

U.S. ARMY ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★
JOURNAL
★ ★ ★ ★ ★ ★ ★ ★ of Installation Management



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A SUSTAINABLE INSTALLATION...

- Operates as a living system
- Serves as the “land mass” and “air space” that optimizes military training while contemplating future impacts to training capability given the decisions made and actions taken today
- Provides for the readiness and well-being of Soldiers, Civilians, and Families
 - Energy efficient and environmentally sustainable facilities (built and natural)
 - Strong minds, bodies, and spirits through exemplary cultural/community services
 - Knowledge sharing, innovative, and collaborative working environment
- Adds value to and has mutually-beneficial relationships with the local community (inside and outside the fence-line)
- Is life-cycle cost-effective to operate and proactive in doing so
 - Eliminating the concept of “waste”
 - Understanding the true financial (hidden) cost of decisions and actions
- Proficiently incorporates appropriate technology and competent expertise
- Demonstrates its understanding of regenerative limits associated with natural resource use (does not use natural resources at a rate faster than nature is able to regenerate) and its responsibility to systematically eliminate its addiction to:
 - Non-renewable energy sources (fossil fuels)
 - Non-biodegradable and toxic compounds
 - Resources derived from environmentally annihilative sources/processes

From the
COMMANDING GENERAL

★ ★ ★ ★ ★ We are the Army's Home ★ ★ ★ ★ ★



SUSTAINABILITY: THE KEY TO THE FUTURE

The term sustainability came into common use around the year 2000 as installations that had once been intentionally isolated from urban populations began to see residential and commercial developments creeping across those once-isolated acres, right up to the installation fence. This surge in development introduced another word—encroachment—into the Army's vocabulary as installations found themselves in competition with their new neighbors for access to land, water, airspace and frequency spectrum to the extent that Army units on those installations were threatened with the inability to carry out their missions.

Since those days, the Department of Defense, the Army, and now IMCOM, have invested considerable intellect into addressing sustainability. Once considered mostly an environmental preservation issue, sustainability planning introduced programs such as Army Compatible Use Buffers (ACUB), which have helped shield installations from encroachment while building partnerships with communities to set aside wild lands for environmental protection. Sustainability planning has evolved to drive initiatives for green buildings, renewable energy projects, water conservation, waste reduction and range management.

In recent years, the Army has published strategies for the Environment, Energy, Water, and Green Procurement. In response to Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance, the Army published the Army Sustainability Campaign Plan

(ASCP) in 2010 to coordinate and synchronize the Army's sustainability requirements as set forth in the E.O. Elements of the ASCP are incorporated in nearly every aspect of the Installation Management Campaign Plan (IMCP).

The ASCP states, "sustainability is an organizing principle that is being instilled throughout everything the Army does, including planning, training, equipping, and operations, to ensure our Soldiers are capable of achieving any task given them, now and in the future."

For IMCOM, sustainability is even more complex than the declining availability of resources. We rely on resources such as water, land, energy and building materials to run our installations, but at the same time, our workforce is aging and we will be losing an irreplaceable amount of expertise over the next ten years. Our military communities are under stress in the wake of a decade of persistent conflict, and needs exist for better and more varied services to maintain the appropriate quality of life for Soldiers and Families. Meanwhile our monetary resources are sure to shrink, requiring even greater stewardship of the finances entrusted to us. Our challenge for the coming years is to close the gap between what is needed for the future and what we can provide now. It will not be easy.

This issue of the Journal is dedicated to Sustainability, and it focuses on three large areas: Energy and Environmental, Human Capital, and Fiscal Sustainability. We are emphasizing these three areas to point out that sustainability has come to mean much more than just environmental protection and energy conservation. However, these three areas are inextricably linked in strategic planning, as an article by the IMCOM G-5 points out.

We are honored once again to open the journal with an article from the Assistant Secretary of the Army for Installations, Energy and Environment (ASA-IE&E), that discusses net zero installations, private sector investment in installations and reducing the

need for operational energy in base camps. Following Ms. Hammack's article, we have an article from USAG Vicenza about their experience building an entirely new, LEED certified installation on the site of an old Italian airfield.

The IMCOM G-8 and Southeast Region lead the fiscal discussion, but articles from Picatinny Arsenal, Fort Jackson and Fort Drum show us the fiscal benefits of waste management—and even maple syrup! We have an article from Fort Huachuca about their water program and their quest to achieve net zero water usage. The IMCOM G-1 contributes an article on sustaining the civilian workforce through health and fitness programs, and from Fort Stewart and Joint Base Lewis-McChord we get ideas on building and sustaining a high-performing workforce. This is only a sample of the more than 25 articles that were submitted for this issue, which coincides with and will serve as a great take-away for our April Installation Management Symposium in San Antonio. Once again, we have the luxury of abundant articles—more than the printed journal will hold. We will publish the best possible cross-section of articles in the print edition and post the remaining articles to the Journal's website edition. If you're not checking the website for journal content, I recommend you start because there is a lot of great additional content there.

Thanks as always to all who volunteered to contribute their experience and insight.

A handwritten signature in black ink, appearing to read "Rick Lynch".

Lieutenant General Rick Lynch
Commanding General
U.S. Army Installation
Management Command

Assistant Chief of Staff
for Installation Management
"Defender 6"



U.S. ARMY **JOURNAL** of Installation Management

Spring 2011

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The icons below represent three pillars of sustainability on which we focus our concentration. Each article in this edition is marked with one, two, or all three of these to tell the reader at a glance which pillar or pillars are represented in the article text. These designations are somewhat subjective, so other perspectives may also be valid. Comments are welcome by email or discussion on the website.



Environmental & Energy Sustainability



Fiscal Sustainability



Human Capital Sustainability

JOURNAL OF INSTALLATION MANAGEMENT

★ ★ ★ CONTRIBUTORS' GUIDE ★ ★ ★

Topics and Contributors

The U.S. Army Journal of Installation Management is the Army's print forum for ideas, experiences, case studies and opinions relating to the many disciplines that pertain to the broad area of installation management. Each edition will feature articles from a select group of garrison leaders and other contributors discussing topics relating to the issue's designated theme, which will ordinarily stem from some part of the Installation Management Campaign Plan (IMCP). The IMCP is available at the IMCOM Web site, <http://www.imcom.army.mil/hq/>.

Articles will be evaluated for consistency with commander's intent and for topical fit within the theme. All submissions are carefully reviewed and may be shared with a subject matter expert to provide a second opinion as to accuracy and relevance. Where appropriate to maintain consistent focus and high editorial quality, authors may be asked to clarify or expand on some aspect of their papers.

All articles should be titled and designate the name of the author(s) of record, along with a short bio of approximately 50-60 words.

Length

Articles should be of adequate length to engage a reader in a substantial exploration of the topic. A good average length is about 2,000-3,000 words, although longer articles are acceptable. Articles lacking in depth or substance will be returned to the writer with suggestions for bringing the work up to standard. If the standard is not achieved, the article will be excluded.

Manuscript Style

Writing should be clear and concise, ideas should be the author's own, and cited material must be properly accredited. We are looking for a scholarly or expository text—not a Command Information news story.

Standard article structure normally proceeds from a thesis statement, to three main points of discussion, followed by conclusion, recommendations, and summary. Proposal outlines or abstracts are not required, but will be considered and feedback provided if writers want to test an article idea.

The Journal does not require adherence to a particular academic style, but rules of good writing always apply. A good and widely available reference book is *The Elements of Style*, by Strunk and White. For articles with several citations, an academic style such as the American Psychiatric Association (APA) Style or the Chicago Style can be helpful in managing references. Word processing programs have made these citation protocols much more user friendly than in the past.

The following stylistic guidance is offered to answer the most frequently asked questions:

- Military ranks are denoted in the military style, i.e. LTC, MG, SGT, etc.
- Names of people and organizations are spelled out on first reference with the acronym, if any, in parentheses following. Thereafter, people are normally referred to by last name only—organizations by acronym.
- IMCOM style calls for capitalizing Soldier, Civilian and Family, listed in that order.
- Senior Commander and Region Director are capitalized, garrison commander is not.

Although most of the audience is senior installation management professionals, vocabulary should be accessible to a general college-level audience, with technical or function-specific language used only as necessary and explained to the extent practical. The editorial staff will edit all manuscripts for general rules of good grammar and style. Substantive changes will be referred to the author for clarification. Editors will also consider security and appropriateness when editing manuscripts.

Writers should include a short biography that mentions current duty assignment, education, and any credentials or experiences that establish the writer's topical authority. Also include contact information that allows editorial staff to reach you. We will not publish contact information.

Accompanying Material

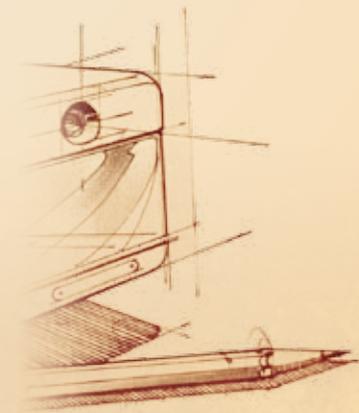
Photographs, charts, and other supporting visuals are encouraged, but will often have to be modified or recreated by the designers for reproduction quality. Photos must be print quality—normally 300 DPI or higher. Do not embed visuals into the text of an article—instead, submit them separately, with identifying information and relevance to the article.

Clearance

All articles and supporting visuals must have any required clearance for operational security. Editors will also screen for public releasability.

Engage the Audience

Authors wishing to invite discussion from community members are welcome to reference their articles in posts to IMCOM Garrison Commanders' Net, an Army Professional Forum established for members of the IM Community. Just log in to www.garrisoncommand.com and register with your CAC or AKO account if you're not already a member. Garrison Commanders' Net is not affiliated with the Journal.





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EDITOR'S NOTE:

In this and future copies of the Journal, you will see these codes from time to time and place to place. Known as Quick Response Codes (or QR Codes), they are similar to the familiar barcodes and they contain information. You can read the code with a smart phone that has a QR Code reader installed on it. There are a multitude of code readers available from the Apple App Store or your phone's equivalent, and they range in cost from nothing to a few dollars. The code here will take you to the Installation Management Community Facebook page, which you need to see if you haven't yet. There is another one in this issue that will take you to more sustainability resources. We hope you enjoy this new technology.



Energy and Sustainability Priorities and Opportunities

by *Hon. Katherine Hammack, Assistant Secretary of the Army, IE&E*

Albert Einstein said, “The world will not evolve past its current state of crisis by using the same thinking that created the situation.”

As an Installation Management Community, we are at a turning point. We are faced with limited natural resources, yet we require access to those resources in order to meet the Army’s mission. Securing and sustaining our energy and water sources is operationally necessary and financially prudent.

As a means of continuing our effort to seek ways to improve efficiency and reduce overhead expenditures as good stewards of our nation’s valuable resources, Lt. Gen. Rick Lynch and I have placed energy and sustainability issues among the top priorities for installations.

We’re working on several initiatives that will help us continue to support the mission and our most precious assets, our Soldiers, Civilians, and Families.

Securing energy is critical for our installations, our operations and our mission. It is operationally necessary and financially prudent. For all of us, energy security is also a responsibility that requires personal commitment and accountability.

Today, as part of the Installation Management Community, we are focused on three Army energy goals. These goals will help us make great

strides and allow us to obtain secure energy well into the future. They are net zero installations, leveraging opportunities for private sector investments and reducing operational energy in base camps.

NET ZERO

The Army’s net zero installation strategy is important to our nation and national security.

Net zero is more than just achieving greater efficiencies and reducing energy consumption. Net zero is about building on our existing programs and accomplishments, going beyond the call to simply promote sustainability through a series of isolated projects, to integrating all of these existing efforts towards one end goal: achieving installations that are self-sustaining.

A net zero installation applies an integrated approach to the management of energy, water, and waste to capture and commercialize the resource value and/or enhance the ecological productivity of land, water, and air. A net zero installation has three interrelated components: net zero energy, net zero water, and net zero waste.

A net zero energy installation produces as much energy on site as it uses over the course of a year. To achieve this, the installation starts with aggressive conservation and efficiency efforts

while benchmarking energy consumption to identify further opportunities.

The next step is to utilize waste energy—that is, to “repurpose” energy. Boiler stack exhaust, building exhausts or other thermal energy streams can all be utilized for a secondary purpose. Co-generation recovers heat from the electricity generation process. The balance of energy needs then are reduced and can be met by renewable energy projects.

Similarly, a net zero water installation limits the consumption of freshwater





The pilot installations will be showcasing their efforts, strategies and practices and providing lessons learned as they strive to achieve net zero.

resources and returns water back to the same watershed so not to deplete the groundwater and surface water resources of that region in quantity or quality over the course of a year. To achieve a net zero water installation, efforts begin with conservation, followed by efficiency in use and improved integrity of distribution systems. Water is repurposed by capturing and reusing water generated from sources such as showers, sinks, laundries or cooling towers (grey water) and by capturing precipitation and storm water runoff for on-site use (purple pipe). Wastewater can be treated and recharged into groundwater aquifers. Several Army installations are already well down the path to reaching net zero water goals.

A net zero waste installation reduces, reuses, and recovers waste streams, converting them to resource values with zero landfill over the course of a year. Every day, more recycling strategies are developed, moving beyond metals, paper and cardboard to include mattresses, glass, plastics, batteries, computer printers and motor oil. The best strategy is to consider the waste stream when purchasing items, reduce the volume of packaging, reuse as much as possible and recycle the rest. A true cradle-to-cradle strategy considers the end state at the time the purchase decision is made. A net zero waste strategy eliminates the need for landfills, protects human health, optimizes use of limited resources and keeps the environment clean.

We have identified installations that have committed to be net zero by 2020. They include five net zero energy installations, five net zero waste installations, five net zero water installations and one installation to be all three.

Net zero energy installations were identified based on energy security needs, the installation's leadership support, energy costs as an indicator for renewable and alternative energy economic viability, project development capabilities of the installation, renewable energy resource availability and the local policy environment.

Net zero water installations were identified based on the command's willingness and commitment to participate, the level of water supply constraints and vulnerabilities, water efficiency project capabilities and progress made in reduction goals, access to alternative water sources, water and wastewater costs as an indicator for economic viability, the local policy environment that may restrict the use of alternative water sources and the impact of utility privatization.

Net zero waste installations were also identified based on the command's willingness and commitment to participate, as well as recycling program availability in the community, waste diversion programs in the community, ability to deploy waste-to-energy, availability of community solid municipal waste to supplement a waste-to-energy plant, existence of an installation pollution prevention and waste minimiza-



tion program team and the potential for impact. Larger reduction is better.

The pilot installations will be showcasing their efforts, strategies and practices and providing lessons learned as they strive to achieve net zero. Achieving net zero will require significant commitment from installation personnel to appropriately plan for, implement



I encourage all installations to continue working toward net zero goals and communicate good news stories, since there are many benefits. In 2014, we will be expanding the program focus to include 25 installations in each category with a target net zero date of 2030.

and report on net zero progress. While selection does not guarantee that additional funding will be available for achieving these goals, the intent is to leverage available resources and expertise, as well as providing training and technical support throughout the pilot process.

I encourage all installations to continue working toward net zero goals and communicate good news stories, since there are many benefits. In 2014, we will be expanding the program focus to include 25 installations in each category with a target net zero date of 2030.

A key element of the Army's Sustainability Campaign Plan is to reduce the natural resource demands of our installations. Better management will ultimately reduce the Army's operating costs and maintain mission performance capability and quality of life, while continuing to enhance relationships with local communities. By fully integrating sustainability into Army operations at the installation level, we will preserve our flexibility to operate in a constrained economic future and with limited natural resources.

When the Army changes the way it does business, there is an enormous shift in throw-weight that accompanies that change. For the Army, installations alone make up over 954 million square feet of space within the U.S. and abroad. It is for this reason that Thomas Friedman, New York

Times columnist and Nobel Laureate said "When the U.S. Army desegregated, the country really desegregated; when the Army goes green, the country could really go green."

As I have travelled to installations and met leadership, I have come to believe that the Army is ready to engage in a challenge. We can help to lead the nation through appropriate resource management. To that end, we have implemented the Army's net zero installation strategy to manage natural resources.

LEVERAGING OPPORTUNITIES FOR PRIVATE SECTOR INVESTMENT

Our second goal is to work closely with the private sector to increase private sector investment in Army installations to increase our savings. The Army is evaluating our processes and support level provided to garrisons. We hear from many of our energy managers that this is an area where they need support, training and guidance. We are working diligently on a strategy to address those challenges.

Through contractual agreements formed between the Army and a private sector entity, the private party provides a service or project to the Army and assumes substantial financial, technical and operational risk in the project. Capital investment is made by the private sector on the strength of a contract with the Army to provide agreed services.

Since energy projects cost money, Congress authorized federal agencies to use private sector financing in the Energy Policy Act of 1992 (EPAAct) to implement energy savings opportunities.

Four major authorized sources of financing are: Energy Savings Performance Contracts, Utility Energy Savings Contracts, Enhanced Use Leasing and Power Purchase Agreements.

Energy Savings Performance Contracts (ESPC)

One authorized source of financing is provided by Energy Service Companies (ESCOs) through ESPCs.

Private sector ESCO contracts allow installations to improve their infrastructure and implement energy projects while paying for the measures with the anticipated savings being generated by the project over time (10-25 years). An ESCO performs services that include: evaluation, design, financing, acquisition, installation and maintenance of energy efficient equipment; altered operation and maintenance improvements; or technical services for the Army. The ESCO receives compensation based on the verified energy savings generated.

Perhaps more importantly, ESPCs give Army facility managers a solution to facility problems with minimal up-front cost. Applied with care and consideration, ESPCs can help facility managers:



The program to date has helped private development execute projects of tremendous range such as General Motors Hot Weather Test Track in Yuma, AZ, projects of scope such as our award winning Central Utilities Plant in Frederick, MD, or traditional use...

- reduce equipment breakdowns and emergency repair requests,
- provide better, more productive living and working conditions for people,
- reduce costs,
- meet environmental mandates,
- save energy and meet management goals.

The EAct of 2005 reauthorizes ESPCs through Sept. 30, 2016. The Energy Independence and Security Act of 2007 (EISA) permanently reauthorized ESPC for Federal agencies and eliminated Congressional notification requirements.

Utility Energy Savings Contracts (UESCs)

UESCs are similar to ESPC's. The most notable difference is that the projects are financed and implemented through utility companies. UESC's are contracts that allow utilities to provide the Army with comprehensive energy and water efficiency improvements and demand reduction services. The utility provides comprehensive assessment of cost effective energy efficiency, renewable energy or water efficiency opportunities to the Army for our evaluation.

The utility also provides the capital costs of the assessment, design, construction, performance testing, and other optional services like Operation and Maintenance (O&M), Commissioning, and Measurement and Verification (M&V). The Army agrees to pay for the costs of services and equipment replacement from generated savings.

Enhanced Use Leasing (EUL)

EUL is part of a legislative authorization for the Army to lease underutilized real property. Started in 2001, the Army Enhanced Use Lease program has progressed from an ambitious concept to a successful reality. The EUL Program engages through a competitive process, private sector entities to acquire and leverage value from underutilized non-excess real estate assets on Army Installations. Mirroring a private sector transaction, the EUL's value proposition is competitive on cost and speed of execution.

The law requires the lessee to pay in-kind consideration in an amount that is not less than the fair market value of the lease interest. However, the categories of in-kind consideration that may be accepted include construction of new facilities, restoration (including environmental), acquisition, alteration and other services. Further, the Service Secretary may now accept in-kind consideration for any property or facility under the control of that Service, rather than just at the installation where the property was leased.

The program to date has helped private development execute projects of tremendous range such as General Motors Hot Weather Test Track in Yuma, AZ, projects of scope such as our award winning Central Utilities Plant in Frederick, MD, or traditional use such as our office and residential

projects throughout the U.S.

The EUL program can meet the needs of private developers with a value proposition on par with or better than that of the private sector.

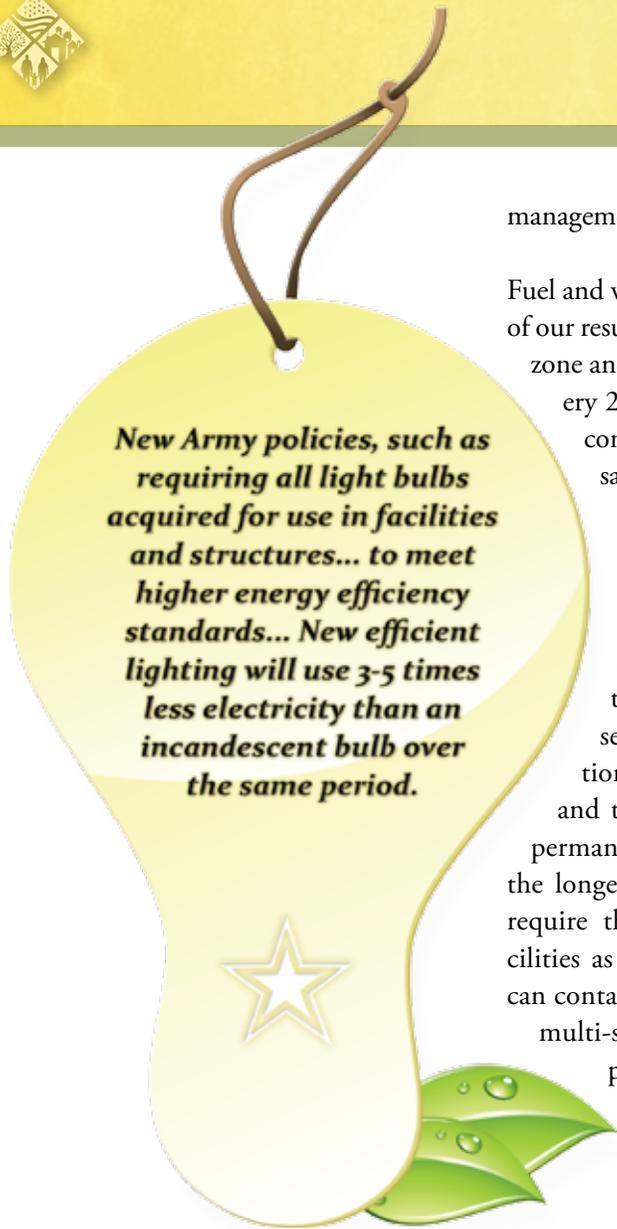
Power Purchase Agreements (PPAs)

PPAs cover up-front equipment and installation costs for renewable energy systems while the customer pays only a monthly amount.

PPAs involve a third party who pays for and owns the system. With a PPA, the installation purchases the kilowatt hours used monthly at a pre-set rate that may or may not incrementally increase over the term of the agreement.

PPAs make operational power costs predictable. The advantage to investors is that they have the long-term security of a system that will produce revenue from electricity generated for more than 20 years, while the Army gets affordable electricity, typically below the retail electricity rate, for the life of the contract.

Among the barriers to PPAs is that they are relatively complex, incorporating legal obligations, procedures and technical requirements that are well beyond the ability of the average facility manager to understand, requiring a consulting engineer and legal counsel. An alternative is hiring a solar



New Army policies, such as requiring all light bulbs acquired for use in facilities and structures... to meet higher energy efficiency standards... New efficient lighting will use 3-5 times less electricity than an incandescent bulb over the same period.

integrator, a company that can handle financing details and system installation from design to commissioning. PPAs also mean that the developer can receive tax deductions, cash incentives, utility rebates and, some, but not all of the renewable energy credits. PPAs have their pluses and minuses, but when money is not available for a capital investment in solar power, they can turn visions of cleaner power into reality.

BASE CAMP OPERATIONAL ENERGY

Our third major goal is to reduce our operational energy in base camps through increased efficiency, demand

management and diversifying supply.

Fuel and water make up 70-80 percent of our resupply weight into the combat zone and there is one casualty for every 24 convoys. So our efforts on contingency bases will not only save money but will save lives.

Contingency bases are evolving locations that support military operations by deployed units and provide the necessary support and services for sustained operations. They support tenants and their equipment. While not permanent bases or installations, the longer they exist, the more they require the same functions and facilities as permanent locations. They can contain one or more units and be multi-service. They have a defined perimeter and established access controls, which take advantage of natural and manmade features.

Contingency bases include the full spectrum of humanitarian, peace-keeping, theater engagement and combat actions and all their potential mission requirements. They can be established and operated in any region of the world. They can be small (company size or less), medium (battalion +/-) or large (brigade combat team or larger) bases and may be established and occupied for a short duration.

Experience in Iraq and Afghanistan has shown that the period of occupancy can extend for several years. The demands for facilities, security, energy, logistics services, contracting, environmental management and other re-

quirements are the same as traditional bases. However, the supporting infrastructure, personnel, and operational controls are much different for contingency bases than traditional installations and can be significantly different for sites that are only occupied for a few weeks or months.

Everything that we learn and implement in our permanent installations with regard to net zero operations can be leveraged into contingency basing strategy to reduce the consumption of fuel and water through better efficiency, recovery and reuse, local production and lighter weights. Efforts employed in shelters, energy generation and distribution, waste water and solid waste processing all contribute to reduced operational energy.

CONCLUSION

New Army policies, such as requiring all light bulbs acquired for use in facilities and structures owned, leased or controlled by the Army to meet higher energy efficiency standards, reinforce our efficiency goals. The goal is a complete replacement of all inefficient incandescent lighting on Army installations within five years. New efficient lighting will use 3-5 times less electricity than an incandescent bulb over the same period.

I have also signed policy that establishes a new comprehensive process that makes energy and sustainability considerations a fundamental part of every component of a new facility design and building renovation. This strengthens construction practices and encourages incorporation of new and innovative approaches. The policy specifies sustainable design and development principles, following guidance as detailed



in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 189.1.

Through strategies such as strategic siting, cool roofs (in appropriate climate zones only), solar water heating, storm water management and water efficiency, the Army will reduce its impact on the environment.

Our commitment to sustainable design and development extends beyond construction or renovation savings. While the benefits will vary based on location, preliminary analysis by the U.S. Army Corps of Engineers indicates the energy savings over a standard building will be 45 percent or greater.

The Army's "Building Energy Efficiency" Tax-Deduction Policy dated Dec. 17, 2010, will assist Army contractors in validating and obtaining tax deductions for the costs of installing certain energy-efficient systems in Army buildings. The Army can assign a tax deduction of up to \$1.80 per square foot, for energy efficient design and construction in new construction or remodeling. Tax Deduction 179D can be leveraged to reduce the cost of LEED certification or other design fees associated with increased efficiency.

The Army is committed to assigning the deduction to qualified contractors who are supporting the Army's energy-efficiency goals and seek to derive greatest value from building energy efficiencies developed and implemented by its contractors.

Through the efforts of our installations the Army is already boasting significant progress that will lead

to clean, secure energy.

Through hard work and a deliberate approach to readiness, the Installation Management Community has put in place many practices to help launch us into energy security and sustainability projects in a meaningful and measurable way.

Through a net zero approach, we can secure our future energy.

We can increase utilization of private sector investment to save the Army money and engage the expertise of the private sector.

We can take the lessons learned and transfer them to our warriors who are fighting in Afghanistan. Deploying new solutions to increased efficiency, demand management, and diversifying supply will be critical to the mission.

I am committed to an Army where we have secure energy and water sources that will help us complete our mission and be a better fighting force. I am committed, my team is committed and we need your continued commitment to leadership to make this happen.

I look forward to meeting and talking with you at the Installation Management Symposium in San Antonio later this month and announcing the installations that are stepping up to the net zero challenge.

Thank you for what you do on Army installations. Army Strong.



Ms. Katherine Hammack is the Assistant Secretary of the Army for Installations, Energy and Environment, serving as the primary advisor to the Secretary and Chief of Staff of the Army on all matters related to Installation policy, oversight and coordination of energy security and management. Ms. Hammack has more than 30 years experience in energy and sustainability advisory services. She holds a Bachelors Degree in Mechanical Engineering from Oregon State University and an M.B.A. from the University of Hartford. Ms. Hammack is a founding member of the U.S. Green Building Council in Washington, D.C.



USAG Vicenza Manages Present and Future Costs in Building Italy's Newest U.S. Army Installation

by **Anna Ciccotti**, Transformation Construction Management Office, USAG Vicenza

The U.S. Army Garrison (USAG) Vicenza, Italy, is two years into one of the largest and most sustainable military construction (MILCON) projects ever undertaken on the European continent. When the project is complete in 2012, U.S. Army Africa (USARAF) headquarters and the 173rd Airborne Brigade Combat Team (ABCT) will occupy a new home on 151 reborn acres of Dal Molin, former site of an old Italian air base. The project is nearly 40 percent complete now and is progressing rapidly.

The \$400 million dollar program is the largest MILCON project ever built in Italy, and one of the largest in Europe. Once completed in 2012, it will also be the first Department of Defense (DoD) installation to obtain Leadership in Energy and Environmental Design (LEED) Silver certification, with potential to achieve LEED Gold, for an entire On-Campus project. While demonstrating leadership in sustainable design, the project is on track to be delivered within scope, on time and, most importantly, within budget.

The Army Installation Management Command-Europe (IMCOM-E), ultimately responsible for the management and use of natural and cultural resources, as well as lands under their administrative control, is coordinating a team effort that involves several organizations, including USARAF, U.S. Army Europe (USAREUR), and the U.S.

The \$400 million dollar program is the largest MILCON project ever built in Italy, and one of the largest in Europe.

Navy Facilities Engineering Command (NAVFAC) along with multiple Italian military and civilian agencies.

The Design/Build MILCON contract for the multiple-facilities complex was awarded March 28, 2008, supporting the LEED initiatives as project in-scope. In coordination with NAVFAC, the construction agent for U.S. Army projects in Italy, it was decided to adopt a fast track approach with a contract time of about four years from design to occupancy. Such an aggressive timeline was required to meet the deadlines directed by the Army's transformation program to consolidate four battalions of the 173rd ABCT currently based in Germany with the Brigade headquarters at Dal Molin by 2012.

In an effort to demonstrate how a sustainable development plan has been integral to the success of the Dal Molin project to date, the purpose of this article is to:

1. Explain how properly clearing a construction site of unexploded ordnance, underground storage tanks and archeological artifacts

reduces overall project costs and construction time.

2. Show how implementing sustainability principles can turn an old air field into one of the Army's most environmentally friendly installations.
3. Highlight how integrating sustainability themes from the Installation Management Campaign Plan (IMCP) helps foster ties with the local communities and reduces political opposition.

From the Dal Molin project's initial planning to the final approval, sustainability has been a key driver for long-term strategic thinking and has helped overcome a wide array of potential obstacles that could have slowed down the overall program. Given the magnitude of the scope of work and its compressed schedule, systematically preventing any type of construction delay has been of paramount importance and has set the paradigm for the best possible approach.

From a sustainability perspective, this implies identifying and managing current issues with a long-range vision. It also means adopting an integrated ethic that enables a step-up from a compliance-based approach to a more performance-based model.

From a strictly environmental perspective, there were many potential concerns



Dal Molin Construction: The \$289 million Design/Build contract for Dal Molin was awarded March 28, 2008 to a joint venture of the Italian firms, CMC and CCC with bid savings of \$33.5 million. Twenty-six facilities are under construction and five already covered to the roof: recreation/BOSS, brigade headquarters, both parking garages and two company commands. With the consolidation of the 173rdABCT in Vicenza in 2012, Vicenza will be the second largest American community in continental Europe.

coming from the consignment of a project site vacated by the Italian air force in 2008 after over 70 years of operations to the U.S. Army for the purpose of enlarging their military footprint in Vicenza. USAG Vicenza embarked on the Dal Molin redevelopment effort in line with its mission to provide standardized, effective and efficient services, facilities and infrastructure to Soldiers, their Families and Civilian employees commensurate with the quality of their service.

Part of that mission involves balancing sound environmental practices that demonstrate compliance with all host nation and U.S. requirements with a commitment to be exceptional stewards of Italian lands. The project's teams have proven themselves able to rise to the challenges inherited and make them opportunities for advancement and innovation.

If preparing and clearing a site for construction demands a great deal of resources and coordination under any circumstances, clearing Dal Molin

meant coping with an extraordinary combination of exceptional challenges in a complex, fragile environment. Located in a densely populated urban area within a renowned historical context and protected habitat, and zoned as a military industrial site, Dal Molin posed most of the environmental issues that program managers hope to avoid in the execution of MILCON project. In fact, preparing the site for construction required an extraordinary amount of innovative thinking from all stakeholders, who had to come up with the best solutions to properly manage a clean-up plan first, and then an adequate redevelopment plan of action.

Understanding the "chain-effect" of delays and their associated time and cost consequences, the teams' effort demanded an aggressive strategy to identify an approach with the greatest benefits and lowest cost. This was an absolute condition for a seamless construction phase.

In theory, a site development plan should be performed prior to turning

the area over to a general contractor for its building purposes. In reality, due to initial delays in the transfer of Dal Molin, preparation activities such as demolition of old facilities had to be done concurrently with the design phase and the construction work.

In the spirit of removing any potential project-adverse factors from the site, the initial site development program included clearance of World War II-era ordnance - the legacy of intense aerial bombing on the Vicenza airport in 1944. Technically, it would not be strictly required by the Italian laws to carry out a UXO removal plan and clear the footprint of each building and/or its utility lines prior to any activity. However, a preliminary study produced physical evidence of buried munitions on site. Balancing safety risks and potential work stoppages due to detection of subsurface ordnance, it was highly recommended to proceed with an extensive clearance of the entire site beforehand. This approach proved to be successful for two important reasons.



Construction Debris: The contractor has crushed, stockpiled, and recycled the concrete from demolished buildings on-site. This material will be used in the construction of the new project. Material reuse cuts down on landfill waste, reduces the demand for virgin materials, and reduces the project costs. Photo courtesy of the U.S. Army Garrison, Vicenza

First, it added to the safety of the work site, the safety of the future tenants and that of the surrounding community. In fact this investment is paying dividends in environmental stewardship, as it has helped increase public awareness and continued to foster host nation support.

