

Public Works

DIGEST

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2017 ARMY

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U.S. ARMY

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U.S. ARMY

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Enabling installation readiness through environmental stewardship

by Lt. Gen. Gwen Bingham

The Office of the U.S. Army Chief of Staff for Installation Management supports readiness by establishing policies, programming funding and human resources to accomplish environmental stewardship and land management initiatives. Environmental stewardship enables Army readiness by preserving access to training lands, land management for future growth or emerging missions, and safeguarding the health and well-being of our Soldiers, Civilians and Families.

My office is the proponent for Army environmental policies including Army Regulation 200-1 “Environmental Protection and Enhancement.” Protecting our flora, fauna and cultural resources; providing clean air and water; and ensuring prompt environmental cleanup ensures the Army can train while complying with various Federal, State, and local laws and regulations. At Fort Hood, Texas, we collaborated with Forces Command, Installation Management Command, and the U.S. Fish and Wildlife Service to protect and conserve habitat occupied by two endangered species, the Golden-Cheeked Warbler and Black-Capped Vireo. We developed innovative management strategies, ensuring habitat quality and species numbers while allowing the Soldiers to train and support readiness. The Army spends more than \$40 million a year to protect species on its installations.

Another important readiness enabler is wildland fire management. Fort Huachuca, Arizona, and Fort Carson, Colorado, are examples of installations employing innovative methods for managing fuel load and fire breaks necessary for containing wildland fires. Wildland fire inhibits training and poses danger to Soldiers, Civilians and Families. We are collaborating with industry and academia to analyze wildland fire risk across the Army as understanding risk allows us to apply resources across installations to prevent and fight wildland fires.

The Army Compatible Use Buffer Program is a growing and successful program to mitigate the effects of and prevent

encroachment at our installations. The Army and its partners have invested more than \$860 million to set aside 332,000 acres adjacent to installations to achieve conservation goals and sustain Army readiness. The Fort Bragg Army Compatible Use Buffer program preserved access to training lands while accelerating recovery of Red-Cockaded Woodpecker habitat by 10 years.

My office oversees environmental compliance to enable the future Army. We spend more than \$440 million annually on Army environmental compliance ensuring clean air, water, and land is available for Soldiers, Civilians and Families around the world. The Army continues to provide safe drinking water on our installations and has reduced the number of environmental violations at our installations during the past 25 years. The Army’s commitment to comply with Federal, State and local laws exceeds business industry standards.

Our Soldiers, Civilians and Families expect a clean and safe environment. The National Environmental Policy Act of 1970 requires an environmental review with stakeholders to understand the environmental impacts of Army actions. Environmental performance assessments and internal inspections at our installations allow us to find, fix and mitigate potential environmental threats. Being proactive protects Soldiers, Civilians, and Families while prompting us to be good stewards of the environment and Army resources.

Army environmental programs support the strategic objectives of our Army and ensure its current and future readiness. We recognize great performance across the Total Army through our environmental awards program. In 2016, we recognized our environmental workforce at Camp Ripley, Minnesota, for their outstanding work in natural resource conservation; Cultural Resources management achievements at Camp Pendleton, Virginia; and the environmental quality program at U.S. Army Garrison Bavaria, Germany.



The Environmental Quality program at U.S. Army Garrison Bavaria, Germany, was one of the winners of the Secretary of the Army Environmental Awards. Army environmental programs support the strategic readiness of the Army and ensure its current and future readiness.
(U.S. Army photo)

The Army is committed to environmental protection, stewardship, and compliance to ensure our Soldiers can train and live with their Families in a safe and healthy environment. Ensuring Army lands are available to support training directly improves Army readiness today and provides adaptability for emerging requirements and future Army missions.

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Corps of Engineers continues its focus on sustainability

by Lt. Gen. Todd T. Semonite

I am energized by the vital initiatives the U.S. Army Corps of Engineers and our partners have developed and executed together so we can achieve energy security, water conservation, and waste reduction goals. Why? Because sustainability initiatives protect vital ecosystems and ensure the security and prosperity of our Nation. Our work supports military readiness, improves the natural environment, and boosts the quality of life and resilience for all Americans, including warfighters and their Families.

I've been a long-time advocate for incorporating sustainability into everything we do. As a division commander, I established key partnerships to enable federal agencies to engage with regional, state, and local stakeholders so as to develop mutually-beneficial solutions to common concerns, such as endangered species protection, water supply and distribution, and access to recreation.

The Corps of Engineers has applied environmental stewardship, sustainability, and resilience fundamentals in planning, engineering, design, and construction even before the wave of environmental legislation of the 1970s. During the last decade, a renewed focus on sustainability and a much greater reliance on systems thinking and alternative financing has emerged.

We are relentless in pursuing environmental conservation, sustainability, and resilience objectives because we get it. We understand these issues are interdependent, and we know how crucial they are to enabling the readiness of our Nation, protecting the health of communities across the country, as well as reducing risk and safeguarding economies.

Achieving these objectives requires us to break through barriers and stovepipes within our own organization. Delivering solutions to our Nation's fiercest environmental challenges requires us to access the right capabilities, talent, and insight across all our mission areas.

Sustainability has been an explicit part of



Solar panels on U.S. Army installations are becoming more and more prevalent as the Army and the U.S. Army Corps of Engineers increase its focus on renewable energy sources that will help keep the installations sustainable and resilient. (U.S. Army photo)

the Corps of Engineers' culture since 2002, when we first adopted our "Environmental Operating Principles." We strive not only to meet Federal energy, water and waste reduction targets, but rather think strategically to anticipate the need for adaptation to climate change and extreme weather events.

I was proud to renew the Environmental Operating Principles in my first year as commanding general of the U.S. Army Corps of Engineers and recommit our organization to these crucial principles. And let me emphasize these principles are not just for our Environmental/ Regulatory teammates, they apply to all of us. I consider them a foundation task.

I have made environmental stewardship a priority in our newly revised Corps of Engineers Campaign Plan. You will find our environmental commitment more prominently displayed in some of our key mission areas.

I expect the Corps of Engineers to be recognized as leaders in sustainability as well as enablers for our partners to achieve their sustainability goals. It's not just about energy

either – we need to ensure that we put our attention on our water use, sustainable acquisition practices, and continued commitment to reducing waste.

We will fully "walk the talk" by integrating sustainability and our Environmental Operating Principles into all our operations and missions. Our sustainability team is working hard to propose key criteria and monitor and evaluate our success.

We must grow world-class sustainability leaders. We must develop a community of sustainability professionals who are chosen for their passion, commitment, knowledge and expertise. Leaders among their peers, recognized for their ingenuity and innovation.

Through the update in our Campaign Plan, we plan to develop a training curriculum and propose options for sustainability accreditation for our professionals. The concepts and principles of sustainability that promote collaboration, systems thinking, and creative problem solving are attributes we need to develop

(See Corps of Engineers, page 5)



(Corps of Engineers, continued from page 4)

and cultivate in all our future Corps of Engineers leaders.

As engineers, we have unique capabilities to translate science into actionable information and innovation. All of this important work is accomplished by teams of people deeply committed to sustainability.

As Army Engineers, we have made a promise to our country. We have abundant evidence, 241 years' worth, that demonstrates engineers honor our promises. Members of the U.S. Army Corps of Engineers are passionate, consistent, and convincing advocates for protecting our nation's interests, including our natural resources. I believe we will continue to play our full part in promoting our Nation's peace, prosperity, and sustainability through our science and engineering expertise and leadership. Everything we do supports our Nation's readiness. We need to keep setting the example of what right looks like.

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U.S. Army Corps of Engineers Environmental Operating Principles

- Foster Sustainability as a way of life throughout the organization.
- Proactively consider environmental consequences of all Corps activities and act accordingly.
- Create mutually supporting economic and environmentally sustainable solutions.
- Continue to meet our corporate responsibility and accountability under the law for activities undertaken by the Corps, which may impact human and natural environments.
- Consider the environment in employing a risk management and systems approach throughout the life cycles of projects and programs.
- Leverage scientific, economic and social knowledge to understand the environmental context and effects of Corps actions in a collaborative manner.
- Employ an open, transparent process that respects views of individuals and groups interested in Corps activities.

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on Engineer Knowledge Online



DPW Leadership Workshop encourages 'adaptability'

by Candice Walters

More than 250 members of the Army's public works community came together Feb. 6 through 8 in San Antonio, Texas, to focus installation Directorate of Public Works (DPW) managers on Army and Installation Management Command (IMCOM) priorities, current and future resource challenges, and strategic efforts required to adapt and change in an uncertain and resource-constrained environment.

The workshop equipped DPW managers with a better understanding of the future of Army installations, their role in leading day-to-day public works operations, and created an environment to share ways to accomplish mission goals efficiently and effectively to meet the demands of senior commanders.

The Directorate of Public Works Leadership Workshop, hosted by IMCOM, featured talks by J. Randall Robinson, the acting Assistant Secretary of the Army (Installations, Energy and Environment), and Lt. Gen. Kenneth Dahl, commander of the Installation Management Command. Joining IMCOM directors of public works were representatives from Army Materiel

Command, the U.S. Army Corps of Engineers and Headquarters, Department of the Army.

Much of the conference focused on resourcing and logistics; ensuring that installation infrastructure projects "are on the shelf" and ready to go if and when additional money is allocated for those projects in fiscal years 2017 and 2018; reviewing manpower models to ensure they accurately reflect real world situations in the DPW shops; getting ready for the Real Property Audit Readiness, an Army priority that is scheduled to begin in FY18; dealing with the current hiring freeze and its effects on DPW operations, and identifying what activities DPWs are now doing that could be more efficiently managed as an enterprise function.

Robinson said he is relatively confident the DPW community will see additional money to begin addressing infrastructure concerns on military installations. "We have to be able to execute" when the money arrives, he said.

He praised the public works directors for doing "amazing work with limited resources of people and funding." He said he will

continue to stress the importance of more DPW personnel with Army leadership as well as push for eliminating redundancies in policy and expediting approval processes.

Robinson said the Installation 2035 initiative is still being worked, with a focus on learning what young Soldiers need and desire in 2035, and then taking the steps to make that a reality, noting that collaboration and communication will be needed.

Dahl also praised the public works directors, saying he and Army leadership recognize that within the DPW community there are "not enough people, money or time, but you do have an abundance of talent and leadership, and you are making the best we can" of the limited available resources.

"I have a tremendous amount of respect for what you do," he said.

"Infrastructure has been my No. 1 priority for the last 15 months and remains my No. 1 priority," Dahl said, adding that he continues to stress to senior leadership that there needs to be a "bold shift in resources (for infrastructure) in the next 10 years. My role is making decision makers understand the risks that are being taken."

Dahl listed his five priorities in order as infrastructure, emergency services, support for training, Soldier programs that make them resilient and ready, and family programs.

"I'm OK with not doing low priority functions," he said. The focus must continue to be on the programs and activities affecting "life, health and safety and getting combat formations out the door. I'm willing to take more risk in lower priorities," he added.

One of the biggest changes during Dahl's tenure, and since the last DPW Conference in November 2015, has been realigning IMCOM into directorates, transforming continental United States regions into directorates that mirror U.S. Army Europe and U.S. Army Pacific. "I saw three advantages" of realignment: reducing span of control, establishing a unity of purpose

(See DPW, page 7)



Lt. Gen. Kenneth Dahl tells those attending the Directorate of Public Works Leadership Workshop that infrastructure continues to be his No. 1 priority as commander of the U.S. Army Installation Management Command. (Photo by Neal Snyder)



(DPW, continued from page 6)

reflecting a common focus, and a co-location with the senior commanders, Dahl said.

The three new directorates – IMCOM-Sustainment located with Army Materiel Command (AMC) at Redstone Arsenal, Alabama, IMCOM-Training located with Training and Doctrine Command (TRADOC) at Joint Base Langley-Eustis, Virginia and IMCOM-Readiness located with Forces Command (FORSCOM) at Fort Bragg, North Carolina – were stood up in October and are still being staffed.

Dahl said he is seeing positive impacts with the new directorates – “better communication, clarity, cohesion of purpose, and TRADOC, FORSCOM and AMC are now becoming advocates for resources for IMCOM.”

Other topics discussed during the conference included: infrastructure investment initiatives; rebuilding the military; dealing with dwindling manpower; doing less with less; sessions on Net Zero Energy Best Practices and Improving Building Turnover/Success in Small Project Execution both presented by the Corps of Engineers; Garrison DPW Case Studies presented by U.S. Army Garrison Hawaii and U.S. Army Garrison Fort Benning, Georgia; Operations and Maintenance Update; Roles and Responsibilities of the New IMCOM Directorates; Asset Management;

two environmental panels on Drinking Water Quality and Insect Borne Disease, and Wildland Fire Program Programming and Responsibilities; a panel discussion on Managing Public Works with General Fund Enterprise Business Systems; and Human Capital Fund.

Gregory Kuhr, director of Facilities and Logistics for IMCOM Headquarters, said he was encouraged to see the cross communication among the conference participants as well as the sharing of issues and lessons learned.

He said he was especially pleased to see senior leadership attend and share information. “It helps everyone understand what Headquarters is doing for them, and to them,” he said. “The biggest benefit is getting to know people and establish relationships so everyone can work together closer and better.”

As part of the conference, Dahl presented six IMCOM team members with awards (see sidebar article). The next IMCOM DPW Leadership Conference is expected to be conducted in about 18 months.

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Directorate of Public Works Awards

Lt. Gen. Kenneth Dahl, commanding general of Installation Management Command, presented six 2016 Directorate of Public Works awards during the IMCOM Directorate of Public Works Leadership Conference.

Receiving the awards were:

DPW Executive of the Year – Sally Pfenning, U.S. Army Garrison Hawaii

DPW Engineering and Planning Executive of the Year– John Mores – U.S. Army Garrison Red Cloud, Korea

DPW Business Management Executive of the Year – Michael Crain, Fort Campbell, Kentucky

Housing Executive of the Year – Donald Meyer, Joint Base Lewis-McChord, Washington

Operations and Maintenance Executive of the Year – Kirk Ticknor, U.S. Army Garrison Fort Benning, Georgia

Garrison Support Executive of the Year – Taek Chu Yi, U.S. Army Garrison Red Cloud, Korea

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Because it is a closed group, you will have to request permission to join, which will be granted by the managing editor – please include information about your job title and where you work in your email requesting permission to join.

Check it out!



Fort Carson Soldier receives IMCOM Environmental Officer Award

by Sonja Lynn Odom

U.S. Army Soldiers serving as Environmental Officers are the true backbone of the Army's environmental program. These Soldiers take on additional duties, serving to implement complex environmental processes across their entire unit. In this time of growing environmental requirements and reduced civilian manpower, they are being asked to shoulder more of the load. They are selfless servants and force multipliers of our civilian environmental workforce.

So it is only fitting that the U.S. Army Installation Management Command (IMCOM) would recognize excellence of Soldiers serving as Environmental Officers.

The new Installation Management Command Environmental Officer Award, initiated by the IMCOM Commanding General Lt. Gen. Kenneth Dahl and Gregory Kuhr, the IMCOM director of Facilities and Logistics, provides an opportunity to recognize outstanding performance and excellence in environmental stewardship by individual Soldiers, stationed at Installation Management Command-managed installations, who are performing at the highest level in their role as designated Environmental Officers.

The award debuted in 2016, and the first recipient is an Explosive Ordnance Disposal (EOD) Soldier who was stationed at Fort Carson, Colorado, when the call for award nominations was answered.

Sgt. 1st Class Michael E. Kidd, of the 242nd Ordnance Battalion (EOD), distinguished himself in his role as environmental officer with achievements that not only contribute to Army readiness but also Army Sustainability. He was nominated by John Wachter, the Compliance Branch chief of Fort Carson's Directorate of Public Works Environmental Division. As the command's first Environmental Officer award recipient, Kidd will receive the Army Commendation certificate and medal for Environmental Stewardship, signed by the Installation Management Command's commanding general, Lt. Gen. Kenneth R. Dahl.

Kidd's commitment to the Fort Carson Resource Conservation and Recovery

Act (RCRA) program was evident as he worked directly with the garrison's RCRA manager to complete all training and inspection requirements for his battalion. His unwavering support and constructive feedback on the hazardous waste program for Range 121 resulted in exceptional service to the Colorado and Wyoming Fort Carson regional support community. His meticulous attention to detail ensured permit requirements were met and all work was properly documented and reported.

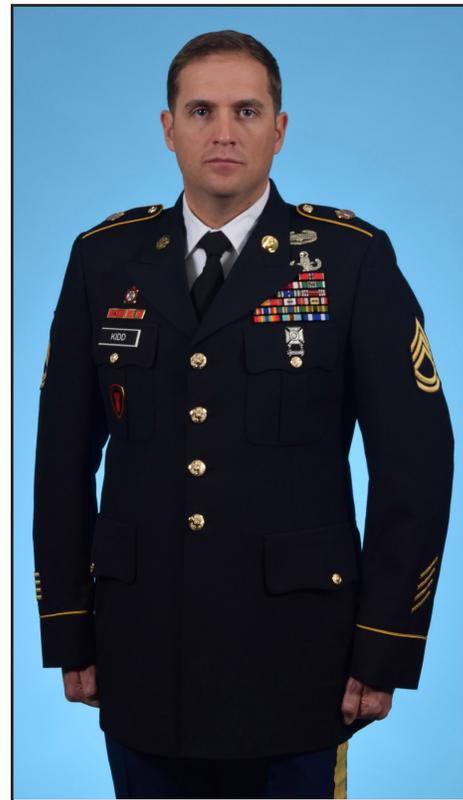
Kidd demonstrated his astute leadership and technical expertise as he coordinated with the RCRA program manager for the Colorado Department of Public Health and Environment's Summer 2015 permit inspection. Through his ability to provide critical information to state regulators and quickly make necessary program adjustments, he is credited with achieving an estimated cost avoidance of \$250,000 in both monetary fines and labor costs for the Department of the Army.

