PENNSYLVANIA ARMY NATIONAL GUARD
SECRETARY OF THE ARMY ENVIRONMENTAL AWARDS FY14
SUSTAINABILITY—NON-INDUSTRIAL INSTALLATION

Introduction & Background

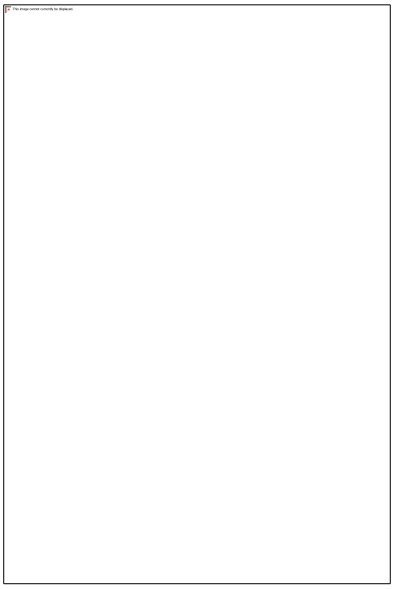
The Pennsylvania Army National Guard (PAARNG) Fort Indiantown Gap National Guard Training Center (FIG-NGTC) is the only live fire, maneuver military training facility in the state. Located in Central Pennsylvania, Fort Indiantown Gap has a military mission that supports over 18,000 PAARNG personnel each year, including the largest and most deployed Army and Air Guard, the 56th Stryker Brigade Combat (SBCT) and the 28th Infantry Division. Guard, Reserve, Active Army, Navy and Marine units, law enforcement entities from Pennsylvania and other states, as well as Joint Services with the Air Force, swell the training lands' and facilities' users to over 230,000 personnel each year. Over $150 million of new construction has been executed over the past ten years at FIG-NGTC. All the activities on the installation are designed to enhance the quality of training for the soldiers, and for environmental resources as well. Components of its operation effectively integrate installation chain-of-command with the interests of resource management agencies, private conservation groups, regulatory agencies, and the local community to conserve resources while providing an optimal atmosphere for military training and readiness. FIG-NGTC is comprised of 17,150 acres and is a Tier II military installation, providing training to military personnel while also sustaining vital habitat for rare native flora and fauna. The PAARNG commitment to installation sustainability ensures that FIG-NGTC will continue to be among the finest training facilities in the nation.

The Sustainability program at FIG-NGTC has achieved several milestones over the past two years across a range of program aspects. Conventional recycling on post has been expanded and now includes reuse of recovered sewage sludge for sustainable landscaping, and the post is on its ways to meeting or again exceeding its goal of 50 percent diversion through recycling. The Sustainability program staff completed a rewrite of the energy plan this year and is in the process of implementing a new solar array on the training site. In addition, a new hazardous material management plan was developed and launched this year. A large-scale conversion from heating oil to natural gas has yielded tremendous cost savings of around $1 million each year while eliminating environmental liability.

Program management for sustainability activities is undertaken by individuals across several departments to ensure full coordination and oversight. Within the environmental bureau, primary day-to-day operations are completed by the installation EPAS manager, federal technician, compliance manager, air/water/sewer specialist, UST/spill specialist, planning personnel, and RCRA manager. This team is further supported by the post energy manager and facilities and engineering staff. More broadly, however, sustainability is an ethic that is instilled in all departments and directorates at FIG-NGTC, promoting organization-wide accountability and ownership. The installation also has a vibrant eMS program with strong inter-departmental EQCC participation and support. The eMS program is focused on significant aspects of energy

reduction and Army Compatible Use Buffer (ACUB) development. Cross-functional teams incorporate environmental, engineering, and facilities management experts to promote these programmatic goals, coordinate with trainers and officers, and provide training. Additionally, the post recycling committee meets regularly to review progress towards waste diversion goals and strategize ways to encourage greater program participation and expansion.