Secondly, as the clearance campaign resulted in the detection and safe disposal of 46 explosive items, ranging from 2-inch bullets to 500-pound bombs, its well-timed execution prior to construction helped avoid costly delays to the contractor and, most importantly, kept the project moving forward.

The same pervasive strategy was chosen for another important phase of site redevelopment, i.e. the removal and disposal of old underground storage tanks (UST) previously used by the Italian military for gasoline and other combustibles.

As underground storage tanks pose significant environmental hazards, with threats to soil, surface water and groundwater, a thorough investigation was performed to identify, contain and mitigate any hazard. A plan for prioritizing removal and remediation activities in parallel with other on-site activities was developed and executed.

A total of 65 USTs, ranging in size from 10,000 to 55,000 liters, were safely removed and disposed of in compliance with Italian requirements. Individual storage tank removals, including soil excavation, sampling and analysis, and closure reporting, were completed within the required 30-day timeframe. A remediation plan followed for several UST locations and included remediation designs, soil removal and disposal. Groundwater extraction and treatment systems have been imple-

mented at two additional locations to improve groundwater quality.

An additional prerequisite to beginning any construction in Italy involves the archeological clearance. To obtain the final authorization and allow unimpeded construction, and in compliance with current host nation's requirements, the Army hired a team of highly qualified archeological consultants to work the procedure under the scientific guidance of the Sovrintendenza dei Beni Archeologici, the Italian regional office for Archeological Heritage. The SBA has the final authority on releasing a site for construction and the clearance is obtained only after it has been properly investigated and documented.

The methodology of excavation and the time required to obtain the clearance are dependent on the findings.



Archeological Investigation at Bldg 18: While construction continues to move ahead, accredited project archeologists complete their Neolithic investigation of the footprint of one of the future vehicle maintenance facilities. Construction of this building is planned to start immediately after archeological clearance. Archeological assessments are integral and mandatory pre-construction activities on constructions projects throughout Italy.

Knowing the area to be ‘eligible’ for thorough investigations and significant discoveries, all stakeholders agreed to an accelerated approach based on a phased clearance process instead of the traditional and prolonged final approval obtained at the completion of all surveys at the entire site.

To this end, the entire project site was split into many small archeological sites to be investigated and cleared individually. To date, 90 per cent of the project site is clear, with anticipated clearance of the last area in April 2011. Thousands of artifacts are being discovered from various historical periods, including Modern Age (Eighteenth century) Roman-era and Neolithic Period (approximately 7,000 B.C.).

Arch of Roman Aqueduct: Previously known and unknown Roman archeological resources have been encountered during the preliminary archeology investigation of the site. Shown are the remains of an arch of the Roman aqueduct that intersects the installation fence line. The structures of the aqueduct, part of the Vicenza monumental heritage, have been properly recorded and then reburied to preserve their integrity for future generations.

The Neolithic findings from Dal Molin are considered among the most important for this period ever discovered in Italy. Collected artifacts include fragments of polished stone tools, pottery pieces and a series of postholes. Although the wooden posts have long since rotted away, the holes suggest the position of a number of circular hut-like structures likely inhabited by prehistoric humans.

Investigation is still ongoing and slated to be completed in a few months so that construction can move on accordingly. The historical significance of the Dal Molin archeology and success stories in the project coordination, implementation and artifact recovery will result in a research publication by the SBA.

Archeological sites such as those at Dal Molin are rare and offer extraor-





4th of July celebrations at Caserma Ederle, Viceza: To help foster partnering and engagement with the local community, USAG Vicenza is managing an active, year-long calendar of community relations activities. These include school exchange programs, combined sports, mayors' days, base tours, cultural and outdoor recreation events that outreach to the citizens of Vicenza as well to those of the nearby municipalities.

inary challenges and opportunities. The USAG Vicenza's team consisted of experts in the field of archeology and construction who negotiated with the Italian authorities on a process that was not the norm. The successful management and unique approval that USAG Vicenza received from SBA to process the sites in segments, while continuing the MILCON project, is indicative of the strong working relationship and trust built over the years. The salient lessons learned and successes are well documented and can be used as a roadmap by any military installation Europe-wide.

When complete, Dal Molin will be one of the most modern Army installations worldwide and the first to achieve, at a minimum, a LEED Silver Certification under the rating System for New Construction for On-Campus Building projects. Dialogue is ongoing to get the Green Building Council Italia certification.

As the internationally accepted benchmark for the design, construction, op-

erations and maintenance of high performance green buildings, the LEED certification of a Campus Project offers even greater opportunities to reduce the impact of the buildings, sites and infrastructures. In a Campus Project, each building must meet the LEED requirements to be certified; the same prerequisites are also mandated for shared utilities, amenities, site landscape, efficiencies and infrastructure. The certification of the entire campus demonstrates sustainability at a higher level by enhancing the ease of future operation and maintenance. This economy of scale ensures a sustainable approach to the entire Dal Molin multi-facility complex.

Sustainable design principles were utilized to develop a coherent strategy for the site that uses less energy and water, provides a better user environment, reduces operating costs, and creates less waste in construction and operation. The Dal Molin Campus Project achieves a multitude of sustainable objectives while reducing impact on the environment.

The overall strategy was to approach the design of the new facility as one large urban complex, comparable to a pedestrian-friendly campus. The complex features 34 buildings master planned into command, residential and operational areas. The design has maximized open space, minimized the building footprints and preserves more than 1.8 million sq ft of open green space, which is more than twice the building footprint. Additionally, building design includes environmentally preferable purchasing, through the use of regionally harvested, extracted and manufactured materials.

Within the installation, two parking garages are strategically located in a central position to drastically reduce reliance on automobile use and foster an interactive and walkable community. A shuttle service to and from the facility will also reduce personal automobile use.

Water use will be reduced almost 36 percent compared to conventional construction techniques by installing low-



flow water fixtures and high efficiency drip irrigation systems, which will save 4.3 million gallons of water annually.

A Central Energy Plant will provide energy for the buildings and will optimize the use of fossil fuels to generate electricity and heat. The design of the energy systems is estimated to reduce total energy use and save more than 42 per cent of the annual costs.

The project will have Zero CFC use, which is a refrigerant known to contribute to ozone depletion and global warming.

Every building will have locations to recycle solid waste and reduce the impact on community landfills. In addition, the construction contractor is on track to divert 95 per cent of construction waste from the landfills, including the debris generated removing the runway and old Italian air force buildings. An on-site batch plant maximizes the recycling process, reduces transportation costs and traffic pollution while ensuring continuity of supply.

From a Strategic Communication point of view, the sustainability of Dal Molin has been fundamental to the success of the entire program. The project site area was transferred from the Italian military to the U.S. Army after a long process involving political discussion at the national level and amid rising complaints and protests from the local population. Vicenza is a city full of history and culture and a UNESCO World Heritage site. Initially, the decision to build a new U.S. military base was not well received by local residents.

Keenly aware of the impact of such a

construction program, the Army adopted the most stringent sustainability policies to master plan an installation that would blend harmoniously into the existing urban environment. This was a first tangible effort made to address the concerns of the local community.

The project commenced after the Italian government appointed a dedicated commissioner to oversee development of the base at Dal Molin, and the final site location was identified. The sustainable aspect of the reuse of an existing military installation was fundamentally important to make the difference in public opinion and helped gain support. In fact, the redevelopment of Dal Molin was perceived as a fairly acceptable solution reached to meet the requirements of the Army's mission in Italy, as it provided an alternate option to developing on a greenfield site. It also offered solid existing infrastructure economically viable for redevelopment. Reuse and sustainable design were key factors in the approval procedure. In 2009, the final authorization to build Dal Molin issued by the Italian Ministry of Defense was the result of intermediate endorsements from the host nation's local and national agencies, both military and civilian, entitled to evaluate the impact of the new installation on the existing urban setting.

Highlighting the environmental, economic, and community-related benefits of this redevelopment is a wide-ranging effort that currently engages several organizations. The project stands as a clear demonstration to the Italian people and citizens of Vicenza of the importance that the U.S. Army places on the stewardship of Italian lands. The coordination

efforts required to execute this program helped leverage new and cross-level partnerships between Italian and the American stakeholders, ranging from public institutions to private businesses at the local, regional and national levels.

Today, Dal Molin is a vibrant site that shows how shared interests foster deep ties between the two nations. Its sustainability has set a standard for an institutionalized, innovative approach that reaches out to our Italian military and civilian partners and can be a catalyst for similar results elsewhere.

Building a new installation overseas is more than pouring concrete and steel to meet our Army's mission. It is also about the ability of building capacity and fostering relationships with our host nation, maintaining the trust that allows the U.S. Army to operate in a supportive and permissive environment. This way, USAG Vicenza remains an enduring Army community and charts the way for a sustainable future.



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Picatinny Arsenal, Using Public Investment to Improve Infrastructure and Reap Millions in Energy Savings

by *Nicholas Stecky*, Resource Efficiency Manager, & *Eric Kowal*, Public Affairs Specialist, USAG Picatinny Arsenal



Figure 1: Former Sergeant Major of the Army Kenneth O. Preston looks out from behind a Picatinny designed Objective Gunner Protection Kit. U.S. Army Photo by Eric Kowal

Home of American Firepower

Situated on a 6,500-acre military installation in the northwest corner of New Jersey, Picatinny Arsenal plays a unique role in the United States' ability to wage war. Dating back to the Revolutionary War period, there is no other comprehensive armaments facility like it in the country; it is a one-of-a-kind facility that provides virtually all of the lethal mechanisms used in Army weapon systems and those of

the other military services. Picatinny is a joint service armament research and development center.

Picatinny Arsenal's mission is to support Army transformation goals. In an effort to streamline the acquisition process and deliver the armaments Soldiers need when they need them--and at an affordable price--Picatinny Arsenal has established increasingly close partnerships with universities and industry partners, involving them

in collaborative efforts early in the research and development process.

Picatinny Arsenal uses unique laboratories and special facilities to evaluate prototype designs, thus reducing development cycle time. These facilities are also available to Picatinny Arsenal's contractors and other government agencies that are part of the national energy consortium established by Picatinny and the Army Research Laboratory.



...the 70-year-old heating plant was designed and operated as a cogeneration plant, producing electricity and steam, to serve the large energy demands related to munitions production that existed through the 1940's to 1960's.

Picatinny Energy

Twelve years ago, Picatinny Arsenal recognized the need to reduce costs, save energy and maintain a competitive position with other Army installations, and began an evaluation of its major energy-saving opportunities. The single largest user of energy was the central heating plant because it provided cold weather heating for most buildings on-site and year-round process steam for special operations, thus the plant became the most obvious opportunity for energy savings.

A Picatinny Arsenal Energy Project Team was assembled to determine the way ahead. It included the director of Public Works, a contracting officer, a project manager contracting office representative (COR), a program support specialist, and an environmental coordinator. After much preliminary study, Picatinny Arsenal selected Energy Masters International, EMI, to perform a site survey report. Note that EMI has since become Chevron Energy Services, CES.

Existing Conditions in 2000

The report, dated April 2000, summarized the existing conditions and suggested decentralizing the existing central steam heating plant based upon their findings.

Originally, the 70-year-old heating plant was designed and operated as a cogeneration plant, producing electricity and steam, to serve the large energy demands related to munitions production that existed through the

1940's to 1960's. Over time, changes in Picatinny Arsenal's everyday mission and operations brought about a greatly reduced demand for steam, especially high pressure process steam. The backpressure steam turbines and electrical generator were no longer in use, and the heating plant had primarily become simply a source of centralized heating for the approximately 650 mixed-use buildings on site.

By this time, Picatinny Arsenal had evolved to its current state, primarily as a research and development facility, with many support facilities, administrative operations offices, and military housing. Gone was the actual production of munitions that had required the much larger central heating plant. The size of the steam lines and the high pressures supplied were well in excess of current needs for space heating. Steam lines were leaking, had partially missing insulation, failed steam traps, leaking valves, broken drip legs and more.

There was also no condensate return system, which wasted not only energy, but water and treatment costs. The site survey report also noted that the central steam plant was an energy security risk because one plant was essentially the sole source of space heating for the entire installation.

Summarizing, the plant was expensive to operate, and wasteful of energy, water and resources. The ultimate decision was to investigate the potential replacement of the heating plant.

Actions Taken

A multidisciplinary team was established to look at methods to ensure long term heating capabilities for the installation. The team consisted of representatives from engineering, legal, environmental, safety, fire and resource management offices, as well as the acquisition center. The team initially focused on privatization of the central heating plant and steam distribution system. However, upon further study, a decision was made to look at energy savings performance contracting (ESPC) for decentralizing the steam distribution system. That approach was approved by the Armament Research, Development and Engineering Center (ARDEC) board of directors.

Chevron Energy Services developed the design build project which was awarded in Sep. 2003. The project required extensive coordination and innovative approaches to overcome a multitude of issues and concerns raised by requirements relative to each team on the committee. Each issue, whether it be an acquisition, environmental, legal, safety, or engineering concern, had to be carefully and thoroughly addressed before moving forward. An innovative agreement had to be developed with the local natural gas transportation company in order for them to extend the natural gas line 11 miles throughout the installation. Prior to award, consultants from Construction Engineering Research Laboratories, the Defense Contracting Audit Agency,



Figure 1: A coarse strainer/filter that takes lake water and prepares the non-potable service water for use in the boiler to replace what used to be potable water consumption. U.S. Army Photo by Nicholas Stecky.

and the Huntsville District Corps of Engineers joined the team and provided an independent project review.

The Project

The basic scope of the Steam Decentralization Project was to design and install a distributed heating system at Picatinny Arsenal to replace the aging central steam plant. The new system required installation of an arsenal-wide natural gas distribution system to supply the new equipment. The project also required a major expansion and upgrade of the energy management and control system to allow remote monitoring and operation of the new system, and to realize significant labor savings.

A wide range of available heating technologies were applied, including steam and hydronic boilers, low-tem-

perature infra-red heating units, furnaces, unit heaters, electric heat, and propane-to-gas conversion systems. The use of multiple heating technologies created logistical challenges during construction, but it also ensured that building occupants were provided the most energy-efficient heating solutions that met their needs. Several methods of heat production were employed to replace the central heating plant heat energy but heating systems and controls within buildings have, for the most part, remained unchanged. Preliminary analysis had shown that adding the upgrades of HVAC systems within the buildings to the project scope would be very costly and significantly detract from the economic viability of the project. It was decided to focus on completing the heating plant decentralization initially and consider the HVAC upgrades after several years of familiarity with the project.

One notable highlight of the new heating system is the “boiler in a box.” Due to space constraints and other issues, this innovative product was used to incorporate a boiler and all necessary support equipment in a shipping container. Boilers ranging in size from small residential units to large industrial type boilers were installed in containers. Additionally, explosive safety quantity-distance requirements restricted the use of natural gas equipment in large areas of the Arsenal. In these instances, satellite boilers were installed to service several facilities and existing steam distribution lines were renovated.

Additional project highlights include:

- Designed and installed heating systems with more than 400 pieces of equipment totaling over 211

MMBtu within 18 months;

- The largest satellite boiler plant has three Cleaver-Brooks 500 HP steam boilers located near the old central plant and provides steam to explosives testing areas;
- Decentralization project related construction occurred in a total of 275 buildings;
- 135 buildings have new or converted heating systems while the remainder are fed by satellite boilers;
- 6,000 feet of existing steam distribution system was refurbished for the satellite boiler plants;
- More than eight miles of deteriorated and leaking steam lines were decommissioned. In the main office areas of the Arsenal, 1.4 miles of steam line were demolished, which significantly improved aesthetics;
- The existing natural gas distribution system was extended for more than 11 miles in order to supply 130 buildings and to provide for future expansion;
- At the height of construction nearly 200 workers covering all trades were on site.

The system was constructed as a design-build partnership between Picatinny

Figure 2: Housing for final water filtration system, super fine, prior to using in the boilers as feedwater. U.S. Army Photo by Nicholas Stecky.





Arsenal, Chevron Energy Solutions, and New Jersey Natural Gas (NJNG). Work began on Sep 30, 2003 and was completed May 20, 2006. The final shutdown of the central steam plant occurred on July 1, 2005.

Effectiveness of Investment
Economic Analysis/Consideration of Alternatives

Privatization was initially looked at by the team up until the solicitation was close to being announced in fiscal year 1999. At that time, the ARDEC board of directors directed that the use of an ESPC be considered because of the potential savings that could be achieved. Three options were initially considered under the ESPC. Those options included upgrading the existing central plant boilers, replacing the existing central plant boilers, or decentralizing

the steam distribution system. The board chose to pursue decentralization. Once the project was under development, the central plant boilers failed while undergoing burner renovations for environmental emissions. A temporary boiler plant had to be constructed and operated for a period of two years to meet the installation's heating needs. At the time of this project's award the installation had virtually no viable option left.

ECONOMIC JUSTIFICATION SUMMARY

- Investment costs were calculated using the actual financed project costs as detailed in the contract with the primary contractor.
- Yearly savings were calculated by first setting the baseline energy and weather data to 2001 actual energy use and adjusting for the build-

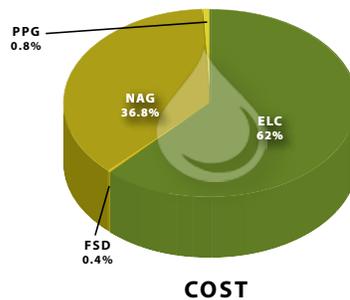
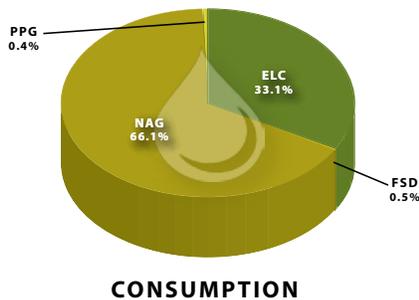
ings to be included or excluded from the projects. Unit energy costs were fixed based on rates in effect in 2001 to determine baseline energy costs.

- FY 2005 energy savings were calculated using actual energy use and adjusting for buildings that were deleted or added to the project and for actual weather conditions. Savings for the full year were then estimated using energy savings calculated in the Chevron ES Implementation Proposal and adjusting for actual energy savings experienced in FY 2005 and 2006.

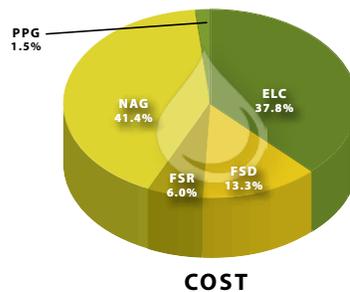
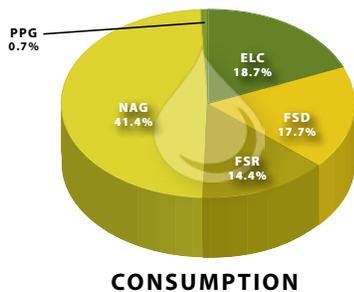
Financial Summary

Total Investment	\$36,124,711
Life Cycle of Project 25 years	
Annual Energy Savings ...	\$2,536,326
&	272,375 MMBTU
Annual Non-	\$2,856,000
Energy Savings	
First Year Savings	\$5,392,326
(Energy plus Non- Energy Savings)	
Simple Payback	6.7 years
Total Net	\$96,691,365
Discounted Savings	

FY 2010 ENERGY CONSUMPTION & COSTS



FY 2005 ENERGY CONSUMPTION & COSTS

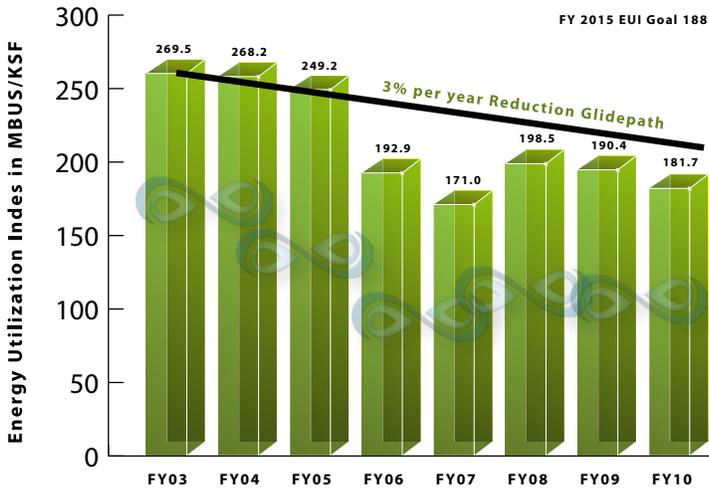


Actual Experience with the Decentralization Project

After two years' experience with the project, the decentralization project was found to be generating savings beyond the conservative estimate that was originally contracted for. Picatinny Arsenal officials decided to modify the existing ESPC to generate additional investment dollars which could be used to fund additional energy upgrades that were purposely left out of the original contract scope of work. By modifying the existing energy conservation contract, Picatinny



ARMY ENERGY & WATER REPORTING SYSTEM ENERGY REDUCTION GLIDE PATH



Arsenal gained additional energy and water improvements and savings.

In order to develop the workscope for the additional energy work, Picatinny Arsenal officials established an Energy and Water Team consisting of operations and maintenance personnel; the resource energy manager; the energy savings performance contractor, Chevron Energy Services; and the on-site, government-owned/contractor-operated potable water plant operator, Veolia Water. Its mission was to develop a holistic, comprehensive plan to address energy, water, safety and environmental concerns.

The goals were to:

- Optimize energy efficiency and reduce energy costs by eliminating wasted energy and installing more efficient equipment and heat recovery systems;
- Reduce energy costs for those buildings not included in decentralization by replacing higher cost oil and propane use with lower cost natural gas. This would reduce the environmental risks and reporting requirements associated with oil storage tanks and

reduce use of petroleum-based fuels;

- Conserve and protect potable water by rebuilding the nonpotable service water system to improve its distribution and quality so that it would replace potable water use in industrial, nonpotable water applications;
- Improve energy performance, use heat recovery, reduce water consumption, replace potable water with service water, reduce water treatment chemical use and reduce sewage wastewater discharge flows at a 1,500-horsepower and a 500-horsepower boiler plant; and
- Increase energy efficiency, occupant comfort and productivity by improving heating, ventilation and air conditioning with new equipment and additional building controls systems.

Picatinny Arsenal chose to modify an existing energy conservation project contract rather than create a new ESPC project. This approach saved two years in delivery time and achieved savings two years earlier. The modification increased the guaranteed savings by \$1,020,000 per year and installed an

additional \$10,069,338 in energy-related capital improvements.

The following projects were completed in fiscal years 2008 and 2009:

- conversion of two buildings from oil and propane to natural gas;
- installation of new boilers for a group of buildings called the “1400 Enclosure Area” to eliminate steam distribution lines, which eliminated about 5,000 feet of steam line and associated losses;
- rebuilt service water pump station, installing high-efficiency pump motors with variable speed drives and high-efficiency filtration for sediment control;
- expanded a postwide energy management system to include heating and air conditioning controls for 13 buildings;
- upgraded steam system by installing boiler stack economizers and boiler wastewater, called “blowdown,” heat recovery units at the two boiler plants; and
- Installed a filtration system and converted the two largest boiler plants from potable water use to service water.

Although the individual energy and water saving measures stand alone as good projects, it is the holistic integration of some measures that magnifies the effect. This is especially true of the largest steam plans called E-1 and E-3.

These steam plants serve space-heating and process related loads. Space-heating demand is limited to the winter season, but the process loads are year around. This plant uses 100 percent makeup water as it has no condensate return due to process uses and long distances to the loads. Condensate returns were analyzed and found to be a poor payback.

Operational issues included very hard potable water, frequent backwashes of



the boiler water softener system, the need for quenching boiler blowdown, scaling of sewage piping due to high water hardness and lack of adequate service water. In addition, the onsite potable water plant was operating near its maximum output of 1 million gallons per day, and a capital expansion was being considered. The boiler plant used an average of 200,000 gallons per day of potable water.

The water and energy team developed a strategy to replace the hard potable water uses with much softer service water and an energy-savings plan using heat recovery techniques. When the service water plant was upgraded, soft service water displaced the hard potable water. This change also reduced the work load on the water softening system, the backwashes and treatment chemicals use.

A boiler blowdown heat recovery system was installed to preheat the makeup water before sending the blowdown water to the sewer. This process also reduces the blowdown's high temperature, which means it no longer needs the hard potable water previously used as quench water that fouled the sewer piping with scale. Quench water has just about been eliminated, and sewer piping scaling has been eliminated.

Only 60,000 GPD of service water are now needed as opposed to the previous requirement of 200,000 GPD of potable water. In addition, the boiler stack economizers that preheat the boiler makeup water save energy and reduce boiler exhaust stack temperatures.

This holistic approach reduces energy consumption, green house gases, potable water use and chemical treatment

use. It also saves money, avoids potable water plant expansion, preserves the long-term sustainability of the potable water well aquifer and reduces the sewage flow rate by 140,000 GPD.

Program Achievements Summary after Five Year Experience

During the period of the decentralization project's startup in FY2005 to five years later in FY2010, Picatinny Arsenal has surpassed the Army's FY15 30 percent Energy Reduction Goal, ERG, five years ahead of schedule. The Picatinny Arsenal Energy Utilization Index, given as MBTUS/KSF for the Energy Baseyear of FY2003 was 269.5 and the FY15 Goal was 188, which has been surpassed by the actual EUI of 181.7 in FY10.

This performance exceeds the federal energy reduction requirements of the Energy Policy Act (EPA) of 2005, Executive Order 13423 and the Energy Independence and Security Act (EISA) of 2007. Picatinny Arsenal has striven to comply with all aspects of the referenced Federal requirements by using ESPC and sustainable design and development initiatives to deliver energy reduction performance. In addition, Picatinny Arsenal has greatly reduced its water use intensity from the 62.1 GAL/SF of the Water Baseyear FY07 down to 56.6 GAL/SF in FY10. All this was achieved despite a 26 percent increase in population from about 4,100 in FY05 to 5,100 in FY10.

In 2010, the Army recognized Picatinny Arsenal's energy saving efforts by awarding them Annual Secretary of the Army Energy and Water Management Award for FY09 Accomplishments. In addition, the Federal Energy Management

Program, FEMP, awarded Picatinny Arsenal an Energy Efficiency Award for Small Groups. Picatinny Arsenal was the only Army installation to win a FEMP Energy Award in 2010.

The success of this effort was the result of close teamwork, planning and execution between Picatinny Arsenal, Chevron Energy Services, the ESPC contractor, and VEOLIA Water Inc, the GOCO water plant operator.



Nick Stecky is currently the SEA Associates resource efficiency manager at Picatinny Arsenal. He is a certified energy manager, and LEED AP with a BS in Engineering and an MS in Systems Science. He has forty years of experience in the construction, operation and management of various facilities including DoD, DOE, industrial, corporate headquarters and R & D Facilities. Leadership activities have included vice president of the Assn. of Energy Engineers, Chair of The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Technical Research Group 7 for Sustainable Buildings. Active in the New Jersey chapters of ASHRAE and AEE, including Chapter President. He is one of the founders of the New Jersey U.S. Green Building Council Chapter and on the Chapter's Board of Directors.

Eric Kowal has been assigned as both a public affairs and protocol specialist with Picatinny Arsenal for more than three years. Prior to becoming a DA Civilian employee, Kowal served in and was honorably discharged from the Marine Corps as a Staff Sergeant, E-6. Kowal spent more than six years in the Corps and served as a Marketing and Public Affairs Specialist. He holds both a Bachelors and a Masters of Business Administration in the field of Marketing, as well as being a 2010 graduate of the Defense Information School.

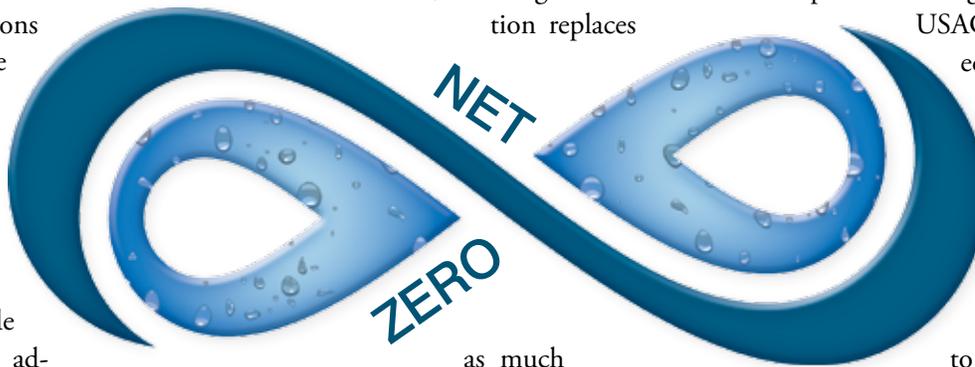


Sustainable Water: Reaching Net Zero

by COL Timothy Faulkner, Commander, USAG Fort Huachuca

The most critical resource that will challenge military installations' sustainability in the 21st century is water. Once thought of as a problem western states faced, it now has become critical to the survivability to the entire United States and nations worldwide. According to the U.S. Government, 36 states will face a water shortage in the next five years. (Associated Press, 2007) The vulnerability of military installations is a key concern of the U.S. Army and presents a particular challenge to military installation sustainability. Military installations and operations throughout the nation and around the world are already subject to water resource issues to include water supply adequacy, water quality, cost of delivery, and competition with ecosystem water needs (Jenicek, et.al, 2009). In fact, one of the goals of the 2005 Base Realignment and Closure was to have fewer but more sustainable installations worldwide. At the bedrock of sustainable installations are the requisite efficiencies needed to sustain our Army. Barry Nelson, a senior policy analyst with the Natural Resources Defense Council stated that "The last century was the century of water engineering. The next century is going to have to be the century of water efficiency." (Energy Bulletin, 2010).

Fort Huachuca is a high desert post that has faced water resource challenges for more than a decade. The water efficiencies gained from 1989 to 2010 reduced the fort's water pumping by more than 60 percent, from 3207 acre feet per year to 1142, even as the installation's employee population increased by more than 30 percent. Synonymous with water pumping is the energy savings that are afforded to an installation. Other conservation efforts have brought the installation to a net zero impact on the regional aquifer, meaning that the installation replaces



as much or more water than it uses. These results have brought the installation to the forefront of water sustainability within the Department of Defense (DoD), garnered the President's White House Closing the Circle Award for Sustainability, and has allowed the fort to secure its role in supporting the warfighter.

Fort Huachuca is in southeastern Arizona, near the U.S./Mexico border and typically receives 15 inches of rain per year. Groundwater within the watershed not only supports perennial flow in the San Pedro River but also

supplies our community of approximately 78,000 residents with their potable water. The U.S. Army Garrison, Fort Huachuca (USAG-HUA) knew that a holistic water management system, combined with a long-range plan for water sustainability could make it possible for an installation to zero-balance their impact on the regional water source. Planning, processes, technology, projects and transformation thinking by leaders and installation personnel are required to meet this challenge. Recognizing the need to minimize impacts to the region's water resources,

USAG-HUA implemented a Groundwater Resources Management System (GRMS) and water resource management plan with a variety of strategies to improve water use efficiency both on and off-post. The Community Covenant approach to solving a regional issue was instrumental to make the necessary gains in water efficiencies.

The GRMS is an effective and systematic process that manages multiple aspects of the fort's groundwater and its associated uses. The fort's GRMS program includes a management plan, goals, measures, community education, and feedback. The approach addresses legal requirements, Army goals and requirements, management of shared resources, and societal respon-



Standard thinking is that water is a limitless commodity of negligible cost, which leads to the perception of minimal value. From this perception, we do not question water use, why we are using it and whether the function using water can be accomplished with less or no water.

sibilities in the broader community. Elements of the process include conservation, efficiency, command policy, education, technology deployment, resource recovery and reuse, community outreach outside the fort boundary, and partnerships with non-profit organizations. The community outreach serves a dual purpose in the fact that it supports the Community Covenant and supports regional planning efforts in a greater watershed.

The 2009 garrison strategic plan Line of Effort (LOE) #6, Sustainability, mirrors the Installation Management Campaign Plan (IMCP) LOE #6, Energy Efficiency and Security. This practice of strict groundwater resource management directly relates to Key To Success EN 1 – Reduction of Energy and Water Consumption. Managing groundwater is imperative to our ability to provide resources, services and infrastructure to our customers. Failure to protect this limited, critical resource has direct implications on our ability to support ARFORGEN, our tenant organizations, and our installation partners. The broader impact on DOD was the fact that Fort Huachuca is home to 1000 square miles of restricted air space and 2600 square miles of Joint Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance (C4ISR) test range that supports Unmanned Aircraft System (UAS) and Counter Improvised Explosive Device (IED) efforts. This

process is required to sustain personnel and missions on post by providing high quality potable water in amounts needed, but with minimal waste. By reducing waste, we also conserve the energy needed to pump water from 500 feet below the ground. Therefore, our water mitigation efforts decrease annual energy costs due to water no longer needing to be pumped from depth. The annual energy savings for pumping 410 million gallons less in FY 10 than the original baseline was more than \$2 million.

Transformation in thinking is one of the key ingredients to starting water sustainment. Three major changes in thinking are: perception of water as a limited and valuable resource, cost benefit analyses that reflect that value, and education at all levels to spread this way of thinking. Without these critical ingredients, garrisons will struggle to change behaviors, rethink water cost and redirect sustainment planning.

The garrison and Senior Commanders must lead a community-wide change in how we think about water. The transformation of thought is about how personnel, especially on post, perceive water. Standard thinking is that water is a limitless commodity of negligible cost, which leads to the perception of minimal value. From this perception, we do not question water use, why we are using it and whether the function using water can be accomplished with less or no water. Transformation

thinking makes the presence of waterless urinals a given, and the sight of a flush urinal unconscionable. This one simple change saves us 25 million gallons of water annually. This perception transformation is particularly important to the Directorate of Public Works (DPW) personnel, especially the engineers and engineer technicians who will be responsible to find and implement the changes.