Kidd's professionalism was reflected in his ability to garner the support of his leaders and fellow soldiers which enabled his unit to meet all federal, state and Army environmental compliance standards for the first time in five years.

He planned, coordinated and conducted permit-specific RCRA program requirements relating to the Range 121 open detonation training for more than 100 EOD personnel. This training led to the accurate recording and reporting of all required permit-specific blast reports to Colorado regulators. Additionally, Kidd conducted monthly EOD-specific hazardous waste permit training classes and tracked attendance, while still performing his primary duties.

The IMCOM Environmental Officer Award recognizes Soldiers who emphasize innovation and implementation of positive change at the unit level when carrying out the garrison's environmental mission. Kidd serves as the standard to which other environmental officers should aspire.

Kidd was born in Simi Valley, California. Upon graduating high school, he enlisted in the U.S. Army as an EOD specialist. He has had a distinguished Army career and



Sgt. 1st Class Michael E. Kidd, of the 71st Ordnance Group (Explosive Ordnance Disposal), is the first recipient of the new Installation Management Command Environmental Officer Award for his exceptional work as an environmental officer at Fort Carson, Colorado. (U.S. Army photo)

graduated advanced courses and programs of study while in the Army. He is currently assigned to the 71st Ordnance Group (EOD) in the Operations office.

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Army announces its annual environmental awards

The Army recently announced the winners of the Fiscal Year 2016 Secretary of the Army Environmental Awards. Five installations and three teams will receive the highest honor in the field of environmental science and sustainability conferred by the Army.

“These awardees clearly demonstrate how fully engaged leadership, coupled with sound environmental practices and innovative approaches, can directly enhance Army readiness,” said Eugene Collins, Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health.

“This year’s nominations include a wide variety of winning solutions, ranging from alternative remediation strategies for accelerated cleanup to innovative land and pest management practices, all demonstrating mission-enhancing environmental stewardship.”

The competition requirements are stringent and take a tremendous staff effort

for those who prepare their nomination in-house.

Congratulations to the Army’s fiscal year 2016 award winners:

- Natural Resources Conservation (large installation category) – Minnesota Army National Guard, Camp Ripley, Little Falls, Minnesota
- Cultural Resources Management (small installation category) – Virginia Army National Guard, Camp Pendleton, Blackstone, Virginia
- Sustainability (non-industrial category) – Hawaii Army National Guard, Honolulu, Hawaii
- Environmental Quality (overseas installation category) – U.S. Army Garrison, Bavaria, Germany
- Environmental Restoration (installation category) – Fort Bragg, North Carolina
- Cultural Resources Management (team or individual category) – Alabama Army National Guard, Montgomery, Alabama

- Sustainability (team or individual category) – Pennsylvania Army National Guard, Fort Indiantown Gap, Pennsylvania
- Environmental Excellence in Weapon System Acquisition (small program) – Army Research Laboratory Wash Primer Replacement Team, Aberdeen Proving Ground, Maryland

These winners will represent the Army in the Department of Defense Environmental Awards competition. To all, a job well done.

Editor’s note: This article was prepared by the Army Environmental Command and the Headquarters, Installation Management Command Environmental Division.

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Taking care of natural resources pays dividends for Camp Ripley

by Rita Hess

Camp Ripley, Minnesota, is the largest Army National Guard training center in the region. It hosts more than 450,000 man-days of military and civilian training annually. Lying at the confluence of three major rivers, Camp Ripley is also notable for its immense natural resources.

Its 53,000 acres are home to 665 plant, 203 bird and 51 mammal species, as well as 18 miles of Mississippi River frontage. It is home to 88 species determined to be in greatest conservation need. These species are the focus of many studies and are a driving force in the camp's conservation activities.

The efforts of the installation's Natural Resources Conservation program in protecting natural resources, along with the vital training and testing mission of the facility, while working with a wide array of federal, state, local and non-government partners, earned Camp Ripley the fiscal 2016 Secretary of the Army Environmental Award for Natural Resources on a large installation.

The support of Camp Ripley, state, county and local leadership became evident when, in 2004, Camp Ripley implemented an Army Compatibility Use Buffer, expanding ecological preservation and protection of the military mission beyond its borders. It was recognized that encroachment of residential development not only threatens training, due to the large amount of noise smoke and dust produced at many training facilities, it also threatens natural resources and critical habitat.

Funded primarily by the Department of Defense, the Minnesota Board of Water and Soil Resources and Morrison Soil and Water Conservation District, working with the camp's Natural Resources Conservation staff, secured \$1.2 million in 2015 to support buffer projects. About \$35 million in state and federal funds have been used to implement perpetual conservation easements and acquire lands for public access within the three-mile buffer.

Further demonstrating support of Camp Ripley, the state legislature designated the state Camp Ripley Sentinel Landscape in

2015. This designation formed a coordinating committee comprised of representatives from state and federal partners with priorities complementary to group and operating with a shared set of best management practices.

"For more than 30 years, the Department of Natural Resources has worked in partnership with the Minnesota National Guard. Together, we have successfully blended natural resource conservation and restoration with high quality military training," said Tom Landwehr, Minnesota Department of Natural Resources commissioner.

This collaboration expands the tools available to limit encroachment on the installation and protect natural resources throughout the landscape. This demonstrated cooperation led to the federal designation of the Camp Ripley Sentinel Landscape in 2016.

"With the addition of the Sentinel Landscape Program, our partnership has grown," Landwehr said. "The DNR is enthusiastic and committed to helping create a buffer around Camp Ripley that serves both a military mission and protects significant natural areas."

Camp Ripley's Natural Resources Conservation staff has worked with partners on a wide variety of animal survey efforts. In 2015, as part of a capture release project, a golden eagle, a protected species under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, was fitted with a transmitter that revealed her 1,800-mile journey north and subsequent return.

NRC staff noted six bat species on Camp Ripley in 2015. Staff fitted female northern long-eared bats, a federally listed species, with transmitters to identify roost locations. This builds on Camp Ripley's telemetry programs for wolves, bears and fishers. Also, the installation monitors a wide variety of state-listed species.

Camp Ripley manages its 32,000 acres of forest in mature growth stages, and timber sales in 2015 raised \$133,305. Prescribed



Radio telemetry collars have allowed the Natural Resources Conservation staff to track wolves on Camp Ripley, Minnesota. This project also has an educational component in that local schools have helped purchase radio collars with classes "adopting" particular wolves and tracking their animals' movements. The tracking data has shown that the Army Compatibility Buffer is beneficial to the wolves, which depend on both Camp Ripley and its buffer for their range. (U.S. Army photo)

fire is used to maintain vegetative health and reduce fuel loads in areas susceptible to wildfire.

In 2015, Camp Ripley continued to implement its Wellhead Protection Plan by sealing wells, sampling source water and monitoring groundwater. The installation also runs its own wastewater treatment plant.

The NRC program is rooted in community connection and education. Its environmental classroom hosts thousands of schoolchildren each year, and visitors see NRC participate in more than 100 community events annually. Camp Ripley hosts hunts for civilians and military personnel and is helping complete Camp Ripley Veterans State Trail.

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Collaboration hallmark of USAG Bavaria environmental program

by Christine Fox and Corina Habermann

GRAFENWOEHR, Germany – U.S. Army Garrison Bavaria is the Environmental Quality winner in the overseas category of the annual Secretary of the Army Environmental Awards and will represent Army in the Secretary of Defense Environmental Awards program.

The garrison’s multifaceted environmental program oversees a range of environmental aspects such as managing hazardous substances, remediating contaminated sites, improving energy efficiency, recycling, conserving wildlife and habitats, monitoring water quality and protecting the area’s cultural resources. Supporting the military readiness mission and its evolving needs is the environmental program’s top priority, while environmental stewardship is its essence.

For the past few years, the garrison has seen an increase in visiting rotational units, with approximately 180,000 troops from more than 35 countries coming each year to one of the four military communities to train, placing high demands on training lands and military infrastructure.

In a combined team effort with the Utilities Branch of the Directorate of Public Works, 7th Army Training Command, host nation authorities and other organizations, the garrison’s Environmental Division’s staff has successfully handled the increase in rotational forces, as well as continued to provide quality support to permanent units while complying with environmental laws.

It is these efforts that earned the garrison the Environmental Quality category award, which recognizes the excellence of an environmental program as a whole.

Cooperation and collaboration with all stakeholders, hard work from a dedicated and highly motivated team of professionals, and a well-balanced and mission-oriented environmental program is what Manfred Rieck, chief, Environmental Division, attributes to the garrison’s success.

Environmental staff assist military trainers in evaluating training scenarios to avoid

negative environmental impacts, like soil and groundwater contamination due to hazardous materials spills. Providing quality environmental training, offering technical assistance, and establishing a hazardous waste disposal system make environmental protection easier for Soldiers. The program has installed numerous strategically-placed refueling sites, as well as hazardous waste storage and disposal facilities, to make safety and compliance more convenient.

The garrison works cooperatively to effectively manage military lands to support a realistic training environment in compliance with laws, while allowing more than 800 legally protected flora and fauna species to flourish within the garrison’s boundaries.

“In recent years, the garrison has experienced the re-emergence of highly threatened species that have been absent since the 19th century,” Rieck said. “The white-tailed eagle, European lynx, fish otter, wild cat and greater horseshoe bat are just a few of the species that are now thriving. Currently, we are excited about European wolf sightings in the Grafenwoehr Training Area. It was first spotted in September 2016 by a wildlife camera and has been breaking news in German media.”

Another boost for wildlife are the numerous habitat restoration or enhancement projects completed throughout U.S. Army Garrison Bavaria.

In the Hohenfels Training Area, a European Union-funded project is ongoing to stabilize roosting habitats for the greater horseshoe bat, the only reproducing population in Germany. The environmental program coordinates with the Federal Forest Service, the county and district nature protection authorities, and a local nature protection non-governmental organization to ensure the project’s success.

“The garrison’s environmental program is thriving because of its trustful partnerships with host nation authorities. We have earned and maintained their trust by sharing our expertise in managing military



The greater horseshoe bat and mouse-eared bat hibernate in caves at Hohenfels Training Area, Germany. In a joint effort, host national authorities, natural protection non-governmental organizations, and U.S. Army Garrison Bavaria implement projects to save these bats. Hohenfels Training Area is home to the only reproducing population of the greater horseshoe bat in Germany. (U.S. Army photo)

training lands while conserving nature and protecting endangered species,” Rieck said. “In turn, our host nation has supported the garrison by providing permits to conduct necessary military operation activities and, by monitoring soil, improve surface water and groundwater quality.”

The garrison’s environmental outreach program also has built partnerships with international groups.

Another highlight of the environmental program is its focus on modernizing energy infrastructure and improving energy efficiency within the garrison.

“I have always known we have the best environmental program in USAREUR [U.S. Army Europe],” said Col. Lance Varney, garrison commander, U.S. Army Garrison Bavaria. “This award was hard-won and is greatly deserved by the folks at the Environmental Division. I take tremendous pride in their efforts and sound environmental stewardship.”

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Fort Bragg works to restore environment quickly, efficiently

by Rita Hess

Established in 1918, the Fort Bragg military reservation, which includes Pope Army Air Field, Simmons Army Air Field, and Camp Mackall, lies 10 miles northwest of Fayetteville, North Carolina. This strategically important military installation relies heavily on its Installation Restoration Program to restore land for training.

Fort Bragg's Installation Restoration Program earned the fiscal 2016 Secretary of the Army Environmental Award for Environmental Restoration.

One of the program's top objectives is streamlining environmental restoration, which can return big dividends. For example, the program uses performance-based contracts to investigate and remediate sites. These contracts have saved approximately \$7.3 million, and sites that were not expected to reach closure for 30 years have instead garnered No Further Action status in an average of five years.

One of the program's top objectives is streamlining environmental restoration, which can return big dividends.

Some locations simply needed a second look. The site known as Hardfill #2 consisted of waste left in place, contaminating low-level groundwater and surface water. A 2010 estimate said it needed 30 years of monitoring and controls. But a 2015 Installation Restoration Program review discovered volatile and semi-volatile organic compound levels had not exceeded North Carolina standards since 1992. Consequently, the site received No Further Action status, resulting in about \$224,000 in cost savings and more than 13 acres returned to the installation 25 years ahead of schedule.

A second look at anomalies at five Munitions Response Sites revealed they were associated with historical and cultural features and not munitions, avoiding costly investigations and saving \$2.5 million.

The Installation Restoration Program uses alternative cleanup and/or restoration techniques when possible. Instead of excavation, soil sampling and screening while performing underground storage tank removals saved approximately \$1 million in lifecycle costs at four sites in 2015 and 2016. Innovative groundwater sampling procedures, such as passive diffusion bag sampling, increased after a Fort Bragg pilot study demonstrated its effectiveness. Now a primary method for groundwater monitoring, it reduces investigation waste and sampling costs, saving about 40 percent per sample on each well.

Using the North Carolina Notice of Residual Petroleum and the Notice of Contaminated Site processes allow placing land use controls on soil and groundwater at sites where excavation is not practical due to adjacent buildings. Lifecycle cost savings for the past two years are estimated at \$1.5 million.

Fort Bragg's Installation Restoration Program relies on green/sustainable remediation cleanup techniques if available. One method treating chlorinated solvents in groundwater plume source areas is enhanced anaerobic bioremediation, which involves pumping a mixture of water, buffer solution, and "neat" vegetable oil into the ground at the source. This boosts anaerobic microbial activity, which feeds on contaminants and accelerates the cleanup process. Fort Bragg also uses natural attenuation – allowing nature to clean up a site. These processes take longer but are less intrusive.

Many remediation sites are in prime regions and are critical for future development. Prioritized site remediation has thus far returned more than 1,775 acres of land to the inventory for vital military construction projects. Fostering responsible use of natural and fiscal resources – and



The passive diffusion bag technique is used on environmental restoration sites at Fort Bragg, North Carolina, as a less invasive option for sampling groundwater. Once the bag is deployed, it is removed and tested for volatile organic compounds. (U.S. Army photo)

sharing best management practices with other military installation representatives within the state – bode well for Fort Bragg's future.

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Alabama Army National Guard uses technology to discover resources

by Rita Hess

Making the transition from pure data to functional data can change how project managers approach a task. Such is the case for the Alabama Army National Guard. While about 90 percent of its known cultural resources are on the Fort McClellan Army National Guard Training Center, Alabama, the Alabama Army National Guard manages diverse resources across approximately 30,000 acres, including ancestral lands of 19 federally recognized Native American Tribes; battle sites associated with both Andrew Jackson and the Civil War; and training ranges relating to World War I, World War II and Vietnam; and has an integral connection to the Civil Rights movement.

To identify archaeologically and culturally sensitive areas, and educate others of their importance, the guard's Cultural Resources Management team led efforts to design and implement a tool for its activities and project planning. The Geographic Information Systems staff designed an integrated relational database system that works in tandem with required geospatial layers for cultural resources. The database spans numerous Construction and Facilities Management program areas, allowing the team to manage both the spatial data and attributes associated with its resources, and proposed or ongoing construction projects.

These "relational databases served as the forerunner to the complete integrated management system, currently in use by all directorates" of the guard's Construction and Facilities Management programs, said Rebecca Ridley, the guard's Geographic Information Systems program manager.

The result is a state-of-the-art, interactive geodatabase and web-based mapping tool that includes archaeological sites, cemeteries, old roads, bridges and railroad spurs, as well as Alabama Army National Guard facilities, boundaries and other constraints. It informs users when proposed actions might affect cultural resources; it also minimizes delays, streamlines recordkeeping and provides greater oversight among unit activities.

For its efforts, the Cultural Resources Management (CRM) Team earned the fiscal 2016 Secretary of the Army Cultural Resources Management Team environmental award.

"The CRM Team includes staff members who exhibit the professionalism and dedication to incorporate cultural resources and heritage preservation planning into everyday work practices," said Col. Philip Clayton of the Alabama Army National Guard Construction and Facilities Management program. "The end result transfers to the training mission, which is the real benefit to the Soldiers."

Using hillshade data created by the GIS Program, in conjunction with Light Detection and Ranging data, the team is able to see features and footprints of historical sites and pinpoint the potential for additional resources. This data helped identify World War I-era training trenches, World War II-era unit camp and training locations, historical mining operations and previously unrecorded cemeteries. By combining maps, archival records and survey results, the team was able to identify a World War II-era archaeological site as a "Buffalo Soldiers" training camp.

The team developed the Cultural Resources Management –Geographic Information System tools in-house, saving thousands of dollars and culminating in a more tailored, responsive product. In addition to that system, the team used public outreach and partnerships to reach out to the descendants of one family to conduct research on an African American cemetery at the Fort McClellan Army National Guard Training Center.

"A family member associated with New Mount Sellers cemetery told a story of their grandfather being buried, with his grave marked by a porcelain pitcher. She thought she could find his grave, if she could find the pitcher. We explored non-invasive options to help her quest," said Dr. Heather Puckett, Alabama Army National Guard



The Alabama Army National Guard has used technology to help locate cultural resources such as this network of trenches, dugouts and command posts used by 29th Division, 112 Heavy Field Artillery Soldiers, commanded by Maj. Gen. Charles G. Morton, for training around Trench Hill at the Fort McClellan Army National Guard Training Center. They used these trenches for training in 1917 and 1918 prior to deploying to France. The network also included a communications trench and observation posts, similar to those used in trenches on the Western Front. (U.S. Army photo)

Cultural Resources manager.

In partnership with the Natural Resources Conservation Service, the team used Ground Penetrating Radar, which revealed a larger cemetery footprint than previously known, as well as unmarked burial sites.

