U.S. Army Environment Quality Technology Program, has developed UXO detection systems and UXO discrimination models and algorithms," said John Ballard, UXO focus area manager at ERDC. "The ERDC-developed Hand-Held Dual-Sensor UXO Detection/Discrimination System was awarded the 2006 U.S. Army

Research and Development Achievement Award for Innovation."

M²S² capitalizes on extensive capabilities in technology and also sustains a large contract capacity.

"Sacramento District recently awarded a \$200 million environmental contract that includes munitions-related services," Berry said. "Huntsville Center alone has a \$1.5 billion M²S² multiple-award contract. These are just two of the many contract vehicles available to our customers.

"Our contractors are valuable members of our team," she said. "They have extensive experience and excellent safety records in executing the cleanup of military munitions."

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ferry or trailer and shipped nearly anywhere in the state, including island sites.”

The ROST uses an ultraviolet laser light to excite petroleum molecules, causing the molecules to give off light, in other words, to fluoresce. This process is called laser induced fluorescence. The direct-push drill rig forces a 1.5 inch hollow steel rod into the ground. Inside this rod are two fiber optic cables which transmit laser light to a probe at the end of the rod. The light exits the probe via a window made of sapphire. The resulting fluorescence is sent back to the surface via a second fiber-optic cable for analysis by the ROST system.

The results are displayed on a computer in real time, giving the field crew immediate information about the depth and magnitude of contamination. The system is sensitive enough to detect petroleum hydrocarbons at concentrations of 100 parts per million. Fluorescence data is recorded throughout the drilling process which provides hundreds of data points per boring.

“ROST data recording is instantaneous and continuous,” said Paul Caron, an environmental engineer. “Investigation decisions can be made on the fly in the field.”

“Making adjustments in the field lowers the chance that additional investigations will be needed to fully characterize the site,” said Andraschko. “Knowing where the contamination lies beneath the surface also allows for better placement and design of remediation systems. This saves valuable time and money.”

Other benefits are that no investigative-derived waste is generated, and the equipment can be used to collect traditional samples, Andraschko explained.

“Samples can be collected and sent to an analytical laboratory to correlate the ROST screening results data with actual lab values,” he said.

“Another advantage is that plume boundaries can be seen during drilling,” Caron added. “We can map out plumes while we are still in the field.”

“We can surround the plumes with clean readings to define the contaminated area,” said Mary Jemin, FUDS project manager.

“I am excited about the ROST technology. Finally, we have a technology that is more advanced than using an excavator and a photo ionization detector. With the ROST, we can turn plume data into a visual depiction that we can use in meetings with the public.”

The data can be uploaded into software programs that create graphs depicting the types and depth of the hydrocarbon contamination. Various graphic forms, such as bar graphs, area maps and vertical views, can be developed with different colors representing the various products.

The ROST operates at about one-third the cost of conventional soil sampling techniques. Less equipment is mobilized, and far more data is collected at a significantly faster rate. The result is a more complete and accurate site investigation. Because the data is acquired in real time and interpreted on site, the chance of having to return for additional investigation is minimized. This represents a significant savings in Alaska,

where mobilization costs can be extremely expensive.

Since the ROST was brought to Alaska District, the demand for its use has rapidly increased. The project delivery teams benefit from the more complete site picture that the ROST provides. The design and implementation of remediation systems has also been improved. While it may not completely replace traditional soil sampling techniques, ROST gives the Alaska District a valuable alternate investigative method for measuring petroleum contamination with real-time results in the field.

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It's coming down



Charter Environmental begins the second phase of demolition of Building 408 at Fort Hamilton, N.Y., April 2. Phase one involved removing asbestos. The Engineering and Support Center, Huntsville's Facilities Reduction Program is working with the installation, the U.S. Army Corps of Engineers New York District and contractor partners to remove, by traditional demolition, three multi-use buildings that were employed as barracks, administrative and dining facilities. The plan is to recycle or re-use as much of the material as possible. Photo by Kevin J. Merenda, U.S. Army Corps of Engineers, New York District



Tiny species gets major protection from Army in Hawaii

by Stefanie Gardin

Singing sweet songs, three little birds in a popular Bob Marley tune spread the message, “Don’t worry ’bout a thing, ’cause every little thing is gonna be alright.” Unfortunately, that tune is not ringing true for many of Hawaii’s native birds. The American Bird Conservancy (ABC), a non-profit agency focused on conserving America’s wild birds and their habitats, listed the Hawaiian Islands as one of the top 20 most threatened bird habitats in the United States.

In 1778, when Capt. James Cook arrived in Hawaii, there were at least 71 native species and subspecies of birds. Since then, 24 of the native birds have become extinct, and 30 have been listed as threatened or endangered, according to ABC’s report. These numbers add up to 76 percent of Hawaii’s native birds being threatened, endangered or extinct.

The Oahu elepaio, a monarch flycatcher, is one of these native birds fighting for its survival. Listed as an endangered species in 2000 by the U.S. Fish and Wildlife Service (USFWS), about 1,982 of these small brown and white birds are thought to exist in the Waianae and Koolau mountains. In fact, the third largest population of the Oahu elepaio is right in the Schofield Barrack’s backyard at the West Range, and U.S. Army Garrison Hawaii has stepped in to help.

USAG Hawaii’s Natural Resources Staff (NRS) provides the elepaio some much-needed protection from a foe against which the six-inch bird is helpless, the black rat. This nighttime predator is one of the biggest threats to elepaio during the breeding season. Other threats include diseases such as avian malaria and avian pox, wild cats, mongoose and habitat loss.

“Rats can climb up into the nests of the birds and prey on the eggs and nestlings during the nesting season,” said Kapua Kawelo, NRS biologist. “Elepaio don’t have very many chicks a year...two at the most, so (rats) can really do a lot of harm to the reproductive capacity of the species.”

As part of an agreement with USFWS, NRS manages 75 elepaio pairs a year by controlling rats during the birds’ breeding season.

“Basically, what we do is put out poison bait in these tamper-proof bait boxes,” Kawelo said. “We put those out in a grid to protect the territory of the birds — those and snap traps.”

Their job is made surprisingly easier by the elepaio themselves, because the birds are so territorial.

“The male will establish a territory, which is really convenient for us, because we can go back and monitor the birds, and they generally stay in the same area,” Kawelo said. “It’s actually possible to do really localized control because we know where the birds are, and they’re endangered, so there aren’t that many of them.”

But it is not possible for NRS to protect 75 elepaio pairs on Schofield Barracks, due to increased activity on training ranges and difficult terrain, so to reach 75 pairs, NRS heads to areas off post. Currently, NRS protects off-site pairs in Honouliuli Forest Preserve, Makaha Valley and Moanalua Valley on the Leeward Side of Oahu and, starting this year, on the Windward Side in Waikane.

“We’ve been thinking it’s really important for the species as a whole to protect something on the Windward Side of Oahu, and this year, we’re actually going to be able to do it. That feels good,” Kawelo said.

More good news is that these predator-control efforts appear to be working. In 2006, 28 pairs successfully fledged at least 34 young, and in Honouliuli Forest Preserve, which has been baited for six years, elepaio territories are filling up. Birds are being found outside areas they had previously been observed.

A lot of work goes into helping these fragile, yet feisty birds, and the bulk of it is being done by the Army. According to Kawelo, the Army is doing more conserva-



U.S. Army Garrison Hawaii programs help to protect the Oahu elepaio, a monarch flycatcher that is one of Hawaii’s native endangered species. Photo courtesy of Natural Resources Staff, U.S. Army Garrison Hawaii

tion for the Oahu elepaio than any other agency on the island by successfully managing 75 pairs a year.

Some may wonder why one little bird is important for the Army to protect. The big reason is that the elepaio is endangered; however it is also one of the most fun and charismatic birds to see in native forests, and it is culturally significant, Kawelo said.

In early times, canoe builders used the birds to help choose which tree to use for a canoe. If a bird pecked at a tree, the canoe builders would not use it, because it was likely infested with insects, hence the Hawaiian proverb, “U`elepaio`ia ka wa`a,” or “the canoe is marked out by the elepaio.”

Preserving the elepaio means preserving a piece of Hawaiian culture. Plagued by so many problems, the elepaio cannot sing a sweet song of “no worries” now, but thanks to NRS efforts, there is hope for change on the horizon

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Burning now prevents problems later at Camp Atterbury

by Amy May

Smoke rising over an installation usually causes concern, but the community at Camp Atterbury, Ind., was told in late winter not to be alarmed if that happened over the following few months. The fire would probably have been intentionally set.

Most of the camp's 33,000 acres is forested, but 5,700 acres of grasslands are part of the prescribed burn program. These areas are used for training troops, so they must be maintained and kept safe. According to experts, the best way to maintain grassland is to burn it periodically.

"It keeps the ranges from being dangerous in the summer," said Walt Anderson, environmental management supervisor.

"It minimizes the occurrence of uncontrollable fires and their intensity," added Bradley Schneck, the camp's conservation director. He said the prescribed burns have three purposes.

Burning grassland reduces the fuel loads. Since the Soldiers are training with pyrotechnic devices, there is the potential to accidentally set a fire in an area where fuels have built up, especially in drought conditions.

"You can't stop training, even in a drought," Schneck said. "If a fire is accidentally ignited during training and the area is

part of the prescribed burn program, it is easier to suppress since the available fuel is low. It's not as rapid moving. We can tackle it with two or three people instead of calling in assistance."

The burning prevents "woody encroachment," too, Schneck said. Some of the ranges need to be kept grassy so Soldiers can see downrange and walk easily in the area. Trees and bushes would hinder the training.

The burning also helps maintain wildlife habitat for grassland creatures, can stall the growth of invasive species and encourages the growth of other plants and trees. After a burn, the grass and wildflowers come back within a couple of months.

The burning usually starts when the snow melts and the grass areas dry out enough to get a "clean burn," Schneck said. A clean burn leaves the area completely blackened.

Atterbury is home to the federally endangered Indiana bat, so no burning is done April 15 to Sept. 15, when bats are roosting and foraging on the installation. Schneck said he also prefers not to burn in the fall. The lack of vegetation makes the ground more vulnerable to erosion in the coming winter.

He maintains a schedule that helps him decide which areas to burn and when. The areas are divided into 17 units with 51 subunits. The units are divided according to firebreaks, such as creeks or roads. About 2,000 acres are burned every year. The impact area also catches fire occasionally due to training. These fires are monitored and allowed to burn.

When Schneck decides to burn a specific area, the first thing he does is check the perimeter of the subunit, which can be up to 242 acres. He makes sure the firebreaks are still in place and in working condition. He coordinates with range control to

make sure no training is being conducted in the area and checks the predicted weather conditions. If the wind is blowing north, for example, he might decide to delay burning an area near the town of Nineveh, Ind., so the smoke doesn't drift into the town.

On the day of the burn, he calls Bartholomew and Brown county fire and health departments, Atterbury Fish and Wildlife Area and the state Department of Natural Resources. He informs the camp's public affairs office, which might receive calls from neighbors who have noticed the fire.

After Schneck decides conditions are OK, two workers ignite the downwind side of the burn area. As it burns inward, it creates more firebreak. Then the upwind side is lit. Schneck said the fires then burn toward each other and, finally, go out.

The environmental office maintains a plan describing how the burns are to be conducted, which is mandated by the Department of Defense.