The second transformation, cost-benefit analysis, in thinking is also important to the process. It 'breaks the code' on the true value of conservation. Standard cost-benefit analyses for water-related practices are usually based on a fragment of the 'cradle to grave' cycle of water management. We overcame this by determining the full cost of water use. It includes all these cost elements: the commodity, pumping, potability treatment, distribution, waste water collection, wastewater treatment, wastewater disposal and the often overlooked cost, commodity replenishment for any water consumed. All these costs must include the cost of the energy as well as personnel and infrastructure. Once the true cost to the installation is understood, many additional technologies become cost effective. Using this methodology, the water management team made three lists, all calculated to compare cost per 1,000 gallons of water use. Projects were selected for funding based on the highest water yield for the funding available. Treated effluent reuse started mak-



ing good economic sense. Technology implementation such as 1.5 gallon per minute (gpm) showerheads, dual flush toilets and horizontal axis washing machines become extremely cost effective based on this full accounting of the cost of water. Some of these had pay-back periods of less than one year.

The third transformation in thinking is led by installation leadership, from the top down. The imperative that water management and conservation is as important as other cost savings and training measures must be measured and modeled by leadership. It becomes a part of the quarterly leadership briefs to all tenants. Articles are written, meters installed, and report cards issued. Pride in accomplishment and leader-

methods, we have grown mission and population while reducing our use of a critical resource. The policy and technology implementations in the plan can be easily exported to and implemented at other installations, based on what they can afford or are willing to put into policy. For example, the installation's irrigation policy cost almost nothing to implement, yet reduced pumping by 10 percent, or more than 300 acre feet (97 million gallons) per year. The accompanying energy cost savings at Fort Huachuca, for just this policy implementation, using today's electrical rates, is approximately \$500,000 per year. Included in this policy was a prohibition on irrigating with unattended hoses. Violation of the policy carries serious consequences

As these new devices are implemented, the education aspect alerts personnel to both the new fixtures and the reasons why. Additional tips are taught through education programs and command information venues. The USAG-HUA WaterWise-Energy Smart conservation education improves conservation awareness and actions among all demographics on the fort. The off-post community had a "WaterWise" program provided through the University of Arizona Cooperative Extension. Because the basic elements of our need were covered by the program, we contracted with the University to make some changes to the program for use on post, and added the energy conservation element. The WaterWise-Energy Smart

Through the continuous education, innovation and application of multiple methods, we have grown mission and population while reducing our use of a critical resource.

ship accelerates a change in action. Water is serious business for Soldier and Family support and leaders understand progress in their efforts will garner more new conservation technology for their units.

The four pillars of the program implementation are education, conservation, reuse, and recharge. Water is measured at the well-head, at points of recharge and diversion for reuse, so all consumption and waste are included in the accounting. The GRMS maximizes the beneficial use and reuse of water, and minimizes waste from leaks and poor practices.

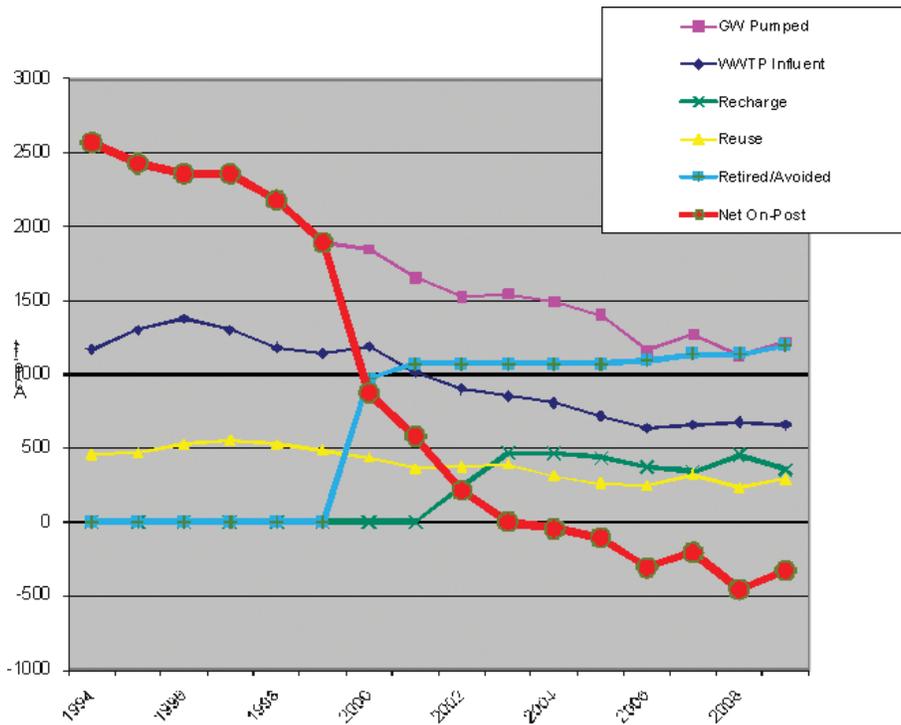
Through the continuous education, innovation and application of multiple

for repeat offenders. No longer will high installation water bills be the price for 'yard of the month' competitions.

Low cost efficiencies are the low hanging fruit that every commander can cultivate with little investment. The first area to attack in the short term was technology implementation. Much of the water used on post is for personal hygiene, showers, and toilets. Inexpensive adaptations include the change to 1.5 gpm shower heads, 1.5 gpm faucet aerators, dual flush toilets and waterless urinals. These can be installed as funding permits and when fully implemented can reduce your water bill by 20 to 25 percent.

program includes elements from water and energy checklists for quarters and administration buildings, to facility conservation audits and children's programs through youth services. The program stressed doing the right thing, saving the installation money and the high desert location of the installation. When residents and employees understand why the urinals are waterless, why there are strictly enforced lawn-watering hours and why they cannot hold limitless fund-raising car washes on post, they accept and become part of the process – often reporting the broken valves or running water themselves.

Longer-time horizon projects must also be planned and executed. Other



specific reduction measures include: demolition of more than a million square feet of old, leaky facilities and infrastructure; leak detection and repair or replacement of pipes; installation of artificial turf; broad implementation of low-flow technology such as horizontal axis washing machines and replacement with evaporative coolers with refrigerated air conditioning. Waste water is treated to EPA Class B or B+ quality and used to irrigate the golf course and some landscaping. Remaining treated effluent is recharged into the aquifer. Other recharge on post includes several rainwater basins. Artificial turf has the ancillary benefit of saving grass maintenance, fuel cost and provides the Soldiers the great hand to hand combat training areas with the proper cushioning.

Fort Huachuca operates its own wastewater treatment plant producing a high quality effluent that has been

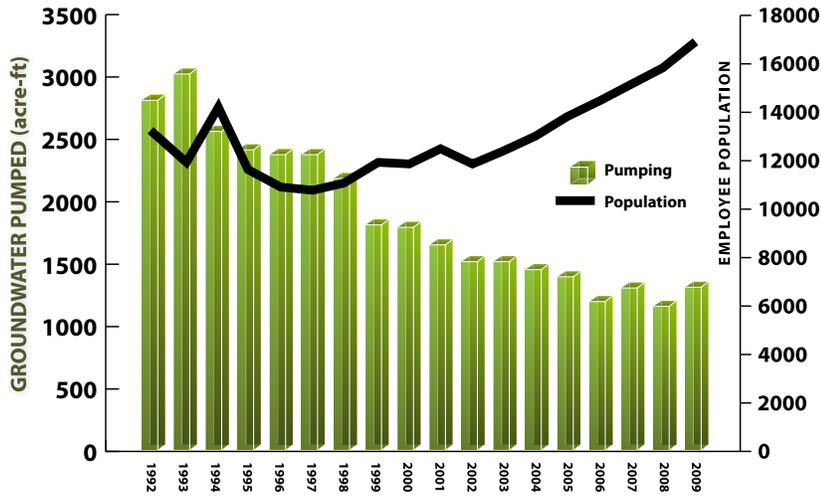
used for irrigating its golf course since the mid 1970s and more recently, has been used to recharge the groundwater system through its East Range Recharge Facility, a MCA project constructed in 2001. A recent upgrade to the golf course's irrigation system and conversion to a desert-style course (i.e., reduced fairway widths and overall irrigated turf footprint) allows the course to use roughly half the water of comparable golf courses in the region. The saved water is then available for recharge.

Capitalizing on a multi-year Army-wide whole neighborhood revitalization program, Fort Huachuca has been able to save an estimated 200 acre-feet/year through installation of xeric landscaping and water efficient plumbing fixtures in new Military Family Housing (MFH) units.

Through partnership with The Nature Conservancy and cooperation with

other federal agencies, Fort Huachuca has been able to purchase conservation easements on over 5,200 acres of land. These conservation easements, which enhance mission viability by maintaining open space on adjacent ranches and retire agricultural land use, reduce current and future water use by an estimated 1,400 acre-feet/year. Funds for these conservation easements were either locally-derived Army funds, from grants from the Arizona Military Installation Fund program, or obtained through the Army Compatibility Use Buffer (ACUB) program. These easements also ensured the post could sustain and increase the use of its restricted airspace and have the capability to support four Predator Class UASs, all Shadow training for the US Army and Marine Corps, Army and Joint C4ISR testing, two Air Force Wings, and the Air Guard Combat Assault Training Center.

Fort Huachuca is a founding member of a consortium of 21 agencies and organizations working together to achieve sustainable yield of the area's groundwater resources. The purpose of this consortium, known as the Upper San Pedro Partnership (USPP), is to coordinate and cooperate in the identification, prioritization and implementation of comprehensive policies and projects to assist in meeting the region's water needs including those of the San Pedro River. Through the USPP, Fort Huachuca has contributed to community-wide programs to reduce groundwater use including participation in the USPP Water Conservation Business Grant Program. This program funds water conservation improvements in area schools and businesses with recurring water savings of over 20 acre-feet/year.



Other USPP efforts have resulted in substantial water savings, including the funding of a reclaimed water distribution system for a community golf course with 300 acre-feet/year of treated effluent, and the funding of a sewage treatment and recharge project to replace an evaporative sewage lagoon. It is important that partnerships like this with your outlying communities are fostered as an integral part of your overall water management strategy.

Monthly and annual progress reports are published in the fort and local city newspaper, and announced on local radio stations. Education and technology deployment are installation-wide, engaging the 54 tenant organizations, the elementary and middle schools and the families of military personnel living on the fort. Many practices within the GRMS extend to the surrounding community through partnerships that support or are supported by the USAG-HUA. USAG-HUA has helped export these practices into the larger watershed with our USPP government and land management partners. This partnership exemplifies the Army

Community Covenant and embraces a holistic approach to water sustainability. Many elements of the GRMS are exportable to other installations.

These environmental benefits are both actual realized gains in water savings and environmental stewardship that put the Army at the forefront of water sustainability. The practice has resulted in a 60 percent reduction in the annual groundwater pumped in 2010 versus 1993, more than 410 million gallons of conservation. The energy to pump this water would have added more than \$2.4 million to our 2010 funding requirements. This reduction has allowed Fort Huachuca to reach the net zero position for water use – we reduce, capture, reuse, or recharge more water than we consume.

Where do we go from here? We have more projects on the books, including additional stormwater capture with reuse or recharge projects and exploring facility net-zero concepts for new and existing buildings. We continue to require education of incoming Soldiers, Civilians and Families. We continue to

survey the environment for technology that will bring reasonably priced water use reductions to Fort Huachuca. Net zero is not the end of our requirement, just a spot to stop and audit what we have accomplished and look forward to ensuring we can stay here through the many changes to the Army at War.



COL Timothy Faulkner is the garrison commander of the U.S. Army Garrison Fort Huachuca. He's a graduate of the University of North Carolina at Chapel Hill, Central Michigan University, Command and General Staff College, Joint Forces Staff College and the U.S. Army War College. From Field Artillery to Military Intelligence, he has commanded several times in both CONUS and OCONUS units and served in various staff assignments including Chief Intel Planner in the III Corps G3 War Plans section, Deputy G2, Assistant Chief of Staff V Corps and National Security Agency. He has authored articles on leadership, intelligence priorities, operational and strategic planning synchronization and reforming U.S. Nation Building Strategy.

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Flatlined — IMCOM's Progress with Municipal Solid Waste

by Greg Kubr, G-4, IMCOM

It comes as no surprise, but Americans generate more municipal solid waste than any other country. Per the EPA, in 2009 we generated a national average of 4.34 pounds per person per day with 1.46 of those pounds recycled and .52 pounds sent for combustion.¹ The rest--2.36 pounds per person per day--went to the landfill, netting a national landfill diversion rate of 45 percent. FY10 data for IMCOM installations indicates a command-wide landfill diversion rate of only 33 percent --well below the national average. This clearly indicates a need for improvement in order to demonstrate federal government leadership, as mandated in Executive Order 13514.

In this article I want to present the latest data points that indicate the status of municipal solid waste management (MSW) on IMCOM installations. I will provide a snapshot assessment and propose a way ahead to meeting statutory waste reduction goals. This article focuses on solid waste management, excluding construction and demolition (C&D) debris.

Definitions

First let me cover a few definitions and our goals (per OSD memo, 1 February 2008, subject: DoD Integrated (Non-Hazardous) Solid Waste Management Policy.)

Integrated Solid Waste Management

(ISWM) - A comprehensive approach to managing non-hazardous solid waste that encompasses waste prevention, recycling, composting, and disposal programs. Through ISWM, DoD Components seek to determine the most cost-effective, energy-efficient, least-polluting ways to deal with the various segments of, and the items typically found in, an installation or facility solid waste stream.

Qualified Recycling Program (QRP) -A recycling program that requires diversion or recovery and sale of recyclable materials from the non-hazardous solid waste stream. QRP proceeds are distributed in accordance with





10 U.S.C. 2577 to first cover the cost of processing recovered materials, with any remaining funds available to designated other projects, and ultimately to MWR activities.

Source Reduction - Effecting changes in the design, manufacturing, purchase, or use of materials or products (including packaging) to reduce the amount of toxicity before they are discarded.

What are our goals?

Executive Order 13514, signed on October 5, 2009, promotes pollution prevention and elimination of waste by minimizing the generation of waste and pollutants through source reduction. It establishes the goal to divert at least 50 percent of non-hazardous solid waste, excluding C&D debris, by the end of FY15. The Department of Defense memorandum on the Integrated (Non-Hazardous) Solid Waste Management Policy dated February 01, 2008 required installations to achieve the following goals:

- a. Divert at least 40 percent of non-hazardous solid waste, excluding C&D waste by FY10.

- b. Divert at least 50 percent of C&D waste by FY10.

OSD has now set goals which put the agency on a glide path to achieve the 50 percent diversion goal for all non-hazardous waste by 2015.

The Assistant Secretary of the Army (Installations, Energy and Environment), has also proposed a goal of net zero waste for installations. This means an installation reduces, reuses, and recovers waste streams, converting them to resource values, with zero landfill. Its key attributes are:

- Implementation of a sustainable supply change to eliminate nearly all discharges to land, water, or air and reuse of all products used on the installation to eliminate waste or environmental damage.
- Designing, procuring, and managing products and processes to dramatically reduce the volume and eliminate the toxicity of waste, conserve and recover all resources, and not relocate or postpone handling them.
- Mimicry of natural processes

which include entropy, hence “waste happens” but on a limited predictable basis, with optimal efficiency

How is IMCOM doing?

IMCOM G4/Public Works (PW) recently completed the FY10 annual report on the Solid Waste Diversion Goal. Overall, IMCOM met FY10 solid waste goals due to the high diversion rate for construction and demolition materials (78%). In FY10, 714,437 tons of MSW were generated, with 233,190 (33%) recycled and 481,247 (67%) tons land-filled. For municipal solid waste, 52 of 88 installations did not meet the 40% diversion rate, with 43 of those also failing to meet the goal in FY09. More telling is our historical diversion rates: FY07 – 36%, FY08 – 40%, and FY09 – 34%. We have been essentially FLATLINED since FY07.

How do we compare to the nation?

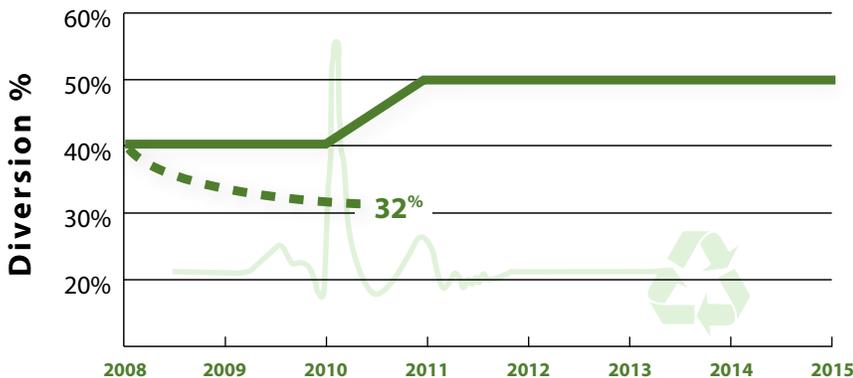
As would be expected, we are lagging behind the rest of the nation with only 33 percent diverted and not making progress from year to year. In 2009 the United States recycled 25.2 percent, composted 8.6 percent, and eliminated 11.9 percent through combustion. This resulted in a 54.3 percent diversion rate from the landfill.

ⁱⁱ We lack the data to compare compost and combustion rates, but most of IMCOM’s diversion is reportedly a result of recycling.

How do garrison commanders assess their programs?

Garrison informal responses to a recent CG IMCOM Defense Connect On-line (DCO) session provided some excellent feedback. Generally, most garrison commanders reported positive progress and emphasis on im-

IMCOM FY 10 Solid Waste Diversion from Landfill



NOTE: Construction & Demolition Diversion Goal = 50%; Currently Operating at 78%



These used plastic bottles found a new life in California, where recycling reached an all-time high last year due to a deposit law, but nationwide the rate has been dropping, in large part due to the growth of plastic water bottle sales.

proving programs. Many commanders expressed concern over the current statutory moratorium on deforming brass for resale (DODI 4715.4) and the loss of revenue to an MWR account or their recycling program. From these messages I drew the following conclusions:

- Garrisons are dependent on their surrounding community recycling programs. Those located in areas with robust programs, like Europe, had the benefit of integrating the on-post program. Those without local programs, like Alaska, generally had a minimal or non-existent program.
- Program management is not standardized within IMCOM as Directorates of Morale, Welfare and Recreation and Public Works manage these programs. DMWR management evolved from the application of recycled product revenues into the non-appropriated funds account (AR 420-1, paragraph 23-11).
- Several installations were managing their own recycling centers, which sorted and packaged materials for shipment. For example, Fort Sill DMWR

runs their recycle center and USAG-Hawaii DPW also manages a center.

- Successful recycling programs advertise and incentivize their programs. Examples include Fort Meade’s “Green Meade” program, Baden Wuerttemberg’s “Rumbling Rubbish” and school education programs and Fort Sill’s “Cash for Trash” program.
- Partnerships strengthen the program. Several garrisons have integrated all on-post recycling by including their Residential Communities Initiative (RCI) partners. Some commanders expressed an interest in partnering with AAFES and DeCA, both of which manage their own recycling programs, particularly for plastics and cardboard.
- Several garrisons are also working on enforcement by issuing blotters to households which fail to sort their recyclables or by inspecting dumpsters for material which should be recycled.
- Some exemplary programs included—
 - Fort Bliss’s Single Stream Recycling increased recycling by 64 percent.
 - Electronics Waste Recycling at Fort Bliss resulted in 11.4 tons

of electronic waste recycled.

- Litter Free events with unit financial incentives (Fort Bliss).

Given the plateau our program seems to be on, how can we move forward?

Most have heard of Albert Einstein’s famous quote, “We can’t solve problems by using the same kind of thinking we used when we created them.” Managing an installation’s waste stream is complex business. It involves changing behaviors and in many cases inconveniencing people. Establishing and managing a recycling program is also complex. Waste must be sorted and transported, recycled product markets identified and sourced, and revenues managed, all in compliance with federal government appropriations and acquisition laws. Overcoming these challenges will require leadership, innovation and hard work. Below are my thoughts on significant actions which would enable IMCOM to accelerate its progress.

Commit to Source Reduction. This is the most significant action we could



take to break through the current stalemate and make significant progress. Source reduction will have many facets. These could include:

- Establish and Communicate Alternatives. Once an installation identifies the major components of its waste stream, what are the alternatives to generating this waste in the first place? We need a campaign against petroleum-based products such as plastic bags, plastic water and soda bottles and containers. This will require us to identify alternative products and practices which can be used. IMCOM can demonstrate federal leadership with a campaign to minimize these and other products.
- Extended Product Responsibility. IMCOM can incentivize our industry partners by mandating their responsibility to remove wastes generated by their products. This would require mandatory contract language for all purchases which requires suppliers to

remove packaging waste or refund the government for its disposal.

- Extended Product Responsibility. IMCOM can incentivize our industry partners by mandating their responsibility to remove wastes generated by their products. This would require mandatory contract language for all purchases which requires suppliers to remove packaging waste or refund the government for its disposal.
- Strategic Partnerships. Establish strategic partnerships with AAFES, DeCA, MWR vendors and others to reduce the waste stream while also partnering with the installation on recycling efforts. We can't keep fighting against ourselves with garrisons working to recycle products while other on-post agencies do not constrain the introduction of these products into the waste stream. Additionally, there are likely significant advantages to combining our waste diversion

efforts on post in order to reduce overhead costs and increase recycling revenue with volume increases.

Standardize Recycling Program Management.

Standard organizations and procedures enable IMCOM to improve program management and seek enterprise-wide efficiencies. Given IMCOM's commitment to a standard garrison organization, we should establish which garrison office manages the recycling program. Other areas requiring some level of standardization include –

- Incentivize waste minimization among non-paying tenants. Given on-post Army tenants do not reimburse garrisons for waste management, reducing wastes generated in barracks and other on-post Army activities is challenging. In order to get all tenants working to meet statutory diversion goals, the garrison should market the program and readdress the situation with installation leaders.

Spc. Dean Kalogris charges the installation's command sergeant major's electric car on Fort Bliss, Texas, April 14, 2010. The base leaders drive the cars, which are made from recycled plastic and can reach speeds of 25 mph, to demonstrate their commitment to helping keep energy costs down and protecting the environment.





- Establish waste minimization in Army and privatized housing. Using the same concept as above, on-post housing residents should be financially incentivized to minimize their waste streams. See the Pay-As-You-Throw description below.

Strengthen HQ IMCOM Program Management. HQ IMCOM program management should provide leadership and guidance to assist garrisons in meeting and exceeding their goals. HQ can assist in several areas:

- Conduct annual IMCOM-wide assessments to evaluate progress toward diversion goals.
- Seek innovative solutions to assist garrisons which lack access to recycled material markets and local community programs. Evaluate industry best practices for application on Army installations.
- Share garrison best practices and evaluate which should become IMCOM policy.
- Track financial aspects of the Integrated Solid Waste Management Program, with the goal of landfill cost reductions funding diversion opportunities.

Nationwide Programs for IMCOM Consideration.

The following are a few interesting trends in the management of municipal solid wastes.

Sweeping across America is the Pay-As-You-Throw (PAYT) program. In lieu of funding waste pickup with a broad-based tax scheme, households are charged a variable rate based upon the volume of their waste containers. Those needing only the smallest con-

tainer are charged the least; whereas those households which routinely generate more waste and need larger or more waste containers would be charged a higher rate. According to the EPA, PAYT communities generate about 49 percent less waste than those leaving the cost of trash in the tax base or in a fixed fee.ⁱⁱⁱ Could Army installations apply the PAYT methodology onto Army installations? This would clearly require a change in resourcing policies but could incentivize all of those current waste generators.

Single-stream recycling, where all recyclables are placed into the same bins, is also claimed to significantly increase recycling by removing the generator's burden of sorting papers, cardboard, glass, and metals. As mentioned above, Fort Bliss reported a 64 percent increase in recycling. Application to other installations is dependent on the infrastructure and resources to further sort into marketable waste streams.

Waste-wise is an EPA program to partner with businesses, institutions, non-profit organizations and government agencies to prevent waste, recycle, and buy and manufacture recycled content products. IMCOM should consider adopting Waste-wise accomplishments into enterprise-wide initiatives.

Several installations are supported by local (or on-post) waste-to-energy (WTE) plants. These plants provide an excellent opportunity for further landfill diversion while also providing a source of renewable energy. Current Army policy does not recognize MSW waste-to-energy as a diversion and/or a recycling program, but we will work to change that. Some concerns are air

pollution from incinerator operations, disposal of ash residue and the loss of materials to the recycling stream, causing further degradation of natural resources. Other installations are purchasing and operating waste compactors in order to produce marketable products.

Way Ahead

Identifying 5 installations to reach net zero waste by 2020 will serve as a catalyst and provide pilot sites for experimenting with new approaches. As stated above, a multi-prong approach is recommended which includes source reduction, strategic partnerships, program standardization and improved command program management. With renewed focus IMCOM can lead the federal government and the nation in waste reduction.



Greg Kuhr is the IMCOM HQ G-4, Director of Facilities and Logistics. He previously served as the Pacific Region Chief of Staff

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Achieving Fiscal Sustainability in an Era of Persistent Conflict: A Leadership Challenge

by *BG Thomas A. Horlander, G-8, IMCOM*

“...But this country’s dire fiscal situation – and the threat it poses to American influence and credibility around the world – will only get worse unless the U.S. Government gets its finances in order. And as the biggest part of the discretionary federal budget, the Pentagon cannot presume to exempt itself from the scrutiny and pressure faced by the rest of our government.”ⁱⁱⁱ

*~ Robert M. Gates
Secretary of Defense*

In October 2010, the United States of America entered its ninth consecutive year of armed conflict with mass formations deployed in Southwest Asia and costly security measures implemented across the home front to ensure Americans and the American way of life are safeguarded from the evils of terrorism and those who perpetrate it. The price of war is both measurable and immeasurable. In the case of the current conflict, the measurable cost of conducting full spectrum warfare over this extended period of time has come with a hefty price tag for the U.S. and has progressively burdened the nation’s economic capabilities to the point where measures must be taken to mitigate the

financial impacts of this persistent conflict and the resultant deficit spending.

The task at hand is a balancing act. The nation’s leaders have no choice but to make some difficult decisions about where to invest limited financial resources in the national security apparatus. We must decide where we can become more efficient without sacrificing effectiveness, and where we must reduce certain capabilities and potentially assume a greater level of risk. Neither of these options stands alone as the optimal solution and the answer lies somewhere between them. Maintaining national security spending at its current level would continue to overly burden the federal budget, driving the nation deeper into debt and perpetuating its dependence on foreign wealth for security. Flat-lining the national security budgets will serve as the forcing function to achieve greater efficiencies and drive leaders to make critical decisions about which capabilities the country should invest in and which capabilities are no longer relevant in 21st Century warfare.

Timing is everything. To flat-line or reduce spending on national security too quickly could create unintended detrimental impacts to any number of critical national security capabilities. Move too slowly and the nation’s economy continues to suffer the perils of deficit spending. With almost ten years of persistent, full-spectrum con-

flict to learn from and the time to better understand the security challenges of the 21st Century, we can now make better decisions on how to resource the nation’s security. “Well planned and measured reductions and redistribution of resources realized over time” should be the watch words that guide our efforts and serve as the mainstay in the development and implementation of this inevitable undertaking of rebalancing and reprioritizing our investments in the nation’s national security. While there is much we can do to help ensure we achieve fiscal sustainability, fundamental to our success is strong, sound and decisive leadership at every level to reverse the tides of unconstrained spending that we have grown accustomed to over the past decade and embrace the cultural change that is necessary given the realities of today’s economic environment.

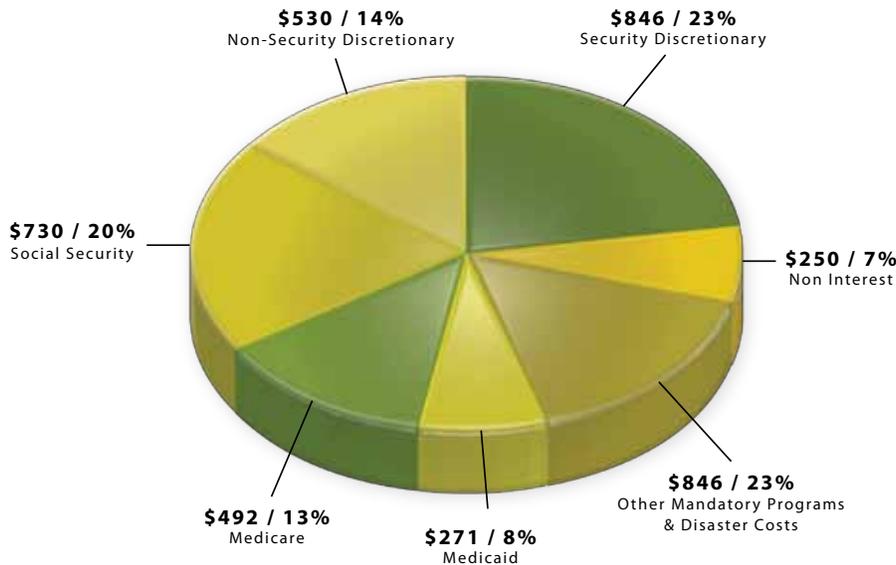
In most Americans’ minds, national security equates to national defense and the military. A quick study of the distribution of the federal budget, and one would arrive at the same conclusion. While the U.S. government does spend U.S. tax dollars for numerous purposes other than the country’s national security, the money trail clearly indicates that most of the discretionary portion of the federal budget is spent on national security, and most of this national security wedge is spent on the country’s military (defense) capability. Of the \$846 billion requested in the



US Federal Budget

(in Billions of Dollars)

2011: **-\$3,728**



SOURCE: <http://www.whitehouse.gov/omb/budget/fy2011>

Figure 1

“security discretionary” category of the 2011 federal budget, the 2011 defense budget request accounts for \$548.9 billion, or 65 percent of this categoryⁱ. The conclusion one must take from this is inescapable. As military leaders, we must all come to terms with the reality of this situation and the proximity of our decisions to the federal budget. Said another way, all leaders throughout the national security community and DoD must clearly see the direct linkage between the defense budget and the future health of the federal budget and the U.S. economy. This stark reality is clearly reflected in the announcement made by Secretary

of Defense Robert Gates in May 2010 when he said the Department of Defense, in order to maintain and modernize America’s key military capabilities at a time of war and fiscal pressure, would need to fundamentally change the way it does business. Shortly thereafter, in June 2010, he established savings targets for DoD and each military department starting in 2012 and going through 2016 that in the aggregate total \$100 billionⁱⁱ. Since these announcements, senior leaders across the Department of Defense have been grappling with how to realize these adjustments and exact the right balance between requirements

and risk, capabilities and efficiencies, all while ensuring we are successful in the current conflict and any future ones that may be on the horizon.

We as a nation have been here before – kind of. You are familiar with the adage, “a picture is worth a thousand words.” The graph (figure 2) is testimony to a road traveled four times in the last half of the 20th century. Perhaps unique to our challenge is the fact that the current conflict persists today and likely will continue well into the next decade in one form or another. This will require the country and the Department of Defense to remain on a solid war footing, continuing to compete for the nation’s precious resources while simultaneously changing how we resource our armed forces. Secretary Gates has provided the department with a broad road map on how to do this, articulated in his guidance to pursue four tracks: 1) find more than \$100 billion in overhead savings over the next five years; 2) seek efficien-

“But as a matter of principle and political reality, the Department of Defense cannot go to America’s elected representatives and ask for increases each year unless we have done everything possible to make every dollar count. Unless there is real reform in the way this department does its business and spends taxpayer dollars.”^{iv}

*- Robert M. Gates
Secretary of Defense*



DoD Budget Authority Since WWII

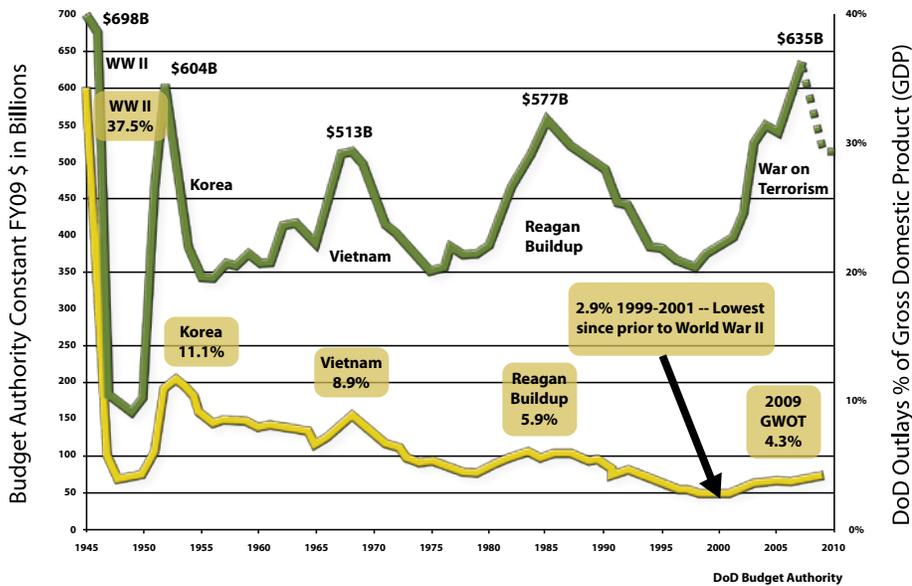


Figure 2

...our Army has realized its great victories and triumphs of high achievement for a myriad of reasons; but for certain, good leadership has been at the heart of each one of them.

cies from outside normal channels; 3) conduct a broad review of how DoD is organized and operates to inform the President’s 2012 budget process; and 4) reduce headquarters and support bureaucracies while instilling a culture of cost consciousness. From these four tracks, the Army and its subordinate commands have established efficiency tasks and goals complementary to these objectives and have dedicated an extraordinary amount of time and energy to developing a plan to reduce over time the Army’s top line without sacrificing the capabilities

required to be successful in this time of persistent conflict.