Nearly all of the Alabama Army National Guard lands have been surveyed and reassessed using modern archaeological standards, an effort made possible by state and federal partners, such as Troy University, the Natural Resources Conservation Service, and professional archaeologists. Troy students gain valuable experience with the possibility of moving into an intern position with the Cultural Resources Management program.

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ANG blends rich history with technology at Camp Pendleton

by Rita Hess

The Virginia Army National Guard Cultural Resources Management program is dedicated to conserving historic resources across state training sites and armories. That often means blending rich history with modern technology.

When Camp Pendleton, an oceanfront installation in Virginia Beach, needed to update facilities and grounds to meet energy initiatives on its 325 acres, it still had the challenge of meeting historic preservation goals and maintaining its status on the National Register of Historic Places. Though facing seemingly conflicting objectives, the Cultural Resources Management program staff was successful at managing both. An unexpected result was receiving the Secretary of the Army Environmental Award for Cultural Resource Management on a Small Installation.

A particular goal was to make Camp Pendleton capable of supporting the Virginia Beach military complex in the event of a disaster, which ensures the readiness of not only the Virginia Army National Guard, but also other area military branches. This required significant coordination between the Cultural Resources Management and Sustainability staffs, with the ultimate goal of taking the installation off grid and slash energy consumption by nearly half. Camp Pendleton is the epicenter of a massive effort to establish energy security and resiliency.

Recently the Cultural Resources manager, with support from the National Guard Bureau, set up a state-wide programmatic agreement with the State Historic Preservation Office and the Advisory Council on Historic Preservation. This has simplified oversight and consultation processes required for the Camp Pendleton endeavor by streamlining Section 106 compliance requirements for many activities, from routine maintenance to rehabilitation, resulting in a dramatic reduction in time and resources.

Upgrading Camp Pendleton's World War



Lake Christine, a centrally located and important natural resource on post, contributes to Camp Pendleton's status as both a historic district and a cultural landscape. (U.S. Army photo)

II-era buildings, designed in the 1940s to be temporary, proved challenging. Structures needed new high-efficiency heating, ventilation and air conditioning (HVAC) systems and energy-conserving lighting, as well as new insulation, roofs, and windows, but the upgrades needed to preserve the historic aesthetic. Installing a new HVAC system in the Governor's Cottage, for example, meant running ductwork beneath the floors and in the attic, where it was out of sight. Elsewhere on the installation, original chimney and stovepipe heating systems were replaced, while detached chimney stacks were retained. Roofs were replaced using historically appropriate green asphalt shingles.

Repairs and renovations also had to make sense economically, with some trickier than others. Divided light, double-hung wood sash windows were costly to replicate, so the Virginia Army National Guard installed them on buildings facing main roadways but updated others with a budget friendly option closely matching the historic windows. Obtaining State Historical Preservation Office approval of this balanced treatment significantly stretched resources.

Ultimately, the Virginia Army National Guard relied on energy savings performance contracts to complete \$38.4 million in energy, HVAC, and building envelope upgrades at facilities throughout Hampton Roads including Camp Pendleton, which are repaid with the cost savings that those investments create. The guard has documented an energy intensity drop of nearly 50 percent per square foot across Camp Pendleton's buildings that received system and building envelope upgrades.

Updates continue to meet the requirements of a modern post, while preserving its past and anticipating its future. This allows the Virginia Army National Guard to sustain the mission and secure the future.

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Unconventional sustainability method in Hawaii brings award

by Rita Hess

The Hawaii Army National Guard Sustainability Program had a unique challenge: maintain pest management measures and reduce waste in a cost-efficient manner within a tropical island environment full of sensitive ecosystems and endangered species.

The program met those directives, in part by launching a new and somewhat unconventional pest management technique: goat and sheep grazing. It slashed costs, safeguarded sensitive habitat from adverse maintenance impacts, and allowed sections of training land to re-open. Project efforts resulted in a fiscal 2016 Secretary of the Army Environmental Award for Sustainability (Non-Industrial Installation).

The Hawaii Army National Guard installation's primary training site is the Keaukaha Military Reservation in Hilo on the Big Island of Hawaii. Almost half of the reservation's 504 acres are among the most endangered lowland wet forest ecosystems. Numerous non-native species have invaded these forests, which are home to the Hawaiian hawk, the Hawaiian hoary bat, and a shrub called Haiwale—all of which are endangered. The reservation's forest also is home to endemic species not found anywhere else in the world.

With such a sensitive habitat, guard officials knew they needed a pest management program that supported both wildlife and the training mission. Goat and sheep grazing appeared to show significant cost savings over other methods they had used at Keaukaha. The cost of using goats and sheep is \$500 per acre, compared to \$1,500 per acre for inmate labor and \$5,500 per acre for contractors. Both inmates and contractors previously provided herbicide application and/or mechanical removal methods.

When choosing grazing test sites, the Sustainability Program staff considered terrain, previous pesticide use, and existence of threatened or endangered species that may be harmed by grazing. In 2016, 46 acres were ultimately managed with a 194-animal



Grazing was used at Keaukaha Military Reservation in areas that were challenging to maintain due to terrain and fast re-growth of invasive plant species. This location is a ditch approximately one acre in size with a one-year growth. Portable electrical fencing charged by solar panels and batteries were used to set up paddocks within areas or to fence the entire acre to contain the animals. (U.S. Army photo)

herd in portable paddocks. Results have been dramatic: the goats and sheep clear an average of one acre in just one and a half days and are able to clear areas with terrain that is difficult for machines to access. As a bonus, eliminating machines also reduces petroleum emissions and the potential for leaks or spills of fuel or hydraulic fluids. Herbicide use has been eliminated for the acres under grazing management as well.

Efforts also have yielded significant benefits to the guard's mission. The cost-efficient removal of invasive species frees up critical funds for other projects. Grazing reduces fire fuel loads, minimizing fires that might interrupt training. Goats and sheep remove understory while keeping middle and upper canopies intact, meeting natural resources management goals. Bottom line: controlling invasive vegetation helps ensure the training site will not be subject to restrictions related to protection of threatened and endangered or endemic species.

Sustainability program efforts also kept more than 46 tons of paper and 42 tons of cardboard out of landfills during the past two years, and adding batteries to their allowed recyclables in 2016 generated \$5,000 in additional income and 13 tons of batteries. The program also has enacted measures to reduce energy use. In 2012, the Adjutant General set an energy reduction goal of 25 percent, with 5 percent annual reductions through 2017, a goal the Hawaii Army National Guard is on track to meet. Dedication to sustaining the environment will serve it and the surrounding communities well.

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Fort Indiantown Gap National Guard Training Center strikes a balance

by Rita Hess

Pennsylvania Army National Guard's Fort Indiantown Gap National Guard Training Center is a live-fire maneuver military training facility sitting on 17,150 acres in central Pennsylvania. It supports more than 18,000 Pennsylvania Army National Guard personnel annually, and training swells the count to more than 130,000 personnel each year.

The Fort Indiantown Gap training center also sustains a vital habitat for rare native flora and fauna. It has a robust hunting and fishing program, populations of endangered regal fritillary butterflies, and a rich cultural and military history. Providing for Soldiers while providing for nature and the community can be precarious. But the Sustainability team is doing exactly that, and its efforts resulted in a fiscal 2016 Secretary of the Army Environmental Award for Sustainability.

The team was especially successful this award year with waste stream reduction and diversion as it established recycling, reuse and resale of solid waste and other materials, resulting in more than 50 percent reductions in universal waste streams compared with the 2012 baseline, as well as 44 percent reduction in hazardous waste.

Formalizing a pharmacy exchange program for materials throughout the Pennsylvania Army National Guard's properties was a huge team undertaking. Previously, units turned in items they did not need to the Sustainability program. Now, the team documents inventory, everything from cleaning supplies to drywall screws, and updates facility managers monthly about new products. In less than one year, the pharmacy avoided more than \$15,500 in disposal costs and avoided \$30,000 in redundant purchases.

In the past two years, the team worked with local Defense Logistics Agency to divert materials that would otherwise be disposed of conventionally or as hazardous waste as well as working with the U.S. Property and Fiscal Officer and local recyclers to recycle materials. Mixed brass, telephone poles, batteries empty gas cylinders and empty aboveground heating oil tanks are just a few examples of materials



Thousands of expended brass shell casings that have been deformed are ready for recycling through the Pennsylvania Army National Guard's Qualified Recycling Program at Fort Indiantown Gap National Guard Training Center. The program generates revenue to support and expand the recycling program, health and safety initiatives, and morale, welfare and recreation purchases. (U.S. Army photo)

processed – resulting in substantial associated savings.

“Although it is challenging to divert waste streams for recycling and reuse, at the same time it is rewarding when you step back and look at the success as a whole,” said Megon Riddell, Pennsylvania Army National Guard environmental specialist.

Another team effort is recovering lead from rubber blocks on Fort Indiantown Gap training center ranges. Working with a contractor, the Guard's cost is 70 percent less than disposing of the blocks as hazardous waste. Concrete from demolition projects also is recovered and reused, and the Guard's forestry department uses excess fuels when possible in the prescribed fire program, avoiding costs for hazardous waste disposal and buying fuel.

At Fort Indiantown Gap National Guard Training Center's largest maintenance shop, the team implemented a water jet system that reduces hazardous waste to a minimum, and helped unit coordinators and shop managers substitute potentially harmful materials with safe green alternatives. For example, a citrus-based degreaser product replaces chlorinated products such as carburetor cleaners, mineral spirits and petroleum naphtha.

At the wastewater treatment plant, a sludge press captures bio solids that fertilize hay on

25 acres; harvested hay is used for projects like sedimentation control. In the first eight months of 2016, the press helped avoid disposal costs of almost \$20,000. Converting the training center to natural gas heating and light emitting diode systems continues. New construction incorporates efficient features, and retrofits are ongoing around the state.

Dreama O'Neal, Environmental Compliance manager, acknowledged the sustainability team members: Megon Riddell, environmental specialist; Todd Eakin, environmental supervisor; Chief Warrant Officer 3 Michael O'Donnell, Field Maintenance Shop #4 shop supervisor; and Chief Warrant Officer 3 Chris Prinzivalli, Field Maintenance Shop #4 shop foreman.

“But also beyond those specifically identified above, the waste stream diversion, the pharmacy reuse program and the hazardous material substitutions encompass a much larger team of people within the PAARNG staff,” O'Neal said.

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Research lab's effort improves health, environment, bottom line

by Rita Hess

A team of researchers at the U.S. Army Research Laboratory, Aberdeen Proving Ground, Maryland, recently addressed a need for safer “wash primers” at Army depots, installations and repair facilities. As a result of its solution, the wash primer replacement team at Army Research Laboratory won the fiscal 2016 Secretary of the Army Award for Environmental Excellence in Weapon System Acquisition (small program).

The Army relied on hexavalent chromium compounds, known as Cr(VI), to protect its ground vehicles, combat service support equipment and aviation/missile systems from corrosion. As a pretreatment, the wash primer was sprayed on bare metal to provide protection and promote coating adhesion.

Although toxic and dangerous to the environment, the military specification DOD-P-15328 remained a mainstay pretreatment for mixed metal applications at depots and original equipment manufacturers for decades. The DOD-P-15328 wash primer is called-out in thousands of drawings and contracts mandating its use and making it one of the largest sources of Cr(VI) across the Army. Until now there has been no approved alternative and premature cancellation of the DOD-P-15328 specification would have created a significant technology gap in surface treatments for the Army and DOD.

To address the problem, the Army Research Laboratory team tackled the development, demonstration, process and implementation phases of Cr(VI)-free products. They collaborated significantly with Army organizations and original equipment manufacturers, who were the main users of the product (e.g., U.S. Army Tank-Automotive and Armaments Command and U.S. Army Aviation and Missile Command) to determine what type of product would meet performance and sustainment requirements.

The team investigated dozens of commercially available products and selected nine for laboratory testing and analysis.

The products tested were all Cr(VI)-free, did not contain hazardous air pollutants and contained low levels of volatile organic compounds. The success of the project resulted in the Army Research Laboratory qualifying three pretreatments in 2015, listed on Federal Specification TT-C-490 qualified product database for use on mixed metal substrates. These qualified products are now available to all users, paving the way for the eventual cancellation of DOD-P-15328 and replacement with TT-C-490 QPD.

The team worked with multiple depots during the demonstration phase to help each site select the best product for its needs. During demonstrations, painters applied three candidates to surplus parts to gauge ease-of-use and ability to work within existing equipment and processes. Once the coating system was cured, adhesion and coating hardness tests confirmed laboratory findings. Further performance testing on the demonstration assets were conducted in outdoor exposure environments.

In January 2016, the U.S. Army Public Health Center published its findings, verifying the three alternatives were preferable to wash primer and identifying no serious environmental or health risks that would prevent their implementation. A proposed “sunset date” for the DOD-P-15328 specification was set for Sept. 30, 2017, and users were referred to TT-C-490 QPD to transition to qualified alternatives.

Cancelling the old specification is expected to eliminate 24,000 pounds per year of Cr(VI) compounds and reduce volatile organic compounds emissions by 2.3 million pounds per year in Army operations. Letterkenny Army Depot, Pennsylvania, is expected to eliminate more than 6,000 pounds of volatile organic compounds annually due to its high usage of wash primer and variety of weapon systems maintained.

Eliminating Cr(VI)-based wash primer also will reduce costs associated



The U.S. Army Research laboratory prepared more than 100 metal coupons with different metal, pretreatment, primer and topcoat combinations for 50 months of outdoor weather testing at Cape Canaveral, Florida. The test enabled the laboratory to determine how the paint system performs in outdoor environments prior to demonstration on a weapons system. (U.S. Army photo)

with hazardous waste disposal (e.g., wastewater treatment, water and air quality monitoring, medical screening for workers, recordkeeping, etc.). Anniston Army Depot, Alabama, is expected to save about \$220,000 annually in disposal costs by removing Cr(VI) from its pretreatment lines.

The winning team members include John “Jack” Kelley, Thomas Braswell and Fred Lafferman, all from Army Research Laboratory; and contractors Tom Considine and Alicia Farrell, both from Bowhead.

“It’s an honor to be part of a team that truly understands the challenge of reducing the Army’s impact on the environment while improving performance and readiness,” said Kelley, who led the Army Research Laboratory team.

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USACE, The Nature Conservancy enhance lower Roanoke River habitat

by Lisa Parker

In 2002, the U.S. Army Corps of Engineers and The Nature Conservancy (TNC) established the Sustainable Rivers Project to modify water operations at Corps of Engineers dams to enhance the habitat conditions for plants and animals that depend on downstream river flows.

Sustainable Rivers Project activities are occurring in eight U.S. river basins, the largest coordinated effort of its kind in the world. One of those basins, the Roanoke River, is defining environmental strategies as part of a water management plan. At these sites, scientists gather data on the river flows and work with water managers to modify dam and reservoir operations within existing water control policies and manuals for each reservoir.

Corps of Engineers reservoirs affect the timing and magnitude of river flows to meet the competing needs of both human and environmental impacts. The reservoirs generate increased benefits by improving fish migration and water quality, flood damage reduction, and hydropower while also supporting navigation and recreation.

One of the largest and least disturbed Bottomland Forest Systems on the Atlantic Coast as well as one of the largest and least disturbed Brown Water River Systems, the lower Roanoke River floodplain is approximately 137 miles long, and up to five miles wide. Its 31 natural communities provide habitat for two federally listed animals, 16 state listed animals, 13 state listed plants, and 214 bird species, 88 known to nest including 44 neo-tropical migrants and several heron rookeries. Also, the Roanoke has the most diverse and significant populations of migratory fish on the United States' Atlantic Coast.

The Nature Conservancy Roanoke River Project started in 1982 with a donation from Union Camp Corporation of 176 acres of land. Since that time, TNC, along with various partners, has conserved approximately 95,000 acres along the river, its floodplain and in the surrounding watershed.



U.S. Army Corps of Engineers South Atlantic Division Commander Brig. Gen. David Turner, Jean Richter, a biologist with the U.S. Fish and Wildlife Service, and Chuck Peoples, of The Nature Conservancy, discuss the partnership enhancing the Roanoke River Basin. (Photo by Hank Heusinkveld)

“One of the things that led us to a successful outcome is everyone who is concerned with recreation on the river came together and said, ‘We need to coordinate among ourselves in a more unified voice to USACE,’” said John Morris, former director of North Carolina Division of Water Resources. “Starting in 2014 this stakeholder group really took hold and we had many meetings with USACE. We did some coordination with ourselves and gave USACE a more unified partner to work with as they were looking at different ways to improve the operation of Kerr Lake.”

Modifications needed to be made to the Corps of Engineers operation at Kerr Lake. In place for more than 50 years, the John H. Kerr Dam and Lake has played a pivotal role in the life of the Roanoke Valley.

“We have shaped our operations regime, as we usually do, to optimize the dam’s many authorized purposes and in accordance with prevailing conditions (flood, drought, etc.). But as we began our work with TNC and our state partner

in North Carolina we could see that there were additional opportunities to enhance operations and improve conditions for the floodplain ecosystem,” said U.S. Army Corps of Engineers Wilmington District Commander Col. Kevin P. Landers, Sr.

“The Roanoke River begins in the mountains, comes through the Piedmont, and ends here on the coastal plains, and empties out into the sound. The coastal plain reach is the most significant part of the river because it’s your typical alluvial flood plain. You have the levee, you have the swamp area, you have the high ridges, and you have the low ridges. The diversity that you’re going to find here is just unbelievable,” said U.S. Fish and Wildlife Service biologist Jean Richter.

Through modeling and review of historic river flows, the Corps of Engineers came up with the QRR, or quasi-run-of-the river alternative, that more closely mimics the natural variations of the river and is now

(See Roanoke River, page 19)



Army Reserve leadership signs environmental strategy, policy

by Jonelle Kimbrough

Major General Peter Lennon, United States Army Reserve Deputy Commanding General (Support), has signed the Army Reserve Environmental Quality Implementation Strategy and the Army Reserve Environmental Quality Policy.