"We take into consideration other things at Camp Atterbury, such as threatened and endangered species and natural and cultural resources," he said.

The camp has a separate burn unit, not part of the camp's regular fire department, which handles emergencies and structure fires.

Schneck said members of the Department of Natural Resources fire crews often come to Camp Atterbury to help with the fires.

"We're able to get a lot more done when they're here," Schneck said. Many of these firefighters volunteer to go help with the large western wildfires, so the training is valuable to them.

"You can never know too much about fire," he said.

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Brad Schneck, conservation director, ignites fuel with a drip torch for a prescribed burn at Camp Atterbury, Ind. Photo courtesy of the Camp Atterbury Environmental Office



LEED takes hold at Fort Bragg

by Rob Harris

The Leadership in Energy and Environmental Design (LEED) sustainable design and development program for Fort Bragg, N.C., has been years in the making. In 2006, new garrison goals were developed. The first of these is entitled “Sustainable Communities.” Sustainable facilities is an objective under this goal with the initiative to design, build, maintain and operate green buildings based on the LEED rating systems.

The target for new construction is to achieve LEED Platinum ratings by 2020. The target for existing buildings is to achieve LEED-certified ratings in 25 percent of the existing square footage, about 6.5 million square feet, by 2020.

To reach these targets, the objectives team developed a number of projects based on the Environmental Protection Agency’s Environmental Management System plan-do-check-act model, resulting in the following:

- training 100 staff members using LEED trainers furnished by the U.S. Green Building Council (USGBC);
- developing a LEED-New Construction (NC) and Existing Buildings (EB) credit-based vendor and product database to help contractors, architects and engineers locate regional materials that will help achieve LEED credits;



Rain barrels capture water for reuse at Fort Bragg, N.C.

- hiring a contractor to support the LEED program funded through the Environmental Management Branch but located with the Engineering staff and reporting to the Engineering and Real Property/Master Planning divisions’ directors;
- contacting government and higher education members of USGBC to see what tools and processes they have that could be of use at Fort Bragg;
- attending USGBC’s Greenbuild in Denver;
- reviewing all processes for both military construction and operations and maintenance Army projects, and incorporating LEED into those processes and related contract documents;
- developing an automated best practice tool for the project teams’ members to use to improve and incorporate sustainable design; and
- working with the Interagency Sustainability Working Group and the subcommittee on updating green specs for the whole building design guide.

These activities have contributed to a LEED program that provides a whole-building design approach, applies throughout all buildings’ life cycles, and improves long-term efficiency, occupant satisfaction and performance.

To date, several LEED-EB efforts have been accomplished. The installation will register 43 buildings that include 5.2 million square feet for LEED-EB certification. All are 45,000 square feet or larger and were built between 1990 and 2005. Objective team members developed a geographic information system map layer for the EB buildings.



Recycled plastic furniture and pavers are used in this open-air seating area at Fort Bragg, N.C. Photos by Fort Bragg Environmental Sustainment Division staff

They also began conducting initial LEED-EB building audits for 16 percent of the installation’s existing square footage. This effort included collecting installation-wide or individual building information such as policies related to credits. Records for underground storage tank, asbestos surveys, pesticide applications and real property were also compiled. The team assembled and distributed to the appropriate staff members packets with detailed information to assist in evaluation of the projected cost, time and effort needed to obtain each credit. It developed an Excel workbook with spreadsheets for each credit that contains information gathered, current status and the work needed to achieve each requirement.

Fort Bragg is also developing a LEED-EB database that will interface with the installation’s work order coordination system, the LEED Best Practice database and the LEED Credit-Based Vendor/Product database. The installation identified outputs from certain databases that include a list of buildings that need various types of projects to earn points or credits, a detailed listing of who is responsible for each data element within a credit and data that can be loaded into the online templates for LEED-EB on the USGBC website. The project lists provide a programmatic approach to



Forts McPherson, Gillem work to leave positive legacy

by Victor Bonilla

The life cycle of a military installation may mirror that of a person. The early years are a time of growth and exploration to test capabilities and limits, the middle years produce a realization that more care is needed to ensure good health and longevity, and the later years bring the desire to ensure the legacy left behind is a good one.

Fort McPherson, Ga., and its satellite installation, Fort Gillem, Ga., are in their later years as military installations, with Fort McPherson expected to close completely and Fort Gillem to be reduced to a military enclave in September 2011 as a result of Base Realignment and Closure. And while the effort to repair and improve the quality of the properties has been active since the posts' middle years, environmentalists are working hard to ensure the legacy left behind when the posts transition is a positive one.

The Installation Restoration Programs on each post are organized by different areas of concern based on the type of contamination, the status of the sites in the cleanup process and the type of contract in place.

At Fort McPherson, two leaking underground storage tanks are being addressed. The cleanup strategy is to replace the skimmer. Once free produce is removed and the

plume is determined to be stable, no further action is expected.

The small arms ranges at both posts are areas that have been identified in an Environmental Condition of the Property (ECP) assessment. The next phase of the ECP involves evaluating those areas to determine the existence and extent of lead contamination through visual inspection and sampling.

Properties at both Forts McPherson and Gillem have undergone historical site assessments to identify areas with low-level radioactive materials in sealed sources. Facilities identified will go through additional surveys and samples to determine future actions.

Fort Gillem houses several landfill, burial and disposal sites, and three abandoned sewage treatment plants. Remedial investigation and base line risk assessments have been completed on the properties, and the reports on those assessments are in different stages of coordination with the Department of the Army, the U.S. Army Corps of Engineers and the Georgia Environmental Protection Division.

Through it all, Forts McPherson and



About 4,000 tons of soil contaminated with volatile organic compounds is removed from Fort Gillem, Ga., during an interim remedial action in 2001. Photo courtesy of Fort McPherson Public Affairs

Gillem environmentalists are striving to ensure that the installations' later years are comfortable ones, the property is cleaned to protect human health and the environment, and that the legacy left behind is positive for the Army as well as the communities surrounding both installations.

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operation and maintenance work that will allow the installation to be proactive rather than reactive on a large scale.

In addition, the installation applied for grant opportunities that will allow it to test new technologies and achieve additional LEED credits.

LEED-NC efforts have also been strong at Fort Bragg. The post intends to register and seek certification for 27 LEED-NC projects, totaling 2.8 million square feet, in the 2008-10 MILCON programs. With the Savannah District of

the U.S. Army Corps of Engineers, the installation developed a handout of preferred, prioritized LEED-NC credits and revised the installation design guide to include the credits.

The team uses charrettes to discuss which NC credits are preferred. Similar to the EB program, the team applied for grant opportunities and developed a proposed Chapter 6 for the Transformation Request for Proposal.

As a result of this coordinated and integrated approach, the 2008-10 MILCON projects will be able to be certified under LEED-EB a year after completion, rather

than being required to wait two years if they are not certified under LEED-NC. In addition, there will be lessons learned under the LEED-EB program that can be used to provide feedback to the Corps' centers of standardization. This information can then be incorporated into the standard designs for various building types as well as the existing building stock.

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Fort Lewis chapel move epitomizes sustainability

by Kayla Overton

An 87-ton, World War II-era chapel was hauled to its new home at the Sequatchew Training Area Center for Environmental Education and Earthworks, Wash., March 10. By September, it will be transformed into an environmental education and conference center. This extreme makeover is the outgrowth of “green” building practices at Fort Lewis, Wash.

In 2005, the old chapel, located on Fort Lewis’ North Fort, was removed from the Army’s list of chapels by the chief of chaplains. It was determined not to be historically significant and was cleared for demolition under a national programmatic agreement. Faced with tens of thousands of square feet of building demolition per year for the next five years, Fort Lewis waste managers have been working hard to find ways to minimize the debris going to local landfills. The chapel would become one of their success stories.

“The idea of moving the chapel started as a simple conversation over lunch about how we could use materials from the chapel in an education center in order to meet our long-term sustainability goals,” said Elizabeth Chien, an environmental engineer with the U.S. Army Corps of Engineers, Seattle District. “That’s when we thought, ‘Why not demonstrate the ultimate in reuse, and move it intact and use it as the educational center?’”

With heart and determination, the Corps and Fort Lewis teamed to prevent the chapel from being torn down. Careful planning, along with obtaining funding, placed the chapel on track to be relocated rather than razed.

The monumental task of moving the chapel took three weeks of preparation. On the day of the move, 23 workers — utility lineman, heavy equipment operators, flagmen, laborers, fence erectors and movers — worked in synchronization to move the building 1.5 miles.

“The move was a huge success and went according to plan,” said Jeremy Mickey, project manager for contractor MCS Envi-

ronmental, Inc. “The chapel was placed perfectly into the newly prepared foundation excavation on the first try. The skill and coordination of all parties made the placement of the building look as simple as parallel parking a compact car.”

“Everyone involved has their own expertise,” said Tom Tolman, a Seattle District architect. “Working together made the project much better than any one person could have made it.”

Tolman is one of three Seattle District Leadership in Energy and Environmental Design (LEED)-accredited professionals trained to promote sustainability by balancing the social, economic and environmental aspects of projects. LEED focuses on low-impact site development, recycling, reusing materials, saving water and energy, and creating healthy indoor environments.

“On this project, it’s important to note that 100 percent of the building will be reused or recycled,” Tolman said.

Recovered materials from the chapel were incorporated in the education center’s design, used elsewhere at Fort Lewis or sent to local salvage yards or recyclers. The steeple will be used as the top of a gazebo. Bricks from the chimney will be used to edge walkways. Roughly 2,600 square feet of pine flooring and 560 square feet of windows, doors and paneling will be reused or recycled.

“This is one place where we have combined our sustainability goals,” said Ken Smith, Directorate of Public Works



Rich Littooy, Barry Poirrer and Elizabeth Chien observe as the chapel is carefully placed at its new location. Littooy and Chien are with the U.S. Army Corps of Engineers, Seattle District, and Poirrer is the MCS Environmental superintendent. Photo by Kayla Overton

environmental program manager for Fort Lewis, about the project.

The Corps’ Construction Engineering Research Lab (CERL), located in Champaign, Ill., is providing more than \$500,000 to the project in order to demonstrate high durability and high performance materials under the Department of Defense Corrosion Prevention and Control (CPC) program. The CPC project at Fort Lewis focuses on sustainable and durable construction products that demonstrate reduced waste, durability (corrosion resistance), efficient energy use, reduced water use and increased quality of life.

The durable materials to be used on the education center include fiber-cement exterior siding materials, metal roofing with high performance coatings, recycled plastic lumber and translucent skylight panels.

“This is a great opportunity to demonstrate durable, long-lasting, high-performance building materials,” said Tom Napier, a CERL research architect. For example, the structural-grade plastic lumber being used is made from recycled plastic bottles.

“The wood has great holding abilities,” said Mike Iacono, the project designer, “and up front it may be expensive, but it has great long-term benefits.” ➤



Korea's Area I conducts environmental assessment

by Margaret Banish-Donaldson

Through a partnership with contractor URS, Installation Management Command, Korea Region's Area I performed an environmental assessment March 12-16. Lynn Penniman and Kaye Sigmon of URS helped Area I review its conformance with the requirements of International Organization for Standardization (ISO) 14001:2004 and train cross-functional team members to conduct future internal environmental assessments.

Full compliance with the ISO must be completed by fiscal year 2009.