The sustainability ethic and extensive training help to ensure full environmental compliance at FIG-NGTC, which has long maintained excellent regulatory relationships. Thorough planning also aids compliance; the energy plan was rewritten this year, and the hazardous material management plan was revised last year. The new hazardous materials plan also features a green procurement addendum that encourages all staff and soldiers to replace hazardous materials with green substitutes whenever possible. If there is a question about product efficacy, the Sustainability program is available to acquire and test green products in order to justify a switch. All Spill Control and Countermeasure (SPCC) plans are reviewed annually. The range of expertise among the environmental staff means that these plans can be maintained and updated in-house at minimal cost. Doing the SPCC plans in house saves between $13,000 and $15,000 in contracting costs each year, and the Sustainability staff also perform all necessary training and refresher courses. The staff manages nearly all projects in-house, from spill response and clean up to well monitoring and soil testing.



The sustainability staff located a specialty smelter in Minnesota that would grind up the blocks and recover the lead residue. The cost to the PAARNG is the transportation and recycling of the blocks, which is less than the disposal cost of hazardous waste. All the components of the blocks are recycled with a savings of approximately 70 percent.

In other areas, program savings are achieved through cost-sharing and resource leverage; Sustainability initiatives also directly contribute to avoided costs associated with waste disposal and utility usage. Funding for the new solar array being installed along a service road was acquired through operations and maintenance funds through a Power Purchase Agreement Provider. The Sustainability program's push to convert buildings from heating oil to natural gas systems has also resulted in a utility cost savings of approximately 40 percent. The Sustainability program has also negotiated contracts with Safety-Kleen for free pick up of used oil and antifreeze; only new antifreeze needs to be purchased in the installation shops. Recycling innovations have also saved FIG-NGTC disposal costs while often generating revenue.

Some of the greatest Sustainability gains over the past two years have been centered in the FIG-NGTC recycling program. Waste diversion remains a key goal for the PAARNG, with progress continuing to achieve 50 percent diversion of non-hazardous solid waste and 60 percent diversion of construction and demolition waste by 2015-2020. Last year, the installation exceeded its recycling rate goal and is on track to meet or exceed this year's target as well. Everything except glass is recycled on the installation, including batteries, tires, oil, and antifreeze. The installation QRP generates revenue to support and expand the recycling program, health and safety initiatives, and morale, welfare, and recreation purchases.

	2013	2014 (to 6/30)
Recycled Material	**Tons Diverted**	**Tons Diverted**
Fluorescent Bulbs	2	3
Aluminum	.214	2.45
Cardboard	155.4	50
Paper	76.89	4.64
Miscellaneous Metal	5357	3657.4
Plastic	6.56	.27
Grease	.77	.008
Expended Brass	47	2.77
Statewide Cardboard	168	
Antifreeze	52	25.2
Batteries	1.4	
Tires	17.23	
Used Motor Oil	52	84.4
Ammunition cans/boxes	9.89	
Rubber Range Blocks	16.5	
Wood Pallets	4.5	5
*WWTP Sludge (land applied)	307	91
Fuel-Oil Contaminated w/ Water		15.2
Total Diverted	6274.35	3941.34
Landfill Waste	**Tons Disposed**	**Tons Disposed**
WWTP Sludge	281	117
Construction & Demolition	450	57.17
General Trash	1219	536

Statewide Waste	890	420
Petroleum Contaminated Soil	29.14	0
Total Disposed	2588.14	1013.17
Total Diversion Rate	**70.80%**	**79.55%**

*Sludge from waste water treatment plant was not recycled per se, but diverted from landfill

Throughout 2012, 2013, and 2014, the resulting sludge (biosolids) was used to sustainably fertilize fields spanning about 25 acres. The fields produce Timothy Hay which is harvested and used for sedimentation control, erosion repair, construction projects, and land stabilization throughout the installation. This sustainable agricultural practice eliminates the costs associated with disposing of sludge and purchasing hay.

A sludge press was installed at the FIG-NGTC Wastewater Treatment Plant in 2010. During 2011, the Bureau of Environmental Management obtained a General Permit through the Pennsylvania DEP allowing the Installation to beneficially reuse the sludge generated at the wastewater treatment plant. Throughout 2012, 2013, and 2014, the resulting sludge (Biosolids) was used to sustainably fertilize fields spanning approximately 25 acres. The fields produce Timothy Hay which is harvested and used for sedimentation control, erosion repair, construction, and land stabilization throughout the installation. This sustainable agricultural practice eliminates cost associated with disposing of the sludge at the landfill as well as the cost of purchasing Hay used for establishing vegetation at construction projects on the installation. The QRP funded the cost of the agricultural equipment used in this process.