The documents solidify the Army Reserve's commitment to environmental stewardship with four strategic goals: to conserve natural and cultural resources; to ensure compliance with environmental laws and regulations; to prevent pollution of land, air and water resources; and to strengthen an integrated Environmental Quality Program foundation.

The strategy and policy also bolster command support of sustainability objectives that will ensure continued readiness. Furthermore, they encourage Soldiers, Civilians and Families at all levels of the Army Reserve and its surrounding communities to foster a conservation minded culture.

"The execution of these guiding documents will serve to strengthen the Army Reserve's ability to sustain the environmental quality of our land, air, water, and natural and cultural resources and therefore ensure the resiliency of our Installations and facilities across the Army Reserve," said Paul Wirt, chief of the Army Reserve Sustainability Programs Branch, Army Reserve Installation Management Directorate.

All four of the Army Reserve sustainability programs – energy, water, solid waste and environmental quality – now have signed implementation strategies.

The Army Reserve relies on dependable energy, clean water, accessible land and viable air to fulfill its role as a capable and resilient defense force, as well as its role as a good neighbor.

"Sustainability enhances our readiness and resiliency for the mission and warfighters of today as well as the mission and warfighters of tomorrow," Wirt said. "Sustainability

allows us to adapt to constantly evolving military objectives, maintain our relevance, allocate our resources efficiently and reduce our environmental impacts."

"Army Reserve leadership support for sustainability has been tremendous," he said. "Such support lends invaluable credibility to our programs and will further the Army Reserve's position as a pioneering leader in the Department of Defense. While there is still much to do going forward, our entire team is proud of the accomplishments we have achieved so far in establishing a solid foundation of culture change in the Army Reserve."

For more information about the Army Reserve Sustainability Program, visit www.usarsustainability.com.

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(Roanoke River, continued from page 18)

the operational paradigm for Kerr Lake releases.

"Working with USACE, we came up with an optimal solution where the plan kicks in only when Kerr Reservoir is in flood control operations and it allows USACE the flexibility to send a bit more water downstream, but within the way the dam was designed to operate. So USACE is able to maintain its flood control operations and the river gets the sustaining flows that it needs at the same time," said Chuck Peoples, director of conservation, North Carolina Chapter of The Nature Conservancy.

QRR will significantly reduce the frequency and severity of bank collapse, preventing further degradation of fish and aquatic habitat and reducing the rate of shoreline land loss.

"The concern we have with erosion is the banks become vertical. When you have vertical banks, there are actually bird species using the banks for forage and they can't use those banks or use a vertical bank. When the river is at flood stage they can actually use the vegetation along the banks as refuge. But if you have a vertical bank with no vegetation, they have no place to go," Richter said.

"So what happens is the river starts looking like a bathtub; banks with no vegetation and wildlife can't use it anymore. That's why we're trying to preserve what we have left with the vegetation on the banks so the wildlife can continue to use it, aquatic life in the river can use it as a refuge to escape from predators, and as feeding areas, too, and nursery areas," she said.

"You can't find forests like you find in the Roanoke River basin across the United States like you perhaps could a hundred years ago," Landers said. "I think it's

important for us as nation to make sure that we're being good stewards of our environment that we live around."

"We have to try and strike a balance that both meets our project's intent, but also incorporating into that solution, the environment, and the needs of the stakeholders. There's a whole myriad of different angles that have to be looked at and addressed in coming up with the optimum solution," Landers said. "Sometimes we don't ever reach the optimum solution, but at the end of the day we're definitely trying to strike a balance among the stakeholders by collaborating and understanding their needs."

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Fort Hood dining facility goes green with composting

by Christine Luciano

Throughout the day, at the Blackjack/Ironhorse Dining Facility, Fort Hood, Texas, Spec. Ousmane Tiemore, a repair and utilities specialist, 15th Brigade Support Battalion, 2nd Brigade, 1st Cavalry Division, is emptying containers of food waste and inspecting for any contamination. Stepping up to the net zero waste challenge, Tiemore is doing his part to turn food waste into compost and helping the installation achieving its 2020 goal.

“The environment impacts everybody and we need to take care of it,” Tiemore said. “Together we can make it better.”

The Blackjack/Ironhorse Dining Facility is the one of largest food service operations on the installation, providing an average of 1,500 meals a day. It stood out for having the best food waste composting program.

“It is so significant that we won this award because of the amount of food we produce every day,” said Sgt. 1st Class Maurice Owens, Blackjack/Ironhorse Dining Facility manager. “I feel very grateful for my team to receive this award because of the work and discipline it takes to do this on a daily basis.”

In July, Owens set a goal to achieve and win the net zero waste award. “This award is not only for us, but to show our support to Fort Hood and the net zero waste program,” Owens said.

Each facility's performance was based on a daily report highlighting highest compliance, lowest contamination, proper disposal of food waste, and recycling innovation.

“We wanted to create an incentive program that inspires and motivates the facilities to not only meet the requirements of composting but try to exceed them by coming up with innovative strategies to make it easier for their facility to comply and divert food and waste from the landfill,” said Jennifer Rawlings, net zero waste project officer.

In the fall of 2015, Rawlings implemented a food waste composting



Spec. Ousmane Tiemore, a repair and utilities specialist with the 15th Brigade Support Battalion, 2nd Brigade, 1st Cavalry Division, Fort Hood, Texas, deposits food scraps into a compost bin. The food waste is collected weekly and once composted, will be reused as fertilizer. (Photo by Christine Luciano)

program at 10 facilities, provided each facility containers, and trained Soldiers, Civilians, and contractors on how to carry out the initiative.

“Dining facilities like the Blackjack/Ironhorse helped us, during the pilot phase, to improve collection and handling processes and develop best practice strategies to move forward,” Rawlings said.

“The Blackjack/Ironhorse DFAC helped us gather best practices to improve the food waste collection and handling processes,” she said. “These strategies created a model for expanding the program installation-wide.”

Rawlings is leading a project to upgrade the installation's compost facility that will be completed later this year. The new facility will help Fort Hood reach its net zero waste goals and help divert about 4,800 tons of compostable material from going into the landfill.

“The facility will give us the capability to compost material on-site,” she said. “The program will continue to grow the next five years and eventually expand so that everyone in the Fort Hood community can participate.”

Supporting the installation's compost program is Owens. “It's not about just putting food on the server lines and feeding diners but it's about the realm of supporting the net zero waste program and building a team that cares,” he said.

Owens and his team were recognized at the quarterly Environmental Quality Control Committee meeting, and presented the award for best food waste composting program by Maj. Gen. John Uberti, III Corps deputy commanding general.

He called Blackjack's success a testament to team work, leadership, and ownership.

“If the team doesn't care, it's not going to work. The manager is the key because he or she must take ownership of the program,” Uberti said. “Our level of care, our attention to detail, and our willingness to get it right is what makes Blackjack stand out.”

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New guide assists with organic waste reduction, diversion

by Curtis Fey

As installations strive to meet the Army's goal of diverting 50 percent of their landfill waste, they are presented with a unique set of options, each with its own challenges, for reducing and diverting their organic waste stream. When considering declining defense budgets and labor projections, installations will no longer be able to add additional duties or implement novel technologies that require additional training, testing, operations time and maintenance.

To assist installations address this problem, the U.S. Army Environmental Command teamed with the U.S. Army Engineering Research and Development Center to identify alternatives to support organic waste diversion at U.S. Army installations. Project efforts culminated in a new guide which provides guidance for off-post waste diversion, on-post waste diversion, an overview of small scale food waste technologies and situational based flow chart decision support tool. Each section of the guide presents case studies of installations currently implementing the various diversion alternatives described.

The guide emphasizes the importance of first reducing the amount of waste generated. Guidance for donating edible, wholesome food to charities and farmers is discussed and case studies reveal how Army installations have donated several tons of food to local food banks and hog farmers. The rise of commercial composting operations and their availability to Army installations are increasing, and a list of these facilities located near Army installations is included. Case studies of installations that have modified their waste disposal contracts to secure local commercial composting services are provided along with sample contract language used when contracting for this service. One case study covers an analysis conducted at Fort Jackson, South Carolina, which showed that as much as \$24,000 may be saved annually by using commercial composting services.

Different opportunities an installation

may explore to manage and process organic waste on-post are also covered in the guide. Partnerships have been successfully developed for using federal civilian inmates to augment labor for almost a dozen installations, producing installation net cost avoidance on the order of hundreds of thousands to several million dollars.

Case studies of installations adopting inmate labor are provided and excerpts from Installation – Prison Memorandums of Understandings also are given in the guide. A list of prison facilities near Army installations is included as well.

Several installations have implemented on-post composting operations to manage large volumes of organic waste. Fort Leonard Wood, Missouri, and Joint Base Lewis-McChord, Washington, have established contract agreements with their waste service provider to operate their composting sites. The guide presents case studies providing insight as well as contact language associated with securing contacting support services by these two installations.

An overview of the most common types of technologies available for processing food waste are discussed with a handy side-by-side comparison summary of four categories of small scale technologies over 12 metrics.

Case study presentations cover the four categories to include Fort Bragg, North Carolina, successfully adopting food waste digesters, Fort Lee, Virginia, incorporating food waste dehydrators, Fort Leonard Wood completing a demonstration of an in-vessel food waste composter, and Wright-Patterson Air Force Base, Ohio, employing a vermicomposting, or worm-based composting system.

Accompanying the report is an interactive flowchart tool to help guide waste diversion practitioners in selecting organic waste management practices and technology that best meets the installation's specific capacities and preferences. The tool uses a set of "if-then" questions, with the questions' responses directing the user to appropriate information and resources.



Food waste is emptied into the Ecovim Food Waste Dehydrator at Fort Hood, Texas, where it is processed into a dry granular product reducing waste weight and volume. About one-third of the solid waste at installations may be processed into a useful product, a valuable alternative as installations strive to meet the Army's goal of diverting from landfills at least 50 percent of the solid waste generated. (U.S. Army photo)

The guide and associated references provide successfully employed practical guidance to enable installations to adapt organic waste diversion solutions tailored to their local situation. These new resources are available for downloading online at <https://erdc-library.erdcdren.mil/xmllui/handle/11681/20415>.

Questions or comments associated with this or other organic waste disposal projects may be directed to U.S. Army Environmental Command's Acquisition and Technology Branch at <https://aec.army.mil/>.

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Management plan helps track hazardous material inventory

by David Carr

Being able to answer “Where is your hazardous material stored and how much is there?” at any given time is very important for all hazardous material managers.

It can help avoid tragedies like the one in April 2013, where 15 people died while responding to a fire at a fertilizer plant in West, Texas. Tons of ammonium nitrate were stored at the plant, but unfortunately, the emergency responders didn’t know the quantity of hazardous material in storage because it wasn’t properly reported.

Reporting of hazardous material is mandatory. The Emergency Planning and Community Right to Know Act Section 311-312 requires facilities to submit Safety Data Sheets, or a list of hazardous chemicals, to their State Emergency Response Commission, Local Emergency Planning Committee and local fire department, as well as conduct an annual inventory of these chemicals due March 1 of each year.

Additionally, Army Regulation 200-1 and Department of Army Pamphlet 710-7 require each Garrison Commander to implement an installation-wide Hazardous Material Management Program, which can help avoid tragedy. But to be effective, the Garrison Commander must ensure that the plan is fully implemented and enforced with all individuals who procure or manage hazardous material down to the shop level, including tactical Supply Support Activities.

One of the plan’s goals is reducing the hazardous material inventory and consequently reducing hazardous waste generated. To know you are reducing your inventory you must be able to answer two basic questions: “Where is your hazardous material stored?” and “How much is there?”

In May, Installation Management Command developed and published a Hazardous Material Management Program Implementation Guide to set the standard for all of its installations to manage hazardous materials in an environmentally



Where is it and how much do you have?

compliant manner. This will enhance mission readiness and reduce the Army’s boot print by controlling the acquisition, use, handling and disposition of hazardous material enterprise-wide. Integration of mission and environmental requirements are foundational to a sound Hazardous Material Management Program. This guide lays the foundation for the development of an installation-specific plan and standard operating procedures.

The implementation guide emphasizes the need to: 1) Identify all personnel responsible for the lifecycle management of hazardous material down to the unit/shop level; 2) Ensure that all personnel who manage hazardous material in the course of their work receive proper training from the garrison and operate in compliance with the plan, including utilization of Enterprise Environmental Safety and Occupational Health – Management Information System; 3) Procure all hazardous material through the Army enterprise systems, e.g., Global Combat Support System-Army, or the installation Logistics Readiness Center; 4) Enforce the prohibition from purchasing hazardous material using a government purchase card in accordance with Army policy; and, 5) Ensure that all hazardous material, regardless of procurement pathway, is recorded in the Enterprise Environmental Safety and Occupational Health – Management Information System; properly rotated and stored; and properly marked, labeled, and barcoded.

Exceptions to the policy prohibiting the use of government purchase cards to

acquire hazardous material require garrison commander (or designated representative) approval on a case-by-case basis for each hazardous material item purchased.

There also is a requirement for Environment, Safety, and Occupational Health, and Logistics Readiness Centers to review Safety Data Sheets for existing and new products to ensure requirements of green procurement are met, and establish and update the installations authorized use list.

Triennially, U.S. Army Environmental Command includes an assessment of the installation’s Hazardous Material Management Program during its external Environmental Performance Assessment System. Establishing an installation plan consistent with the installation guide, procuring hazardous material through the Global Combat Support System-Army, generally prohibiting the use of government purchase cards to procure hazardous material, and managing hazardous material in the Enterprise Environmental, Safety, and Occupational Health Management Information System, will achieve the Hazardous Material Management Program standard across the Installation Management Command enterprise.

Part of each Garrison Commander’s challenge is ensuring compliance for the tenants that work for organizations other than the garrison. In August 2016, Lt. Gen. Kenneth Dahl, commander of Installation Management Command, signed and

(See *Hazardous Material*, page 23)



Enterprise management information system comes to installations

by Haywood J. Perkins III

Due to delays in fielding of the Headquarters Army Environmental System, and because hazardous materials management is not included in the system's capabilities now, or in the future, the Office of the Assistant Chief of Staff for Installation Management is requiring Army installations to use the Enterprise Environmental, Safety, and Occupational Health Management Information System to manage hazardous materials and maintain regulatory compliance.

Supporting that requirement, the U.S. Army Installation Management Command published an operations order directing its installations to transition by the end of September 2017. To facilitate the implementation process, Headquarters Installation Management Command partnered with the U.S. Army Corps of Engineers Environmental and Munitions Center of Expertise to coordinate with each installation's liaison and tenants.

Implementing the management information system has been challenging, requiring more collaboration and support from the tenant organizations to

achieve success. Working in concert with Army Sustainment Command and the Environmental and Munitions Center of Expertise, installations' environmental divisions and tenant organizations are taking lessons learned, refining strategies and improving working relationships to promote the implementation process moving forward.

Transitioning organizations to using the enterprise management information system is important. The Army must remain compliant with federal, state and local environmental laws, and Department of Defense policies for preserving, protecting, conserving and restoring the quality of the environment. Implementation of an installation-wide Hazardous Materials Management Program is required to support environmental regulatory compliance.

The Enterprise Environmental, Safety, and Occupational Health Management Information System is the Army's enterprise management information system that supports the Hazardous Materials Management Program. Most recently, recognizing the importance of implementing that program, the G4 at Army Headquarters

developed a working group to revise the current program. This working group is tasked with identifying gaps and implementing standard management practices across the enterprise to support regulatory compliance, life, health and safety.

The group recognized that an enterprise management information system is a key component to program success. The Army's G4 plans to reinforce Hazardous Materials Management Program importance, compliance, and the use of supporting enterprise systems through regulatory policy.

The Enterprise Environmental, Safety, and Occupational Health Management Information System will be implemented at all installations very soon. Garrison Commander enforcement and active participation from all tenant activities are the keys to success!

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(Hazardous Material, continued from page 22)

distributed a memo to support this effort and the Hazardous Material Management Program Implementation Guide. The memo reinforced the existing regulatory requirements for Forces Command, Training and Doctrine Command and Army Materiel Command personnel to manage hazardous material in accordance

with the Installation Management Command Garrison Hazardous Material Management Program. In addition, the Headquarters, Department of the Army G4 has begun developing policy directing Army Commands to use the Enterprise Environmental, Safety, and Occupational Health Management Information System. This gives garrison commanders the ability to fully implement a Hazardous Material

Management Program throughout the installation, including tenant organizations.

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Tracking, reporting real property assets require accuracy

by Haywood J. Perkins III

Are my real property assets properly accounted for?

This question rings a bell of concern for those professionals in environmental divisions throughout the Army enterprise. A good environmental chief knows that accurate accountability and reporting of real property assets for an installation is a challenge and overall fiscally impacts environmental program sustainability.

The Office of the Assistant Chief of Staff for Installation Management, under its enterprise Installation Management Application Resource Center umbrella, uses the Headquarters Installation Information System (HQIIS) as the Army's authoritative reporting source for real property information. HQIIS currently functions as the consolidated repository for all Army real property and related data, as well as the Army's official registry for installations, sites, bases and enclaves/complexes.

What is important to know and understand is not only the purpose of HQIIS, but ultimately what other enterprise systems of records with which it interfaces. As the single reporting source for real property information, HQIIS receives real property asset data from multiple authoritative source systems, including General Fund Enterprise Business Systems (GFEBs).

What is important to know and understand is not only the purpose of HQIIS, but ultimately what other enterprise systems of records with which it interfaces.

The relationship between HQIIS and GFEBs is not always easily understood. From an environmental program fiscal sustainability perspective, the Army has identified HQIIS as its consolidated repository for all Army real property and related data. HQIIS is not the enterprise system of record where real property asset information is updated for accurate reporting actions, GFEBs is.