Area I participants were trained for two days and then assisted Penniman and Sigmon in doing internal audits at Camps Red Cloud, Stanley, Castle North and Casey on their hazardous material, transportation motor pools, pest control shops, tank farms, gas stations, fire stations and environmental offices. Afterwards, the results of their findings were given to top management.

"The areas selected were those that showed significant environmental aspects," Sigmon said. "There were other areas, but with only two days and the limited number of people, we could only visit so many. However, from what we saw, we feel Area I is currently at 40 percent."

Audit findings were generated by evaluating audit evidence against the audit criteria. Major and minor nonconformances were addressed and recorded along with supporting evidence. Seventeen nonconformances were identified: 10 major and seven minor.

This internal audit identifies problems before they become a major liability, Penniman said.

"This is our way of helping the installation resolve these nonconformances before the environmental inspectors come to Korea in June," she said.

"Measurable objectives and targets to meet policy commitments and legal requirements, to reduce the facility's significant environmental impacts and to meet the performance commitments made should be part of the installation's participation in the program," Sigmon said. "In setting objectives and targets, the installation should consider preventing noncompliance, preventing pollution at its source, minimizing cross-media pollutant transfers and improving environmental performance."

The U.S. government now requires each Army installation to have a manage-

ment system to develop and implement its environmental policy and manage its activities. The management system provides a structured approach to planning and implementing environment protection measures. To develop an environmental management system, an installation has to assess its environmental impacts, set targets to reduce these impacts and plan how to achieve the targets.

"The environmental management system is an approach an installation uses to identify those operations that can have a negative or positive impact on the environment," said Don Needham, director of Public Works at IMCOM-Korea. "It can put procedures in place to prevent or mitigate negative impacts to the environment. Plus, keep an eye on operations to ensure negative impacts are not occurring and to improve overall environmental performance."

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PWD

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Where the steeple once stood tall, there will be a skylight. Eight additional skylights will be installed to distribute light evenly. Heating, ventilating and air conditioning "occupation sensors" will also be used. These carbon-dioxide sensors are able to tell how many people are in the building and regulate the temperature and fresh air supply accordingly.

The location of the education center on the site of a landfill that was closed in 2004 adds another green layer to this project. The 240-acre former landfill is now being developed as a habitat that will attract Western Washington's rare and candidate-endangered species, such as the Mazama pocket gopher, the streaked

horned lark and butterflies like the Taylor's checkerspot, the zereine fritillary and the Mardon skipper. Bald eagles, deer and bears are also found in the area.

Other noticeable efforts at the site are: improving the wet oak habitat, thinning understory that hinders mid-level tree development, introducing prairie grass on the tops of capped landfill mounds and creating a storm water treatment wetland.

The challenges of building on a landfill can be turned into sustainability opportunities, according to Smith.

"Methane gas produced from waste at the landfill has the potential of being used as an energy source," he said.

The new education center will become

a meeting place for Fort Lewis personnel as well as local Boy Scouts and other groups.

Tolman and Napier will travel to Coventry, England, in June for the Sustainable Construction Materials and Technologies Conference, where they will spotlight the education center project and its sustainability components.

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PWD



Public Works, Environmental Office partner at Fort Hunter Liggett

by Lawrence E. Moore

The Fort Hunter Liggett, Calif., Directorate of Public Works and the Environmental Office have built a productive partnership that protects natural resources and supports the installation's training mission.

As at any installation, the fort's Public Works crew grades roads, maintains airfields and tackles any task that requires earth movement. On occasion, it works with the Environmental Office by assisting in resource management and compliance.

The Environmental Office ensures that regulatory issues are dealt with smoothly. There are laws that protect endangered species and their habitats, ancient and historic sites, and air and water quality. The missions of Public Works and the Environmental Office don't necessarily conflict. Two examples involve cultural resources and construction projects at Schoonover Airfield, Calif.

Soon after the Army acquired the land for Fort Hunter Liggett in 1940, Schoonover Airfield was built. This dirt airfield has been modified several times, and in 2006, the airfield was expanded to accommodate C-17 Globemaster aircraft landings. During this expansion, several issues came up involving cultural resources.

The field was made longer and wider, and a large culvert was installed on one end. These actions required the Environmental Office to consult with the State Historic Preservation Office (SHPO) about known archaeological sites adjacent to the airfield, including a standing adobe house from the mid-nineteenth century that is on the National Register of Historic Places. This register lists many of the nation's popular historic and cultural sites as well as many lesser known sites that retain valuable scientific data.

The Environmental Office negotiated the amount and intensity of archaeological work that needed to be done at three sites. This eventually involved limited

archaeological investigation of the sites, which included "pot holing" with a backhoe provided by Public Works to investigate soils. An analysis of noise and tremor effects on the adobe structure was also done. Consultation closed with a determination of no adverse effect from the airfield expansion.

Schoonover Airfield is used in many training activities by the Army, the Air Force, the Navy Seabees and the Marines. During training, temporary observation posts, command and control posts, and communications stations are often placed on a nearby knoll that provides a good spot to observe activities on the airfield. The location is the site of another mid-nineteenth century home. The archaeological site has been wearing down due to regular use of the knoll.

In 2000, a limited archaeological investigation was done to determine the quality of the site. This investigation used simple hand tools and excavation of exploratory trenches with a backhoe provided by Public Works. The archaeology revealed the remains of adobe bricks melted down over time. At the bottom of the mound were laid bricks and a cobble feature thought to be the base of a chimney.

Historical research found that a man named Teodoro Robles and his family lived there from 1860 into the 1870s. As the site retained quality data from the mid-nineteenth century related to historic Hispanic farming, it was deemed eligible for the National Register of Historic Places. With this determination, the Army made plans to protect the site from further erosion.

After consultations with the SHPO, it was agreed that the site would be capped with clean fill dirt. This task was done in August 2000 by Public Works. The process included using chain link fencing as a liner



Staff from Fort Hunter Liggett Public Works cover the Robles archaeological site in August 2000. Photo by Susan Alvarez

over the foundation and then covering it with 18 to 24 inches of fill. Four truck loads were spread over the adobe with water used to help compact it. Severe compaction was avoided as it could have damaged the archeological remains. This technique protects the site from further erosion and allows continued use of the location during training events.

Today, as airplanes practice take-offs and landings, there may be fire trucks or tents located near the Robles site and platoons nestled in the oaks close by training to defend the airfield. And the historic site quietly retains its scientific value.

The Standard Garrison Organization brings environmental offices under DPW command and control to improve the mission of the installations. If planned and implemented well, the regulatory issues of environmental compliance do not interfere with construction projects or training. In working through the process, the Environmental Office sometimes needs the assistance of Public Works. At Fort Hunter Liggett, the two offices have a very professional partnership.

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Hohenfels HMCC workers 'refuse' to settle for conformity

by Justin Ward

Don't expect any sympathy from the environmental guys at Combat Maneuver Training Center, Hohenfels, Germany. If they find a can of spray paint or any other Environmental Protection Agency-designated dangerous-substance container chucked in the woods, they'll find you.

"There's a barcode on each item," said Jochen Dörr, who supports the Hazardous Material Control Center (HMCC). "We can find exactly who did it."

In operation since March 2001, the HMCC is one of only a handful of hazardous material management units throughout the Army. Officially, the centers are tasked with tracking and reporting environmentally harmful materials to comply with both German regulations and the U.S. Emergency Planning and Community Right-to-Know Act.

Unofficially, they reduce hazardous material and hazardous-waste risk, improve unit environmental compliance and save about \$135,000 per year.

"I've been in the Army for 17 years, and this is the best hazardous containment center I've seen," said Chief Warrant Officer Anthony Coleman, operations group motor

officer for the Blacksheep Observer-Controller unit. "These guys really do simplify things for us."

Similar programs have been implemented in various forms throughout many Army installations, including Grafenwöhr, Vilseck and the Kaiserslautern military communities in Germany, said U.S. Army Corps of Engineers, Europe District's Sharon Lehn, the project manager. But it's a rare occasion to find such a comprehensive and consolidated program, especially at a small installation.

Europe District's role in the project is to administer the contract between the garrison and the contractor, The Environmental Company (TEC).

"We just want to make sure that they (TEC) are keeping the customer happy and doing the work by keeping any new units up to speed on what's going on," she said.

The concept behind the HMCC is simple: instead of having each unit on Hohenfels exert manpower, time and money to acquire, use, store and dispose of hazardous materials, the district helped the garrison create a unit to centralize the process. Centralization brings dual benefits: the HMCC staff frees up local units' resources and tracks all hazardous materials.

Tracking the materials is important, said Reinhold Fröhlich, the Hohenfels Directorate of Public Works Environmental Office manager.

"If we see the whole system, then we can have control cradle-to-grave," he said.

That means the HMCC orders and houses materials to support each unit's maintenance mission, and it also manages each unit's supply, safeguarding against unused surplus.

This supply is stored in a small corrugated trailer on Hohenfels called the "Hazmart," which contains a 30-day supply of all the hazardous material each customer needs, such as antifreeze, adhesives and oil. Once a week, an HMCC employee goes to each customer's site and restocks with a seven-day supply.

"The HMCC works with each customer to determine what they need," said Dörr. "And then they work with those customers to actually get those materials."

If there is surplus, the HMCC also serves as a turn-in point for serviceable hazardous materials that can be reused. This has a twofold benefit, Dörr said. It avoids the costly disposal of a hazardous material, and it also enables the HMCC to redistribute, free of charge, any excess that would otherwise be thrown away.

Coleman asserted that his unit takes advantage of the HMCC's redistributed materials as often as they can.

"It saves money from our Class 3 budget, and it's good to know that this stuff is not being wasted," Coleman said.

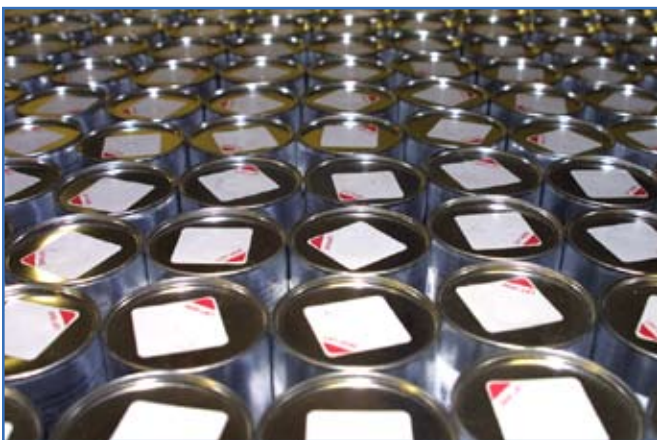
Customer satisfaction with the HMCC has been consistently high, said Lehn.

"They're always looking for ways to improve the system," she said. They provide courtesy inspections, frequent awareness training workshops and "weekly waste runs," during which they take accumulated hazardous waste to the local storage facility. "We encourage this improvement, as long as it keeps the customer happy."

"The service is great," Coleman said. "It really makes it easier on us to have one central person and one central location for hazardous material."

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Boxes and cans of everyday hazardous substances, like cleaning powder, line the aisles of Hohenfels's Hazardous Material Control Center Hazmart. Much of this material is surplus waiting to be redistributed among the units stationed on post. Photo by Justin Ward



Savannah District uses sustainability to make life better for Soldiers

by Billy Birdwell

Transforming the Army means transforming how it lives and works. Over the past several years, the Army has undergone a tremendous restructuring of the way it organizes, trains, equips and employs combat units and individual Soldiers. To meet this change, the U.S. Army Corps of Engineers changed the way it designs and builds facilities.