A key leadership challenge in today’s Army is, “how do we as an Army maintain and further develop the critical capabilities that ensure we can successfully protect America’s national security interests while simultaneously achieving substantial savings for the nation?” We as an Army and a profession take great pride in planning, organizing and training our forces for any mission we are given and achieving victory no matter the difficulty. Clearly, our Army has realized its great victories and triumphs of high achievement for a myriad of reasons, but good leadership certainly was at the heart of each of them. It is with this belief that I assert that the fundamental key to the success of this undertaking is the same - to ensure every leader takes ownership of this fiscal and operational chal-

lenge and focuses on the fiscal sustainability of our Army —not just the immediate needs and wants of his/her respective organization. Absent this dimension in every leader’s decision making process, the Army will struggle to succeed in this mission. And while the Army is fortunate to have capable and experienced higher headquarters elements with cadres of highly skilled staff officers, this is not a mission for the higher headquarters to figure out. It is a leadership mission at every level and must be pursued as one.

An undertaking of this magnitude has led to a reemergence of the term “fiscal sustainability” in our lexicon. While many may consider this term synonymous with good stewardship, it connotes a greater long-term approach to how we make decisions and manage the Army’s resources. Today’s current corporate process is known as Planning, Programming and Budgeting System - a system designed by then SECDEF Robert McNamara during the Vietnam War era. It has matured over time and served the Defense establishment well during the Cold War and times of peace, however the persistent conflict of the last 9 years has stressed it and forced deviations from its otherwise rigid process. Leaders at every level are grappling with reconciling three major forces that will define the Army’s future resourcing program: 1) the institutional resourcing solution generated through the Planning, Programming, Budgeting and Execution System; 2) the rapidly and ever-changing needs of an Army at war and; 3) the need for our country to reduce spending on national security without sacrificing critical capabilities.

To lead change is one of the top lead-



By anyone's measure, this is no small undertaking and, given the magnitude and complexity of the operation, requires every leader in our Army to understand and embrace the challenges and the way ahead.

ership challenges most senior leaders face. To lead belt-tightening change after a decade of fiscal largesse is surely at the top of the list and there is certainly no sure-fire way to get all the right people “on the right bus” to ensure an enduring change that will safeguard the fiscal sustainability of our Army. By anyone's measure, this is no small undertaking and given the magnitude and complexity of the operation, requires every leader in our Army to understand and embrace the challenges and the way ahead.

While I do not profess to be a pioneer or an expert at 21st Century “fiscal sustainability,” I will offer a few thoughts for leaders to consider as we journey through the next decade of fiscal change, however I caution the reader to not expect a cookbook solution to the road ahead but a visitation of many of the same leadership and management principles we learned as young Officers and NCOs.

1. Make and Enforce Balanced Decisions. Demand thoughtful analysis and prudence in every decision – considering the sizeable savings that the U.S. Army and the other Armed Services are seeking to achieve, leaders must not lose sight of the operational and long term impact of our decisions

in order to achieve short term savings. The question that must be prevailing in every decision made is, “How does this resourcing decision impact the Army's current readiness and future capabilities?” This means looking beyond the immediate needs of one's command and considering the enterprise as a whole. This is not an easy question to answer, however if we cannot or do not address it during our decision making process, then perhaps we have more work to do.

2. Is this the best way or the easiest way to do the job? As a former Special Weapons Officer, my peers and I were taught to ask the simple question, ‘right tool for the right job?’ In resource management parlance, this equates to, ‘are we making the right sourcing decision?’ Should this mission or task be performed by military personnel, DoD/DA Civilians, contractor manpower equivalents (CME), another source, or some combination thereof? And we must find the balance between “good, fast and cheap” understanding that we rarely can have all three. Sourcing decisions drive effectiveness, drive cost and ultimately drive fiscal sustainability.

3. Am I properly task organized and structured for the mission? This goes beyond organizing our forces for a tactical mission and resides in more enduring force structure decisions that are critical to ensuring both operational effectiveness and efficiency and fiscal sustainability. Examining the necessity for intermediate layers of command and control and redundant capabilities that do not enhance the capabilities of our formations is key to our efforts.

...the Army has recognized the need for and is implementing a more robust effort to develop its people to make better resourcing decisions by growing some segments of the workforce and investing in the training and education of that workforce.

4. Are we developing the right skill sets? Said another way, “are we training and educating our leaders and their workforces for the skills they will need to achieve fiscal sustainment and operate in this rapidly changing fiscal environment?” Do we have the requisite skill sets at the right levels to enable staffs to develop sound, cost-informed recommendations to leaders, thereby empowering them to make the right resource-informed decisions? Corporately, the Army has recognized the need for a more robust effort to develop its people to make better resourcing decisions by growing some segments of the workforce and investing in the training and education of that workforce. This is evident in: 1) the recent decisions to grow and develop the Acquisition and Contracting workforce (i.e. decisions made as a result of the 2007 Gansler Commission Study); 2) including these subjects in the Army's Senior Leaders Courses curricula (i.e. development and integration of procurement and contract management training for General Officers and SES's into the Army's Senior Leadership Development program); and 3) providing training opportunities for mid-level managers in key areas like cost management (i.e. starting in FY10, the Army's ASA-



FMC developed and sponsors the Cost Management Certification Course (CMCC) conducted at the Naval Post Graduate School in Monterey, California). Achieving fiscal sustainability requires a long-term investment to develop the right skills in our most precious resource, our people. We cannot forego this small investment today, for the sake of current year savings, to the detriment of future critical capabilities.

5. What should this capability cost?

This is probably the most elusive of questions to try to answer. In recent years, the U.S. Army has made an admirable attempt and some progress in changing its culture from a consumption-based to a cost-based culture. Perhaps not visible to an outside observer, the Army developed and implemented such initiatives as 1) the creation of four core enterprises to ensure we gain a broader understanding of corporate processes to inform leaders' resourcing decisions; 2) the conduct of capability portfolio reviews (CPRs) to help understand requirements and identify redundant capabilities across the force and where the Army could achieve greater efficiencies; 3) the requirement to conduct a cost benefit analysis for certain requirements before they can be considered for resourcing; 4) the development and conduct of the Army's CMCC to educate mid-level managers on cost management so that they can take their skills and expertise and apply them in their respective organizations, etc. All of these initiatives are aimed at achieving a cost culture

and ultimately ensuring the Army can fiscally sustain itself in an era of persistent conflict.

6. Am I focused on the right things?

As leaders, our most precious resource is time. In today's operating environment, most leaders are challenged to accomplish everything they consider important to the mission. In the area of resourcing, I recommend leaders focus their efforts on "the big things" -- those areas that are the largest cost drivers or impact their resourcing program the most. This will vary from one organization to another. In a tactical unit, leaders will likely need to focus on training events and supply manage-

"In any organization that spends a large portion of its annual funding program on contracts, a leader cannot afford to not have a contract management program where the leaders and managers of the organization are integrally involved."

-BG Thomas A. Horlander

ment; at an installation level, leaders would need to focus on workforce and contract management to ensure installation services are adequately resourced to the desired capability level; and at the strategic and/or higher headquarters level, leaders may need to focus more on leveraging existing capabilities external to their organization or ensuring the right processes and procedures are in place to ensure subordinate organizations manage resources properly.

7. Do our current processes enable us to make decisions about the right

things and then make the right decision? If our current processes are focused in those areas that do not constitute where the majority of our capabilities lie, then our processes are not serving us well. This question begs the follow-on question of whether these processes are well integrated in the other systems we utilize, to ensure leaders are not making fragmented decisions but more holistic ones. For example, in an Army that relies heavily on contracted capabilities, we must dedicate leadership energy throughout the contract management process, especially in the requirements generation, planning and post-award review stages. Equally important to involving

leaders in this process is to ensure that these venues are integrated into the operational and resourcing activities of an organization, ensuring the same leaders can make better integrated operational and resourcing decisions.

8. "We've always done it this way!" Better stated,

"Are we stuck in the past?" Have we leveraged modern day technology where it makes sense to do so and thereby identified and implemented more efficient ways to produce the same or better results? What are those legacy capabilities that we either need to divest ourselves of completely or change? The Army today is fielding several new automated business systems to improve its management capabilities, thereby empowering leaders to make better informed decisions. The fielding of the General Fund Enterprise Business System (GFEBS)



is but one of those systems that can provide leaders a great appreciation for the cost of their operations and enable them to conduct analysis to make cost-informed decisions.

9. Follow through. Once a plan has been decided upon and enacted, are we following through by monitoring its execution? Critical to the success of ensuring that we “achieve the balance” and ensure fiscal sustainability of our Army, is to monitor the progress of each organization’s implementation of the necessary changes. Much like we would check the development and readiness of a tactical formation preparing for a mission by monitoring the execution of their scheduled training or maintenance readiness reports, we must also monitor our implementation of this resourcing operation. This step is easily neglected but imperative to our success and must be planned for.

10. Strategic Messaging. I referred to “getting on the bus” previously in this article as a portent to this final assertion. Have we ensured everybody who needs to know, knows? We have all seen the greatest of plans suffer because of less than adequate strategic communication plans that did not ensure the right people were “on the right bus” and/or had an adequate understanding of the mission and the concept of operation. This is fundamental to any successful operation and cannot be over-emphasized in this undertaking.

While my offerings are broad and conceptual, they hopefully serve as reference points for us as we plan for the implementation and execution of our Army’s mission to reduce its resourcing requirements without sacrificing capa-

bilities and thereby achieving a level of fiscal sustainability that ensures our Army is capable of safeguarding our national security in a 21st Century of persistent conflict. Many have referred to this persistent conflict as the “long war.” The United States’ ability to fiscally sustain its Armed Forces throughout this “long war” is a key to our success as a nation and a leader of the free world. The Armed Forces’ role in this is greater than just being the most capable and ready military force in the world, always capable of protecting the U.S. National security interests but it must also do so in a more economic and efficient manner. This is partially achieved through some of those ideas I have represented above but undeniably, the fundamental key to the success of achieving fiscal sustainability is in a word - Leadership.



BG Thomas A. Horlander currently serves as the U.S. Army Installation Management Command G-8/ Resource Manager. He is a U.S. Army Master Strategist and holds Master’s Degrees in Business Administration, Military Arts and Science – International Relations and National Security. He is a sitting member of ASMC’s CDFM Certification Commission.

References:

ⁱ These figures were pulled from the 2011 Budget of the Federal Government found at www.whitehouse.gov/omb... and the author recognizes that they are subject to change given that currently the USG is operating under a Continuing Resolution and it is possible that this budget request could be modified.

ⁱⁱ SECDEF memo to the Service Secretaries dated 04 June 2010

ⁱⁱⁱ SECDEF Speech delivered at the Pentagon, January 06, 2011

^{iv} SECDEF Speech delivered in Abilene, KS on 08 May 2010



Cost Management vs Budget Management: Performance Based Band of Excellence

by Joe Staton, Management Integration Branch Chief, IMCOM-SE

Introduction

“In today’s resource-constrained environment, the Army must exercise wise stewardship of every dollar it manages. A key element in that stewardship is to develop and use sound cost-benefit analysis (CBA) practices throughout all requirement/resourcing processes. For every proposed program, initiative or decision point that is presented to decision makers, it is important to provide an accurate and complete picture of both the costs to be incurred and the benefits to be derived.”¹

Leadership and operational management complement each other, so both must be assessed to determine the organization’s capacity to meet today’s and the future’s challenges. Cost manage-

ment is about “doing the right things” and “doing things right.” Continuous process improvement focuses on doing things right. Strategic management and leadership define what the right things are. Garrisons require good business strategies, solid business rules and efficient operations to deliver cost-effective services to our customers.

In the 2010 Army Posture Statement, the Headquarters, Department of the Army defined cost management as, “the effective and efficient management of business operations through the accurate measurement and thorough understanding of “full cost.” Cost management provides full cost awareness of an organization’s business processes, products, and services that deliver the best value to the organization’s customers.”

We are compelled to change our decision processes to weigh tangible and intangible costs and benefits. We must evaluate new and current processes, codifying the benefits they provide to the Army, not just to any one garrison. Garrisons are connected organizationally and best practices, even at the lowest levels, must be documented and shared with other Army organizations. The purpose of this essay is to highlight the need to change the way

we do business by assisting leaders in identifying, quantifying, and evaluating the costs and benefits of alternative solutions.

Cost Management vs. Budget Management

No one executes their household budget like we manage resources in the Army. “In the past, the Army’s budget-oriented culture defined success as spending every appropriated dollar to accomplish assigned missions, and this frequently resulted in cost considerations entering the decision process as an afterthought rather than as a key element of decision making.”² This technique is difficult to control because garrison services and missions are based on unconstrained requirements that vary wildly between installations. It is a system that rewards programs for spending all of their budgeted resources. Efficient use of resources is usually an afterthought. Terms like process cycle efficiency, cost-performance, and process capacity are not connected to management decisions.

In a cost management environment, resources are driven by documented requirements. Garrisons’ budget performances in and of themselves cannot be compared – it’s apples and oranges. Assuming garrison budget equals the direct obligation, the only conclusions that can be drawn from our current budget system are that Fort J obligated

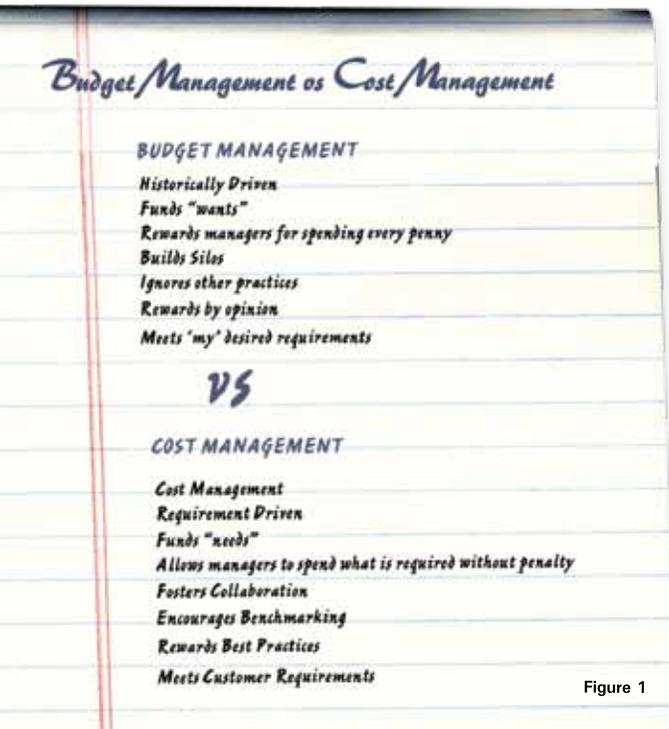


Figure 1



Service 800 Garrison Comparison

Obligations represent 100% spend plan executed

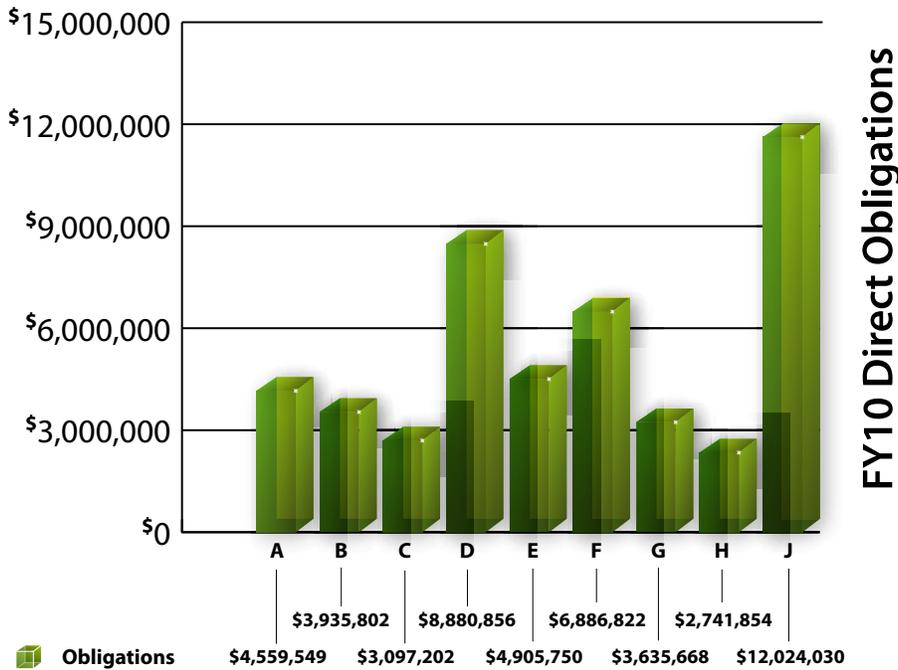


Figure 2

the most money and Fort A the least. The cost management analyst may consider comparative budget execution based on a common denominator (population, size, area, etc) or “cost per unit” and process capacity. These two views enable analysts and planners to normalize garrisons, allowing benchmark comparison, deeper understanding, and best practices indicators. By analyzing how garrisons are executing their budgets, better decisions can be made to allocate resources based on needs instead of wants.

Tactical-level Execution Map

IMCOM is dedicated to ensure that our Soldiers, Families and Civilians, today and in the future, have the resources they need to train, deploy, fight

and win; support well-being, and have a safe and healthy infrastructure and environment in which to live.³ The Garrison’s challenge is to not compromise the quality of services our Soldiers and Families deserve, but to provide quality services within a resource constrained environment.

The Installation Management Campaign Plan (IMCP) provides strategic direction and a foundation for continuing to provide quality services and infrastructure into the future. Figure 3 depicts a way to display the IMCP application at the tactical level, or the resources-to-customer relationship: it takes money to provide services and infrastructure to the Mission, Community and Environment (triple

bottom line). Customer feedback is one element of “doing things right;” and regulatory requirements and leadership tell us if we are “doing the right things.” Leaders balance customer requirements against resources using exceptional stewardship to measure performance, quantify process efficiencies, benchmark garrisons and implement best practices. Within available resources, garrisons provide a variety of services, supporting Soldiers, Family members, Civilian Employees, and retirees. The services have a capacity that is tied to available resources. From a business stand point, without measuring process capacity and customer through-put, how do we know how efficiently we are “doing the right things?”

Linking End-to-End Processes

Garrisons provide 55 services as defined in the Installation Status Report (ISR). Garrison commanders are responsible for reporting performance and quantity data in five key Army systems: Army Stationing and Installation Plan (ASIP), Real Property Planning and Analysis System (RPLANS), Common Levels of Support (CLS), Installation Status Report (ISR) (Figure 3 - Garrison Gunnery Tables), and Continuous Process Improvement. Accurate data reporting is essential since these feed Army-level decision making tools. Additionally, the AR 5-10 Stationing Process complements the garrison gunnery tables. It uses the staff-study methodology that should synchronize installation services and facilities requirements against resources. Although the stationing process does not require installations to synchronize services and infrastructure requirements with the budget process, the stationing process results in a



recommendation that is acceptable from a garrison perspective, satisfying environmental concerns, and highlighting any risk considerations.

Army Stationing and Installation Plan (ASIP) establishes the foundation for master planning and base operations resource programming at the installation. It provides a single data source that contains the official HQDA authorized planning populations by location and fiscal year. It gives Army planners and programmers consistent information to determine facilities and other authorized planning populations or unit driven requirements for all assigned units, activities, and tenants at Army installations. It is used to validate and justify many services and programs, Army and Reserve Component military construction, Army family housing (AFH), and non-appropriated fund (NAF) projects that are submitted to Congress for approval.⁴

System (RPLANS) is the primary means for the Army leadership to allocate facility resources to support Army roles and missions. It translates Office of the Secretary of Defense (OSD) programming guidance and congressional guidance into planning decisions based on a detailed allocation of forces, manpower, and funds. It produces the Army's proposal for a balanced allocation of its resources among centrally managed programs for manpower, operations, research, development and acquisition, and stationing and construction within specified constraints.⁵

Common Levels of Support (CLS) is on a strategic pause for evaluation and improvement in FY11. CLS is a decision process enabling successful uniform delivery of Army installation services, within available funds, by defining an Army-level approved level of service (quality and/or quantity). CLS is based on a comprehensive understanding of the Army's Base Operations Support (BOS) services, standards, and costs. Within CLS, each service and subservice is described by tasks, conditions, and standards. CLS enables Enterprise leaders to identify risk and determine acceptable standards of service delivery within available resources.

Installation Status Report (ISR) provides data for assessing key elements of an installation at a specific point in time. The ISR program assists Army leaders to make appropriate decisions to sustain or improve facility management, natural infrastructure,

and services. The ISR program can assist garrison commanders to assess overall installation condition and readiness, articulating needs identified in the ISR data, estimating resource requirements, assisting in prioritizing programs and projects, and measuring progress.⁶ ISR consists of three reports:

ISR Infrastructure (ISR-I) provides an evaluation of the facilities and infrastructure on a base. ISR-I assesses the quality, quantity and mission support of rated facilities and provides estimated costs to improve the base's current infrastructure through revitalization or modernization.

ISR Natural Infrastructure (ISR-NI) assesses the capability and capacity of an ISR reporting organization's ability to support the current and future mission requirements with its natural infrastructure assets (air, land, water, and energy).

ISR Services and ISR-S (Service Based Costing) (ISR-S and ISR-S (SBC)) evaluates the cost and quality of service delivery performance for base support services provided at each Army base. These components assess cost, quantity, and quality of services provided to organizations and individuals associated with Army bases. ISR-S and ISR-S (SBC) are used in the Standard Service Costing model to calculate cost estimating relationships (CER) that are used by the Base Operations Support Requirements Model (BRM) to develop base operations support requirements.

Continuous Process Improvement (CPI) is a Department of the Army sponsored initiative committed to promoting and sustaining a culture of improvement throughout all levels of the Army. It provides a mechanism to

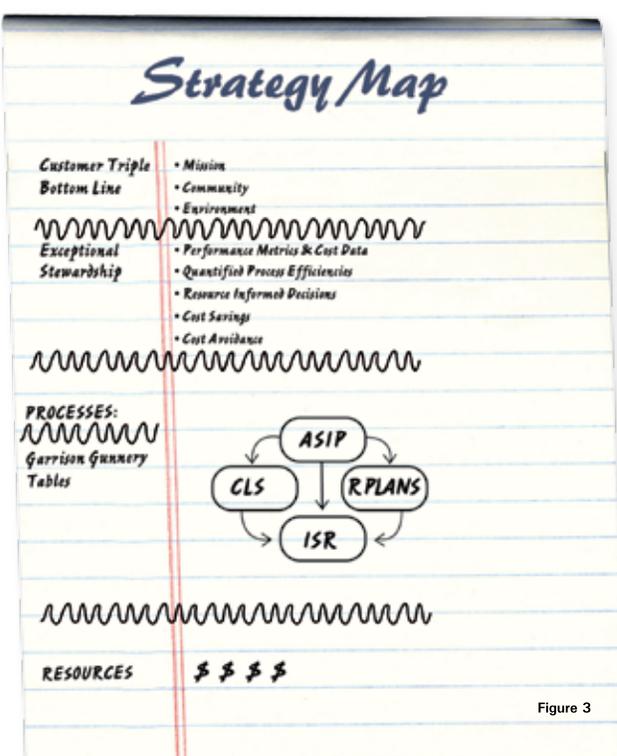


Figure 3



IMCOM-SE Service 800 Cost Comparison

Adjusted Average* = \$186/Soldier • Best Practice = \$150/Soldier

*Average excludes fort H-I as Outliers

		Fort A	Fort B	Fort C	Fort D	Fort E	Fort F	Fort G	Fort H	Fort J
	FY10 Direct Obligation	\$4,559,549	\$3,935,802	\$3,935,802	\$8,880,856	\$4,905,750	\$6,886,822	\$3,635,668	\$2,741,854	\$12,024,032
	Soldiers	30,438	25,522	5,522	51,543	26,041	32,924	13,943	5,330	17,649
	\$/Soldier	\$150	\$154	\$154	\$172	\$188	\$209	\$261	\$514	\$681
Over Performance Adjust to Average	Delta Potential	\$0	\$0	\$0	\$0	\$3	\$23	\$75	\$329	\$496
	Cost Savings	\$0	\$0	\$0	\$0	\$68,349	\$770,828	\$1,045,603	\$1,751,748	\$8,745,537
Over Performance Adjust to Benchmark	Delta	\$0	\$4	\$4	\$23	\$39	\$59	\$111	\$365	\$531
	Potential Cost Savings	\$0	\$112,660	\$112,660	\$1,159,822	\$1,004,862	\$1,954,875	\$1,547,036	\$1,943,431	\$9,380,249

Potential Average Cost Savings = \$12.4M
 Potential Best Practice Cost Savings = \$17.4M

Figure 4

stimulate an environment for healthy competition, promoting ideas and opportunities to learn new techniques and methods for improving IMCOM's processes and delivery of services. CPI is simply a way of looking at how we can do our work better. When we take a problem solving approach, we engage in process improvement, seek to learn the root causes and then use this knowledge to reduce process variation, remove activities that have no value to the organization, and improve customer satisfaction. To foster collaboration and sharing of best practices, CPI results are reported in the Army Business Transformation web page at (<https://bt.army.mil/usarmycorp/Home.page>) and at www.garrisoncommander.com.

Effect Major Cost Drivers

In and of themselves, the Garrison Gunnery Table data do not drive cost. A "cost driver" is the unit of an activ-

ity that causes the change of an activity cost. Cost drivers are developed from the execution of the business activities (such as capacity utilization, plant layout, workforce involvement, etc.) in relationship to the amount of money to perform the activity. For a cost driver to be effective, the obligations must be directly proportional to the process outcome. One cost driver may not be enough. For example, in Service 800 (Military Services) it may require cost per identification card or cost per Soldier due to other processes performed.

The Army Stationing and Installation Plan is the source database for several performance measures in ISR-S and pacing measures in Army Service Based Costing. The remaining ISR-S pacing measure data come from ISR-I (facility square footage) and ISR-NI (environment, and improved and unimproved acreage). The pacing measure data are

certified by Garrison Commanders through other systems and top-loaded into SBC. When comparing garrison performance, marrying ISR-S cost data with the ISR-S pacing measures make it possible to benchmark garrisons and identify efficiency indicators, highlighting potential best practices.

Model and Analyze

Most of us have heard some version of the standard performance measurement cliché: "if you can't measure it, you can't control it; if you can't control it, you can't manage it; if you can't manage it, you can't improve it."⁷⁷ The fundamental reason for measurement is to benchmark and improve performance. Benchmarking involves leaders identifying the best garrisons in their region or any other region where similar processes exist; comparing the results and processes to one's own results; and learning how well the processes



Average Cost per Soldier

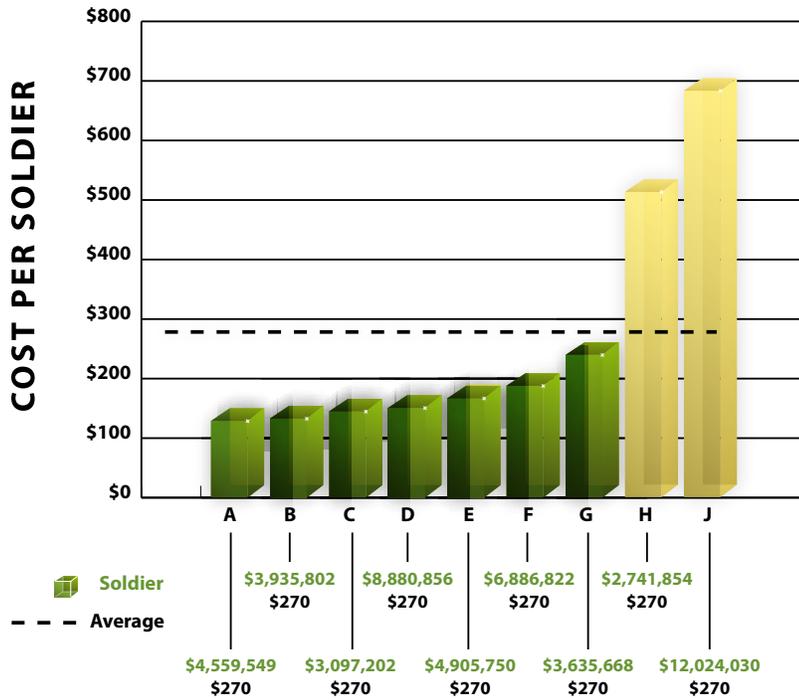


Figure 5a

perform against targets and, more importantly, how they do it.

IMCOM has been conducting Performance Management Reviews (PMR) for three years using Common Levels of Support and reported service costs. The PMR has progressed from a by-service side-by-side garrison review to statistical execution comparison to a process of comparing normalized service performance among garrisons. Typically, dividing the garrison's direct obligations by the SBC pacing measure standardizes garrison costs, allowing benchmarking and identification of potential best practices (Figure 4). One source available to anyone, for garrison obligations is through the Cost and Performance Portal (<https://cpp.army.mil>) and SBC pacing mea-

sures are available through ISRWeb (<https://isrtrain.hqda.pentagon.mil/>).

What is the average cost per driver? Is the garrison performance statistically acceptable? Can we realize cost savings by garrisons moving toward the average cost? By comparing delivery of service through financial obligations among the garrisons, the region can identify potential best practices and areas for further investigation. Our band of excellence is defined as the area between the upper and lower control limits (UCL and LCL, respectively). From accepted business practice, the UCL and LCL are each a three-sigma distance from the average.⁸

The comparison should not be taken at face value for action. Deeper cost

analysis is required to reach a resource informed decision. Is the lowest cost really the best? Maybe the employees are dissatisfied and leaving the organization. Through additional research, the tangible and intangible benefits can be documented and considered in a Cost Benefit Analysis. After a decision is reached, the benchmark practice may not be exportable to all garrisons; or only portions of it are exportable. Although some improvement can be achieved, one cannot assume that you will realize a 100 percent savings. Due to location, wage differences, and other factors; it is more likely garrisons could achieve 60-75 percent savings.

Lean Out Inefficiencies

Figure 5a shows the average IMCOM-SE Service 800 cost is \$277/Soldier. Assuming cost management efforts reduce the cost per soldier at Forts H and J, the average cost will eventually reach the adjusted average in Fig 5b at \$186 per soldier. The band of excellence is defined by the UCL of \$227 per soldier and the LCL of \$125 per soldier. Forts A-F are in the band of excellence: Forts A-D are at or below the average cost per soldier and represent potential best practices. Forts E-G are in the band of excellence, but above the average. Forts H and J are well above the average cost, and are highlighted as potential process improvement initiatives.

Forts E-J differential between their costs and the \$186 average represents a savings potential of \$12.4M. These garrisons are identified as opportunities for process improvement. Forts A-D are opportunities for best practices. Both require detailed investigation and cost-benefit analysis. The Region Director can decide to launch tiger



teams to document best practices or assist a garrison to reach the cost management band of excellence. Once Forts H and J reach the band of excellence, the next step is to analyze all installations around the validated best practice. If all installations in this example approach the best practice cost, the Region would realize a cost savings of \$17.4M.

Championing Change

Change is inevitable, and turmoil exists in its wake: budgets will shrink, jobs may be in jeopardy, and time is a valued commodity. To convert the hearts and minds to cost management, cost managers must maintain a flexible approach to deal with leaders, employees, and customers. While each constituency requires a different approach, it is generally described as awareness, buy-in/acceptance, participation, and evaluation/reward.

The concepts of cost management must be methodically introduced to build awareness. Active listening, genuine concern, and balancing triple bottom line requirements will build cost-awareness and program confidence. Cost managers must present leaders with viable cost-effective options in a timely manner. Employees need to see the leadership “walk the talk” by leading change through the incorporation of cost management techniques in their normal business. Carefully crafted strategic messages must inform Leaders, Soldiers, Family Members and Civilian employees of changes and results.

The organization benefits through unity of command and discipline. Leaders will buy in when cost management increases their effectiveness by leaning out inefficiencies. Management must be willing to invest the time and train-

ing resources to see the cost culture change evolve within their organization. Employees will buy in when the leadership empowers and encourages creative thinkers and critical reasoners to discover trends and outliers leading to greater efficiency and savings. The employee must be empowered to cross-coordinate and present innovative new ideas. If the employee cannot accept the cost culture methodology, the Army will have a distinct disadvantage competing for necessary future resources.

The entire organization will improve as everyone participates in the cost management process. Future resource requirements will be available because budgets are derived using actual costs to meet needs, rather than wants. Leaders and employees indoctrinate cost management tools every day into their daily activities for truer continuous process improvement. When cost culture measures and activities are common practice, the customers and

stakeholders will have greater confidences that IMCOM is balancing needs against available resources.

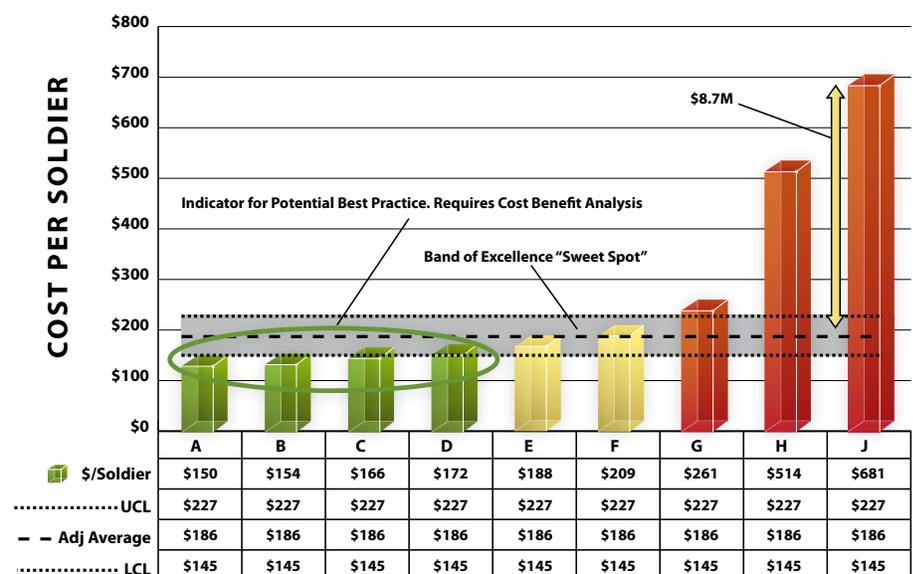
Leaders must continuously evaluate the cost-benefit process contribution. Are customer needs being met? Are employees rewarded for increasing efficiencies? How are other organizations improving? A policy for rewarding teams and individual practices should be implemented to cement the leadership’s commitment to employees for a long-term cost culture pledge.