Although HQIIS is frequently used by environmental staff to acquire real property asset information, it is incumbent upon staff members to understand when the information they are viewing is inaccurate and which system of record must be updated to annotate needed changes. As it pertains to the fiscal aspects of environmental program planning, the most important

elements of HQIIS data include the real property asset type, real property asset operational status, design use/configuration code, primary unit of measure and secondary unit of measure. All of this data are "criteria fields" within the HQIIS system and are used to calculate fiscal allocations.

The cliché of "Garbage-in-Garbage-out" holds true with the accuracy of data entered in GFEBs when related to the

number of real property assets that are actually on-hand. Extensive real property asset data analysis indicates that inaccurate data is being reported in GFEBs, which is updating the same bad data in HQIIS for on-hand real property assets.

Diligence in our efforts to accurately account for and report real property asset data is paramount. We must identify and overcome the challenges, and make a concerted effort to ensure accuracy of real property asset reporting is achieved. The real property asset manager is a key player in this process. Your environmental budget depends on it!

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Constructed wetland system aids stormwater management

by Heidi R. Howard

The Federal Government is required to meet regulatory requirements including those contained in the Clean Water Act. Executive Order 13693, “Planning for Federal Sustainability in the Next Decade,” stipulates that all Federal land holding agencies are to be environmental leaders on all Federal lands, while Executive Order 13514 requires management of water quality that deal directly or indirectly with stormwater management. Executive Order 13693 stipulates that federal agencies (where life-cycle cost-effective) install suitable green infrastructure features to facilitate stormwater and wastewater management. Stormwater management can present physical challenges for installations.

The Office of the Assistant Chief of Staff for Installation Management funded a demonstration of a green infrastructure technology under the Installation Technology Transition Program to demonstrate the feasibility of a modular wetland system as a viable option for installations in treating and managing on-site stormwater runoff from areas with limited space and high pollutant loads, such as paved parking lots and motor pools.

A modular wetland system treatment system was demonstrated at the Fort Hood, Texas, Recycle Center. Because it has a large amount of various contaminants and debris associated with its operations and processes, it was selected as a “worst-case” scenario to test the modular wetland system’s ability to successfully treat petroleum, oils and lubricants, heavy metals, and total suspended solids on-site. The demonstration goals were to avert contaminant migration to surface water and facilitate compliance with regulatory stormwater and management objectives while determining if this low impact development technology could be beneficial to installations activities that are at risk of a Notice of Violation for MS4 (municipal or industrial permit).

The constructed wetland system addresses stormwater management with biological, chemical, and physical processes that



The U.S. Army Engineer Research and Development Center Construction Engineering Research Laboratory demonstrated a modular wetland system at Fort Hood, Texas, as part of a project funded through the Installation Technology Transition Program. (U.S. Army photo)

comprise a space-efficient “treatment train.” The concrete structure, with an estimated lifespan of 50 years, is a multi-stage, completely passive, self-contained unit that treats and manages stormwater within its structure. The modular system is suitable for new or retrofit applications in all soil types, and can use a wide variety of upland or wetland vegetation.

The system design includes three non-corrosive treatment chambers and filters to prevent clogging during subsequent stages. A catch basin filter prevents trash from entering the pre-treatment chamber. The pre-treatment chamber contains media cartridges with inert, naturally occurring minerals that act as the first storm water filter. Next the storm water flows through to the wetland chamber, where it is treated by physical and biological means, including uptake by vegetation planted on top of this particular chamber. The storm water then flows to the final chamber, and then out of the system through the discharge pipe. Alternatively, the modular wetland system can have holes in the bottom of this chamber to discharge directly to the soil for maximum infiltration.

The U.S. Army Engineer Research and Development Center Construction Engineering Research Laboratory collected samples before and after the modular wetland system treatment to measure runoff levels for heavy metals, petroleum, oils, lubricants, and total suspended solids. Overall results equaled or exceeded manufacturer’s claims, providing evidence that the modified wetland system is a potential solution for treating and managing stormwater on-site from motor pools and parking lot runoff. *Public Works Technical Bulletin 200-1-149*, “Demonstration of Modular Wetland Treatment System for Stormwater Runoff,” provides the runoff results as well as lessons learned from the demonstration of this technology.

The bulletin can be found at <https://www.wbdg.org/ffc/army-coe/public-works-technical-bulletins-pwtb/pwtb-200-1-149>.

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Environmental hotline fields questions worldwide

by Kari Hawkins

Finding solutions to environmental issues related to the U.S. Army Aviation and Missile Command's aviation and missile systems can extend an environmental scientist's reach all around the world.

From Fort Hood, Texas, to the National Training Center, California; from Corpus Christi Army Depot, Texas, to Fort Rucker, Alabama; from Fort Wainwright, Alaska, to Kandahar, Afghanistan – the command's Environmental Hotline is open to field questions related to environmental issues.

And it's environmental scientist LaDonna McCann of Aviaton and Missile Command's Environment Division who is ready to answer the call either by phone – 256-313-1711 – or by email – usarmy.amcom-environmental@mail.mil.

"We get all kinds of requests related to environmental concerns," McCann said. "Most of the requests we get are for materials used in maintenance at the depots. They are from Army personnel looking for a solvent, adhesive or paint that is 'greener' (more environmentally friendly) than what they are using now or that works better."

McCann and other employees within the Environmental Division can identify currently approved substitute maintenance materials, and provide expertise in materials and processes associated with Depot Maintenance Work Requirements and Technical Manuals. The hotline also serves the purpose of resolving issues involving product obsolescence, hazardous material alternatives, regulatory guidance and alternative technologies needed to reduce the environmental burden placed on the command's maintenance organizations.

Often, hotline requests come in when aviation- or missile-related employees discover they can no longer get a particular maintenance material and they are looking for a substitute.

"That's our opportunity to look for something that is 'greener' than what they

have been using," McCann said. "If they need a solvent to replace something that is no longer available, then we will provide them a solvent that is greener but that works just as good."

Some requests are related to visits from the command's Environmental Division's compliance branch, which oversees compliance with federal environmental laws; or to projects and programs that are just being established. Requests also ramp up when there are revisions to the Environmental Protection Agency's National Emissions Standards for Hazardous Pollutants.

"Those revisions often affect materials on aircraft," McCann said. "We are mainly concerned about complying with federal laws governing pollutants. At one time, we were doing a lot of work to reduce ozone depleting substances. We aren't doing much of that anymore because we were able to find solutions that made those reductions."

These days, one of the hotline's main topics is hexavalent chrome reduction, which involves reducing the hexavalent chrome contaminant from rinse water associated with helicopter maintenance so that the water is returned to being environmentally safe.

Most requests for assistance and information come through the Environmental Hotline's email address. But, regardless if by phone or email, each is handled with a sense of urgency.

"We reply to the request within 24 hours," McCann said. "If we need to do research, we let them know the timeline we are working from and give them a disposition date. If we don't have a replacement solution, I will tag one of our subject matter experts to help find a replacement."

"A lot of chemicals and adhesives, we already have solutions for. But, if we don't have a solution, then it can become a future research project."

Once an environmental issue is resolved,



LaDonna McCann is the environmental scientist on the other end of the line when employees call the U.S. Army Aviation and Missile Command Environmental Hotline. (Photo by Kari Hawkins)

McCann then works with the AMCOM Logistics Center to integrate changes to reflect that resolution into all relevant documentation.

Manning the command's Environmental Hotline is the ideal job for an environmental scientist who enjoys both researching solutions and working with employees to solve issues.

"I am both solution oriented and people oriented," McCann said. "I really like the research and interacting with a team of co-workers and subject matter experts who are focused on finding a solution to an issue. I'm learning all the time, and I really enjoy that."

The Aviation and Missile Command Environmental Hotline has been in place as far back as 1997. It is available during normal business hours. Emergency hazardous spills or releases should be reported immediately by calling 911.

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USACE Buffalo District supports nationwide HTRW efforts

by Andrew A. Kornacki

The nationwide focus on environmental sustainability has increased public interest in sites found to contain hazardous, toxic, or radioactive waste (HTRW); and for local communities with properties with potentially harmful materials on the premises, sometimes there is a perception that the site is unusable for alternative purposes.

The U.S. Army Corps of Engineers, Buffalo District, Buffalo, New York, takes these environmental concerns head-on with a team of individuals who specialize in HTRW investigation and clean-up. The well-trained team performs environmental investigation and human health risk assessments, remedial actions to remove or control exposure to hazardous materials, and monitoring of completed remedies to ensure they are protective into the future.

The HTRW team consists of specialists in the fields of health physics, chemistry, environmental engineering, toxicology, industrial hygiene, ecology, and cartography; these individuals are at the top of their field and have been sought out by agencies such as the U.S. Army, the U.S. Environmental Protection Agency, and the New York State Department of Environmental Conservation because of their unique skillset and competence with HTRW-related matters.

“The Buffalo District HTRW team is a great example of how we are ‘Improving Regional Processes’ across the division,” said Brig. Gen. Mark Toy, U.S. Army Corps of Engineers Great Lakes, and Ohio River Division commander. “This in-house technical expertise can be shared among other districts or agencies to reduce the need for duplicating efforts and passes on cost savings to the taxpayers while maintaining the highest standards.”

When the National Institute of Standards and Technology began planning renovations and construction for its campus in Boulder, Colorado, the Corps of Engineers Center of Expertise contacted Buffalo District Health Physicist Neil Miller to be part of the team that would conduct a radiological site



Neil Miller, a health physicist with the U.S. Army Corps of Engineers Buffalo District, conducts a gamma walkover survey at Great Kills State Park, Staten Island, New York. The survey is part of the hazardous, toxic or radioactive waste work that Buffalo District provides. (Photo by Andrew Kornacki)

assessment before the project moved forward with construction.

“Initially we conducted a radiological historical site assessment, which means we looked at log books, records, licenses, and talked with employees to identify potential areas and laboratories where radioactive materials might have been used within the buildings,” Miller said. “Moving forward we will go back to the site and use radiation detectors to scan floors and walls, and collect smears with filter pads to confirm or deny the presence of the residual radioactivity. Ultimately we will have to collect sufficient data to verify that the facilities can be recommend for unrestricted release prior to renovation.”

The Corps of Engineers typically performs historical site assessments and investigations at properties where there was potential for hazardous materials and also performs routine monitoring of active HTRW sites under both the Formerly Utilized Sites Remedial Action Program and Formerly Used Defense Sites program. But what really makes the Buffalo District stand out is its community outreach aimed at engaging the public on risks associated with HTRW. The team has organized numerous public technical demonstrations and have even participated in educational events held at the Buffalo Museum of Science, for example, covering topics ranging from evaluating radiation levels to the various types of monitoring options available.

“I think what a lot of people do not realize is that every day we are exposed to some level of radiation, but that is not to say that type or level of radiation would be harmful,” Miller said.

“One part of our job is to ensure sites are safe for future use. A perfect example of this is when we performed gamma walkover surveys at a park in Staten Island, in support of our Baltimore District. A large portion of the park was made with dredged material which was found to contain some radioactive material and a portion of the park was closed. We were able to map the gamma radiation on small portions of the park and provide data that allowed for re-opening of a portion of the park for recreational use,” he said.

The level of expertise required for this type of high-profile and sensitive work is significant, as the Buffalo District HTRW team is in charge of some of the most complex, intense and important work the Corps of Engineers performs.

“Education, outreach, monitoring, and eliminating future risk across the nation is how the Buffalo District is Building Strong and taking care of people,” Toy said.

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Ramstein High School earns Army Green Boot certification

by Mary Ann Davis

KAISERSLAUTERN, Germany – Active energy conservation plus a smaller ecological footprint equals a Green Boot certification for Ramstein High School from the U.S. Army Garrison Rheinland-Pfalz.

On Feb. 15, Col. Keith E. Igyarto, U.S. Army Garrison Rheinland-Pfalz commander, presented the Green Boot certificate to Ramstein High School Principal Sharon O'Donnell, who accepted the award on behalf of her 1,010 students and faculty that made her school the first high school in Europe to receive the certification.

"I'm proud to say that Ramstein High School is a member of the Kaiserslautern Military Community," Igyarto said. "There is a Native American saying, 'We don't own the land; we borrow it for our children.' You, as our children, are setting the standard for this program, so with that I congratulate the administrators, staff, faculty and most of all the students for being actively committed to this energy conservation program."

Also there to praise the school's efforts was Col. Curtis Juell, 86th Mission Support Group commander.

"I would like to congratulate you for the phenomenal things you've done with this program," Juell said. He noted how the Ramstein High School Environmental Club started its conservation efforts off small, "like the grain of sand inside an oyster, creating a pearl that we need to expand upon in this high school and other schools within the KMC [Kaiserslautern Military Community]. I encourage you to continue these practices and pass along to your parents, siblings and friends the importance of preserving our planet's critical resources."

The Green Boot Program began in 2013 in Wiesbaden, Germany, to inspire organizations to conserve energy and natural resources. The program's conservation focus areas include heating, ventilation and air conditioning, awareness, waste management, transportation and water efficiency and quality, all which help organizations diminish



Col. Keith Igyarto, U.S. Army Garrison Rheinland-Pfalz commander, and (far right) Konstantin Gross, U.S. Army Garrison Rheinland-Pfalz environmental engineer, present a Green Boot certificate to (center) Sharon O'Donnell, Ramstein High School principal, Lauren Jones, the school's Environmental Club president, and Glenn Porter, the school's Physical Education teacher and Green Boot Program manager, Feb. 15 at the high school on Ramstein Air Base, Germany. (Photo by Mary Ann Davis)

their ecological footprint while saving money and the environment, the garrison commander said.

"I'm so excited and proud of our students and staff who helped with this effort by increasing awareness and decreasing our environmental footprint," O'Donnell said. "This program was possible due to the leadership of Glenn Porter, our Green Boot Program manager. He was the driving force behind this endeavor."

The high school enrolled in the program in October 2015 and chose energy reduction and awareness as its primary focus areas, said Porter, a Physical Education teacher and who initiated the school's environmental club, inspiring students to become environmentally minded.

"We knew this would be a great program to start here at RHS because we could get everyone in the school involved," Porter explained. "We replaced standard light bulbs with LED bulbs for lower energy consumption and longer usage. Photocopiers and printers with energy-saving modes were programmed to shut down after 15 minutes of inactivity. Computer monitors were turned off daily after school and before weekends."

Additionally, radiators were adjusted to moderate heat settings of "3" instead of maximum "5" settings. Classrooms were lit with natural sunlight whenever possible, and a campaign to remind staff and faculty to turn off equipment and lights when not in use helped bring energy usage down, Porter said. In one year, the school reduced energy consumption by .89 percent, equaling thousands of dollars of savings due to the conscientious energy usage in the 136,805 square foot school facility.

"We are so proud of our staff and students and impressed that they would take on the challenge and make these new habits part of their normal day. Both teachers and students are showing that we have an important part to play in conserving energy. We started small, but we made big steps in this program, we will keep it going," Porter said.

It's not just about saving money, but understanding how each person in an organization can contribute to protecting resources, said Konstantin Gross, an environmental engineer with the garrison's Directorate of Public Works Environmental office.

(See *Army Green Boot*, page 29)



Recycling is the right thing to do at Daegu barracks

by Sgt. Chun, TaekJun

United States Army Garrison Daegu, Korea, Directorate of Public Works, Environmental Office handed out recycling bins to the Camp Henry Consolidated Barracks where there were none to help Soldiers recycle easier.

“The work that we do in the environmental [division] is ensuring that we all follow all federal state and local regulations to ensure the protection of the environmental resources,” said Russell Grossley, Daegu Directorate of Publics Environmental Division chief. “We perform inspections to ensure we are following those rules and regulations, ensuring that the units and shops have right tools and equipment to perform their duties in protecting the environment.”

On Jan. 19, U.S. Army Garrison Daegu Commander Col. Ted Stephens and Command Sgt. Maj. Juan A. Abreu took time to observe the installation of the recycling bins into the barracks.

“There are three reasons recycling is important. It reduces waste. It reduces pollution, and it reduces the amount of energy it takes to reproduce items.” Abreu said.

“Right now, there are about 110 to 120 new recycling bins distributed throughout the garrison,” Grossley said. “The new ones are



United States Army Garrison Daegu Commander Col. Ted Stephens and Command Sgt. Maj. Juan A. Abreu test the new recycling bins that were installed into the Camp Henry barracks. (Photo by: Sgt. Chun, TaekJun)

sturdier, can be placed outside, and also have ‘dual language’, both English and Korean on the bin, so everyone can understand what particular materials go where.”

“It is important to recycle in the barracks as any other facility, because we generate waste,” Abreu added. “It is also important to make sure that all are held responsible for the environment and take care of it.”

According to Grossley, approximately about 8,600 tons of solid waste are generated in Area IV.

“Of that 8,600 tons, we recycle approximately 67 percent. Our cost avoidance by recycling is approximately \$385,000 a year. Recycling is the right thing to do. It helps us to conserve natural resources, protects our cultural resources and protects the overall environment,” Grossley said.

“It is important to recycle because it is the right thing to do, as well as practicing good environmental stewardship,” said Pfc. Teion Middleton, of the command group administrative staff.

“I want to tell the USAG Daegu, Area IV: Take pride in your environment, in your community. Make a difference,” Abreu said.

And with the new recycling bins, Area IV is doing just that – making a difference, conserving energy and recycling.

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(Army Green Boot, continued from page 28)

“Schools are the best places to run this type of program, because it teaches the students the right things to focus on when it comes to the environment,” Gross said. “All actions performed by the students and staff affect their environment making the program more visible and memorable.”