In designing these improved facilities, the Corps faced the added challenges of constrained budgets and the desire to impact the natural environment as little as possible. Including sustainability into the early plans for facilities allows the Corps to produce a better building with reduced impact on the environment.

“Sustainability in construction is about trying to save our planet, not wasting its limited resources and not polluting it,” said Judy Milton, an architect with the Corps’ Savannah District and an expert on sustainability, in describing the importance of considering the environmental impacts of construction during planning and design. Adding sustainability features into construction has real customer benefit, too, because it improves occupant conditions and saves money significantly over a building’s lifecycle.

Savannah District’s \$1 billion military construction program could place a significant strain on resources and the environment if they are not addressed early. Every new facility the Corps builds for the Army must meet the LEED Silver rating.

LEED — Leadership in Energy and Environmental Design — is a construction industry standard for measuring sustainability. The Army’s earlier standard, SPiRiT, the Sustainable Project Rating Tool, applied basic requirements to the Army for sustainability. LEED puts the Army in line with industry and uses criteria contractors follow in their private sector projects. SPiRiT will be dropped by the Army in 2008.

The LEED Silver criteria apply to all new Army vertical construction, Milton said. She expects that, as the program pro-

gresses, even higher LEED goals may be set by the Army.

Soldiers get a better facility that is easier to maintain that lasts longer. In addition, their living conditions improve.

“The indoor environment is significantly improved (over earlier construction methods) in indoor air quality, in comfort and in reduced exposure to harmful chemicals used in traditional construction,” Milton said. In addition, many projects incorporate natural daylight and scenic outside views to make Soldiers’ living and work areas more pleasant.

Lt. Gen. Carl Strock, then chief of engineers, included “focusing on sustainability” into the 12 Actions for Change he announced in 2006. This emphasis brought the program, already well underway in Savannah District, into the forefront of action.

To increase the sustainability of a project, designers and builders look for ways to increase recycling. They seek ways to recycle construction waste and increase the amount of recycled content in materials used to construct a new building.

Almost all the domestic steel used in construction today is from recycled material, according to Milton. Some projects grind used concrete for use in new construction or in paving. She noted that during replacement of the 16th Military Police barracks at Fort Bragg, N.C., used refrigerators were offered to a national charity, rather than sending them to landfills.

Designers also seek to reduce energy consumption in new construction. Changed lighting, more use of natural light, better insulation and more efficient heating and cooling contribute to energy reduction “points” in the LEED program. Reducing the volume of potable water use also garners points. This can include installing more efficient bathroom fixtures, capturing rainwater for irrigation or landscaping with native plants that do not need irrigation.

“Savannah District has taken the lead in developing tools for incorporating and validating sustainability that are available to the rest of the Corps of Engineers,” Milton said. “We compare very favorably with the private sector in sustainability because of our across-the-board commitment to it.”

By incorporating sustainability into many projects, the Savannah District has been the springboard for niche industries to blossom in the region.

“Building material recycling companies have benefited due to our demand, which creates a more viable resource for the private sector to recycle more material,” she said. Keeping excess building material out of landfills benefits the entire community.

Milton sees the sustainability program as an extension of a bigger program, one with global implications.

“We have to take care of our planet,” she said. “Sustainability in construction is a ▶



As in this barracks building at Fort Bragg, N.C., almost all steel used in new construction in U.S. Army Corps of Engineers’ Savannah District projects comes from recycled material. Photo by Jonas Jordan, Savannah District



New bullet trap provides safer, more environmentally friendly shooting ranges

by Joe G. Tom, Charles A. Weiss Jr. and Philip G. Malone

Military and law enforcement training ranges, as well as recreational shooting ranges, face a number of serious safety, environmental and cost issues. Bullet traps are increasingly used on ranges to prevent potentially toxic metals, especially lead, from leaching into the range soil and local groundwater. Other concerns include the noise produced at the training ranges and the potential for fire from some of the munitions being used.

Researchers at the Engineer Research and Development Center (ERDC) partnered with Super Trap Inc. to develop a system to address these concerns. The result of that partnership is GEL-COR, a new fireproof bullet-trapping medium that accepts bullets fired from any angle, produces little or no lead dust, and reduces the risk of fire, lead-leaching and range noise.

The new medium uses a mixture of chunk rubber and hydrated potassium or sodium polyacrylate-polyamide gels, consisting of about 60 percent rubber and 40 percent hydrated polyacrylate by volume. It will resist ignition even when fired on with tracer rounds or when deliberately exposed to ignition sources that set conventional rubber on fire. Researchers added a phosphate-rich buffer material to reduce the solubility of lead in any drainage water the trap might produce. By combining a stable gel and a solid, mildly alkaline buffering material, researchers created a mixture that will maintain the water-absorbing characteristics of the gel for years. The presence of the moist gel removes the problem of lead dust being scattered during trap clean-

out or bullet removal operations.

The combination of fireproofing, dust control and immobilization of lead in the trap solves many of the problems seen in earlier bullet-trapping media. The ERDC-developed system provides both military and commercial shooting ranges the safest, most environmentally friendly and cost-effective system available. Furthermore, because of its design and heat-suppression capabilities, a GEL-COR range backstop can accommodate automatic small arms and calibers up through 50-caliber Browning machine gun cartridges, unlike other traditional rubber-trap systems.

The bullet-trapping medium has demonstrated its fire resistance by passing the standards set by the American Society of Testing and Materials International for burning brand ignition constructions, ASTM E 108-00, Section 9.

GEL-COR is used as the interior medium for the firing range backstop while SACON, a foamed fiber-reinforced concrete also developed by ERDC, is used to build the enclosure around the backstop. SACON concrete blocks work well with the new bullet-trapping medium and absorb bullets that miss the trap and strike the enclosure.

The cost to implement the GEL-COR firing range backstop depends on a number of factors, including square footage, foundation, location and access, SACON perimeter and whether the facility is to be



Joe Tom of the Engineer Research and Development Center (ERDC) assesses GEL-COR materials after firing munitions at the bullet-trapping system. Photo courtesy of ERDC

indoors or outdoors. Bullet trap costs can range from \$450 to \$2,200 per linear foot of trap width. In certain cases, existing dirt berm, steel and other rubber trap systems can be retrofitted with the new system to improve training capabilities, safety and environmental stewardship.

The new medium has been well accepted in the user community. GEL-COR traps are currently in use at the National Park Service Firing Ranges at Grand Canyon National Park, Ariz.; the Coxsackie Correctional Facility Firing Range near Albany, N.Y.; the Corpus Christi Police Department Range, Texas; and the Ohio Department of Natural Resources Range at Spring Valley, Ohio.

GEL-COR is a patented technology (U.S. Patents 6,837,496, 7,111,847 and 7,134,664) and is licensed through Super Trap Inc. of Corona, Calif. GEL-COR and SACON are registered trademarks.

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big commitment to that effort. Before, the industry was not on a sustainable path. Today, we are.”

At the same time, Milton recognizes that sustainability in construction goes hand-in-hand with the Corps’ ultimate purpose: to support the Army and Soldiers. She quoted from the official defini-

tion of sustainability, “Meeting the needs of the present without compromising the needs of the future.”

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PWD



Fort Bliss achieves AAP equivalent with Programmatic Agreement

by Russell Sackett

Fort Bliss, Texas, entered into a Programmatic Agreement (PA) that addresses how its Cultural Resources Program will meet its National Historic Preservation Act (NHPA) Section 106 responsibilities in October. While developing the PA, the post consulted with the Advisory Council on Historic Preservation, the New Mexico State Historic Preservation Officer (NM-SHPO), the Texas State Historic Preservation Officer (TX-SHPO) and other interested parties.

The Advisory Council's Section 106 implementation regulation — 36 Code of Federal Regulation, Part 800, Subpart C-Program Comments — offers federal agencies the ability to streamline compliance through various program alternatives. The U.S. Army is the only federal agency that has developed an alternate procedure to 36 CFR Part 800.

To take advantage of the Army Alternate Procedures (AAP), installations must develop historic properties components to their integrated cultural resources management plans and have them certified by the advisory council as meeting at least the minimum requirements of 36 CFR Part 800. Developing a historic properties component may involve a lengthy consulting process that has taken pilot projects up to five years to complete. Once this historic properties component is certified by the advisory council, the SHPOs and other stakeholders are no longer involved on a project-by-project basis.

Faced with time constraints brought about by Base Realignment and Closure and the need for a supplemental environmental impact statement to address changing land use, Fort Bliss opted to use the PA approach to achieve the core AAP requirements. Although PAs have been a tool available to federal agencies since the passage of the NHPA in 1966, the Fort Bliss PA represents the first time this process has been used to devel-

op the equivalent of alternative procedures to 36 CFR Part 800 at the installation level. Neither the advisory council nor the Army had considered use of the PA process to achieve this goal. Both are impressed with the innovation.

The approach used by Fort Bliss was to take the requirements of the historic properties component, strip it down to its core standard operating procedures and format it as a PA. Finalizing the PA required four months of consultation with the NM-SHPO and the TX-SHPO, the Advisory Council and other stakeholders, and an additional three months for internal Army review.

This PA streamlines regulatory requirements by removing project-by-project review by the SHPOs and the advisory council. The federal regulations allow for a 30-day review by the SHPOs per each individual undertaking. For 99 percent of the projects, review is limited to the appropriate Fort Bliss cultural resources staff, resulting in a decrease in the length of the process by more than 29,000 project-days in the first seven months of the PA.

Regulatory review of the other 1 percent of the projects is through National Environmental Policy Act procedure.

This PA serves as a model for other installations on how to streamline their regulatory requirements and develop alternatives. At the request of Installation Management Command, West Region, Fort Bliss presented the PA to other installations as a viable alternative to implementing a historic properties component to the integrated cultural resources management plan.

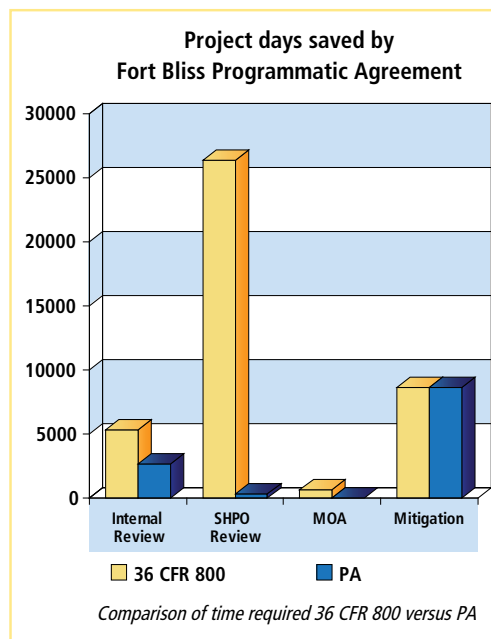
The Army Environmental Command commended Fort Bliss on this approach. The SHPOs and the advisory council are also very pleased, as the PA reduces their overall review workload. Their reactions also show their trust that Fort Bliss can manage their historic resources with minimal oversight.