Exceptional Stewardship

The future will require exceptional stewardship to ensure that our Soldiers, Families and Civilians have the resources required to train, deploy, fight and win; support well-being, and have a safe and healthy infrastructure and environment in which to live. Garrison commanders will be continuously challenged to operate within the cost management band of excellence and balance

Figure 5b

BAND OF EXCELLENCE: Based on Adjusted Cost Average





the triple-bottom-line customers.

As leaders, we are entrusted to responsibly execute the resources provided to meet directed service levels. The performance objectives we choose must add value to the process. We cannot afford to rely on metrics that emphasize the immediately measurable and ignore high value measurements simply because they seem harder to measure. If closely tied to outputs, performance metrics encourage improvement, effectiveness and appropriate levels of control. We must make resource-informed decisions to ensure that the costs, projected benefits and trade-offs were considered before obligating resources. The available data and cost management techniques must be incorporated to supplement our professional experience and military judgment.

Cost management is about balancing “doing the right things” and “doing things right.” Continuous process improvement focuses on doing things right. Strategic management and leadership define what the right things are. Garrisons require good business strategies, solid business rules and efficient operations to deliver cost-effective services to our customers.



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Fort Drum Forest Management: Innovation Brings Sweet Profits

by Jason Wagner, Chief of Natural Resources Branch, USAG Fort Drum

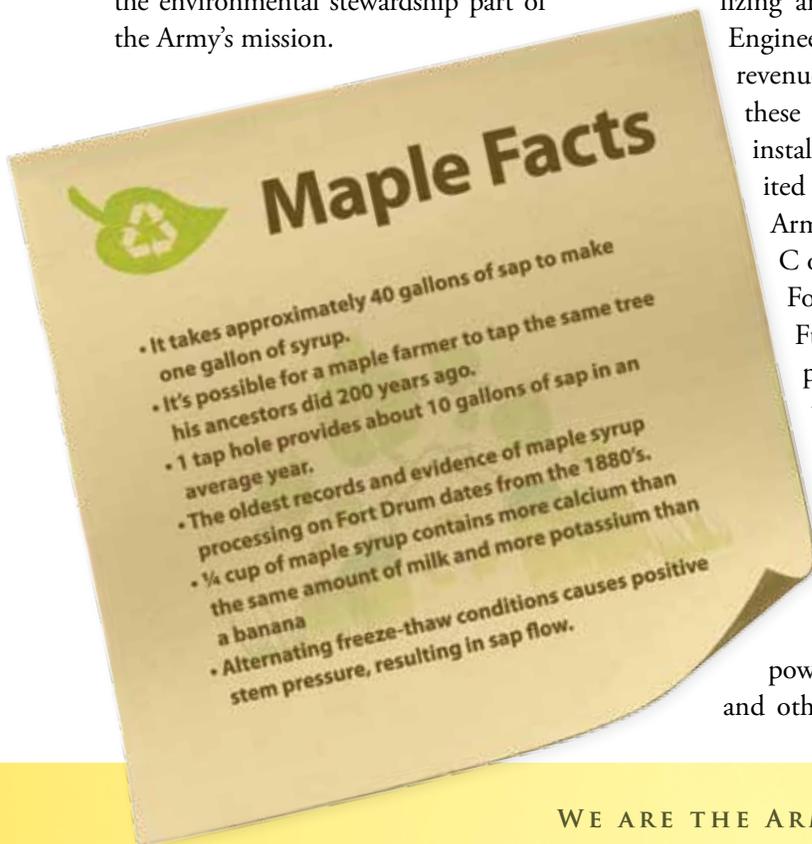
With over 65 percent of the installation covered in some type of forest land, historically there have been no conflicts between mission, training needs, timber harvest objectives and funding.

As an installation Natural Resources Manager with 10 years experience as an Army forester, my notion of sustainability encompasses forest management principles and sound ecosystem management. Sustainability, in this perspective, has been the primary goal of my professional career, to include developing timber management objectives, emphasizing sustainable forest products, manipulating the forested environment for direct mission support, and ensuring ecosystem sustainability and biodiversity. This sustainability focuses on the environmental stewardship part of the Army's mission.

Since the 1960s, the Fort Drum Forest Management Program has practiced sustainable forest management, originally focusing on commercial timber harvesting and tree planting for soil stabilization and erosion control. Until the late 1980s, the primary program driver was to capture available timber value from Army real estate while planning ways to grow more forest for future harvests. Forestry staff marks trees to be harvested with paint and then sells that standing timber on the open market to the highest bidder utilizing an Army Corps of Engineers contract. The revenue generated from these sales, from every installation, is deposited into a centralized Army Reimbursable Conservation Forestry account. Funding is then provided back to the installation level Forest Management Program to cover operating expenses, such as man power, equipment, and other forest manage-

ment projects. This centralized funding mechanism is a critical element of the program. Timber markets, like any agricultural product, tend to be cyclical. If Fort Drum has a low income year due to low markets, cutting restrictions or training requirements that wouldn't allow harvests to occur, then the program would be funded through the centralized reimbursable forestry program. Generally the funding in the accounts comes from an installation in another region that had net profits that year. Historically, the Army Reimbursable Conservation Forestry program has a net profit yearly and after basic operating costs are funded they then fund installation requests for forestry and natural resources projects.

In 1992 the Army developed a new Environmental Strategy that was based on four pillars, conservation, restoration, pollution prevention, and compliance. This led to the development of the Conservation Branch at Fort Drum and the hiring of new biologists which tripled the staffing levels from 2 to 6 personnel. Up until that time the 2 foresters handled all natural resources related issues on the installation. The Army's new emphasis on conservation began to shift the forest management strategy from purely maximizing yields to ecosystem management



- Maple Facts**
- It takes approximately 40 gallons of sap to make one gallon of syrup.
 - It's possible for a maple farmer to tap the same tree his ancestors did 200 years ago.
 - 1 tap hole provides about 10 gallons of sap in an average year.
 - The oldest records and evidence of maple syrup processing on Fort Drum dates from the 1880's.
 - ¼ cup of maple syrup contains more calcium than the same amount of milk and more potassium than a banana
 - Alternating freeze-thaw conditions causes positive stem pressure, resulting in sap flow.



Fort Drum Forester Travis Ganter collects the days run of maple sap. On a good day each tap can produce up to 2 gallons of sap.

centered on diversity, wildlife habitat, air and water quality, soil conservation and watershed protection.

Forest management activities in the last ten years have reflected the needs of the “missionscape” development, the creation and maintenance of forested environments requested by the training community. Regardless of the primary objective, requirements still followed the model of cutting and selling saw timber to provide income to cover the program’s operating expenses. With over 65 percent of the installation covered in some type of forest land, historically there have been no conflicts between mission, training needs, timber harvest objectives and funding. However, the last few years have brought some significant challenges to the Forest Management Program.

One challenge arrived in the discovery of Fort Drum’s first endangered spe-

cies--the Indiana bat (*Myotis sodalis*). This tree-dwelling bat lives and raises young during the summer in large mature trees with exfoliating bark. Through consultations with the US Fish and Wildlife Service, Fort Drum has a conservation protocol in place to not cut down any standing trees between April 15 and October 1, effectively losing 6 months of commercial saw timber operations.

Another challenge to the Forest Management Program is on-post development. For the past three years, Fort Drum has seen a sharp increase in infrastructure and facility development with a new brigade combat team and Army transformation. This construction has permanently removed a large acreage of mature forest from the available timber inventory.

Simultaneously, there has also been a drastic down turn in the timber mar-

kets due to the economic slump the country is experiencing, especially in the housing industry. Historic average prices of \$1.50 a board foot for quality maple and cherry hardwoods have dropped to an average of \$0.50. The Army’s Reimbursable Conservation Forestry Program’s funding levels, which historically covered the program’s operating expenses, have subsequently been reduced.

With all these compounding issues, the Forest Management Program funding quickly became unsustainable. In looking for other opportunities, the program began researching other marketable forest products or commodities. Other installations have been successful marketing their pine straw while still others have large agricultural leases that augment their timber harvesting program income. The Fort Drum area has the annual educational “Maple Days.” Why not capitalize on the success



of Maple Days and create a commercial maple syrup processing operation, an idea that is pure “North Country”?

New York is one of the leading states in maple syrup production in the United States, and the bulk of that production takes place in the three counties surrounding Fort Drum. Historically, maple syrup prices have been exceptionally stable (\$30-\$35 gallon in New York) and are currently trending upward due to increased global demand. Maple syrup is a North American product, native to southeastern Canada and the northeastern United States. Producers in the U.S. and Canada provide syrup for the rest of the world, and are struggling to keep up with global demand. In September 2008, New York Senior Senator Charles E. Schumer released a statement in support of the New York State maple industry and called for increased utilization of the state’s maple resource. In the press release, Senator Schumer supports the establishment of a maple syrup bottling plant in Lewis County, one of Fort Drum’s neighboring counties. The creation of a bottling plant would allow local producers the opportunity to sell bulk syrup locally, instead of sending it out of state for bottling.

Fort Drum Forestry’s first foray into the maple syrup arena began on a rainy spring day in 2006 at our first Maple Days event. This event featured 25 trees tapped with buckets to collect the sap and a 2 foot by 4 foot wood-fired evaporator set up in a parking lot next to a sugar maple stand. Twenty-five brave souls from the Fort Drum community came out to see what was happening. The process of collecting and boiling maple sap into pure maple



Fort Drum Forester Rodger Voss gets the evaporator started for a day of education at the “Sugar Shack”.

syrup was demonstrated. Of the 25 attendees, 20 of them had no idea where pure maple syrup came from, nor had they ever tasted it. It was a shocking realization that Soldiers and their Families living and serving on post had very little experience with what Northern New York had to offer. This realization validated the creation of a small maple syrup processing demonstration area for the following year’s Maple Days event. The demonstration area consists of a small shed to house the evaporator, a stack of firewood and approximately three acres of mature sugar maple trees to collect sap from.

The goal of Maple Days, a unique outreach program is to provide a truly unique experience in the Department of Defense by educating Soldiers, Families, Civilians, contractors and Fort Drum neighbors on another sustainable forest product. It has grown into a huge success story for everyone involved.

Since 2006, on the last two Saturdays in March we hold our Maple Days event and provide proof to Fort Drum’s new residents that winter’s blowing cold and deep snow is about to end and that spring will indeed come. As daytime temperatures start to rise above freezing, sap begins to flow from the roots of



Almost syrup! Fort Drum Forester Rodger Voss explains the boiling process.

the sugar maple trees. The alternating freeze-thaw (night/day) cycle creates pressure in the tree which pushes high levels of sap up the tree. We “tap” trees by drilling a quarter inch hole into the tree, into which a small metal spout is inserted to direct this flowing sap into a bucket hanging on the tree. When day/night temperatures are optimum, a steady drip/dribble occurs. When the sap comes out of the tree it is approximately 97 percent water and 3 percent sugar. Sap is collected and then boiled in a wood-fired evaporator. Once it is boiled long enough to remove 65 percent of the water, all that’s left is pure

maple syrup. The demonstration area gives visitors the chance to see the process first hand. Foresters lead tours through the woods explaining the parts of the tree, how we tap and collect sap as well as the importance of non-wood based forest products management. The syrup season can last anywhere from about 2 to as many as 8 weeks but 4-6 weeks is the norm. It comes to an end once the trees begin to sprout buds. When this occurs, the syrup loses its maple flavor. In 2010, over 500 visitors attended the event, learned how to make syrup from trees in their backyard and most of all, enjoyed the sweet

taste of a sample of maple syrup, cooled from the boiling process.

Capitalizing on this great event, in 2011, the Forest Management Program is starting a commercial scale sugaring operation. Over a thousand trees will be tapped with an additional 4,000 taps planned in the future. Due to the classic tap and bucket approach being very labor intensive, the program will utilize a plastic tubing collection system. A network of tubing will run from tree tap to tree tap which pipes the sap into a 500 gallon tank on the side of the road. This allows one per-



son to pump out the tank from each “sugar bush” (forested area dominated by and managed for sugar maple trees) in a matter of minutes versus multiple people carrying buckets for the whole day. Another advantage of tubing/pipeline systems is it allows for the freshest sap to be collected and transported to the evaporator. The faster sap can be processed the higher the quality of the resulting syrup. Since higher quality syrup commands a higher price, it makes sense to collect and boil sap as quickly as possible. Some small areas will still utilize the tap and bucket approach to avoid conflicts with training activities. A reverse osmosis machine will also be used to increase efficiency. Reverse osmosis is typically used for water desalination operations where a semi-permeable membrane is used to separate water from minerals and impurities. In the maple syrup production world, water is the by-product and the sugar concentrated sap is the product. This process removes up to 50 percent of the water resulting in about a 70 percent reduction in fuel costs associated with boiling. An operation of this size can be expected to produce around 2,300 gallons of syrup in one season. Due to the weather-dependent nature of maple syrup production, this number could be slightly higher or lower. Using a conservative estimate of \$30 per gallon, this equates to potential gross revenue in the range of \$69,000 per year for about 9 weeks of work.

By utilizing this management strategy in the cantonment area, which is dominated by mature sugar maple forests interspersed across the area, we promote and educate people on the natural and cultural heritage of Northern New York. Prior to government ac-

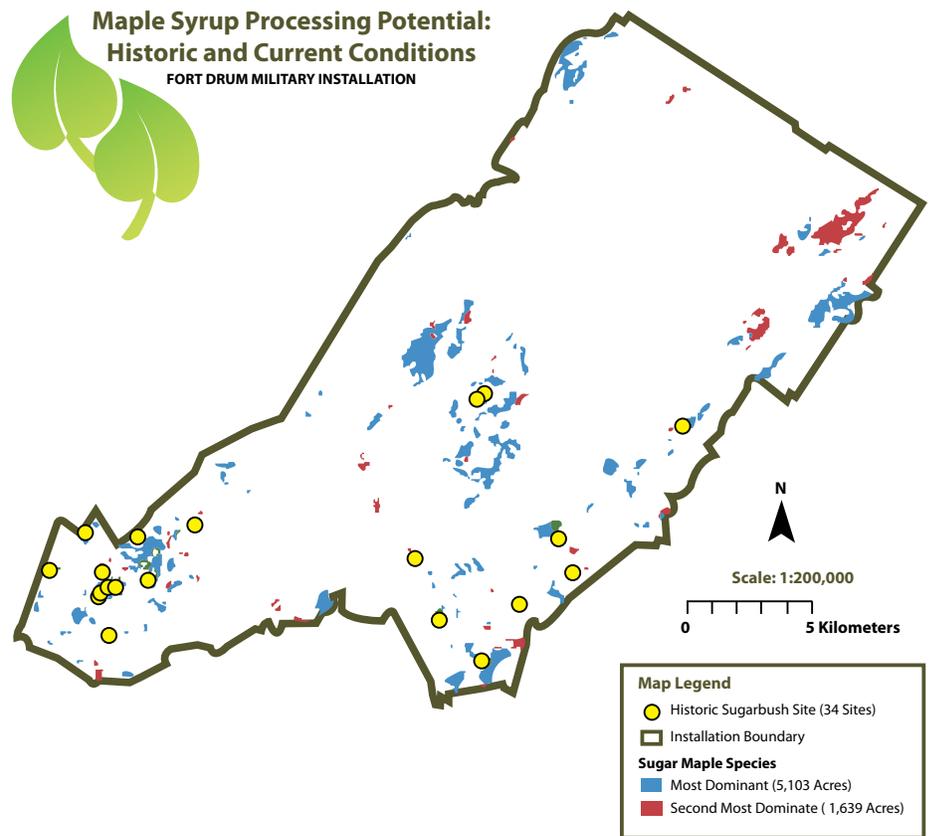


Figure 1

quisition in 1940-1944, the land that is now Fort Drum played a major role in local maple syrup production. The included map (Figure 1) illustrates all of the known historic processing sites once located on Drum proper. The map also shows all of the sugar maple stands currently on the installation with the potential for syrup production.

To accurately compare economics between a classic timber harvest system and a maple syrup processing operation, it is necessary to assess revenue derived from an individual tree. On average it takes 90-120 years for a sugar maple tree to reach adequate size (18-22 inches diameter at breast height) and form for use as a high quality saw

log. A tree of this size will yield approximately 320 usable board feet. At the current average of \$0.50 per board foot, this equates to potential revenue of \$160 per tree. In comparison, this same tree put into syrup production could conservatively be tapped for approximately 50 years. Over that 50 year period, each tree has the potential to produce a minimum of 0.5 gallons annually. This equates to the production of approximately 25 gallons of syrup throughout the life of the tree. At an average of \$30 per gallon, each tree would yield \$750. As a tree reaches its expected life span, sap production will decrease. At this point the tree can be harvested and sold, which should still yield a quality saw log



(bottom 6-8 feet removed due to stain caused by tapping). The revenue potential for a previously tapped tree will conservatively bring \$100. This means that a tree used for maple syrup production could provide \$850 in revenue over its expected life span. In summary, putting a tree into maple syrup production has the potential to provide five times more revenue than simply harvesting the tree for saw log production.

Anyone who has ever lived or worked on Fort Drum will most likely recall the beautiful fall colors across much of the landscape, in large part due to sugar maple trees. Between mid September and late October, the hardwood forests of New York and New England draw a million tourists and generate \$1 billion in revenue. Sugar bush management strategies directly lend to the preservation of these unique, aesthetically pleasing, and historically significant qualities of Fort Drum, New York.

These installation sugar maple stands, which are managed for maple syrup production, also solve another problem by providing suitable habitat requirements for the endangered Indiana bats. The retention of large diameter trees allows for suitable roosting habitat. The open understory structure of these stands also provides travel corridors for the bats and protection from predation. With the recent changes in suitable bat habitat due to construction and changing land use in the cantonment Area and surrounding communities, it is critical to maintain and enhance the remaining suitable Indiana bat habitat. Sugar bush management directly supports Fort Drum's endangered species conservation measures.

Promotion of the local maple syrup

producers in the surrounding communities is done by holding the annual event and directing our Soldiers and Families to purchase their syrup. We provide samples and sell small souvenir bottles (enough for a pancake or two) but we do not sell the popular half-gallon to gallon sizes. This avoids direct competition with the small family operations that surround the installation. The commercial sale of syrup will be done by selling 40 gallon drums into the wholesale market, which helps promote and feed into local bulk sales and the commercial viability of the syrup industry in the North Country.

Our outreach program is also directly aligned with the IMCOM Community Campaign Plan's Soldier, Family and Civilian Well Being line of effort. The Maple Days event is not only educational and fun but provides a great outdoor activity for everyone who may be suffering a little cabin fever from the legendary north country winter. It is rewarding for this garrison to provide our Soldiers and Families this unique experience available only in the north country.

The Fort Drum Forest Management program challenges other garrison Natural Resource teams to take a step back from the way things have always been done and use some innovation to increase the sustainability of your programs. The results can be "Sweet!"

Jason Wagner is chief of the Public Works, Environmental Divisions, Natural Resources Branch at Fort Drum. He holds a Masters Degree in Forest Management and Silviculture, as well as a Bachelors Degree in Environmental and Forest Biology concentrating in Wildlife, both from the State of New York College of Environmental Science and Forestry.





Solid Waste Diversion on Fort Jackson

by **Tameria Warren**, Sustainability Management System Coordinator, Environmental Division, Fort Jackson, SC,

Ken Burghardt, Environmental Division Chief, Fort Jackson, SC, and **COL JJ Love**, Commander, USAG Fort Jackson, SC

Many of the aspects of Fort Jackson's sustainability policy - particularly continual improvement, pollution prevention, and sustainable programs - are evident within the initiatives executed on the installation.

Introduction - Why It Matters

The Army's strategy for the environment, "Sustain the Mission - Secure the Future", is the base on which Fort Jackson has built our over-arching environmental programs. Being the largest and most active initial entry training center in the Army, we have a large-scale task of preparing generations of the nation's future leaders for combat action and international and domestic security. While proudly executing this mission, we have also undertaken the responsibility of ensuring the environment and resources impacted by training are preserved for both current and future needs. Fort Jackson has embraced environmental stewardship as a key to success in implementing the Installation Management Campaign Plan and ultimately what makes the installation a viable presence in our local community – in this case - the Midlands area of South Carolina. Our dedication to serving this great country, the shared responsibility for the well-being of its surrounding neighbors, and the "bootprint" left on the land are what lead Fort Jackson on our quest for sustainability. Our motto, based on our location in the "Palmetto State" of South Carolina, is appropriately articulated as "**PALMS**" - Promote continual improvement,

Always be in compliance, Look to prevent pollution, Manage sustainable programs, and Sustain natural and cultural resources.

The Scope and Effort

The installation has a massive effort ensuring waste is properly managed, especially given the number of Soldiers, Civilians, tenants, and visitors on the installation on a recurring basis. We train approximately 50,000 Soldiers with basic and advanced individual training annually. Fort Jackson trains an additional 12,000 soldiers in the U.S. Army Soldier Support Institute (SSI), U.S. Army Chaplains Center and School, and Drill Sergeant School. In addition, Fort Jackson accommodates 3,900 active duty Soldiers, 14,000 Family members, 5,200 Civilian workers, 36,000 retirees, and over 100,000 visitors (for graduation activities) annually.

Fort Jackson's Environmental Division established a solid waste management program to address the challenges pertaining to the generation and disposal of solid waste by this large and diverse population. Our program aligns with the goals and metrics outlined in Executive Orders (EOs) 13423 and 13514 and the

Installation Management Campaign Plan (IMCP). It includes increased acquisition of environmentally-preferable and recycled-content goods and services and increased diversion of both non-hazardous solid waste and construction and demolition (C&D) waste, plus other applicable laws and regulations.

Our program utilizes an Integrated Solid Waste Management Plan (ISWMP) which outlines the objectives, strategies, and responsibilities for improving solid waste management through source reduction, reuse, recycling, composting and mulching, and "green" or affirmative procurement for items such as furniture and bio-based penetrating lubricants. Many of the aspects of Fort Jackson's sustainability policy - particularly continual improvement, pollution prevention, and sustainable programs - are evident within the initiatives executed on the installation. One of our biggest programs, managing a portion of solid waste on the installation, is one we are most proud of – our Qualified Recycling Program (QRP).

Fort Jackson's QRP spans over 25 years, when initial activities were overseen by a recycling planning board representing Community Affairs, Maintenance,



Environmental, and various installation units and activities. In 1991 recycling activities were formalized into the Fort Jackson Recycling Program, and in June 1998, Fort Jackson's leadership formally signed and established the Memorandum of Instruction (MOI) for the QRP, making it mandatory for all Fort Jackson military and civilian personnel to incorporate waste prevention and recycling into daily operations. From the MOI, we developed the Qualified Recycling Program Handbook. Our handbook, developed in consonance with DOD, U.S. Army Office of the Assistant Chief of Staff for Installation Management (OACSIM) and Army guidance, addresses the following goals:

- Increase recovery of recyclable materials via the diversion of non-hazardous solid waste (excluding C&D debris) and increased recycling categories

- Improve direct sales and unit incentive programs
- Maximize net dollar sales and savings for installation recycling funds

The installation's Recycling Planning Board, which is chaired by the garrison commander, is the governing body for recycling activities on Fort Jackson. Aside from reviewing projects submitted to the board for funding, the board meets semiannually to review and track financial solvency of the QRP, review Recycling Center operations and projects, consider recommendations for proposed expenditures, and promote the QRP. What is outstanding about the Recycling Planning Board is that it includes membership from throughout the installation to ensure both mission and garrison concerns are addressed. Figure 1 is the representation of the board:



Figure 1

HOW IT WORKS... AND WHY

Through the operations of Fort Jackson's Recycling Center, waste diversion and recycling efforts are realized on a larger scale. Our Recycling Center personnel manage and operate recycling drop-off services; coordinate the pick-up and delivery of recyclable materials for units, organizations, and housing residents; pro-

vide a learning center for interested visitors and school children; and coordinate programs essential to the QRP. The center accepts numerous categories of waste for recycling, all of which are outlined in the Reuse/Recycle/Disposal (R2D1) Guide, Disposal Guide for Housing Residents, and Fort Jackson Environmental Guidebook.

Diversion — A Key Component

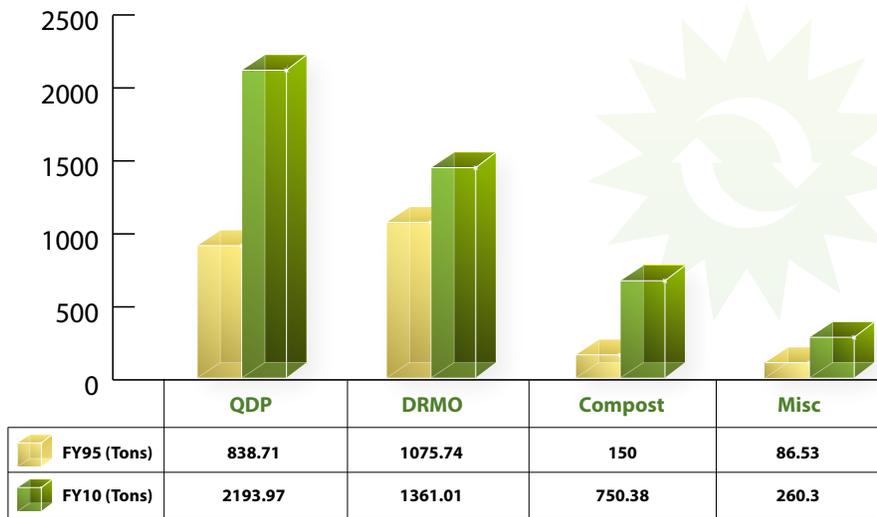
Diversion practices have steadily grown over the years and with the inclusion of new and expanded recycling categories, diversion numbers are on track to increase. Figure 2 is a snapshot of the generation and diversion of non-hazardous solid waste - expressed as Municipal Solid Waste (MSW):

Increased diversion has not only propelled the amount of recyclable materials collected on the installation, but has generated substantial savings.

Construction and demolition (C&D) waste is excluded under the QRP, but its impact on diversion is substantial. Nowhere is this more evident than in the construction, demolition, and renovation projects occurring on the installation. In order to meet executive orders to increase sustainable practices in new construction and major renovation, projects are required to meet Leadership in Energy and Environmental Design (LEED)[®] certification for Silver as set by the U.S. Green Building Council (USGBC). Fifty percent of the project waste must be diverted to meet the requirement, and in some cases, contractors or project managers have diverted at least seventy five percent to generate extra LEED[®] points. These efforts have played a huge role in increasing Fort



MSW Diverted



DIVERTED = Reuse, Recycle, and Compost Activities

Figure 2

Jackson's C&D waste diversion efforts. With the inclusion of C&D waste generated from numerous projects, we have processed and crushed over 12,000 tons of concrete and 1,200 tons of asphalt at its concrete and asphalt reuse site. The site has been in existence for approximately eight years and has been the central location for C&D waste generated by both Fort Jackson personnel and contracted groups. By crushing the waste onsite, the installation has avoided nearly \$351,000 in landfill tipping fees -which does not include transportation costs. This is not only financially beneficial, but the C&D waste serves as fill for roads and stabilizer for erosion control.

The QRP oversees another aspect of waste diversion with the sales program for expended small arms brass cartridge casings generated at rifle ranges. The brass cartridge casings are collected by the units and trans-

ported to the Ammunition Supply Point (ASP) for processing. The DLA Disposition Services [formerly the Defense Reutilization and Marketing Office (DRMO)] is then responsible for soliciting bids for sales. During FY10, collections for the recycling program totaled \$1,092,000.00 of which \$744,000.00 was from brass sales. The sale of small arms brass cartridge casings has recently been impacted by the current ban on deforming small arms brass cartridges and selling them locally through the Mission and Installation Contracting Command (MICC). Brass sales through

MICC brought a good price and the funds were received for the recycling program the day of the sale. Under the ban, Fort Jackson is selling undeformed brass through DLA Disposition Services and receiving a good price, but receipt of funds is delayed by up to three months. When the ban is eventually lifted and we are able to deform the brass and sell locally through MICC, we will regain the flexibility to sell through either MICC or DLA Disposition Services depending on which option will bring the best price.

Another initiative being pursued through the QRP is the used grease and cooking oil program. Fort Jackson has various facilities in which used grease and cooking oil are generated in large quantities and would benefit from an established reclamation process. Until recently, the waste was collected and managed by an independent contractor with no costs incurred by the installation. Unfortunately, we were missing an opportunity to financially profit from the waste



Figure 3



UIP Collected Recyclables for FY10

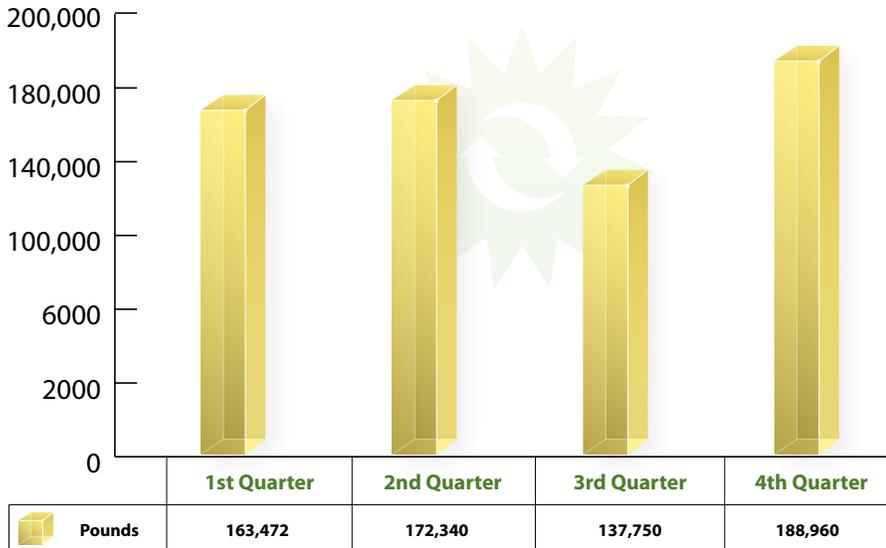


Figure 4

Largest Unit Payout FY10

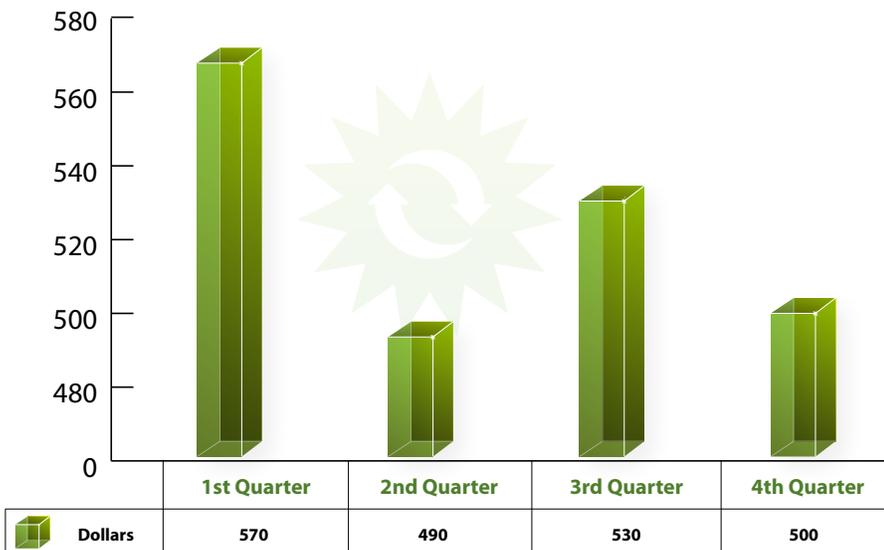


Figure 5

stream. The installation has established a contract with a regional vendor to manage the waste at the current Southeast market value. The vendor

services approximately 25 locations onsite (including the dining facilities (DFACs), the Fort Jackson Recycling Center, the NCO Club, the Officers

Club, the bowling centers, and an installation school). Fort Jackson's goal is to better reclaim the waste stream while benefitting monetarily.

Benefits — What We Achieve

Activities and initiatives associated with the QRP have allowed Fort Jackson to amass funds that would benefit organizations financially and further promote the installation's sustainability commitment of preventing pollution. The Unit Incentive Program (UIP) encourages military units to actively recycle on a continual basis. Units that participate in the UIP deliver their recyclables to the Recycling Center and receive points based on the number of pounds delivered. The UIP distributes a total of \$5,000 in monetary awards each quarter to participating units based on the number of points accumulated during the quarter. Figures 4 and 5 highlight the success in promoting unit recycling aggressiveness. Figure 6 depicts unit payouts and amount collected for the 4th quarter of FY10

While the military units benefit directly from their recycling efforts, other organizations at Fort Jackson can take advantage of the recycling funds as well. Money generated through the QRP can be used to fund projects approved by the Recycling Planning Board for pollution abatement, energy conservation, and occupational safety and health. This has proven beneficial for programs and initiatives lacking financial support or qualifications from other funding sources. In addition, recycling funds are transferred to the Directorate of Family and Morale, Welfare, and Recreation (DFMWR) for various projects such as the construction of Fort Jackson's walking



trail and gym renovations. DFMWR received approximately \$395,000 from the recycling program FY10 profits.

Figure 7 depicts a snapshot of some of the projects funded under the QRP:

Our Way Forward

Fort Jackson's QRP has been very instrumental in increasing diversion and recycling initiatives over the years, and we are pursuing an expanded set of goals and objectives. The exciting thing is that in addition to our QRP, other programs and objectives have been established and are making significant progress across the installation.