Based on previous Landfill disposal costs, the diversion of sewage sludge from the landfill alone saves the PAARNG nearly $20,000 each year. Indeed, with disposal rates averaging $65 per ton over the past several years, the recycling program represents over $400,000 in costs avoided each year. The chart below represents estimates of the revenue generated from the QRP program.

FY2013		FY2014	
ASP Recycling	$198,873.63	ASP recycling	$27,111.45
Aluminum cans	$747.49	Aluminum Cans	$359.40
Brass Scrap	$10,774.68	Aluminum Scrap	$1,206.00
Cardboard	$17,338.53	Cardboard	$8,884.68
Copper	$837.76	Kitchen Grease	$283.00
Kitchen Grease	$292.50	Miscellaneous Metal	$28,723.80
Misc Metal	$41,341.04	Paper	$5,320.67
Plastic	$251.72	Plastic	$124.00
Paper	$11,221.15		
Total	**$281,678.50**	**Total**	**$58,982.33**

The Sustainability program also implemented recycling for rubber backstops used on firing ranges, finding a solution to a unique training site challenge. Rubber backstops that are roughly 2 x1'x1'in size and panels that are roughly 3'x4' in size are used behind targets at the FIG-NGTC small arms ranges in order to prevent erosion of the berms. The block captures the lead rounds and prevents ground contamination—but the installation is left with a lead-contaminated rubber block. Instead of disposing of these materials as hazardous waste; in 2013 the Sustainability program located a specialty smelter in Minnesota that employs a process of grinding up the block, recovering the lead residue, and recycling all the components. The cost to the PAARNG is transport of the blocks and the recycling of the blocks which is less than the disposal cost of hazardous waste. This is a savings of approximately 70 percent.

Fort Indiantown Gap continually strives to improve its recycling program. Everything except glass is recycled on the installation including batteries, tires, oil, antifreeze, and expended brass casings. SSG Brian Powell from the PAARNG shows brass casings that will be recycled.

As demolition projects continue on post, concrete is recovered using grinders on site; the crushed concrete is then reused for road material in training corridors and on erosion control projects. Recovering the demolition debris simultaneously avoids disposal costs and expenditures for purchase of new gravel and construction material.

Material Management and Substitution: The installation CSMS-E (Combined Support Maintenance Shop-East) is pursuing OSHA Star status and implementing a new pharmacy system to enhance material management. In addition, CSMS-E staff have piloted installation of secure workstation lock boxes and mini flammable cabinets to enhance individual accountability and control of workstation needs, thereby reducing redundant ordering or waste. The storage cabinets were purchased with QRP funds.

When paint is picked up from various locations for disposal, it is taken first to the installation paint shop to determine if there is another facility that can use it, similarly avoiding new purchase and wasted disposal costs. As facilities are closed down or moved, any remaining materials are collected and routed to FIG-NGTC as a central point; an internal network allows various armories and shops to request materials rather than simply dispose of them.

In terms of material substitution, the installation has focused over the past two years on eliminating heating oil tanks in favor of natural gas conversion. Natural gas is a greener, cheaper alternative that also avoids the inspections/maintenance costs, and spill or leak liability associated with heating oil tanks. In one year, the installation has saved over $1 million in utility costs through the natural gas conversion. Over 400

aboveground storage tanks have been removed, saving countless hours of inspections and servicing. Now the installation has fewer than 100 remaining under/aboveground storage tanks, and the installation's heating systems are operating much more efficiently.

Green Construction, Sustainable Landscapes, and Alternative Energy: The rehabilitations of older structures use LEED guidance to enhance energy/resource savings and efficiency. The reuse of biosolids discussed above has contributed to sustainable practices and supports broader land management by natural resources and ITAM staff. The installation continues to develop the resources to be fully self-sustaining. The ten-year-old wastewater treatment plant at FIG-NGTC processes around 700,000 gallons of water daily (permitted for 1 million gallons). The installation is focused now on updating the wastewater collection system that is 70 years old in some areas. Between 85 and 90 percent of the training site's pipe system has been upgraded to prevent groundwater from leaking into the wastewater system. The wastewater treatment plant (WWTP) continues to test for alternative green treatment chemicals to reduce environmental and safety concerns and improve efficiency. Throughout the installation, Sustainability staff ensure that wash racks and other equipment have working valves and covers to prevent feeding the wastewater system with rainwater. The QRP program has funded the purchase of automated composite samplers which allow the installation to maintain compliance with its NPDES Permit.