Specific achievements that have resulted in project time savings include:

- Internal review of 99 percent of projects without regulatory review.
- Standard mitigation measures when installation actions would unavoidably adversely affect a historic property. Additional savings of project time are achieved because development of a project-specific memorandum of agreement to address appropriate mitigation is eliminated.
- Archaeological survey strategy that provides for completion of surveys within range development schedules and allows maneuvering to occur without 100 percent finalization of survey. This maximizes the land available for off-road training.
- Annual review of the PA and ability to amend as required to further streamline the process.

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AEC employee wins DoD award for Chesapeake Bay support

by Kristin Miller

"... neither better fish, more plenty, nor more variety for small fish, had any of us ever seen in any place so swimming in the water."

— Capt. John Smith on his visit to the Chesapeake Bay, 1606

Teaching children about the Chesapeake Bay and its unique ecosystem at elementary schools in Harford County, Md., is just one of the ways Janmichael Graine shows his concern for the bay.

Graine, an environmental protection specialist for the U.S. Army Environmental Command, has led the Army's support to the Chesapeake Bay Program for more than 12 years.

Nineteen Department of Defense installations exist in the watershed of the Chesapeake. The Chesapeake Bay Program is an intergovernmental partnership linking local, state and federal agencies, including the DoD, in protecting and restoring the Chesapeake Bay. The Army joined the program in 1984.

In the bay, water from more than 64,000 square miles of watershed mixes with the inflow from the salty Atlantic to produce a unique but fragile ecosystem.

Graine describes his job as "supporting installations to protect and restore the Chesapeake Bay, thereby providing a better quality of life for Soldiers and community."

In recognition of his efforts in protecting the Chesapeake Bay and dedication to environmental stewardship, Graine became the first recipient of the *DoD Chesapeake Bay Program Bernie Fowler Award*.

Graine received the honor at the DoD Chesapeake Bay Commanders' Conference in November. On hand to offer congratulations were Tad Davis, deputy assistant secretary of the Army for environment, safety and occupational health; and Kenneth Beehler, assistant deputy undersecretary of

defense for environment, safety and occupational health.

Named after a former Maryland state senator known for his love of the bay, the award, also called the "Bernie Sneaker Index," consists of a pair of white sneakers mounted on a plaque.

Fowler grew up on the Patuxent River in the bay watershed. In the 1960s, he began to measure and record how far he could walk into the water before his feet disappeared. Each year his measurement would decrease, indicating buildup of pollution in the bay. Over the years, the Bernie Sneaker Index Wade-In has become a large media event, conducted each year at several tributaries.

The Army's participation in the Chesapeake Bay Program is a subset of the Army's overall environmental program. It emphasizes sustainability by going well beyond simple regulatory compliance to thinking about the environment as a holistic system, Graine said.

"The Army Chesapeake Bay Program has pioneered several innovative approaches to environmental protection that safeguard future mission requirements by sustaining natural resources," he said.

Some of the most notable projects overseen by Graine include the Aberdeen Proving Ground (APG), Md., submerged aquatic vegetation program and the installation of DoD's first low-impact-development demonstration project at Fort Meade, Md. Graine also managed the creation of the APG "BayScape" garden, a demonstration project to educate the APG and sur-



Janmichael Graine (right) is the recipient of the DoD Chesapeake Bay Program Bernie Fowler Award, named after former Maryland State Sen. Bernie Fowler (left). Photo courtesy of Janmichael Graine.

rounding communities on various types of conservation landscapes, including rain gardens. He played a key role in transferring low-impact-development technology throughout the Army and DoD through a series of workshops across the country.

Recognized for his service and support to more than 19 installations in the Chesapeake Bay Watershed, Graine served on the Environmental Protection Agency Chesapeake Bay Committee, the Chesapeake Bay Federal Agency Committee and as chair of the Army Chesapeake Bay Steering Committee. Graine is also a lieutenant colonel in the U.S. Army Reserve and combat veteran of Operation Iraqi Freedom.

For more information on the program, visit the DoD Joint Military Services Chesapeake Bay Program web site at <http://www.hqda.army.mil/acsim/env/cbi/index.html>.

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Army recognizes top environmental programs

by Deborah Elliott

Accomplishments from greening the way the Army makes TNT to increasing maneuver space through good environmental management earned Pentagon recognition in January when the Army announced the winners of its highest honors for environmental stewardship. Six installations, one team and one individual were named as recipients of fiscal year 2006 Secretary of the Army Environmental Awards.

The awards honor the Army's top programs in endangered species protection, historic preservation, waste reduction, environmental cleanup and pollution prevention. The winners are:

The Fort Drum, N.Y., cultural resources staff constructed mock Moslem cemeteries and archeological sites for use as aerial-gunnery-avoidance target training and won the *Cultural Resources Management, Installation* award.

Fort Lewis, Wash., won the *Pollution Prevention, Non-industrial Installation* award by re-using lumber and other resources from building deconstruction to make improvements to training facilities.

Radford Army Ammunition Plant, Va., one of the Army's main TNT production facilities, won the *Pollution Prevention, Team* award.



The Secretary of the Army's Environmental Awards program supports the Army's mission to sustain the environment for a secure future.

Karstin Carmany-George, a cultural resources manager for the Indiana Army National Guard, took the *Cultural Resources Management, Team/Individual* category by using technology to manage and preserve cultural resources and support the building of a state-of-the-art urban training complex.

Letterkenny Army Depot, Pa., won the *Environmental Quality, Industrial Installation* award by applying lean manufacturing

methods as it delivered almost 900 reinforced armor High-Mobility Multipurpose Wheeled Vehicle, commonly called Humvee, door kits to Soldiers in Iraq.

The Fort Riley, Kan., environmental staff helped make land available for a Tactical Unmanned Aerial System operational area, earning the *Environmental Restoration, Installation* award.

At **Camp Edwards Training Site**, a Massachusetts Army National Guard installation, a robust training program that benefits 11 natural plant and animal communities contributed to winning the *Natural Resources Conservation, Large Installation* award.

The U.S. Army Garrison Grafenwoehr, Germany, won the award for *Environmental Quality, Overseas Installation*, in part for its efforts to give Soldiers more room to train.

Winners of Army awards compete for the Secretary of Defense Environmental Awards.

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Fort Drum cultural resource efforts support warfighting mission

by Deborah Elliott

Teaching Soldiers how to build trust with the people they encounter in the Middle East is part of the Environmental Division's mission at Fort Drum, N.Y. The installation's cultural resources staff has launched a two-pronged training initiative for the 10th Mountain Division, one of the most deployed divisions in the Army. This educational outreach and resource-preservation-in-theater training is designed to help Soldiers demonstrate their

respect for the people, land and culture of Middle Eastern countries.

The first prong is a set of training aids, including playing cards and Army Combat Uniform (ACU) pocket cards, with key cultural resources photos and messages. The cards promote identification of and respect for sensitive cultural resources, such as monuments and religious sites. Fort Drum created the training aides for distribution across the Department of Defense with

40,000 decks of playing cards and 50,000 ACU cards in the first printing.

The second prong is resource avoidance training. Together with the installation Integrated Training Area Management team, the cultural resources team built two mock Middle Eastern archaeological sites and two Middle Eastern-style cemeteries for use in providing realistic infantry training assets. The teams built another at the Adirondack Bombing Range to help



Fort Lewis on its way to zero net waste generation

by Deborah Elliott

The pollution prevention team at Fort Lewis, Wash., diverted more than 725 tons of organic material and 1,400 tons of waste wood from its solid-waste stream and avoided \$174,000 in disposal costs by reusing lumber and other resources from building deconstruction.

These gains in Fort Lewis's model sustainable waste management program have been realized as the result of its first phase (13 buildings) of the North Fort Lewis military construction redevelopment, part of which required removing 100 to 200 World War II-era wood-framed buildings. Before a single building was touched, Fort Lewis and its partner, the Seattle District of the U.S. Army Corps of Engineers, held an "alternatives to demolition" workshop to facilitate communication between contractors and promote reuse of building materials. This workshop, combined with other aggressive material-recovery initiatives, resulted in 100 percent diversion of all non-hazardous solid waste for the inaugural project.

"'Landfill' is one of our least favorite words around here," said Ken Smith,

Resource Conservation and Recovery Act program manager. "It has been since we first committed ourselves to environmental sustainability practices in 2002. We're determined to meet zero net waste by 2025."

It seems that not even lead-based-paint-coated building materials will keep Fort Lewis from its goal. The installation pollution prevention team was the first to test and demonstrate a new technology to salvage wood coated with lead-based paint. With successful removal of the lead from the wood, the team was able to make the wood available to local markets for reuse and avoid depositing the debris in a hazardous-waste landfill.

Building materials that can't be reused or recovered at Fort Lewis are recycled to the greatest extent possible. In fiscal year 2006, more than 9,000 tons of asphalt and



One of many World War II-era buildings at Fort Lewis, Wash., is "deconstructed" to increase the recovery of usable materials as well as the solid waste diversion rate of construction debris. Photo courtesy of Terry Austin.

concrete from construction and demolition projects were recycled through a natural aggregate replacement project that ground the materials up and used them in other ways across the installation. Fort Lewis also used 5,000 tons of recycled concrete for projects such as road restoration, ▶

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New York Air National Guard crews learn to avoid striking sensitive sites.

The resource preservation initiatives developed by Fort Drum's cultural resource team are only one aspect of a

program recognized by the Secretary of the Army in the fiscal year 2006 Environmental Awards Program. The team also hardens valuable cultural resource sites to prevent damage during training activities. These include a National Register of Historic Places-listed archaeological district, now transformed into a historic area training site.

program recognized by the Secretary of the Army in the fiscal year 2006 Environmental Awards Program. The team also hardens valuable cultural resource sites to prevent damage during training activities. These include a National Register of Historic Places-listed archaeological district, now transformed into a historic area training site.

The cultural resources team has developed an innovative model to predict the locations of prehistoric sites anywhere in the continental United States. In collaboration with four installations and four universities, the cultural resources

team used its model to generate specific, predictive maps for Hill Air Force Base and Dugway Proving Ground in Utah, the Military Academy at West Point, N.Y., and Wright Patterson Air Force Base, Ohio. Fort Drum will use these maps to publicize and share the model.

Fort Drum's cultural resources management team has integrated its efforts to preserve cultural resources and support its training mission. With the support of DoD Legacy Program funding, it is working to share its best practices throughout DoD, assisting projects at other installations. It has demonstrated that the cultural resource methods used at Fort Drum can be implemented at different installations in different environments with equally successful results.

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This simulated Muslim cemetery is one of several training aids to teach Soldiers and pilots how to identify and avoid harming sensitive cultural resources. Photo courtesy of Laurie Rush, Fort Drum, N.Y.



Radford removes toxic red water from TNT production

by Deborah Elliott

A new production process for the Army's most widely used explosive, TNT, that does not create its characteristic hazardous waste, is now underway at Radford Army Ammunition Plant, Va.

The process replaced technology that created more than 60,000 pounds a day of "red water," named for the color of TNT exposed to air. Radford completely eliminated the environmental toxin — and its estimated \$1-million-annual disposal bill — from the production of the explosive.

During the Vietnam War era, Radford was an expert in TNT production. The Department of Defense shut down the operation in 1986 when a surplus of the explosive was reached. With the advent of the Global War on Terrorism, the requirement for TNT production returned. However, simply starting the process back up was impossible since environmental laws had become more stringent.