Becoming a member of the Green Boot community can be done in six steps, Gross said, which includes using Green Boot Program checklists to assess unit compliance with the standards followed by an on-site checklist verification visit. Once the on-site verification is successful, the organization becomes a certified member of the garrison’s Green Boot Program

for one year. After the initial period, the certification can be extended on a yearly basis by executing a recertification process.

“Unit participation raises ecological awareness, while wrapping together their environmental-related actions and processes to make annual program recertification easier,” Gross said. “The depth [of how much they want to do] can be decided by the organization itself.”

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Fort Leonard Wood calls sustainability key to present, future Army

by Ryan Thompson

In the 1970s, the Army was often referred to by the media as the “Big Green Machine” tearing up the environment and eating resources.

Today that image could not be further from the truth.

According to the Installation Management Command sustainability initiative, the Army is working to be a good steward of the environment and address conservation of resources. Sustainability is now the key to a vital Army today, and in the future.

Fort Leonard Wood, Missouri, uses limited resources such as land, water and energy in large quantities on a daily basis. Sustainability means managing all these resources in a way that will best support the mission by improving the quality of life in military communities, protecting resources and reducing operational costs.

To address how Fort Leonard Wood can best meet these challenges and remain a viable and successful installation well into the future, installation leadership works with stakeholders to formulate the Installation Strategic Sustainability Plan (ISSP), according to Mark Premont, Plans Analysis and Integration Office director.

“The ISSP is a quarterly meeting we have on the last week of the first month of every quarter. Essentially it is a 25-year plan we put together in order to enhance the sustainability of the installation,” Premont said.

At the backbone of the ISSP are six topics that address the full scope of sustainability on post. From the need to maintain secure energy sources, to maintaining a healthy and resilient workforce, the plan breaks down into groups to tackle these issues individually throughout the week, he added.

The surrounding communities also play a major role in the sustainability of Fort Leonard Wood, he said, noting that more than “60 percent of the people assigned to the installation live off the post. You want to have good communities there.”



Mark Premont, Plan Analysis and Integration Office director, explains how the Installation Strategic Sustainability Plan is being implemented at Fort Leonard Wood, Missouri, at a January update meeting. Community members play a vital role in implementing the plan. (Photo by Ryan Thompson)

It takes partnerships with surrounding communities to provide a safe environment for our Soldiers and civilians to live and play, Premont said. “We are not an island.”

Allen Simpson, Directorate of Public Works installation energy manager, works with the team tasked with planning for sustainable infrastructure powered by secure, sustainable energy sources, an area in which the post and its organizations are constantly improving.

“We have recently been through a large build-up of infrastructure which was constructed and certified under LEED criteria,” Simpson said. LEED, or Leadership in Energy and Environmental Design, is a widely used third-party verification for green buildings.

Recently, the installation signed a new regulation, Fort Leonard Wood Regulation 420-3, Energy Conservation, that establishes energy-specific guidelines for how occupants use facilities assigned to them, he said.

Small changes in building use such as

setting limits to thermostats, ensuring appliances are unplugged at the end of the day and changing out incandescent bulbs for compact fluorescent bulbs, can add up to real energy savings.

Through training and by following the regulation’s guidelines, Simpson said he hopes to achieve a 10- to 15- percent energy reduction through this initiative.

Editor’s note: This article first appeared in the Fort Leonard Wood Guidon.

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CASI focus areas address complex sustainability issues

by William J. Wolfe

The Center for the Advancement of Sustainability Innovations focuses U.S. Army Engineer Research and Development Center expertise, technologies, and partnerships on helping the U.S. Army Corps of Engineers, the Army, and the Department of Defense achieve more sustainable missions, facilities, and operations.

The center provides the military with capabilities that enhance national security by more effectively using limited resources and improved coordination and partnerships with host communities and stakeholders in the United States and across the globe. It provides “systems level” expertise to address complex sustainability issues and enable installations and communities to engage across a wide range of economic, environmental, social, and mission issues that the center categorizes into nine dynamic technology focus areas.

Anticipating Emerging Issues

This focus area strives to engage stakeholders through forums, white papers, publications, etc., about emerging issues; interpret how these emerging issues might impact Department of Defense activities and operations; and initiate a dialogue about potential courses of action to respond to these issues. The Center for Advancement of Sustainability Initiatives White Paper series is one forum that does that.

Climate Change

Climate change impacts national security in that a changing climate will impact how the military executes its missions, supports civil authorities, and provides humanitarian assistance and disaster relief. This focus area addresses the challenges of changing climatic and related conditions as they affect facilities, lands, and operations, and stressors that can affect regional and national stability across the globe.

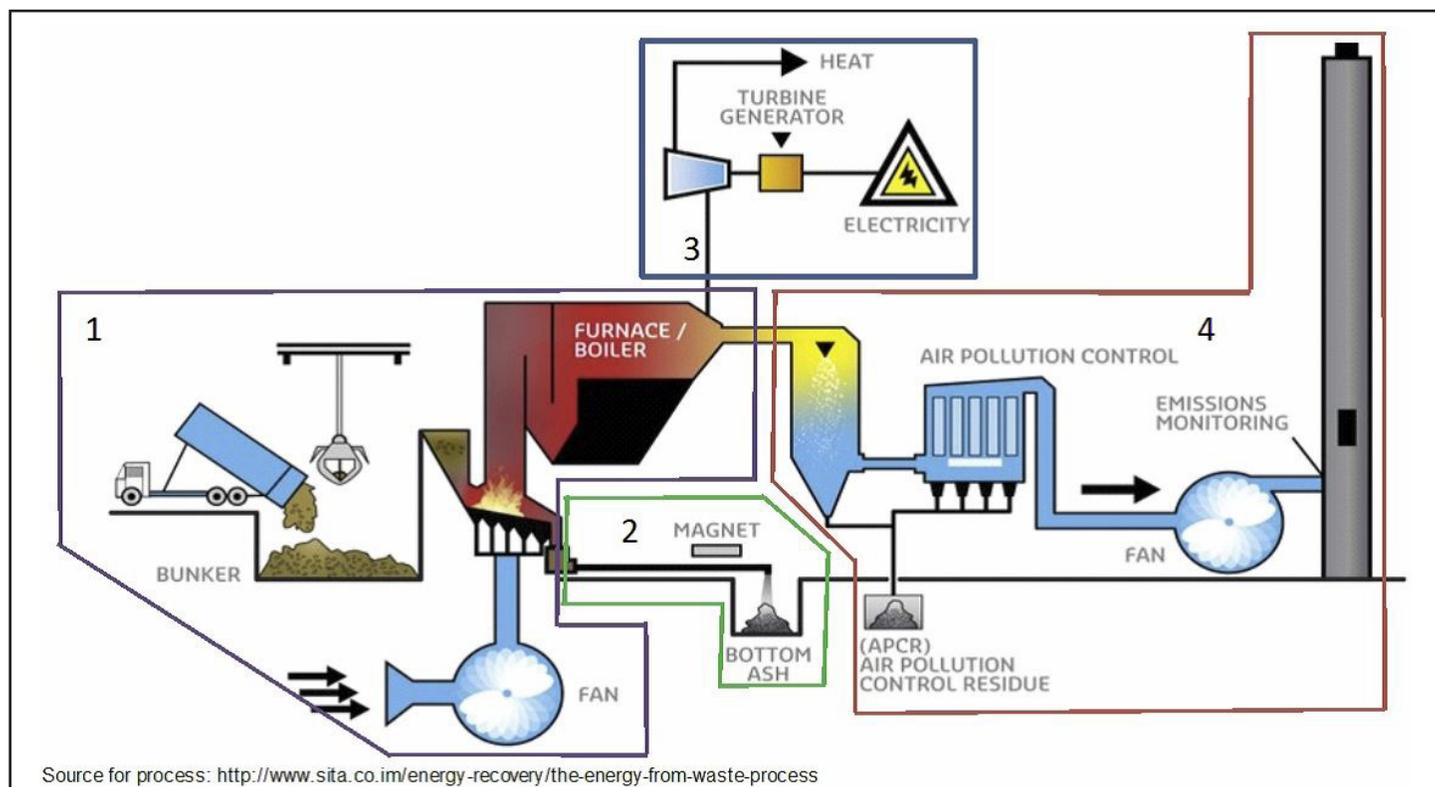
Sustainable Installations — Net Zero Planning

The Army faces significant threats to energy and water supply requirements around the globe. “Net Zero” is a strategy to bring the overall consumption of resources on installations down to an effective rate of zero. The Army’s vision is to appropriately manage our natural resources (energy, water, and waste) with a goal of achieving Net Zero Installations.

Sustainable Energy Solutions

From a military capability systems support perspective, power and energy are critical to sustainability. The DOD has established challenging goals to increase energy efficiency and reduce greenhouse gas emissions of their installations in all five services with an ultimate goal of Net Zero Energy installations. This

(See CASI, page 33)



U.S. Army Engineer Research and Development Center Construction Engineering Research Laboratory Technical Report-14-21, “Considerations for Net-Zero Waste Installations,” characterizes municipal solid waste and describes processes and technologies (e.g., this incinerator energy recovery and air pollution control) that may be integrated to support a Net-Zero Water installation. (U.S. Army Research and Development Center graphic)



Aberdeen Proving Ground marks a century of forestry

by Scott English, Jessica Baylor and John Leader

As the U.S. Army's oldest proving ground celebrates its centennial this year, it is a good time to reflect on what has been accomplished, and how we are preparing for the next 100 years of service to the Nation.

Aberdeen Proving Ground, Maryland, is one of the most important research, development, and testing facilities for military weapons, equipment, homeland defense and counterterrorism. It also is home to more than 72,000 acres of forests, fields, creeks, wetlands, islands, and an open water estuarine section of the Chesapeake Bay.

The Natural Resources Branch, within the installation's Directorate of Public Works, is charged with ensuring these impacts don't limit the sustainability of these critical biologically and economically important assets, nor threaten the long-term living infrastructure needed for current and future military operations. The branch is carrying on a long tradition of guiding the sustainable use of all these natural resources for the next 100 years. The Forest Management Plan, within the comprehensive Integrated Natural Resources Management Plan, is a key long-range tool in sustaining these natural resources while providing for the military mission.

As installation activities transitioned from its founding in World War I to its expansion in World War II, technological changes worldwide changed mission needs. More advanced vehicles and equipment had more destructive impacts on the natural infrastructure. Initial efforts to correct this unsustainable use involved guidance from the U.S. Department of Agriculture Soil Conservation Service agronomists and foresters. Trees and groundcovers were planted on Army properties and after the war timber, agriculture, and hunting programs were started. By the 1960's, the Sikes Act encouraged wildlife conservation, public access, and cooperation with the U.S. Fish and Wildlife Service and state fish and game agencies.

In the last decades of the 20th century, the U.S. Environmental Protection Agency was established. National environmental legislation added pressure on military installations to conduct better stewardship of, and have less negative impact on, all natural resources. Poor management of some lands had led to

degradation of natural infrastructure needed for military testing and training and compliance problems with the new legislation. That helped motivate the 1989 requirement for installations to have Integrated Natural Resource Management Plans.

By the 1990's that led to more partnerships with federal and state agencies and the work of natural scientists to improve sustainability. The 1994 Department of Defense policy encouraged ecosystem-level management as a primary tool to integrate ecological, socioeconomic, and military needs. The Keystone Dialogue in 1996 expressed the importance of biodiversity on military lands, and by 2011, the defense department was providing invasive species guidance to natural resource managers. All of these refinements to managing military lands mirrored advances in the natural resource sciences and changes in public awareness of, and concern for, environmental issues.

During the last 100 years, Aberdeen Proving Ground has kept pace with the evolution of approaches to managing military forests. The installation's current overall forestry mission to create and sustain landscapes for military mission testing and training, while managing those landscapes for ecosystem biodiversity and forest health. The details of this approach form the 50-year Forest Management Plan, as part of the larger Integrated Natural Resources Management Plan.

Planning is essential to managing forests. It starts with assessing the legacy situation by completing forest inventories and defining individual stands. A unique agreement between the installation and the Maryland Department of Natural Resources and Critical Area Commission allows for a landscape-level approach to forest mitigation. The goal is to reduce the mitigation footprint by enhancing current forests, which historically have grown wild with little management on unused parts of the post, rather than create new ones.

Specific forestry activities include: encouraging natural regeneration of 14 native oak species; protecting bald eagle habitat; encouraging urban forestry in intensively developed areas; promoting healthier multi-levelled forests of uneven age;



Planting trees to support pollinators at Aberdeen Proving Ground, Maryland, helps the installation and its Natural Resources Branch continue a long tradition of guiding sustainable use of its natural resources. (Photo courtesy of the Aberdeen Proving Ground Natural Resources Branch)

reducing fuel loads to minimize wild-land fire risks; and in general, maximizing forest product and ecosystem service values.

Healthier native forests not only support floral and faunal biodiversity on post but also improve water quality in Aberdeen Proving Ground watersheds that flow to the Chesapeake Bay. Other benefits of sustainable forest management include healthier game populations for hunting programs, higher quality recreation opportunities, and forest product sales to fund future conservation efforts. The forestry program and the Natural Resources Branch participate in outreach activities for students and adults to create greater understanding of conservation activities within the local and tenant communities.

Aberdeen Proving Ground forest management faces both common and unique challenges for natural resource programs on military installations. The intense and changing uses of installation lands requires ongoing work with contractors and tenant organizations to comply with Federal and State laws, regulations and guidance. Because 100 percent of the installation's Aberdeen and Edgewood Areas are in the coastal zone, compliance with the 1972 Coastal Zone Management Act is particularly significant.

Extensive wetlands on the installation are of particular concern. Clearing invasive plants and planting trees are complicated, slowed, and made far more expensive, by the need to professionally

(See APG, page 33)



(APG, continued from page 32)

check all areas for legacy unexploded ordnance or other dangerous materials that could be found in almost any area of the installation. Prescribed burns for reducing fuel load are hampered by frequently strong winds (coming off the adjacent fetch of Chesapeake Bay) blowing downwind towards inland communities. Natural oak regeneration in the forests is hampered unless deer populations are kept in check and individual saplings are protected by tubing. Through all of these constraints the forestry program and the Natural Resources Branch try to serve the Garrison and tenants through the National Environmental Policy Act process to support the military mission while sustaining healthy ecosystems for the future.

Since it was established in 1917, the Aberdeen Proving Ground forests have expanded six-fold

from roughly 3,000 to more than 18,000 acres. Big and Champion trees that witnessed the American Revolution, as well as the last 100 years, still stand at the installation, dwarfing their descendants in the forest. Local students are learning about careers in forestry and other natural resource sciences from the installation's professionals, while trees are being planted yearly, to produce both future scientists and future forest ecosystems.

In spite of a substantial increase in mission activities, there may now be nearly as many bald eagles in the upper Chesapeake Bay, many of those at the installation, as there were in 1973, when they were listed as an endangered species. Aberdeen Proving Ground has been recognized by both the Arbor Day Foundation and the State of Maryland for its exemplary forest management.

Due to its geographic position, seasonal climate

changes, variety of ecosystems, land and water, Aberdeen Proving Ground will continue to be needed for Army testers and trainers well into the future. Due to a professionally crafted Forest Management Plan and the establishment of cooperative partnerships with federal and state agencies and other professionals, the forests of Aberdeen Proving Ground should serve the Army and the Nation well for another 100 years and beyond.

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(CASI, continued from page 31)

technology focus area seeks to identify the sustainability needs associated with integration of power and energy into military missions.

Sustainable Water and Waste Resources

Military installations have been impacted by conditions of increasing demand and decreasing supply of high quality fresh water. Urban growth adjacent to installations has combined with prolonged regional droughts to place key military missions at risk. Regional competition for water threatens continued availability of adequate water on post and in adjacent urban areas. This focus area addresses access to, and the sustainable use of, water resources.

Sustainable Facilities and Infrastructure

This focus area helps the Corps of Engineers, the Army, and DOD work toward achieving net-zero and sustainable planning, design, and development goals. Center for the Advancement of Sustainability Initiatives team leaders are part of the Corps' "Sustainable Design and Development Directory of Expertise" that

supports development of criteria, research and development, design and construction support services, and training and advisory assistance. The center's staff supports the U.S. Green Building Council and other organizations involved in sustainable design and development.

Sustainable Contingency Basing

This focus area relates to identification of the Army's required capabilities for full spectrum contingency operations. To meet its objectives, this focus area requires a multi-disciplined approach to develop solutions that ensure sustainability and efficiency while eliminating redundancy in a contingency environment.

Sustainable Natural Infrastructure

The Corps of Engineers is committed to ensuring that sustainability is broadly part of its organizational culture. As steward for some of the Nation's most valuable natural resources, the Corps of Engineers strives to ensure sustainable solutions that address short- and long-term environmental, social, and economic considerations. This focus area works to engage stakeholders through forums, white papers, publications, etc. regarding defense department-related concerns with

natural resources, in terms of managing the department's assets and natural resources as they relate to international and national security and stability.

Green Remediation and Reuse

The Corps of Engineers must provide quality and responsive services in an environmentally, economically, and socially sustainable manner. This focus area seeks to increase awareness and activity across the Corps of Engineers and the Army by incorporating sustainable practices into environmental remediation and reuse activities.

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Gray Cyber Center sets gold building standard in Europe

by William King

WIESBADEN, Germany – The Lt. Gen. Robert E. Gray Cyber Center Europe was recognized as the Army’s newest green building at a LEED Gold plaque unveiling ceremony June 27 on Clay Kaserne in Wiesbaden.

LEED, or Leadership in Energy and Environmental Design, is an internationally recognized program for the design, construction and operation of green buildings. Gold is the second highest rating a project can receive after platinum. The U.S. Army 5th Signal Command’s Gray Center is the first Department of Defense building in Europe and the first within the U.S. Army Network Enterprise Technology Command to achieve a LEED Gold rating.