Acknowledging our QRP is limited in the kinds of waste that can be recycled, our Environmental Division has expanded the Solid Waste Management program and the opportunity to recycle more items. The post mulch site accepts yard waste, broken wooden pallets, some compostable food waste, and bulky trash; the Auto Craft Shop accepts used motor oil, anti-freeze, and oil filters; the Army and Air Force Exchange Service (AAFES) Tire Center accepts used POV tires; and the Thrift Store accepts clothes, furniture, toys, appliances, and other household items. Fort Jackson is also collaborating with Goodwill Industries to donate used clothing, appliances, other personal and household items. Additionally, we have partnered with the City of Columbia in the Nike Reuse-a-Shoe campaign; a sustainable program that grinds used athletic shoes into material used in track surfaces, gym flooring, playground surfaces, basketball and tennis courts, and in some cases, new Nike products. All of these are positive steps in the

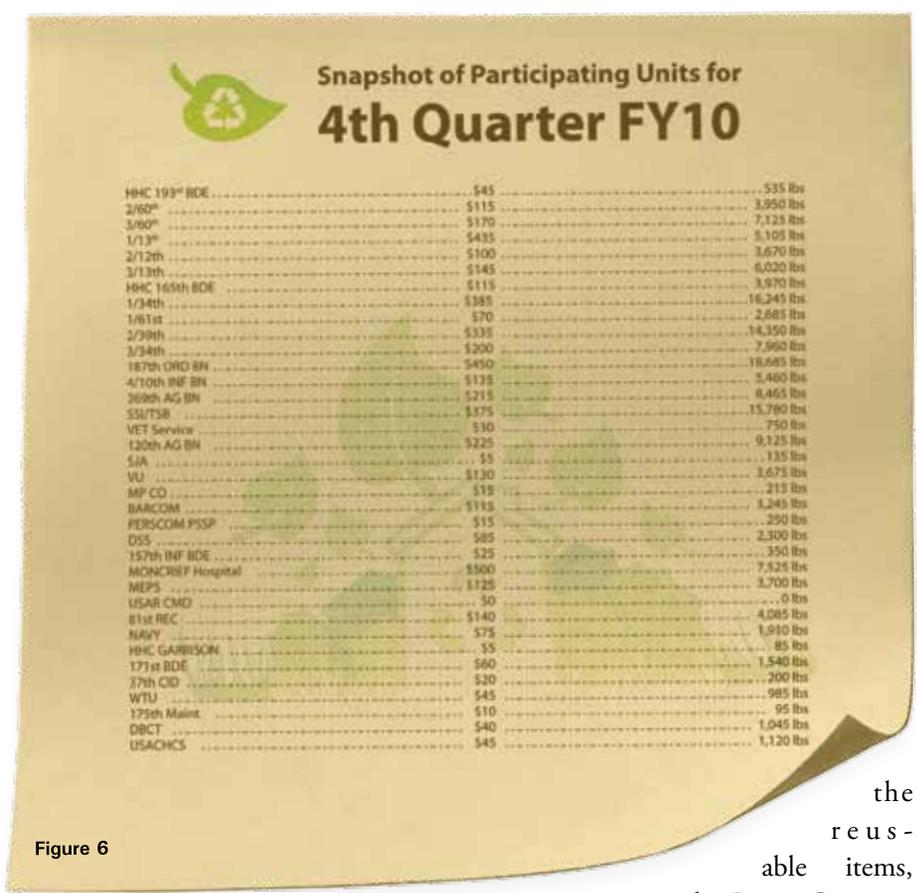


Figure 6

right direction. One of the best practices we have implemented, however, is our Reuse Center.

Fort Jackson's Reuse Center sets the bar for conserving natural resources and reducing environmental pollution by providing a haven for reusable materials. The center serves as a central location where used and recyclable materials can be dropped off and possibly used in other locations on the installation. Paint (both new and used) is the largest stocked item, but other products are just as popular, including general cleaning supplies, automotive materials, and building or maintenance supplies. There are also office supplies (i.e. pens, pencils, and folders), arts and craft supplies, and even books that are turned in for reuse. In addition to

the reusable items, the Reuse Center is a drop-off location for used cell phones and universal waste (light bulbs, rechargeable batteries, and mercury-containing equipment). As the installation has increased recycling efforts and undergone numerous internal and external compliance audits, units and organizations have been diligent about using the Reuse Center in a constructive way.

From the Recycling Center to the Reuse Center, there are various outlets on Fort Jackson to divert and recycle materials. In an effort to continuously improve, the installation is pursuing a new initiative that could save Fort Jackson thousands of dollars and lower its impact on local landfills. We are exploring a partnership with Waste 2 Energy (W2E), an organic waste management facility that uses a closed-loop

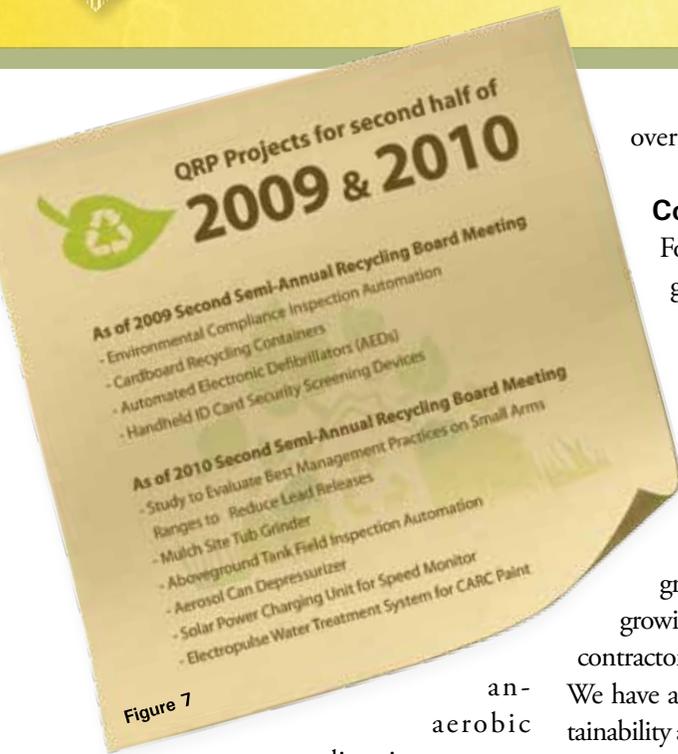


Figure 7

anaerobic digestion system to break down organic waste into biogas, compost, and liquid fertilizer. The resultant material (which surprisingly is minimally odorous) can be used for local agricultural, commercial, and residential land applications. In addition, W2E could supply the organic power into existing electrical grids and potentially provide electricity, green natural gas, and green compressed natural gas. The W2E Columbia facility is the first of its kind in the United States and will be the prototype for six other projects. Since W2E uses organic waste, Fort Jackson would be an ideal supplier because of the large amount of food waste generated from the DFACs. Of the total amount of MSW disposed of each year, approximately 45 percent is food waste. Diverting this waste from the landfill could reduce landfill tipping fees by as much as \$123,000, as well as generate additional savings from decreased dumpster maintenance and pickup costs. It is estimated that pursuing this initiative could increase Fort Jackson's diversion rate to

over 55 percent.

Conclusion

Fort Jackson has witnessed the growth of our Solid Waste Management Program beyond general refuse pick-up to a sophisticated diversion and recclamation system. We are no longer restricted to a limited selection of recycling categories, but offer a diverse grouping that benefits an ever-growing population of employees, contractors, tenants, units, and visitors. We have also extended the realm of sustainability and environmental responsibility from beyond the borders of the cantonment to the training sites impacted by our Soldiers and our local community.

As our sustainability policy implies, we are firmly committed to continuously improving - including tackling challenges now and in the future. To guarantee that all individuals and organizations adhere to and support the recycling initiatives on an installation the size of Fort Jackson is a huge task, but through continued support from leadership and committed personnel the effort will be less challenging. Fort Jackson's sustainability management system (SMS) is based on the premise of continual improvement and all of its programs from the QRP to daily environmental management are a true reflection of that.

Fort Jackson is working hard to sustain its immediate and long-term mission, as well as secure its future by implementing goals and initiatives that are sustainable. By standing on its policy to promote continuous improvement, be in compliance, prevent

pollution, manage sustainable programs, and sustain resources, we are decreasing our "bootprint" on the surrounding and expanding environment.



Ms. Tameria Warren is the coordinator of Fort Jackson's Sustainability Management System (SMS). Her environmental experience extends both in the public and private sector, previously working as an environmental engineer at General Motors for over six years.

Ken Burghardt is Chief of the Fort Jackson Environmental Division where he has worked for over 28 years, serving as Chief for the past 22 years. He is a retired Army engineer LTC and served on active duty and in the Army Reserve for 28 years.

COL James J. Love is the Commander of USAG Fort Jackson and has been in command since June 2010. Previous assignments include Commander 1st Squadron 10th Cavalry in Iraq and Fort Hood, TX as well as other operational assignments as an Armor Officer over his 23 years of service.



There's Gold in Those Woods—the Accounting is Clear

by Robert R. Baumgardt, Public Works Director, USAG Fort Stewart

Fort Stewart is poised to save approximately \$2.5 million off its annual utility bill while increasing its renewable energy component from zero to at least 62 percent.

In Fiscal Year 2010, Fort Stewart and Hunter Army Air Field consumed over 305,000 Megawatt-hours (MWH) of energy at a cost of \$14.7 million. On average a MWH of energy cost just \$47.88. Compared to Europe or major metropolitan areas in the United States this cost seems very moderate. One might be tempted to quickly conclude that little else can be done to economically save energy and dollars; but that is far from the truth. Fort Stewart is poised to save approximately \$2.5 million off its annual utility bill while

increasing its renewable energy component from zero to at least 62 percent. To do this, we will double the amount of reportable energy that we consume today. An interesting conundrum: Should we save money and increase the amount of renewable energy used or reduce the amount of reportable energy used?

Current Energy Mix and Costs

Electricity and natural gas are the two largest energy carriers at Fort Stewart making up nearly 97 percent of their energy mix. Fuel oil and propane make up the rest of the energy pie as shown at Figure 1.

other use of steam is to drive two heat absorption chillers, which produce chilled water to cool the same buildings on the distribution system.

In January 2011 boiler #4 came on line. This boiler is wood fired and is the cheapest source for producing steam. In fact, wood-fired steam costs the installation just 60 percent of the cost of gas-fired steam. This is graphically shown at figure 4.

Wood-fired steam compares favorably to gas-fired steam and electricity when it comes to cooling buildings. Compared to natural gas, wood reduces the cost of cooling by 40 percent. Compared to electricity, wood has a 22 percent advantage over the average annual electric cost of \$64.82/MWH in FY 2010. However this is understated. Fort Stewart's electricity is priced at hourly intervals, which go up and down with demand. Last year the cost reached a peak of \$195.40/MWH during the height of summer cooling season. Against this extreme, the wood advantage grows to over 74 percent. It is anticipated that producing steam from wood instead of natural gas will save the installation up to a million dollars a year. Even so, only a fraction

Figure 1

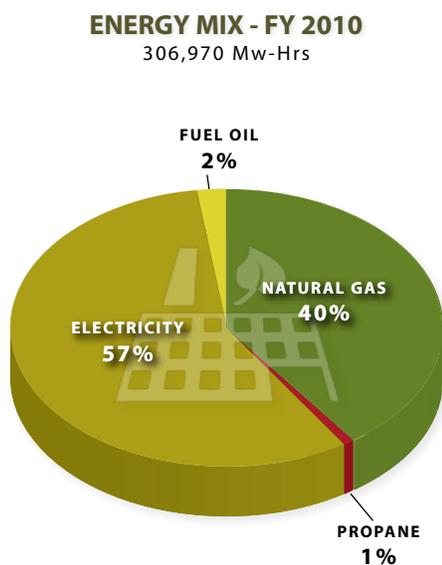


Figure 2 depicts electricity as the main cost driver at 57 percent of the energy used and 77 percent of the dollars spent. A review of average commodity prices shown at figure 3 shows that fuel oil and electricity are the two highest cost energy carriers while natural gas and wood are the two lowest. No wood was used in FY 2010 due to ongoing repairs to the wood-fired boiler.

Central Energy Plant and Boiler #4

The biggest single user of energy is the central energy plant which uses natural gas to produce steam, used for heating and domestic hot water use at over 120 buildings in the cantonment area. The



of the boiler's capacity will be used. This underutilized asset presents the installation with an interesting opportunity to save even more money going forward.

Boiler #4: An Underutilized Asset

Even converting all current steam production to Boiler #4, it is a severely underutilized asset. In the past, all the steam that the boiler produced was used, and even then it was not enough. However, new hot water and chilled water distribution lines, coupled with other energy-saving projects have reduced the demand to the boiler to approximately 40 percent of its designed capacity. A more interesting use of boiler #4 might be to produce electricity.

An ongoing study of Boiler #4 seems to indicate that an investment of approximately \$12 million is needed to generate 10 MW of electricity or 80,000 MWH per year. At current wood prices, electricity could be produced at \$49.00 per MWH versus last year's average price of \$64.82 per MWH. Incorporating a recently announced 10 percent rate hike, this plant might generate \$1.8 million in annual savings; however there is even more potential that is ripe for harvesting.

Fort Stewart's Training Area

Fort Stewart and Hunter Army Air Field is home to the Army's Third Infantry Division and sports the largest training area east of the Mississippi River. The training area is used first and foremost for training Soldiers to perfect their warrior skills. It is the home for the Red Cockaded Wood Pecker (RCW) and other endangered species which demand special protection and habitat management. It is also a timber resource that supports the second

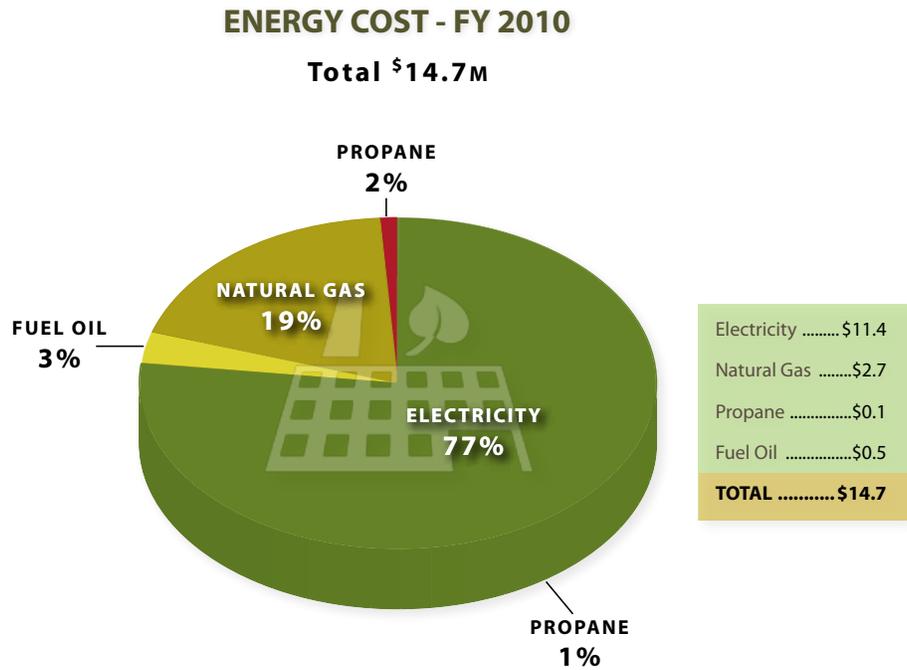


Figure 2

largest logging operations in the Army.

On average, the installation harvests approximately 110,000 tons of timber annually. These operations also produce nearly 30,000 tons of waste, which is burned or abandoned on site. Some of the timber is sold for just over one dollar per ton while other wood is just cut and burned to support the RCW habitat. In comparison, Fort Stewart currently buys wood at \$28.00 per ton, much more than what we receive for selling the wood. We also have the largest prescribed burn program in the nation. This is directly associated with maintaining RCW habitat and supporting warfighters and their high training OPTEMPO.

Additionally, other trees in the training area are contaminated from weapons fire and cannot be sold. This is not to be confused with trees that are con-

taminated with unexploded ordnance and are considered dangerous. These bullet contaminated trees could easily be used to fuel boiler operations if the wood is properly processed before it is burned.

It is unreasonable to assume that the installation could meet all of its fuel requirements from training area timber. Military training and endangered species habitat issues will always trump logging operations. However it might be a source of fuel that could help mitigate and stabilize fuel prices going forward. Depending on harvesting costs and the amount of fuel that could be harvested, the electricity savings could easily exceed \$2 million and even approach \$3 million in the best of years. Choosing an average of \$2.5 million in annual savings, Fort Stewart's electrical generation project could be repaid in about 5 years. That translates to only \$31.25 per MWH of self pro-



AVERAGE UNIT COST OF ENERGY - FY 2010

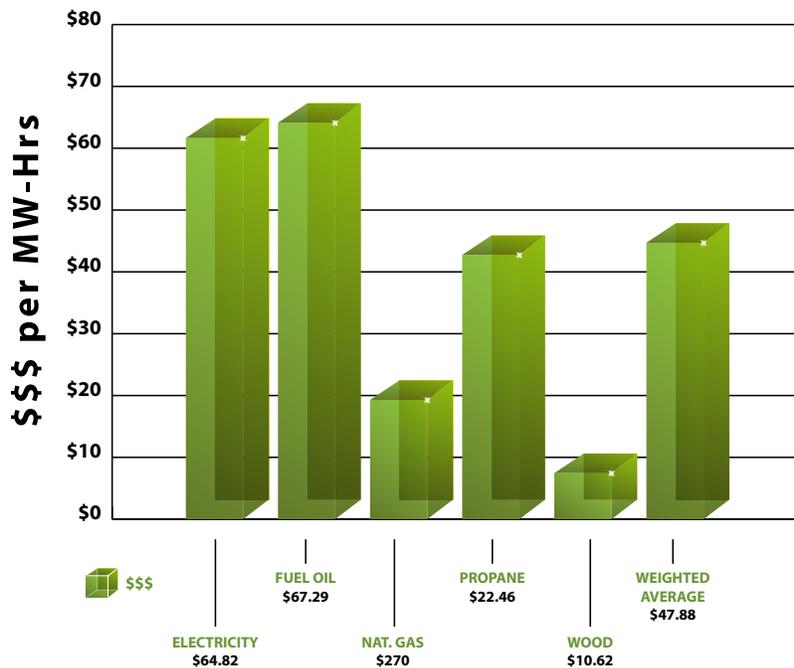


Figure 3

duced electricity or less than half of the average commercial rates.

Renewable Energy

Assuming all other things remain the same, Fort Stewart could expect its wood or renewable energy component to grow to at least 62 percent. If it harvested all of its own fuel requirements,

this could grow to 124 percent. (Fuel that is grown and used on the installation is counted twice according to current accounting rules). Actual FY10 energy mix data is compared to what the energy mix might look like using producing electricity with boiler number four is shown at figure 5 and 6.

Reportable Energy will Explode

To save \$2.5 million a year the garrison would increase its reportable energy consumption by 62 percent. This explosion is tied to the way we report energy consumption. If one uses a kilowatt hour of electricity at an electrical outlet, the installation reports one kilowatt hour of consumption. But that does not truly represent the energy used to generate that electricity. In the case of Fort Stewart we will have to have to burn about 140,000 tons or 370,000 MWH of wood to generate

80,000 MWH of electricity. In the case of self generation the fuel that is used to generate the electricity is reported. This is thermodynamics of producing electricity and is no different than what is experienced by any other commercial utility.

Accounting Rules

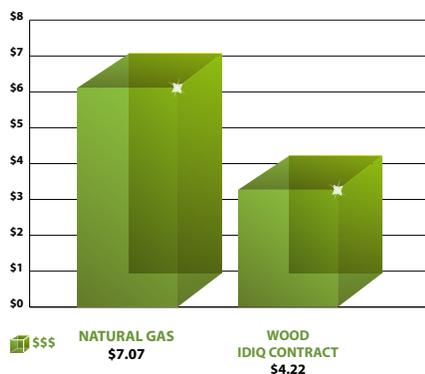
If the accounting rules were changed to treat self produced electricity as commercially procured electricity, our reportable energy would remain constant (all other things remaining constant). The renewable component would range between 26 percent and 52 percent depending on the sourcing of fuel.

Changing the accounting rules seems to make sense. The amount of renewable electricity that is produced by solar, wind or hydro power is measured at the electrical outlet as opposed to the amount of sunlight that hits a photovoltaic solar cell to produce the electricity. In the southeast, solar, wind and hydro power are not economically viable sources of energy. Here, biomass or wood is king. In essence the Fort Stewart's training area can be looked at as a giant solar panel that uses solar energy to produce a renewable fuel. Unlike a photovoltaic solar cell, it must be burned to produce steam which is run through a turbine to generate electricity. Thus, this process falls under the laws of thermodynamics. A lot source fuel has to be consumed to produce lesser amount of electricity.

If the accounting rules are not changed, any other energy savings measures that are implemented will pale in comparison with the potential explosion. It is not reasonable to think that anyone can reduce their energy consumption by 62 percent just to get back to the starting

Figure 4

COST OF PRODUCTION - 1,000 lbs. of Steam





ENERGY COST - FY 2010

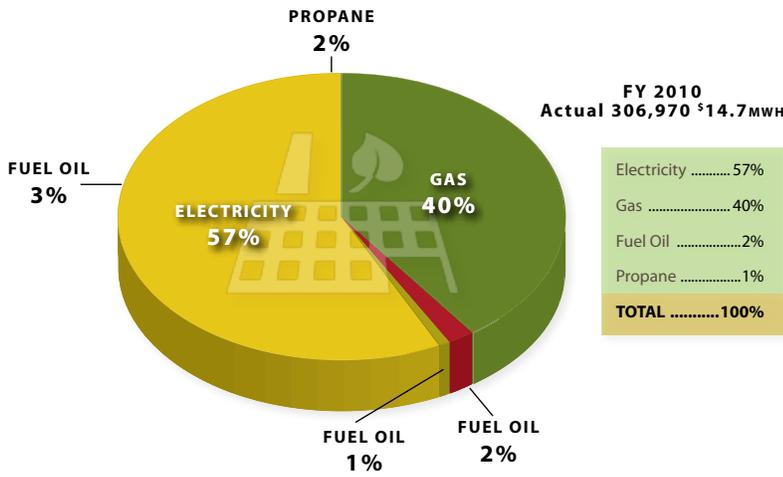


Figure 5

Robert (Bob) R. Baumgardt has been the director of Public Works at Fort Stewart/Hunter Army Airfield since 2009, as part of a civil service career in science and engineering that began in 1982. He entered federal civilian service as a nuclear engineer with the U.S. Navy at Mare Island Naval Shipyard, Vallejo, CA followed by an assignment as a project engineer with the Navy's Trident Missile Program at Bangor, WA. He served in various Public Works positions in Germany, and has supported four combat deployments to Kosovo, Bosnia, and Iraq.

POTENTIAL ENERGY MIX

FUTURE NOTATIONAL ENERGY MIX 596,150 MWH

Electricity	95,370 MWH	16%
Gas	122,090 MWH	20%
Fuel Oil	7,180 MWH	1%
Propane	2,330 MWH	1%
Wood	369,180 MWH	62%
TOTAL	596,150 MWH	100%

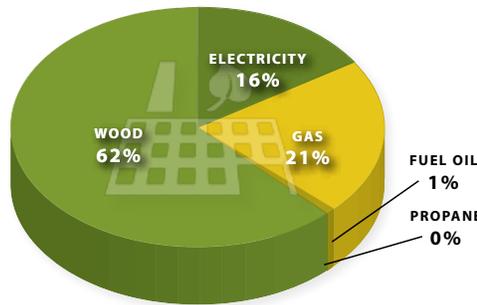


Figure 6

point, let alone think that further savings would ever be economically possible.

The Conundrum

Actually there is no conundrum. Accounting rules are just that, accounting rules. It is much more important to remain viable as an Army installation of choice. Therefore it is imperative that we continue to work at lowering the cost of operating and maintaining the installation that supports the world's finest warfighters.

From a national security perspective it makes sense to use a domestic source of fuel that is immune to world markets or other interruptions. Finally from a planetary perspective some might argue that this will help alleviate the affects of global warming. While the science of global warming is beyond the scope of this article this project would err on the side of safety and that seems to make a whole lot of sense.





What if 5,000 Army Civilians didn't show up for work... for a year?

by Karen Perkins, G-1, IMCOM

Last year, the equivalent of nearly 5,000 Army Civilians called in sick--for the whole year. According to the Defense Finance and Accounting Service (DFAS), in FY10, Army civilians used 10.1 million hours of sick leave, totaling a yearly equivalent of 4,860 Civilian employees not available for work. Of course the perceived impact at the time was not as dramatic as it sounds because those 4,860 lost man-years were distributed across a workforce of some 325,000. Yet, if we assume an average grade of about GS-11 at a salary of approximately \$60,000, we are expending about 290 million badly needed dollars on lost productivity for people who would probably rather be at work than sick. Army leaders have an opportunity to improve efficiency and improve quality of life for a lot of people by reducing days and months lost to sickness and injury. It's time to develop a plan of action to promote wellness among Army Civilians.

Sustainability

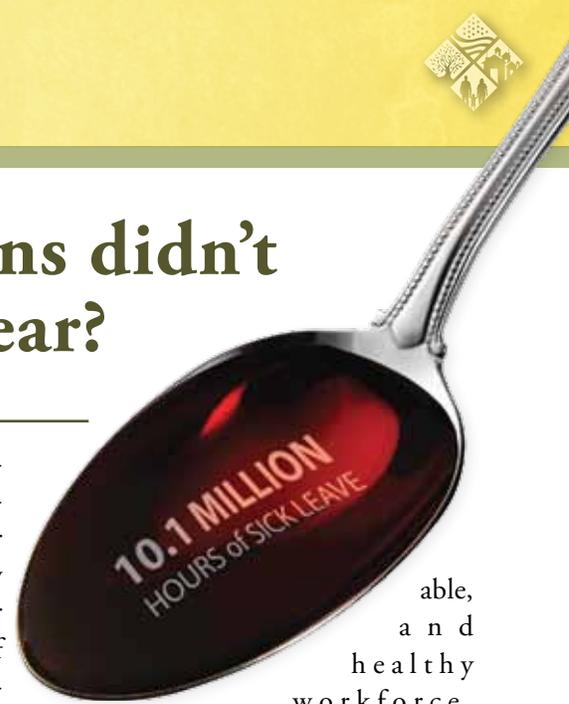
Army leaders are very familiar with the concept of sustainability, but typically in reference to infrastructure and the environment. Investing in the sustainability of our Civilian human capital -- today to meet the challenges of tomorrow -- is a new notion of sustainability, but every bit as relevant to the bottom line since the Civilian payroll is one of the highest Army budget items. How do we measure lost productivity,

whether through sickness, injury, disability, or death? What about the employee who leaves to find an employer that values employee well-being? How do we compute cost avoidance for averted injuries? While all aspects of lost productivity are important, perhaps most costly is sick leave usage.

Organizations play a tremendous role in establishing a culture of health promotion. As the Department of Defense's largest Civilian employer, the Army, and, by extension, our Installation Management Community, has a responsibility to promote national objectives associated with improving the health and physical fitness of our employees.

On June 23, 2010, President Barack Obama signed an amendment to Executive Order 13265 from 2002, directing the Secretary of Health and Human Services to 'develop and coordinate a national program to enhance physical activity and sports participation.' Titled the President's Council On Fitness, Sports, And Nutrition the amendment adds nutrition as a component of the earlier order, recognizing that nutrition plays a vital role in people's ability to adopt and sustain physical activity.

DoD promotes physical activity through its policy and working groups, and in our Installation Management Campaign Plan (IMCP) Line of Effort (LOE) 3, we have addressed this as a priority to build a resilient, sustain-



able,
and
healthy
workforce.

Physical fitness is one of the five pillars of wellness that enables Army commanders to promote reducing overweight/obesity and increasing physical activity through aggressive employee health promotion and wellness programs. The goal of a workforce and leaders capable of being competent stewards of human resources, through focus on sustaining our workforce, is well within sight and IMCOM is at the forefront of Civilian employee wellness programs within Army.

Army leadership has made Civilian employee wellness a priority for good reason. The health and fitness of U.S. citizens is in crisis and the Army Civilian workforce is not exempt. Physical inactivity and overweight/obesity are the leading U.S. health concerns.¹ As obesity rates swell around the globe, in America they are ballooning. Between 1980 and 2008 the number of overweight and obese people in the U.S. doubled. This trend raises strategic concerns because of the correlation between body weight and elevated risk of heart disease, diabetes, cancer and the increased severity of disease associated with hypertension, arthritis, and other musculoskeletal problems.



Cost of Physical Inactivity

Studies have shown that worksite programs leading to increased physical activity tend to produce significant improvements in employee health, decreasing the organization's costs and absences associated with illness and injuries.ⁱⁱ In documented research of corporate worksite wellness programs, sick leave was reduced by 28 percent, health costs by 26 percent, and worker compensation and disability average costs were reduced by 30 percent.ⁱⁱⁱ Overall, these studies provided positive evidence linking wellness programs and decreased costs to the Army as well as to the employee.^{iv}

While sick leave usage is certainly an employee entitlement, in one recent year, Army Civilians earned an average 104 hours of sick leave time, but used 121 hours. This is an alarming trend, but one upon which Army leaders can exert some direct control...or flex some muscle, if you will. Leaders can influence identified trends by promoting employee health and wellness. Reducing sick leave usage by only ten percent can gain 500 equivalent years annually and a 20 percent reduction saves over 1,000 equivalent years. How much more could the Army do in 1,000 years? Promoting Civilian well-being is a critical element to reversing these trends.

Health Care and Worker Compensation Costs

There are more undeniable business reasons for the Army to aggressively promote and resource Civilian workforce health promotion programs. Currently, the U.S. spends more on health per capita than any other country and those figures continue to escalate. As of 2008, health care costs in

...sick leave was reduced by 28 percent, health costs by 26 percent, and worker compensation and disability average costs were reduced by 30 percent

the U.S. were increasing an average of \$160 billion annually – on par with the cost of the war in Iraq.^v Trends suggest that the Army could potentially reduce the health care costs of its civilian workforce by more than 25 percent simply through prevention programs.^{vi}

As costs rise, corporations and government agencies, including the Department of Defense, have rightfully become concerned about employee wellness. Private sector companies around the globe have learned that prevention is the key. The outdated model of focusing exclusively on treatment in lieu of prevention can no longer be justified in an era of shrinking budgets and rapidly increasing treatment costs.

Sustainability also includes the need to prevent or reduce the number of employees injured on the job. Although injuries are covered by the Federal Employees' Compensation Act (FECA), no appropriated funding is provided to cover these costs. Therefore, injuries and the costs associated with them directly decrease the Army's buying power for other strategic needs.

In 2010, the Army's FECA cost was \$177 million – of which nearly \$130 million was for pay and compensation. This wasn't an anomaly; figures

for the past ten years range from \$166 to \$181 million, or almost \$2 billion in the last decade. On average, that equates to 64,000 lost work days per year. This area alone offers a significant opportunity for cost reduction. The cost of long-term compensation certainly results in "sticker shock" when considering long-range projections as every employee who does not return to work will cost an average of \$1.5 million dollars over their lifetime, not including any medical expenses associated with the disabling injury.^{vii}

Historically, slips, trips, falls, and back strain are the most prevalent Army Civilian job injuries, and the single leading cause of lost workdays.^{viii} They are also the most likely to be reduced by health promotion, increased fitness, and wellness programs. Physical activity provides a quick return on investment and a speedy return to work in the event of injury.

Next Generation Workforce

Without action, hope for generational improvement is bleak as America's children are well on their way to becoming heavier and more sedentary than their parents. Early health behaviors developed as a child are generally perpetuated as an adult and are likely to manifest into health-related problems.^{ix} This defines the root problem. We must surge ahead by implementing strategies, plans and actions focusing on prevention, rather than treatment, as the best means to minimize workforce impact.

Leaders, both military and civilian, must "Win the Global War for Talent," by attracting and retaining a healthy, fit and ready workforce. We have demonstrated that healthier employees



50 percent of the federal workforce will leave government service in the next five years

of Personnel Management (OPM) projects 50 percent of the federal workforce will leave government service in the next five years, mostly due to retirement.^{xi} The Army population mirrors this trend. With the looming talent shortage quickly approaching, health promotion programs will be a key ingredient for workforce recruiting as the Army markets itself as an “employer of choice.”

Building Blocks for Success

Workplace health-risk challenges cannot be successfully overcome at the individual level -- action must occur at the organizational and institutional levels. The essential building blocks for improving the future fitness in the Army Civilian workforce are in place, but remain fragmented. Regulations, policies, and our culture, infrastructure, personnel programs, and strategic plans must be intertwined to establish a model program.