At Radford, a team was created to transform the outdated, costly and environmentally challenged TNT production process using "green" design. The team — including eight environmental and process design engineers, managers and technicians — worked to make significant reductions in hazardous waste streams and air emissions by substituting the fundamental feedstock, switching to a nitric acid crystallizing process and installing new fume abatement and acid recycling facilities.

Because DoD planned to select the new U.S. producer of TNT competitively, the Radford design team members knew they

would need an edge.

"The red water waste stream had always been a big environmental and cost issue since the early days of U.S. TNT production," said Brad Jennings, the team's environmental coordinator. "The team at Radford found their competitive edge by going back to the drawing board and making some daring and innovative fundamental changes to Radford's TNT process. The result is a TNT process design without a red-water waste stream."

New by-products took the place of red water, but these wastes are useful in other industries and can be sold to generate income. For example, the new production process generates about 650,000 pounds of isotriol per year. Since this is an ingredient in commercial dynamite, sale of isotriol could produce an estimated \$650,000 annually.

The old process also emitted hundreds of tons of nitrogen oxide and carbon monoxide into the air every year. The new system produces less than 10 tons of these emissions yearly. The emissions are now



TNT weak nitric acid crystallizer vessels eliminate the generation of hazardous red water at Radford Army Ammunition Plant, Va. Photo courtesy of Brad Jennings

captured in an effective weak nitric acid crystallization process. The new process sends the emissions through a fume abatement tower and carbon monoxide oxidizer. In addition, a maintenance tank now collects the nitrator vessel dumps, eliminating a process that previously generated significant quantities of nitrous oxide.

Radford's new TNT process is friendlier to the environment and produces a better product. By substituting ortho-nitrotoluene — a non-toxic, less flammable and less hazardous chemical — for toluene, the original base feedstock material, the environmental hazards were immensely reduced. Even so, the new process produces TNT that is virtually 100 percent pure.

Radford's new TNT-manufacturing process shows how legacy weapons and munitions systems can be redesigned in an environmentally responsible manner while creating a safer work environment. TNT is now produced much more economically with the potential for recurring savings of \$3 million annually, primarily as a result of eliminating waste, pollution and environmental risk.

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repair and access to the timber sales area, and road maintenance. In FY 2006 alone, recycling efforts avoided more than \$80,000 in disposal costs and \$70,000 in procurement costs for new materials.

Fort Lewis's environmental sustainability initiatives are among the best established in the Army. Not only has the installation said it will reduce waste

generation to zero by 2025, but it is well on its way to getting that job done. As if this one goal isn't enough, Fort Lewis also has eight other goals for 2025, including reducing air emissions by 85 percent, generating all energy used on post from renewable sources and reducing potable water consumption by 75 percent.

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Individual turns historical site into urban training complex at Camp Atterbury

by Deborah Elliott

Karstin Carmany-George is a new kid on the block at Camp Atterbury, Ind., where she manages cultural resources for the Indiana Army National Guard (INARNG). Yet, since she arrived just over two years ago, she has cleared the way for a historical hospital complex acquired in 2005 to be turned into an urban training center.

INARNG acquired the self-contained community, once home to the Muscatatuck State Development Center, with its Soldier training mission in mind. The site included a hospital building and 67 other structures, such as power and sewer plants and a school, all of which have historic properties status. Before the training mission could be accomplished, the environmental mission had to be completed.

Carmany-George was the driving force behind a speedy Section 106 process and the quick development and execution of a memorandum of agreement (MOA). Before INARNG officially took over the property, she was working with the State Historic Preservation Office (SHPO) and the local

community to lay the ground work for the Muscatatuck Urban Training Center (MUTC) MOA.

Normally the Section 106 process would take from three to five years for a district as large as the MUTC. With time of the essence, Carmany-George pushed through the process in about 16 months. She oversaw the inventory and evaluation of the 979-acre site; wrote an MOA among the INARNG, the National Guard Bureau and the Indiana SHPO; responded to the concerns of six other stakeholder groups; and achieved an expedited Section 106 process that not only enabled conversion of the site to a training area but also ensured the unrestricted use of the Muscatatuck buildings for Departments of Defense and Homeland Security training purposes.

In its first year of operation, more than 16,000 people from the military and other government and private agencies have honed their urban engagement skills at the MUTC.

“Before Kari came on board, we weren’t

doing a good job communicating with our internal and external stakeholders,” said Lt. Col. Rick Jones, supervisory environmental specialist for the INARNG. “She worked with the SHPO, local and state historic preservation groups and Native American tribes to streamline the process, build the MUTC and realize our urban training vision.”

As important as it is, the MUTC is only one of more than 140 projects Carmany-George manages. In the last two years, she has cleared about 392 acres for new construction projects that have included more than 57 miles of tactical trail. She created and executes a cultural resources management program for an organization with more than 50 National Register-eligible structures scattered across the state and more than 400 archaeological sites located on the 33,000-plus acres of training land managed by INARNG.

Carmany-George is bringing all of these resources under an integrated cultural resources management plan to ensure that INARNG is in compliance with federal and state laws and regulations while balancing preservation and management of the resources with Soldier training and construction projects.

She is also seeking to develop additional Section 106 agreement documents to streamline the process for repetitive actions that INARNG has at Camp Atterbury. Such agreements will save time and money, and will expedite the construction of additional training facilities.

Carmany-George’s efforts on behalf of the INARNG have earned her a Secretary of the Army Environmental Award for individual achievement in cultural resources management. Her efforts showcase the talent and dedication of the Army in the practice of environmental stewardship.

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This aerial photograph shows some of the 980-acre property that the Indiana National Guard acquired and converted into the Muscatatuck Urban Training Center. Photo courtesy of Karstin Carmany-George



Letterkenny's 'lean' manufacturing produces real-world results

by Deborah Elliott

In 40 percent less time than it normally takes, employees at Letterkenny Army Depot, Pa., fabricated almost 900 reinforced armor door kits for upgrading High-Mobility Multipurpose Wheeled Vehicles (HMMWVs) deployed in Iraq. Their efforts to address the significant threat to American Soldiers from improvised explosive devices saved lives and prevented countless injuries.

Despite their already-humming manufacturing pace, the depot crew delivered the door kits four weeks early, came in \$1 million under budget and worked into the process an annual savings of \$1.4 million dollars — enough to provide 27 HMMWVs per month to the warfighters since August 2006. How did they do it?

“When the call came in to deliver the door kits, we were experiencing production rates twice as high as normal,” said Randall Quinn, chief, Environmental Management Division. “Even though we didn’t build new facilities to accommodate increased production, instituting ‘lean’ manufacturing methods enabled us to meet the need of our Soldiers in Iraq.”

Lean manufacturing at Letterkenny is the result of the depot's commitment to the Army's Lean Six Sigma management approach. The lean core team uses the kaizen and value stream analysis tools to discover and eliminate waste by reducing floor space, flow time and distance traveled as a means of increasing productivity. More than 80 percent of the workforce at Letterkenny has participated in at least one Lean Six Sigma rapid improvement event (RIE). RIEs are exercises designed to identify inefficiencies quickly and recommend immediate corrective action.

Lean manufacturing revolutionized pollution prevention at the depot, too. Iterative improvements to lean initiatives have vastly improved waste reduction and eliminated sources of pollution.

In fiscal year 2006, Letterkenny reported

a 58 percent solid waste diversion rate in the amount of 4,756 tons. It accomplished this goal by implementing aggressive reuse, recycling and reclamation programs. One of these programs included collecting diesel fuel drained from vehicles being overhauled and recycling this fuel for reuse in the main heating plant. This action saves disposal costs and reduced the need to purchase new fuel oil. The depot also set up a program to sell its used motor oil through a qualified recycling agent.

In addition to recycling waste, Letterkenny reduced the amount of waste it generates. Since the beginning of FY 2005, the depot has eliminated the use of any new chemical formulations containing methylene chloride, trichloroethylene and other hazardous chemicals. As a result, the depot met its environmental management system goal of reducing hazardous chemicals use in existing products by 75 percent.

Aggressive waste elimination and management with lean process improvements is netting Letterkenny big savings in production time, impact on the environment and dollars. The lean manufacturing production methods combined with environmental initiatives save the depot almost \$15 million per year.

Improvements made to the existing manufacturing facilities and the incorporation of lean manufacturing approaches produce real-world results vital to the suc-



Workers at Letterkenny Army Depot, Pa., maintain, repair and overhaul Army vehicles in streamlined processes that produce more finished vehicles per month because of the depot's commitment to Lean Six Sigma. Photo courtesy of Randall Quinn

cess of Operations Enduring Freedom and Iraqi Freedom. As the Center of Industrial and Technical Excellence for Air Defense and Tactical Missile Systems, Letterkenny civilian professionals continue a 60-year tradition of providing critical support to the Army.

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Fort Riley cleans uphill

by Deborah Elliott

Cleaning up contaminated groundwater that was moving uphill turned out to be no problem for the environmental restoration team at Fort Riley, Kan. Finding a solution to a tough environmental challenge when even gravity seemed to be broken marked one of several cleanup projects helping to earn recognition for the team in the fiscal year 2006 Secretary of the Army Environmental Awards competition.

The unexpected up-gradient plume appeared as Fort Riley worked to place a new well near a dry cleaning facilities area during preparations to clean up a known site. A records review and examination of the site determined that perchloroethylene-contaminated water from a plugged sewer line had moved, under pressure, through a utility corridor slightly uphill from the eastern side of the site to the western side.

After evaluating cleanup technologies, the team chose a high-pressure injection system to shoot potassium permanganate, a strong oxidizer, uphill to treat the western plume. This is the first time a high-pressure (10,000 psi) injection system has been used to inject potassium permanganate.

Along with the difficult uphill shot, the environmental restoration team had to figure out how to protect a nearby endangered bald eagle habitat. To do this, the team got permission from the Union Pacific Railroad to drill under its tracks to place the injection equipment where it would not affect the eagles. That was one of many coordination and relationship-building aspects to the project. Fort Riley's comprehensive approach to the cleanup won the installation the U.S. Fish and Wildlife Service *Military Installation Conservation Partnership Award* for 2005.

Microbes supplied the challenge as Fort Riley addressed cleaning-fluid contamination at another site. There, the problem was that microbes in the groundwater weren't effectively destroying low-level contamination. The cleanup team used a new refined soybean-oil product to energize



Workers drill under Union Pacific Railroad's tracks to place a cleanup project's injection equipment where it would not impact the endangered bald eagle habitat nearby. Photo courtesy of Herbert J. Abel

the microbes and force the groundwater to break down the contaminants.

The techniques used by the cleanup team at Fort Riley to treat chlorinated solvents in groundwater are both effective and economical. Initial results show that cleanup of the sites will be accelerated by many years. This efficiency has the dual benefits of improving public safety and saving millions of dollars.

Innovation isn't the only reason Fort Riley's cleanup programs receive accolades. The installation is also recognized for implementing challenging, long-term cleanup projects in conjunction with a changing mission due to the Base Realignment and Closure and the Global Defense Posture Realignment initiatives. These changes have resulted in rapid development of training areas.