The Gray Cyber Center, officially opened in July 2014, makes use of several energy-efficient features, including a state-of-the-art electrical and thermal co-generation unit, that allows it to achieve about 42 percent in energy savings each year, or about \$500,000.

“The building uses 47 percent less potable water and 78 percent of the construction waste has been diverted from landfill. These are big numbers that make a real difference to our environment,” said Kay Killmann, president of the German Green Building Association.

‘We didn’t spend more money to achieve gold, it was just the result of a very efficient design.’

– Albin Toth

“This is remarkable, especially for an energy intensive building such as a data center,” Killmann said.

The Gray Cyber Center is named after Lt. Gen. Robert E. Gray, a former U.S. Army Europe deputy commander and Chief of Signal. The 52,000 square-foot facility manages and defends the U.S. Army’s communications network throughout Europe and Africa.



U.S. Army Maj. Roberto Santiago, Gray Cyber Center director of operations; Kay Killmann, president of the German Green Building Association; Col. Jimmy L. Hall Jr. commander of 5th Signal Command (Theater) and the U.S. Army Europe chief information officer/G-6; and Lt. Col. Charles Hemphill, U.S. Army Corps of Engineers – Europe District deputy commander, unveil a Leadership in Energy and Environmental Design Gold plaque June 27 at the Lt. Gen. Robert E. Gray Cyber Center Europe in Wiesbaden, Germany. The Gray Center is the first Department of Defense building in Europe and the first throughout the U.S. Army Network Enterprise Technology Command to achieve a LEED Gold rating. (U.S. Army photo by William B. King)

“It is only fitting to have some of the most technically proficient teams executing the Army’s cyber operations and initiatives in one of the most advanced and environmentally friendly facilities,” said Maj. Roberto Santiago, Gray Cyber Center director of operations.

Albin Toth, an architect who helped design the Gray Cyber Center, said his team looked for opportunities to maximize energy efficiency in every design decision.

“We didn’t spend more money to achieve gold, it was just the result of a very efficient design,” Toth said.

Col. Jimmy L. Hall Jr., commander of 5th Signal Command (Theater) and the U.S. Army Europe chief information officer/G6, described the project as a leading

example of the Army’s Energy Security and Sustainability Strategy published last year.

“We also recognize this initiative as an important achievement in interoperability and partnership,” Hall said.

He said interoperability isn’t limited to military capacity, but also builds partnerships with government and industry, and works together to have a positive effect on the environment.

“This is a testament to U.S. Army 5th Signal Command’s dedication to investing in your Soldiers, Civilians and their environment. Furthermore, it shows that the U.S. Army is committed to building sustainable military engineering solutions while working closely with host nation building counterparts,” Killmann said.

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Aerial data acquisition ensures installation sustainability

by Samuel Vance

Army installations have been utilizing aircraft to acquire data for decades. Aircraft equipped with traditional visual spectrum cameras, light detection and ranging (LiDAR) and thermal imagers have provided powerful tools for installation management; however, the expense and administrative burden required for coordinating flights limits the frequency of data collection.

Enter the Unmanned Aircraft System (UAS). A research team at the U.S. Army Engineer Research and Development Center Construction Engineering Research Laboratory is demonstrating the use of Unmanned Aircraft Systems in multiple installation applications. In fiscal year 2016, the team completed an Installation Technology Transition Program research project, funded by the Army Office of the Assistant Chief of Staff for Installation Management, investigating the efficacy and feasibility of UAS to conduct non-destructive roof leak detection inspections at Army installations.

Localized roof areas that differ in temperature from the surrounding roof area often indicate the presence of water below the roof membrane. Preliminary tests of a UAS platform equipped with a thermal imager led to the identification of roof leaks, which was demonstrated at Fort Leonard Wood, Missouri.

Through feasibility analysis and comparison with alternate roof leak detection techniques, the team reported that an UAS with a thermographic payload for roof leak detection is a viable option for Army use and presents a new capability which would, if implemented, significantly augment roof management practices.

A major portion of the project included navigation through the UAS flight approval process, which included an Airworthiness Release from the Army Aviation Engineering Directorate. In some airspaces, a Certificate of Authorization also is required from the Federal Aviation Administration. The UAS flight approval process is outlined in the technical report of the project, including templates of the required documents.

While at Fort Leonard Wood, the team demonstrated the use of UAS coupled with Structure from Motion photogrammetry software to create three dimensional models of the Fort



The U.S. Army Engineer Research and Development Center Construction Engineering Research Laboratory's Unmanned Aircraft System is used in multiple installation applications, from conducting non-destructive roof leak detection inspections to land surveying. (Photo by Samuel Vance)

Leonard Wood training quarry. The team interfaced with garrison representatives to identify additional use cases of the technologies.

The team's ongoing research includes two additional Installation Technology Transition Program projects. The "Visual and Thermographic Spectrum Three Dimensional Modeling for Building Energy Envelope Analysis and Visualization" project seeks to develop a means to rapidly create three dimensional models of building exterior envelopes in the thermal spectrum, allowing energy managers to easily visualize and compare the thermal efficiency of multiple buildings simultaneously, in addition to pinpointing thermal bridges. The proposed methodology includes the use of UAS as a data collection platform and will be demonstrated at Fort Campbell, Kentucky.

Land surveying has been accomplished in recent years by traditional winged aircraft at substantial expense. The "Surveying Techniques utilizing the Unmanned Aircraft System platform: LiDAR and Photogrammetry" project will demonstrate the use of LiDAR and Structure from Motion photogrammetry in land surveying, with particular emphasis on the accuracy, precision, and corresponding use cases of each technology for land surveying at Army installations.

The research team has interests in remotely sensed change detection applications. Quantitative erosion monitoring could be accomplished by comparing multi-temporal, bare earth three dimensional point clouds. High accuracies are anticipated with LiDAR data sets. The technology may also prove useful in quantitative measurement and monitoring of land disturbance on training lands.

Other applications include mapping and leak detection of multiple surface and subsurface utilities using UAS platforms equipped with thermal and multi-spectral imaging cameras.

The team solicits ideas on future use cases and desires to partner with installations to leverage the low cost remote sensing capabilities that UAS platforms offer.

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Contract helps buildings become more energy efficient in Hawaii

by Santiago J. Hernandez

The Department of the Army is focused on reducing energy and water usage across garrison installations, and Hawaii is no exception.

In February, U.S. Army Garrison-Hawaii kicked off energy efficiency improvements at select buildings to help reduce local energy consumption. The buildings included military office spaces, barracks, family and recreation facilities, fire departments, and chapels on Fort Shafter, Aliamanu Military Reservation, Schofield Barracks, and Wheeler Army Airfield.

Changes on the horizon

During the next two years, the garrison's Directorate of Public Works will begin making multiple improvements to save energy and decrease water consumption under an Energy Savings Performance Contract.

The directorate supervises the Energy Savings Performance Contract in conjunction with the U.S. Army Corps of Engineers, through its U.S. Army Engineering and Support Center, Huntsville, Alabama, and Honolulu District.

Planned improvements include:

- Installation of building automation components and systems at 15 buildings;
- Heating, ventilation and air conditioning improvements in three buildings;
- Retrofits of more than 38,000 lights in 88 buildings;
- New weather-stripping in 27 buildings;
- Solar thermal systems for 16 buildings;
- Low-flow plumbing fixtures in 15 buildings; and,
- Installation of 124 energy efficient transformers across 39 buildings;

The directorate also will receive operations, maintenance, and repair support on select components for the next 20 years.

Planning for success

The directorate started initial planning and preparations for these projects nearly three years ago, in the summer of 2014.

During the research phase, staff looked at an array of technologies and opportunities across



Army contractor Joshua Clark, front center, installs conduit at Fort Shafter, Hawaii, for an automation support center while Kyle Brown, a site, safety and health officer, looks on. Clark and Brown are both employed by Siemens Corporation. (Photo by Santiago Hernandez.)

multiple facilities. They focused on a “whole building” approach, selecting energy efficiency measures that supported both financial and environmental targets.

The staff was then able to secure funding through the Energy Savings Performance Contract, in which the government pays for the improvements over time, using the savings generated by the various energy efficiency measures.

Key to both planning and implementation is ensuring work is conducted in a manner that keeps the mission, Soldier welfare, and safety at the forefront. The public works directorate is following a detailed planning and notification process to ensure that building occupants have advance notice of the work; can engage in the planning of the activities; and have a means to provide feedback throughout the installation process.

Collective effort

The Energy Savings Performance Contract project is designed to save energy and Army

funds, which then can be redirected to other public works' projects. Critical to the project's success is buy-in from leaders, Soldiers and Civilian employees.

The directorate found that across the garrison's facilities, automation can only do so much. Things like broken sensors, windows, doors, air conditioning thermostats, and failures to call-in work orders can have a negative impact installation goals. Success will depend on energizing the U.S. Army Hawaii community to take personal and collective ownership of energy conservation efforts.

Energy security depends on conserving current and future energy supplies, water, and protecting the environment. If you need to use it, use it wisely. If not, set the example, turn it or shut it off. Conservation is everyone's responsibility.

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U.S. Army plays matchmaker to Hawaii's endangered plants

by Kayla Overton

SCHOFIELD BARRACKS, Hawaii — On Valentine's Day, love was in the air at the U.S. Army's Natural Resources Program, here, as biologists lend a matchmaking hand to Oahu's endangered plants, literally.

Many threatened and endangered plants have been unlucky in love. They haven't been able to find a perfect match and reproduce on their own due in large part to disease, habitat loss, predatory rodents and environmental change.

The decline of many of the plants' original matchmakers – native bird pollinators – also has been a huge obstacle, according to Kapua Kawelo, a biologist with U.S. Army Garrison-Hawaii's Oahu Natural Resources Program.

Kawelo and the Army's natural resources program work to ensure the survival of threatened and endangered species on Army installations and training areas in Hawaii.

"We do a lot of field studies and research, and we've found that our native plants just aren't successful reproducing anymore. They need help," Kawelo said.

One native mint plant in particular, the *Stenogyne kanehoana*, has been terribly unlucky in love. In fact, it practically went extinct in the wild and was almost lost forever, due in large part to the loss of its original pollinator, the 'I'iwi, a Hawaiian honeycreeper bird.

"The 'I'iwi bird has a distinct hooked beak that fits the blossom of the mint like a hand to a glove," Kawelo said. "With those birds becoming fewer and fewer in number, the plants need a different hand."

According to Kawelo, approximately 20 percent of the threatened and endangered plants the Army manages in Hawaii have lost their bird pollinators.

"We're getting creative and giving these plants a hand because they can't get it done on their own," Kawelo added. "As part of our military training mission, we have a responsibility to ensure their survival."

Tools of the Matchmaking Trade

So how does one create plant love?

The true matchmaking begins when matchmakers (Army biologists) hand-pollinate plants in need. Army biologists use different tools like eyebrow brushes to delicately collect pollen from various types of plants in both the greenhouse and in the forest.

Love knows no bounds when Army biologists are involved in matchmaking.

"In certain plant species, male and female plants may be miles away from each other, making pollination difficult, so we may collect pollen from a particular male plant and hand-pollinate a female plant miles away," Kawelo said.

Everlasting Love – How to make it last

Finding a match is just part of the story. The next goal is raising offspring and keeping the family name going.

As "keiki" seeds are produced after hand-pollination, the natural resources staff collects them for safe keeping in the Army's seed conservation laboratory on Schofield Barracks.

The seed lab is one of only four in Hawaii, and houses millions of potential offspring. The lab's climate-controlled refrigerators can replicate ideal lighting and temperature environments for the young keiki to grow. Other seeds are stored in vacuum-sealed pouches in case they're needed down the road.

"Some of the seeds in the lab are as old as 15 years," Kawelo said. "They're critical to the future of native species of plants should something devastating happen to the population in the wild."

Once the young keiki get big enough, they are moved to an Army greenhouse, and eventually planted back in the wild.

Match Success Stories

Through hand-pollination, cultivation and reintroduced planting, successful love matches are on the rise. Here are just a few of the Army's Oahu natural resources

program success stories:

- **Hawaiian mint** (*Stenogyne kanehoana*): In 2001, there were no known plants in the wild. Today there are more than 500 plants in the Waianae mountain range.
- **Mehamehame** (*Flueggea neowawrae*): In 2001, there were 39 known male and female trees spread across the Waianae mountain range. Today, there are more than 700 plants.
- **Kamakahala** (*Labordia cyrtandra*): In 2001, there were only 100 known plants in the wild. Today, there are more than 700 plants in the Waianae and Koolau mountain ranges.
- **Hesperomannia oahuensis**: In 2001, there were 21 remaining plants in the wild. Today, there are more than 300 plants in the Waianae mountain range.



A biologist with U.S. Army Garrison-Hawaii Oahu Army Natural Resources Program uses an eyebrow brush to hand pollinate a Hesperomannia oahuensis, an endangered plant found on garrison property. (Photo courtesy of U.S. Army Garrison Hawaii's Oahu Army Natural Resources Program)

For more information about the Army's local natural resources programs, visit <https://www.garrison.hawaii.army.mil/sustainability/NaturalResources.aspx>.

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Soldiers train, improve endangered species management

by Kapua Kawelo

Accessing the forests of Oahu's Waianae mountain range has become much easier, thanks to Soldiers with the 25th Infantry Division's 29th Engineer Battalion, Schofield Barracks, Hawaii. Last year, Bravo Company repaired the dirt access road to the Army's Kaluaa endangered species management unit above Schofield Barracks.

"The road was very eroded," said Joby Rohrer, senior natural resource manager, U.S. Army Garrison-Hawaii's Oahu Army Natural Resources Program. "Shrubs and trees were encroaching on the road corridor. It needed repair to be safe for our natural resource crews to drive it."

The project was the result of good ideas hatched casually at the garrison's 2015 Earth Day event, where the garrison's natural resource program manager and Bravo Company leaders got excited about partnering on win-win projects.

The win for the environment comes from increased road access efficiencies, cost savings and Soldier education about the role of the garrison's natural resource program. It's also a win for Soldiers as the unit obtained realistic training and a sense of accomplishment.

"The opportunity to work with [them] improving the road provided our Soldiers the opportunity to broaden their scope of capabilities as engineers," said 1st Lt. Johannes Olind from Bravo Company. "Soldiers learned and practiced skills such as grading, tree felling and gravel compaction that are very difficult for us to replicate in other types of training events."

Olind noted the project gave unit leaders the opportunity to exercise project management skills by working with a different Army command, sequencing activities, and managing resources to see the project through from planning through execution. He said the platoon's capabilities to provide mobility enhancement to their brigade have been greatly increased while producing a real world product.

Soldiers used earth-moving equipment to re-establish water bars for diverting water from the road corridor. They cleared vegetation and trees along the corridor to improve visibility around corners, and applied gravel along the road bed where necessary to improve compaction.

The garrison's natural resource staff demonstrated safe chainsaw operation practices to expand the engineers' skills, which they applied in practice while clearing vegetation encroaching



Soldiers fly 98,000 pounds of fence materials to a remote work site in the Koolau Mountains, supporting U.S. Army Garrison-Hawaii's Oahu Natural Resources Program. The fencing will be used to keep invasive species out of critical native habitats. (Photo courtesy of U.S. Army Garrison-Hawaii's Oahu Army Natural Resources Program)

along the roadside.

The Kaluaa road repair project was a jumping off point for a second partnership project with Bravo Company. The Soldiers' task was to clear a blocked culvert along the Schofield Barracks West Range firebreak road. They finished the work in two days and saved garrison resources – again, a win-win for both organizations.

Firebreak roads are critical as Oahu wildfires can have catastrophic impacts on endangered species. These roads are essential to the firefighting response and are the first line of protection for the endangered species who live in the forest above.

Another unit partnership was forged on Oahu – this time with a different Bravo Company. A year ago, Bravo Company, 3rd Battalion, 25th Combat Aviation Brigade, airlifted fence materials into the Koolau mountain range. Ten loads of fencing weighing 98,000 pounds were flown from Schofield Barracks to the summit of the Koolau Mountains within the state's Ewa Forest Reserve.

"The pilots and crew conducting this operation are highly skilled, and flew all day to complete the mission in support of a Koolau watershed protection project fence," said Matthew Burt,

Ungulate Program/Elepaio Stabilization coordinator for the Oahu Army Natural Resources Program.

Once erected, the fencing will protect an intact native wet forest, a critical watershed for Oahu, and will secure fresh drinking water for generations to come.

A final unit partnership occurred last year with Charlie Company of the 2-25 Aviation Regiment, 25th Combat Aviation Brigade. In June, the unit sling-loaded and flew OANRP's wood chipper to the southern Waianae mountains where the staff is protecting the endangered Hawaiian tree snail, known as the kahuli snail (*Achatinella mustelina*).

"Charlie Company scoped out the rigging required to fly the chipper, assessed the drop zone, and executed the operation with precision and accuracy," said Jamie Tanino, a Rare Snail Conservation specialist with the garrison's natural resources program.

The chipper has a similar size and shape as some artillery guns that the Army regularly sling-loads for training and warfighting.

(See Aerial data, page 39)



Consortium helps Army find water at remote training area

by Jim Frisinger

Dr. Donald Thomas has been a frequent visitor to the high plateau saddle between Mauna Loa and Mauna Kea on the Big Island, Hawaii. The geochemist, director of the Center for the Study of Active Volcanoes at the University of Hawaii, likes to drill holes into the mountain.

“Most people are drilling for water. We are drilling for information,” Thomas said.

His research crew even brought in a specialized diamond wireline core drilling rig to the Big Island from Minnesota to plumb the mountain’s depths. A tube inside the drill receives the core, then the wireline cable recovers the core every 10 feet as the drill advances.