AR 600-63, Health Promotion Program, provides an avenue to “maximize readiness, war fighting ability, and work performance” and enhance the “well-being of all Soldiers, Army Civilians...” encouraging “lifestyles that improve and protect physical, behavioral, and spiritual health.”^{xii} The regulation serves as a catalyst for the Army to revitalize programs and pursue civilian fitness and well-being as a strategic objective. However, the regulation limits use of on-duty time for participation in wellness programs. Our leaders are challenged by this limitation to achieve desired results. As a result, IMCOM commanding general LTG Rick Lynch has requested Army change the regulation, and has received commitment that the requested change will come. In the meantime, we strongly

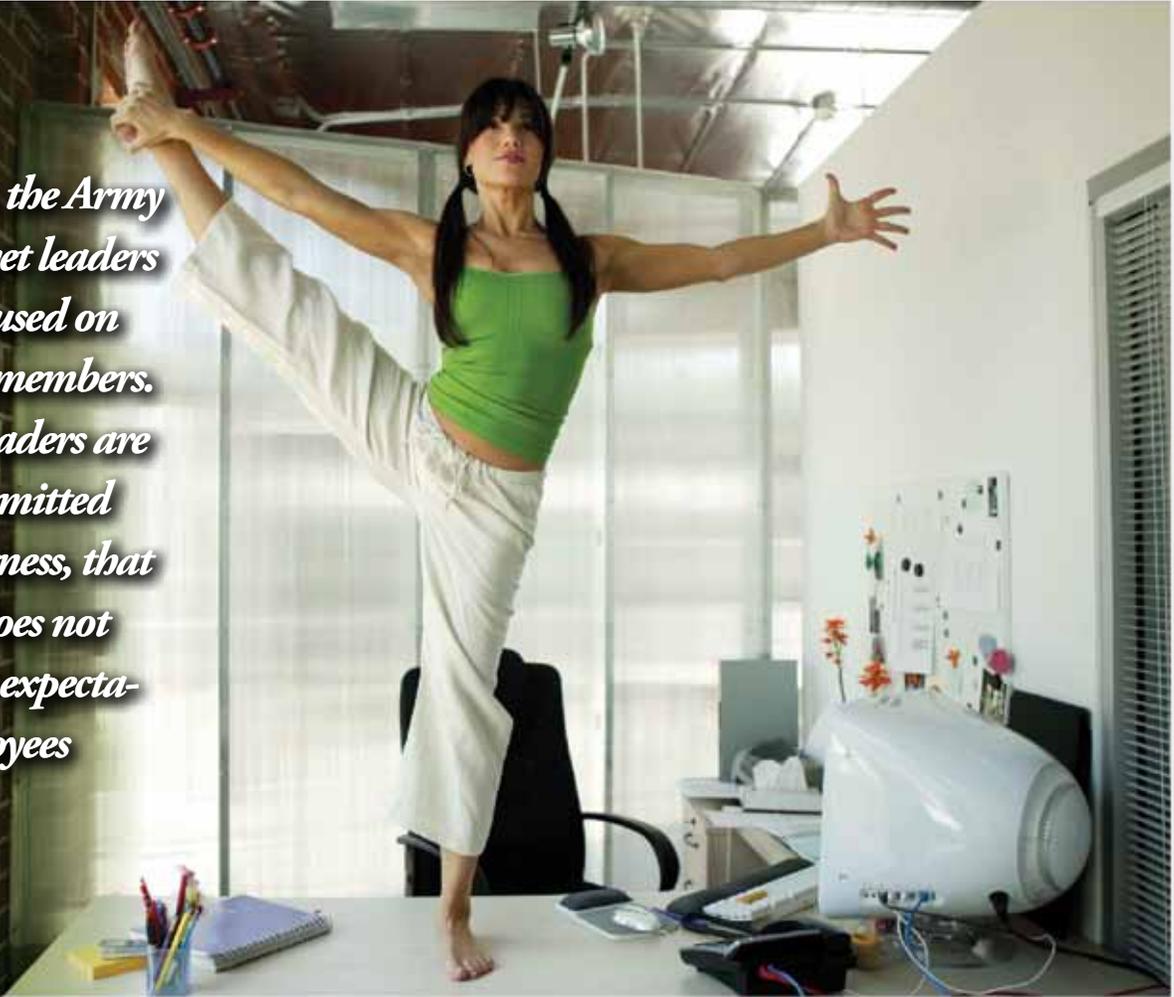
reap long-term savings in health care costs, workers’ compensation, and sick leave; yet, these are only a portion of the cost savings. What is the intangible cost to an organization of a shorter career due to chronic disease or injury and what is the cost of training a new employee? In reality, organizations with a “wellness culture” also realize cost savings in recruitment and retention.^x

In a competitive labor market, employers must distinguish themselves from their competitors to attract the best and brightest new employees, as well as ensure long-term workers remain healthy.

Human resource planners are eyeing a strategic concern as the leading edge of the Baby Boom generation (1946-1964) reaches retirement. The Office



Institutionally, the Army values fitness, yet leaders have rarely focused on Civilian team members. While many leaders are personally committed to their own fitness, that traditionally does not translate to an expectation that employees do the same.



encourage our leaders to find all possible means to increase unit-sponsored activities to get people moving and to enhance educational programs on duty time.

Regulation and policies alone cannot serve as a change catalyst without well-planned initiatives and committed leaders. Absent endorsements, personal leadership and strong command policy statements, we can only aspire to moderate success. In order to achieve results, we must promote awareness, monitor change, and evaluate trends. IMCOM is leading the Army in establishing a viable, enduring, and accountable program that achieves desired, measurable results.

Need for Leadership

Leaders will make the difference. Through mentoring and coaching we can make the critical link to a culture of wellness. Institutionally, the Army values fitness, yet leaders have rarely focused on Civilian team members. While many leaders are personally committed to their own fitness, that traditionally does not translate to an expectation that employees do the same. Leaders are the most influential cog in shaping culture, institutionalizing policy and process, and influencing a work environment in which employees either fail, survive or thrive. This includes a shared wellness vision,

modifying the organization's environment to promote desired behavior, and recognizing success. Without visible leader support from the top of the organization to the unit level, there is little hope of achieving results.

Take Aways

Army Civilians spend at least one-third of their day at work. This makes the workplace an important place to institute behavioral changes. The Army Civilian Corps is a large, discrete population easily targeted to influence behavior changes where opportunities for mentoring, reinforcement, and support can yield significant results. As an enter-



prise, we can provide a supportive environment, leveraging existing services and infrastructure to offer low-cost, yet effective, intervention programs.

As we hurtle towards the goal, you shouldn't feel as if you need to jerk the wheel to keep from careening over the cliff. However, the warning lights are flashing and it is imperative that we take swift action. Establishing a culture of wellness in the local community begins with leadership. There is help readily available - just a phone call or email away. The G1 Workforce & Sustainment Branch, and the Civilian Wellness Coordinator in particular, oversee Civilian wellness, health information, and injury prevention for IMCOM installations. By providing oversight for these programs, we serve as a valuable resource to assist our commanders and leaders in their efforts to establish a wellness culture locally. Who knows what we could accomplish if our portion of those 5,000 Army Civilians showed up for work healthy and ready to work!



(Vance Penn, Civilian Wellness Coordinator for the G-1, contributed to this article.)

Karen Perkins is the IMCOM G-1/Director of Human Resources. She has previously served as the Director, Human Resources for HQ Department of the Army in the Office of the Administrative Assistant to the Secretary of the Army. Her previous IMCOM assignments include Human Resources Chief, Northeast Region. She is a 2008 graduate of the U.S. Army War College.

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Sustaining a High Performing Workforce - Doing the Right Thing!

by **Beverly S. Fordham**, *Workforce Development Program Manager, USAG Fort Stewart/Hunter Army Airfield*

“Today, we have the world’s greatest workforce serving the world’s greatest customers. Our challenge is to continue to improve the skills of our workforce and to grow leaders for tomorrow. This is why we put such a high emphasis on workforce development.” COL Kevin W. Milton, Garrison Commander, USAG, Fort Stewart/Hunter AAF, Georgia.

Being a four-time Army Community of Excellence (ACOE) between 2004 and 2009, suggests that something is being done right among the garrison team at the USAG Fort Stewart/Hunter Army Airfield, Georgia. High performance is no surprise here; it is the way business is done. Drawing from an array of in-

formation resources from government and private industry, we developed a comprehensive, systematic Strategic Human Capital Planning process.

The 2010–2015 Strategic Human Capital Plan (SHCP) is the third generation product of what has proven to be a critical process in shaping our human resource objectives, measures, programs and, ultimately, our success. The Installation Management Campaign Plan, Line of Effort 3 (LOE 3), Leader and Workforce Development, brought new emphasis and exciting opportunities for our workforce development efforts. The five-year anniversary for review of our overall Strategic Human Resources Plan (SHRP) in 2010 and

human capital strategic performance objectives and measures. From this vantage point, we identify, design and implement programs to meet specific workforce needs. Our SHCP objectives are incorporated into our Installation Strategic Plan (ISP) and our Installation Planning Board (IPB) process. By including our SHCP objectives in the ISP process, we address human capital requirements in consonance with other operational requirements. The result is a level playing field that allows equal priority to our workforce needs while addressing total requirements. For example, we are able to match workforce needs to programs that build resilience, improve morale, develop skills and promote continued sustainability. By focusing attention on growing a diverse, technically competent, high-performance workforce, we increase our productivity, leverage resources, improve our environment, and increase our worth to the Army as a whole.

Our SHCP Process is no mystery and one who is mildly familiar with this topic will readily recognize many of its components. The basic steps of the process are found in Figure 1. The value of this process is that it consists of a combination of elements from other similar models combined with specific local requirements. Most important, however, is that the process is systematically applied and results are employed.

Some worthwhile outcomes of this

formulation of LOE 3 provided the impetus in a full-scale realignment of our SHCP. Our SHRP process creates a profile of the workforce, the environment, and the overall key challenges to be negotiated within the next five years. With this knowledge, we pinpoint areas requiring management’s attention to develop



Strategic Human Capital Planning Process

1. Review the Vision/Mission/ and Culture of the Garrison/Installation
2. Review Values
3. Review Environmental Factors
4. Review Strategic Plan and Strategic Performance Objectives
5. Conduct a Workforce Assessment
6. Define Facts and Assumptions
7. Describe the Current Workforce
8. Identify Local Occupational Trends
9. Describe the Local Labor Pool
10. Define Future Local Occupational Growth Projections
11. Review Diversity of the Workforce
12. Review Employee Input from Surveys
13. Analyze, Synthesize, Develop Summary and Conclusions
14. Develop Implementation Strategy

Figure 1



process are the segmentation of the workforce and the development of workforce and employee profiles. For example, we found that our average employee is 49 years old; is not retirement eligible; is in or below General Schedule (GS) grade GS-11; has prior military service; and is male. Based upon these data and the DA 2006 Civilian Employee Attitude Survey, we deduced that the average employee is highly interested in career progression since they will not be immediately eligible to retire for five years or more. Civilians having prior military service are familiar with the Army culture, values, and mission. Their familiarity with the Soldier as a customer provides a unique perspective on customer service, as well as a general understanding of many of the services and benefits available to Soldiers and Families - our primary customer groups. These experiences are valuable and some skill sets are directly transferable from the

military to the Civilian component. However, new Civilian employees need familiarization with performing in a Civilian capacity. For example, training and development to provide awareness and skills in garrison processes and systems may be needed. Similarly, training in Civilian personnel programs, processes, benefits, and the Civilian workforce culture may also be needed. Such specific information about the target audience is vital when deploying new programs, e.g., the President's Fitness Challenge Program, the Civilian Health and Resiliency Program, etc. Knowledge of our workforce characteristics helps us develop and deliver programs that fit the needs of employees, as well as the garrison's needs as an employer. By selecting methods and media tailored to specific employee group characteristics, we are more effective and efficient in delivering quality programs and effectively managing employee expectations.

An important part of the SHCP process is our analysis of the external and internal environmental influences. We included the following areas:

Occupational Trends:

DoD identified the following positions as hard to fill: engineers; scientists; mathematicians; physicians, nurses and pharmacists; security specialists and police officers; intelligence specialists; financial management, budgeting and accounting specialists; contracting specialists; logistics management specialists; quality assurance specialists; information technology specialists; and human resource specialists. Local Labor Pool statistics are also considered to determine the availability of needed skills within the local community. Knowing the skill shortages within the Army, we determine the best approaches to filling these types of positions.

Local Labor Market:

The labor pool in the local geographic area has direct impact on the intake of new employees. Assessments of local area influences help identify our workforce focus - recruitment, workforce development or a combination of the two. According to the Georgia Department of Labor (DOL) August 2010 statistics, Southeast Georgia's unemployment rate was 10 percent compared to the U.S. rate of 9.5 percent, suggesting that the local area has an abundance of job seekers. Availability of special employment programs for prior military personnel, veterans, spouses, and students combined with local available job seekers results in





*The economic downturn results in an abundance of job seekers with the U.S. unemployment rate at **9.5 percent** and the Georgia unemployment rate at **10 percent** as of August 2010. These conditions combined with the **Army being rated as one of the best places to work...** in the federal government for 2007 generate a **surplus of potential workers***

an abundance of potential employees from the local area.

Future Occupation Growth:

Occupations with the largest growth in private business do not affect garrison recruitment since these skills are typically privatized. Fort Stewart's mission requires providing service in an environment increasingly reliant on information technology coupled with network security. Insourcing of privatized functions will likely increase federal employee populations within the next few years.

Diversity:

We seek to sustain a diverse workforce. We considered data from the FY 2008 FS/Hunter AAF Annual EEO Program Status Report Affirmative Employment

Program to determine our posture. We compared our federal civilian minority population percentage with the local civilian labor force population in surrounding counties and the national minority civilian labor force population. Data from the DCPDS database, showed our minority civilian population to have increased by 10 percent since 2004. The EEO Officer is included as a key member of workforce development planning efforts to ensure tenets of diversity are included in our programs.

Customer Input:

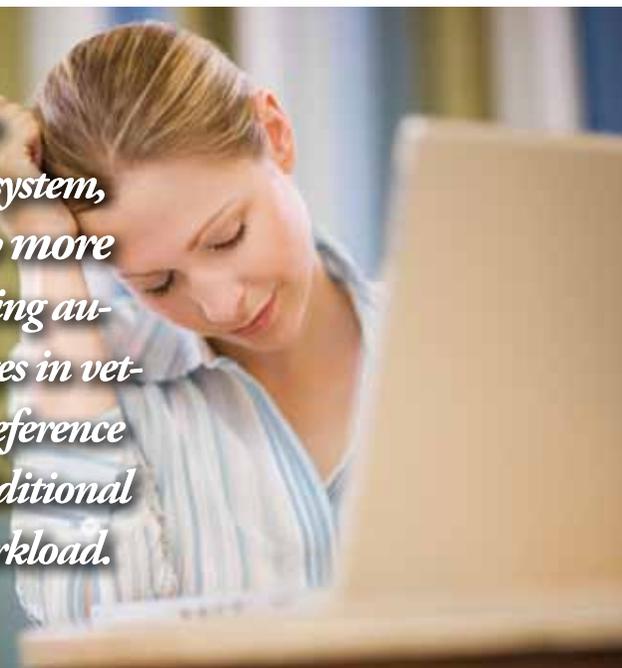
The FY 2006 Army Civilian Attitude Survey provided insight into the retirement plans of the workforce. Of the supervisors responding, 43 percent

stated that they would retire in more than five years while only 36 percent of non-supervisory employees responded that they would retire in more than five years. Supervisor responses to this question: "If you had to decide whether to continue to work for your organization, how likely are you to choose to stay," resulted in 68 percent responding they would stay. Comparably in 2005, supervisors responded that they would not stay beyond their retirement eligibility date; and 21 percent responded they would take early retirement if offered. Supervisors and leaders compose 12 percent of the total appropriated fund workforce.

Recruitment Picture:

According to Tony Whitehouse, Deputy Assistant G-1 for Civilian Personnel in the FY 2008 CHR Evaluation, despite efforts to simplify the hiring system, it continues to grow more complex. New hiring authorities and changes in veteran and spouse preference programs create additional complexity and workload. The civilian personnel population has also grown due to new programs designed to take care of Soldiers and Families; base realignments, retirements, attrition, and in-sourcing of some contractor positions. The economic downturn results in an abundance of job seekers with the U.S. unemployment rate at 9.5 percent and the Georgia unemployment rate at 10 percent as of August 2010.

...Despite efforts to simplify the hiring system, it continues to grow more complex. New hiring authorities and changes in veteran and spouse preference programs create additional complexity and workload.





These conditions combined with the Army being rated as one of the best places to work in the federal government for 2007 (by the Partnership for Public Service and American University’s Institute for the Study of Public Policy Implementation) generate a surplus of potential workers. Civilian voluntary retirements are projected to remain stable for the next five to six years according to Dr. Susan L. Duncan, Assistant G-1 for Civilian Personnel, in her report to the Senate in May 2009. Economic trends may affect this projection, but the next potential retirement bulge may be in FY 2015 as retirement eligible employees under the FERS system may increase.

A variety of recruitment sources, former Soldiers, Family members and the public, provide ample candidates

to fill positions. Mandatory Priority Placement Programs protect current employees from job loss, but at the same time tend to limit the number of vacant positions into which new employees (first time workers with government) may enter. Hiring mobile employees contributes to higher attrition rates. Internal recruitment and formal trainee positions leading to promotions increase employee morale, benefit the community, and give employees the opportunity for growth and career advancement. The Student Trainee Experience Program (STEP) and Student Career Experience Program (SCEP) are being used to encourage both education and employment. These programs may also be used to promote diversity in the workforce.

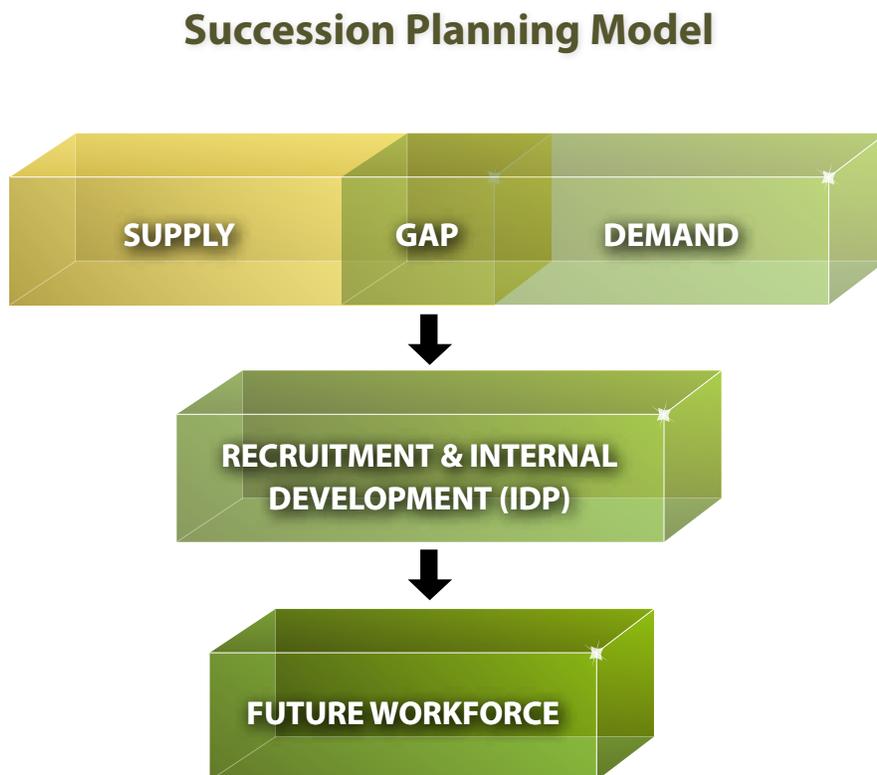
Based upon all considered environ-

mental factors, retirement projections, local labor market, and occupational outlook, we would likely be concerned with: an increase in the number of positions to be filled in part due to our high attrition rate; a steady but predictable loss of employees to retirements during the next five years; high availability of applicants with some lacking the right skills, thus requiring training and development; prior military and spouses being key recruitment sources; and a continued use of student trainees to meet skill requirements.

From these conclusions, we developed a model to further quantify and categorize workforce segments for recruitment, training and developmental programs. An example of this model is shown in Figure 2. The model is based upon a standard gap analysis model with which many are likely familiar. The “gap” identifying the workforce positions to be filled is then further evaluated to determine the skill needs that can be met through recruitment, and which will require training and development. The Individual Development Plan (IDP) is the vehicle used to identify the training and developmental needs of those with skill deficits. IDP contents are then consolidated, analyzed, and annual training plans are crafted to meet the needs.

Additional gap analysis revealed that adequate supplies of candidates to fill GS 3 – 5 positions and GS-12 and above positions exist, pinpointing employees in GS-7 through GS-11 positions to be the primary target for developmental programs. Segmentation of the workforce and subsequent gap analysis led to the development of two strategic performance objectives: (1)

Figure 2





*This alignment enables us to leverage **both Army and community resources**. Additionally, we can identify and focus on areas that **provide the best return on investment both dollar-wise and people-wise**.*

to use the Civilian Education System (CES) as developmental opportunities for non-supervisory employees; and (2) to use the Student Career Experience Program (SCEP) and other competitive developmental programs to grow needed skills. Then, based upon the following conclusions, we developed an implementation strategy:

Conclusions

- Broad knowledge and skill sets will be needed for multi-disciplined and leadership/management positions.
- Leader development will be emphasized at all levels within the workforce.
- Mission critical occupations are: engineers, physicians, nurses, pharmacists, security specialists, police officers, intelligence specialists, financial management, budgeting and accounting specialists, contracting specialists, logistics management specialists, quality assurance specialists, information technology specialists, and human resource specialists.
- Fewer supervisors and employees will retire during the next 5 years.
- Workforce diversity will be monitored and considered in recruitment strategies.
- Sufficient applicants exist for entry-level positions (GS-3 to GS-5). Some positions GS-12 through GS-15 and NSPS equivalents will be filled through Placement Programs and other recruitment sources. This leaves

a core of mid-level positions GS-7 through GS-11 that require training and development of critical skills.

Implementation Strategy: To achieve the objectives of this plan, the following course of action was identified:

- Employ recruitment strategies that provide for current/future skill requirements and diversity
- Provide training in critical skill areas for current and future workforce (defined in the FY 11 Annual Training Plan of Action)
- Continue to emphasize and provide leader development to the mid-level workforce.
- Resource the SHCP through the Command Budget Execution Program.
- Evaluation:
 - Continue to track strategic performance objectives/measures in the Leader and Workforce Development Quality Management Board (LWQMB) and further align with IMCOM Campaign Plan, Line of Effort 3, Leader and Workforce Development.
 - Add strategic performance action/measures in the LWQMB to track leader development training of the workforce.
 - Add strategic performance action/measure in the LWQMB to provide and track career development planning and training for the workforce.

- Continue to emphasize recruitment of developmental employees to enable growth within the workforce, e.g. (STEP, SCEP and other developmental positions).
- Annually, review the Human Capital Strategic Plan to update mission and workforce demographics.

In summary, through our SHCP process we are able to systematically and continuously translate broad corporate goals into local installation strategic objectives and measures that are aligned to unique needs within the workforce. This alignment enables us to leverage both Army and community resources. Additionally, we can identify and focus on areas that provide the best return on investment both dollar-wise and people-wise. This perspective allows us to strengthen community partnerships and meet community responsibilities for workforce skill requirements. Simultaneously we can develop programs that are tailored to meet the needs of the Fort Stewart/Hunter Army Airfield workforce. The Army culture is common to us but every installation has unique characteristics that apply only to that locale. By systematically and strategically considering the environmental influences and exigencies that are unique to that specific location, one may define what is right in that particular set of circumstances. We are convinced that our SHRP process is paying big dividends by enabling us to “do the right thing” in our strategic human capital management and would most likely have similar positive outcomes for other installations.





Beverly S. Fordham serves as the Workforce Development Program Manager for the Directorate of Human Resources, USAG Fort Stewart/Hunter Army Airfield, GA. She was a 2003 “Outstanding Student” graduate of Army Management Staff College; served as AMSC Adjunct Faculty for eight years; and served as Army Center for Civilian Human Resource Management Adjunct Faculty for 10 years. She assisted on numerous panels and taskforces, such as the ATLDP, helping to shape Army Workforce programs and systems. She attended Georgia Southern College.

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We the People: Joint Base Lewis McChord takes the pulse of its sustainability program

by COL Tom Brittain, Garrison Commander, & Miriam Easley, Sustainability Outreach Coordinator, JBLM

Introduction

“I love this job working with the sustainability program – every year for 10 years has been a different experience.”

“I’ve accomplished more Soldier support in the past 5 years guided by sustainability concepts than I did in the previous 20 years of traditional management.”

Do your people talk like this? Ours do, and keeping this positive attitude and motivation up requires leadership, direct involvement and reinforcement.

Joint Base Lewis McChord (JBLM) is located in the Pacific Northwest—a region that is legislatively, corporately and communally very active in sustainability. Being a leader in sustainability is no easy feat but outreach by members of the Installation Sustainability Program (ISP) to neighbors and counterparts has helped establish and build up sustainability programs and plans which have benefited the entire South Puget Sound.

When Fort Lewis (now JBLM) began writing a sustainability baseline document in 2001, the net was cast far and wide to gather needed data and coordinate discussion. Fort Lewis had already established a good base for systemic, sustainable management, through a Public Works Environmental Management System that was third-party ISO 14001 certified in September 2000. When sustainability training was provided in 2001 to local military leaders, a cross section of organizational

leaders, subject matter experts, and other early adopters from around Forces Command (FORSCOM), it proved to be the first step in the evolution from a compliance based program to a sustainability focused one.

This initial effort and a subsequent February 2002 community workshop involving approximately 250 participants produced ambitious 25-year sustainability goals in the areas of Air Quality, Energy, Infrastructure, Products and Materials Management, Sustainable Training Lands, and Water Resources. Team Leaders and subject matter experts organized themselves immediately afterwards and began the transition to ‘triple bottom line (economic, social, and environmental success) thinking’ and planning. Our team turned first to low-hanging fruit and achieved quick victories. These achievements such as an 85 percent waste diversion rate in 2010; robust fish and wildlife and forestry programs that include extensive prairie restoration, species preservation, and a Forest Stewardship Council certified forest; and a sustainable master plan that breaks with the usual planning model of urban sprawl, reduces need for personal transportation, preserves training lands, and improves quality of life.

With these early achievements met, the program faced the usual challenges of personnel departures and increasingly complex opportunities. Although our program matured to meet these challenges, leaders in our sustainability

program began to sense a waning enthusiasm in some quarters of the installation. Program leaders soon recognized a need for more precise feedback from installation personnel in order to understand and address this challenge, so we determined to pilot-test our sensing sessions with Joint Base Garrison Public Works personnel first.

To obtain this feedback, program leaders just needed to ask the right questions. Based on the concepts of Doug McKenzie-Mohr’s “Fostering Sustainable Behavior”⁽¹⁹⁹⁹⁾ an effort was initiated to obtain in-depth qualitative information regarding attitudes and behaviors pertaining to sustainability. Initial efforts focused on the JBLM Directorate of Public Works (PW) given its close operational relationship to the sustainability program. To lead the effort, the installation asked a trusted and respected former garrison commander to interview a cross section of personnel from every PW division and at every level of responsibility. In order to acquire valuable feedback, we had to consider the best way to conduct these interviews.

Conducting a sensing session

Forming appropriate questions is a crucial first step when conducting interviews. The way a question is phrased and delivered can elicit different responses. For instance, in “The Leader’s Handbook” Dr. Peter R. Scholtes⁽¹⁹⁹⁸⁾ suggests that many organizations ask “...‘who’ questions. ‘Who is accountable?’...In the



new organization we ask ‘why’ or ‘how’ questions: ‘Why has the problem occurred?’ How can we improve the system and eliminate the cause of this problem?’” (p. 263). This avoids a language of blame and opens up the dialogue to receive honest and constructive input.

It is also important to conclude the interview with a question that asks about a positive experience. Questions such as “What is one of your proudest moments in your current position?” or “What positive impact have you made in your job?” end the session on a positive note and leave the interviewee with a sense of pride in their work. It also gives the interviewer input into what’s important to the employees and what motivates them.

To set the tone of the interviews, the JBLM Director of Public Works, Mr. Steve Perrenot, P.E., sent out an email to PW employees commending the hard work of all in the directorate; acknowledging the decreased emphasis on the sustainability program; and requesting their sincere feedback and suggestions. “We are a busy directorate and my hat is off to all of you that have made us successful over the past years as well as your efforts that continue to allow us to perform at an exceptional level... In order for PW to continue our efforts toward organizational improvement, I request your full assistance in this effort.” Having this leadership support and encouragement was vital to the success of this endeavor.

Results

With all of these things in place – well thought-out questions, a trustworthy and honorable interviewer, and leadership support – we created an



environment to get reliable responses that would help us determine the next steps. The interview team selected interviewees from a cross section of the organization conducted interviews in both individual and group settings.

While some of the responses and findings were no surprise to our team, many responses shed new light on the source of the waning motivation toward sustainability. Some of the key revelations from these interviews can



SENSING QUESTIONS

1. What is your understanding of the larger purpose of the sustainability goals?
 - a. In general, is that important? Why?
 - b. Is that important as it relates to your job? Please explain.
2. Do you think most employees consider sustainability when planning their work and/or projects? Why or why not?
3. Were you already or have you now incorporated some sustainability aspects into any of your work? Please describe.
4. Have you worked on any projects that were specifically developed for a sustainability goal?
 - a. If "no" – why do you think that is the case?
 - b. If "yes" - how has the project worked out?
5. Do you think Soldiers/customers benefit from sustainable aspects or features in work done by Public Works or the Corps of Engineers? Discuss.
6. If efforts continue toward achieving the sustainability goals, what impact do you think that is likely to have for the future?

be summarized as follows:

Sustainability is just an environmental program, right? – Some employees did not see how sustainability fit into their daily operations and perceived sustainability as being a program for which only the environmental staff is responsible.

How do I apply this to my job? – Integration into employees' daily operation needs to be clarified. One possible mechanism for doing so already exists on JBLM in the form of an Environmental Operating Permit (EOP). At JBLM, the installation Environmental Management System (EMS) Coordinator creates EOPs as a means to incorporate military units (but not most garrison elements) into the EMS. Units are given a customized EOP to detail how environmental and EMS requirements can be incorporated into their jobs. This method may also prove successful with all organizations within JBLM.

The sustainability goals are ambitions and lofty. We need to know the steps required to get there. – Although JBLM utilizes its EMS to bridge this gap by providing annual objectives and targets leading to the 25-year sustainability goals, this response informed the sustainability program that they needed to do a better job of communicating the connection between the Installation Sustainability Program (ISP) and the EMS. It occurred to the team that a strategy to communicate how these two programs are functionally combined needed to be developed. Two possible approaches include in-depth education and outreach on the relationship of the programs and combining the programs under the same name.

How are we doing on those goals anyway?

– Some employees requested to have more communication on the progress and successes of the program.

Re-energizing with a top-down approach needs to occur – When the sustainability program started a lot of excitement and energy went into it. It was new and cutting edge and leaders were eager to be one of the first installations to implement a sustainability program within Department of Defense. Employees suggested that this excitement and motivation needs to be sparked again by leaders.

Sustainability is a great thing. I stand behind it and try to incorporate it into my own life – There was a consensus that sustainability was the right thing to do and most had a positive outlook on the concepts. It is important to make the most of this general goodwill and, where possible, make it easier for employees to do the right thing.

After conducting these interviews, we know it's important that we act on what was discovered. Not only is it incredibly useful information that was obtained, it will also give my employees the message that they've been heard and that their input is valuable.

The path forward

The discussion generated by the answers to our sensing questions is the basis for improving our sustainability program and its communication plan, which is currently under revision. The first step is to reinvigorate the many people who made this sustainability program such a success in the first place -- internal communication is key. Posting monthly sustainability highlights on an internal website will



serve to inform everyone; will provide updates on progress towards sustainability goals, and may also encourage increased collaboration between the various Garrison elements.

A specific component of that effort will be the JBLM Sustainability Annual Report, which is an effective communication tool both inside and outside the fence line. It communicates the progress JBLM is making on our sustainability goals, and it acknowledges the hard work done by everyone on the installation. The sensing sessions affirmed the importance of periodically updating this report, and once prepared, print copies will be placed in prominent locations across the installation and all annual reports will remain online on our sustainability website.

Joint Base Garrison or directorate-wide events can also be leveraged to inform and encourage. For example, each directorate holds an annual summer picnic that brings its many employees together in one location filled with fun. This might be an excellent opportunity to have leadership show their support for the program by sharing success stories; discussing the path forward; requesting feedback; and recognizing a few sustainability champions.

In addition, it's important that the ISP increase publicity of its successes to the JBLM community, thereby emphasizing the external recognition of their hard work and dedication; and we plan on highlighting individual contribution towards our recent recognitions with the Secretary of the Army Environmental Award in the category of Sustainability and the EPA Region 10 Champions

of Environmental Leadership and Green Government Award.

Sustainability Communication Plan

The pilot testing of sensing sessions within Public Works proved highly worthwhile. Additional sensing sessions will be used throughout the installation to acquire useful qualitative information to update and expand the installation-wide sustainability communication plan. Interviews will be used to determine what the perceived barriers and benefits are to sustainable behaviors – we need to avoid making assumptions about what individuals see as barriers and benefits to an action. For example, we might assume that an individual did not recycle because there was not a recycling receptacle next to the trash can. Instead, it may be because they were uncertain about whether or not the article in question was recyclable and did not want to do the “wrong” thing. By relying on facts instead of assumptions, we can then deduce the best possible action, which in this example may be to post highly visible and clear signs that provide information on what can and can't be placed in the recycling bin. This will then remove barriers impeding desired behavior and make it easier for everyone to do the right thing.

By using this method we can determine effective steps to take in our communication plan. The finished plan will consist of events, initiatives, and projects for each of the six sustainability teams. It will proceed from high level detail listing the action, the audience, and the reasoning behind it to a step-by-step plan on how to do that action including contact information, useful links, timelines, and helpful



SENSING QUESTIONS

7. Are the current goals the right goals? What assumptions or theories need to be tested?
8. Who should be involved with these sustainability goals? Anyone else?
9. Regarding this effort, where are the:
 - Managers
 - Movers and shakers
 - Coworkers
 - Staff
 - Other important people
10. What lessons should have been learned by now?
11. How can learnings be integrated into all of the organization?
12. “What is one of your proudest moments in your current position?”





hints. This will not only make outreach more effective and efficient, it will ensure continuity of the sustainability message being delivered to the installation.

Conclusion

JBLM's sustainability goals rely on the involvement of everyone on our installation, and the continued motivation of our personnel to strive for greatness is the responsibility of JBLM leadership. Becoming a completely sustainable installation will remain a difficult task, but we must remain diligent. Sustainability is a crucial component of our mission to support our customers, the war fighter and the Department of the Army, both today and in future generations. JBLM leadership has full confidence in the sustainability team's dedication and continued success in reaching our sustainability goals and more importantly faith in the sustainability concepts which are enabling us to enhance traditional management concepts and improve Servicemember support.



COL Thomas H. Brittain took command of Joint Base Garrison at (then) Fort Lewis in August 2009. Since then, he has overseen the merger of Fort Lewis and McChord Air Force Base into Joint Base Lewis-McChord. As joint base commander, he manages installation support to more than 40,000 Army and Air Force service members, plus about 55,000 Family members and a Civilian workforce of about 14,000.