Evidence that Fort Riley is succeeding, however, is found in the cleanup team's response to a need for a tactical unmanned aerial system operational area. After an intensive search for the best available location, the installation staff selected a closed landfill, monitored and managed by the

installation restoration program, as the most appropriate site for this important tactical asset. The cleanup team and installation personnel worked with the Kansas Department of Health and Environment to secure approval for the system runway and operational facilities to meet the July 2006 time-critical completion date. Working as an integrated team, the installation and regulatory personnel were able to get this mission-essential asset placed in time to support operational requirements.

Thoughtful planning for the future is evident in many environmental actions at Fort Riley.

"Fort Riley exemplifies the mission of sustainability by restoring the environment while promoting its current and future use," said Mark Smith, branch chief at the Georgia Department of Natural Resources and Secretary of the Army Environmental Awards judge.

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Camp Edwards recovers training grounds

by Deborah Elliott

At one of the Northeast United States' critical year-round training areas, land that was once lost as a training resource has been recovered.

Last year, the environmental staff at Camp Edwards, Mass., conducted efforts that brought 175 acres of prime training ground back into use.

This is good news for the more than 36,600 Soldiers and 17,200 civilians who participate in training events at Camp Edwards every year. The camp is home to the Massachusetts Army National Guard and host to other armed forces components, law enforcement agencies and civilian organizations.

"In our training, we have involved civilian and military communities that expect their Soldiers to be deployed with the proper training, all while protecting the environment they train on," said Michael Ciaranca, Camp Edwards' natural resource manager. "That training ground happens to be in their own backyard."

The Camp Edwards Training Site, located on the upper western portion of Cape Cod in Barnstable County, Mass., is a 15,500-acre area that makes up the lion's share of the 22,000-acre Massachusetts Military Reservation. The camp is subdivided into 23 designated training areas and 20 fir-

ing ranges dedicated to realistic multi-echelon combat and lanes training.

The Natural Resource Office at Camp Edwards has the considerable challenge of supporting the camp's training mission while managing a sensitive natural environment, including more than 39 state-listed threatened and endangered species. Because Camp Edwards is the single largest tract of open space on Cape Cod, the area provides the only habitat for many rare plant and animal species.

Surprisingly, surveys conducted at Camp Edwards show that Soldier training actually contributes to the support of threatened and endangered species, such as the Eastern box turtle. According to one survey concluded in fiscal year 2006 that focused particularly on that reptile, the Eastern box turtle was found to be more prevalent in areas used for training than in areas that were not.

What makes the difference? Fire.

Prescribed burning is one highly effective way natural resource managers at Camp Edwards keep lands open for training. Fire burns away invasive plants that choke training lanes, and it promotes the regrowth of native ecosystems that make up the natural habitat of local endangered plant and animal species. Last year,



The spotted salamander thrives in Camp Edwards' pine barren ecosystem, as do many other Massachusetts threatened or endangered species. Photo courtesy of Camp Edwards Natural Resource Office

more than 175 acres of training area were recovered and restored due to prescribed burning. Camp Edwards also aided the Air National Guard in restoring a 160-acre grassland by providing restoration advice and a prescribed-burn team.

"The underbrush in the training area is impossible to maneuver through, but after a prescribed burn, it opens the area up," said Capt. Jerrime Oliver, Camp Edwards' training site manager. "The burns allow us to do land navigation and other maneuvers through a large area in a realistic setting."

Low-tech solutions to solving training and environmental challenges are combined with high-tech solutions. Extensive use of a geographic information system (GIS) enables the camp to plan environmental activities, evaluate geographical information about wildlife and create wildfire hazard models on the one side. On the other side, GIS is used to develop land navigation and vehicle training courses, identify restricted areas, and produce field cards and other map materials. Using GIS, the Environmental Division was able to place an engineering equipment training area and upgrade a small-arms range last year.

Other environmental initiatives, including permanently repairing one-quarter mile of a chronically eroding combat trail and establishing vegetation to prevent future erosion, helped earn Camp Edwards



Courtney LaMere, a 2006 seasonal staff member monitors a prescribed burn to promote healthy grassland eco-communities at Camp Edwards, Mass. Photo courtesy of Camp Edwards Natural Resource Office



Grafenwoehr prepares ground for Stryker unit

by Kristin Miller

Training lands at the U.S. Army Garrison Grafenwoehr, Germany, were once gradually melting away. Soil eroded by prolonged training and constant vehicle traffic diminished the environmental quality of some of these areas. These conditions made some people question whether a Stryker unit could be trained on the northeastern Bavarian installation.

But, by the time the 2nd Stryker Cavalry Regiment (SCR), the first Stryker unit in Europe, arrived in the summer of 2006, Grafenwoehr was ready. The Environmental Division of the garrison's Directorate of Public Works ensured their ability to train there long before the SCR arrived, according to Manfred Rieck, chief of the Environmental Division.

"To get ready for the 2nd SCR, we built 24 maintenance and 24 refueling pads throughout the training area," said Rieck.

To build them, Grafenwoehr had to follow not only Army regulations, but German and U.S. environmental law as well.

"It's our job to provide the technical and biological infrastructure for the performance of an effective and realistic military training in compliance with U.S. and host nation environmental laws and regulations on a day-to-day basis," Rieck said.

The installation also had to take steps to make certain its land could sustain Stryker training for the long haul. First, the Environmental Division studied the effects of the Stryker vehicles on soil, vegetation and surface water runoff. The extensive tests and field trials indicated that the soil in areas off limits for tracked vehicles could endure Stryker training with less negative

impact on the environment.

Second, the Environmental Division began several projects to manage the biggest problems: erosion and soil compaction. To keep soil from washing away in the rain or blowing away on windy days, the Environmental and Operations and Maintenance divisions, in cooperation with the trainers, moved and cut open berms, eliminating erosion bottlenecks and containing storm-water runoff. The strategic rearrangement of berms also increased maneuver space, according to Rieck.

In addition, the installation reseeded 4,000 acres of training land with a mix of native grasses. The new ground cover not only anchored the soil, it also resisted vehicle traffic better, grew faster and did not disturb threatened and endangered species.

For places where the soil was so hard grass could no longer grow, the team invented a roller with specially shaped hardened steel teeth to loosen the soil without destroying existing protective vegetation. Dragging this device behind a tractor, Grafenwoehr staff brought about 2,000



A tractor pulls specially developed decompaction equipment that loosens the soil but does not destroy vegetation, both of which are very important for the prevention of surface water erosion. Photo courtesy of Manfred Rieck

acres of land back to realistic training conditions in half the time it normally would have taken, Rieck said.

"Grafenwoehr's aggressive environmental program is evidence that you can achieve true harmony between mission execution and environmental stewardship," said Juan Lopez, a senior program analyst with the Office of the Federal Environmental Executive. Lopez served as a judge for the fiscal year 2006 Secretary of the Army Environmental Awards.

Grafenwoehr took the award in the *Environmental Quality, Overseas Installation* category, partially for its efforts in preparing for the 2nd SCR's arrival. The unit is now at home and training at Grafenwoehr, Strykers and all.

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the Army's highest award for environmental stewardship. The Secretary of the Army award for *Natural Resources Conservation, Large Installation* was presented for managing a threatened habitat while supporting an important training mission.

"Clearly the Massachusetts Army National Guard's Camp Edwards delivers an outstanding and complete natural resource management program," said award judge Lewis E. Gorman III of the U.S. Fish and Wildlife Service. "It sustains military training while promoting a

high level of ecosystem stewardship."

Soldiers who train at Camp Edwards serve in all of the United States' current operational environments.

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IMCOM announces 2006 DPW Awards winners

by Brig. Gen. John A. Macdonald

It is always a great day when leaders have an opportunity to acknowledge exceptional members of the Installation Management Command team. The Directorate of Public Works Awards Program affords the opportunity to recognize excellence in the execution and management of the public works, base operations, real property maintenance and Army Family Housing missions.

The selection process for the annual 2006 DPW Awards is complete, and the award winners are listed below. My congratulations for a job well done goes to the seven individual and two group winners.

William C Gribble Jr. DPW Executive of the Year – Michael Biering, Fort Stewart, Ga.; IMCOM-Southeast

DPW Engineering, Plans and Services Executive of the Year – Dennis Abell, Fort Bragg, N.C.; IMCOM-Southeast

DPW Business Management Executive of the Year – Sang-Yun Han, Area I; IMCOM-Korea

DPW Housing Executive of the Year – Wilfredo Moore, Area II; IMCOM-Korea

DPW Operations and Maintenance Executive of the Year – David Pawlak, U.S. Army Garrison Hawaii; IMCOM-Pacific

DPW Support Executive of the Year – David Heins, Fort Bragg, N.C.; IMCOM-Southeast

DPW Region Support Executive of the Year – John Mores, IMCOM-Korea

DPW Installation Support Program of the Year – U.S. Army Corps of Engineers, Louisville District; Fort Campbell, Ky.; IMCOM-Southeast

DPW Installation Support Contractor of the Year – Base Operations Services, GmbH; Darmstadt, Germany; IMCOM-Europe

Brig. Gen. John A. Macdonald is deputy commanding general of the Installation Management Command.

PWD

Corps employees receive value engineering awards

Kenneth Krieg, undersecretary of defense for acquisition, technology and logistics, hosted the Department of Defense Value Engineering (VE) Achievement Awards ceremony May 16 in the Pentagon Auditorium. Among the recipients were U.S. Army Corps of Engineers employees.

The *Outstanding Value Engineering Team* award was presented to a team that used 13 value engineering and management workshops to help the Corps transform its military construction delivery process. Their work culminated in the award of a pilot project at 100 percent scope and within budget during a difficult construction bid climate. About \$130 million in cost avoidance was documented on this work, and more than \$120 million was documented on other projects using similar delivery.

Receiving the award were **Howard Moy**, a program manager at Corps headquarters; **Jeffery Hooghouse**, deputy chief architect at Corps headquarters; **Carole Lee Rankin**, Louisville

District value engineering/management program manager; and **Joel Hoffman**, standards and criteria team member, Engineering and Support Center, Huntsville.

A *Special Award for outstanding support to, and use of, the VE Program* was given to the **Louisville District**. All parts of the district supported the VE Program as it transitioned from a technical improvement and cost reduction tool to broader use for management success. The district doubled its combined Military and Civil Works cost savings and avoidance to \$15.5 million in fiscal year 2006, while providing management, technical and contracting support to help Headquarters transform the MILCON delivery process.

Receiving the award on behalf of Louisville District were **Col. Raymond G. Midkiff**, the district's commander, and **David Dale**, its deputy commander.

Information provided by Michael Holt, U.S. Army Corps of Engineers. PWD

USAG Japan achieves excellence



Lt. Gen. Robert Wilson, left, presents the 2007 Army Communities of Excellence flag to Col. Robert M. Waltemeyer, U.S. Army Garrison Japan commander, while Brig. Gen. John A. Macdonald, right, presents the first-place Army Communities of Excellence trophy to Corrie Nakamoto, left center, and Nory Nakanishi at a Pentagon ceremony May 3. Wilson is assistant chief of staff for installation management and commander of Installation Management Command. Macdonald is IMCOM deputy commander. Nakamoto is Plans, Analysis and Integration Office chief, and Nakanishi is a PAIO program manager at USAG Japan. The garrison was also honored at the Department of Defense's Commander in Chief's Annual Awards for Installation Excellence ceremony May 4.