His latest water research was funded by U.S. Army Garrison-Hawaii through Cooperative Ecosystem Studies Units (CESU) National Network, a consortium of 15 federal agencies and 390 universities and non-governmental organizations. It links federal land-managing agencies with universities, museums and other non-profit organizations that can provide research, training and technical expertise in managing natural and cultural resources. It allows easy transfer of federal funds through cooperative agreements, rather than contracts, to individual principal investigators.

The U.S. Army Corps of Engineers, Fort Worth District, is the designated point of contact for all Department of Defense installations that work with CESU. More and

more are turning to CESU for cost-effective solutions, said Kathy Mitchell, who manages the program in Fort Worth for the Regional Planning and Environmental Center.

Pohakuloa Training Area (PTA), one of the nation’s premier military training fields, is located 6,200 feet up Mauna Loa’s slopes, ideal for maintaining combat readiness. Units train at Pohakuloa to prepare for deployments to Iraq and Afghanistan since it replicates hot days and cold nights. The very remoteness of this 133,000-acre facility creates logistical challenges: securing water to supply 2,300 military personnel during four- to six-week training rotations.

Lt. Col. Christopher M. Marquez, the garrison commander at Pohakuloa, calls it “the most expensive water in the Army.”

Every single drop of water must be transported up the mountain, said Gregory R. Fleming, the deputy garrison commander.

“The cost of providing water to PTA is \$3.6 million, annually,” he said. “On average, it requires 4,000 deliveries by tanker trucks carrying 5,000 gallons of water to meet the 20 million gallons required annually. Every water need on the installation depends on these deliveries.”

The research may contribute a lot to mission sustainment. It documented for the first time two significant aquifers amid a generally porous geologic zone. One was a perched groundwater pocket, at the 6,000-foot level, just 700 feet down. It stayed stable to just shy of 1,200 feet.

“Then we drilled through the perching formation. We wanted to find out why the water was there. This is where the perching information is. What we were seeing was an ash layer, fairly rich in clay,” Thomas said.

The team also found a second aquifer, deeper down, that was huge and hot – 280 degrees F.

One reason for CESU’s growing popularity is it can match installation environmental and cultural service needs with providers from the public sector research community at a very affordable cost, Mitchell said.

“CESU is a better deal because we are using available resources of universities and non-profit organizations to carry out a public purpose that extends beyond the exclusive direct benefit of the government,” she said. “It can provide project results to a wide audience and project



Researcher Donald Thomas, right, and veteran wireline drilling supervisor Ron Fierbach examine volcanic core samples brought up by the rig at Pohakuloa Training Area. (Photo by Eric Haskins)

results or outputs add to scientific literature and knowledge base while allowing academic and other nonfederal partner institutions the ability to gain professional experience and develop skills and abilities.”

CESU is not suitable for compliance with air and water quality requirements regulated by the Environmental Protection Agency. But CESU is a good match for environmental work related to research and conservation, including compliance with National Environmental Policy Act issues such as endangered species and cultural resources, she said.

For the volcano research, the garrison can tap the 19 members of the CESU Hawaii-Pacific Islands regional hub. The hub posts work opportunities, which then can draw competition for the assignment. It takes 60 to 75 days to accomplish, start to finish, ending with a signed agreement, Mitchell said.

“This work has completely turned on its head our understanding of the groundwater hydrology of Hawaii,” Thomas said.

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(Aerial data, continued from page 38)

These partnerships require out-of-the-box thinking, perseverance to navigate the coordination and approval processes, and good communication skills. Members of the garrison’s natural resources team and the Army units involved exemplified these skills, and the Army can now better protect important forest resources because of their efforts.

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USACE Facilities Reduction Program achieves Best in Class designation

by Amy Newcomb

Outside of the General Services Administration, the U.S. Army Corps of Engineers is the first agency to deliver a usable/active acquisition vehicle to the Category Management Leadership Council for evaluation and designation of Best in Class.

On Dec. 15, the Office of Management and Budget awarded this designation to the U.S. Army Corps of Engineers and its Engineering and Support Center, Huntsville's Facility Reduction Program.

To earn the award, the Corps of Engineers and Huntsville Center had to prove the agency to be a governmentwide solution provider resource by meeting rigorous criteria under Category Management business practices.

USACE has been participating with other Department of Defense, federal agencies and the General Services Administration on the GSA Acquisition Gateway – the site where federal government buyers from all agencies act as one acquisition community.

Earning this designation included the scrutiny of the Category Management Leadership Council, chaired by the Office of Federal Procurement Policy administrator and includes representatives from several federal agencies who reviewed and evaluated everything from the Facility Reduction Program's planning processes to its performance management practices.

'When looking at who to pick, this kind of puts us on the top of the list.'

– Chris Shepherd

Acquisition vehicles must meet five major criteria with a total of 16 major and sub-category criteria earn Best in Class.

Meeting and surpassing the process to be awarded the Best in Class designation put the program in the ballpark to obtain work from any federal agency, said Chris Shepherd, program manager for the Facilities Reduction Program.



In a Feb. 27 ceremony at the U.S. Army Corps of Engineers Headquarters in Washington, D.C., Mary Ruwwe, second from left, presented a Best-in-Class certificate to (left) Jacqueline Woodson, acting director of Contracting; Lloyd Caldwell, director of Military Programs; Charles Ford, former Huntsville Engineering and Support Center programs director; and Stacey Hirata, chief of Installation Support. (Photo by Leanne Bledsoe)

“When looking at who to pick, this kind of puts us on the top of the list,” he said.

Category Management involves breaking down different areas of federal spending into categories of commonly purchased products and services to enable more efficient management of government dollars.

“This is a common theme in industry, and the federal government is now adopting the philosophy on how to better handle acquisitions from the perspective of Category Management,” said Steve Goolsby, Base Operations, Facilities Repair and Renewal and Facilities Reduction Program branch chief.

Within Category Management, the USACE program falls under Facilities and Construction, which has the largest of all spend categories at \$75.7 billion (total for fiscal year 2014). This budget covers construction-related materials and services, facility-related materials and services and facilities purchase and lease.

“I am excited that the Facilities and Construction Category was able to provide its Best-in-Class stamp of approval for the FRP (Facilities Reduction Program)

contract vehicle. In addition to meeting the standardized criteria imposed on all BIC candidates, this BIC (Best in Class) determination recognized the role the FRP contract has played in streamlining facility removal efforts within multiple federal agencies,” said Facilities and Construction (F&C) Category Manager Mary Ruwwe, who presented senior leaders at the Corps of Engineers Headquarters with a certificate at the end of February.

She noted that the General Services Administration began looking to the Corps of Engineers and its Facilities Reduction Program upon the recommendation of NASA and the Veterans Administration.

“For facility reduction, we looked for an agency that had the subject matter experts, years of experience and demonstrated success,” she said. The Corps of Engineers and the Huntsville Center demonstrated that they could provide “best value for the government, and they can't be beaten. You know that using them for this program you will be getting your money's worth.

“The F&C Category will now begin

(See Best in Class, page 41)



Corps of Engineers architect selected to AIA College of Fellows

by Candice Walters

WASHINGTON, District of Columbia – The American Institute of Architects (AIA) has named Edmond G. Gauvreau, chief, Planning Branch of the Installation Support Division, U.S. Army Corps of Engineers, to its prestigious College of Fellows.

Gauvreau is among a very few U.S. Army Corps of Engineers employees to earn this honor, which he will receive in an Investiture Ceremony at the AIA Conference on Architecture on April 28 in Orlando, Florida.

Gauvreau was one of 178 AIA members elevated to the College of Fellows this year. The Fellowship program elevates architects who have made a significant contribution to architecture and society, and who have achieved a standard of excellence in the profession. Fellowship selection recognizes the achievements of architects as individuals and for their significant contribution to architecture and society on a national level.

The elevation to fellowship is based on one or more of five nominations categories. Gauvreau was elevated in Category Four – Advanced the living standards of people through an improved environment.

As chief of the Installation Support Division's planning branch, Gauvreau

oversees strategic coordination and execution of installation-focused programs supporting the warfighter, including real property master planning, small project execution processes, Programming, Administration and System/Construction Appropriation, Programming, Control and Execution System/1391 Processor software suite, the Combat Readiness Support Team, and the Army's *Public Works Digest*.

In addition to the AIA Fellows recognition, Gauvreau also has been selected as the Society of American Military Engineers (SAME) Urbahn Medal awardee. The SAME Urbahn Medal is named in honor of Max O. Urbahn, American Institute of Architects. The medal is awarded to an SAME member for distinguished performance in the field of architecture. An Urbahn Medal nominee must be a Registered Architect who has made "Eminent and notable contributions in the field of architecture with emphasis on accomplishments in the past five years." Gauvreau will receive the Urbahn Medal at the SAME Joint Engineer Training Conference & Expo in May in Columbus, Ohio.

A registered architect in Maryland and Michigan and a member of AIA and



Edmond Gauvreau will be inducted into the American Institute of Architects College of Fellows in late April. (Photo by Candy Walters)

SAME, Gauvreau served as the Chair of the AIA's Public Architects Knowledge Community in 2015. He currently serves as Vice Chair – Communications with AIA for SAME's Architecture Practice Committee, and on AIA's Federal Government Task Force.

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(Best in Class, continued from page 40)

marketing the solution so that all federal agencies will be aware of the Best-in-Class demolition solutions available through the Huntsville USACE office," Ruwwe said.

With this "stamp of approval," the Facilities Reduction Program solution becomes a standardized practice within the GSA Acquisition Gateway Facilities and Construction Category.

Benefits of the Facilities Reduction Program saving solutions include:

- The program eliminates excess facilities and structures to reduce fixed installation costs and achieve

energy savings. In fiscal years 2004 through 2015, it removed more than 22 million square feet from real property inventories with a landfill diversion by weight of 70 percent.

- The program focuses on doing stand-alone demolition work without follow-on construction projects. This allows the program to use a specialized contractor base that can drive substantial savings on the cost of removal per square foot.
- Although the customer agency can alter Facilities Reduction Program's approach to fit its needs, typically everything under \$500,000 is awarded to the 60 percent of contractors who

are 8(a) set-asides. This has helped the program exceed its small business utilization goals every year.

- The Facilities Reduction Program heavily leverages re-used, recycled, and re-purposed materials and is currently at 72 percent, exceeding the U.S. Environmental Protection Agency's goal by 12 percent.

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Amy Newcomb was a public affairs intern with the U.S. Army Engineering and Support Center, Huntsville, Alabama. Additional material provided by Candice Walters, managing editor, the *Public Works Digest*. 



CP-18 leverages limited resources to provide opportunities

by Karen Baker

If it doesn't hurt to send someone to training, you may not be sending the person.

I can't begin to count the number of times I have heard that quote from retired Maj. Gen. Ron Johnson, former deputy commanding general of both the U.S. Army Installation Management Command and the U.S. Army Corps of Engineers, and now civilian aide to the Secretary of the Army.

Investing in our Army civilian professionals by providing them with the skills needed to do their jobs, as well as the knowledge to advance to greater leadership, is one of the most important contributions managers can make to Army readiness. Still, supporting professional development of our environmental personnel can be challenging, given both limited training funds and the impact of divesting our reduced staffs away from current operations.

Within the Army environmental community, we struggle with this balance every day. As the Chief of the Environmental Community of Practice at the U.S. Army Corps of Engineers, I sit on the Career Program 18 Planning Board, where I represent not only USACE but the 4,591 Army professionals in five series 0028 (Environmental Protection Specialist), 0029 (Environmental Protection Assistant), 0401 (Natural Resources Management and Biologic Sciences), 0819 (Environmental Engineer), and 0408 (Ecologist).

My partners in Installation Management Command and other commands work hard to identify key needs in training for our environmental professionals. Most of our discussions and initiatives associated with training fall into four categories – the need to continue integration of environmental elements into the broader garrison operations; the constant need to keep the foundational technical skills strong; the need to provide training and expertise in “soft skills” such as communication and negotiation with regulators; and the need to prepare our workforce for emerging legislative and operational challenges.

We have been following the Installation Management Command's lead in identifying key areas of reinforcement in our foundational skills. The command

recently conducted a training survey of 381 environmental professionals at its Army installations that demonstrated that training needs are significant. The U.S. Army Environmental Command partners with the Corps of Engineers and other services to offer a broad curriculum of environment courses available to the joint services. However, there remains a considerable gap in meeting the extensive need for quality, applicable environmental training.

Beyond technical environmental training, our professionals need training to reinforce “soft skills.” A few years ago, a Career Program-18 task force representing environmental specialists across our Army commands analyzed the skill sets needed for environmental professionals at the journeyman and expert level. The findings demonstrated that in addition to a basic knowledge of environmental laws and how they were implemented on Army installations, environmental staff needed training in other more nuanced communications such as negotiating with regulators, risk communication and articulating complex environmental issues in simple, actionable terms for decision-makers.

We also need to build skills to solve today's environmental issues and prepare our Army to address the readiness needs of the future, an example being more holistic systematic solutions that apply the principles of sustainability. While we have long embraced sustainability as an operating principle, those whom we rely upon daily to integrate those standards are often performing them as collateral duty. At the Corps of Engineers we are taking a hard look through our strategic plan at potentially building professional certifications and curriculum. We've begun this exploration by looking at our own in-house resources at our centers and laboratories, as well as talking to academia, where this is a growing area of study.

We believe this investment will have a long-term benefit in building Army leaders of the future. As our Chief of Engineers Lt. Gen. Todd T. Semonite has stated, “The concepts and principles of sustainability that promote collaboration, systems thinking, and creative problem-solving are attributes



Karen Baker, chief of the U.S. Army Corps of Engineers Environmental Division (U.S. Army photo)

we need to develop and cultivate in all our future USACE leaders.”

As we work together as one Army team, we need to continue to share best practices and lessons learned. Each command cannot solve all its resourcing problems in regards to training. Wherever possible, we should leverage common requirements and collective resources to develop Armywide solutions. As I sit on the Career Program-18 board, I'm looking to advocate for strategies that solve problems for multiple Army commands. If together we identify a critical need for environmental professionals in a series represented across the Army, we can better make a strategic case for very limited Career Program-18 central funds to help bridge the gap.

We are continuing looking for feedback and suggestions from those within Career Program 18 and other environmental professionals as to how we can deliver professional development that is relevant to your needs.

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Master planning helps Far East District sequence infrastructure challenges

by Catherine Donohue

The U.S. Army Corps of Engineers Far East District has a very robust military engineering and construction program on the various Army installations throughout the Korean peninsula. The District partners with the Directorate of Public Works communities to build world class facilities for servicemembers and their families using the installation-specific Master Plan as the construction roadmap.

The base master plan lays out where the development is to occur and anticipates future growth and capacity. It shows the installation's future with a location layout of the facility development and documents the optimal sequencing of the supportive infrastructure necessary for full functionality. Siting can be a challenge, and tradeoffs with mitigation are often the way to resolve real estate issues.

Challenges also may occur when a new facility and its necessary supportive infrastructure are funded through different funding sources and planned for different fiscal years. Individual components of larger projects have separate line items that compete for funding prioritization. Often the separate support infrastructure type of projects (i.e. sanitary sewer lines, flood pumps, etc.) may not fare as well in the "rubric" of funding prioritization procedures for the Army, resulting in negative effects on the optimal sequencing of projects as described in the Master Planning document.

Siting can be a challenge, and tradeoffs with mitigation are often the way to resolve real estate issues.

For Army installations, the Corps of Engineers, as the design manager, and the installation Department of Public Works, as the operations manager, share responsibility in planning and developing new facilities. Coordination throughout the scoping and planning process is essential to ensure supporting infrastructure projects and adequate utility capacity are available prior to construction work and should minimize unintended consequences.

Master plans, supportive infrastructure projects, and unintended consequences of out of sequence work were discussed

within the Far East District last summer. Due to limited real estate on an Army installation, a tradeoff was made during the master planning process to in-fill an existing rainwater detention area to locate a new housing project. As mitigation for the loss of water detention area, the master plan called for the sequenced construction of flood pumps to evacuate the interior drainage during storm events. The planned trade-off is only realistic if the flood pumps are in place prior to filling in the detention area or even built concurrent to the housing development.

In this case study, the facility was funded for design, but the pumps had not yet been built or planned (funded) through the various funding streams. The scoping document for the funded housing project did not consider the inclusion of the pumps in the housing design most likely because there was an assumption the flood pumps would be constructed as public works under a separate supportive infrastructure project. The Directorate of Public Works and the Corps of Engineers agreed that the best course of action would be to consider updating the scoping document to include the pumps as a critical feature of the housing project and request additional project funds to reduce the risk of potential flooding issues for the entire installation.

Although funding should not drive engineering decisions on projects, it is

always a consideration. The public works directorate and Corps of Engineers should jointly develop project scopes in a holistic manner, consistent with the master planning documents, during the planning charrettes and the project definition phase. It is critically important to identify the supporting infrastructure required to make the proposed facility fully functional and to verify that the infrastructure is in place and ready to perform with the added capacity before defining the scope of work of a new building. It is not prudent to assume that all separate projects will be funded in the optimal sequencing demonstrated in the

master plan.

The challenges of the Army planning and budgeting processes from a variety of funding streams that prioritize projects differently are daunting tasks. The early and continuous coordination between the Corps of Engineers and Directorate of Public Works, plus adherence to the Master Planning document at both the scoping and project definition phases, can manage the risk of one requirement of a project being funded while the other is not. While the installation defines the requirements, which should be prioritized at the enterprise level, both the Army Corps of Engineers and the Directorates of Public Works need to champion funding of necessary project features by clearly communicating the risk and impacts of not funding the supporting infrastructure.

Editor's note: In 2016, Donohue participated in a short-term developmental assignment as the Deputy Chief, Engineering Division, at the U.S. Army Corps of Engineers Far East District. She called it a professionally enriching experience in terms of technical decision making, leading a technical staff of 120 engineers and scientists working on host nation-funded projects plus Department of Defense military construction projects in Korea. She worked on this project during that developmental assignment.

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