Miriam Easley is the Sustainability Outreach Coordinator for Joint Base Lewis-McChord. In 2010, Miriam obtained her Masters in Sustainable Business from the Bainbridge Graduate Institute. She is enthusiastic about her role and strives to engage the community in issues of sustainability. She brings her passion for sustainability to each endeavor she pursues.

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IMCOM Strategic Planning through a Sustainability Lens

by *S. Lynn Odom, Ph.D., G-5 Program Analyst, HQ IMCOM*

Will you be a commander or leader who truly understands and operationalizes sustainability, or will you unintentionally endorse stovepipe operations which squander precious capital in a time of dwindling resources? Will your decisions improve or impede our installations' ability to support their critical missions in 2020, 2030 and even farther into the future? Will your decision set into motion a culture of endurance?

With respect to installation management, one of the most important responsibilities of a garrison commander is to direct a comprehensive vision and lead integrated long-term planning, based on the Senior Commander's priorities, that encompasses installation-wide aspects and impacts, and fully engages all affected stakeholders. Astute commanders comprehend the revelation that our installations are irreplaceable assets to our nation's defense. Utilizing them and managing them for future use go hand in hand. It is a joint venture of garrison operations teamed with the Senior Commander, tenants, and the outside community that ensures an installation's long-term mission capability and operational readiness.

Our IMCOM installations have traditionally been managed as compartmentalized operations driven by legal and other requirements (LORs) — all of which are considered as imperative by those charged with their execution.

How these perceived competing and independent LORs are met can be extremely resource intensive, thus the battle for (financial) resources begins. Justifications are based on a plethora of decision criteria such as legal citations and statements such as "if this is not completed, we will..." And unless the ending of this sentence is "go to jail..." the requirement may or may not make it above the (financial) cut line.

Instead of looking at IMCOM's LORs as competing and independent, they should be viewed as collaborative opportunities to enhance mission capabilities. Remember, issues that can be addressed through mutual agreement with regulators do not require legislative solutions. The installation should be recognized as a complex system of systems, each capable of being cognizant of the others and operating in an optimal manner. Creating a sustainable installation means examining and changing the way we plan for, invest in, and operate our installations. It means identifying approaches, technologies, and incentives that will best support the military mission, improve the quality of life in our military communities, conserve nature's capacity to provide resources, and reduce our operational costs within a competing objectives system of systems. Stepping back to take a good long look at how to make the most of the resources available (e.g. financial, human, natu-



ral, land, air, built infrastructure, et al) begs for collaboration, innovation and willingness to stop doing things 'the way they have always been done.' I know, it's a big ship that doesn't turn



Installation Sustainability in ACTION: Fort Bragg Freedom City Training



SITUATION: The crowded schedule at Fort Bragg's two other MOUT training villages threatened to hold back the deployment of units during March 2004. Over one third of 48,000 soldiers training on the installation were being deployed to Iraq at any given time, in addition to thousands of reserve and

NG soldiers mobilized for the then termed Global War on Terror???. In addition, the existing urban training sites were built to simulate more traditional towns, not realistic Iraqi villages. Fort Bragg needed another training facility and they needed it fast! First thoughts conjure up traditional a vision of funding and build out taking several months...if not longer....to construct at a cost of hundreds of thousands of dollars that was not allocated in the budget. This left Range Officer (Mr. Bill Edwards) thinking 'out-of-the-box'. He and the Director of Plans, Training and Mobilization decided to put their sustainability hats on and build a facility completely using in-house labor and available materials already on the installation, including material located in the installation landfill. The results are impressive... Fort Bragg's range control staff built the entire village in 3 months, working with only photographs of buildings located in Iraq (no blueprints). Fifty salvaged steel transport containers became the buildings enhanced by plywood to round the corners of arches and domes. The structure was painted using one hundred gallons of paint that came from the recycling center. The roads, like most dirt tracks on Fort Bragg, are surfaced with tons of ground concrete from the foundations of deconstructed buildings.

IMCOM Principles of Sustainability applied:

Mission Excellence: Soldiers are provided realistic training prior to deployment in theater.

Community Collaboration: Teamwork amongst the Fort Bragg staff to coordinate the reuse of salvaged materials from the installation's landfill and reuse center.

Environmental Stewardship: Materials were diverted from traditional disposal the installation landfill thus lessening solid and hazardous waste (paint) generation and eliminating the burden on natural resources (materials, water, energy) that would have resulted in the traditional use new virgin materials.

Economic Benefit: Project financial cost was roughly \$4,500 and cost avoidance included more than \$420,000 of new building material (based on standard construction cost).

Systems Thinking: Even today this project supports LOE 1 Soldier, Family & Civilian Readiness, LOE 3 Leader and Workforce Development, and LOE 4 Installation Readiness. Personnel innovativeness in this project brings home an understanding of the human capital (level of knowledge and willingness to apply that knowledge in non-traditional ways) contribution towards a sustainable installation.

easily, but in times of continual resource reductions, we have to roll up our sleeves. The question that should be crossing your mind right about now is "will my installation still be an asset to the Army and the community in which it resides in 25 years based on the decisions I am making today?" It is time to take on the critical thinking required to effectively move our installations from resource intensive to resource generating operations. It's time to understand sustainability and build upon the successes already achieved. Are you up for the challenge?

'Sustainability' is not the Army buzz word *de jour*, it is an evolution in systems thinking

Sustainability is not a program — it is an ethos that has been under development for some time. It is a set of guiding principles, requiring critical thinking, from which a systems approach to managing and organizing complex systems (i.e., installation management) is derived. Operationalizing sustainability at IMCOM installations has evolved over the past two or three decades from several points of reference (depending upon where one sits within this system of systems). Thus, it is not solely environmental or infrastructure or financial or human. For example:

- In the mid to late 1990s, "green building" concepts were being explored and adopted within the services. A feasibility study for implementing sustainable development concepts and principles into the Army, Navy, Air Force and Marine Corps land and facilities planning processes and programs titled, *Sustainable Planning: A Multi-Service Assessment 1999*, was the first



service-wide attempt by the DoD to address sustainability and sustainable infrastructure planning at a policy level.¹ Meanwhile, the U.S. Army Corps of Engineers established engineering technical guidance on sustainable design and construction in 1999 and the Army issued its first sustainable design and development policy in 2001. In June 2008, AR 420-1 Army Facilities Management was revised to incorporate sustainable design and development principles.

- In June 2000, the Senior Readiness Oversight Council (SROC) began reviewing encroachment issues to include endangered species habitat on military installations, unexploded ordnance and munitions constituents, competition for radio frequency spectrum, protected marine resources, competition for airspace, air pollution, noise pollution, and urban growth around military installations.² Awareness of these issues grew over time. Encroachment is now viewed in three broad categories:
 - 1) Competition of resources (for example access to land, water, airspace, and frequency spectrum).
 - 2) Development near military training areas.
 - 3) Environmental enforcement and compliance issues.³
- Research on how to manage Army owned land for continued mission training and readiness became the Army's Integrated Training Area Management (ITAM) program in 1988. The ITAM program is a core component of the Sustainable Range Program and is responsible for maintaining the land to help the Army meet its training requirements to ensure long-term sustainability.



Installation Sustainability in ACTION: Dealing with encroachment is MAJIC at Ft. Jackson

Situation: Fort Jackson completed its ISSP process in May 2006. The process identified Mission-Military Training (M-MT) as one of five installation core functions and as part of developing the M-MT team, folks from DPTMS, ITAM, DPW Environmental, Engineering and Master Planning, Unit Commands, South Carolina Army National Guard (SCARNG), state and local government, community conservation and regional planning group representatives were brought together to collaborate on issues and challenges for the future of Fort Jackson. This team established four 25-year sustainability goals, one of which was "Optimal utilization of all existing Fort Jackson lands for training purposes." At the core of this goal were the facts that regional population growth was beginning to encroach on the military installations ability to utilize land within the fence-line for training. A second team, the Regional Interaction team developed three 25-year sustainability goals, one of which was complementary to the M-MT goal, "Integrated compatible regional land use." Before the dust could settle, Mr. Bryan Hall, SCARNG Conservation Manager and Mr. Bill Hayes, Fort Jackson ITAM Coordinator built on these teams' momentum and marched forward with establishing MAJIC, the Midlands Area Joint Installation Consortium to affect a reduction of future encroachment pressures on the area's military bases and installations. Members of MAJIC include DoD partners: Fort Jackson, McCrady Training Center, McEntire Joint National Guard Base, Shaw Air Force Base and Poinsett Bombing Range together with non-DoD partners: state and local government agencies & NGO's to facilitate projects like a region-wide Joint Land Use Study (JLUS) and the development of Joint Compatible Use Buffers (JCUBs). Without losing a beat, Mr. Hall and his team at SCARNG (Ms. Karen Ellett) developed a GIS-based model to appropriately prioritize land based primarily on risk of incompatible development and high value ecological/threatened and endangered species habitat on properties where landowners were identified as willing to enter into a conservation easement within the delineated MAJIC area. In the early summer of 2007, MAJIC armed itself with facts related to the impending encroachment threat then prepared and submitted a Range Environmental Protection Initiatives (REPI) request for \$2.4M to leverage \$11.7M of partner contributions for 8 tracts of land totaling 5,541 acres within the focus area of the five installations. During 2008, MAJIC received \$1.4M which enabled the conservation of 3,506 acres of land. MAJIC continues to submit REPI request, securing another \$1.5M to date. The consortium continues to meet, and in addition to working the JCUB program, has completed a JLUS for the two counties within the MAJIC boundary and is working on the resulting land use recommendations.

IMCOM Principles of Sustainability applied:

Mission Excellence: Conservation of land around the boundary of our military bases allows installations to provide the precious resource of land for training up to the fence-line thus eliminating future voluntary training restrictions.

Community Collaboration: Regional collaboration enables landowners to keep their land without being pressured to sell and/or develop in ways incompatible with military missions.

Environmental Stewardship: Undeveloped land close to a military base allows for expanded habitat for endangered species while lessening the burden for providing for that habitat on federal land.

Economic Benefit: A comprehensive economic analysis has not yet been completed.

Systems Thinking: Regional DoD and non-DoD partnerships such as MAJIC support LOE 1 Soldier, Family & Civilian Readiness (SR5), LOE 3 Leader and Workforce Development (LW3 and LW4), and LOE 4 Installation Readiness (IR1, IR4, and IR6). The ISSP process initiated teamwork that encouraged a partnership promoting regional support for the military mission, utilized technology to depict encroachment threats, and allowed for leveraging of resources to meet compatible goals.



The proponentcy for this focus on the doctrinal capability of the Army's ranges and training land transferred from the Environmental Quality Program to the Deputy Chief of Staff for Operations in 1993.^{4,5}

- The Communications Act of 1934 and the Communications Satellite Act of 1962 govern frequency management and how the frequency spectrum is controlled. According to the June 2002 General Accounting Office report, titled *DoD Lacks a Comprehensive Plan to Manage Encroachment on Training Ranges*, DoD has lost approximately 27 percent of the total frequency spectrum allocated for aircraft telemetry since 1992 due to the reallocation of some radio frequency spectrum from federal to non-federal control. This loss of frequency spectrum is due to pressure from the telecommunications industry for consumer communications services.⁶ There is concern about the availability of adequate spectrum to support increased military operations and training. Increased airspace congestion, caused by airline industry demands, is an additional DoD concern as it is seen as a limitation on the ability of pilots to train as they will fight.
- The passage of the Federal Facilities Compliance Act in 1992 sent the message to federal agencies that public expectations with respect to environmental responsibilities had changed. The Army could no longer ignore its environmental compliance burdens due to several significant events at Army installations involving legal challenges and notices of violation that had high visibility. In

December 2007 Army Regulation (AR) 200-1, *Environmental Protection and Enhancement* was revised to incorporate legislative requirements associated with environmental components of installation sustainability and outlines associated commander responsibilities.

- The National Energy Conservation Policy Act (EPCA) of 1978 required federal agencies to perform energy surveys in order to reduce consumption of nonrenewable energy resources in buildings, vehicles, equipment, and general operations and replaced the minimum energy performance standards set by EPCA 1975. With the release of EO 13123—Greening the Government Through Efficient Energy Management in June 1999, the Army as a defense agency was required to submit an energy management report to the Office of the Deputy Under Secretary of Defense (Installations & Environment). EPCA 1978 was later amended by the Energy Policy Act (EPAAct) of 1992 and EPAAct 2005 followed by the Energy Independence and Security Act of 2007. The Army Energy Security Implementation Strategy (AESIS) was developed in January 2009 and established five strategic energy goals for the Army. Implementation of AESIS is now a specified task outlined in the Army Sustainability Campaign Plan (ASCP).

Historically, the concepts of Army installation sustainability planning began to take root in U.S. Army Forces Command (FORSCOM). FORSCOM responded to SROC encroachment concerns by examining approaches to address mission, community and environmental en-

croachment. In March 2000, US Army leadership met at the Senior Environmental Leadership Conference in Washington, D.C., to discuss its concerns about environmental issues and Army missions. The conference mandate, published in *An Operational Directive and Campaign Plan* signed by the Vice Chief of Staff of the Army on November 17, 2000, was to develop “an integrated strategy, with a defined end-state, that ties resources to objectives and engages stakeholders at all levels to sustain the mission.” FORSCOM's Installation Sustainability Program (ISP) was developed to meet this mandate under the guidance of MG Geoffrey D. Miller, the FORSCOM Deputy Chief of Staff for Personnel and Installation Management.⁷

At Fort Hood in May 2000, FORSCOM convened for an initial working group comprising environmental managers from FORSCOM installations. The working group reviewed and discussed various planning frameworks and decided that academic, civil community and industry sustainability concepts and planning were best suited to address their installations' inextricably linked needs. This session resulted in the creation of an evolving long-range planning process that requires active engagement of operators, installation personnel, regulators, and the local community to create and achieve strategic sustainability goals. In 2001, the FORSCOM deputy commanding general issued a requirement and schedule for FORSCOM installations to initiate the ISP.⁸

The first installation to host an installation-wide sustainability planning session and develop a comprehensive



uphill.” Thus, the task of operationalizing sustainability across an installation’s complex system of systems will not be embraced as just another Army program. It will be embraced when stakeholders accept sustainability as an ethos, a personal commitment to cooperatively and collaboratively work as a team in support of the current mission with the future mission in mind.

Due to the very real multi-disciplined nature of developing and implementing a 25-year installation-wide sustainability strategy and the recognition that there was a need for long-range integrated planning, IMCOM installations (having completed the sustainability planning process) requested that sustainability oversight move from the narrowed scope of the environmental staff to the broader scope of the plans staff. To facilitate this responsibility, HQ IMCOM, chartered the Center for Future Installation Strategies, Sustainability and Emerging Technologies Branch in February 2009, which is now known as G5 (Strategic Planning Division (SPD)). The IMCOM Sustainability Working Group (ISWG), formed in June 2009 and co-chaired by SPD and U.S. Army Environmental Command (USAEC), defined sustainability as the proficient and efficient management of resources — financial, human capital (personnel, information, institutional knowledge, technical expertise), infrastructure, natural capital (land, water, air, airspace), energy, technology — so they are available when needed to support current and future mission requirements at our installations.

As installations successes have mounted, many in the Army grew to under-

stand and embrace sustainability as a valuable planning concept and framework that is today referred to as the Integrated Strategic and Sustainability Planning (ISSP) process.

The first step in operationalizing sustainability on a personal level is to become educated in the concepts of sustainability and aware of what academia, industry, communities, and other installations have achieved (through successes and lessons learned). Two of the numerous installation sustainability successes are highlighted early in this article. As Army sustainability has evolved from the narrowed scope of environmental systems to the broader scope of resource security and stability, the IMCOM principles of sustainability have evolved—

- (1) Mission Excellence — IMCOM’s proficiency in managing its resources necessary to support the installation tenants’ ability to achieve their missions.
- (2) Community Collaboration — IMCOM’s proficiency in ensuring the long-term viability of its installations through active local and regional partnerships supporting mutually beneficial goals and objectives.
- (3) Environmental Stewardship — IMCOM’s proficiency in meeting mission requirements through prudent life-cycle use of resources, active environmental management, and replenishable conservation.
- (4) Economic Benefit — IMCOM’s proficiency in realizing true cost savings, eliminating duplication of effort and expanding services through cross-functional planning and cooperative resourcing.

- (5) Systems Thinking — IMCOM’s proficiency in identifying and exploiting interrelationships within and between LOEs and operations that optimize resource allocation and process performance.

To operationalize sustainability, all stakeholders who have a role in installation management must understand and apply the principles of sustainability to enterprise operations and the fulfillment of LORs. We must begin to ask and clearly define — what is the service we need? — what is the requirement we must fulfill? — followed by, how can we attain that service or fulfill that requirement while building our future installation capabilities? A prime example is the concept of demolition. What is the service the installation requires? The installation needs a building removed. Can the building be removed by a means that enhances future installation capability? Yes, the building could be deconstructed (in whole or in part) so that useful building materials can be salvaged for future use in the Army construction and maintenance program (see AR 405-90; 6-5c.(1)(a)). Concrete from a deconstructed building can be stockpiled and crushed for use to refortify tank trails and low-water crossings, thus enhancing mission capabilities. The World War II wood can be planed for reuse. Changing the mindset from one of “it’s always been done that way” to one of “we can do that” will take leadership support and integrated planning so that resources will be there when needed for mission support. Managing resources requires accountability — it is imperative that IMCOM move away from the concept of “what we can’t do,” and



build on our vision by collaborating on “what we can do.” The deconstruction example represents a minuscule sample of what is possible when we move from a mindset of ‘resource intensive’ to ‘resource generating.’ We do not have to keep cutting up the pie; we need to share recipes for making pies.

The ISSP Process as it has evolved

AR 5-1 requires installations to “develop and periodically update, as appropriate, macro-level, cross-functional strategic plans that support continuous organizational performance improvement based upon customer requirements and feedback.” AR 200-1 requires Senior Commanders to “participate in the installation’s planning, sustainability efforts, and EMS” and garrison commanders to “ensure that the installation strategic planning office (or equivalent) incorporates sustainability principles into strategic and other installation management plans; coordinate installation strategic plans with the [Senior Commander] prior to finalization.” Personnel who understand how the principles of sustainability are inextricably linked to one another and directly relate to the Army’s tenets of sustainability outlined in Army Sustainability Campaign Plan (ASCP) and Lines of Effort (LOEs) outlined in Installation Management Campaign Plan (IMCP) are able to produce an effective plan that conveys the installation’s vision, mission and goals, AND how AND with what resources the installation will move from point A to point B in its 25-year journey.

Applying the principles of sustainability is an evolution in planning and execution. Following the ISSP process, cross-functional installation-wide

planning efforts drive an integrated installation-wide strategic action plan, not a compartmentalized garrison strategic plan or independent tenant plans. This installation-level process has proven itself with value-add results in resource-efficient initiatives and effective community-wide partnerships as described in the enclosed cited successes. It is time to take this effort to the next level to ensure that the process continually improves to fully support current and future campaign plans of our Senior Commanders.

The ISSP process, as stated earlier, follows the “A-B-C-D-E-F-G” Strategic Planning Model depicted in Figure 1. Key features that attribute to the success of the ISSP process include:

- a long-term planning period (25-year goals) that transcends command and reflects an enduring installation;
- active participation from garrison staff, installation tenants and community stakeholders (inside and outside the fence line);
- collaborative cross-functional teams that know how to plan for and optimize resource allocations for mutual benefit;
- resourced operational implementation initiatives (3-5 years) and tactical action plans (1-3 years) that are reflective of installation-specific issue and challenges; and
- an agreed upon governance structure with clearly articulated roles and responsibilities within a complex installation-wide hierarchy.

Prudent management of the

overall (installation) system is a necessity for successful planning, execution, evaluation and continual process improvement. David Barber (IMCOM-EU Environmental Division), in reflecting on the planning and implementation sides of the sustainability coin said, “It is one thing to go through this inspiring process and develop a plan, but without leadership commitment to resource that plan it is easy to fall back into the routine. As a leader you cannot say, ‘let’s be a sustainable installation,’ then put your resources elsewhere. We have to bridge the gap between the [ISSP] process that ‘brings the cream to the top’ and providing the resources needed to harvest that cream.” As installation action plans are developed and aligned with resource [human, financial, natural and man-made capital] requirements via time-lining, it becomes apparent today what short- and mid-term POM cycle human resource priorities are needed in the future. Through collaboration, inside and outside the fence-line, installations can leverage resources with their partners.

Figure 3: Army Triple Bottom Line, Plus.





The six IMCP LOEs are a reflection of the IMCOM commander's intent to create Sustainable Army Communities of Excellence and are the commander's priorities over the next 6 years (2010-2017). As such, these will be the foundation for development and integration of future installation strategic action plans being developed via the ISSP process.

Conclusion

It has been demonstrated that collaborative installation-wide planning with visible command support and community participation will drive integrated long-term partnerships and execution efforts that operationalize sustainability at our IMCOM installations. Mary Barber, USAG Fort Carson Sustainability Coordinator since their planning sessions in 2002 recently commented, "Our garrison Commander-hosted monthly breakfasts, annual conference and other educational events in partnership with the community, our attempts to be transparent and accountable to all stakeholders, and our team's visibility throughout southeastern Colorado demonstrate our commitment and understanding that sustainability requires a shared vision and direction." Gretchen Kent, Fort Huachuca PAIO Chief recently stated with respect to the IMCOM ISSP process, "One direct result of the Sustainability planning [process] was the basic understanding that the issues were complex and we needed some expert advice." She continued with specific reference to the 2008 Fort Huachuca ISSP efforts, "What is really interesting to me is that even though we have not done a formal update of the sustainability plan, many of the issues continue to be worked -- something about the planning process

'embedded' the need in many of the participants (not just in the USAG) and they continue to work the issues, more than two years after."

IMCOM installations that have embraced the sustainability planning challenge understand that their local communities look to the installation for leadership, inspiration and momentum for achieving regional sustainability. Forts Bragg, Jackson, Benning, Lewis, Carson and Hood et al have welcomed their local community as a team player in this joint endeavor of shaping sustainable installations. Sustainable Fort Carson received the 2010 Community Sustainability Award in November 2010. Cindy McLaughlin, wife of the Garrison Commander, USAG Fort Carson stated during the 18-19 November 2010 Southern Colorado Sustainable Communities Conference, "What I learned at the conference is that "sustainability" is far reaching and means so much more than being good stewards of our environment. There is opportunity in everything we do, from the foods we choose; to the time we take to make sure we are caring for ourselves which all contribute to a stronger, more sustainable family and community. And, for me, it was great to see in real programs that the army recognizes this and is putting effort behind making our team, the army family, as resilient as possible."

If you were able to travel into the future, what would those serving in your position be saying about the installation you left behind? Would you find that the decisions you are making today contributed towards a reduced mission capability or even the closure of your installation? Or would you find a thriving legacy of

innovation and efficiency resulting in enhanced mission capability?



Dr. S. Lynn Odom has more than 15 years experience working within the realm of sustainability, including seven years working on Army sustainability efforts preceded by being a founding member of the Laboratory for Sustainability at the University of South Carolina, where she received her Doctorate Degree in Mechanical Engineering in 2001.

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Integrated Installation Planning: Fort Leonard Wood ensures a sustainable future

by COL Charles Williams, Commander, USAG Fort Leonard Wood

Garrison commanders (GC) have the combined responsibilities to provide the infrastructure, services and facilities to ensure that the installation's military mission requirements are met, and at the same time, to ensure that Service Members, Family Members, and Civilians are afforded the highest standard of living possible. The GC must also incorporate the current priorities of the Senior Commander, the requirements of IMCOM Headquarters and the impact on the surrounding communities while concurrently anticipating changing realities and future requirements including deployments, mission changes and fiscal restructure.

Fort Leonard Wood (FLW) is a thriving and prosperous post that trains 80,000-90,000 Military and Civilians each year. It is home to the U.S. Army Chemical, Biological Radiological and Nuclear School, the U.S. Army Engineer School, the U.S. Army Military Police School, the Army's largest Non-Commissioned Officers Academy, 1,700 interservice personnel including Navy, Marines, and Air Force, the 102nd U.S. Army Reserve Training Division headquarters, and the 35th Engineer Brigade, Missouri Army National Guard. FLW is a proven valued Army investment. In addition to the Training and Doctrine Command (TRADOC) mission, over the past several years, it has received numerous additional responsibilities, which includes supporting and taking care of a large Forces Command

(FORSCOM) presence with deployable units including the 4th Maneuver Enhancement Brigade Headquarters as well as four battalion headquarters and 25 subordinate or separate companies. FLW is also home to the entire Department of Defense (DoD) truck driver training and has a large international student detachment with representation from more than 120 countries. Add to these the strength of our retirees, families, civilians, resident school district presence, and industry and academic liaisons, and you have the full picture of FLW's current population served – more than 100,000 - competencies and contributions to the Army and nation. Our estimated regional economic impact is \$3 billion.

Clearly, FLW is an extremely complex installation, and the GC balances daily operations in order to manage and meet or exceed the widely varying customer expectations. This is accomplished through integrated planning, coordination and effective communications that optimize use of finite resources

Integrated long-term and sustainability planning

As the new Senior Commander, MG David Quantock, began developing his campaign plan covering a two- to five-year window. Quantock and his staff, as well as the GC and garrison staff, realized that to have long-term, sustainable services and products, we had to find a methodology to





This phase was somewhat challenging since many of the objectives are very long-term without a clear, actionable path to accomplishment; however, we have acknowledged that this is a living document and are comfortable working toward long-term, one step at a time.

incorporate FLW's mission, energy, environmental, infrastructure and resource planning not only into the two- to five-year planning cycle, but also into a long-term strategy that supported the DoD and Army goals.

With the assistance of Army Environmental Command (AEC), HQ IMCOM, the Army Corps of Engineers Research and Development Center (ERDC) Construction Engineer Research Laboratory (CERL), and the Center for Sustainable Solutions, we initiated our process for developing a 25-year Integrated Strategic Sustainability Plan (ISSP). The Senior Commander and the command team fully support the initiative, and after gaining buy-in from other key staff organizations, Quantock issued an operations order (OPORD) for the process to ensure that his intent was clear and to maximize participation from all key organizations on FLW. Although the garrison has the responsibility for this process, nearly every organization on post has touch points and participates.

The sustainability planning process began with organizational leaders identifying the installation's key business areas or lines of effort, which are: (1) Infrastructure and Energy; (2) Mission Services; (3) Community Engagement; (4) Caring for Service Members, Families and Civilians; (5) Workforce Development; and (6) Training Lands, Ranges and Facilities. The teams con-

ducted analyses on strengths, weaknesses, opportunities and threats for each area and the major challenges. Next, cross-functional teams developed long-term strategic goals to capitalize on identified strengths and opportunities and to improve and counter weaknesses and threats.

The team held battle rhythm interim progress reviews and azimuth checks with the Senior Commander, the GC and other key leaders. The teams also conducted cross-walks and comparisons of the sustainability strategic goals to various executive orders, directives and regulations to ensure that the goals were coordinated and nested.

Once goals were in place for each line of effort, subordinate objectives were drafted. With the help of CERL, the long-term sustainability plans of other installations were examined for lessons learned and other considerations. FLW team representatives were sent to installations with proven success in sustainability planning to gather additional information. At this point, objectives were refined and subordinate action plans were developed to ensure success along the line of effort. This phase was somewhat challenging since many of the objectives are very long-term without a clear, actionable path to accomplishment; however, we have acknowledged that this is a living document and are comfortable working toward long-term, one step at a time.

As previously mentioned, the team went to great lengths to follow and cross-walk efforts with other orders and regulations; in addition, we cross-walked with the IMCOM Campaign Plan (IMCP), the Senior Commander's campaign plan and other related staffing actions. Our goal was to ensure that efforts were not duplicative but were complementary. In our cross-walk activities, the ISSP teams' analysis found that the majority of the sustainability initiatives were already included and inherent in the IMCP.

The ISSP teams met in February to review the draft goals, objectives and actions, and to establish metrics as well as define resource requirements. The final draft is being staffed to all installation organizations for feedback. Once the staffing is complete, our intent is to input it into an automated application that will allow us to easily communicate and coordinate the elements of the plan on a regular recurring basis.

We have studied various methods of automating our plan to include the Army's Strategic Management System, which is used to track other campaign plans including IMCP. At this time, we are working with ERDC-CERL to design and establish a secure web-based application that will be accessible behind Engineering Knowledge Online (EKO). The application will be accessible for viewing the ISSP goals and supporting objectives and actions, for



“Army’s net zero goal is for installations to be net zero, based on net zero energy, net zero water and net zero waste, all striving towards sustainable installations. We are creating a culture that recognizes the value of sustainability measures in terms of financial, mission capability, quality of life, local community relationships, and preserving the Army’s future options.”

inputting data, and for conducting performance updates. This is a collaborative system that will allow the key business managers to stay coordinated with a plan that will run more than two decades.

In a related effort, FLW was selected in December 2010 as the site for the U.S. Army Corps of Engineers’ (USACE) 2030 Integration Project, which will directly support our ISSP infrastructure and energy goals and objectives. Recently, the Assistant Secretary of the Army for Installations, Energy and Environment (ASA-IE&E) said “Army’s net zero goal is for installations to be net zero, based on net zero energy, net zero water and net zero waste, all striving towards sustainable installations. We are creating a culture that recognizes the value of sustainability measures in terms of financial, mission capability, quality of life, local community relationships, and preserving the Army’s future options.”

The Integration Project and our ISSP key business areas are right on track with the Army goal. The Integration Project study team is focusing on our Basic Training Barracks projects and Advanced Individual Training Complex 2 as examples to develop strategies for creating net zero facilities that reduce demands on energy, water and solid waste disposal. The latest technology and design methods are

being explored, as well as the impacts of highly technical systems on future maintenance and operations. The project will help in setting the Army’s strategy and design guides to maximize net gains on a systems, building and community scale that will result in the construction of a net zero energy, net zero water and net zero waste area development that meets or exceeds specified sustainability and energy mandates up to fiscal year 2030.

The challenges ahead will be to maintain these ISSP planning instruments and automated systems and to orient the changing commanders and staff on the goals and objectives. As personnel changes take place across the installation, new members of the ISSP planning teams will have to step up and work the plan. One thing is certain, communication and leader involvement will be a must and key to carrying forward our accomplishments to date and realizing the long-term goals.

Nesting and integrating with IMCOM’s and the Senior Commander’s plans

The garrison staff conducted a detailed analysis of the IMCP and developed a subordinate Garrison Campaign Plan (GCP), which seeks to execute and implement the IMCP.

The garrison staff also worked closely

with the Senior Commander’s staff as they developed and made changes to his campaign plan, which designates garrison as lead for a line of effort titled “Take Care of People and Ensure Quality of Life.” This line of effort’s purpose is generally to ensure execution of the IMCP and GCP as well as ISSP. This provided a perfect opportunity to integrate all existing garrison and IMCOM sustainability planning efforts into the senior commander’s battle rhythm and governance. Three objectives were included in the line of effort.

The first objective was to establish FLW as an Army Community of Excellence (ACOE). The objective was a match to executing the GCP, which aligned with the IMCP and is the basis for the ACOE recognition.

The second objective was to establish and coordinate a strategic sustainability plan with nested energy studies. This objective was a match to the ISSP that was already under development.

The third objective was to develop a customer focused sustainment organization. This objective was a match for the Customer Relationship Management System keynoted by our Interactive Customer Evaluation System (ICE).

By building the garrison’s planning tools into the Senior Commander’s



campaign plan, it made our plans actionable to him, and it institutionalizes our plans into the overall systematic process. In addition, it gives visibility to milestones, issues and decision points with the Senior Commander.

The garrison briefs the line of effort's status once per quarter to all installation leaders at the Senior Commander's Executive Session, which is actually a campaign synchronization meeting. Updates on the integrated planning process are also provided at the Chief of Staff's staff calls, the GC's staff meetings and the town-halls that the GC conducts for garrison employees. Details of each of the line of effort objectives are further discussed in other planning meetings. The GCP is reviewed at the semi-annual Installation Planning Board. The ICE results are discussed at the quarterly Installation Action Council (IAC).

We have successfully integrated the garrison plans and planning process into the Senior Commander's plans and planning process. At the December 2010 Maneuver Support Center of Excellence offsite, we briefed our line of effort with extensive detail on the three objectives. The Senior Commander and his staff actively participated in the development and the planned governance for the line of effort. Integration is also shown in the reporting processes already in place. At the last Installation Planning Board, the Installation Priority List was developed from the priorities that are listed in the GCP and are thus in the Senior Commander's campaign plan under the "Take Care of People and Ensure Quality of Life" line of effort. At the recent Installation Action Council, the

ICE results were discussed for the last two quarters and issues were developed for follow-on actions.

The key advantage is that the plans and processes are now integrated into the Senior Commander's plan and are systematically reviewed.

Summary

By integrating the garrison plans into the Senior Commander's plans, we are making the plans actionable for him and are able to bring the IMCP through the GCP and the ISSP to an installation focus. This provides a previously unrealized opportunity to have a coordinated planning effort, not only at the garrison level but also at the Senior Commander level. This allows us the opportunity to create a culture that recognizes the value of sustainability measures in terms of financial, mission capability, quality of life and local community relationships, while also preserving the Army's future options through appropriately stewarding available resources, managing costs and providing our service Members, Families and Civilians with a sustainable future. This assures us that we are correctly integrating IMCOM and Department of Army priorities into our planning. This process also benefits us in building vital relationships to provide continuity and resilience both on the installation and with surrounding communities for creating long-term sustainability initiatives.



COL Chuck Williams assumed command of USAG Fort Leonard Wood in May 2009. He began his career as a Military Policeman and was later commissioned as an Armor Officer through the Officer Candidate School at Fort Benning. He earned his Bachelor of Science in Criminal Justice at Eastern Kentucky University and his Masters of Science in Counseling Psychology and Leader Development from Long Island University. His military education includes the Armor Officers Basic Course, Military Police Officer Advanced Course, Combined Arms Services and Staff School, and the Command and General Staff College. He was selected for the Senior Service College in 2006.

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