Pohakuloa Training Area garners 2006 USFWS top partner award

by Stefanie Gardin

Representatives of Pohakuloa Training Area (PTA), Hawaii, received the *Military Conservation Partner Award* for 2006 at the 72nd North American Wildlife and Natural Resources Conference in Portland, Ore., March 22. The U.S. Fish and Wildlife Service (USFWS) award recognizes military installations that have attained significant achievements in natural resource conservation through partnerships and cooperation.

"We highlight installations that we feel have really done an outstanding job of conservation, especially in partnership with us and other organizations," said Laura Henze, USFWS National Sikes Act coordinator and developer of the award.

The award is in its third year. Fort Carson, Colo., received the 2004 award, and Fort Riley, Kan., received the 2005 award. As word gets out, installations are getting more excited about the award, according to Henze.

"I think it helps improve morale, and we're hoping it helps improve partnership building between the agencies," Henze said. "That's our main goal here — to improve partnerships and benefit the resources that way."

It's a goal the Army shares, especially when it comes to sustainability and working towards the future.

"Sustainability is a team effort," said Col. Howard J. Killian, U.S. Army Garrison Hawaii commander. "By ourselves, we can only accomplish so much, but when we pair up with other stakeholders, we can share ideas and break down barriers; thoughts become realities. Our partnership with the U.S. Fish and Wildlife Service is an excellent example of that."

Partnering with agencies like the USFWS, the Hawaii Division of Forestry and Wildlife, the Junior Sierra Club and Hawaii Community College, PTA has accomplished quite a bit for its more than 131,000 acres and 19 federally listed threatened or endangered species. However, con-

servation does not stop with those.

"We don't only focus on federally listed species," said Darryl York, PTA biologist. "We also focus on rare species that don't have a federal designation, because they're part of the ecosystem, and they need to be preserved."

One big way the natural resource staff is preserving these species is by putting up 6-foot metal fences. The fencing project keeps wild animals, like sheep, goats and pigs that devastate the land with their eating habits, away from threatened and endangered species so the habitat has a chance to recover. Since 2005, workers have fenced 7,000 acres, with the end goal of 33,000 acres, or about 70 miles of fence.

"The large-scale kind of stuff we're doing is unprecedented," York said. "To have 33,000 acres of native dry-land forest protected is just going to be phenomenal."

Another key part of PTA's conservation work is its rare plant propagation facility. The Natural Resources staff develops sprouting and reproduction techniques for its threatened and endangered plant species, in addition to learning how to treat the plants for disease.

"Recovery is a big part of the Endangered Species Act," York said. "It doesn't do the species any good if you're just out there protecting the last 50 of them. You have to protect the last 50, and 10 years from now have 150, and 20 years from now have 500, so that one day, hopefully, the species can be de-listed."

From small seeds or cuttings, these plants grow to become the future, and possibly the savior, of their species.

"With the state, we plant these species in suitable habitats throughout the island where they may have been found in the past," York said. "That way, if there is a catastrophic event here at PTA, such as a vol-



Contractor Tony Rosa pounds a stake into the ground to anchor a fence bottom at Pohakuloa Training Area. Once completed, about 70 miles of fence will protect threatened and endangered plants from goats, sheep and pigs. Photo courtesy of U.S. Army Garrison Hawaii Natural Resources

canic eruption or huge wildfire, we would have other populations of plants around the island and wouldn't be faced with an extinction event."

PTA and its partners work together serving on the Hawaiian Hoary Bat Working Group, coordinating firefighting resources, constructing fuel breaks to guard against fires and volunteering to help weed and reintroduce native plants at the West Hawaii Veterans Cemetery.

"Pohakuloa has shown that military installations can complete their mission while still doing their part to promote long-term habitat management and conservation that benefit wildlife, especially endangered or threatened species," said Patrick Leonard, field supervisor, Pacific Islands Fish and Wildlife Office.

"The conservation of native ecosystems and endangered species is compatible with the Army's training mission" York agreed. "We can do both, and we can do both well."

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Stefanie Gardin is with U.S. Army Garrison Hawaii Public Affairs. 



CP-18 Leadership Development Program important to way ahead

by Lt. Gen. Carl A. Strock

With the wave of civilian retirements and concern about where the next group of engineer leaders will come from, a program that has been under the radar in recent years is seeking resurgence. The Career Program 18 (CP-18) Leadership Development Program (LDP) has produced more than 135 graduates from across the Army who are now achieving senior management and leadership positions.

The CP-18 LDP was created in 1998 by William A. Brown Sr., then deputy director of Military Programs for the U.S. Army Corps of Engineers. Bill's intent was to give leadership and management training opportunities to the bulk of the CP-18 population, which is at the GS-12 and -13 levels. Through a three-part program of classroom instruction, experiential learning and mentoring, the goals are to expand employees' career horizons beyond their technical specialty and help them gain a greater perspective of the Army and its engineering roles.

Until this year, the LDP consisted of the following:

1. Six courses: Supervisor Development Course, Leadership Evaluation and Development (LEAD), Organizational Leadership for Executives (OLE), Sustaining Base Leadership and Management (SBLM), Seminar for New Managers and one course from the Office of Personnel Management Public Policy curriculum.
2. A six-month developmental assignment outside of the candidate's functional and geographic area. The original concept was for candidates to swap positions, but in recent years, candidates have come to USACE headquarters, deployed to Iraq or Afghanistan, or found other assignments.
3. An established mentoring relationship with a senior Army engineer leader.

In the past year, several events have occurred that affect the program: the creation and implementation of the Civilian Education System (CES), an increased

workload for all Army personnel to support the Global War on Terrorism and the effects of the largest round of base closures and realignments. These factors have decreased the number of applicants. Therefore, I have asked Bob Slockbower, the functional chief's representative for CP-18, to take a fresh look at the program and suggest needed changes.

If you would like to participate in this review or would like more information about CP-18 LDP, please contact the CP-18 functional POC, Ed Gauvreau at 202-761-0936 or edmond.g.gauvreau@usace.army.mil.

One change that has already been decided is the substitution of the CES for LEAD, OLE and SBLM. If you had taken any of the previous Army leadership courses, you will receive credit for them in CES and not be required to take the respective new course. CES is centrally funded for tuition, travel and per diem for all employees attending resident sessions. Enrollment in CES can be done through the Army Management Staff College web site at <http://www.amsc.belvoir.army.mil/>.

Another change under discussion is the method of selection for developmental assignments. The original reason for job swaps was to assure the home organizations that they would receive a valued Army employee in return for letting their own valued employee go on a six-month assignment. While swaps may still be included as an option, there are other possibilities for a developmental assignment outside of your lane.



Lt. Gen. Carl A. Strock
Photo by F.T. Eyre

USACE is accepting applicants to volunteer for deployment to either Iraq or Afghanistan to assist in our assigned reconstruction mission. While the working environment can be very challenging, the experience will give you immeasurable personal and professional satisfaction. Also, USACE has stood up Task Force Hope in Louisiana to oversee the reconstruction of the New Orleans levees and dikes, as well as a comprehensive program for flood control and wetlands restoration. We will provide additional information on these options when the LDP program announcement is released later this summer.

Bob and his team will examine the entire program, taking into account past comments and surveys and seeking ways to assure CP-18's continued growth and success. As of this date, more than 50 percent of the 136 LDP graduates have moved on to higher positions of leadership within the Army engineer community. It is my wish that the CP-18 LDP continue to prepare the new generation of engineer leaders that the Army needs to sustain the force.

I expect that later this year, following the ongoing review of the CP-18 LDP, that revised guidance will be issued in conjunction with a call for nominations. Once again, I ask all CP-18 career program managers to encourage their employees to apply for the LDP, as well as all other CP-18 programs, regardless of your location or mission. Despite all the challenges the Army faces today, training for future leadership is more critical than ever for the Army to meet present and future expectations. Sending your employees to advanced leadership training like the CP-18 LDP helps to keep your employees, organizations and yourselves Army Strong!

Essayons!

At the time this commentary was written, Lt. Gen. Carl A. Strock was the chief of engineers, commanding general of the U.S. Army Corps of Engineers and functional chief of Career Program 18.

PWD



Training targets installation energy reduction goals

by Dana Finney

The Engineer Research and Development Center (ERDC), in partnership with three U.S. Army Corps of Engineers Design Centers of Expertise, will conduct week-long training courses about energy conservation requirements for new construction.

Public Law 109-58, also known as EPA Act 2005, requires in part that newly constructed federal facilities achieve 30 percent better energy consumption than a comparable facility designed in accordance with American Society of Heating, Refrigeration and Air-conditioning Engineers Standard 90.1-2004, but only if it is life-cycle cost effective. The Army is committed to meeting these goals for all new barracks, battalion headquarters and

tactical equipment maintenance facilities, among others.

ERDC's Construction Engineering Research Laboratory (CERL) is currently completing a study sponsored by the Office of the Assistant Chief of Staff for Installation Management and Headquarters, USACE to determine the appropriate energy conservation measures needed to meet the EPA Act goals in each U.S. climate zone.

While some of the recommended measures are easily understood, others are more complex. ERDC-CERL will structure the training courses to provide a practical interpretation of the more complicated recommendations. These workshops will also help ensure appropriate implementation of the Military

Construction Transformation Program.

A "short course" version will be presented during the Corps' Infrastructure Systems Conference in Detroit June 25-29. Full-week courses will be held at Louisville District the week of July 9; at Fort Sam Houston, Texas, with Fort Worth District, the week of Sept. 17; and at Fort Bragg, N.C., with Savannah District, the week of Oct. 22.

For more information, contact Alexander Zhivov at CERL, (217) 373-4519, alexander.zhivov@us.army.mil.

Dana Finney is a public affairs specialist at the Engineer Research and Development Center's Construction Engineering Research Laboratory in Champaign, Ill. **PWD**

LonWorks building automation systems workshop to be held at Fort Hood

by David Schwenk

Fort Hood, Texas, and the Engineer Research and Development Center (ERDC) will host a LonWorks building automation systems workshop at Fort Hood Aug. 21-23. Sponsored by the Installation Management Command, the workshop will focus on implementing basewide control systems at Army installations.

Over the past several months, ERDC, along with the Corps' Savannah District and Huntsville Engineering and Support Center, developed guidelines to help installations create an implementation plan. The team is now working with several installations to develop and execute installation-specific plans.

Workshop participants will:

- review LonWorks technology and discuss key specifications and requirements for LonWorks direct digital control systems and basewide utility monitoring and control system (UMCS);

- step through the development of an implementation plan;
- discuss the challenges associated with implementation of a basewide system;
- demonstrate the Fort Hood LonWorks UMCS and how to use a LonWorks network configuration tool; and
- provide an opportunity to share experiences, ask questions and learn from others.

Attendance at the workshop is limited to 50, and funds are available to cover travel and temporary duty costs (but not labor) for a limited number of attendees. If you are interested in attending, contact Dave Schwenk at ERDC's Construction Engineering Research Laboratory, (217) 373-7241, david.m.schwenk@erdc.usace.army.mil.

This contact is not a commitment as confirmations will be handled at a later date. If you are able to cover your own TDY and travel costs, let organizers know



Students participate in a field exercise during an engineering course. Photo courtesy of the Engineering and Support Center, Huntsville, Ala.

so they can make the best use of the available travel funds. The workshop will end at noon Aug. 23.

David Schwenk is a project manager at the Engineer Research and Development Center's Construction Engineering Research Laboratory in Champaign, Ill. **PWD**



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