In energy conservation, the installation has instituted off-peak energy deals with utility providers and maintains numerous emergency generators on post. Rather than simply firing up these generators as part of testing and maintenance, the Sustainability staff coordinates with local utilities to have these maintenance events supply energy for portions of the installation during peak demand times. In return, FIG-NGTC receives energy cost subsidies. Staff also continue to conduct energy audits throughout the installation and elsewhere in the state to identify energy hogs, develop costs of retrofitting older facilities, and acquire more energy efficient equipment. The installation is currently competing for grant funding to support a joint project with an area contractor to construct a 17-acre solar field. Under a unique opportunity in the state, the contractor would pay the costs of installing the field and resell energy to FIG-NGTC. FIG-NGTC would benefit by purchasing the energy at a reduced rate and then owning the solar field after approximately 10 years.

Other ongoing construction projects include a running track sited at a legacy landfill from the 1940s. While the landfill site is being capped and will not be eligible for significant use in training, the minimally invasive track allows the installation to keep the site in use rather than sacrifice other training areas for this need.

In addition to the use of biosolids on hay fields, FIG-NGTC blends the goals of the natural resources and sustainability programs to offer sustainable wood fuel to soldiers and the community. When trees fall on a training area, the maintenance staff assists by dragging the trees to a harvesting area which is easily accessible to installation neighbors who are invited to collect firewood. Branches are ground up and reused as mulch. The tub grinder was purchased with QRP funds, and a nominal woodcutting permit helps to support this outreach program.

All the undertakings of the Sustainability program are done with the intent of protecting and enhancing the training and readiness capabilities of the PAARNG and FIG-NGTC now and in the future. The sustainability ethic is ingrained through the entire training site's operations, so that responsibility and awareness is not limited to the purview of the environmental branch. Each unit on post has its own environmental officer to manage pollution prevention, energy and resource conservation, waste and material management, and environmental awareness. The Sustainability staff coordinates with these officers to ensure that all internal stakeholders are fully trained multiple times a year. Extensive training, tailored management plans, and regular review of sustainability processes all combine to create continuity throughout the installation and ensure compliance, which in turn protects operations from regulatory issues. The projects and accomplishments of the Sustainability program over the past two years have also enhanced efficiency and cost savings, thereby freeing ever greater resources to support other mission needs.

The Sustainability staff of FIG-NGTC are involved in the broader environmental community to share their expertise and assistance as widely as possible. Staff sit on various environmental committees in the region and at the NGB level, including the Environmental Advisory Council, Chesapeake Bay Action Team, Training and NEPA committee, and Conservation Committee. Another staff member is the president of the national Military Lands Wildlife Association. Relationships forged in these organizations have also fostered partnerships with state agencies, like the Pennsylvania Game Commission and Bureau of Forestry, which provide management assistance and guidance. As an environmental leader in the region, providing other states and military units with the tools they need to be equally successful remains a priority for the PAARNG.

FIG-NGTC has long prided itself on its community outreach and accessibility. FIG-NGTC is an open post, with an extremely robust hunting and fishing program, as well as popular resources related to its growing populations of endangered Regal Fritillary butterflies and its rich cultural and military history. The installation hosts National Lands Trust Day events every year and received grant funding to conduct special projects to beautify and maintain unique natural and cultural features at the training site. One longstanding partnership involves the Milton Hershey School, through which disadvantaged children are invited to participate in environmental service days on the installation and learn more about sustainability and the PAARNG. Earth Day events are held every year, and these involve aspects unique to the Sustainability program, with displays and presentations emphasizing recycling and energy conservation.

Over the past two years, the installation has hosted booths, education displays, educational materials, and discussion opportunities at the Annual Armed Forces Day, Historic Annville Days, Cleanup Open House events, Annual Guard Day at the state Capital, Annual Diversity Day at FIG-NGTC, multiple Chamber of Commerce events, annual FIG-NGTC Earth Day celebrations, displays in the FIG-NGTC Administrative Building, and more. The installation's ACUB has led to even greater partnership expansion. These relationships help to expand the installation Sustainability program's capacity for outreach and education among the broader FIG-NGTC community.